Examining the impact of Management Control Systems use on the development of firm capabilities

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Abstract:

Organizations under great pressure to deliver value, believe that Management Control Systems (MCS) can help them in this task. MCS research has been done regarding design criteria, purposes, types and factors that influence the adoption or use, but less is known about MCS impact in the organizational capabilities that trigger performance. The research question is: What is the impact of MCS use in generating capabilities of Entrepreneurial Orientation (EO) and Learning Orientation (LO) in firms. The hypothesized relationship was tested using a unique and self-devised dataset of 644 firms in Mexico. The main findings show that the type of MCS use is related to the capabilities of EO & LO, independently of its size or industry. Resource-based view (RBV) (Barney, Ketchen, & Wright, 2011) and management control literature (Simons, 1995; Vandenbosch, 1999) are used to contextualize and explain the MCS' role and relationship with firm capabilities.

Keywords: Management Control Systems (MCS), Learning Orientation, Entrepreneurial Orientation, Strategic Management and Capabilities.

1. INTRODUCTION

As part of the strategic process, consisting of three main phases (Formulation, implementation, performance) (Hitt, Ireland, & Hoskisson, 2011; Rumelt, Schendel, & Teece, 1991), exists an activity that is common to all phases, where activities and results are monitored, so that actual performance can be compared with desired performance and managers can take corrective actions. It is in this activity where MCS are responsible for creating the models and systems to support the strategic process. MCS are defined as the process by which managers ensure that resources are obtained and used effectively and efficiently in the accomplishment of the organization's objectives (Anthony, 1965). They help provide relevant strategic information on the drivers of success and causes of failures (Mintzberg, 1994; Simons, 1995; Widener, 2007). Over the last two decades, the development of the MCS has been exponential and has triggered the need for a better understanding of its role and how they can meet managerial needs. In the line of approaches that see MCS as more than mechanistic tools, but also as powerful devices to stimulate and manage the emergence of strategies, this research focuses on four MCS´s uses (Monitoring, Legitimizing, Attention Focusing, Strategic Decision-Making) and its relationship with two firm organizational capabilities that are related to superior performance, Learning and Entrepreneurial Orientations (LO & EO) (Ripollés & Blesa, 2005; Wang, 2008).

From the resource-based perspective (Barney, 1991), MCS (resources) do not generate rents per se, but rather are a function of the way they are used (Penrose, 1995). Even assuming that MCS can be employed for different uses, there is a lack of prior empirical research examining this use. Some studies suggest that capabilities are shaped by MCS, but how? Research on MCS use & capabilities have yielded valuable, but ambiguous, inconclusive or sometimes contradictory results (Chenhall, 2003; Ittner, Larcker & Randall, 2003). We can see positive (Cruz, Scapens, & Major, 2011; Simons, 1990; 1991; 1995) or negative (Bisbe & Otley, 2004) relationships between MCS and innovation or learning (Ahn, 2001; Chenhall, 2005; Godener & Söderquist, 2004), or mixed depending on how the MCS are used; positively related (used interactively) or negatively (used as diagnostic) with capabilities (Henri, 2006a; 2006b). With the possible exception of research conducted by Henri (2006a, 2006 b), there are no studies linking the various MCS uses and its impact on firm strategic capabilities (Berry, Coad, & Harris, 2009). Despite these studies, there is still a need to better understand the impact of the various MCS uses on organizational capabilities.

Based on insights from the related literature and the fact that the impact of MCS on capabilities remains unclear, this work argues that the different MCS uses (Simons, 1995; Vandenbosch, 1999) could encourage the development of strategic firm capabilities. Specifically the research question in this work is: What is the impact of MCS use in generating strategic capabilities within the firm? This work also seeks to investigate how MCS uses determine LO & EO capabilities.

In the attempt to test the link between MCS use and strategic capabilities, this study builds upon the model presented by Henri (2006a) which connected two MCS uses extracted from Simons (1995) (diagnostic and interactive use) with four capability items (entrepreneurship, innovativeness, market orientation, and organizational learning). In the current study we merge the mutually complementary categorization of MCS usage of Vandenbosch (1999) to that of Simons (1995). We also expand on Hernri's (2006a) strategic capability construct by working with the more encompassing EO and LO concepts (Wang, 2008) which hold five items in the case of the former (Lumpkin et al., 2009) and a four-item scale in the case of the latter (Hult, 1998). With this richer model, a more complete analysis of the MCS Use–Strategic Capability linkage will be carried out which may help to solve some of the inconsistencies in the results found within the related literature.

Furthermore, this study offers addition contributions: to improve understanding of how the various MCS uses can be a source of competitive advantage and to perform an empirical application in a big sample of different sectors (Manufacturing, Services, Trade and Banking); Previous studies have been in samples of 100-300 and focused only on manufacturing firms (Bisbe & Otley, 2004; Cruz, Scapens & Major, 2011; Henri, 2006a; 2006b), also such studies were not performed in SMEs and have not been compared with large firms.

The remainder of this paper is organized as follows: Section 2 defines the theoretical framework behind this research. Section 3 presents the theoretical model and hypotheses of the research. Section 4 shows the research methods, sampling procedures, data collection and measurement of variables whilst Section 5 offers a validity and reliability analysis. Section 6 shows the results of the study and finally Section 7 reports our conclusions, limitations and suggests avenues for future research.

2. THEORETICAL FRAMEWORK

Resource-Based View (RBV)

This work draw on the principles of Resource Based View (RBV) and the Dynamic Capabilities (DC) literature (Barney, 1991; Day, 1994; Teece, Pisano, & Shuen, 1997; Wernerfelt, 1984). The RBV of the firm was originally developed in the field of strategic management with the aim of explaining the reasons why firms obtain different results (Barney, 1991; Wernerfelt, 1984) and how firms achieve sustainable competitive advantages. RBV rests on the principle that competitiveness is a function of the strength, exploitation and leveraging of specific internal resources and capabilities controlled by a firm (Lengnick-Hall & Wolff, 1999) and conceptualizes firms as a group of resources heterogeneously distributed across firms and that resource differences persist over time (Barney, 2001). In other words, they are tied semi-permanently to the company and the sources of sustainable competitive advantage are specific and idiosyncratic resources (rare, valuable, imperfectly imitable and non-replaceable or substitutable) that cannot be easily duplicated (Barney, 1991; Wernerfelt, 1984).

Although in words of Porter (1980), competitive advantage depends on firms' ability to position and differentiate themselves in their industry, some studies provided evidence to suggest that firm-level resources and capabilities, not industry characteristics, are the primary determinants of firms' performance (Hoskisson et al., 1999). Day (1994) distinguishes two related sources of advantage: assets (i.e. scale economies, locations, distribution system or brand value) and capabilities (complex set of knowledge and abilities accumulated throughout time) that allow the firm to coordinate and make use of its assets (Day, 1994). It is worth mentioning that resources do not generate rents per se, but rather are a function of the way in which they are used (Penrose, 1995). Capabilities are a link between resources and their deployment, because they are organizational processes and routines to integrate, reconfigure, gain and release resources, to match and even create market change (Eisenhardt & Jeffrey, 2000; Grant, 1996). According to RBV principles, firms must pay special attention to identifying, developing, protecting and using those resources and capabilities that assure the achievement of a sustainable competitive advantage (Santos, Pérez, & González, 2005).

The most recognized and researched organizational strategic capabilities are: Entrepreneurship, innovativeness, Market Orientation and Organizational Learning (Covin & Slevin, 1991; Henri,

2006a; 2010; Lumpkin & Dess, 1996; Ripollés & Blesa, 2005). In this study we focus on the capabilities of entrepreneurial & learning orientation for various reasons. Although the beneficial effect of market orientation on the results has been extensively studied (Narver & Slater, 1990), other studies have questioned this effect, suggesting several limitations to a market orientation. For example, Hamel and Prahalad (1991) suggest that market oriented firms may suffer from the "tyranny of the served market", ignoring or missing markets and competitors (Hamel & Prahalad, 1991). Many times, market oriented firms may fail to identify and capitalize on the latent needs of customers, due to their excessive focus on expressed needs (Slater & Narver, 1995). The same studies suggest that organizations should aim to become learning oriented if they look to achieve a sustainable competitive advantage, because market orientation can be copied but the learning environment cannot. Therefore, learning processes may be critical in creating competitive advantages in the firm (Baker & Sinkula, 1999). On the other hand, the studied characteristics of innovativeness and the classical elements of entrepreneurship, among others, are captured to some extent by the construct known as Entrepreneurial Orientation. Business literature supports that learning (Widener, 2007) and Entrepreneurial Orientations (Ripollés & Blesa, 2005) are positively associated with performance (Wang, 2008).

Learning Orientation (LO)

LO is considered to be an important facilitator of competitive advantage by way of improving a firm's information processing activities at a faster rate than rivals do (Baker & Sinkula, 1999). But to do so requires frequently updated information (Simons, 1987). LO was defined as the development of ideas, knowledge and relations among past actions and future actions (Fiol & Lyles, 1985). A learning organization has the capability of explicit focus on the acquisition of knowledge in order to continually refine existing knowledge and routines or to question long held assumptions (Wang, 2008).

Some studies report that high performing firms rely on the information provided by frequently updated formal control systems to drive organizational learning (Simons, 1987) and argue that MCS has a significant positive impact on staff perceptions of learning capability (Yuan, Wang, & Yi, 2008).

Sinkula, Baker, & Noordewier (1997) developed a 13 item scale to measure LO. This scale has been adapted by Hult (1998) into a four-item scale intended to offer a more general measure of learning

orientation applicable to the overall company. The use of MCS supports a holistic view at all the strategic processes, resulting in organizational learning (Slater & Narver, 1995; Speckbacher, Bischof, & Pfeiffer, 2003) through the operationalization of the four steps of the organizational learning process: Information Acquisition, Information Dissemination, shared interpretation and organizational memory (Slater & Narver, 1995).

Entrepreneurial orientation (EO)

EO captures specifically the entrepreneurial aspects of the firm´s strategies (Covin & Lumpkin, 2011; Covin & Slevin, 1989; Lumpkin & Dess, 1996). EO is defined as the set of processes, practices and decision-making activities undertaken to successfully manage the entry of a new company to market (Lumpkin & Dess, 1996). A permanent attitude of the company (Covin & Slevin, 1991), that is proactively seeking new business opportunities (Zahra & Garvis, 2000). From the standpoint of the RBV, the entrepreneurial orientation can be identify as a high-level organizational routine, durable and difficult to imitate or transfer (Gómez-Villanueva, Llonch Andreu, & Rialp Criado, 2010). Literature on entrepreneurship emphasizes the importance of EO as a determinant of business performance (Ripollés & Blesa, 2005). Entrepreneurial orientation can be seen as the intangible ability of the company's strategic position hardly replicable and related to superior results (Wiklund & Shepherd, 2005).

One of the first measures of EO was done by Covin & Slevin (1989) who developed a three dimension scale (proactiveness, innovation and risk aversion). This scale was later built upon by Lumpkin et al. (2009) who added two more dimensions (autonomy and competitive aggressiveness) to the EO scale to give it a more complete character. This latter scale has become the accepted measure for EO within the related literature.

There is growing literature interest in identifying and defining the determinants of organizational capabilities (such as EO and LO). MCS play an important role here, because as discussed above, they have a direct impact in the ways and perceptions related to learning and they can support strategic decision making in the company related to the market, opportunities and results.

MCS use: The levers of control framework

Management control was defined by Anthony (1965) as the process by which managers ensure that resources are obtained and used effectively and efficiently in the accomplishment of the

organization's objectives. MCS seek to influence human activity within the company; they are formal or informal procedures and systems that can be identified by common management practices present in the business that use information to maintain or alter patterns in an organizational activity (Mintzberg & Waters, 1985). MCS are comprised of multiple control systems that work together (Widener, 2007), for example, Performance Measurement Systems (PMS) are one important aspect of MCS and represent the process and the set of metrics used to quantify both the efficiency and effectiveness of actions (Neely, Mills, & J. Platts, 1994) by providing the information necessary to challenge the content and validity of the strategy (Ittner, Larcker, & Randall, 2003). Some MCS are formal such as planning, budgeting or reporting systems, monitoring procedures, project management systems, human resource systems, cost accounting systems or support decision making systems like SAP platforms or informal as weekly meetings, daily checks, emails, etc. (Simons, 1991). There is general agreement that MCS do not automatically improve performance, rather, performance is totally related to how systems are designed, developed and used. Langfield Smith (1997), argues that the best way to approach the study of administrative controls is by looking at the different uses that give those who apply them (Langfield Smith, 1997). This study combines two MCS classification of uses and relates both to identify the expected relationships: The theoretical proposition of Simons (1995) about levers of control (LOC) and Vandenbosch (1999) classification proposal.

Simons (1995) proposed a framework that has been used extensively, describing four types of MCS use: Beliefs, Boundaries, Diagnostic and Interactive. Beliefs and values are systems to secure commitment towards goals and to inspire employees in their search for opportunities and solutions. Belief systems are an explicit set of organizational definitions or procedures, that might be use by top management (Marginson, 2002) to communicate formally the organization's basic values, purpose vision and direction (Simons, 1995). Belief systems are: Communication channels, formal mission statements, credos, statements of purpose, email, meetings, (un) written codes of conduct, strategic planning systems and formal rules and procedures. Boundaries: The boundary lever of control is an explicit set of organizational definitions and parameters; administrative controls hierarchically based (Marginson, 2002), expressed in negative or minimum terms (Simons, 1995). Any system that sets out minimum standards or guidelines for behavior can be used by managers as a boundary lever of control (Mundy, 2010; Pun & White, 2005). For example boundary processes aim to prevent employees from wasting the organization's resources. The Diagnostic systems use (control over

organizational goals)**,** refers to the use of MCS, including PMS (performance measurement systems) or KPIs (key performance indicators), to monitor organizational performance against important dimensions of a given strategy, with a broad range of metrics in key areas (Marginson, 2002) used to compare actual performance against pre-set targets (Simons, 1995) to identify exceptions and deviations from plans (Mundy, 2010; Navarro & Guerras Martín, 2001). The Interactive MCS use consists in formal two-way processes of communication between managers and subordinates, where employee participation is encouraged in a formal process of debate (enable employees to search for opportunities, solve problems and make decisions). In this use, managers involve employees in the objective design to find relationships within and performance measurement, as a form to share information (Henri, 2006a; Mellahi & Sminia, 2009; Mundy, 2010; Simons, 1995). An example of this practice is creation process of a Balanced Scorecard (Kaplan & Norton 1992).

This framework shows that MCS uses influence or inhibit strategic capabilities in organizations through the routines they stimulate (Franco-Santos, Lucianetti, & Bourne, 2012). In this study we focused in these last two uses (diagnostic and interactive uses) because MCS are present and related with them (Simons, 1990).

The second MCS use classification, described below, is represented by four major categories of management information systems: 1.Score keeping; 2.Problem solving; 3.Focusing organizational attention and learning; and 4.Legitimizing decisions. This categorization was proposed in an empirical analysis between MCS and organizational competitiveness carried out by Vandenbosch (1999).

Score Keeping (Monitoring): Score keeping are standardized processes that evolve over long periods of time within an organization. Monitoring use responds to the question: How am I doing? (Simon, Guetzkow & Kometsky, 1954). Here MCS are used to provide feedback regarding expectations; A feedback system where goals are previously defined, outcomes are measured and compared with the goals, thus providing feedback, that enables the necessary corrections. Monitoring is characterized by consistency between time periods so that comparisons are easy to make (Vandenbosch, 1999). This type of use is similar to diagnostic control (Simons, 1990).

Problem solving (Strategic decision making): Problem solving concerns a non-routine issue that requires top manager´s commitment and requires information to support the analytical processes of strategic decision-making. Fast decision makers use more information and develop more alternatives

than slow decision makers (Eisenhardt, 1989). This type of use is similar to an interactive control (Simons, 1990).

Focusing organizational attention (Attention focusing): The organizational learning associated with an attention-focusing MCS use, contributes to the emergence of new strategies within the organizations (Mintzberg, 1978; Simons, 1990; 1995), by responding to the question: What problems must we focus on? (Simon et al., 1954). This type of use is similar to interactive control (Simons, 1990).

Legitimizing decisions (Legitimization): Refers to justify a decision that has been made and is a major reason for the use of a decision support system (Vandenbosch, 1999). MCS can be used to justify and validate past actions and increase and ensure the legitimacy of future actions. MCS use information of the entire firm, what gives them the authority and credibility to provide legitimacy of activities. This type of use is similar to diagnostic control (Simons, 1990).

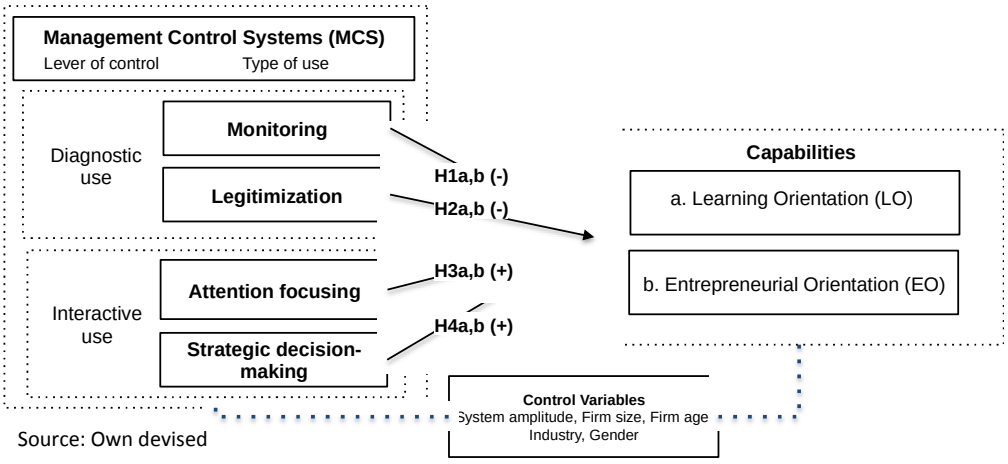
Both typologies, Simon's (1995) and Vandenbosch's (1999) are generally used within the related literature. They are often disaggregated into different points which both highlight complimentary aspects of MCS use. This is why examining them jointly may allow us to have a more complete picture of the links between MCS use and the strategic capabilities of the organization.

3. THEORETICAL MODEL AND HYPOTHESES

Theoretical model

Figure 1 presents the conceptual model of this work and also represents the major relationships that we seek to test. In this structured investigation we explicitly examine the relationships among the four MCS use (Monitoring, Legitimization, Attention Focusing, and Strategic Decision-Making) and two organizational capabilities (Entrepreneurial & Learning Orientations). Based on the theoretical framework, a major premise behind the development of this model is that monitoring and legitimization uses influence negatively on the capabilities, because they are acting in a diagnostic mode. Likewise, it is expected that attention focusing and strategic decision-making uses, can help to improve capabilities positively because they are acting in an interactive manner.

Figure 1
Theoretical model



Source: Own devised

Hypotheses

Monitoring & Legitimizing (Diagnostic use):

In a LOC approach (Simons 1995), monitoring and legitimizing uses are related with diagnostic MCS use, to "justify, monitor and reward" the achievement of pre-established goals. Simons (1995) argues that the MCS use in a diagnostic manner, seeking primarily to achieve objectives, constrains innovation and the search for opportunities, therefore the input signal sent is negative, because their contribution is based on a negative sense of deviations search. On the same line, Henry (2006a) argues that these systems represent a negative force because typically this use focuses on the review, finding "errors" and see why we are not what were intended, used only when productivity and efficiency have fallen (Theriou et al. 2009), and innovation needs to be curbed (Miller and Friesen 1982). But there are arguments (Mintzberg, 1973; Eisenhardt, 1989; Vandenbosch, 1999; Slater & Narver, 1995; Grafton et al. 2010) that suggest that the use as monitoring and legitimization can have a positive influence on the development of skills, laying the foundation for carrying out a conversation to enable better decisions, such as having the same information and understand it in the same way.

Monitoring use: A traditional feedback role of MCS to support the implementation of strategy is related to monitoring or diagnostic use (Simons 1995) and comprises the review of critical performance variables to monitor and coordinate the implementation of intended strategies in a

routine process. Monitoring is usually tied to a division and specialized work, and control values like stability, enforced roles and bureaucracy (Hofstede 1978). Previous studies indicate that monitoring use of MCS is not related to innovation activities present in the entrepreneurial orientation, which accepts a considerable amount of risk, a high degree of flexibility and broad communication processes within organizations. Instead, monitoring use is associated with highly structured channels of communication and limited organizational performance (Chenhall et al. 1995). Because of its routine nature or single-loop learning (Argyris & Schön 1978), there is evidence that people tend to react to control measures by developing suspicion and resistance (Henri 2006a), critical factors in the learning orientation. However in other hand, Vandenbosch (1999) argued, the discussion triggered by the diagnostic use leads to corrective action as a way of learning and in the same line Grafton et al. (2010) argues that diagnostic use of MCS facilitates exploitation of existing capabilities. More over other MCS uses need this important monitoring role because they requires information to support his analytical process. For example, it has been observed that those who make more rapid decisions used more information and generate more alternatives than slow decision makers (Eisenhardt 1989). This would mean that in some cases, even if diagnostic use works against the deployment of capabilities (Henri 2006a), it may contribute to performance through organizational capabilities by monitoring goal achievement, restricting risk taking, providing boundaries for innovation, and closely monitoring variations in effectiveness, which is necessary to produce a better performance.

Although the above arguments for or against the development of capabilities related to the monitoring use opens more than one possibility, in this study we decided to propose a negative relationship in line with a previous study (Henri, 2006a) generating the following hypothesis:

H1a: Monitoring use of MCS exerts a negative influence on LO

H1b: Monitoring use of MCS exerts a negative influence on EO

Legitimizing use: MCS can be used to justify past actions or decisions that have been previously made under conditions of uncertainty (Henri, 2006b) and is a major reason for the use of a decision support system (Vandenbosch 1999). MCS use information of the entire firm, what gives them the authority and credibility to provide legitimacy of activities. Legitimizing MCS use is a political tool

not only to establish authority but also to maintain credibility (Dermer 1990). In this sense legitimizing use is associated to a control dominant type (Henri 2006b), centralization of power and sometimes a strong prevalence of only financial indicators, as a weapon of power (Markus & Pfeffer 1983). Centralizing power, as a feature of controlling companies is not related to the characteristics of the capabilities, having a negative effect on the relationship under study. In other hand, legitimizing use of MCS also has the main purpose of learning and communication. This use operationalized the second and third steps of the organizational learning process proposed by Slater & Narver (1995): ii) Information Dissemination and iii) shared interpretation, both steps are related with people communication, learning and building up knowledge (Mintzberg's, 1973). Managers by legitimizing prior ideas ensuring their interpretation because they believe that doing so, allows the competitiveness of his organizations (Vandenbosch 1999).

Based on the previous arguments and the lack of a consensus in the literature about legitimization, we have chosen to propose a negative relationship between MCS legitimizing use and capabilities, in line with a previous study (Henri, 2006a), generating the following hypotheses:

H2a: Legitimizing use of MCS exerts a negative influence on LO

H2b: Legitimizing use of MCS exerts a negative influence on EO

***Attention focusing & Strategic decision-making (Interactive use)*:**

In a LOC approach (Simon et al., 1954), interactive MCS use is associated with the signals sent throughout the firm to focus organizational attention, stimulate dialogue and support the emergence of new strategies. Interactive uses emphasizes the interaction chief-employee and reflects a leadership style (Naranjo-Gil & Hartmann, 2007), thus provide, in terms of information processing, three basic components: intelligence generation, intelligence dissemination, and responsiveness (Kohli & Jaworski, 1990). This use has a positive impact on capabilities because it promotes participation and involvement of employees, essential elements in both studied capabilities.

Attention focusing use: This type of use send signals to the organization about strategic issues (Simons, 1995). A high-level learning (double-loop) (Argyris & Schön, 1978) that contributes to the emergence of new strategies within the organizations (Simons, 1995). This type of MCS use involves

and fosters organizational dialogue, debate, discussion and information exchange to foster organizational learning (Mintzberg, 1978; Simons, 1990; 1995). Attention-focusing use requires a liberal management style that values the principles of empowerment, entrepreneurship, and self-control (De Haas & Kleingeld 1999). Therefore, the following hypotheses are proposed:

H3a: Attention focusing use of MCS exerts a positive influence on LO

H3b: Attention focusing use of MCS exerts a positive influence on EO

Strategic decision-making use: In this type of use, MCS are facilitators (Hickson, 1986) by providing information support systems when faced with a problem or the need to make a decision. Top managers involved in a new venture or an entrepreneurial action should be associated with more frequent strategic decision-making and more changes, thus need a considerable amount of information from the MCS to support their decision-making processes. Fast decision makers use more information and develop more alternatives than slow decision makers (Eisenhardt, 1989). Hence the following hypothesis is consequently suggested:

H4a: Strategic decision-making use of MCS exerts a positive influence on LO

H4b: Strategic decision-making use of MCS exerts a positive influence on EO

4. RESEARCH METHODS

Stages and data collection

***Data- Sources*:** Data were collected from primary sources in the form of structured surveys from business managers from a list of firms in the manufacturing, trade, banking and service sector in Mexico City. The target population consisted of 4750 Mexican firms in México DF, listed in DENUE 2012 database (INEGI). The classification used to categorize firms by size is determined according to the number of workers: 1-50 Small, 51–250 medium size, and 250 > Large firms and was published on the Official Journal of the Mexican Federation (2009).

Collection of information: We collect the information over the course of eight weeks Online and Offline systems. 323 (50.2%) completed surveys were collected through online participation and 321 (49.8%) were performed offline (face-to-face), giving a total of 644 units (13.56% of the sample).

The invitation to participate consisted of an initial personalized email letter and to increase the response rate (Dillman, 2000), we send two follow-up remainder emails and a final reminder to non-respondents according to Dillman.

Questionnaire: The questionnaire (appendix A) was designed following the steps suggested by the literature (Archer, 2003; Dillman, 2000):

1) Select in the literature of strategy and management control systems the constructs that measure the variables and drawing up a first draft of the questionnaire.
2) This draft is contrasted with interviews of members of the target population,
3) Make adaptations based on the comments received.
4) Choose an attractive format, good quality WEB and printout form.

The questionnaire was checked for potential non-response bias; no significant differences ($p < 0.01$) were found.

Variable measurement

The variables in the model are explained below and were measured using previously validated scales. All questions were asked using a five-point Likert scale (appendix A. Survey instrument)

Table 1
Variable measurement

Construct	Source	Dependent & independent variables
MCS uses	27-item scale, adapted version for Henri (2006b) of Vandenbosch (1999)	**Independent:** Monitoring; focusing attention; strategic decision-making; legitimizing
Learning Orient.	4-item scale proposed by (Hult 1998)	**Dependent** One dimension Scale (LO)
Entrepreneurial Orient.	14-item scale by (Lumpkin et al. 2009)	**Dependent** Five dimensions Scale (EO)
Control variables	System amplitude, firm size (10-50 small; 51-250 medium; > 250 Large), firm age, industry and gender	
Measurements	A higher factor score indicates a more intense MCS use, a more Learning-Entrepreneurial Oriented firm	

MCS uses are measured using a version of Vandenbosch (1999) system with four dimensions: Monitoring; Focusing Attention; Legitimizing decisions and Solving problems, but adapted by (Henri, 2006b) leaving aside the dimension of solving problems, an adding a dimension to measure the Strategic Decision-Making with seven elements given by (Brockmann & Simmonds, 1997). Henri

(2006a) chooses those items because they are the most generic (refer to strategic decision making in general) while the others refer to specific strategic decisions (venturing, new regulations, etc.). A factor score is calculated for each of the four uses based on all the items. A higher factor score indicates a more intense MCS use.

System amplitude was measured using a comprehensive MCS forced-choice instrument, developed by Hall (2008). Respondents were asked to indicate, which of the following two options represents more your management control system. 1 corresponds to a comprehensive and 0 corresponds to a partial MCS used.

Capabilities: Two different validated scales are used to measure capabilities.

Learning Orientation is measured using an adapted version of the four-item scale proposed by (Hult, 1998). This scale is intended to measure a learning orientation overall company, thus is more general than the 13 items scale of (Sinkula, Baker, & Noordewier, 1997). This section asks the respondents the extent to which, each item describes their organization. A factor score is calculated with the four items. A higher factor score indicates a more Learning-Oriented firm.

Entrepreneurial Orientation: To measure EO, the scale proposed by Lumpkin et al. (2009) was used, which is a mixture between the 9 items and the three dimensions scale (proactiveness, innovation and risk aversion) originally developed by (Covin & Slevin, 1989), on which two more dimensions (autonomy with four items and competitive aggressiveness with one more item) were added. The final five dimensions are as follows**: innovativeness, risk taking, proactiveness, autonomy and competitive aggressiveness** (Lumpkin, Cogliser, & Schneider, 2009). A factor score is calculated with the fourteen items. A higher factor score indicates a more Entrepreneurial-Oriented firm. Descriptive statistics of the constructs and correlation matrix are presented in the table 5.

Control variables

This study is controlled by the following variables: Amplitude of the system, firm size (10-50 small; 51-250 medium size; > 250 Large firm), firm age, industry to which it belongs and respondent gender . Size is measured converted as a binary variable. Some variables were asked with a flipped scale (reverse-scored)(†EO4 †EO13 †EO14).

5. CONSTRUCT VALIDITY AND RELIABILITY

Several procedures and tests were conducted to establish the validity of constructs and reliability: Content & face validity, pre-test of the questionnaire in three steps, tests of convergence and discriminant validity and test of normality. Based on the tests, all constructs reflect strong validity and reliability.

Construct validity

***Content & face validity*:** To establish content validity, existing scales used in the existent literature have been employed. To provide a face validity, we pre-test the questionnaire in three steps for clarity, complexity, ambiguity and face validity: 1) Five academic business professors in planning/financial/accounting were asked to revise and complete the questionnaire to provide comments on its form and content; 2) Five top managers (planning/financial/accounting officers) were interviewed and asked to complete the questionnaire; 3) The questionnaire was completed by a group of MBA students. Minor adjustments were made in terms of wording and presentation, according to recommendations given.

***Convergent and discriminant validity*:** To ensure convergent and discriminant validity we conducted two empirical test: 1) A correlation matrix of all items related to MCS uses and Capabilities and 2) An exploratory factor analysis (EFA) across all questions :

1) Both correlation matrix, MCS uses and Capabilities, show positive and significant correlation coefficients at the 0.01 level. Knowing that convergent correlations should always be higher than the discriminant ones, the correlation matrix provides evidence for both convergent and discriminant validity. 2) The exploratory factor analysis (EFA) across all questions (management control uses and capabilities) to tests convergence and discriminant validity, shows that every construct exhibits acceptable results. Cronbach's Alpha results show values above 0.95 confirming previous results (Nunnally et al. (1967) recommended 0.70 level of acceptability) (see appendix B).

Normality: Also two tests were performed (Kolmogorov-Smirnov; Shapiro–Wilk) to verify the hypothesis of normality necessary for the result of some reliable analysis, for example the ANOVA. These tests supported the normality of all constructs.

Table 2
Tests of Normality

Factors	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
FAC_L	.049	644	.001	.978	644	.000
FAC_D	.036	644	.046	.992	644	.001
FAC_F	.036	644	.049	.995	644	.039
FAC_M	.075	644	.000	.961	644	.000
FA_LO	.125	644	.000	.915	644	.000
FA_EO	.092	644	.000	.958	644	.000

a. Lilliefors Significance Correction

Descriptive Statistics

Table 3
Constructs descriptive Statistics and correlations

	Capabilities		MCS use			
	Learning Orient.	*Entrep. Orient.*	*Monitoring*	*Legitimizing*	*Focusing Attention*	*Strategic Decision*
Descriptive Statistics (average)						
Mean (Avg)	3.709	3.457	4.012	3.367	3.216	3.488
Standard deviation	1.113	1.034	.935	.941	.936	.902
Median	4.000	3.643	4.250	3.444	3.286	3.571
Factor Analysis	FA_LO	FA_EO	FAC_M	FAC_L	FAC_F	FAC_D
No. Items	4	14	4	7	7	9
KMO	.781	.966	.956	.956	.956	.956
Approx. Chi-Square	983	8715	11860.3	11860.3	11860.3	11860.3
Bartlett's Test Spher. (sig.)	.000	.000	.000	.000	.000	.000
Cronbach's Alpha	.826	.967	.958	.958	.958	.958
Correlation matrix (pearson)						
FA_LO Learning Orientation	1.000					
FA_EO Entrepreneurial Orientation	.450**	1.000				
FAC_M (monitoring)	.164**	.195**	1.000			
FAC_L (legitimizing)	.336**	.250**	.000	1.000		
FAC_F (focusing attention)	.306**	.274**	.000	.000	1.000	
FAC_D (Strategic decisions)	.215**	.194**	.000	.000	.000	1.000

**. Correlation is significant at the 0.01 level (2-tailed). N= 644

With 644 questionnaires received we obtained a response rate of 13.56%. This is similar to the 12–25% range reported in recent studies 22.5% (Hall, 2008); 24% (Henri, 2006a); 42% (Naranjo-Gil &

Hartmann, 2007); 12% (McKelvie & Davidsson, 2009); 15.6% (Wiklund & Shepherd, 2003). The final sample is comprised of 644 firms of which of which 296 (46%) are large-size with an average of 4,257 employees and 44 years age, 191 (29.7%) medium-size firms with an average of 158 employees and 24 years age and 157 (24.4%) are small-size with an average of 32 employees and 11 years age. The respondents are 79 CEOs (12.3%), 109 divisional-directors (16.9%), 111 department-directors (17.2%) and 345 managers (53.6%). Firms are distributed in four sectors: 105 manufacturing (16.3%), 51 trading (7.9%), 407 services (63.2%) and 81 banking (12.6%).

Analysis models

The methodologies selected for this study are twofold:

1) Analysis of variance (ANOVA) with the control variables as factors and the results of factor analyzes (EFA) as dependent variables.

2) Multiple regressions with the full sample in two models (A & B) and dividing it into sub-groups by size and industry to test the robustness of the model. The coefficients and significance in the model (B) seek to support the two sets of hypotheses (a, b). Statistical analysis was performed using SPSS (V.21) software.

6. RESEARCH FINDINGS

Results of the ANOVA analyses:

Table 6 presents the summary of the ANOVA analyses. Based on a comparison of the means obtained from the different MCS uses in companies of different sizes and different sectors, the results show that of from the four different types of use (Monitoring, legitimizing, Focusing attention and Strategic Decision-Making), three of them do not show a significant difference in companies of different sizes ($p<0.001$). The exception is observed in the “monitoring use”, in which we can identify two groups of companies: small companies that have a mean of monitoring well below the average for the entire group of companies (-0.257) and another group of medium-sized (0.052) and large (0.103) companies (no statistical differences between medium & large size).

Table 4

ANOVA analyses between MCS uses, LO & EO versus Size and Industry

MCS uses			Capabilities					
Monitoring			Learning Orientation			Entrepreneurial Orientation		
Differing	Mean (S.D.)	Groups	Differing	Mean (S.D.)	Groups	Differing	Mean (S.D.)	Groups
Size F:7.126 ***	-0.257 (1.155)	*Small*	Size F:2.757 *	0.141 (0.964)	*Small & Medium*	Industry F:3.398 **	-0.246 (0.982)	Banking
	0.052 (0.941)	*Medium*		0.02 (0.996)	*Medium &*		-0.133 (1.083)	& Trade
	0.103 (0.925)	*& Large*		-0.088 (1.016)	*Large*		0.014 (0.994)	Services &
							0.200 (0.959)	Manufacturing

Note: N=644 in all cases Note 1: * Significant @ 90%; ** Significant @ 95%; *** Significant @ 99% Note 2: All others constructs are not significative

In the same analysis of company-size regarding capabilities, the results show that in learning orientation we can identify two groups: Group of small and group of large firms (as mid-sized companies, statistically could be part of both groups) and that small firms have a higher and positive mean (0.141) than large firms (-0.088), suggesting that smaller companies present greater learning orientation ($p<0.10$). With respect to industry type observed, in the entrepreneurial orientation analysis, we can identify the major differences between the banks with a negative average (-0.246) and the manufacturing industry (0.200). This suggests that manufacturing, followed by services firms, have higher entrepreneurial orientation than trade and banking ($p<0.05$).

Results of the multiple regression analyses:

Table 5 presents the main results for each capability (Learning Orientation & Entrepreneurial Orientation) with two models: (Model A) comprising the control variables and the model B includes the control variables and the four MCS uses. The variance inflation factor (VIF) and TOLER scores were examined for all variables to quantify the severity of multicollinearity and all were within acceptable ranges (Ryan, 1997).

Learning orientation (LO) & hypotheses:

***Model A*:** The base model A included only the effects of the control variables; It explained a significant portion of variance ($R^2 = 0.113$, $F = 10.105$, $p < .001$). Significant variables are system amplitude (0.636; $p<.001$), being a small (0.206; $p<0.05$) & large firm (-0.192; $p<0.05$) instead to be a medium-size firm.

Table 5

Multiple Linear Regressions results

	Learning Orientation		Entrepreneurial Orientation	
	Model A	*Model B*	*Model A*	*Model B*
Variables	*Control variables*	*Control & Independent variables*	*Control variables*	*Control & Independent variables*
Controls				
System amplitude	**0.636*** **	**0.287*** **	**0.627*** **	**0.326*** **
Firm Small	**0.206** **	**0.204** **	**0.176***	**0.183***
Firm Large	**-0.192** **	-.110	*0.042*	.655
Firm Age	0.001	.000	.002	.133
Ind 1: Manufacturing	0.211	.086	**0.463*** **	**0.368*** **
Ind 2: Trade	-0.005	-.058	.098	0.567
Ind 3: Services	0.124	.055	**0.312*** **	**0.264** **
Gender	-.060	-0.046	.003	0.967
Mgmt. Control Use		**MCS use**		**MCS use**
		Legitimizing **0.310*** **		Focusing att. **0.234*** **
		Focusing att. **0.274*** **		Legitimizing **0.223*** **
		Strat. Dec. **0.185*** **		Monitoring **0.168*** **
		Monitoring **0.151*** **		Strat. Dec. **0.156*** **
F-value	**10.105*** **	**23.507*** **	**10.649*** **	**17.662*** **
R^2	**0.113**	**0.309**	**0.118**	**0.251**

N=644; * Sig. @ 90% ** Sig. @ 95% *** Sig. @ 99%

Note 1: Unstandardized Coefficients are reported

Note 2: Industry reference: Banking Note 3: Size reference: Medium

* Sig. at 90% level ** Sig. at 95% level *** Sig. at 99% level

Model B: To assess the direct relationships on each capability, the MCS uses set variables were introduced in Model B, the results explained a significant portion of variance in the Learning orientation, over Model 1, suggesting that the overall model is significant (R^2 = 0.309, F = 23.507, p < .001). Significant variables are system amplitude (0.287; p<.001), to be a small firm (0.204; p<0.05) instead of being a medium-size firm. All the MCS uses are significant and positive and with these results the hypotheses (a) are verified.

Hypotheses (set a) vs. LO: H1a predicted that a monitoring use would be negatively related to learning orientation in firms. Our analyses suggest that MCS used as monitoring is positively and significantly related to the learning orientation capability, contrary to the expected direction (i.e. positive instead of the expected negative direction) (β= 0.151, p < .001). H1a therefore is not supported.

H2a predicted that a legitimizing use would be negatively related to learning orientation in firms. Our analyses suggest that MCS use as legitimizing is positively and significantly related to the learning

orientation capability, contrary to the expected direction (β = 0.310, p < .001). H2a therefore is not supported.

H3a predicted that attention focusing use would be positively related to learning orientation in firms. Our analyses suggest that MCS use as attention focusing is positively and significantly related to the learning orientation capability (β = 0.274, p < .001). H3a therefore is supported.

H4a predicted that a strategic decision-making use would be positively related to learning orientation in firms. Our analyses suggest that MCS used as strategic decision-making is positively and significantly related to the learning orientation capability (β = 0.185, p < .001). H4a therefore is supported.

Entrepreneurial orientation (EO) & hypotheses:

***Model A*:** In the EO capability, the base model A included only the effects of the control variables and explained a significant portion of variance (R^2 = 0.118, F = 10.649, p < .001). Significant variables are system amplitude (0.627; p<001), being a small firm (0.176; p<0.1) instead of being a medium-size firm and if the firm belongs to the manufacturing industry (0.463, p < .001) or service (0.312, p<.001) and not banking, shows a direct relationship with the entrepreneurial orientation. To be a trade firm is not significant in this analysis.

***Model B*:** Model B assesses the direct relationships with EO and the MCS uses and control variables. Model B explained a significant portion of variance in the entrepreneurial orientation, suggesting that the overall model is significant (R^2 = 0.251, F = 17.662, p < .001). Significant variables are system amplitude (0.326; p<.001), beign a small firm (0.183; p<0.10) instead of being a medium-size firm, and if the firm belongs to the manufacturing industry (0.368, p < .001) or services (0.264, p<.005) and not banking, it shows a direct relationship with the entrepreneurial orientation. Again, to be a trade firm is not significant in these analyses. All the MCS uses are significant and positive and with these results the hypotheses (b) are verified.

***Hypotheses (set b) vs. EO*:** H1b predicted that a monitoring use would be negatively related to entrepreneurial orientation in firms. Our analyses show that, contrary to the expected direction (i.e. positive instead of the expected negative direction), MCS used as monitoring is positively and significantly related to the entrepreneurial orientation capability, (β= 0.168, p < .001). H1b therefore is not supported.

H2b proposed that a legitimizing use would be negatively related to entrepreneurial orientation in firms. Our analyses suggest that MCS used as legitimizing is positively and significantly related to the entrepreneurial orientation capability, contrary to the expected direction ($\beta = 0.223$, $p < .001$). H2b therefore is not supported.

H3b predicted that a focusing attention use would be positively related to entrepreneurial orientation in firms. Our analyses suggest that MCS use as focusing attention is positively and significantly related to the entrepreneurial orientation capability ($\beta = 0.234$, $p < .001$). H3b therefore is supported.

H4b predicted that a strategic decision-making use would be positively related to entrepreneurial orientation in firms. Our analyses suggest that MCS use as strategic decision-making is positively and significantly related to the entrepreneurial orientation capability ($\beta = 0.156$, $p < .001$). H4b therefore is supported. In general the results show that both Learning Orientation (LO) and Entrepreneurial Orientation (EO) in an organization relate more with the use of MCS to legitimize ideas or approaches, to something we know or we need to do or learn, and as systems that help in the focusing attention on opportunities or problems in organizations. Using the MCS for monitoring or strategic decisions making, but also have a positive and significant relevance, have less impact on the relationship with both capabilities.

MRL sub-group analyses (Size & Industry)

To test whether these relationships hold in the same way previously shown, in different company sizes and industry, the multiple regression analysis was repeated but now dividing the sample into subgroups by size and industry. These analyses show results in the same line: H1 a&b and H2 a&b are not supported, although the relationship is positive and significant in most cases. H3 a&b receives complete support for firms of all sizes and all industries with exception of LO-Trade industry where it is not statistically significant. H4 a&b receives partial support, except for LO-Medium and EO-Small sized firms, LO-Trade firms, EO-Manufacturing and EO-Trade firms where it is not statistically significant.

Table 6

Multiple linear regressions results (Sub-group analyses)

			Hypotheses by size						Hypotheses by Industry							
			Hypotheses a: Learning Orientation LO						Hypotheses a: Learning Orientation LO							
	All sample		BIG		Medium		SMALL		MANUFACTURING		TRADE		SERVICES		BANKING	
	Hyp.	Coeff.	Hyp.	Coeff.	Hyp.	Coeff.	Hyp.	Coeff.	Hyp.	Coeff.	Hyp.	Coeff.	Hyp.	Coeff.	Hyp.	Coeff.
H1a Monitoring	✗	*0.151****	✗	*0.252****			✗	*0.129***	✗	*0.307****	✗	*0.290***	✗	*0.11***		
H2a Legitimizing	✗	*0.310****	✗	*0.274****	✗	*0.400****	✗	*0.297****	✗	*0.286****	✗	*0.465****	✗	*0.299****	✗	*0.355****
H3a Focusing att.	✓	*0.274****	✓	*0.291****	✓	*0.238****	✓	*0.280****	✓	*0.386****			✓	*0.282****	✓	*0.274****
H4a Strat. Dec. Mak.	✓	*0.185****	✓	*0.225****			✓	*0.266****	✓	*0.229****			✓	*0.157****	✓	*0.284****
R square		0.309		0.347		0.280		0.293		0.447		0.290		0.295		0.276
F		23.507		30.830		24.274		15.754		16.017		9.826		27.839		9.773
F Sig.		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000
			Hypotheses b: Entrepreneurial Orientation EO						Hypotheses b: Entrepreneurial Orientation EO							
	All sample		BIG		Medium		SMALL		MANUFACTURING		TRADE		SERVICES		BANKING	
	Hyp.	Coeff.	Hyp.	Coeff.	Hyp.	Coeff.	Hyp.	Coeff.	Hyp.	Coeff.	Hyp.	Coeff.	Hyp.	Coeff.	Hyp.	Coeff.
H1b Monitoring	✗	0.168***	✗	0.115**	✗	*0.238****	✗	*0.151****	✗	*0.255****			✗	0.205***		
H2b Legitimizing	✗	*0.223****	✗	*0.219****	✗	*0.329****	✗	*0.178****			✗	*0.326****	✗	*0.236****	✗	*0.377****
H3b Focusing att.	✓	*0.234****	✓	*0.154****	✓	*0.340****	✓	*0.327****	✓	*0.268****	✓	*0.256***	✓	*0.257****	✓	*0.248***
H4b Strat. Dec. Mak.	✓	*0.156****	✓	*0.212****	✓	*0.203****							✓	*0.153****	✓	*0.400****
R square		.251		0.220		0.245		0.288		0.271		0.416		0.204		0.395
F		17.662		16.322		15.093		15.368		12.524		11.138		25.689		12.400
F Sig.		.000		.000		.000		.000		0.000		0.000		0.000		0.000
N=	644		296		191		157		105		51		407		81	

Note: * Sig. at 90% level; ** Sig. at 95% level; *** Sig. at 99% level

Are not significant

Results summary

***MCS uses – Size & Industry*:** MCS use as monitoring shows significant differences between companies of different sizes and specially was much greater among small (-0.257) and large (0.103) businesses.

***Learning Orientation (LO) – Size*:** Similarly to the previous ANOVA results, the coefficients in the multiple linear regressions suggest that small firms have a greater propensity to learn ($p<0.10$) than large companies and even more, the negative coefficient in large companies suggests an inverse relationship between the size and learning orientation.

***Entrepreneurial Orientation (EO) – Industry*:** Equally to ANOVA results, the coefficients in multiple regression analysis (positive and significant) suggest that manufacturing, followed by services firms, have higher entrepreneurial orientation than trade and banking ($p<0.05$).

***MCS uses*:** The global study results indicate that different MCS uses have substantively different effects on Learning and Entrepreneurial orientations. Impacts (coefficients magnitude) of the different MCS uses varies depending on the size of the company and with greater or lesser extent depending on the industry in which they reside, but in all cases the relation is positive and significant.

In LO the MCS use with more impact on LO is legitimizing, followed by Attention Focusing, Strategic Decision-Making and finally Monitoring. For EO, the MCS use with more impact is Attention Focusing, followed by Legitimizing, Monitoring and lastly the Strategic Decision-Making. Both capabilities (LO & EO) are more related with legitimizing and focusing attention uses but Monitoring and Strategic Decisions-Making uses are positive and significant too.

In the complete sample, hypotheses H1 and H2 in both capabilities are not supported. Although they are positively and significantly related to the learning and entrepreneurial orientations, are contrary to the expected direction (i.e. positive instead of the expected negative direction). Hypotheses H3 and H4 (a & b) are supported.

Globally, significant and positive relationship is observed for small firms in both capabilities, which can be understood as a higher propensity of small firms to develop both Learning and Entrepreneurial Orientations. Specifically in the case of entrepreneurial orientation (table 7), we can see that belonging to manufacturing or service industry, also relates in a positive and significant manner with EO.

7. CONCLUSIONS, DISCUSSION, LIMITATIONS AND FUTURE RESEARCH

Conclusions and discussion

In general, the literature in management control systems (MCS) used an explicitly or implicitly RBV approach (Barney, 1991; Teece et al., 1997; Wernerfelt, 1984) and together with Simons' levers of control framework (Simons, 1995) shows that MCS influence the strategic capabilities in organizations through the routines they stimulate. Based on the RBV we can identify the MCS as available resources in an organization, which generate a competitive advantage in terms of the use made for them (Lengnick-Hall & Wolff 1999). Therefore, understanding how these resources can be used in a better way, generate a source of sustainable competitive advantage, it could be seen as a specific resource inimitable, that cannot be duplicated easily. MCS (resources) do not generate rents per se, but rather are a function of the way in which they are used (Penrose 1995), even assuming that MCS can be employed for different uses, there is a lack of prior empirical research examining his use.

The general findings of this work are aligned with Simons' (1990) arguments in terms of raising the contribution of MCS over a tool for monitoring and evaluation, and offer them more as a catalyst for

the complete strategic process, which supports and encourages the creation and execution of strategies across the organization.

The results suggest that globally, MCS use as monitoring shows significant differences between small and Medium-large companies, being large companies that make more use of their MCS in a monitoring way. The other three uses (Legitimizing, focusing attention and strategic decision making) of MCS are not significantly different in the various sizes of companies analyzed. The results suggest that small firms have a greater propensity to learn ($p<0.10$) than large companies and even more, the result negative coefficient in large companies suggests an inverse relationship between the size and orientation to learning. The results also suggest that manufacturing, followed by services firms, have higher entrepreneurial orientation than trade and banking ($p<0.05$) firms.

The four uses of MCS contribute positively to capabilities and highlight a positive impact of diagnostic use (Monitoring and Legitimizing) on capabilities, contrary to the expected direction identified in previous studies. In the literature we can identify positions for and against this negative relationship, for example: Grafton et al. (2010) argues that diagnostic use of MCS facilitates exploitation of existing capabilities and in the same line Vandenbosch (1999) argued, the discussion triggered by the diagnostic use leads to corrective action as a way of learning, but Henri (2006a) argues that corrective actions are not sufficient to sustain such capabilities. This would mean that in theory, even if diagnostic use works against the deployment of capabilities (Henri, 2006a), it may contribute to performance through organizational capabilities by monitoring goal achievement, restricting risk taking, providing boundaries for innovation, and closely monitoring variations in effectiveness, which is necessary to produce a better performance. Diagnostic use of MCS could help to increase the positive effects of an interactive use on capabilities by providing the necessary information to perform the interactive use. Therefore, further research should be developed to have a better understanding of these relationships.

Our results are not consistent to those of Henri (2006), which fully supported the negative relationship of the Diagnostic use and capabilities in the Canadian context. This difference can be explained in part by the focus of his studies on the diagnostic and interactive use of MCS while the current study integrates four kind of uses not only Diagnostic and interactive. The conclusions raise the possibility of questioning the position that diagnostic use inhibits strategic capabilities of the organization (Henri,

2006a; 2006b) and supports the previous findings about an interactive use of the MCS enhances the development of organizational capabilities. The following prior research and theoretical arguments are provided to tentatively explain these expected and unexpected results.

Context: The first possible explanation for our results could emerge from the context in which our research was conducted. Mexico is a newly developed country and has the characteristics of an emergent economy. This has implications for example, competition is at an early stage, companies mostly use traditional MCS in a diagnostic manner, which is not necessarily bad, however, they are in a learning process according to their reality to act upon it where the first challenge is to know how to use MCS in an interactive manner.

Monitoring & capabilities: Research findings show that the primary reason for having a MCS was monitoring/controlling (30%) (Marr 2005). Use MCS as monitoring, is a necessary condition, but not sufficient to generate a capability. His conceptualization is directly linked to the notion of "what is not measured is not controlled" (Kaplan & Norton 1992; Berry et al. 2009) and in this sense monitoring is a necessary condition for providing the information to challenge the context, the content and validity of the strategy followed by firms (Ittner et al. 2003), by translating the strategy into deliverables (outcomes) and measures, helps managers to measure and ensure business (Hall 2008), necessary condition to learn and to carry out a process change or improvement (Mintzberg 1973). Two of the four steps proposed by Slater & Narver (1995) as the process of organizational learning are related to the monitoring use of MCS: i) Information Acquisition –Collection- (How am I doing) and iiii) Organizational memory –Storage- (How I Do It). Previous research shows that the MCS monitoring use helps ensure that performance information is distributed fairly among participants, which enables learning and problem solving (Mahama 2006) and argues that high performing firms rely on the information provided by frequently updated formal control systems to drive organizational learning (Simons 1987) and found that updated MCS has a significant positive impact on staff perceptions about learn capability (Yuan et al. 2008). The use of updated MCS supports a holistic look at all the strategic process, resulting in organizational learning (Slater & Narver 1995; Speckbacher et al. 2003). In summary monitoring uses, provides updated MCS´s, necessary element to conduct a constructive dialogue on the evaluation of a situation or to evaluate performance vs. expectations.

Legitimizing & capabilities: Executives in organizations often use MCS´s to confirm or deny their own prior beliefs or to check against its primary expectations (Vandenbosch 1999). The legitimizing use of a MCS can operationalize the second and third steps of the organizational learning process proposed by Slater & Narver (1995): ii) Information Dissemination and iii) shared interpretation. Disseminating information, according to Mintzberg's (1973) is related with learning, that can be either directing attention or legitimizing previous decisions and with this building up knowledge. Managers use information systems to legitimizing prior ideas ensuring their interpretation (Vandenbosch 1999). This implies that to make things happen, the leaders in an organization devoted considerable effort to justify and legitimize their proposals and actions. Feldman and March (1981) argues that legitimacy may be a relevant attribute of effective decisions in some organizations because if actions will only be taken if they have been legitimized, organizations become dependent on information that can provide legitimacy (Feldman & March 1981). From this point of view, the ability to learn or perform depend heavily on this stage of legitimization, for example: With the legitimizing use of MCS, Headquarters employ MCS in order to monitor local performance results, influence and guide local decision-making (Dossi 2008), or influence entrepreneurial attitude for initiation and implementation of strategic decisions (Fama & Jensen 1983; Prahalad & Doz 1987).

Focusing attention & capabilities: Seeking opportunities by stimulating the participation and dialogue, proposed in attention focusing MCS use, is presented in the Entrepreneurial Orientation perspective as a permanent attitude and a process to proactively seeking and exploit new business opportunities (Covin & Slevin, 1991; Zahra & Garvis, 2000), who favors the generation of competitive advantage and better results in relation to its competitors (Ripollés & Blesa, 2005). Attention focusing MCS use act as facilitator and can guide the organization learning (Ahn, 2001; Simons, 1991) and fostering innovative practices (Bisbe & Otley, 2004; Cruz et al., 2011; Henri, 2006a; Marginson, 2002). The attention focusing use of a MCS is also related with step 2) Information Dissemination and step 3) shared interpretation in the organizational learning process proposed by Slater & Narver (1995). Attention Focusing MCS use, foster organizational dialogue, stimulating creativity and focusing organizational attention, thus impacting the development of both capabilities.

Strategic Decision-Making & capabilities*:* This influencing role of the MCS is widely accepted in International Business literature, according to which MCS are data management tools influencing the cognitive orientation of managers in decision-making (Prahalad & Doz, 1987) and have the potential to be, not only answer and learning machines, but also ammunition and rationalization for learning and decision-making (Burchell, Clubb, Hopwood, & Hughes, 1980). According to Mintzberg's (1973) identifying problems and opportunities are ways to direct attention and making decisions. Therefore, the strategic decision-making MCS use, positively impact the development of capabilities.

System amplitude**:** The control variable "System amplitude" is significant in all analyzes and highly correlated with the various uses of MCS. In recent years organizations have sought to develop more comprehensive MCS and Performance Measurement Systems (PMS) to provide managers and employees with relevant information for the complete strategic process by which managers is served with the necessary information to track his initiatives (Ittner et al., 2003). More comprehensive MCS provide an understanding of the linkages between business operations and strategy (Chenhall, 2005). Previous studies indicate that today most complete MCS includes a more diverse set of monitoring and performance measures that are linked to complete strategic process and can be used in different ways, to follow, to motivate, to challenge or to drive (Chenhall, 2005; Malina & Selto, 2001; Neely, Gregory, & K. Platts, 1995). Norton and Kaplan (1996) argue that the more comprehensive system used, the greater the contribution of it to improve managerial performance by clarifying managers' role expectations (diagnostic use), and providing feedback to enhance managers intrinsic task motivation (interactive use). A practical example can be observed in the widespread deployment in firms of different models as "the Balanced Scorecard" (Kaplan & Norton, 1996) and "Performance pyramid" (Lynch & Cross, 1991). Thus, we can conclude that a broad set of measures that cover different parts of the organization's operation is an important aspect of more comprehensive MCS.

Our results show that a greater or lesser extent the different uses that can be given to the MCS, are related to learning and entrepreneurial orientations in business. Diagnostic use that can be given to a MCS, is a necessary condition to subsequently generate an interactive use, ie, the first will generate the necessary elements in order to explore and evaluate alternatives and thus to have a constructive dialogue, and this may be the reason of both uses have a positive and significant relationship with the capabilities. Managers who use these systems must be aware and be wary of designing and using such systems, as the results show a possible complementarity and balance necessary between different uses

and not just focus on some of them. If a MCS is used only diagnostically, not seem to generate their maximum potential, because although generate relevant information, not necessarily occur conversations that can gain value from this data. Similarly MCS used only to focus attention or make strategic decisions support by financial analysis or results monitoring without being fed continuously with data from the monitoring, will not add much value in generated dialogues around. The elements provided from this system are relevant in all strategic process phases (Widener 2007) and if being used in a complementary manner, MCS can provide information on the drivers of success and causes of failures.

Limitations

In the same way that all empirical studies have, this study presents potential limitations that should be taken into account when making generalizations. Although empirical results indicate that the instrument used is a reliable and we used a valid measure of the MCS uses, Capabilities and MCS constructs, future research could refine and further validate the instrument. We must see the results in good conscience that were obtained through a survey, and using the survey method to collect data creates the potential for bias due to common response. In terms of capabilities, this study focuses on Learning and Entrepreneurial capabilities that have been studied and shown to have a strong relationship with performance in organizations, but other capabilities could be included. Some possible limitations regarding the database are the scope of the current sample (Mexican firms en Mexico City, not all country). Finally, the study focused on business managers or directors, thus further research is required to assess whether different MCS uses have the same results at other managerial levels.

Suggestions for further research

Previous research indicates mixed (+/-) results in the MCS-capabilities relationship, thus future research could retest the meaning of these relationships in other contexts or contextual factors like the uncertainty perception, the measurement diversity or human capital factors, as the results shown so far cannot be conclusive. This study focused on evaluating the impact of MCS in only two capabilities; therefore how other strategic orientations may be impacted by the MCS uses can be developed.

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APPENDIX

Appendix A.

Convergent and discriminant validity.

Exploratory factor Analysis

Exploratory Factor Analysis across all items in MCS uses (27)				
Rotated Component Matrixa				
	Component			
	1	2	3	4
L9	0.749			
L4	0.745			
L6	0.744			
L5	0.741			
L8	0.714			
L7	0.682			
L3	0.668			
L2	0.655			
L1	0.631			
D3		0.749		
D5		0.746		
D4		0.733		
D2		0.680		
D6		0.660		
D7		0.643		
D1		0.571		
F4			0.722	
F5			0.701	
F6			0.666	
F7			0.637	
F2			0.616	
F1			0.616	
F3			0.521	
M2				0.791
M3				0.790
M1				0.787
M4				0.698

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 6 iterations.

KMO, Bartlett's Test & Cronbach's Alpha		
KMO	KMO	0.956
Bartlett's Test of Sphericity	Approx. Chi-Square	11860
	df	351
	Sig.	0.000
Cronbach's Alpha	Cronbach's Alpha	0.958
	2.003	27

EFA all Capabilities items (27)		
Rotated Component Matrix		
	Component	
	1	2
EO1	0.853	
EO3	0.849	
EO2	0.840	
EO5	0.836	
EO8	0.818	
EO7	0.813	
EO6	0.808	
EO11	0.806	
EO13r	0.803	
EO12	0.798	
EO10	0.791	
EO14r	0.790	
EO4r	0.785	
EO9	0.772	
LO1		0.838
LO2		0.816
LO4		0.778
LO3		0.722

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 3 iterations.

KMO, Bartlett's Test & Cronbach's Alpha		
KMO	KMO	0.961
Bartlett's Test of Sphericity	Approx. Chi-Square	9884
	df	153
	Sig.	0.000
Cronbach's Alpha	Cronbach's Alpha	0.952
	N of Items	18