

The Importance Of Performance Management Tools Usage For Surviving The Economic Crisis

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ABSTRACT

The main objective of our research is to explore how using performance management (PM) tools impact the exit hazard of firms by considering a sample of Slovenian firms during the recent economic crisis. The paper finds that, when firm and industry characteristics are not accounted for, the firms that used PM tools in 2007 experienced around a 6 percentage points lower hazard of shutting down during the current economic crisis. Further, our study supports the view that firm size and age are more important determinants of a firm's survival probability than the influence of using PM tools (and other firm characteristics) due to a strong and significant correlation between the use of PM tools and firm size and age.

Keywords: Crisis; Firm Survival; Performance Management; Performance Management Tools

1. INTRODUCTION

Firms are facing tough challenges to succeed in the global competitive market. One of the most visible threats to firm performance brought by the current financial crisis is the closure of firms. In our paper we argue that, besides other well-established survival factors (i.e. firm size, age, and productivity), performance management (PM) is one of the key factors of firms' survival in the economic crisis. The purpose of this paper is therefore to investigate whether at a time of economic slowdown performance management is crucial to firm survival. Namely, during the economic crisis the rapid altering of a firm's performance goals and its business strategies in response to the changed economic environment and the translation of adapted goals and strategies into concrete action guidelines are extremely important.

Since performance management delivers success only if it is integrated or strategically aligned (Hudson Smith & Smith, 2007), the use of appropriate performance management tools is crucial in assisting managers when tracking the implementation of the firm's strategies and comparing the actual results with the strategic goals and objectives. The provision of strategically-aligned PM tools is expected to improve organizational outcomes by enhancing the decision-relevant information available to managers and thereby facilitating strategy-consistent decision making. The paper thus aims to investigate whether performance management tools (systems) play a significant role in firms' survival probabilities. More specifically, our analysis tests: (i) whether there is a statistically significant difference in survival probabilities between firms that use specific PM tools and firms that do not; and (ii) how the importance of using a particular PM tool for firm survival depends on other firm characteristics, especially a firm's size, age, productivity, export activities and the intensity of its competition.

To investigate the factors of firm survival and/or exit during the economic crisis, we estimate a firm-exit model employing a logit specification that rests on firm and industry dynamics models. These models focus on the selection process among heterogeneous firms within a particular industry that operates through the entry and exit process. In the center of the selection and evolution process within the industry is the firms' learning process through which they learn about their own cost structure (efficiency), which is not known to them before their entry

but is discovered after entry based on their actual market experiences (Erikson & Pakes, 1995; Jovanovic, 1982). In this context, we explicitly account for the role of performance management and the use of PM tools in the selection process among heterogeneous firms. The integration of both industrial organization and performance management aspects in the investigation of firm survival is the paper's main contribution to existing empirical studies.

The described methodology is applied to data from the survey "Cost management and contemporary management tools in Slovenian companies" conducted during the summer of 2008 using personal interviews with the top or middle managers of 323 Slovenian firms. The survey data are extended with data from the Business Registry of the Republic of Slovenia and the data from financial statements of the firms in our sample.

In the following paragraphs we first present our main research hypothesis and its theoretical underpinnings. Next, we describe the methodological approach, which is followed by a section explaining and discussing the results, and then we finally wrap up with a conclusion.

2. LITERATURE REVIEW AND RESEARCH HYPOTHESIS

Performance measurement has to provide the data that will be collected, analyzed, reported and, ultimately, used to make sound business decisions. As such, performance measurement is a process of monitoring and reporting on how well someone or something is doing. Strategic performance measurement is defined as a measurement and reporting system that quantifies the degree to which managers achieve their strategic objectives (Verweire & Van den Berghe, 2004). However, today's managers have more trouble managing their business than finding optimal performance measures (and measurement frameworks). Therefore, more attention should be paid to performance management which is "*a process that helps an organization to formulate, implement, and change its strategy in order to satisfy its stakeholders' needs*" (Verweire & Van den Berghe, 2004, p. 7). In other words, performance management is "*a comprehensive management process framing the continuous improvement journey, by ensuring that everyone understands where the organization is and where it needs to go to meet stakeholder needs*" (Statement on Management Accounting No. 4DD, 1998, p. 3). Performance management's ultimate goal is to achieve a sustainable organizational performance. Important aspects of performance management are setting performance goals, developing strategies, and translating them into concrete guidelines for action (i.e. making the strategies operational). Performance management only delivers success if it is integrated or strategically aligned. This means that all performance management processes and activities have to be linked to the company's strategy, focusing on those critical activities that, if done well, will lead to a competitive advantage and long-term growth. Appropriate performance management tools are important facilitators on this journey. PM tools assist managers in tracking implementation of the strategy by comparing the actual results with the strategic goals and objectives. A performance management tool typically comprises systematic methods of setting business goals together with periodic feedback reports that indicate progress made against those goals (Simons, 1995, 2000).

Performance management is an element of the planning and control cycle that captures performance data, enables control feedback, influences work behavior and monitors strategy implementation (Flamholtz, Das & Tsui, 1985; Simons, 1990). In a holistic view, performance management plays a key role in the development of strategic plans and evaluating the achievement of organizational objectives (Ittner & Larcker, 1998) as well as acting as a signaling and learning device (Simons, 1990). The purpose of performance management is to provide information to support managers in effective decision making. The paper addresses performance management at the operational and strategic level because the authors believe that the strategy can only be successfully implemented if it is coordinated with the operations. This means that firms should shift from simply measuring performance to incorporating the resulting information in systematic efforts to actually improve performance. When strategic concerns are woven into performance, rather than the more limited concept of measurement, management then becomes the focus of performance (Ballantine et al., 1998). Performance management is the process by which the firm integrates its performance with its corporate and functional strategies and objectives (Bititci et al., 1997). Performance management begins with purposes and objectives. It has been long established that a fundamental requirement for control is the existence of objectives, which are then used to evaluate performance (Otley & Berry, 1980). Firms have to meet multiple and sometimes competing objectives (Chenhall, 2003), and these are typically set out by senior managers to meet key stakeholders' expectations (Otley, 2008).

Firms' adoption and use of performance management (PM) tools (systems) is the subject of significant attention by scholars (Battisti & Iona, 2009; Bloom & Van Reenen, 2007; Chen, Duh & Lin, 2006; Kaplan & Norton, 1996, 2008; Mol & Birkinshaw, 2009). These studies associate the adoption of PM tools with innovativeness, which they view as an imperative for organizational and national economic prosperity and wealth creation. For example, Bloom and Van Reenen (2007) and Mol and Birkinshaw (2009) find that the adoption of PM tools is associated with superior firm performance, while a review of UK competitiveness suggests that low levels of adoption of what is termed best practice is a contributor to the productivity gap (Daniel et al., 2012). The relationship between the adoption of PM tools and both firm and national economic performance underlines the importance of this area of study for both practicing managers and academics.

Research in the domain of PM tools explores the adoption, adaptation, use and discontinuance of PM tools and frameworks. PM tools help the firm consider what is relevant for its survival. The survival of firms in competitive operating environments will depend on the effectiveness of identifying changes and developing effective responses (Chenhall, 2005). More specifically, information acquisition provides potentially useful ideas related to external and internal opportunities and threats that are relevant to formulating an innovative strategy to gain a competitive advantage by differentiating products or lowering costs (Chenhall, 2005; Hambrick, 1982; Shrivastava, 1983). For many firms, PM tools have provided a competitive boost and enabled them to meet the demands of global competition. A holistic adoption of PM tools can be quite expensive, yet many firms see the introduction of PM tools as a worthwhile investment that will generate significant returns via cost savings in future years. However, mixed results have been found in research studies relating PM tools to performance. The continued popularity of PM tools in practice paired with the inconsistent research results linking PM tools to specific performance outcomes has provided impetus for a growing body of research devoted to understanding PM tools.

In recent years, scholars have suggested that today's firms need modern PM tools to help them adapt to the rapidly changing environment (Abernethy & Bouwens, 2005; Baines & Langfield-Smith, 2003; Cavalluzzo & Itner, 2004). Relevant PM tools (also called models or systems) integrate and balance the use of financial and non-financial measures. Examples include the balanced scorecard (Kaplan & Norton, 1992, 1996, 2008), Performance Pyramid (Lynch & Cross, 1991; Nilsson & Olve, 2001), stakeholder model (Atkinson et al., 1997), Tableaux de Bord (Epstein & Manzoni, 1998), and performance management framework (Otley, 1999; Ferreira & Otley, 2009). These PM tools all use financial and non-financial measures for strategy formulation and implementation. There is a view that modern PM tools (such as the balanced scorecard and other integrated performance measurement systems) produce relevant information that provides senior executives and other personnel with continuous signals as to what is most important in their daily organizational decision-making and operational activities (Chenhall, 2003; Hoque, 2011; Hoque & James, 2000; Kaplan & Norton, 1996, 2008). The design and use of PM tools to enhance performance are of central interest to managers in firms and to management accounting researchers (Stringer, 2007). Firms are continually adapting their PM tools to help them survive in the dynamic business environments in which they operate (Otley, 1994).

PM tools are used to support outward-looking and strategically-oriented firms. In recent years several PM tools have been introduced to help firms improve their decision making and performance in a highly competitive business environment. The performance management literature has been advocating the balanced use of non-financial measures alongside traditional financial measures, possibly within integrated performance measurement systems, since the early 1990s. Among various proposed integrated performance measurement systems, the Balanced Scorecard – proposed first by Kaplan and Norton in 1992 – has received the greatest attention from practitioners and academics. The diffusion of this and similar approaches to measuring performance has been notable in the last 20 years. The fundamental problem modern firms face when implementing these tools is integrating them. This study would like to emphasize that PM tools have to derive from and be tailored to fit each firm's changing requirements. Performance management only delivers success if it is integrated or strategically aligned (Hudson Smith & Smith, 2007). This means that all performance management processes and activities have to be linked to the firm's strategy, focusing on those critical activities that, if done well, will lead to a competitive advantage and long-term growth.

In our study, we integrate industrial organization and performance management aspects into the investigation of firm survival. There is vast empirical and theoretical literature on the exit decision of a firm. In

Jovanovic's (1982) widely acclaimed model, firms learn about their relative efficiency and are forced to leave the industry when they cannot meet the required efficiency. As a result, most often it is small and young firms that exit the industry. Capital-intensive industries and industries with a large average firm size exhibit strong barriers to exit (Pennings & Sleuwaegen, 2002). In a review of empirical papers on exit, Siegfried and Evans (1994) find ample evidence that, as predicted by theory, poor profitability, weak demand conditions, low capital intensity and small firm size have a significant impact on the propensity to exit. The literature on economic crises highlights the need for better management as a survival mechanism (Champion, 1999). From a resource-based perspective, such better management represents the organizational resources and capabilities firms can use to manage economic conditions and perform (Barney, 1991; Day, 1994; Dickson, 1992; Grewal & Tansuhaj, 2001). Therefore, a firm's viability is limited when managers fail to diagnose the causes of their firm's decline and to respond with appropriate strategies given the demands of an evolving and changing environment (Peng & Heath, 1996). As discussed, PM tools can help firms improve their profitability by providing relevant information to support the restructuring of their operations.

The literature review thus leads us to empirically test the main research hypothesis; namely, that the use of performance management tools positively impacts a firm's survival probability after controlling for other theoretically proposed factors of firm survival.

3. METHODOLOGY

3.1. Research Setting and Data

Our setting is represented by a sample of firms operating in the Slovenian economy. Slovenia is a small economy with a population of about 2 million. It achieved independence in June 1991 after breaking away from the former Yugoslav Federation. Since 2004 Slovenia has been a member of the European Union and since 2007 it has been a member of the Economic and Monetary Union. In 2008 Slovenia's GDP per capita (PPP) was 91 per cent of the EU-27 average and 78 per cent of the EUR-15 average. Slovenia has been relatively severely impacted by the current financial and economic crisis. In 2010 Slovenia accounted for only 85 per cent of the EU-27 average GDP per capita (PPP). The process of real divergence continued in 2011 with Slovenia being one of three EU member states to record negative GDP growth compared to EU-27 average real GDP growth of 1.5 per cent in 2011. This period has been characterized by a significant rise in firms shutting down due to bankruptcy and liquidation. The unemployment rate had doubled from 4.4 per cent in 2008 to 8.7 per cent by the end of 2011 (Eurostat, 2012).

The data sources for our analysis are, first, the survey "Cost management and contemporary management tools in Slovenian companies" conducted during the summer of 2008, second, data from the 2007 financial statements of the surveyed firms (collected by the Agency of the Republic of Slovenia for Public Legal Records and Related Services) and, third, data from the Business Registry of the Republic of Slovenia (on the termination of operations). The survey was based on an extensive questionnaire, fully structured and with pre-coded responses. The questionnaires were filled in during personal interviews with top or middle managers. In our opinion, personal interviews provide more complete and precise information than postal, telephone or e-mail questionnaires when taking the length of questionnaires into account. At the same time, they provide opportunities for feedback when clarifying any questions a respondent has about the instructions or questions. Other advantages of personal interviews are the moderate to fast speed of data collection, excellent respondent cooperation, small number of unanswered questions, and the lowest possibility of respondent misunderstanding (Zikmund, 2000). We conducted personal interviews using 160 specially trained interviewers. Each interviewer questioned 2 to 3 companies. Slovenia is a relatively small country so we could cover all geographical areas at a relatively low cost, which is usually not the case when personal interviews are involved (Zikmund, 2000).

This study is based on a research sample of 323 companies but, due to some unanswered questions, the number of firms considered in the empirical model estimations varies between 228 and 249 firms. Our sampling technique corresponds to judgmental or purposive sampling as the population elements were selected based on the judgment of the interviewers. Nevertheless, the sample is relatively large and offers a fairly good representation of the whole population as regards the size of the firms, their geographical position and their industry (branch) structure.

3.2. The Model

The latest empirical studies on firm survival usually rest on firm and industry dynamics models which emphasize the importance of firms' learning process for selection and evolution processes within the industry (Ericson & Pakes, 1995; Jovanovic, 1982). The firm selection process among heterogeneous firms within a particular industry operates through the entry and exit process. In our empirical model specification we follow Olley and Pakes' (1996) version of a general dynamic model of heterogeneous firm behavior in which the exit decision is based on comparing the ongoing value of a firm with the liquidation value the firm would receive in the case of exiting the market, i.e. it is only if the ongoing value of the firm is greater than the liquidation value that the firm chooses a non-negative value of investment:

$$\Pr(\text{dexit} = 1) = F(\beta'x), \quad (1)$$

where *dexit* is the dependent binomial variable, which takes the value of 1 if a firm exits the market and 0 if it continues to operate in the market, and *x* is a vector of firm- and industry-level characteristics that arguably affect the chances of the firm's survival. We apply a logit model which uses a logistic distribution in specifications of the exit decision function (1) (Greene, 2003):

$$\Pr(\text{dexit} = 1) = \frac{e^{\beta'x}}{1 + e^{\beta'x}} = \Lambda(\beta'x), \quad (2)$$

where $\Lambda(\cdot)$ indicates a logistic cumulative distribution function.

In addition to the standard firm- and industry-level characteristics that are, according to industry dynamics models, important for the firm's performance and especially its survival. A variable denoting the use of a performance management tool is also included in our empirical model specifications. Two different formulations of the PM tool use variable are tested, giving rise to the following two empirical model specifications:

$$\begin{aligned} \Pr(\text{exit} 2011_i) = & \beta_0 + \beta_1 \text{dPMtools}_i + \beta_2 L_i + \beta_3 \text{age}_i + \beta_4 \text{age}^2_i + \beta_5 \text{competition}_i + \\ & + \beta_6 \text{indK int}_j + \beta_7 \text{dEX}_i + \varepsilon_i \end{aligned} \quad (3)$$

$$\begin{aligned} \Pr(\text{exit} 2011_i) = & \beta_0 + \beta_1 \text{BSC}_i + \beta_2 \text{otherPMtools}_i + \beta_3 L_i + \beta_4 \text{age}_i + \beta_5 \text{age}^2_i + \beta_6 \text{competition}_i + \\ & + \beta_7 \text{indK int}_j + \beta_8 \text{dEX}_i + \varepsilon_i \end{aligned} \quad (4)$$

where subscripts *i* and *j* refer to firms and industries, respectively, while ² (sq) indicates that the variable enters the estimation in a squared form. The dependent variable in our exit model (*exit2011_i*) is a binomial variable. It takes a value of 0 if a firm from our sample was still active in 2011 and a value of 1 if a firm exited the market during the 2007–2011 period and, as such, did not survive until 2011.

In specification (3) *dPMtools_i* is a dummy variable which takes a value of 1 if a firm uses any performance management tool and 0 otherwise. In the second empirical model specification (4) with two dummy variables denoting the use of PM tools we further distinguish between firms that use the Balanced Scorecard (*BSC_i*) and firms that use another integrated performance measurement system (*otherPMtools_i*) in comparison to firms without any performance management tools.

Concerning the standard firm survival determinants, the theoretical models of firm and industry dynamics (Erikson & Pakes, 1995; Jovanovic, 1982) predict that the survival chances are higher for larger, older and more productive firms. In our model, the size of a firm (*L_i*) is measured by the number of employees. The variable *age_i* denotes a firm's age counting from the year of formation according to the Business Register of the Republic of Slovenia. It enters the equation in both a linear and quadratic form in order to account for the possible non-linear exit hazard-size relationship. We additionally control for the impact of a firm's exporting activity on its survival

chances with a dummy variable taking the value of 1 for exporting firms (dEX_i) and 0 for non-exporters. When other key characteristics of a firm such as its age and size are simultaneously controlled for, exporting is expected to increase firms' survival probability via the utilization of scale economies and learning by exporting (see Wagner, 2007 for a comprehensive survey). To control for the industry characteristics, we include the variable $competition_i$, measuring the firm's self-assessed number of competitors, and the industry-level capital intensity of production ($indKint_j$), measured by real fixed assets per worker. We expect the tougher competition that also characterizes industries with smaller capital requirements to increase the exit hazard firms face.

Table 1: Descriptive statistics of firms in the sample

Variable	All firms in the sample			Exit firms
	Obs	Mean	Std. Dev.	Mean
exit2011	250	0.048	0.214	1.000
dPMtools	319	0.439	0.497	0.167
BSC	304	0.135	0.342	0.083
otherPMtools	304	0.276	0.448	0.083
L	251	332.700	1,238.600	57.382
age	296	22.064	20.140	27.636
dEX	321	0.555	0.498	0.417
EXorientation	294	23.015	33.767	19.545
dservice	323	0.582	0.494	0.667
Kint	229	23.291	68.941	32.926
competition	321	2.470	0.971	2.8332
indKint	251	5.419	10.381	5.637

In Table 1 we provide sample statistics of the firms included in our sample. The results show that 56 per cent of the analyzed firms did not use any form of performance management tools as indicated in Section 2. In addition, 13.5 per cent of the surveyed firms used the BSC, while 27.5 per cent used another integrated performance measurement system. The sample consists of 34 per cent micro, 19 per cent small, 18 per cent medium, and 29 per cent large firms. The average firm from our sample had 332 employees and at the time of the survey was 22 years old. Further, 55.5 per cent of the firms in our sample are exporters with an average share of revenues from foreign markets of around 23 per cent. Manufacturing accounts for 32 per cent of the firms, whereas 58 per cent are in service industries. The other 10 per cent of firms operate in primary industries or in utilities. With regard to the self-perceived number of direct competitors, 22 per cent of the surveyed firms estimated they have less than 5 (value 1), 20 indicated they have from 5 to 9 (value 2), while 45 per cent stated they have more than 10 (value 3). The share of firms finding their competition to be tougher, i.e. those estimating a higher number of competitors, is larger in service and among micro-sized firms. Firms in our sample estimated their market share to be on average 30 per cent of the market, with a median value of 23 per cent. 4.8 per cent (i.e. 12 firms) did not survive until 2011. More than 83 per cent of the exiting firms reported that they do not use any form of performance management tools. In comparison with all firms in the sample exiting firms were on average much smaller but older with lower export orientation (a firm's export orientation refers to the share of foreign sales in the firm's total sales – see *EXorientation* in Table 1). They were operating in more competitive industries with higher industry-level capital intensity of production. Compared to the sample average relatively larger share of exiting firms operates in service industries.

4. RESULTS AND DISCUSSION

In Table 2 we provide empirical results of the logit regression exit models we performed, based on empirical equations (3) and (4).

Table 2: Empirical results of the logit regression exit models

Dependent variable: exit2011	I		II		III		IV		V	
	Coeff. (Std.Err.)	Marg. eff.	Coeff. (Std.Err.)	Marg. eff.	Coeff. (Std.Err.)	Marg. eff.	Coeff. (Std.Err.)	Marg. eff.	Coeff. (Std.Err.)	Marg. eff.
dPMtools	-1.361* (0.786)	-.062			-1.014 (0.816)	-.047	-1.209 (0.907)	-.050	-0.877 (0.927)	-.037
BSC			-0.752 (1.069)	-.036						
otherPMtools			-1.563* (1.509)	-.055						
L					-0.002 (0.002)	-.0001	-0.008* (0.005)	-.0003	-0.009* (0.006)	-.0004
age							-0.057* (0.061)	-.002	-0.050* (0.062)	-.002
age ²							0.002* (0.001)	.0001	0.002* (0.001)	.0001
competition									0.313 (0.384)	.013
indKint									-0.007 (0.061)	-.0003
dEX									-0.924 (0.781)	-.039
constant	-2.58** (0.328)		-2.58** (0.328)		-2.47** (0.346)		-2.26** (0.734)		-2.90** (1.323)	
observations	247		235		244		233		228	
LR χ^2	(1) 3.85**		(2) 3.42		(2) 4.87*		(4) 13.00**		(7) 15.48**	
Pseudo R ²	0.0401		0.0361		0.0509		0.1466		0.1756	
Log-likelihood	-46.074194		-45.67262		-45.412304		-37.8224		-36.336594	

Notes: ** and * denote significance at 5% and 10%, respectively. Standard Errors are reported in parentheses.

The estimates of specifications I and II show that, when other characteristics of the firm or the industrial environment are not accounted for, the use of performance management tool(s) in 2007 decreases the probability of market exit by 2011. Estimated marginal effects show that firms which used any form of PM tools (BSC or other) in 2007 experienced around a 6 percentage points lower hazard of shutting down during the current economic crisis. However, when the standard firm characteristics from the theoretical models of firm and industry dynamics (Jovanovic, 1982; Erikson & Pakes, 1995), such as firm age and size, are added into model specifications III and IV the performance management tools' impact on the firm's survival probability is no longer statistically significant, with the marginal effect of PM tool use dropping to 4.7 percentage points. This decrease in the importance of PM tools use for predicting firm survival is obviously a result of the strong correlation between a firm's size and age on one hand and the use of PM tools on the other. Based on theoretical predictions, the likelihood of a firm's market exit was lower for larger and older firms. Similarly, the impact of performance management tools on survival becomes even smaller, when other firm and industry characteristics such as industry competition, industry-level capital intensity of production and the firm's exporting status are included among the regressors. According to our results, the industry characteristics (competition and the industry-level capital intensity of production) do not have a statistically significant impact on a firm's survival chances. However, the direction of their impact is as expected, i.e. when there is more competition and the industry is less capital-intensive, the firm has a lower survival probability. Although not statistically significant, a marginal effects analysis shows that exit hazard of exporters is 3.9 percentage points lower than exit hazard of firms oriented to the domestic market.

The comparison of the empirical estimates of specifications I-V from Table 2 indicates that the significance of the impact of using PM tools on firm survival is very sensitive to other controlling variables as a result of the high positive correlation between these firm characteristics. This suggest that both a firm's survival and the use of PM tools are positively related and largely explained by the same firm characteristics, especially size and age. In general, the success of implementing any particular management practice frequently depends on a firm's characteristics, and not all firms can or should apply the same set of practices. Many studies have confirmed that

contextual factors play a considerable role in explaining the companies' decisions to use PM tools (Hoque & James, 2000; Joshi, 2001; Mol & Birkinshaw, 2009; Peljhan & Tekavčič, 2008; Tekavčič & Peljhan, 2003).

One long-established relationship is that PM tools are more suitable and viable for larger and older companies (Bloom & Van Reenen, 2007; Bruns & Waterhouse, 1975; Chenhall, 2003; Chow et al., 1997; Gordon & Narayanan, 1984; Hoque & James, 2000; Joshi, 2001; Marc et al., 2010; Mol & Birkinshaw, 2009; Merchant, 1984; Verbeeten & Boons, 2009). Theory suggests that size may affect the way firms design and use PM tools due to the greater decentralization and structuring of activities. Consequently, in large companies a broader set of information and measurement issues arises (Kaplan & Atkinson, 1998). Large firms have more resources to finance the introduction of new PM tools and the overhaul of existing ones enables them to test the new practices (Joshi, 2001). Size influences the introduction of PM tools in various ways. Larger firms face a wider variety of challenges than smaller firms, and encounter a greater number of competitors of all sizes. To overcome these challenges and competitors, larger firms are more likely to want to take up new practices. Moreover, larger firms hold a bigger stock of resources, including knowledge on management practices and human capital and will therefore be more likely to introduce new practices. Thus, larger firms are both under more pressure to introduce new practices, compared to smaller firms, and more capable of doing so (Mol & Birkinshaw, 2009). The research evidence on the impact of firm age on PM tools is less conclusive (Bloom & Van Reenen, 2007) indicating that age is on one hand related to higher rigidity but on the other also to more experience. A source of insight regarding PM tools may also be a firm's participation in international markets since that exposes a firm to a much broader set of management approaches and opportunities in different contexts than it would obtain in its domestic market (Mol & Birkinshaw, 2009).

CONCLUSION

Some firms have been unable to survive the present economic crisis. This study investigates whether the use of PM tools can help firms withstand the challenges of operating in the current economic conditions. The last few years have shown that a firm's survival largely depends on its capacity to constantly satisfy its customers' needs and to overcome competitive pressures (Mar Fuentes-Fuentes et al., 2004). The purpose of this study was to investigate whether the use of performance management tools (systems) plays a significant role in firms' survival probabilities. We found that, when firm and industry characteristics are not accounted for, there is a statistically significant difference in the survival probabilities of firms that use PM tools and those that do not.

Yet our study supports the view that size and age have a major influence on the survival of firms. As these factors also significantly influence the use of PM tools, this could be the reason the impact of PM tools no longer statistically significantly explains a firm's survival probability when firm characteristics are introduced into the model. We found a strong and significant correlation between the use of PM tools and firm size and age (these two variables seem to be the primary survival determinants). We therefore believe that firm size and age are more important determinants of a firm's survival probability than the influence of using PM tools (and other firm characteristics). The use of PM tools has been recognized as an important survival determinant as well, but only when studied "in isolation".

While there have been rare attempts at integrating PM tools with survival analysis, we believe that more research will emerge in the field that relates performance management and firm and industry dynamics. Methodologically, a panel data structure that would allow duration analysis would clearly be welcome. There are alternative interesting avenues for future research on this subject. We would propose a study using structural equation modeling where PM tools would act as a mediating variable between contextual variables (such as firm size and age) and firm exit probability.

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