Environmental Energy and Economic Research 2019 3(1): 61-74
DOI 10.22097/eeer.2019.163543.1062

The Role of Organizational Structure in Designing Performance Measurement Systems

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Received: 12 September 2018 /Accepted: 10 January 2019

Abstract
Organizational structure determines the scope of decisions, tasks, responsibilities, goals, perspectives and rewards for achieving results. In recent decades, due to environmental changes and dramatic technological advances, organizational structure has changed from Mechanistic to organic. The purpose of the restructuring is to facilitate getting the organization's goals. Changing structure is effective on the firm's performance measurement system. The main purpose of this research is analyzing the role of different types of organizational structures in designing of the performance measurement system of firms listed in Tehran Stock Exchange. This study done through a survey distributing 170 questionnaires, that 127 of them were returned. In Iran's economic environment, organic firms with low organizational stages, high level of decentralization, low formal rules, wide control and horizontal communications, emphasize the use of balanced performance measurements. The performance measurement system has also been defined as cause-and-effect or fully-developed in organic structures**.**

Keywords: Organizational Structure, Performance Measurement Systems (PMSs), Stages of Performance Measurement System Development, Balanced Scorecard.

Introduction

Organizational structure is driving force of organization in creating a framework for the proper implementation of organizational processes (Wang et al., 2014). The organizational structure is classified from different perspectives. Lunenburg (2012) describes the theory of Organic and Mechanistic structures. In his view, the structure of the organic has low organizational stages, high level lack of focus, low formal rules, and broad control area and horizontal form of communication. This structure is flexible in dealing with opportunities and threats and encourages employees to achieve the goals of the organization (Lunenburg, 2012). In contrast, Mechanistic structure that has a lot of organizational stages, low lack of concentration, high official rules, narrow control area and vertical form of communication (Clement & Puranam, 2017). Classification of organizational structure should not be only considered based on organic or mechanistic. In this study, to measure the organizational structure, five level introduced including semi -organic, organic, semi-mechanistic, and mechanistic and other structures.

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The performance measurement system must be appropriate to organizational structure (Fujino et al., 2015). Marjani et al. (2016) stated that the establishment of a performance measurement system depends on organizational structure. According to Merchant (2007), performance measurement system must define a mechanism for the scope of decisions, tasks, responsibilities, goals, perspectives and rewards for achieving results. In designing performance measurement system based on organizational structure, firm's perspectives must be determined, measures to achieve the targets identified and to achieve the short-term goals, operational activities done; then the results of financial and non-financial firms measured. The importance of presence and survival in current competitive markets has led firms to apply strategies to improve organizational performance.

The performance measurement system is essential for receiving feedback from inside and outside of the firms and determining the level of achieving goals (Fujino et al., 2015). So understanding the relationship between organizational structure and PMS for designing appropriate systems to achieve the goals is important. (Wang et al., 2014; Chenhall, 2003).

Until the early 1980s, the performance of firms was evaluated using the financial measures; Kaplan and Johnson (1987), considering the complexity of organizations, stated that traditional measures for performance measurement, were deprecated and the use of these tools reduces productivity management, inefficiency and a focus on short-term goals. In 1992, Kaplan and Norton as a result of one project stated that to assess organizational performance, in addition to financial measures, three other perspectives including customer, internal processes and innovation and learning growth must be assessed too. This method called Balanced Scorecard (BSC). In addition to this model, other strategies have been developed to measure performance, including the European quality award models, the Malcolm Beldrich reward and the pyramid Performance Framework (Arban & Buglino, 2003). Among all the proposed models, the Balanced Scorecard enjoys more popularity (Shahin et al., 2003). Nowadays BSC used as a strategic management system for creating the relationship between performance measures, targets and organizational strategies (Varmazyar et al, 2016). Speckbacher (2003) in completing the BSC introduced four stages to develop its PMS.

The first research question is whether the use of performance measurement system is different in organic and mechanistic organizations? And second, whether the stages of performance measurement system is different in organic and mechanistic organizations? According to the literature, the present study for the first time collected financial data related to the performance measurement system, instead of relying on questionnaire, have been extracted referring to financial reports published in the Tehran Stock Exchange(TSE). Then, based on the industry average, financial and non-financial measures of sample firms categorized based on the Likert. Also to assess the organizational structure, for the first time, the range consists of five section including semi-organic, organic, semi-mechanistic, mechanistic, and other structures were introduced. For testing the hypothesis, first, comparative tests run and then Ordinary Least Squares (OLS) regression and ordered and binary logits done. So far, a research that is based on actual data to investigate the role of organizational structure in the PMS in Tehran Stock Exchange has not been done yet. In this regard, this study is unique and Unprecedented in Iran.

Following this article, the theoretical foundations, backgrounds and research hypotheses have been explained. The methodology section introduces the sample and the method of measuring variables and by present of testing hypothesis, results clarified.

Literature review

Fujino (2015) by examining the relationship between organizational structure and performance measurement system, has stated that the type of organizational structure has effect on PMS and

firms according to the type of organizational structure, set goals and the measures to achieve the objectives in the performance measurement system. In this regard, the establishment of a performance measurement system appropriate to the type of organizational structure in different firms is one of the most important factors that causes empowers, efficiency, effectiveness and productivity. It also provides the proper field for accountability within framework of management principles.

Organic and Mechanistic organizational structure

The organizational structure is classified from different perspectives. Lunenburg (2012) fully describes the theory of organic and mechanistic structures, which is explained in Table 1. To measure the organizational structure, five level introduced including semi -organic, organic, semi-mechanistic, and mechanistic and other structures.

Table 1. Comparison of Organic and Mechanistic Organizational Structure

Organic structure	Mechanistic structure
Low organizational stages	High stages of organization
Lack of focus	Little decentralization
Little official rules	Many official rules
Wide control domain	Limited control domain
Horizontal communication	Vertical communication

Performance measurement systems

Veronese Bentes et al (2012) by the study of PMS based on BSC approach stated that this concept is complex and multidimensional, influenced by different factors; for this reason, managers to achieve their long-term goals need a PMS appropriate to organizational structure. Nowadays referring the complex and competitive economic environment, continuity of firm's activity, depends on the changing organizational structure and improving its performance. Performance measurement system must define a mechanism for the scope of decisions, tasks, responsibilities, goals, perspectives and rewards for achieving results (Merchant, 2007). The balanced scorecard is one of the best systems that enable managers to carry out the strategy of the firm and employee participation to improve the performance as well (Hudnurkar& Rathod, 2017). At first, this model was originally designed for firms, but this technique was adopted, gradually to other organizations (Wudhikarn, 2016); the four aspects of a BSC are described in Figure 1.

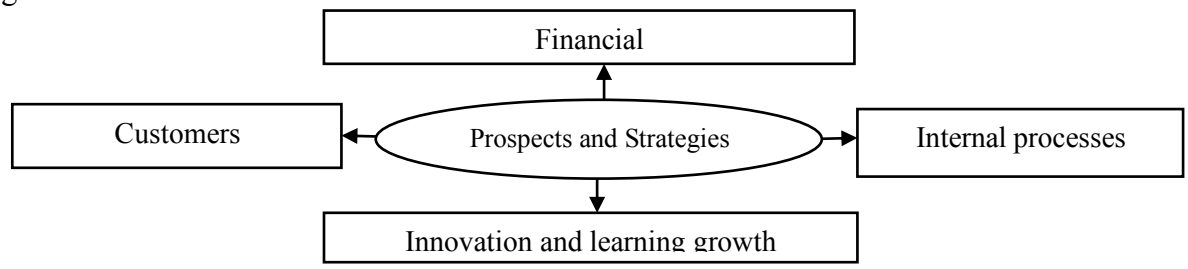

Figure 1. Balanced Scorecard Framework

The financial aspect focuses on maximizing profits as the ultimate goal of the firm. The customer's aspect emphasizes the way to create an organization's distinction to attract, maintain, and deepen relationships with its customers. Aspects of internal processes focus on internal factors referred to strengthen other aspects. Aspects of Innovation and learning growth focouses on learning and educating employees (Wongrassam & Simmons, 2003).

In addition to the BSC framework, other strategies were proposed to measure performance (Arban & Buglino, 2003). Keegan (1989) introduced a performance measurement matrix that examines the financial and non-financial aspects of organizational performance. Lynch & Cross (1991) introduced a performance pyramid model that addresses the effectiveness, efficiency, and integration of organizational goals with performance indicators. Brown et al (1996) introduced the European quality award models. Madorri and Stipple et al (2000) introduced a framework for audit and promotion of performance measurement systems. Li (2001) presented a stakeholder analysis model that refers to key and non-key stakeholders; (Li, 2009). Abuhrab has also developed BSC and introduced seven measures for training, business, research, people, international, sustainability, commfirmity and partnership for performance measurement. Balanced Scorecard is the most useful among all the models (Abuharb, 2017).

The stages of performance measurement system development

Speckbacher (2003) in completing the BSC introduced four stages to develop its PMS that are explained in Table 2.

Table 2. The stages of performance measurement system development

PMS stage	The extent of PMS stage
Minimum-standard PMS	Includes four aspects of balanced scorecard (growth and learning, internal processes, customers and financial).
Cause-and-effect PMS	Establish a Cause-and-effect link between the four aspects of scorecards and strategies.
Fully-developed PMS	Establishing Cause-and-effect link and motivating.
Other	None of the above systems.

Ittner et al (2003) studding the PMSs and its stages of PMS in financing firms, have argued that the systems of Cause-and-effect or Fully-developed can affect decision-making and outcomes. In this article, the PMS assessed by the BSC and the stages of performance measurement system development. PMS should be appropriate to the type of organizational structure (Fujino, 2015). Previous studies have shown that organizational structure directly effect on performance measurement system. (Marjani et al., 2016; Safari et al., 2014). Chenhall (1986) argues that in organic firm, in comparison with mechanistic firm, because of more flexibility and interaction between all departments, change and innovation to achieve goals is easier; but Johnson (2006) stated since in the organic firms management is decentralized and legislation and standards are less, so coordination is more difficult to make changes and achieve goals; However, in the mechanistic firms due to the high concentration of decision-making and rule of law, changes are more easily possible. Scott & Tiessen (1999) stated that the organic firms due to less hierarchical and horizontal relationships used more performance measurement integration, and more Cause-and-effect or Fully-developed PMS; This is also proved by Lee and Yang(2011). Also water house study showed that the organic structure due to decentralization, flexibility, horizontal communication and foster collaboration between different departments can be a Cause-and-effect links between the performance measurers and achieving the expected results. Establish a Cause-and-effect link, increases the manager's understanding of performance drivers, and thus improve decision making (Nilsen, 2006). Das (1986) believes by creating incentives for employees the goals can be achieved. To understand the relationship between variables, conceptual model is presented in Figure 2.

According to the theoretical foundations of research, hypotheses are as follows:

H1: More organic organizations will make greater use of integrated measures than more mechanistic organizations.

H2: More Organic organizations will make greater use (than more organic mechanistic organizations) of PMSs that include Cause-and-effect models and establish linkages with incentives.

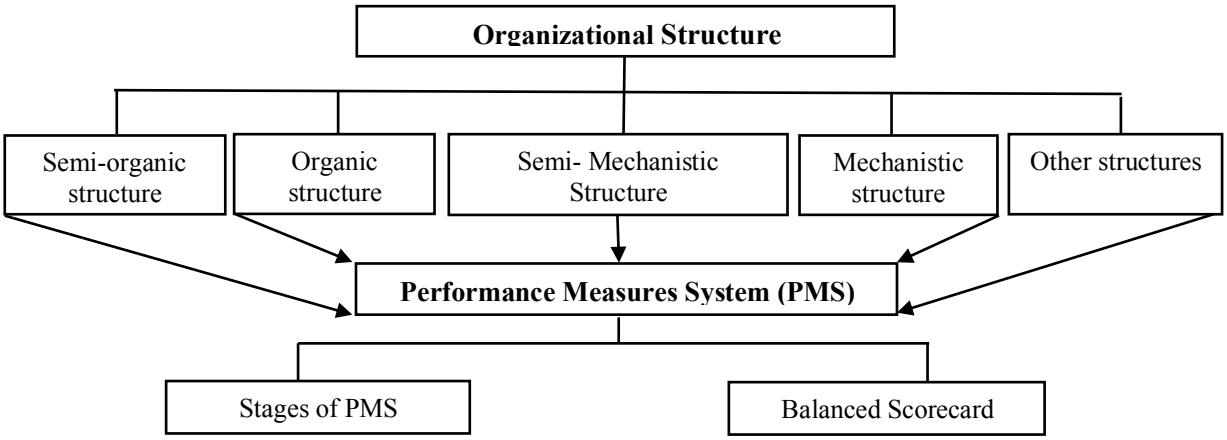

Figure 2. Conceptual Model of the relationship between research variables

Material and Methods

Since the present study consists of quantitative and qualitative variables, it has been done using mixed method. The statistical population of this study is Tehran Stock Exchange (TSE); Among the 30 industries in TSE, 170 sample firms were selected based on systematic elimination method. The required information about organizational structure and BSC has been gathered through a questionnaire. In addition, information related to the financial variables of performance measurement system and control variables is extracted from the financial statements of sample firms. An electronic questionnaire with an electronic explanatory note sent for board of directors and senior managers (including financial, human resources managers and management accountants); finally, 127 completed questionnaires Returned. Table 3 reports information of sample firms.
For standardization and localization of the questionnaire, its validity and reliability were re-evaluated. In order to investigate the validity, at first it was verified by professors and five non-executive directors with more than 10 years reputation; then, the construct validity was confirmed using confirmatory factor analysis. Also, Cronbach's alpha was used to measure the reliability of the questionnaire. For testing the hypothesis, first, comparative tests run and then Ordinary Least Squares (OLS) regression and ordered and binary logits done with SPSS 24 and Eviews8 software.

Organizational structure

In order to measure the four aspects of decentralization, formal rules, type of communication and hierarchical structure, according to the Ylinena Model (2014), 19 measures were defined based on five-stage Likert scale (1 = very low to 5 = very high).

Performance measurement system

To measure the PMS, the Ylinena Model (2014) was used for the BSC and the variables were adjusted to the Iran economic environment. To measure the financial aspect, growth of sale, total operating income and return on investment (ROI), return on assets (ROA) and return on equity (ROE) were used. For this purpose, the required data from the financial statements of

the sample firms were extracted from TSE, then based on average industry, firms were rated based on five-stage Likert scale. To measure customer aspects, Innovation and learning growth and internal processes, 17 measures were defined based on the five-stage Likert scale (1 = very low to 5 = very high).

Stages of performance measurement system

To assess the Stages of performance measurement system in the questionnaire, four options were defined according to Table 2.

Industry

To measure this variable, the current ratio, total debt, return on assets and return on equity were calculated and then the average of them categorized as Dummy variable (advanced industries = 1, otherwise = 0).

Table 3. Characteristics of respondent firms

Items	Classification	Frequency	PERCENTAGE
Industries	Food & Beverage except for sugar	7	5/5
	Pharmaceutical products	8	6/3
	Rubber and plastic	4	3/2
	Automotive and manufacturing parts	4	3/2
	Cement, lime and plaster	8	6/4
	Computer and related activities	3	2/3
	Paper products	2	1/5
	equipment and machinery	5	3/9
	Agriculture and related services	4	3/2
	Sugar	5	3/9
	Machinery and electrical appliances	2	1/5
	Tile and ceramic	1	0/7
	textiles	1	0/7
	Wood products	1	0/7
	Chemical products	7	5/5
	Hotel and restaurant	2	1/5
	basic metals	7	5/5
	Banks and Credit Institutions	8	6/4
	Petroleum products, coke and nuclear fuel	4	3/2
	Power supply, gas, steam and hot water	4	3/2
	Investments	5	3/9
	Social Insurance Insurance and Pension Fund	5	3/9
	Massage, real estate	5	3/9
	Financial and financial intermediaries	5	3/9
	Transportation, Warehousing and Communications	6	4/7
	Technical and engineering services	2	1/5
	Manufacturing of metal products	4	3/2
	Coal mining	1	0/7
	Shipping	1	0/7
	Other non-metallic minerals	6	4/7

Firm size

To measure this variable, the number of employees based on five-stage Likert scale (below 100, 100 to 250, 251 to 400, 401 to 800 and 801 to the top) and log of total assets was used.

Result and discussion

Validity and reliability

For standardization and localization of the questionnaire, its validity and reliability were investigated; for this purpose, structure validity was performed using confirmatory factor analysis; also, Cronbach's alpha was used to measure the reliability of the questionnaire, the results of which are presented in Table 4. As shown in Table 4, the factor load of all variables was higher than 0.5, so no item was deleted. Cronbach's alpha coefficient is more than 0.8, so, reliability is also confirmed. The following describes how variables are measured.

Table 4. Factors and Cronbach alphas(sig=0/000)

Panel A: Balanced Scorecard		
Innovation and learning growth perspective		***α***
Number of new service/product launch	0/894	
Time to market of new products/services	0/812	
On job training hours	0/806	
Employees' suggestions	0/796	
Employee satisfaction	0/745	0/952
Employee productivity	0/735	
Deviation of efficiency wages	0/669	
Available License System	0/684	
Internal process perspective		
Number of customer complaints	0/795	
Percent of shipments returned due to poor quality	0/765	
Ratio of defective output/total output	0/745	0/953
Number of warranty repair requested by customers	0/687	
Customer perspective		
customer satisfaction	0/849	
Customer response time	0/784	
On time delivery	0/774	0/911
Market share	0/647	
Time to products/ services	0/571	
Financial perspective		
This section has been extracted based on actual information in the stock market.		
Panel B: Organization structure		
I. formalization		
There is a guideline to improve operations.	0/881	
There is a guideline for employee participation.	0/874	0/950
There is a guideline to encourage employees to creativity.	0/856	
There is a guideline for registration activities and offers employees.	0/845	
II. Horizontal integration		
Managers with a view to carrying out group work	0/865	
Make decisions that are critical to group performance	0/861	
Product/ service group production	0/856	
Exchange of information, technology and resources between departments of the firm	0/852	0/952
Determine the goals of different circles based on the mutual performance of the groups	0/843	
Division employees for group activities	0/832	
III. Hierarchy		
Low hierarchy layers	0/849	
Lean production system	0/784	0/846
Up to six layers of elementary stage to CEO	0/774	
More than six layers of elementary stage to CEO	0/647	

Table 5. Descriptive Statistics and correlations among variables (N= 127)

Panel A: Descriptive statistics of non-financial variables based on Likert scale

Code	Variable	Theoretical	Actual range	Mean	Std
Integrated_PMS	The use of Integrated Performance Measures	1-5	2/45-5	3/86	0/67
ILG_PMS	Innovation and Learning Growth Perspective	1-5	2-5	3/63	0/5
IP_PMS	Internal Process Perspective	1-5	2-5	4/54	0/56
C_PMS	Customer Perspective	1-5	2/40-5	3/19	0/66
F_PMS	Financial Perspective	1-5	2-5	3/29	0/78
PMS Stage	The Stage of PMS Development	0-3	1-3	2/33	0/56
ORG	Organization structure	1-5	1/45-4/95	3/62	0/69
HORIN	Horizontal integration	1-5	2-5	3/69	0/78
DEC	Decentralization	1-5	2-5	3/69	0/71
FORMAL	Nature of formalization	1-5	1/80-5	3/69	0/78
HIERARCHY	Hierarchy	1-5	1/75-4/75	3/37	0/78

Panel B: Descriptive statistics of financial variables based on Likert scale

Code	Variable	Mean	Min	Max	Std
SGA	Sales growth	1/25	0/26	2/75	0/33
M/B	Market to Book value	2/68	0/46	4/87	0/52
P/E	Price to Earnings per share	9/02	2/35	12/01	0/63
ROE	Return On Equity	0/33	0/08	0/65	0/32
ROA	Return On Assets	0/25	0/07	0/58	0/29
NPM	Net Profit Margin	0/38	0/21	0/54	0/34

Panel C: Pearson and Spearman correlations among variables

Variable	**1**	**2**	**3**	**4**	**5**
The use of Integrated Performance	1	0/43	0/495	0/147	0/407
The Stage of PMS Development	0/331	1	0/286	0/072	0/247
Organization structure	0/595	0/586	1	0/131	0/35
Industry dummy variable	0/147	0/072	0/131	1	0/263
Number of Employees	0/407	0/347	0/35	0/263	1
IV. Decentralization					
Allow employees to solve problems				0/894	
Capability of the firm's working groups				0/846	0/976
Supervisors support of group decisions				0/832	
Let no significant actions without admin approval				0/821	

Descriptive Statistics

Panel A and B in table 5, presents descriptive statistics for the variables that have been examined. the mean of organizational structure variables, PMS and the stage of the PMS were 3.62, 3.86, and 2.33 indicating that most sample firms is organic with integrated performance measures and have Cause-and-effect or Fully-developed PMS stages. Panel C of Table 5, shows that the highest correlation coefficient is 0.595, thus there is no problem with multicollinearity.

In this study, firstly, comparative tests consist of Kruskal-Wallis and the Median were run to assess the PMS in different organizational structures. Chi-square values in Table 6 shows that a different PMS is used in different organizational structures. Then the hypothesis was evaluated through various regressions that is described below.

Hypothesis 1 posits that organic organizations will rely more on integrated performance measures than mechanistic ones. OLS regression in Table 7 shows the associations between organization structure and the use of PMS.

To further analyze the relationships predicted in H1, multiple regressions were additionally run, in which the analysis employed the use of measures for each of the four BSC perspectives.

Thus, there are a total of five independent variables of Integrated PMS, F PMS, C PMS, IP PMS, and ILG PMS used in the regressions. All five regressions represent that organization structure is significant and positively associated with the use of integrated performance measure (Integrated PMS), as well as separately with the use of financial perspective measures (F-PMS), customer perspective measures (C-PMS), internal process perspective measures (IP-PMS), and innovation and learning growth perspective measures (ILG-PMS). Therefore, the results indicate that the degree of organic structure increases the use of integrated performance measures, supporting H1.

Table 6. Chi-square Values of Comparative tests(N= 127)

Panel A - Kruskal Wallis tests					
Variables	ORG	Dec	formal	Horizon	Hierar
I-PMS	91/769	79/288	95/247	95/247	92/676
IP-PMS	47/837	37/693	44/173	44/173	54/124
C-PMS	72/341	58/403	71/842	71/842	81/090
ILG-PMS	86/558	65/198	81/260	81/260	92/380
F-PMS	96/569	111/431	126/000	126/000	75/263
df	3	3	3	3	3
sig	0/000	0/000	0/000	0/000	0/000
Panel B -Median tests					
Variables	ORG	Dec	formal	Horizon	Hierar
I-PMS	84/352	75/984	86/623	89/741	85/749
IP-PMS	39/984	32/415	37/921	41/745	49/361
C-PMS	69/745	52/745	69/325	68/145	76/142
ILG-PMS	81/652	61/248	77/894	79/741	89/784
F-PMS	91/463	108/964	114/978	123/965	71/975
df	3	3	3	3	3
sig	0/000	0/000	0/000	0/000	0/000

I-PMS: The use of integrated performance measures; F-PMS: The use of financial perspective measures; C-PMS: the use of customer perspective measures; IP-PMS: the use of internal process perspective measures; ILG PMS: the use of innovation and learning growth perspective measures; ORG: Organization Structure; Dec: Decentralization; Formal: Formalization; Horizon: Horizontal integration; Hierar: Hierarchy.

The industry dummy is statistically significant in explaining the use of integrated performance measures. The high-tech industries tend to emphasize the use of integrated performance measures, with relatively low usage in non-high-tech industries. Notably, a significant and positive relation ($p < 0.01$) between the industry dummy and the use of internal process perspective measures is found. The results show that high-tech firms need tighter internal monitoring processes as compared to firms in non-high-tech industries. In terms of organization size, SIZE has no significant influence on the use of integrated performance measures.

Hypothesis 2 posits that organic organizations will rely more on PMSs which include Cause-and-effect models and the linkages between incentives and strategy. This study uses order and binary logit to identify the associations between organization structure, market competition and the stages of PMS development. Table 8 gives the ordered logit results, which indicate that organization structure significantly affects the use of different stages of PMS development. This suggests that organic structures allow the possibility of moving from no use of an integrated PMS to a minimum-standard PMS; a minimum-standard PMS to a cause-and-effect PMS; and a cause-and-effect PMS to a fully-developed PMS.

Table 7. The relationship between organization structure and the use of integrated PMS

Variables	Predicted sign	I-PMS	F-PMS	C-PMS	IP-PMS	ILG-PMS
Intercept		1/965	2/176	2/197	2/492	1/721
		(4/361)**	(2/953)**	(2/891)**	(2/244)**	(2/935)
Organization structure	+	0/624	0/537	0/34	0/456	0/392
		(7/819)**	(5/022)**	(4/310)**	(3/659)**	(5/596)**
Number of Employees	NP	0/018	0/018	0/061	0/011	0/040
		(0/410)*	(0/324)*	(0/036)*	(0/196)*	(0/821)*
Total assets	NP	0/114	0/036	0/563	-0/047	0/676
		(1/374)*	(1/842)*	(6/364)*	(-0/471)*	(7/567)*
Industry	+	0/178	0/193	0/123	0/184	0/193
		(3/147)	(2/236)	(3/963)	(3/147)	(4/302)
Adjusted R^2		0/484	0/341	0/281	0/204	0/258
F-value		8/668	8/753	9/864	8/741	9/265

The test is significant at the*P≤0/01 and **P>0/1 respectively. The t-values are in the parentheses.

Table 8. The relationship between organization structure and the stage of PMS development stage

Variable	Ordered logit		Binary logit	
	Coefficients	p-value	Coefficients	p-value
Constant	2/038	0/003	2/088	0/1
Organization structure	4/667	0/001	0/789	0/015
Number of Employees	1/032	0/154	0/678	0/417
Total assets	3/365	0/247	0/915	0/369
Industry	4/104	0/006	0/678	0/004
Chi-squared	49/411(df=4, P≤0/0001)		20/103(df=4, P≤0/0001)	
Pseudo-R^2(Nagel kerke)	0/491		0/451	
Pseudo-R^2(Cox & Snell)	0/405		0/426	

The management accounting literature suggests that a Cause-and-effect relationship between measures and strategy in a PMS should be established. It is thus worthwhile to use this feature to separate firms into two categories, one of firms that go through the stage of establishing Cause-and-effect models, and the other firms that bypass this stage. Firms using cause-and-effect PMS or fully-developed PMS belong to the first category. Firms that use minimum-standard PMS or do not use any of the aforementioned PMS are assigned to the other group in the stage of not using a Cause-and-effect model. Binary logit analysis is used to compare the effect of organization structure and market competition on these two groups. For binary logit, firms were classified into two groups; firms using cause-and-effectPMSor fully-developed PMS, in the first group Prob (Y = 1), and Firms that use minimum-standard PMS or do not use any of the aforementioned PMS, 1-Prob (Y = 1), are classified in the second group. The binary logit results are shown in Table 8. The results of the ordered and binary logit are the same. Firms leaning towards organic structures rely more on the higher developmental stages of PMS which include Cause-and-effect models. The results of the ordered logit and the binary logit thus support H2.

Further analyses

In an attempt to better understand the relationship between the use of PMSs and the four structural elements of decentralization, formalization, hierarchy and horizontal integration, further empirical tests were applied. All of the regressions in Table 9 show that formalization and horizontal integration are significant and positively associated with the use of integrated performance measures. Since this study focuses on the nature of formalization with an emphasis on innovation and adaptation to customer requirements, this form of formalization will assist

in guiding employees to invent, work and learn autonomously. The control of integrated performance measures is more diagnostic in comparison to a cause-and effect PMS. The use of integrated performance measures is facilitated in organizations with a higher degree of formalization, as the rules and instructions within the organization are clearly delineated. The results also suggest that organizations with greater horizontal integration are more likely to use integrated performance measures as departments are functionally integrated into their operations.

Furthermore, ordered and binary logit are used to identify the associations between the four dimensions of organization structure and the stages of PMS development. The ordered logit results in Table 10 indicate that formalization, hierarchy and horizontal integration significantly affect the stages of PMS development, suggesting that they allow for the possibility of moving from not using any form of integrated PMSs to a fully-developed PMS. The results of the binary logit in Table 10 provide support for the idea that all four dimensions of organization structure significantly affect the use of the different stages of PMSs. The results also show that the stages of decentralization, formalization, flat hierarchy and horizontal integration are positively associated with the use of cause-and-effect or fully-developed PMSs.

Table 9. The impact of organizational structure dimensions on performance measurement system

Variables	Predicted sign	I- PMS	F-PMS	C-PMS	IP-PMS	ILG-PMS
Intercept		1/83 (5/276)**	1/176 (2/953)**	1/132 (2/487)**	3/392 (61/13)**	1/596 (2/487)**
Decentralization	+	0/500 (1/033)**	0/452 (3/741)**	0/389 (2/384)**	0/522 (1/952)**	0/35 (2/549)**
Formalization	+	0/23 (3/512)**	0/198 (2/476)**	0/167 (2/574)**	0/189 (2/567)**	0/214 (2/974)**
Hierarchy	+	0/309 (3/156)**	0/247 (2/748)**	0/184 (1/779)**	0/283 (1/738)**	0/301 (3/602)**
Horizontal integration	+	0/512 (3/626)**	0/623 (3/687)**	0/226 (1/516)**	0/273 (1/161)**	0/216 (1/788)**
Number of Employees	NP	0/012 (0/23)*	0/012 (0/214)*	0/056 (0/011)*	0/014 (0/163)*	0/033 (0/729)*
Total assets	NP	0/102 (1/289)*	0/024 (1/918)*	0/511 (6/1)*	-0/035 (-0/269)*	0/507 (7/488)*
Industry	+	0/167 (3/298)**	0/189 (2/114)**	0/163 (3/178)**	0/162 (3/126)**	0/187 (4/258)**
Adjusted R^2		0/524	0/38	0/392	0/263	0/399
F-value		8/216	10/753	7/66	8/802	10/117

The use of integrated performance measures; F_PMS: The use of financial perspective measures; C_PMS: the use of customer perspective measures; IP_PMS: the use of internal process perspective measures; IL_PMS: the use of innovation and learning growth perspective measures. The test is significant at the*P≤0 1 and **P>0/1 respectively. The t-values are in the parentheses.

In considering these results, it should be noted that organic structures are more likely to use PMSs, including at least the cause-and-effect relationships between strategies and measures. These cause-and-effect relationships communicate the linkages between the strategy and the measurement of workers, which are used to satisfy the requirement for widespread communication within an organic organization. The degree of formalization, flat hierarchy and horizontal integration are positively associated with the use of a fully-developed PMS containing linkages between outcomes and rewards, as well as Cause-and-effect relations. Decentralization is the only organizational determinant which does not have a significant impact on the use of a fully-developed PMS. The results suggest that decentralized

organizations may have a greater motivation to adopt the stages of a cause-and-effect PMS if communication is an important factor, and the risk of the effect of linking rewards to performance measures is high.

Principle-agent theory posits that incentive compensation is lower in riskier operating environments (Nagar, 2002) Uncertainty thus results in the delegation of responsibilities, as it is too costly for top management to acquire the necessary information to respond quickly to changes in the environment (Nagar, 2002; Moers, 2006). Performance measures, which form the basis of incentive rewards, are more likely to fluctuate in more uncertain environments. Therefore, the link between outcomes and rewards will impose greater risks on managers, as many factors are beyond their control. Thus, decentralized organizations can only adopt a cause-and-effect PMS instead of a fully-developed PMS. According to Simons' argument (1995), a cause-and-effect PMS is described as a more interactive control system in comparison to integrated performance measures. Thus, the organization structures of decentralization and flat hierarchy can better use of a cause-and-effect PMS than integrated performance measures. As a result, the findings suggest that a cause-and effect PMS is widely adopted in organic organizations.

Table 10. The stage of PMS development tests in four structure dimensions

Variable	Ordered logit		Binary logit	
	Coefficients	p-value	Coefficients	p-value
Constant	2/75	0/012	2/647	0/002
Decentralization	0/601	0/014	0/833	0/024
Formalization	1/243	0/018	1/645	0/032
Hierarchy	1/953	0/009	0/206	0/012
Horizontal Integration	1/364	0/044	0/206	0/014
Number of Employees	1/072	0/123	0/78	0/377
Total assets	3/243	0/211	0/857	0/424
Industry	3/925	0/147	0/745	0/001
Chi-squared	32/262(df=11, P≤0/0001)		31/918(df=11, P≤0/0001)	
Pseudo-R^2(Nagel kerke)	0/447		0/413	
Pseudo-R^2(Cox & Snell)	0/443		0/436	

Conclusion

Organizational structure with effect on performance measurement system can help to achieve expected results. Nowadays, due to complex and competitive environment, firms don't tend to have a mechanical structure, which is based on formalization, concentration, and wide communication, so they like to change to organic structure. Therefore, this study investigated the effect of organizational structure on the performance measurement system.

The results of testing hypothesis, which were analyzed by comparative tests (Kruskal-Wallis and the Median) and various regression (OLS, binary and ordered logit), indicate that there is a positive relationship between the type of organizational structure and performance measurement systems.

Findings show that the firm with a lower organizational hierarchy, horizontal communications, decentralization and less regulatory that is semi-mechanic, semi-organic or organic structure, pay high level attention to internal processes by regarding to the number of customer complaints, the percentage of returned goods, the number of requests for repairs and the proportion of defective products. Also, these firms consider the customer aspect through assessing the market value, customer satisfaction, customer response time, on time delivery and production time. In these firms, the number of new products is high, the time of their delivery

is low, appropriate information system is available, training hours are more and employee proposals are respected which expresses their attention to the aspect of Innovation and learning growth perspective. They also have higher margin of net profit, return on assets (ROA), return on equity (ROE), return on investment (ROI), market value, earning per share (EPS), and market to book value (M/B) than other structures; so their performance have higher effectiveness.

The more organizational structure is closer to the organic structure, the performance measures are higher and the stage of the PMS is closer to the Cause-and-effect and Fully-developed; in other words, with regard to future perspectives should be Cause-and-effect relationship between strategies, measures and incentives to achieve the goals. The existence of this structure, increases the integrated information in all parts of the firms and facilitating the decision-making process of managers and expediting the commitment of employees to achieve organizational goals.

This study highlights the effect that can be achieved, by a joint consideration of integrated performance measures and organization structures, enabling the designer of the organization to benefit from awareness of the PMS design. The organizations proceeding from the design of integrated performance measures to the implementation of integrated performance measures would require elements of organic and mechanistic structures to effectively match the adoption and implementation of integrated performance measures. The results of this study are compatible with the results of Clement (2017), Marjani (2016), Fujino (2015), Safari (2014), Friedrichson (2013), Dehghan (2011), Lee (2011), Nielsen (2006), and Ittner (2003).

To reduce the limitations of the research, instead of focusing on questionnaires used actual data of sample firms. To increase popularization, the sample was selected from all industries with different organizational structures. The only limitation of this research is to communicate with managers in order to answer the questionnaires. According to the results, it is recommended:

The present research was conducted in a case study to obtain a single model; for other research models, other models uses and the results will be compared. To collect information PMSs and the stage of its development, either actual data or collecting questionnaires from qualified employee can be used.

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