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Towards a contingency approach to performance measurement: an empirical study in Scottish SMEs

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Abstract

Purpose – The literature emphasizes the important role performance measurement systems (PMS) play in supporting organizational development in small and medium enterprises (SMEs). However, there are very few empirical and theoretical studies on the factors that influence performance measurement practices in SMEs. This paper aims to contribute to filling this gap using both theoretical and empirical approaches.

Design/methodology/approach – A literature review and interviews were used to identify four key contingency factors for PMS in SMEs. A qualitative research design involving a multiple case study methodology was carried out to investigate how these factors influence performance measurement.

Findings – The relationship between the contingency factors and performance measurement were formalized in four theoretical propositions. First corporate governance structure is one of the main factors influencing performance measurement adoption and use. Second, advanced information practices and advanced behaviours on the part of the people involved appear to be a necessary condition for the effective implementation and use of PMS in SMEs. Third, a change in a firm's business model seems to lead to the development of an improved PMS. Finally, the successful implementation of a PMS seems to be driven by an authoritative management style.

Research limitations/implications – Contingency factors were studied independently. Future research might investigate how these factors collectively influence performance measurement practices to make interdependence more explicit.

Practical implications – The theoretical propositions provide useful knowledge for defining a methodology and managerial tool to support performance measurement in SMEs.

Originality/value – This paper defines key contingency factors influencing performance measurement in SMEs; it contributes to clarifying how these factors could influence performance measurement practices in companies.

Keywords Performance measurement (quality), Small to medium-sized enterprises, Corporate governance, Management information systems, Organizational culture

Paper type Research paper

Introduction

Research studies indicate that performance measurement systems (PMS) can play a key role in supporting managerial growth in small and medium enterprises (SMEs) (Biazzo and Bernardi, 2003; Garengo *et al.*, 2005a). However, most performance measurement studies do not consider company size. The literature on business performance measurement (BPM) emphasizes poor use of PMS in SMEs, but little research investigates the reasons for this. Some of the reasons mentioned in the

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literature include shortage of human and capital resources, lack of strategic planning, misconception of the benefits of performance measurement and an overly technical orientation (Barnes *et al.*, 1998; Hudson *et al.*, 2001). However, in-depth empirical investigations of the factors influencing performance measurement in SMEs are scarce. The aim of the research presented here is to fill this gap. The purpose is to contribute to a better understanding of the factors that affect the adoption and use of PMS in SMEs and the relationship between these factors and performance measurement practices.

In order to carry out this research study, a contingency approach was needed, i.e. based on the assumption that various factors influence performance measurement in SMEs. This approach is not very common in the literature on PMS, but it is as an essential starting point to understanding performance measurement in small and medium enterprises. In this paper, the literature on PMS is reviewed along with an analysis of the research based on a contingency approach proposed by the management control system literature.

The remainder of this paper is organized in five sections. First the research design is presented and the main research phases described. Second, the literature on BPM is analysed making reference to two main research streams, i.e. PMS and management control systems (MCS); subsequently, based on the literature available, the main contingency factors that were chosen are presented. Third, the profile of the companies involved in the empirical study and the characteristics of their PMS are described. Fourth, the relationship between the identified contingency factors and performance measurement are presented. Finally, the answers to the predefined research questions are summarized along with a discussion of the main issues that require further investigations.

Research design

Exploratory research was carried out using a social constructionist paradigm (Easterby-Smith *et al.*, 2002). The unit of analysis was a PMS defined as a balanced and dynamic system that supports the decision-making process by gathering, elaborating and analyzing information (Bititci *et al.*, 2000; Neely *et al.*, 2002). The object of analysis was SMEs that were identified using Scott and Bruce's (1987) definition with some further specifications to define both the characteristics of the population from which the research sample was drawn and the boundaries of generalization of the findings (Eisenhardt, 1989; Yin, 1994). These specifications are as follows: the management is independent, i.e. capital was supplied by an individual or a small group and a parent company could not influence the decision-making process and performance measurement activities; the company belongs to the manufacturing sector; the area of operations is mainly local; the number of employees is between 20 and 250; the company has taken part in improvement projects. Three main phases characterized the research process and are described below.

First contributions from the literature on BPM and SMEs were reviewed at the beginning of the study as well as during the empirical phases (Figure 1). The two main research streams of BPM, i.e. PMS and management control systems, were analysed. Two different approaches stood out: MCS studies adopt a contingency-based approach while PMS research is mainly based on a normative approach. We thought both these approaches were essential to studying performance measurement in SMEs; consequently we applied a mixed analysis that combines aspects of both

management control system and performance measurement system studies. As our focus was on SMEs and few research reports are available on performance measurement in these companies, a study of the factors that enable or constrain performance management in SMEs as well as the relationship between these factors and performance measurement was carried out making reference to the literature on PMS, MCS and SMEs.

In order to further investigate the factors that enable or constrain PMS in SMEs, ten interviews were conducted. Five PMS scholars and five practitioners (entrepreneurs and managers of SMEs) were consulted by means of semi-structured interviews. Each person was interviewed once individually during a face-to-face meeting. At the end of the interview process, we asked for clarifications from one of the five scholars for a better understanding of his statements. The opinions of practitioners and scholars about factors influencing performance measurement are summarized later.

All the information was brought together using the categorical aggregation and interpretation technique, which brings instances together until something can be said about them as a group (Buckley *et al.*, 1976; Stake, 1995). Then six contingency factors were identified and four of them were chosen as the most significant ones for reasons that are explained later in this section.

Second, to investigate the relationship between performance measurement and the factors identified, further literature was reviewed to find out the key dimensions of specific models supporting the analysis of this relationship. In the following sections, these dimensions and the literature justifying their inclusion in this study are explained.

Third, a qualitative research design involving a multiple case study methodology was carried out. This data collection technique was chosen for three main reasons (Eisenhardt, 1989; Meredith, 1993). First this research study was exploratory since, as mentioned above, there is a lack of research on the topic studied. Second, case studies are considered to be very useful for uncovering possible contingency effects and for finding empirically grounded explanations for them (Gioia and Pitre, 1990). Finally, case studies have proven to be one of the most powerful research methods, particularly in the development of theory (Voss *et al.*, 2002).

Four Scottish SMEs were analyzed to verify the importance of the contingency factors and to investigate the relationship between these factors and performance measurement using the dimensions identified. The empirical investigation involved SMEs with heterogeneous experience in performance measurement and different contingency factors. The data were collected by visiting the companies and interviewing people at different organizational levels. The interview protocol was dynamically adjusted to maximize insights into the themes that emerged during

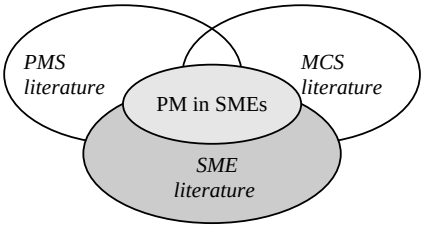

Figure 1.
Literature streams reviewed to define the contingency factors

the interviews. Company documents and interviews with company consultants were used to collect additional information and to better understand the data gathered. When possible, the opinions of other researchers were collected to help confirm our findings. The case studies were analyzed without any predefined hypotheses to test (Eisenhardt, 1989). Some important variables were defined for each contingency factor using the existing literature, but the relationships between these variables were not identified before the analysis of the case studies.

In the empirical study it was necessary to use preliminary data to better understand the nature of the problem. Given the social constructionist paradigm adopted and the exploratory nature of the research, the categorization of the companies was very descriptive.

Cross case analysis was used to analyze the empirical data. Overlap between data analysis and data collection characterized the entire research process. Nevertheless, the data was formally examined in two main phases. First some models were defined to study each contingency factor (Meredith, 1993). Then, the companies were categorized into five frameworks and the relationships between each contingency factor and performance measurement were investigated and summarized in the form of theoretical propositions.

Background literature

In the last 20 years, BPM has been studied using many different perspectives (Franco and Bourne, 2003), two have been recognised as the most relevant: the management control system perspective and the and performance measurement system perspective.

Management control system studies are characterized by a contingency approach: each organization has to choose the most suitable system by taking into account some contingency variables such as strategy, objectives, structures, culture, technology, etc. (Chenhall, 2003). Many empirical studies have been carried out and the literature often calls for an innovative approach (Ittner and Larcker, 1998; Nanni *et al.*, 1992; Shirley and Reitsperger, 1991). Though some non-financial measures are introduced in MCS studies, the majority continue to focus on accounting aspects, and innovative models are not proposed nor are the contingency factors well defined (Reid and Smith, 2000).

In the literature on PMS many normative models are proposed. Following the criticism of traditional approaches, which were based on financial measures, in 1980s balanced and dynamic architectures were developed and analysed. However, the literature reveals that little empirical research on the implementation and use of these architectures has been carried out. Few studies have developed PMS models for SMEs and little research uses an empirical approach to analyse performance measurement practices in SMEs. Furthermore, the factors that enable and constrain performance measurement have not been investigated.

The aim of this study was to define some of the main factors influencing performance measurement in SMEs and to understand how these factors impact performance measurement. Two research questions were investigated:

RQ1. What are the key factors that influence the adoption and use of PMS in SMEs?

RQ2. What are the relationships between these factors and performance measurement practices in SMEs?

In order to identify the contingency factors influencing PMS in SMEs, an in-depth literature review of PMS and MCS literature was carried out, with particular attention to SMEs and managerial themes. Table I summarises the analysis of the literature for the most recurring themes or factors that enable or constrain the use and implementation of PMS and MCS in SMEs along with the main references that support these themes.

Table I shows that the PMS literature review identifies five main contingency factors that may influence the implementation and use of performance measurement in SMEs: management information system (MIS); strategy; organizational culture and management style; external environment; and company size. The MSC literature also highlights five main contingency factors: strategy; organizational culture and management style; external environment; corporate governance structure; and company size.

Conclusions from the literature review

In order to find out the main contingency factors, the information collected through the literature review was aggregated using the categorical aggregation and interpretation technique, which brings instances together until something can be said about them as a group (Stake, 1995). As Buckley *et al.* (1976) pointed out, knowledge consists of building blocks and the aggregation technique can be used to arrange and assemble different sets of blocks for solving more complex problems, i.e. the categorization of properties through intuitive aggregation. Then, interpretation is applied to give a meaning to each group. From this, the following six contingency factors were identified:

(1) corporate governance structure;
(2) MIS;
(3) strategy;
(4) organizational culture and management style;
(5) external environment; and
(6) company size.

As previously mentioned, further information was gathered by means of interviews with five scholars and five practitioners with experience in implementing and using PMS. A summary of the statements collected are summarized in Table II.

The following sections take a deeper look, through case studies, at four of the six factors identified above:

(1) corporate governance structure;
(2) MIS;
(3) strategy (referred to as the Business Model from here on[1]); and
(4) organizational culture and management style.

The other two factors were not addressed for the following reasons:

- the environmental impact on performance measurement was investigated indirectly because our research assumes that environmental dynamics affect

Factors influencing performance measurement	Authors	Contingency factors
There is a mutual influence between the managerial system and corporate governance structure	Compagno (2000), Zahra *et al.* (2000)	Corporate governance structure
The overlap between ownership, company and family influences all of the actions of formal organs (the level of delegation, control systems, PMS)	Corbetta and Montemerlo (2001), Gubitta and Gianecchini (2002)	Corporate governance structure
MCS design is influenced by the information system	Chenhall (2003), Lebas and Weigenstein (1986)	MIS
PMS is influence by the availability of flexible systems that enable the collection, analysis and reporting of appropriate data	Bititci *et al.* (2000), Kennerley and Neely (2002), Neely (1999)	MIS
An adequate information technology infrastructure for supporting data collection, analysis, interpretation and reporting processes are necessary to implement and use PMS	Bititci *et al.* (2002), Bourne *et al.* (2002), Franco and Bourne (2003), Sharif (2002)	MIS
PMS can be made more dynamic and responsive using information technology support	Bititci *et al.* (2002), Bourne *et al.* (2002), Hudson *et al.* (2001)	MIS
An inadequate information system is one of the main obstacles to performance measurement	Bititci *et al.* (2002), Bourne *et al.* (2002), Franco and Bourne (2003)	MIS
An inadequate information system is one of the main obstacles to performance measurement in SMEs	Barnes *et al.* (1998), Bititci *et al.* (2002), Brouthers *et al.* (1998), Hudson *et al.* (2001), Neely *et al.* (2002)	MIS/size
Management's strategic choices influence MCS design and use	Chenhall (2003), Otley (1999), Said *et al.* (2003)	Strategy
Management's strategic choices influence PMS implementation	Franco and Bourne (2003), Hoque (2004), Lingle and Schiemann (1996), Neely *et al.* (1994)	Strategy
MCS/PMS influence and support strategic processes	Archer and Otley (1991), Dangayach and Deshmukh (2001), Kaplan and Norton (1992, 1996), Neely *et al.* (1994), Roberts (1990), Simons (1990)	Strategy
Lack of alignment between performance measurement and business strategy proved to be one of the main obstacles to achieving expected results from a PMS	Garengo *et al.* (2005a)	Strategy
PMS models proposed after the mid-1980s stress alignment between strategy and PMS	Garengo *et al.* (2005a)	Strategy
PMS should support the definition and redefinition of business strategy to promote continuous improvement in large and small companies	Garengo *et al.* (2005a), McAdam and Bailie (2002)	Strategy/size

(*continued*)

Table I.
Literature on factors influencing performance measurement

Factors influencing performance measurement	Authors	Contingency factors
PMS is influenced by organizational culture	Otley (1999), Bititci *et al.* (2006)	Organizational culture and management style
MCS influences and is influenced by organizational culture and management style	Chenhall (2003), Harrison and McKinnon (1999), Lebas and Weigenstein (1986), Bititci *et al.* (2006)	Organizational culture and management style
Corporate culture is one of the critical factors supporting the use of strategic performance measurement if it emphasizes team-working, ownership of problems and risk-taking or entrepreneurship, continuous improvement and the use of a strategic PMS	Franco and Bourne (2003)	Organizational culture and management style
There is a dyadic interplay between organizational culture and management style and PMS	Bititci *et al.* (2006)	Organizational culture and management style
Management leadership and commitment are critical factors for implementing and using PMS	Franco and Bourne (2003), Lingle and Schiemann (1996)	Organizational culture and management style
In SMEs, the lack of explicit strategies and methodology supporting the control process, promote a reactive management approach that obstructs PMS adoption	Garengo *et al.* (2005a)	Organizational culture, management style and Size
MCS is affected by national and cross cultural differences	Baskerville (2003), Chenhall (2003), Harrison and McKinnon (1999), Lebas and Weigenstein (1986), Otley (1999)	External Environment/ organizational culture and management style
External market forces (rules of competition, supply and demand, channel behaviour) influence a management control system	Chenhall (2003), Gordon and Narayanan (1984), Hoque (2004), Lebas and Weigenstein (1986), Otley (1999), Waggoner *et al.* (1999)	External environment
Non-financial measures are more satisfactory in complex or uncertain competitive environments than in stable conditions	Dixon *et al.* (1990), Ittner and Larcker (1997), Said *et al.* (2003)	External environment
An effective PMS has to adapt itself to the internal and external contexts in order to support continuous improvement	Bititci *et al.* (2000), Bourne *et al.* (2000), Dixon *et al.* (1990), Garengo *et al.* (2005a), Kennerley and Neely (2003)	External environment
Large firms tend to use more formal MCS. The use of financial and non-financial measures increases as the size of organization becomes larger	Chenhall (2003), Hoque and James (2000), Lebas and Weigenstein (1986), Moores and Yuen (2001)	Size
Insufficient human resources are a barrier to the adoption and use of PMS in SMEs	Garengo *et al.* (2005a)	Size

Table I.

(*continued*)

Factors influencing performance measurement	Authors	Contingency factors
Limited capital resources obstruct PMS in SMEs	Garengo *et al.* (2005a)	Size
Often SMEs don't understand the utility of PMS; on the contrary these systems are perceived as the cause of bureaucratization and as an obstacle to the flexibility of SMEs	Garengo *et al.* (2005a)	Size

Table I.

Summary of the statements about what enables and limits performance measurement in SMEs	Scholars	Practitioners	Contingency factors
Managerial knowledge and attitudes of entrepreneurs, managers and employees	5	2	Corporate governance structure
Ownership structure	4	1	Corporate governance structure
Internal managerial problems	3	4	Corporate governance structure
Information system	4	5	MIS
Strategy and business model	5	3	Strategy
Organizational culture	3	2	Organizational culture and management style
Managerial style	5	3	Organizational culture and management style
Government support	2	1	External environment
Organizational complexity (number of products, consumers, employees, markets, etc.)	3	1	External environment
Performance measurement system adopted by customer or suppler	2	1	External environment
Information required by banks, government, suppliers, etc.	1	2	External environment
Industry change	1	1	External environment
Company size	4	4	Size
Financial resources	1	4	Size

Table II.
Summary of the opinions of practitioners and scholars about factors influencing performance measurement

business strategy, consequently it is enough to analyze the influence of strategy; and

- since the study focused on SMEs, attention to size characterized the whole study, and thus it is not analysed as a contingency factor.

The following sections introduce the case study companies and then go on to develop the main dimensions of each factor that could potentially be related to performance measurement.

Brief profile of the case study

Four Scottish SMEs were involved in the empirical investigation. For each company we collected information about their profile, history, contingency factors and PMS. The companies' profiles are summarized in Table III.

The PMS of each of the companies was analysed making reference to the framework proposed by Garengo (2005). This framework is based on two groups of dimensions. The first is called PMS characteristics and it considers how a company is using the measures to manage performance. The second group is called PMS scope and it refers to what the company is measuring, i.e. the existence of many perspectives to measure performance. The PMS characteristics and scope of the companies investigated are shown in Figure 2.

Contingency factors and performance measurement

In order to analyse each contingency factor, we used four specific frameworks. For the investigation of corporate governance structure and MIS the frameworks were specifically developed while those used to study business model and organizational culture and management style were chosen from the literature. The case studies were placed in these frameworks in order to study each factor separately. The relationships between each contingency factor and performance measurement were investigated and summarized in four theoretical propositions.

Corporate governance structure

Corporate governance structure is considered to be the whole set of structures and processes used to guide and control an enterprise (OECD, 1999). Its influence is made explicit in the mutual influence between managerial systems and corporate governance structure (Miller and Toulouse, 1986). Different approaches are applied in corporate governance studies. Most of the papers available use agency theory as a main theoretical background (Zahra and Pearce, 1989). Two dimensions are often applied to analyze corporate governance: the composition of the board of directors and its role. Board composition refers to the number and type of directors who serve on the board, and the widely recognized dichotomy between inside and outside directors has a significant impact on the decision-making processes. The board composition in SMEs plays a key role; in these companies the presence of inside directors belonging to the entrepreneur's family is quite common and is a decisive factor in the decision-making process. The literature offers a long list of what boards of directors should and could do, but evidence on what boards actually do in SMEs is not yet well documented. With regard to the role of the board of directors, three main roles are recognized by the literature: strategic, control and service roles (Zahra and Pearce, 1989). Some of the main service roles of the board of directors in family companies are the re-balance role, the share support role and the relationship support role. The service roles are mainly adopted where ownership and management overlap.

In order to study corporate governance structure in SMEs, two key dimensions have to be considered: the role of the board of directors and the influence of ownership on corporate governance. Using these two dimensions, a framework was proposed and three SME typologies were defined, i.e. traditional family company, open family company and managerial company. In a traditional family company capital is held by an entrepreneur or a small group of shareholders belonging to the same family; the

Table III. Summary of company profiles

	Company A	Company B	Company C	Company D
Product	Manufactures and sells mineral water in a wide range of bottles and packs, standard or customized	Provides bottling service to distillers and warehousing, and handles all types of cargo and rework service for its customer base	Is a leading designer and manufacturer of windows and doors	Is an engineering company that designs and manufactures pressure gauges, needle valves, ball valves, check valves, manifolds and instrumentation
Number of employees	200	60 permanent (plus 60 seasonal workers)	150	150
Year of foundation	1979	1994	1900	1870
Revenue (average last four years £)	56.117.792	3.594.572	13.271.099	7.052.640
Trend	Rapid growth	Growth	Slow growth	Zero growth
Markets	Mainly in the UK market. Export is done only to reinforce the brand	Solely in the UK market	Mainly in the UK market	60 per cent far East and USA; 35 per cent Europe; 5 per cent rest of the world
Quality certification obtained	ISO 14001	None	None	ISO 9001
Taking part in quality award or other improvement program	Government funded business improvement program. It has never considered quality award programs	Government funded business improvement program. It is considering taking part in a quality award program in the near future	Government funded business improvement program (five months into the program when data was gathered)	Government funded business improvement program (18 months into the program when data was gathered)

(*continued*)

	Company A	Company B	Company C	Company D
Role played by quality award program or other improvement program	Taking part in improvement projects supports the development of PMS and helps increase the number of IT staff. The company has benefited from new human resources and external consulting	Taking part in improvement projects supports a better understanding of PMS and has encouraged a change in the company culture	The company has been involved in an improvement program focused on PMS. At the beginning, it did not understand the aim of this project but after a few months the PMS activities offered some benefits; consequently the management recognized the strategic role of the PMS project	Taking part in an improvement project has supported PMS implementation; it has favored a better understanding of the company and the diffusion of new knowledge throughout the company. The importance of promoting a lean organization and cost reduction was underlined

Table III.

Figure 2.
PMS characteristics and scope of the investigated companies

decision-making power regarding strategic and managerial issues lies with the owners and the board of directors has a "service role". An open family company is characterized by two main kinds of owners: entrepreneurs that are directly involved in managerial activities and shareholders that pay attention solely to the profitability of the business. The shareholders do not influence the company governance and the board of directors is mainly used to control the management activities, i.e. it plays a "controlling role". A managerial company is owned by shareholders that are not interested in the company's core business; they only check the profitability of their investment. The managerial activities depend totally on the managers and the board of directors, who through formal and informal meetings decide on the company's strategies and objectives, i.e. it plays a "strategic role".

The companies were positioned in the framework and the relationship between PMS and corporate governance was analysed (Figure 3). The empirical investigation supports the choice of corporate governance as a contingency factor. The presence of managers unrelated with the ownership makes it necessary to formally monitor achieved results and use the information gathered in a structured way to support decision making. The analysis of case studies showed similarities between companies D and C (both of which are managed by entrepreneurs): they have similar corporate governance structures and PMS scope – both have a performance measurement system mainly focused on economic and manufacturing perspectives and managed directly by the entrepreneur. Their performance indicators are based on the entrepreneur's knowledge and do not aim to support empowerment processes or to share information. Differences in the PMS evolution of companies D and C could be attributed mainly to ownership structures. In company C the presence of a shareholder not involved in managerial activities seems to favour the introduction of a managerial system; this is probably due to the need to increase the transparency of the managerial activities. Companies A and B are both managed by managers who do not own the companies. The decision-making processes are formally defined and the information on company performance supports the decision-making processes of the management team. Consequently, the adopted PMS are both balanced and advanced, even if with a different level of development. During the case analysis it was clear that while the ownership does not encourage the implementation and use of PMS, the management team feels it is necessary to support decision making and to justify their decisions to the owners.

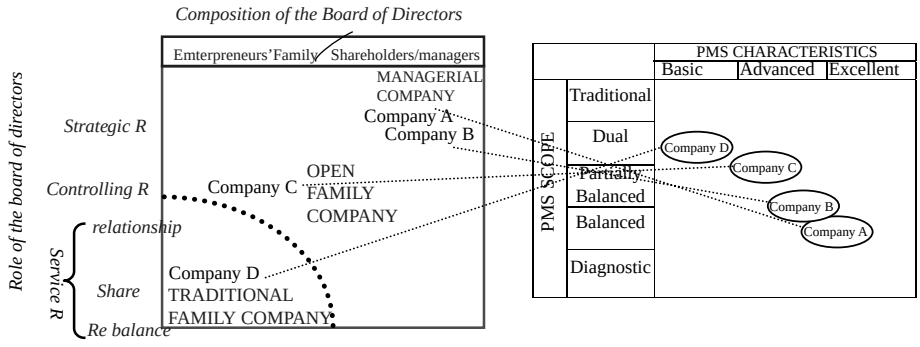

Figure 3.
Corporate governance structure and its relationship with PMS

The relationship between PMS and corporate governance structure is further emphasized by the PMS implementation process in company B. The general manager of company B stated that until four years ago the company was owned by one person who managed the business without any kind of performance measures. When the company was bought by a group of businessmen, a PMS was immediately introduced. In companies A and B all the decisions are made by following a formal process and performance measurement is used to manage the business and support strategic decision making. In both companies C and D, however, measures were introduced to monitor the business but not to support decision making, and information is not shared.

The case study analysis highlights the influence of corporate governance structure in PMS adoption and use. The relationship between PMS and corporate governance structure is summarized in the following proposition:

P1. The nature of the corporate governance structure impacts the perceived value of a performance measurement system as a decision-making support tool.

The empirical results emphasized that when the composition of the board of directors moves from entrepreneurs who own and manage the company to a group of managers and external shareholders, the role of the board of directors moves from a service role to a strategic one. The owners do not manage the company and they have no influence on company governance. In this case the importance of PMS as a tool for supporting decision-making increases. When the owners manage the companies, PMS is not used or is used in the wrong way.

Management information system

The introduction of powerful technological tools has often led companies to focus their attention on technology – called hard aspects – and to neglect managerial practices and human behaviour – called soft aspects. Consequently, insufficient attention is given to the organizational impact of information systems (Serafeimidis and Smithson, 2000). Recently, many authors have underlined the importance of analyzing soft aspects such as performance measurement practices and human behaviour (Claver *et al.*, 2001; Haag *et al.*, 2002). Nonetheless, assessing an information system is recognised as a complex activity and, at least up to now, the models applied to assess MIS are still mainly based on cost benefit analysis, evaluation as experiments and user satisfaction (Stone, 1990).

However, in order to accurately study management information, technology, managerial practices and human behaviour dimensions have to be analyzed. Since, the models currently used to study MIS do not include these dimensions, a specific framework was defined. This framework was based on the two dimensions described below.

The first one is called technology (or hard aspects), which is measured by the average annual amount spent on hardware, software and IT-related managerial activities; this includes depreciation of investments in hardware and software, wages of the IT team, fees paid to external consultants, etc. In order to collect information on how much each company spends, we used the information and perceptions provided by the IT managers of the companies investigated, compared to other companies in their sectors. IT expenses were classified into two groups: low and high investments.

Considering the contextual differences between the companies involved, it was difficult to objectively assess the level of IT investment for each case. Thus, a judgement was made based on IT managers' perceptions of the level of investment with respect to the average in that sector.

The second dimension is called managerial practices and human behaviour (or soft aspects); it considers managerial practices and employees' behaviour with respect to the information system. This was investigated using two main tools: the first one was a questionnaire based on the literature available and the second a predefined tool for studying managerial practices in SMEs (Bernardi, 2003; Garengo *et al.*, 2005b). The information gathered from the questionnaire and tool was processed together and organized using a 1-5 scale. Companies with a score higher than or equal to 2.5 were considered to demonstrate negative behaviours; companies with a score lower than 2.5 were considered to demonstrate positive behaviours.

Combining the two dimensions mentioned above, four MIS typologies were identified and are shown in Figure 4, which has four quadrants: inefficient, ineffective, advanced and under-capitalized. Companies in the inefficient quadrant waste resources because they spend a huge amount of resources on the IS (with respect to the average IT expenses of the other companies in their industry) but they are not able to efficiently use these investments due to inadequate managerial practices and behaviours. Companies in the advanced quadrant have high investments (compared with the average IT expenses of the other companies in their industry) and advanced managerial practices and behaviours. In the ineffective quadrant managerial practices and employee behaviours are inadequate and investments are low. In the undercapitalized quadrant investments in the IS are low but managerial practices and employee behaviours are advanced.

The empirical investigation supports the choice of MIS as a contingency factor. Company B confirmed that one of the main barriers in implementing PMS is the lack of adequate MIS. The general manager of company B stated:

> We could not use performance measure to support decision-making if we collect the information using spreadsheets. When we decided to introduce a new management style based on performance measurement, we started to invest in hardware and software and to involve all the staff in the change program.

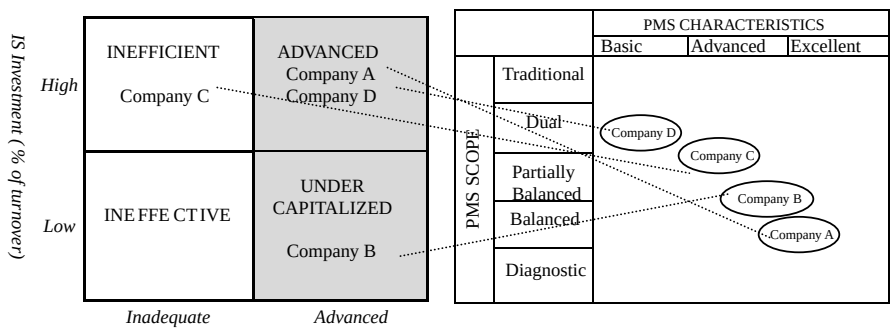

Figure 4.
MIS and its relationship with PMS

Company C invested a large amount of money in its MIS. This company introduced an enterprise resource planning system several years ago, but the company's needs were not analysed. Subsequently, the system did not prove to be suitable for the company and is still not applied. Spreadsheets are currently used. Inadequate information practices and low commitment are still the main barriers to the PMS but these obstacles are still not perceived by the management.

The study emphasizes that high investments are not enough to create a favourable context for PMS implementation. Companies A and D have advanced MIS that produce a favourable context for PMS development. Large amounts of structured and reliable data can be used to answer user needs. In company A the PMS is advanced, whereas in company D the PMS could evolve towards an advanced PMS, but other contingency factors, for instance corporate governance structure, seem to create a barrier to the PMS development (see previous section).

The key roles of the hard and soft dimensions are highlighted by the literature and confirmed by the case studies. The relationship between PMS and MIS is summarized in the following theoretical proposition:

P2. Advanced information system practices create a context that favours the use of a performance measurement system.

The empirical investigation underlines the fact that when managerial practices and human behaviour with respect to the MIS are advanced, there is a context that favours performance measurement, regardless of the level of investment in information systems.

Business model

Different classifications of business models were analysed. In order to study empirically the relationship between performance measurement and business models, we chose the model developed by Martinez and Bititci (2001). This model, called the value matrix, is structured in two value dimensions, tangible (or hard) and intangible (or soft) dimensions along with the addition of the value propositions from Treacy and Wiersema (1996). The result of this combination is a two by three matrix with six value propositions, which are innovators, brand managers, price minimizers, simplifiers, technological integrators and socialisors. The decision to use this framework was based on four reasons. First the completeness of the framework favours a more precise classification of different kinds of businesses with respect to other frameworks. In particular, it introduces the soft value dimensions to support the study of both traditional and innovative businesses and it is based on the changes in the current business environment. Second, the model was applied in theoretical and empirical studies; at first using case studies and workshops the framework was empirically validated in large, medium and small companies (Martinez, 2003). Third, the model is used to investigate creating and managing value in collaborative networks (Bititci *et al.*, 2004). Finally, the framework is supported with an operational tool (Martinez, 2003). This tool was used along with interviews with company managers and external consultants (Figure 5) to classify the business model of the companies investigated.

During the analysis of the case studies, business models were highlighted as a key contingency factor. Company C started to use performance measurement to support changes in its business model. Until a few years ago, the main strength of the company

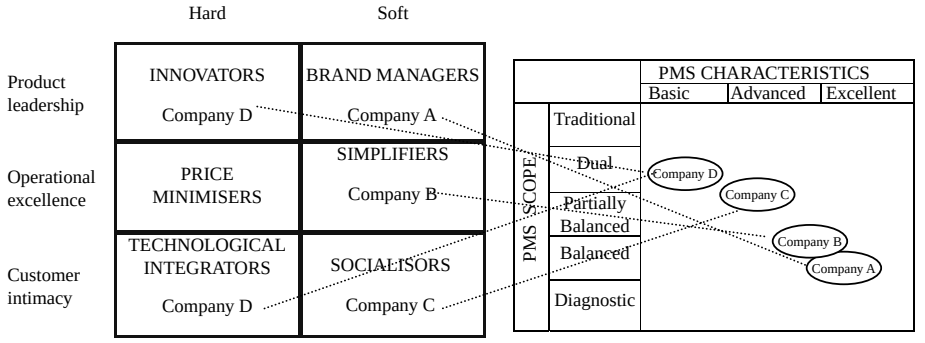

Figure 5.
Business model typology and its relationship with PMS

was the ability to maintain a good relationship with customers. However, in recent years, following the evolution of the market, customers started to require competitive prices. The performance of its manufacturing processes had to be improved to increase productivity. Developing performance measurement became essential for supporting this improvement.

Company B had a similar experience. A few years ago, the company was bought and a new business model was chosen. With the new business model the company wanted to build a streamlined process to make life simple and uncomplicated for the customer, i.e. their motto was: "take the hassle away". The management stated that with the new business model PMS became essential.

In company D a PMS was introduced to supply additional information to the entrepreneur for supporting his managerial process. The business model adopted by the company, innovator and technological integrator, requires there to be a strong relationship with the customer based on knowledge of business, customers, products, operational activities and innovation of products and processes. The need for additional and formalized information emphasized the important role played by PMS; consequently the entrepreneur promoted PMS implementation.

Company A adopted a brand manager business model. The company's core competencies reside in its creative ability to invent new concepts (e.g. exploit the brand recognition of the company's name, build emotional links with a social status, link feeling with images). This business model is characterized by a strong subjective/perceptive component and does not seem to require investments in PMS. In fact, company A did not implement a PMS to support its business model but rather to manage the company's growth (turnover, number of employees and plant dimension). This growth highlighted the need for organizational development, manufacturing reorganization, management by processes, attention to be given to knowledge management, and the use of structured information supporting managerial activities.

The relationship between PMS and the business model is summarized in the following theoretical proposition:

P3. A change in the business model seems to lead to the implementation or development of an improved PMS.

The empirical investigation demonstrates that the maturity of the PMS does not seem to be contingent upon the business model.

Organizational culture and management style

Organizational culture is defined as the deepest level of basic assumptions and beliefs that are shared by members of an organization (Schein, 1985) and considered to be one of the most stable and inertial factors in an organization. Consequently, changes in culture are often described as complex and part of a long process. Management style is defined as the practices adopted by leaders in decision making, management of information, relationships, motivation and managing subordinates (Burton and Obel, 1998). Management style influences the level of delegation, the approach and time required to make decisions and the control of activities. Moreover, management style is considered to be one of the key aspects to understanding organizational culture (Cameron and Quinn, 1999; Pheysey, 1993).

Different frameworks have been developed to study organizational culture and management style. A recent empirical study was carried out by Bititci *et al.* (2006) on the relationship between performance measurement, organizational culture and management styles. These authors adopted a classification based on Harrison's (1987) and Hofstede's (1980) categorization of culture with corresponding management styles. The effective use of this categorization in a research study, similar to ours in topic and methodology, led us to adopt this predefined framework to investigate the relationship between PMS, organizational culture, management style. The framework is shown in Figure 6.

Longitudinal studies have been used to empirically investigate the relationship between organizational culture, management style and PMS adoption. The analysis of the case studies confirms the role of organizational culture and management style as contingency factors in the implementation and use of PMS.

The information gathered showed that, during the implementation phase, all the companies used an authoritative management style and power culture as a starting point. The authoritative management style supported the introduction of PMS in the organizations. After the implementation phase, company A shifted to an achievement culture, and the same thing is happening in companies B and D. Company C has a support culture and a democratic management style; the senior manager adopts an authoritative management style to manage difficulties in implementing the PMS.

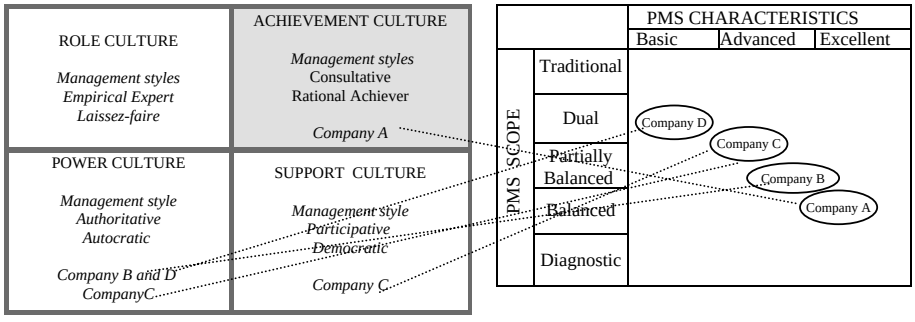

Figure 6.
Organizational culture and management style and their relationship with PMS

According to Bititci *et al.*'s (2006) study, the results emerging from the case studies suggest that the initial organizational culture does not have an impact on the success or failure of the PMS. Moreover, in companies A and B the successful implementation and use of the PMS seems to have led to a more participative and consultative management style. In the other two companies (C and D) it is still not possible to determine whether or not there will be changes in the organizational culture as a consequence of the PMS.

The relationship between PMS, management style and organizational culture is summarized in the following theoretical proposition (Figure 6). This proposition confirms the results of Bititci *et al.* (2006):

P4. PMS use promotes the introduction of an achievement culture and a consultative management style.

The empirical investigation shows that during the implementation process an authoritative management style is required for the successful implementation of a PMS. However, this is only a way to support the implementation process. After that, using PMS in daily work, an achievement culture and consultative management style are used.

Conclusions

This paper presented four main contingency factors that influence performance measurement in SMEs and four theoretical propositions to summarize the relationship between each contingency factor and PMS. These theoretical propositions answer the predefined research questions. Firstly, traditional family firms tend not to adopt advanced PMS and, more generally, they do not use quantitative information gathered by following formal procedures in supporting decision-making processes. Secondly, the maturity of the PMS does not seem to be contingent upon the business model used while a change in the business model seems to lead to the implementation or development of an improved PMS. Thirdly, the study emphasized the key role played by information management practices and employee behaviour in creating a favourable context for the introduction of PMS. Finally, the analysis of the relationship between organizational culture, management style and PMS indicates that an authoritative management style favours the adoption of PMS; moreover, in the long run, the use of PMS tends to activate processes of change in a firm's organizational culture.

This study points out the need for further research on BPM in SMEs based on a contingency approach. Our empirical data prove the effectiveness of the contingency factors chosen and the frameworks developed. Further research would be useful to test the theoretical propositions listed above, check their generalizability and identify any other important additional contingency factors in SMEs. This research was carried out in four Scottish case studies; it would be interesting to extend the investigation to PMS contingency factors in SMEs located in other countries to check the validity of the theoretical propositions defined here. Furthermore, in this study attention was focused solely on PMS contingency factors in SMEs; investigations on the differences and similarities between large and small companies have not been carried out. Some differences seem to appear, particularly in the corporate governance contingency factor. However, further investigations would be necessary to analyze this topic.

It is important to clarify that we studied each contingency factor separately. During the case study analysis, interdependencies between the factors were observed, but future research would be needed to define the relationship between these factors. The data gathered seem to highlight the relationships between combinations of the characteristics of contingency factors and the PMS but additional research based on a configurational approach (Miller and Minztzberg, 1983) would be needed to make these relationships explicit.

Note

1. Business Model is the type of value a company wants to create for the customer (Magretta, 2002). Different reasons have supported this choice. In this study, the focus is on the competitive dimension of strategy and we consider the model of the entrepreneurial success that a company has adopted or could adopt. Business models are based on value propositions including strategy; as Normand and Ramirez (1993) write "strategy is the art of creating value". By using a business model this value can be summarized in value propositions that include the business strategies pursued by companies. Moreover, scholars have proposed many heterogeneous definitions of strategy and no suitable typologies are available to study the relationship between strategy and PMS. On the contrary, business models are studied in more recent literature and taxonomies coherent with today's competitive environment are proposed.

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