

AN INVESTIGATION OF PERFORMANCE MANAGEMENT SYSTEM MATURITY LEVELS AND INFLUENCING FACTORS: EVIDENCE FROM MOROCCAN SMES

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ABSTRACT

Small and Medium Enterprises (SMEs) constitute a significant part of the Moroccan economy. Nowadays, Moroccan SMEs compete in a globalized, fierce and challenging environment. To face this challenge, it became essential and primordial for SMEs to optimize their business practices. One of the ways to do so is through "Performance Measurement". This paper investigates current performance measurement practices and their maturity level in Moroccan SMEs. The paper is directed towards understanding the drivers and barriers of performance measurement practices within the Moroccan SMEs context. Based on a review of the literature, a survey in Moroccan SMEs is conducted to describe the maturity level of Performance Measurement Systems (PMS) in Moroccan SMEs and to explain how some organizational contingency factors influence this maturity level. Results show a significant link between some considered-specific factors and PMS adoption.

JEL: M00

KEYWORDS: Moroccan SMEs, Contingency Theory, Maturity Level of Performance Measurement Systems (PMS), Classification Proposed by Paolo Cocca & Marco Alberti, Survey

INTRODUCTION

Various studies have examined the importance of performance measurement in the development of business management. The same studies have also shown that performance measurement helps organizations gain competitive advantages especially in a fierce and globalized environment (Garengo and Bititci, 2007). This is true for all companies regardless of size but is particularly true in Small and Medium Enterprises (SMEs). These companies compete in a globalized challenging environment. Moreover, they are vitally important for economic growth worldwide. In Morocco, for example, this category of enterprises accounts for more than 95 percent of all enterprises. They provide 50 percent of all private sector employment and generate 30 percent of the region's direct exports. It has become essential and primordial for these companies to optimize their business practices to preserve their competitiveness. Given the increasing emphasis on performance measurement and its importance for SMEs in supporting their managerial growth, we conduct a survey on performance measurement practices in the specific context of Moroccan SMEs. Various researchers have focused on the design of balanced Performance Measurement Systems (PMS) particularly intended for these companies. But most of these studies focused on theoretical issues. There is a lack of empirical investigation in the field of performance measurement and management in the specific context of SMEs, and even less in SMEs belonging to a developing country like Morocco.

The specific purpose of this paper is twofold. First, using a sample of 50 Moroccan SMEs' executives, the first purpose of our study is to investigate the extent of utilization, and the current practices on key aspects of performance measurement. Specifically, this research focuses on current practices related to the use of financial and non-financial measures, the form of data collection and storage, the frequency of performance measurement, the communication of performance results, the use of performance measures and the quality of performance measurement processes. These dimensions allow us to classify Moroccan SMEs into three maturity stages (Basic, Advanced, Excellent) according to the classification of PMS maturity levels proposed by Paolo Cocca and Marco Alberti in 2010. This first main objective helps us explore the SMEs' distribution among the three different maturity levels. This will help us evaluate the current situation of Moroccan SMEs and investigate the need for more effective tools and procedures to support SMEs during their PMS development process.

The second objective of our study is to explain this maturity level using contingency factors. Such an explanation should provide a better understanding of performance measurement practices as utilized in Moroccan SMEs. This will surely enhance our understanding of performance measurement practices within SMEs in general and Moroccan SMEs in particular.

Our study is survey based. The research instrument used to collect the data is the questionnaire. It was developed based on the literature. Several statistical analyses are utilized to accomplish the objective of our study. The remainder of this paper is organized into five main sections. First, a brief review of the literature is presented, and our conceptual model is described. The third section presents the research questions of the paper and develops our research hypotheses. Next, the research methodology is presented including the population and the method used to select our sample. The following section presents the main results and analysis of our survey. Finally, we conclude by presenting a discussion of our results as well as the limitations of our survey.

LITERATURE REVIEW

Various studies propose and analyze Performance Measurement Systems (PMS) models. The problem with these studies is that most do not consider company size. These studies tend to consider Small and Medium Enterprises (SMEs) as small big entities. SMEs should not be considered big entities but as entities that have their own characteristics and specificities. Besides, general frameworks to study PMS evolution are not suggested in the literature. To evaluate the current situation of Moroccan SMEs with regard to performance measurement practices and to analyze their PMS evolution and their PMS maturity level, it is necessary to study the following research question: What are the main dimensions that can best classify the maturity levels of PMSs in SMEs? To do this, a literature review is carried out.

A recent literature review by Paolo Cocca and Marco Alberti in 2010 was chosen because it considers specifically SMEs. The authors proposed a modified version of a maturity model for PMS proposed by T. Wettstein & P. Kueng (2002). Its advantage is that it takes into consideration the SMEs' specificities. This modified version of the framework consists of rearranging maturity levels into three instead of four groups. They are: Maturity Level 1, Maturity Level 2 and Maturity Level 3. Certain dimensions should be taken into consideration while classifying the maturity levels of the PMS used by SMEs. Paolo Cocca and Marco Alberti (2010) pointed out the presence of seven main dimensions that characterize contemporary PMS models to define the maturity level of PMS within the specific context of SMEs. These dimensions are: 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 included in the model proposed by Wettstein and Kueng (2002) and the "Targets setting" dimension was added. The dimensions included in the maturity model are the main dimensions that characterize contemporary PMS models mostly introduced after the mid-1980s.

These dimensions were adopted as the starting point of this research study. In fact, all the dimensions were used to explore the SMEs' distribution among the three maturity levels. This helps us to explore more effective tools and procedures to support SMEs during their PMS development process. Table 1 summarizes the different dimensions and the different maturity levels as proposed by Paolo Cocca and Marco Alberti (2002).

Table 1: Three-Stage Maturity Model for PMSS (Adapted from Wettstein and Kueng, 2002)

	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 nonfinancial	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 a 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 analyzing 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 standardized for some main metrics. Frequency of measurement is regular.	Measurement processes are documented and standardized for all metrics. At least one person is responsible to collect and report the data
Target setting	No target levels are set for the metrics.	Target levels are set for some metrics.	Target levels are set for all metrics.

Table 1 shows the three-stage Maturity Model for performance measurement systems that was proposed by Paolo Cocca and Marco Alberti (2010). It was adapted from the model proposed by Wettstein and Kueng, 2002. There are three different maturity levels defined based on how the SME operates each of the seven dimensions identified within the framework (Scope of measurement, Data collection, Storage of data, Communication of performance results, use of performance measures, quality of performance measurement processes and Target setting).

Various internal factors are identified in the literature as affecting the scope and content of PMS. This paper uses contingency theory as our theoretical framework for investigating factors influencing performance measurement practices within Moroccan SMEs. For example, human capital is a contingency factor that has been positively linked to advanced performance measurement practices. Human skills and training were noted as one of the most important factors leading to advanced PMS (Kaplan & Norton (1996), Richardson (2004), Tung & al. (2011)).

Information technology is another contingency factor as the relationship between IT and PMS maturity levels has not been extensively studied in Moroccan SMEs. The literature points out that technology use is a key factor in performance measurement (Garengo & al (2005), Mendibil & MacBryde (2006)). Moreover, a firm's organizational strategy is also like to shape the design of PMS (Gordon and Narayanan, 1984; Chenhall, 2003; Franco-Santos and Bourne, 2005; Hussain and Hoque, 2002). Other important factors include organizational culture (Chenhall, 2003) and management style (Bititci et al., 2006), ISO 14000 (Rejc, 2004). These factors are said to influence the adoption and use of PMS and management control systems in general. This paper investigates these five contingency factors. These factors and their relationship to PMS maturity level have been proposed repeatedly in the literature. However, no study has analyzed the relationship between these factors and the maturity level of PMS in Moroccan SMEs. Therefore, our study fills this gap in the literature by examining the link between these organizational contingency factors and the adoption of PMS within Moroccan SMEs. Based on this literature review, the conceptual model is presented in Figure 1.

Figure 1: Conceptual Model for Investigating the Maturity Level of PMS and Influencing Factors in Moroccan SMEs

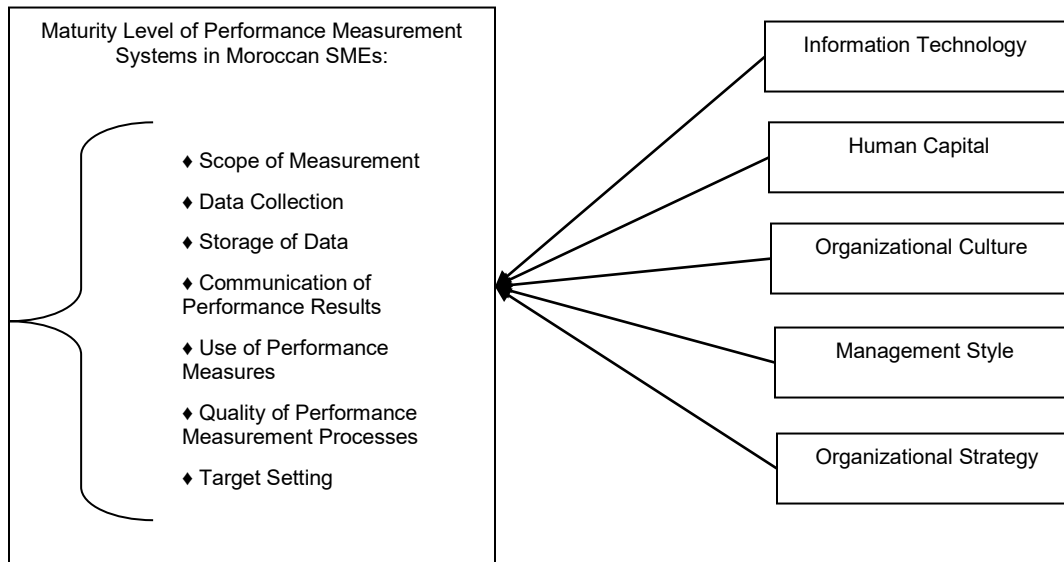


Figure 1 shows our conceptual model which is based on both the three-stage Maturity Model for PMSs presented above and contingency theory. The maturity level of PMS in Moroccan SMEs is determined based on how the SME operates each of the seven dimensions identified within the framework (Scope of measurement, Data collection, Storage of data, Communication of performance results, use of performance measures, quality of performance measurement processes and Target setting). This maturity level is explained by five organizational contingency variables: (Information Technology, Human Capital, Organizational culture, Management style and organizational strategy).

DATA AND METHODOLOGY

The objectives of our study are twofold as stated above. Our paper investigates performance measurement practices among Moroccan Small and Medium Enterprises (SMEs). This helps us categorize them into three main levels of performance measurement systems (PMS) maturity stages. Our paper also identifies factors influencing performance measurement practices in the same context. Thus, the two main research questions that our paper aims to answer can be presented as follow:

Research Question No. 1: What is the maturity level of PMS in Moroccan SMEs?

Research Question No. 2: What factors influence performance measurement practices within Moroccan SMEs?

To answer our research questions, the conceptual framework described in Figure 1 is used to develop our research hypotheses. Furthermore, another hypothesis related to the PMS maturity level is added. SMEs in general, and Moroccan SMEs in particular, have some characteristics in common. They suffer from very limited financial and human resources. They also tend to adopt some informal strategies and a certain management style. This leads us to say that SMEs could still have a basic PMS maturity level as they don't have enough resources and skills to develop advanced or excellent performance measurement practices. Thus, the hypotheses could be formulated as shown in Table 2.

The population investigated consisted of Moroccan SMEs. However, the first problem the authors faced was definitions to adopt for the survey. In fact, defining SMEs, in general, and Moroccan SMEs in particular, is ambiguous as there exist various definitions. Nevertheless, we opted for the most recent definition of Moroccan SMEs in our research. We use the definition proposed by the General Confederation of Moroccan Companies. It defines a small company as a company that has a turnover

between 3 and 10 millions of Dirhams. It defines a medium company as a company that has a turnover between 10 and 175 millions of Dirhams. The authors decided to focus the research on Moroccan SMEs located in the region Casablanca – Settat. This region is located in the central-western part of Morocco. Most Moroccan SMEs are located in this region and it could be representative of most Moroccan SMEs. However, we exclude the service sector to have a holistic and a complete view. Service SMEs were excluded from our survey because literature and practices have shown that their approach to performance measurement and use is very different relative to other business sectors (Fitzgerald et al. 1991).

Table 2: The Research Hypotheses Development

Number of Hypothesis	Hypothesis Development
Hypothesis number 1	Most of the Moroccan SMEs still have a basic maturity level of their PMS
Hypothesis number 2	Advanced information management practice is positively associated with the presence of a balanced PMS in Moroccan SMEs
Hypothesis number 3	Advanced human capital competence is positively associated with the presence of a balanced PMS in Moroccan SMEs
Hypothesis number 4	A participative management style is positively associated with the presence of a balanced PMS in Moroccan SMEs
Hypothesis number 5	A collaborative organizational culture is positively associated with the presence of a balanced PMS in Moroccan SMEs
Hypothesis number 6	Clear organizational strategy is positively associated with the presence of a balanced PMS in Moroccan SMEs

Table 2 shows our six research hypotheses. The first hypothesis answers our first research question on the maturity level of performance measurement systems within Moroccan SMEs. The five other hypotheses are related to our second research question which considers the drivers of PMS adoption within Moroccan SMEs.

After designing the survey questions, data collection was carried out from a randomly selected group of Moroccan SMEs as defined by the General Confederation of Moroccan Companies as presented above. The survey ran from July 2017 to January 2018 and targeted managers-owners of Moroccan SMEs because performance measurement is generally operated at the top management level. The authors promised to share a summary of the findings with the SMEs involved in the survey to encourage them to participate. The first way used to conduct our survey was mailing. It allowed us to collect 23 questionnaires out of 200 companies, an initial response rate of 11 percent. The second approach was e-mailing which allowed us to collect 82 questionnaires out of 1,200 companies, for an initial response rate of almost 7 percent. Finally, contacting 46 SMEs for in person interviews allowed us to collect data from 13 additional firms, a response rate of 28 percent. Table 3 summarizes the response rates of the survey.

Table 3: Response Rate of Our Survey

Ways of Conducting the Survey	Number of Questionnaires Sent	Number of Questionnaires Received	Percentage of Responses
Mailing	200	23	11percent
Electronic Mailing	1200	82	7 percent
In person interviews	46	13	28percent
Total	1446	118	8percent

Table 3 shows the survey response rate. Three methods were used to conduct our survey. It included mailing, electronic mailing and in person interviews. Out of the 1,446 questionnaires sent, we only received 118 responses.

Out of the various respondents invited to participate in our survey, the only exploitable questionnaires available were 50 SMEs out of the 118 received. In fact, only 50 SMEs met our definition. Thus, we considered a total of 50 SMEs for our analyses. SPSS package v11.0 was used to analyze the data. The questionnaire consisted of three main sections: 1.) The company background 2.) The maturity level of the PMS and the performance measurement practices 3.) Barriers and drivers to PMS adoption. The first section of the questionnaire was intended to determine general information about the SME. It provided a snapshot of each respondent and the nature of their organization. It included the number of employees, the

annual turnover, sector of activity and the number of years of existence of the company. Its main objective was to give the authors a general idea on background and most importantly to confirm that the company was indeed an SME as defined before.

The second section consisted of 20 statements about the company’s performance measurement practices. This section measures the firm’s PMS maturity level. It looked at current practices in performance measurement. The analysis of responses allowed the authors to classify the levels of PMS adoption of respondent companies in relation to the performance measurement practices identified in the literature, specifically, the three-stage Maturity Model for PMSs. A fixed set of performance measurement dimensions were developed based on the literature review. The dimensions were: Scope of Measurement, Data Collection, Storage of Data, Communication of Performance Results, Use of Performance Measures, Quality of Performance Measurement Processes and Target Setting. Respondents were asked to rate their degree of agreement with each statement according to a five-point Likert scale from 1 “strongly disagree” to 5 “strongly agree”. Table 4 presents statements’ examples for some dimensions identified in the questionnaire.

Table 4: Examples of Questions from the Second Section of the Questionnaire

Dimensions Identified in Section 2 of the Questionnaire	Examples of Questions Asked
Scope of Measurement	Please indicate how extensively are the following measures used in evaluating your performance: Financial performance/ Competitiveness/ Customer satisfaction/ Resources utilization/ Innovation...
Use of performance measures	Please indicate how extensively are the following criteria used as a purpose for measuring performance: Internal reporting/ Checking improvements and analyzing deviations from targets/ Supporting decision making.
Quality of Performance Measurement Processes	Please indicate how extensively are the following characteristics best reflect the design of your performance measurement system: The measurement processes are not defined/ Measurement processes are documented and standardized for some main metrics; Frequency of measurement is regular/ Measurement processes are documented and standardized for all metrics. At least one person is responsible to collect and report the data.

This table shows some examples of the questions included in our questionnaire. These examples are related to the second section of our questionnaire entitled: The maturity level of PMS in Moroccan SMEs which is intended to answer our first research question. Three sample questions related to three dimensions (scope of measurement, use of performance measures and quality of performance measurement processes) out of seven are presented in this table.

As noted earlier, contingency theory was chosen as the theoretical basis for the third questionnaire section. The final section consisted of the five organizational factors found in the literature to act as drivers or barrier forces to performance measurement practices in SMEs. The same Likert scale used in the second section was used to rate the respondent’s degree of agreement with each of the questions related to each variable. For that section, the five organizational factors chosen for investigation are: human resources, information technology, management style, organizational culture and organizational strategy. Each factor was further developed into statements according to the literature to investigate the influence of these factors on performance measurement practices in Moroccan SMEs. Thus, 60 statements were proposed to evaluate this influence. Table 5 presents an example of a statement for each contingency variable as it appears in the questionnaire.

After testing the questionnaire’s validity, internal reliability was tested. An instrument has content validity if it contains a representative collection of items and if sensible methods of test construction were used (Yusof and Aspinwall, 2000b). The content validity was tested thanks to academics and company managers who assessed them. Thirdly, we tested the construct validity thanks to principal components analysis (PCA). In fact, according to Hair et al., 1998, testing construct validity implies that every measure within a component should have a significant correlation with variables of the same component and low correlation with others.

Table 5: Examples of Questions from the Third Section of the Questionnaire

Contingency Factors Identified in Section 3 of the Questionnaire	Examples of Question Asked
Human Resources	Please indicate the levels of working experience (various choices were given to respondents on the number of years of experience => Examples: less than 1 year to more than 15years) / Education level of your management team (various choices were given to respondents on the educational level of their management team => Examples: Primary education to Doctorate qualification)
Information Technology	Please indicate your degree of agreement with the following statements that are used to describe your company's usage and investment levels of information technology (Various choices were given to respondents on the use and investment levels of IT=> Examples: Our level of IT investment is sufficient).
Management style	Please indicate your degree of agreement with the following statements that best describe the management style of your company: Various choices were given to respondents on their management style => Examples: The management encourages all employees to develop their talents and abilities/ Jobs are clearly defined in the company...)
Organizational culture	Please indicate the extent each of these values is important to your company (Various choices were given to respondents on the values that are important for them: => Examples: Innovation, risk taking, team working...)
Organizational strategy	Please indicate the extent each of these characteristics is important to your company (Various choices were given to respondents on the strategies adopted => Examples: Costs, customer service, Brand identification...)

This table shows examples of questions included in our questionnaire. These examples are related to the third section of our questionnaire entitled: Drivers or barriers forces to performance measurement practices within Moroccan SMEs which is intended to answer our second research question. Some sample questions out of 60 statements are presented. Each is related to one of the five organizational contingency variables (human resources, information technology, management style, organizational culture and organizational strategy).

RESULTS AND DISCUSSION

Out of the 50 Small and Medium Enterprises (SMEs) who returned their questionnaires, 10 were small enterprises and 40 were Medium enterprises. We interviewed SMEs belonging to a variety of activity sectors. The majority of enterprises operate in the electronic sector followed by the building sector and the food industry. All our respondents were managers-owners of Moroccan SMEs because performance measurement is generally operated at the top management level.

Questions related to each dimension of PMS maturity levels were included in the questionnaire allowing a classification of interviewed SMEs among the three PMS maturity levels according to our theoretical framework. Results indicate: 1.) Most interviewed companies have a balanced PMS. Both financial and non-financial indicators are used to monitor performance. Most Moroccan CEOs are aware of the importance of measuring all types of indicators. Contrary to expectations, most interviewed Moroccan CEOs affirm that they measure both financial and some non-financial indicators. These measures include: financial indicators, indicators related to customers' satisfaction, indicators related to human capital and indicators related to target settings. However, indicators related to competitiveness were notably weak.

Ten percent of interviewed SMEs have excellent maturity level on scope of measurement. In most cases, data collection is automated by IT systems and data storage is centralized in more than 40 percent of interviewed SMEs. The dissemination of performance results is a regular process in all firms. In most cases, this involves upper and middle management. However, only 16 percent of interviewed SMEs include operative levels in the dissemination of performance results. Most interviewed companies agreed that reasons for implementing PMS vary. The goal is not simply internal reporting but also checking improvements, analyzing deviations and supporting decision making. The measurement process is formalized in terms of procedures definition and performance targets setting in more than 40 percent of firms. These conclusions are summarized in Table 6 showing the percentage of the interviewed SMEs for each dimension of the three maturity levels framework adapted from Wettstein and Kueng, 2002.

Table 6: PMS Maturity Level of the Different Moroccan SMEs Involved in our Survey

Dimensions	Basic	Advanced	Excellent
Scope of Measurement	10 percent	80 percent	10 percent
Data Collection	26 percent	30 percent	44 percent
Storage of Data	26 percent	30 percent	44 percent
Communication of Performance Results	20 percent	64 percent	16 percent
Use of Performance Measures	18 percent	36 percent	46 percent
Quality of Performance Measurement Processes	20 percent	36 percent	44 percent
Target setting	16 percent	50 percent	34 percent

This table shows the distribution of SMEs engaged in our survey in the different PMS maturity levels. It shows the frequency distribution of sample companies among the three different maturity stages. This is based on how the surveyed SMEs operate each of the seven dimensions identified within the framework (scope of measurement, data collection, storage of data, communication of performance results, use of performance measures, quality of performance measurement processes and target setting).

It is clear from Table 6 that Moroccan SMEs are moving towards more excellent performance measurement practices. This conclusion is based on how the surveyed SMEs operate each of the seven dimensions identified within the framework as mentioned in Table 6. Contrary to expectations, CEOs of Moroccan SMEs have become aware of the importance of PMS in managing their businesses to gain competitive advantages especially in the fierce and globalized environment where they are competing.

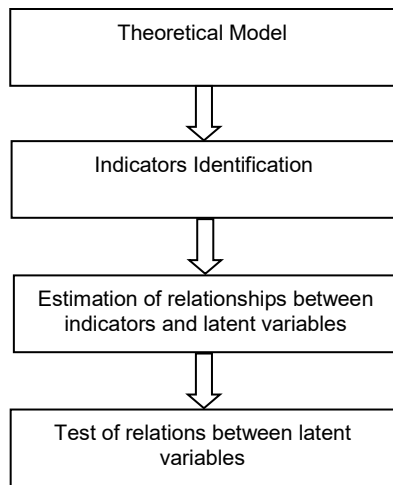
Now, it's important to understand the reasons preventing some Moroccan SMEs from moving to the next level of PMS. It is necessary to investigate factors influencing the adoption of advanced practices. This constitutes our second research question. We have chosen to study the impact of some contingency factors on the maturity level of PMS in the Moroccan context. Therefore, the conceptual model of research presented in Figure 1 presents the different causal links between these variables. To answer our second research question, structural equations models (SEMs) are used. SEMs are useful for representing multiple relationships among a set of variables.

Figure 2 summarizes the steps involved to answer our second research question using the structural equations models. We remind readers that our second research question is as follow: What are the factors that influence performance measurement practices within Moroccan SMEs?

To answer our second research question, we followed the stages identified in Figure 2. Our theoretical model was developed based on the literature review presented earlier. Secondly, we conducted an exploratory analysis. For that purpose, we utilized varimax rotation analysis and calculated the Cronbach Alpha coefficients for each dimension obtained. Furthermore, we conducted confirmatory analyzes. The Jöreskog Rhô was used to check reliability of the measurement model dimensions. Finally, the structural model presented in Figure 3 makes it possible to verify the research hypotheses. It presents the causal model as well as standardized coefficients estimated by the maximum likelihood method.

Figure 3 confirms the following relationships: 1.) Any variation of the manifest variable: Information technology of a unit implies a variation of the latent variable: maturity of the PMS by 86 percent. 2) Any variation in the manifest variable: Human capital of a unit implies a variation of the latent variable: maturity of the PMS by 66 percent. 3) Any variation in the manifest variable: Management style of a unit implies a variation of the latent variable: maturity of the PMS by 66 percent. 4) Any variation of the manifest variable: Organizational culture of a unit implies a variation of the latent variable: maturity of the PMS by 71 percent. 5) Any variation of the manifest variable: Organizational strategy of a unit implies a variation of the latent variable: maturity of the PMS by 70 percent.

Figure 2: Structural Equations Models Construction Stages According to Meschi & Livolsi, 2003



This figure shows the four steps to construct structural equations models according to Meschi & Livolsi, 2003. The first step includes constructing the theoretical model. It is followed by identifying the indicators. The third step involves the estimation of relationships between indicators and latent variables. The final step includes testing relations between latent variables.

To verify the quality of our structural model, we examined some fit indices. The quality of any structural model can be appreciated through the evaluation of fit indices. Each of these indices has a set of specific characteristics. Therefore, several indices that fall into three categories which are: absolute indices, incremental indices and parsimony indices. Absolute indices are qualified as classical indices (Chaput, 2006). These indices indicate the similarity or difference between the estimated model and the observed variance/covariance matrix (Roussel et al, 2002, Schumacker and Lomax, 2004). Included in this category are the Root-mean-square error of approximation (RMSEA), Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI) and the Root-mean-square residual (RMR).

Figure 3: The Causal Model of Research

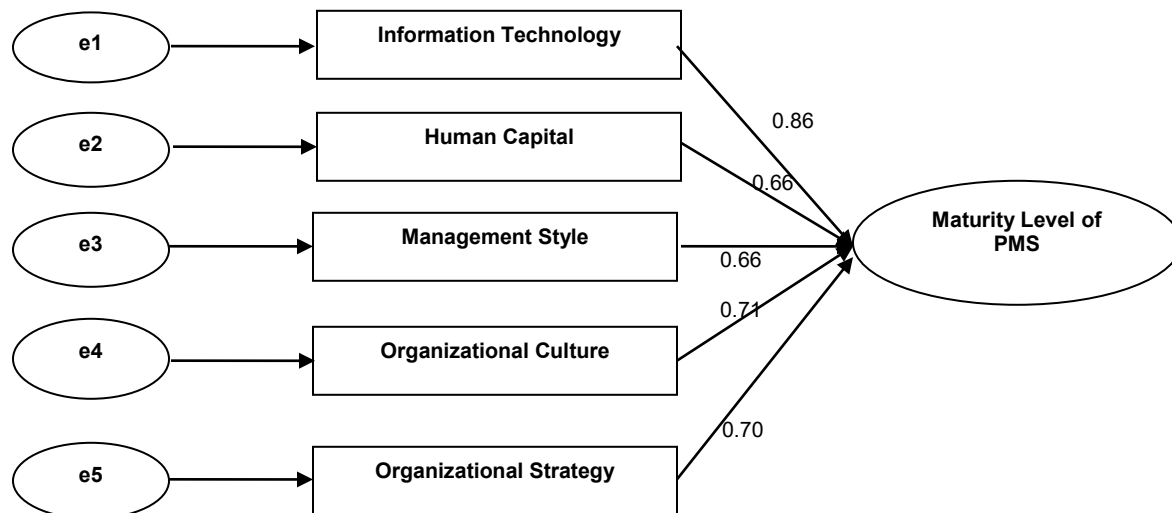


Figure 3 shows the structural model which makes it possible to verify our research hypotheses. It shows the causal model as well as values which are related to the standardized coefficients estimated by the maximum likelihood method (ML). The figure confirms the effect of variation of each manifest variable (Information technology, Human Capital, Management style, organizational culture and organizational strategy) on the variation of the latent variable (The maturity level of performance measurement systems)

Incremental indices are used to make it possible to compare the estimated model and the reference model having a zero correlation between the observed data (Roussel et al, 2002). Included in this category are the Normal Fit Index (NFI) and the Comparative Fit Index (CFI). Finally, parsimony indices control overestimation of the model. They determine the necessary number of parameters to estimate to achieve the specific adjustment level (Schumacker and Lomax, 2004). Table 7 presents examples of indices for each fit index used to verify the quality of any structural mode. The table takes into account the work of Roussel et al (2002), Evrard et al (2003), and Schumacker and Lomax (2004). For each of the indices mentioned, acceptable thresholds are presented. The indices should respect the levels of acceptance commonly accepted by researchers to have a good fit of the tested model.

Table 7: Fit Indices, Their Definitions and Their Acceptable Thresholds

Fit Indices Type	Characteristic	Examples and Descriptions	Acceptable Threshold Level
Absolute fit Indices	These indices make it possible to verify the similarity between the theoretical model and the observed data.	Goodness of Fit Index (GFI): a non-statistical index that measures the overall degree of model fit.	Values more than 0.9
		Adjusted Goodness of Fit Index (AGFI): differs from the GFI in terms of its adjustment for the number of degrees of freedom in the model (Byrne, 1998).	
		Root-mean-square residual (RMR) : is the square root of the average amount that the sample variances and covariances differ from their estimates	Values less than 0.05
Incremental fit indices	These indices make it possible to compare between the tested model and the reference model.	Root-mean-square error of approximation (RMSEA): The purpose of the RMSEA in an SEM study is to adjust the complexity of the model and sample size.	
		Normal Fit Index(NFI): represents a relative comparison between a proposed and the null model (Hair et al., 2010)	Values more than 0.9
		Comparative Fit Index (CFI) : Revised version the normed fit index proposed by Bentler (1990)	
		Relative Fit Index (RFI): This index takes the degrees of freedom for the two models into account.	
		Incremental fit Index (IFI): Describes the parsimony of the sample size in the estimated and null model.	
Parsimony fit indices	This index provides a simpler model with a better fit.	Tucker-Lewis Coefficient (TLC): represents a measure of parsimony between the comparative index in the proposed and null models (Marsh and Hau, 1996; Hair et al., 2010).	
		Chisq/DF: represents the ratio of the minimum discrepancy to degrees of freedom.	Values should be close to 1.0 for correct models.

This table shows the three categories of fit indices used to verify the quality of any structural model: The absolute, the incremental and the parsimony fit indices and their respective definitions. It also shows some examples of fit indices that fall under each category, their definitions as well as their acceptable threshold level.

Analysis of Moment Structures (AMOS) software was used for structural equation modeling (SEM). AMOS output includes results for three models. First, it shows the default model which we have designed. Second, it shows independence which reveals that each measured variable is correlated exactly with each other measured variable (with no latent constructs). Finally, it shows the saturated model, which uses the maximum available parameters and is guaranteed to provide a perfect fit. We report some important fit indices here that fall under each category presented in Table 7. To verify the quality of our structural model, Table 8 presents the results of the previous indices. To justify that our model shows a good fit, we calculated the indices presented above. The results indicate the structural model provides a good fit. For each of index presented, the values of our indices are measured. This table reports most goodness-of-fit measures found in the Model Fit Summary output of AMOS.

Table 8: Results of Our Fit Indices of Our Structural Model

Model	CMIN					RMR, GFI			
	NPAR	CMIN	DF	P	CMIN/DF	RMR	GFI	AGFI	PGFI
Default model	11	3.459	4	0.484	0.865	0.031	0.973	0.899	0.259
Saturated model	15	0.000	0			0.000	1.000		
Independence model	5	104.48	10	0.000	10.448	0.434	0.459	0.188	0.306

Model	Baseline Comparaisons					RMSEA			
	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI	RMSEA	LO 90	HI 90	PCLOSE
Default model	0.967	0.917	1.005	1.014	1.000	0.000	0.000	0.202	0.546
Saturated model	1.000		1.000		1.000				
Independence model	0.000	0.000	0.000	0.000	0.000	0.439	0.365	0.517	0.000

Table 8 shows the results of our fit indices. For each index mentioned above, we present values related to our structural model in Figure 2. The Analysis of Moment Structures (AMOS) output has reported results for three models. First, it shows the default model which is: the model we designed. Second, it shows the independence model which reveals that each measured variable is correlated exactly with each other measured variable (with no latent constructs). Finally, it shows the saturated model, which uses the maximum available parameters and is guaranteed to provide a perfect fit. The CMIN is the minimum value of the discrepancy function between the sample covariance matrix and the estimated covariance matrix. RMR is the square root of the average amount that the sample variances and covariances differ from their estimates. GFI measures the overall degree of the model fit. Baseline comparisons present the values of the NFI and CFI. These latter represent relative comparisons between the proposed and the null model. The RMSEA column presents adjusts the complexity of the model and sample size.

Table 8 indicates the structural model has a good fit. It shows values of absolute, incremental and parsimony fit indices. The values of GFI and AGFI, that measure the overall degree as well as the adjustment for the number of degrees of the model fit, are greater than 0.9 and close to 1. The values of NFI and CFI, which represent relative comparisons between the proposed and the null model, are greater than 0.9. The RFI value is also greater than 0.9. This incremental fit index takes the degrees of freedom for two models into account. IFI and TLC values are also greater than 0.9 and close to 1. These two indices represent the parsimony of sample size in the estimated and null model as well as parsimony between the comparative index in the proposed and null models indices. The RMR, which is the square root of the average amount that the sample variances and covariances differ from their estimates as well as the RMSEA that adjusts the complexity of the model and sample size, are less than 0.1 and converge to 0. The Chisq/DF value, which represents the ratio of the minimum discrepancy to degrees of freedom, is close to 1. The values of these indices lead us to conclude the model specified in Figure 3 is a correct model. Table 9 recapitulates our research hypotheses, the test results and their validation.

All the analyzed contingency variables were found to have a statistically significant association with the adoption of a PMS by Moroccan SMEs. The presence of a balanced PMS in Moroccan SMEs is positively associated with the following elements. Moroccan SMEs need to adopt advanced information management practices and invest in advanced human capital competence. Furthermore, Moroccan SMEs need to adopt a participative management style and encourage a collaborative organizational culture. Finally, Moroccan SMEs need to have a clear organizational strategy. As far as the maturity level of PMS in Moroccan SMEs is considered, Moroccan SMEs are moving towards more excellent performance measurement practices. Indeed, contrary to expectations, Chief Executive Officers (CEOs) of Moroccan SMEs have become aware of the importance of PMS in managing their businesses to gain competitive advantages especially in the fierce and globalized environment where they compete.

Table 9: Our Research Hypotheses Results and Validation

Research Hypotheses	Test Results	Validation
Most of the Moroccan SMEs still have a basic maturity level of their PMS		<i>Rejected</i>
Advanced information management practice is positively associated with the presence of a balanced PMS in Moroccan SMEs	<i>Beta :0.86*** Sig : 0.000***</i>	<i>Accepted</i>
Advanced human capital competence is positively associated with the presence of a balanced PMS in Moroccan SMEs	<i>Beta :0.66*** Sig : 0.000***</i>	<i>Accepted</i>
A participative management style is positively associated with the presence of a balanced PMS in Moroccan SMEs	<i>Beta :0.66*** Sig : 0,000***</i>	<i>Accepted</i>
A collaborative organizational culture is positively associated with the presence of a balanced PMS in Moroccan SMEs	<i>Beta :0.71*** Sig : 0.000***</i>	<i>Accepted</i>
Clear organizational strategy is positively associated with the presence of a balanced PMS in Moroccan SMEs	<i>Beta :0.70*** Sig : 0.000***</i>	<i>Accepted</i>

*This table recapitulates our research hypotheses, the test results and the validation of our hypotheses. Five out of the six hypotheses tested have been substantiated. The contingency factors analyzed were found to have a statistically significant association with the adoption of a PMS by Moroccan SMEs. However only one hypotheses presented was rejected. It is related to our first research question associated with the maturity level of PMS in Moroccan SMEs. *, **, *** indicate significance at the 10, 5, and 1 percent levels respectively*

CONCLUDING COMMENTS

Our paper analyzed the results of a survey involving 50 Moroccan Small and Medium Enterprises (SMEs). Our empirical investigation gave an overview of the performance measurement practices in Moroccan SMEs. All dimensions stated in the framework proposed by Paolo Cocca and Marco Alberti (2010) were analyzed and allowed us to classify the interviewed companies into three maturity levels. According to our survey, Moroccan SMEs are moving towards more advanced PMS (Performance Measurement Systems). Most surveyed companies are middle level. However, some practices were notably weak. In particular, SMEs need to integrate the measurement of some non financial indicators like indicators related to competitiveness. Data collection needs to be more automated by IT systems in more Moroccan SMEs.

Our study allowed us to understand the contingency factors influencing the maturity level of PMS in Moroccan SMEs. We tested six theoretical propositions. All the contingency variables were found to have significant impact on the maturity level of PMS in Moroccan SMEs. Advanced Human capital competences and Information Technology practices were found to be drivers of PMS adoption in Moroccan SMEs. A participative management style and an organizational culture opened to innovation seem to favor the implementation and use of a PMS in Moroccan SMEs. These elements provide useful knowledge for the development of frameworks and tools specifically designed for effective use in SMEs. Our study has some limitations related to our sample size. Future research might include a larger sample to test the generalizability of the present findings.

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