PMS MATURITY LEVEL AND DRIVING FORCES: AN EMPIRICAL INVESTIGATION IN ITALIAN SMEs

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ABSTRACT

Although many studies on performance measurement have been carried out in the last years, just a few of them refer specifically to small and medium enterprises and usually have mainly a theoretical approach. Starting from an analysis of existing literature on PMSs in SMEs, the research aims at extending current knowledge and understanding of performance measurement practice into the context of SMEs. Using data collected through a probability sample survey of 87 Italian manufacturing SMEs, the paper investigates the state of PM approaches adopted by SMEs, analysing in detail the maturity level of their PMSs. Furthermore, several theoretical propositions found in literature about the factors that affect PM introduction and evolution in SMEs have been tested in order to check their validity and applicability and in the majority of cases a statistically significant association between the considered context-specific factors and the adoption of a PMS was found.

Keywords: PMS maturity level, Driving forces, SMEs, Survey.

INTRODUCTION

In the last few years many authors underlined the importance of performance measurement and performance management in gaining competitive advantages and replying to ever increasing market pressure (Hudson et al., 2001; Garengo and Bititci, 2007). This is particularly true for small and medium sized enterprises (SMEs) which account for the 99% of the total amount of operating enterprises, at least in the European Union (E.C., 2007). For this reason, SMEs are socially and economically important and need tools and solutions to preserve their competitiveness in challenging environments. A large amount of research in literature addresses the designing of frameworks and procedures that organisations can follow in order to implement balanced performance measurement systems (PMSs) supporting decision-making and strategy goals achievement. Although many studies on performance measurement (PM) have been carried out, just a few of them refer specifically to small and medium enterprises and usually have mainly a theoretical approach (Garengo et al., 2005). So there seems to be a lack of empirical investigation in the field of performance measurement and management in SMEs.

Purpose of the paper is to extend current knowledge and understanding of performance measurement practice into the context of SMEs. In particular, the paper aims first at investigating the current level of uptake of performance measurement systems by SMEs and analysing the

characteristics of such systems in order to explore their evolution through different evolutionary stages. The second objective of this paper is to identify and test theoretical propositions about the context-specific factors that affect PMSs adoption by SMEs.

This paper is organized into four major sections: in the first section existing theoretical knowledge and empirical studies on PMSs in SMEs are analysed and the context-specific factors which are supposed to influence the introduction of PMSs into the companies are identified; the second section defines the research questions investigated, the conceptual model and the hypotheses to be tested; the third section describes the approach and the methodology adopted in the research; finally, the fourth section is devoted to the illustration of the results and the major findings and the discussion of the theoretical and research implications of the study before identifying directions for future research.

THEORETICAL BACKGROUND

The problem of how organisations should assess their performance has been challenging researchers and practitioners for many years (Pun et al., 2005).

One instrument proposed in literature to help companies in overcoming this problem and that received considerable attention during the last years is called Performance Measurement System. A review of the literature, performed by Franco-Santos et al. (2007), showed that there is lack of agreement on the definition of "performance measurement system" and on its key characteristics. They found that each definition provides a different perspective on the concept and usually describes alternatively the features of the system and/or the role(s) that the system plays and/or the processes that are part of the system. One of the most popular definitions is that provided by Neely et al. (1996), who define a PMS as the "the set of metrics used to quantify the efficiency and effectiveness of actions". Furthermore they highlight that a PMS can be examined at three different levels: the individual measures of performance; the performance measurement system as a whole; the relationship between the PMS and the environment within which it operates. According to Forza and Salvador (2000), a performance measurement system is described as "an information system that supports managers in the performance management process mainly fulfilling two primary functions: the first one consists in enabling and structuring communication between all organisational units […], the second one is that of collecting, processing and delivering information on the performance of people, activities, processes, products, business units, etc." Also Wettstein and Kueng (2002) proposed a definition focusing mainly on the aim of a PMS rather than on its structure: "A Performance Measurement System is an information system that tracks the performance of an organization (or part thereof), supports internal and external communication of results, helps managers by supporting both tactical and strategic decision-making, and facilitates organizational learning." They identify five basic components of a PMS: people, procedures, data, software, hardware.

Since one of the objectives of this research is to analyse the characteristics of SMEs' performance measurement systems and to explore their development during time, it is necessary to identify, by means of the different definitions, the main aspects that should be analysed in a PMS and summarise these aspects and their evolutionary stages in a maturity model.

One of the most complete maturity models proposed in literature is that of Wettstein and Kueng (2002), which describes the development of a PMS over time, following an evolutionary pattern through four maturity levels (Ad-hoc, Adolescent, Grown-up, Mature) which are characterized by the progressive development along six dimensions.

Since we focus on SMEs'performance measurement systems, that usually are characterized by lower complexity levels (Garengo et al., 2005), the general maturity model has been simplified and adapted as described in Table 1. The four maturity levels have been rearranged into three, in order to eliminate

unlikely maturity stages, characterised by unreasonably too low or too high level practices, which could be more adequate in micro/individual or large enterprises contexts.

For the present study, on the basis of the analysis of the different definitions of PMS present in literature, seven main dimensions of a PMS have been chosen to be investigated: Scope of Measurement, Data Collection, Storage of Data, Communication of Performance Results, Use of Performance Measures, Quality of Performance Measurement Processes and Target Setting. The first six dimensions were already included in the model proposed by Wettstein and Kueng (2002), while the dimension "Targets setting" has been added to the previous six because it provides another important element to be considered when evaluating a PMS and its maturity level (Neely at al., 1996; Fitzgerald, 1991).

Table 1 – A three-stage Maturity Model for PMSs (Adapted from Wettstein and Kueng, 2002)

Dimension	Maturity level 1	Maturity level 2	Maturity level 3
Scope of Measurement	Only financial performance indicators are considered.	Financial performance indicators are measured. In addition, a few non-financial indicators are measured as well.	Both financial and non-financial performance indicators are measured in a balanced way.
Data Collection	Most performance-relevant data are collected manually.	Some performance data are collected manually and some by operational IT systems.	Collection of most performance data is fully automated by operational IT systems.
Storage of Data	Most performance data are stored in paper format.	Performance relevant data are stored in local PCs.	Most performance data are stored in an central database integrated with the IS.
Communication of Performance Results	Performance results are disseminated on an ad-hoc basis usually to upper and middle management.	Performance results are disseminated regularly and sometimes also to operative levels.	Performance results are disseminated regularly to all hierarchical levels and also to external stakeholders.
Use of Performance Measures	Performance data are used primarily for internal reporting.	Performance data are used primarily for checking improvements and analysing deviations from targets.	Performance data are used primarily for supporting decision making.
Quality of Performance Measurement Processes	The measurement processes are not defined.	Measurement processes are documented and standardised for some main metrics. Frequency of measurement is regular.	Measurement processes are documented and standardised for all metrics. At least one person is responsible to collect and report the data.
Targets setting	No target levels are set for the metrics.	Target levels are set for some metrics.	Target levels are set for all metrics.

The maturity model implies that SMEs are gradually evolving from one stage in which there is not a PMS in place to others characterized by increasing level of maturity of the PMS and this rises the question about what the most important driving forces that initiate and accelerate the process are in the specific context of small and medium-size companies. In fact SMEs share some common characteristics, like suffering from severe resource limitations and skill shortages, adopting informal and reactive strategies and highly personalised management styles (Hudson Smith and Smith, 2007), and all these aspects make SMEs different from large enterprises and for this reason they need an ad hoc analysis.

A comprehensive review of the literature, in addition to ten interviews with PMS scholars and practitioners, have been performed by Garengo and Bititci (2007) in order to investigate the factors that enable or constrain PMS in SMEs. They identified six main contingency factors: corporate governance structure, management information system, business model, organizational culture and management style, external environment, company size. Corporate governance structure refers to the whole set of

structures and processes used to guide and control an enterprise (OECD,1999), and is usually analysed under two dimensions: the composition of the board of directors and its role. Management information systems are considered both in terms of soft (managerial practice) and hard (IT investments) dimensions (Claver et al., 2001). According to Shafer et al (2005), using the term "business model" we refer to firm's underlying core logic and strategic choices for creating and capturing value within a value network. Organisational culture is defined as the pattern of basic belief, assumptions and values shared by the members of an organization (Schein, 1992), while management style refers to the management's way to influence, coordinate and direct people's activities towards company's objectives (Robbins, 2007). External environment represents the context in which the organisation operates and it encompasses all the factors (conditions, trends, and forces) essentially outside the control of organizational members, like, for example, the broad general environment, the competitive environment and the marketplace. Finally, size refers to the dimensions of a company both in terms of number of employees and annual turnover or balance sheet total. Table 2 shows the SME definition adopted by the European Union (E.C., 2007).

Table 2 – SME definition in EU (E.C., 2007)

ENTERPRISE CATEGORY	HEADCOUNT	TURNOVER	OR	BALANCE SHEET TOTAL
MEDIUM-SIZED	< 250	≤ € 50 million		≤ € 43 million
SMALL	< 50	≤ € 10 million		≤ € 10 million
MICRO	< 10	≤ € 2 million		≤ € 2 million

Each contingency factor can be further developed and analysed in its main dimensions. Wettstein and Kueng (2002), for example, suggest four main driving forces that can cause and influence the implementation of a performance measurement system and that can be considered as specific dimensions of the contingency factors listed above: rivalry among competitors, information need from managers, company-external requirements, IT capabilities. All these forces can be seen as a deeper level of detail of the previous framework.

In-depth empirical investigation of the theoretical constructs described above is still missing in literature. Just a few empirical studies on the subject have been performed in literature. Garengo and Bititci (2007) analysed four case studies and formalized four theoretical propositions regarding the relationship between performance measurement and corporate governance structure, information systems, business model and culture, while Burgess et al. (2007), through a questionnaire survey, focused on size and ownership.

In both the papers, the authors highlighted that further research would be useful to test the theoretical propositions, to check their generalizability and identify any other important additional contingency factor in SMEs.

RESEARCH GOALS AND PROPOSED HYPOTESES

The goal of this paper is to investigate the diffusion of PMSs among SMEs and to analyze their characteristics in order to categorize companies into three different levels of PMS maturity. Furthermore this research is intended to verify some theoretical propositions found in literature about the factors affecting PM introduction and evolution over time in small and medium-sized companies.

For this reason, the results of the study will try to give an answer, with reference to the context investigated, to the following research questions:

- RQ1. What maturity levels characterize PMSs in SMEs?

The analysis of cases revealed that the development of a PMS usually follows a pattern (Wettstein and Kueng, 2002). Table 1 describes the evolution of the seven dimensions of a PMS through three maturity levels (Basic, Advanced, Excellent). The study will explore the distribution of SMEs among the three stages in order to evaluate the current situation and investigate the need for more effective tools and procedures to support SMEs during the development process of their PMS.

- RQ2. What factors influence PMS adoption and evolution in SMEs?

The research aims at investigating the most important driving forces that influence, start and accelerate the implementation process of a PMS in a SME.

This research question will be answered through hypotheses testing. Some of the propositions that will be tested were formulated by other authors in literature on the basis of empirical research, while some others have been proposed by the authors of the present paper since they seem reasonable and likely on the basis of the theoretical background.

In the following the propositions specifying the relationships among the different constructs are listed, along with the related testable hypotheses which are collected in Table 3.

- P1. The nature of corporate governance structure impacts the perceived value of a PMS as a decision supporting tool.
- P2. Advanced information system practices create a context that favours the use of a PMS.
- P3. A change in the business model seems to lead to the implementation of a PMS.
- P4. Increasing uncertainty and wideness of the market in which the company operates favour the adoption of a PMS.
- P5. A quality-oriented organizational culture and the introduction of new norms (like ISO standards) lead to the implementation of a PMS.
- P6. The larger the company size, the more probable the use of a PMS.

Table 3 – Testable hypotheses

Prop.	Contingency factor	Hypotheses	
P1	Corporate governance	H1	The number of managers is positively related to the presence of a PMS.
		H2	The influence of ownership is negatively related to the presence of a PMS.
P2	Management information system	H3	The presence of advanced enterprise applications is positively related to the presence of a PMS.
		H4	Advanced information management practice is positively related to the presence of a PMS.
P3	Business Model	H5	Changes in the business model are positively related to the presence of a PMS.
P4	External environment	H6	Geographical wideness of the market is positively related to the presence of a PMS.
P5	Organizational culture	H7	The certification of the company according to ISO standards is positively related to the presence of a PMS.
P6	Size	H8	The number of employees is positively related to the presence of a PMS.

METHODOLOGY

Sample and population

In order to investigate the above research questions, a survey methodology was chosen rather than the case study approach because while case study research is used to explore construct definitions and generate hypotheses, survey research allows testing of hypotheses and theory building (Malhotra, 1998).

The population investigated consisted of manufacturing SMEs, that means firms with codes included in the section "C" of NACE (rev.2), which is the European standard classification of productive economic activities. The authors decided to focus the research on all the manufacturing SMEs located in the province of Brescia, which is situated in the north of Italy, because it is a highly industrialized province and it could be representative of most of the divisions included in the sector. In fact, the manufacturing sector consists of many different divisions, from textile to food companies, from metallurgical and mechanical to plastics ones.

The total population investigated was composed of all the 17113 SMEs registered to the Chamber of Commerce of Brescia. Micro-companies employing fewer than 5 people were excluded because they usually consist of craftsmen or professional men's activities that usually adopt too low formalized managerial practice, while micro-companies with more than 5 employees were included in the study as representing the lower bound of SMEs' practice.

Through a stratified random sampling, dividing the population into strata according to division and size, a probabilistic sample of 410 companies was obtained, which is larger than the minimum sample size of 377 required for a population of 20000 individuals according to Sekaran (2003).

The questionnaire

The instrument used is a structured questionnaire that allowed the researchers to collect data pertaining to companies' procedures, practices and maturity in performance measurement. Questions were formulated in a clear and precise way, paying particular attention to wording, in order to avoid possible ambiguity for the reader (Forza, 2002). The questionnaire was designed to be self-explanatory and not to need an interviewer for its compiling. All the questions, except the final one, have a closed form with multiple-choice or single-choice answers and do not request the compiler to spend time gathering exact data or information.

Most of the answers are based on a categorical or ordinal scale, first because one of the aims of the study is to categorize companies according to different dimensions and thus nonmetric data, that can be used to identify and describe the different SMEs, are needed (Hair et al., 1992), second because objective measures dealing with facts, rather than with subjective judgements, about the firm's reality, are preferred in order to enhance the objectivity of the research and thus single direct questions that have an ordinal set of categories would be appropriate (Sekaran, 2003). It was assured that the categories were mutually exclusive, but also collectively exhaustive, including the "Other, please specify" category when needed (Rea and Parker, 2005). To limit the length and the complexity of the questionnaire single-item measures for each construct were employed.

Chief Executive Officers, who should have personal knowledge of their organisations' PMS, were identified as being the target respondents to the questionnaire and thus the cover letter explaining the nature and the objective of the research and the questionnaire was addressed to the "general manager" of the company.

The survey consists of two major sections. The first section gathers general information about the company, type of business and external environment, while the second section focuses on performance measurement practice in the firm.

The questionnaire ends with an open-ended question that allows the respondents to make remarks or comments on any aspect in the questionnaire (Sekaran, 2003).

Data collection

The researchers valued fax transmission as the most adequate mean to send the questionnaire since it makes it possible to reach a large amount of companies with a small expense and it is usually taken into consideration by the companies of the area surveyed, in particular by small ones which usually do not

make large use of other communication means such as e-mail. It also gives the respondent time to compile the questionnaire without hurry and it allows one to gather a large amount of information.

In order to present a test instrument that is clear, accurate and valid, extensive pre-testing of this survey was conducted before it was finalized. The final questionnaire in fact was submitted both to academic colleagues and to target respondents. Academic colleagues tested that the questionnaire accomplished the study objectives, while target respondents provided feedback on the aspects that could affect answering and answers (Forza, 2002). The researchers visited 6 potential respondents and observed them filling in the questionnaire, recording the feedback on the clarity of instructions and questions, and about any problems in understanding the expected answers (Fowler, 1993). All the elements were used to fine-tune the questionnaire and some rewording was done in order to improve clarity. After the pilot test, all the other survey forms were transmitted by fax and after three weeks non-respondent companies were telephoned in order to solicit the return of the questionnaire (Rea and Parker, 2005). In some cases it was necessary to send the questionnaire a second time, after the phone call, since the form had not arrived or had been mislaid. Overall, this resulted in 87 usable responses out of a sample frame of 410, yielding a response rate of 21.2%, which meets Malhotra and Grover's (1998) 20% response rate hurdle.

In order to assess non-response bias, the profiles of early and late respondents (Venkatraman, 1989; Armstrong and Overton, 1997) were compared and the differences were tested using the Chi-Square test of independence. No significant differences were found between respondents for industrial type and size of the firm. To further investigate that the sample of respondents was representative of the population in terms of composition (industry and size), so that the findings on the sample could be extended to the whole population by statistical inference, other Chi-Square tests were performed and no statistically significant differences were detected. Thus it was assumed that the sample was representative and gathered data were then used for all further analyses.

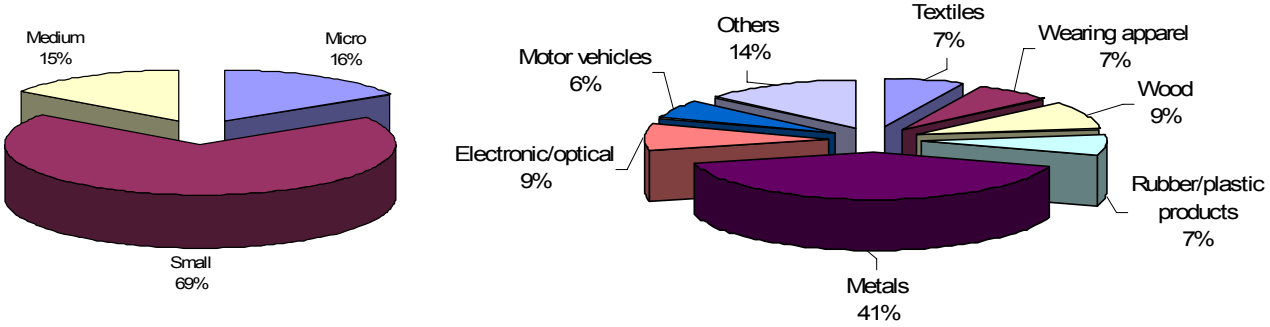
All the activities described took six months, between October 2007 and March 2008.

RESULTS AND ANALYSIS

Demographic variables

From the 87 companies who returned their questionnaires, 14 are micro enterprises, 60 small enterprises and 13 medium enterprises. The majority of enterprises operate in the manufacture of metals (41%), followed by 9% of wood manufacturers, 9% of electrical equipment manufacturers, 7% of textiles products manufacturers (Figure 1).

Figure 1 – Companies' size and division



Fifty five per cent of the companies were traditional family companies, while 37% were open family companies and 8% managerial companies as defined by Garengo (2007).

Maturity level

Questions related to each of the seven dimensions of a PMS were included in the questionnaire and they allowed a classification of the respondent companies among the three different PMS maturity levels defined in Table 1. In contradiction to what stated by Wettstein and Kueng (2002), it was found that the different dimensions were independent one of the other and that a particular company could be very advanced regarding one dimension, while being rather antiquated regarding another dimension. For this reason, in Table 4, the classification is detailed for each dimension, that means that for each dimension it is possible to see the frequency distribution of the companies of the sample among the three maturity stages. The darker the colour in the table, the higher the percentage of companies in that particular maturity stage. From the analysis of the results it emerged that only a few companies have a balanced PMS, while the majority are mostly financially focused. Data collection is usually not fully automated by IT systems and the storage of data is centralized only in a few enterprises. Furthermore the measurement process is not completely formalized neither in terms of procedures definition nor in terms of performance targets setting. Finally it emerged that dissemination of performance results is not regular and usually does not involve operative levels but only upper and middle management.

Table 4 – Maturity level results

Dimension	Maturity level 1	Maturity level 2	Maturity level 3
Scope of Measurement	33.3%	38%	28.7%
Data Collection	9.2%	85%	5.8%
Storage of Data	24.4%	47.7%	27.9%
Communication of Performance Results	83.9%	12.6%	3.5%
Use of Performance Measures	27.4%	25%	47.6%
Quality of Performance Measurement Processes	37.9%	52.9%	9.2%
Targets setting	31%	41.4%	27.6%

Hypotheses testing

Given that the survey questionnaire involves a good deal of categorical scale data, nonparametric methods for testing statistical association between variables are the most appropriate. For this purpose, it was decided to use contingency tables M×N with the χ^2 test. Once the table has been filled in with observed and expected absolute frequencies, it is possible to calculate the χ^2 value, which has to be compared with the χ^2 critical value for the respective degrees of freedom (DF = (N–1)×(M–1)) and a significance α chosen of 0.05. If the calculated value is higher than the critical one, it means that the probability of finding by chance the differences found among expected and observed values is lower than 5%, so that it is possible to refuse the hypothesis that the differences are fortuitous and to state that there is a statistical association between variables.

From the analysis carried out, it emerged that 7 out of the 8 hypotheses tested have been substantiated. Most of the contingency factors analysed were found to have a statistically significant association with the adoption of a PMS by the company. For the present study we considered that a PMS was in place in the company when the following conditions were satisfied: at least one financial and one non-financial indicator regularly measured following a defined procedure. According to this definition 29 out of the 87 companies were found to have a PMS.

Table 5 and Table 6 show that when the owner manages the company and the number of managers is very limited, a PMS is rarely used, probably because there is less need to share information and the decision making process is based on entrepreneur's knowledge and experience.

Table 5 – Cross-tabulation of the presence of a PMS by the number of managers

H1	Number of managers			
Presence of a PMS	≤ 3 (R%,C%)	≤ 5	> 5	Total
Yes	10 (37%;18%)	7 (26%;41%)	10 (37%;83%)	27 (32%)
No	45 (79%;82%)	10 (18%;59%)	2 (3%;17%)	57 (68%)
Total	55 (66%)	17 (20%)	12 (14%)	84
Test	Calculated value	Degrees of freedom	Critical value (.05)	Significance
χ^2	19.97*	2	5.99	✓

* p-value = 0.00005

Table 6 – Cross-tabulation of the presence of a PMS by the composition of the Board of Directors

H2	Composition of the Board of Directors			
Presence of a PMS	Entrepreneurs'Family (R%,C%)	Entrepreneur + Shareholders	Managers designed by Shareholders	Total
Yes	9 (31%;19%)	16 (55%;50%)	4 (14%;57%)	29 (34%)
No	38 (67%;81%)	16 (28%;50%)	3 (5%;43%)	57 (66%)
Total	47 (55%)	32 (37%)	7 (8%)	86
Test	Calculated value	Degrees of freedom	Critical value (.05)	Significance
χ^2	9.98*	2	5.99	✓

* p-value = 0.00681

Furthermore, advanced information management practice, preferably supported by adequate management information systems, create a context that favours the adoption of a PMS because structured and reliable data to evaluate the different metrics are provided (Tables 7 and 8).

The external environment was found to have statistical association with the implementation of a PMS. In fact, companies operating in wider markets, usually at an international level, are more likely to have a PMS in place (Tables 9).

Table 7 – Cross-tabulation of the presence of a PMS by the Information System type

H3	Information System type			
Presence of a PMS	None (R%,C%)	National MIS	Advanced Information Systems	Total
Yes	3 (11%;21%)	17 (61%;30%)	8 (28%;73%)	28 (34%)
No	11 (20%;79%)	41 (75%;70%)	3 (5%;27%)	55 (66%)
Total	14 (17%)	58 (70%)	11 (13%)	83
Test	Calculated value	Degrees of freedom	Critical value (.05)	Significance
χ^2	8.94*	2	5.99	✓

* p-value = 0.01146

Table 8 – Cross-tabulation of the presence of a PMS by the information management practice

H4	Information management practice		
Presence of a PMS	Poor/Fair (R%,C%)	Good/Very good	Total
Yes	11 (38%;24%)	18 (62%;45%)	29 (34%)
No	35 (61%;76%)	22 (39%;55%)	57 (66%)
Total	46 (53%)	40 (47%)	86

Test	Calculated value	Degrees of freedom	Critical value (.05)	Significance
χ^2	4.26*	1	3.84	✓

* p-value = 0.039096

Table 9 – Cross-tabulation of the presence of a PMS by the wideness of the market

H6	Market			
Presence of a PMS	Local / Regional (R%,C%)	National	European / International	Total
Yes	1 (3%;6%)	6 (21%;27%)	22 (76%;46%)	29 (33%)
No	16 (27.5%;94%)	16 (27.5%;73%)	26 (45%;54%)	58 (67%)
Total	17 (20%)	22 (25%)	48 (55%)	87

Test	Calculated value	Degrees of freedom	Critical value (.05)	Significance
χ^2	9.5*	2	5.99	✓

* p-value = 0.008637

Table 10 shows that a quality-oriented organizational culture, usually consequent on a certification process, is likely to lead to the implementation of a PMS. Finally the results confirmed that the larger the company size, the more probable the use of a PMS, also with reference to micro, small and medium-sized companies (Table 11).

The only one hypothesis not substantiated in this empirical study refers to the relation between changes in the business model and implementation of a PMS (Table 12), but it would require further investigation because the "business model" construct is so complex and difficult to operationalize that probably in the present survey it was not analyzed with the needed level of detail.

Table 10 – Cross-tabulation of the presence of a PMS by the possession of certifications

H7	Company certified		
Presence of a PMS	No (R%,C%)	Yes	Total
Yes	4 (14%;9%)	25 (86%;63%)	29 (35%)
No	39 (72%;91%)	15 (28%;37%)	54 (65%)
Total	43 (52%)	40 (48%)	83

Test	Calculated value	Degrees of freedom	Critical value (.05)	Significance
χ^2	25.8*	1	3.84	✓

* p-value = 0.00000037

Table 11 – Cross-tabulation of the presence of a PMS by the number of employees

H8	Number of employees			
Presence of a PMS	Up to 10 (R%,C%)	Between 11 and 50	More than 50	Total
Yes	1 (3%;7%)	18 (62%;30%)	10 (35%;77%)	29 (33%)
No	13 (22.5%;93%)	42 (72.5%;70%)	3 (5%;23%)	58 (67%)
Total	14 (16%)	60 (69%)	13 (15%)	87

Test	Calculated value	Degrees of freedom	Critical value (.05)	Significance
$\chi 2$	11.37*	2	5.99	✓

* p-value = 0.003393

Table 12 – Cross-tabulation of the presence of a PMS by the changes in the business model

H5	Changes in the business model in the last years		
Presence of a PMS	No (R%,C%)	Yes	Total
Yes	2 (7%;17%)	27 (93%;36%)	29 (33%)
No	10 (17%;83%)	48 (83%;64%)	58 (67%)
Total	12 (14%)	75 (86%)	87

Test	Calculated value	Degrees of freedom	Critical value (.05)	Significance
$\chi 2$	1.74	1	3.84	✗

* p-value = 0.1871389

CONCLUSIONS

This paper analysed the results of a survey involving 87 Italian manufacturing SMEs.

The empirical investigation gave an overview of the state of PM approaches adopted by SMEs and allowed a classification of the companies among three different maturity levels of their PMS, highlighting areas of improvement and the need of appropriate tools, framework and procedures to guide and support performance measurement in SMEs. In particular, SMEs seem to suffer from financially based systems and from the lack of adequate IT infrastructure, as long as of effective information management processes.

Furthermore, the study allowed a deeper understanding of the contingency factors influencing PMS adoption by SMEs. Several theoretical propositions have been tested. Statistically significant associations between the presence of a PMS and the characteristics of corporate governance and organizational culture were found. In addition, company's size and external environment pressures, along with advanced management information practices, seem to favour the implementation and use of a PMS. All these elements provide useful knowledge for the development of new frameworks and tools specifically designed for effective use in SMEs.

This study is not without limitations, in particular with reference to the sample size and to the use of simple data analysis due to the employment of categorical scales. Further research would be required to test the generalizability of the present findings at an international level and to investigate possible interactions or interdependencies between the single contingency factors affecting PMS adoption by SMEs.

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