

An Empirical Analysis of the Association between the Organizational Culture and Performance Measurement Systems in the Turkish Manufacturing Sector

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Abstract. Generally, the subject of this study is the relationship between organizational culture and performance measurement systems (PMS) in the context of the Turkish Business environment. Specifically investigated in this study are the changes in the aims and measures of PMS used in different organizational cultures by managers. For this, the model developed by Jean-François Henri (2006) is used to understand and analyze the relationship under Turkish conditions. In this way, the basic question is that in any organization how does culture affect the aims and measures of a performance measurement system used? To test this relationship empirically, data is gathered from 122 manufacturers of the top 500 firms in Turkey. According to the results of logistic regression analysis, firms with a flexible culture tend to use non-financial performance measures, and use PMS for aims such as organizational attention-focusing and supporting strategic decision-making more than firms which have a control culture. On the other hand, firms with a control culture tend to use PMS for aims such as monitoring and legitimization more than firms which have a flexible culture.

JEL Classification Codes: D29, M29.

Keywords: Organizational Culture, Performance Measurement Systems, Monitoring, Focusing Attention, Strategic Decision Making, Legitimization, and Logistic Regression Analysis.

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1. Introduction

In the business environment defined by new elements such as high customer satisfaction, technology-intensive production, high competition and rapid change, firms are left no choice but to adapt to these conditions in order to survive and be successful. These conditions have a direct effect on the organizational structure of businesses and subsequently the organizational culture. Firms which had needed to change from a control-centered culture (based on maintaining their existing functioning and structure) to a flexible organizational one (requiring them to be open to change and renewal), were left no choice but to review their management control systems in line with these changing trends (Dent, 1991; Markus & Pfeffer, 1983).

Management control systems must have a structure which supports the flexible organizational culture taking organizational change and adaptation as a base in the emerging new production and competition conditions. A management control system incompatible with the organizational culture, in which flexibility is a dominant value, is not likely to propose the implementation of new management systems for the agenda or offer the desired performance, even if the new techniques discussed are proposed for the agenda, since it is not compatible with the organizational culture or dependent on the interests and values of members. In this respect, the success of new management systems depends on the existence of an organizational structure and culture compatible with the values of new production environments. (Ungan, 2007; Kalagnanam & Lindsay 1999; Daniel & Reitsperger, 1996; Chow et al., 1996; Schwartz & Davis, 1981).

In the control-centered culture, the management control system is considered a formal control or a feedback system enabling determined goals to be achieved and monitored, and has become a strategic means in a culture where flexibility is a basic value, supporting the change, renewal and learning processes of the firms and, to this end, securing that necessary decisions are made. This paradigm change emerging in connection with management control systems can be traced through the history of the competition process from the 1920s until today; its gradual increase being the determining factor.

While the main concern of management control systems was issues such as the specification of costs and financial control by using budgeting and cost accounting systems from the 1920s until the mid 1960s, this concern turned to management and the information providing form

necessary for planning and control activities during this period until the mid 1980s. Then, management control systems became a means of securing the resources necessary for realizing organizational goals and of being able to use them effectively and efficiently (Anthony, 1965).

From the mid 1980s onwards, of the aim of using the management control system shifted from planning and control to the issue of decreasing waste in business processes. In the mid 1990s, the start of a more comprehensive evaluation could be observed regarding the function of management control systems in business enterprises. Therefore, in one respect, the function of management control systems, entering their fourth and final phase, defined by planning, control and the prevention of waste, was broadened depending on the strategic emphasis made in regard to the creation of firm value through customer value, organizational renewal and management of the factors aimed at the increase, measurement and definition of shareholders' revenues (Johnson & Kaplan, 1987).

Flexibility as a basic value determining organizational culture has affected not only management control systems but also the form of using performance measurement, an important component of it. Performance measurement, increasingly important for firms to maintain their competitiveness, has now turned to a strategic and institutional tool for firms. This case is understood to be directly linked to organizational culture. While flexible systems can take performance measurement multidimensionally in terms of both scope and the realization of strategic managerial goals, the systems where control takes precedence reduce the issue to a very limited dimension, for example auditing activity outcomes from a financial perspective.

This study aims to test the relationship between the organizational culture and the performance measurement system, a component of management control systems. In this study, where procedurally the questionnaire data obtained from 122 manufacturing firms placed in the top five hundred in Turkey were analyzed using logistical regression, answers will be sought for the two basic questions: the extent of the effect of control and flexibility values concerning organizational culture on multiple performance measures, and again the extent of the effect of the values discussed on the aims of using performance measurement system by top executives.

The remainder of the paper is organized as followed. In the second section we discuss the relevant literature and develop the testable hypotheses. In the third section we describe the sample and empirical tests. The fourth section contains the results of the empirical tests and the fifth section includes the conclusion of the study.

2. Literature Review and Hypotheses

2.1. Defining Organizational Culture with Competing Values Model

Generally, common values, goals and meanings shared by the individuals in the organization form the concept of organizational culture. Many authorities have studied the various dimensions of this concept but they have yet to reach a consensus on the meaning of organizational culture.

Daft (1998) identified organizational culture as the whole of a series of common basic values, beliefs, understandings and norms shared by employees as thinking style and handed on new members. In the same way, Uttal (1983) defined organizational culture as a system of shared values (what is important) and beliefs (how things work), which are in interaction with employees to create behavioral norms, organizational structures and control systems. According to this, organizational culture denotes a complex whole composed of the values, beliefs, basic assumptions and symbols determining behavior styles in the organization. Organizational culture, with this characteristic, has a rather wide and intensive effect on firms because business culture determines not only employees, customers, suppliers and rivals related to firms but also the kind of the interaction the firms will have with these basic actors (Barney, 1986).

The most comprehensive definition on organizational culture belongs to Schein. According to Schein (1985), organizational culture is the contextual structure composed of a series of presumptions for firms. This contextual structure might be invented or developed by a certain group to cope with the problems encountered during the processes of outside adaptation and realization of inside integration. This context, achieved in the course of time, is the sum of a series of original perception, thinking and feeling styles believed to be valid and true solutions to problems and, with this characteristic, handed on new members. Chatman (1994), Waterman (1993) and Hofstede (1991) also agree with Schein's definition. According to them, organizational culture is a concept denoting a series of beliefs,

values and behaviors giving shape to an organization's self-identity and differentiating it from other organizations.

As we see from the above definitions, organizational culture denotes a system composed of values and thoughts shared by organization members and forming an identity together with one another. So, organizational culture can be thus evaluated, forming an ethical ground in the firm of right and wrong behaviors in regard to executives and the decisions they make, can be regarded as a general framework representing the organizational integrity and, in this respect, holding members together. In this respect, organizational culture as a value and meaning has functions such as having members acquire an identity and characteristic specific to organization, differentiating organization from other organizations and motivating all its members by directing them to shared goals.

Generally, the organizational culture of firms is categorized in two forms. These forms are named flexible¹ and control culture². As we see, the first one is on agenda in the new competitive manufacturer environment more than the second one.

In today's literature various models are developed on determining organizational culture. In this study, "competing values" is examined. This model is developed by Cameron and Freeman (1999) and Quinn and Rohrbaugh (1983). In the model, the vertical axis of the model strikes continuity from organic processes concerning organization to mechanical processes, a shift is observed in the values, which are important for organizations, toward flexibility, speed and adaptation, and at the other end to stability, control and order. And in the horizontal axis, internal state whose organizational importance is relative (improvement of activities and integration) and external positioning (competition and peripheral differentiation) are defined. In considering the model, it is possible to order four different types of culture, namely clan,³ adhocracy,⁴ hierarchy⁵ and

¹ Flexible culture emphasizes basic values like spontaneity, change, openness, adaptation and sensitivity.

² Control culture emphasizes predictability, stability, permanence, formality, rigidity and conformity.

³ Clan culture has a primary focus on flexibility and internal by means of cohesion, teamwork and morale to advance further development, empowerment and commitment of human resources

market⁶ (Deshpande & Farley, 2004). The first two cultures are flexible and the second two are control cultures.

A flexible or organic culture is suitable for firms in dynamic and instable environments; in such an environment they have to respond to the continuous change and customer profiles and to adapt to conditions rapidly. As we see, in such an environment, because of low predictability, a mechanical organizational structure is not suitable for firms (Leana & Barry, 2000).

On the other hand, in a control or mechanical culture, foreseeing, rigid control on decision and activities, structuring communication processes and precisely defined channels, and determining the information transmission and flow styles are basic characteristics. Firms with these cultures are generally in a stable environmental condition where risk and conflict are minimized.⁷ As we infer from this, if the conditions change to a highly competitive and instable market, firms have to change their cultural structure. So, conditions can change time after time, firms can adopt a control or flexible culture or both at the same time. When we look at any firms at any time, we can observe that sometimes control values or flexible values are evident.

⁴ Adhocracy culture based on flexibility values is characterized by strategic focus on external environment through flexibility, change and readiness to attain growth, resource acquisition and external support.

⁵ Hierarchy culture is based on norms for works, order and monotony and culture emphasize the concepts of bureaucratic management structure and stability.

⁶ Market culture has some main characteristics such as vision to organization's aim, market share, profit, productivity, sales improvement. This kind of cultural type reflects a trend to cope with high competition and profit.

⁷ Also named as rational culture, market culture is a culture based on product-driven strategies. This culture is a kind of cultural typology which wants to increase organizational productivity. So to this end, to make real necessary plans, necessary identifying communication forms in organizations and to construct centralized decision-making, other important characteristics can be noted . See Robbins, S.P. (1987), *Organization Theory: Structure, Design, and Applications*. (pp.443), Prentice Hall.

1.2. Performance Measurement in Various Cultural Structures

Performance measures differentiate in different cultures. Since control cultures consider values like stability, hierarchy and formality, measures are often financial. On the other hand, in flexible cultures, change, adaptation, and creativity are some evident values. Performance measures therefore can generally contain non-financial measures.

According to this, performance measures are used for different aims. While flexible firms use measures to observe the changes around them, establishing and evaluating processes aimed at business targets, checking whether internal performance targets are met, and sustaining the continuation of improvement, etc., control firms can use measures to make plans based on historical and financial data, determine deviation and define productivity.

Today, flexible culture and naturally multiple performance measures can be seen as the most important concepts in a dynamic and changing environment. Because of their structural features, flexible firms prefer to use multiple performance measures including financial and non-financial activities and measures.

In this study, we thought that comprehensive understanding on multiple performance measures was possible with the balanced scorecard concept (BSC) developed by Kaplan and Norton in 1992. BSC can be expressed as the name of a model or mechanism which transforms a firm's organizational strategy to operational concepts (Kaplan and Norton, 2001; Kaplan and Norton, 1992). The model emphasizes, in particular, the terms of "balance" and "measurement". Here, "balance" is explained through four desired factors of the model: (1) long and short-term purposes, (2) financial and non-financial measurements, (3) operation and result indicators, and (4) internal and external perspectives of the organization. The "measurement" gets its meaning in the concise expression of Kaplan and Norton (1996) "if you cannot measure, you cannot manage". Briefly, BSC reminds us once more of how the characteristic of performance measurement system is important in affecting the attitude and behavior of the manager and employees.

BSC has four sub-dimensions. These four dimensions or perspectives will be explained briefly. Firstly, the financial performance

measures: this is the focal point for the target and measures of the other three perspectives in BSC. In this sense, financial performance measures will be able to be considered as the outcome of the operational actions (Rao, 2000). Therefore, each selected measure needs to be a part of the cause-and-effect relationship leading to an improvement in financial performance. These measures are likely to be factors such as sales amount, market share, new customers, new markets, cash flow, return on capital, etc.(Morrow, 1992).

Secondly, the customer performance measures: these measures are an essential vision and mission indicator because being customer-focused is one of basic values of today. In order to implement the company mission, specific measures reflecting critical factors (time, quality, and cost) of which customers are aware should be determined. Hence, it is possible to list these basic measures as customer satisfaction, customer loyalty, gaining new customers, customer profitability, and market and customer shares in targeted scope.

Thirdly, the internal operation measures: these measures are obtained by focusing on actions and work process addressing critical success factors in empowering shareholder and customer satisfaction (Keegan et al, 1989). However, the most important key point that must not be ignored here is the necessity of defining and evaluating an exact internal operation value chain in the phases of design and development, and production and commercializing in order to create value for both customer and shareholder (Eker: 2004). These aforementioned internal operation measures include the duration spent presenting a new product to the market, number of new products, sales percentage of new products, rate of defect, duration of production, production cost, just-in-time delivery, etc.

Finally, learning and growth measures constitute the idea that achieving the targets related with finance, customer and internal operations greatly depends on the learning and growth capability of the organization. Learning and growth measures especially address the question of what type of route should be followed in order for internal operation methods to be improved. These measures are employee-centered and focused on employee satisfaction, productivity and sustainability.

According to this, BSC can be seen as an indicator of a firm's culture. So, by considering BSC including financial and non-financial measures, we can obtain some impressions about cultural typologies of firms, and how these measures are used by management. In this context, it's

possible to argue by considering BSC that there is a positive relationship between control values culture and traditional PMS. (Abernethy & Lillis, 1995; Merchant, 1984). The main cause of this is theoretically that both of them put forward focusing result concepts such as control, stability, hierarchy communication forms in organizational management. But, non-financial performance measures focus on process and in this context emphasize items like reviewing continuously strategic priorities, actual and double faced feedback, flexible and informal control.

In sum, it's possible to contend that while non-financial performance measurement systems show harmony with flexible cultural structures (Banker et al., 1993; Foster & Horngren, 1988; Daniel & Reitsperger, 1991.), and high organizational performance (Chenhall, 1997; Mia, 2000), on the other hand financial measures are suitable with control cultural structures. By considering these general arguments, the following hypotheses can be tested empirically.

Hypothesis 1: financial performance measures are associated with firms which have a control culture more than firms with have a flexible culture.

Hypothesis 2: non-financial performance measures are associated with firms which have a flexible culture rather than firms with a control culture.

2.3. Using Aims of Performance Measurement Systems in Various Cultural Structures

It is widely accepted today that the effective and healthy use of performance measurement systems is of critical importance, because firms must be able to create value for both shareholders and customers in a competitive environment. This means monitoring all activities and processes, continuously comparing the standard targets with actual results, revealing the reasons for the deviations, performing the necessary corrections, and conveying the firm strategy to subordinates.

The aims of using a performance measurement system differ in accordance with the managements goals. When we look at the literature, it appears that different goals have influences on the use of the performance measurement and control system.

In this context, Atkinson (1997) defined three fundamental goals, namely coordination, monitoring and diagnosis. Horngren (2000) claims that there are three different aims – problem solving, scorekeeping and directing attention – that determine the use of performance measurement. For problem solving here, it's necessary to answer the question Which one of the alternatives is best? Scorekeeping is the goal determined by the question: How can I do it by collecting data regarding all management levels and reporting reliable results? And directing attention is the goal determined by the question: Which opportunities and problems should we examine by focusing managers' attention on critical factors?

But Simons put forward two different using aims, namely diagnostic control systems and interactive control systems. Diagnostic control systems as formal information systems that managers use to communicate critical performance variables, monitor organizational outcomes and correct deviations from preset standards of performance (Simons, 1994). The fundamental goals determining the use of diagnostic performance measurement system can be ordered as follows: 1. specifying a goal beforehand, 2. measuring outputs, 3. calculating performance deviations, and 4. changing outputs and processes to draw this deviation data to the goals and standards whose performance has been determined. The diagnostic performance measurement system functions as a feedback system for management at the same time. Typically, there is little debate about the nature of the system and the systems tend to run in a routine fashion (Atkinson, 2004).

Simons (1994) define interactive control systems as formal information systems that managers use to regularly and personally involve themselves in the decision activities of subordinates. According to this, interactive control systems are used for aims such as focusing organizational attention on strategic uncertainties, developing dialogue throughout the organization, and achieving the emergence of new initiatives and strategies.

Generally, it is possible to summarize the performance measurement aims under four headings considering the classifications in the literature. These are monitoring, focusing attention, strategic decision making, and legitimization (Henri, 2006). These basic goals ordered in this empirical study will be examined in detail.

2.3.1. Using PMS for Monitoring

The use of a performance measurement systems for monitoring means diagnostically monitoring whether the business remains “in control” and is able to signal when unusual events occur that require immediate attention (Kaplan & Atkinson, 1998).

Monitoring activity is a kind of feedback system based on cybernetic logic⁸. Cybernetic logic, being a part of the traditional planning-control cycle, is compatible with control value rather than flexibility (Abernethy & Lillis, 1995; Merchant, 1984). In such monitoring, where growing deviances are evaluated as a routine fault and carrying out the plan is essential, actual and recyclable evaluations, such as whether the planned goals are still the ones that are desired to be achieved or the applied methods are still appropriate and valid, are not made. For this reason, cybernetic logic-based monitoring is observed in the bureaucratic organizations emphasizing control values, realizing a low-level top-down information flow and based on the determined rigid rules.

This is the basic characteristic differentiating the organizations with control values from the ones based on flexibility because flexible organizations, rather than control values, include values such as adaptation, change, creativity, responsibility, team work, learning at high level and double-cycled. In this context, if necessary to make a comparison, it can be claimed that flexible organizations, compared to the organizations with control values, are inclined to realize a collective research process within the body of the organization in regard to the development of more complicated rules and new operation styles.

⁸ “The concept of cybernetics is “error” based, in the sense that once a deviation or mismatch between actual outcomes of the activity under control and the objectives set for that activity is observed, this causes a control action to be implemented to reduce or remove that error.” In using a performance measurement system by cybernetic, we mean a process in which a feedback loop is represented by using standards of performance, measuring system performance, comparing that performance to standards, feeding back information about unwanted variances in the system, and modifying the system’s comportment” (see, Gren & Welsh, 1988; Hofstede, 1978)

In sum, monitoring-oriented performance measurements provide the necessary feedback concerning short-term routine actions and operations rather than the long-term strategic ones of the enterprise. As is known, non-strategic routine matters are monitored in a diagnostic manner, and for this purpose the monitored and collected information is used with the aim of reporting and explaining. PMS, functioning as a diagnostic control and an answer mechanism, now becomes a system, related to reporting and appraising the performance, used to meet shareholders' requirements. (Simons, 1990; Burchell et al., 1980). Formally the following hypothesis stated:

Hypothesis 3: Using PMS for monitoring is associated with firms having control culture rather than firms having a flexible culture.

2.3.2. Using PMS for Focusing Attention

PMS gives managers information about problems in business operational processes, by providing data. For better solutions to these problems, managers have directed employees to these problems. In this way, all members within the organization can play an effective role in bringing about a solution through an interest in the problems.

In organizational focusing attention, actual data from PMS is an important component of the identifying process of problems. Generally while PMS sends managers important indications on strategic issues, productive debate to problems and changing information, at the same time it increases organizational learning and value creating capacity (De Haas & Kleingeld, 1999).

By means of performance measurement, managements pass on to their employees a series of messages about matters, such as the problems that employees are to focus on and investigate and the methods they are supposed to use in their solutions, organizational values, basic achievement factors, opportunities, priorities, and finally, the critical uncertainties that are of importance for the organization. From the employee's point of view, these messages passed on are the clues expressing what is important for the organization, and according to this, on what things they are supposed to focus their attention and energy (Simons, 2000). Thus, PMS provides top management with the opportunity to inform employees about the strategy of a firm, critical achievement factors and their roles in reaching strategically important goals, to make organizational strategy connected with personal

targets, and with the possibility to create a shared understanding and determination among all units in the organization.

In the firm, including all subordinates, PMS achieving the focus of attention on the problems and work processes, can function as a control achiever having an interactive quality regarding the development of organizational dialogue or a provisions mechanism highlighting certain positions and operation plans in regard to the realization of an organizational mission. It is evident that the structure where these qualities of PMS become most apparent is in organizations with a flexible type culture (Ittner & Larcker, 1995; Mahama, 2006).

In sum, both vertical and horizontal communication channels are always open in organizations which have a flexible culture, thus there can be free information flowing in and throughout the organization. Furthermore, in this type of organization a informal, in other words flexible, control process is dominant. Because of these characteristics in flexible organizations, PMS can provide positive contributions to businesses' general and operational performance (Naveh & Erez 2004; Flynn et al., 1995). The following hypothesis is consequently suggested:

Hypothesis 4: Using PMS for focusing attention is associated with firms which have a flexible culture rather than firms with a control culture.

2.3.3. Using PMS for Strategic Decision Making

PMS supports and facilitates the strategic decision-making process as a part of administration control systems. (Kobera, Ngb & Paul, 2007). In today's highly competitive manufacturing environments, firms have to get detailed and healthy information on basic subjects like customer, market, technology and rivals' conditions. This means that firms must always reconsider and determine their strategies. PMS has a function that guarantees the quality and success of this process with the assistance of information from operational processes on performance. (Nilsson, 2002; Williams & Seaman, 2001). Firms that use PMS with this characteristic effectively are no doubt adaptive and change easily, and firms with a flexible culture develop more alternatives in valid conditions.

Strategic decision making can be stated as choosing the best among various alternatives. Most of the time, under conditions when there are

different rational alternatives, PMS can help top management quickly by providing comprehensive and up-to-date data.

In this context PMS as a comprehensive information system makes it possible to get effective decisions and indirectly leads to an increase in managerial performance. (Chong, 1996). Constructively in itself, PMS consists of the following stages (Ittner & Locker, 1997): (1) determining the strategy and conveying it throughout the firm; (2) applying the tactics that will meet all strategy requirements, (3) achieving strategic goals and (4) developing a control mechanism to examine the stages of application. With these stages, PMS has a function providing an interactive strategic control for managers. For example, collecting data concerning the strategy, testing the strategy, checking if the strategy is still valid in light of the latest developments and asking all employees for their opinions about new strategic opportunities and procedures and also double-cycled learning possibility can be named as a few of its important functions. (Collins & Gundova, 1999; Kaplan & Norton, 1996; Chenhall, 1997).

According to the empirical studies, since top executives of the firms with flexible value need continuous and comprehensive information, they benefit more frequently from PMS to support strategic decision-making processes. As a matter of fact, in organic structures with flexible values, the empirical fact is put forward that information in broadly and future directed projection are very useful (Abernethy & Guthrie, 1994; Daniel & Reitsperger, 1996). However, in the firms where change is rarely observed and operating in a stagnant and stable environment, it does not appear that an organization's information system and structure are significantly related to each other (Gordon & Narayanan, 1984). Lower risk and consequently less complex production faults can be regarded as other factors influencing this condition.

The other important concept which has an undeniable effect in a firm's strategic decision-making process is "uncertainty". This concept, which simultaneously leads to reveal a flexible organizational culture and modern PMS, points to the fact identified by high competition and continual changing. We can evaluate the effect of this concept's influence on MCS and new management techniques directly, in "contingency theory". According to this theory, while top managers who encounter environmental uncertainty make more subjective performance evaluation, departments that encounter these issues less make a more formal performance evolution and this causes serious results for the general performance of firms (Govindarajan, 1984).

For instance, flexible firms which have a comprehensive MCS increase general organizational performance level. (Mia, 2000). Thus, the following hypothesis can be tested:

Hypothesis 5: Using PMS for strategic decision-making is associated with firms which have a flexible culture rather than firms with a control culture.

2.3.4. Using PMS for Legitimization

Managers can use PMS to obtain a base for their strategic or ordinary decisions (Malina & Selto, 2001). This activity of managers can be translated as legitimization.

Generally in organizations legitimization is useful both in defending the real interests of an organization and in reinforcing the power an organization's top executives (Ansari & Euske, 1987). For this reason, legitimization is not only made in a retroactive manner, but can also be directed at current and intended activities.

Every organization, at the same time, represents a political society. For this reason, talking about an organization means talking about a limited political life where different individuals and thoughts compete with one another. Rules and values currently practiced in an organization, in one respect, can be defined as laws emerging as a result of political interaction where individuals and groups contribute to preserve or develop their self-interests. In short, whatever the organizational culture is, every organization is a potential political entity composed of limitations, conflicts, power struggles and decisions. For this reason, the management of an organization needs to continuously verify and legitimize its past activities and decisions in the organization.

In organizations with a control value, compared to organizational structures with a flexible value, PMS is more frequently used as a legitimization tool (Feldman & March, 1981). Really, considering the presence in control value firms of a powerful central group of individuals who dominate decision making, there is a need to use PMS not only to establish authority but also to maintain credibility (Henri, 2006). The cultures with a control value emphasizing continuity and stability regard

PMS as a kind of ratifier to increase the legitimacy of present and future activities. Hence, the following hypothesis can be tested:

Hypothesis 6: Using PMS for legitimization is associated with firms which have a control culture rather than firms with a flexible culture.

3. Methodology

3.1. Sample and Data Collection

This study depends on the data related to 430 manufacturing enterprises which take their place in the first 500 in Turkey. The data forms concern the study delivered between the 01 January -30 June by post and mail to the top managers (general manager or vice general managers) of the manufacturing firms which participated in this study. The survey forms return rate was %28.3 (122). The industry distributions of the sample respondent firms are presented in table 1.

Table 1: Industry Distribution of Survey Respondents

Industry	Frequency	Percent	Valid	Cumulative
1 Textile, clothing and	25	20,5	20,7	20,7
2 Food and allied	15	12,3	12,4	33,1
3 Drink and tobacco	1	,8	,8	33,9
4 Construction	10	8,2	8,3	42,1
5 Petroleum and	12	9,8	9,1	51,2
6 Plastic products	6	4,9	5,0	56,2
7 Metal Wares	6	4,9	5,0	61,2
8 Machinery	13	10,7	10,7	71,9
9 Wood and paper	7	5,7	5,8	77,7
10 Automotive and	20	16,4	16,5	94,2
11 Glass products	1	,8	,8	95,0
12 Electronic products	6	4,9	5,0	100,0
TOTAL	121	99,2	100,0	

The majority (60.3%) of respondent firms are from four industries: 20.7% Textile, Clothing and Footwear; 16.% Automotive and Spare Parts; 12.4% Food and Allied Products; 10.7% Metal Wares and Machinery Sector.

3.2. Survey Instrument

To examine these relationships, a three-page survey was used to collect specific information about the PMS used, multiple performance measurement, organizational culture, and characteristics of the respondent firms. In the first page, the multiple performance measurement is measured with an adapted version of the instrument used by Hoque and James (2000), Hoque et al. (2001), Henri (2006). The aforementioned terms are based on the four sub dimensions of BSC (financial, customer, internal business processes, and learning and growth) and a total of 20 factors developed by Kaplan and Norton. It was requested by the participants to designate whether their firms used the aforementioned measurements or not. For this, the Likert scale was used which represents the choices which show the degree of usage between 1 and 5: “not used at all”, “partly used”, “used”, “used rather a lot”, “used very much”.

In the second page, the aim was to determine the aim of using PMS (monitoring; focusing attention; strategic decision-making; legitimizing decisions). It consists of 27 items. The items are scored on a five-point scale ranging from “unimportant” (1) to “very important” (5).

In the last page, for the aim of determining organizational culture, R. Deshpande; J.U. Farley and F.E. Webster’s “Competitive Values” model is used. In the study for determining the four aspects of organizational culture 16 cultural variations take part. Respondents are asked to distribute 100 points among the four ideal cultural types along each of the following four dimensions of culture: institutional character; institutional leader; institutional cohesion; and institutional emphases.

4. Data Analysis

The data was analyzed using SPSS 13 (The Statistical Package for Social Sciences). The descriptive data analysis was conducted by calculating minimum, maximum, mean scores and standard deviations for determining values and scores, PMS use sub dimensions, the usage level of financial and non-financial performance measures of firms. The reliability analysis was performed to test the consistency of each variable’s survey results. Pearson correlations were calculated to examine associations among all variables. And lastly, logistic regression analysis was used to explore

whether the aims of using PMS and using financial and non-financial performance measures vary between flexibility value and control value firms.

4.1. Descriptive Statistics, Reliability Analysis and Correlation Analysis for Variables

In table 2, the descriptive statistical data related to flexibility and control values, PMS uses sub dimensions, financial and non-financial performance measures of the firms which participated in the research have been presented. The lowest and highest marks taken from values for the flexibility values and control values are 0-50. According to this, the firms' scores of flexibility values are between 20 and 77.5, the average usage score is 49.6551 and the firms' scores of control values are between 22.5 and 80, the average usage score is 50.4235. When the PMS sub-dimensions are looked at, PMS use for monitoring point is between 2.75 and 5, the average is 4.4373, PMS use for attention focusing points are between 2.57 and 5, the average is 4.1891, PMS use for strategic decision making points varies between 1.57 and 5, the average is 4.0828, PMS use for legitimization points are between 2.44 and 5, the average is 4.05. Financial performance measures mean scores are between 3 and 15, the average is 4.2842. Lastly, non-financial performance measures mean scores are between 17 and 85, the average is 3.6923. These average figures show us that the firms using all PMS uses are at a rather high level, and financial and non-financial performance measures are at an above medium level.

In table 2, the reliability of each variable and its specific dimensions were assessed with cronbach Alpha coefficients. All variables exceeded the recommended cut-off point of 0.70, indicating a satisfactory internal consistency and reliability of variables.

Table 3 displays the correlations between flexibility values, control values, PMS use's sub dimensions, financial and non-financial performance measures. The numbers which are marked with an asterisk in the table show that according to the meaningfulness level 1% and 5%, there is a meaningful relationship between the variables.

Table 2: Descriptive Statistics and Reliability Analysis for the Values Scores, PMS Use, Financial and Non-Financial Performance Measurement Items

Variables	N	No of Items	Theoretical range	Minimum	Maximum	Mean	Standard deviation	Cronbach alpha
Value scores								
-Flexibility values	122	8	0-50	20,00	77,50	49,6551	17,19235	80,2
-Control values	122	8	0-50	22,50	80,00	50,4235	17,06127	70,6
PMS Use								
- Monitoring	121	4	1-5	2,75	5,00	4,4373	,52730	76,1
-Attention Focusing	120	7	1-5	2,57	5,00	4,1891	,55614	83,8
-Strategic Decision Making	121	7	1-5	1,57	5,00	4,0828	,60069	82,7
-Legitimization	121	9	1-5	2,44	5,00	4,0504	,60675	90,0
-Financial Performance Measures	122	3	3-15	2	5	4,2842	,06276	,762
-Non-financial Performance Measures	122	17	17-85	1,88	5	3,6923	,06005	,891

According to this, the relationship between the flexibility values and PMS use for attention focusing, strategic decision making and legitimization, and financial and non-financial performance measures, is meaningful and the relations degree realized is in the order 0.435 ($p<0.01$), 0.352 ($p<0.01$), 0.195 ($p<0.05$), 0.223 ($p<0.05$) and 0.454 ($p<0.01$). According to the table, the PMS use for attention focusing and strategic decision making and non-financial performance measures are positively and significantly correlated with flexibility values. Table 3 also shows that the relationship between the control values and PMS use for attention focusing, strategic decision making and legitimization, and financial and non-financial performance measures, is meaningful and the relations degree realized is in the order -0.430 ($p<0.01$), -0.350 ($p<0.01$), -0.185 ($p<0.05$), -0.236 ($p<0.01$) and -0.469 ($p<0.01$). As proposed, the control values are negatively and significantly associated with PMS use for attention focusing and strategic decision making, and financial and non financial performance measures. Also, according to the table, the correlation between financial and non-financial performance measures and PMS use's sub dimensions is in a positive direction and there is a meaningful relationship between the variables.

4.2. Logistic Regression Analysis

In this section, how the intensity of use of PMS and BSC measures differed according to flexibility values or control values firms will be explained. For this purpose, the logistic regression analysis was used which is one of the multi-variables statistical techniques and aimed to apprise the relationships between the dependent variable and metric independent variables. As it is known, in a logistic regression analysis the effects of independent variables on dependent variables are determined by using probability of the two levels of dependent variables. Logistic regression analysis was preferred instead of other similar methods such as regression analysis and discriminated analysis because of its less stringent assumptions. A logistic regression analysis has two main methods naming single and multi-variables for choosing variables. This multi-variable analysis has two sub-methods which are stepwise and the best subsets methods, however the second one is rarely used in logistic regression analysis. The stepwise method has two methods in itself as forward selection and backward elimination. (Lee & Koval, 1997:566.) In this study, the stepwise forward selection method was used for selecting variables.

Table 3: Multi-correlation Analysis for All Variables

Variables	Flexibility Values	Control Values	Monitoring	Attention Focusing	Strategic Decision Making	Legitimization	Financial Performance Measures	Non-Financial Performance Measures
Flexibility Values	1	,997(**)	,055	,435(**)	,352(**)	,195(*)	,223(*)	,454(**)
Control Values	,997(**)	1	-,055	-,430(**)	-,350(**)	-,185(*)	-,236(**)	-,469(**)
Monitoring	,055	-,055	1	,627(**)	,438(**)	,599(**)	,448(**)	,381(**)
Attention Focusing	,435(**)	,430(**)	,627(**)	1	,523(**)	,687(**)	,410(**)	,498(**)
Strategic Decision Making	,352(**)	,350(**)	,438(**)	,523(**)	1	,512(**)	,269(**)	,405(**)
Legitimization	,195(*)	-,185(*)	,599(**)	,687(**)	,512(**)	1	,440(**)	,515(**)
Financial Performance Measures	,223(*)	,236(**)	,448(**)	,410(**)	,269(**)	,440(**)	1	,629(**)
Non-Financial Performance Measures	,454(**)	,469(**)	,381(**)	,498(**)	,405(**)	,515(**)	,629(**)	1

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

In the logistic regression analysis, for determining the impact of independent variables on dependent variables, firms with flexibility values were coded with 1 and firms with control values (control values firms) were coded with 0.

The Effect of Flexibility and Control Values The logistic regression model which was constituted for determining the relationship between value scores and using aim of PMS, financial and non-financial performance measures. Hosmer-Lemeshow statistic was 4.054, -2 log likelihood statistic (LL) was 99.595 and significant level (p) was 0.852 ($p > .05$) with 8 degrees of freedom. The results of goodness-of-fit test which are shown in Table 4 indicated that the logistic regression model was not a good fit. The Cox and Snell R^2 was found to be 42.3% in the five step and this statistic indicated that there was an approximately 42% relationship between the firm values and ESS and financial and non-financial. Also, Nagelkerke R^2 indicated that there was a 56.5% relationship between independent variables and firm values. In other words, the model explained 57% of the variance in the dependent variable.

Table 4: Goodness-of-Fit Test of Model for Cultural Values

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square	Chi-square	Df	Sig.
1	136,273(a)	,216	,289	6,702	8	,569
2	128,755(a)	,264	,353	6,247	8	,620
3	113,616(a)	,351	,469	14,515	8	,069
4	108,270(a)	,379	,507	17,773	8	,023
5	99,595(b)	,423	,565	4,054	8	,852

a Estimation terminated at iteration number 5 because parameter estimates changed by less than ,001.

b Estimation terminated at iteration number 6 because parameter estimates changed by less than ,001.

Table 5 shows the results of the regression model which was constituted for determining the predictors of firm values. The table's left

column shows that the stepwise model-building process included five steps. In the first step, a constant as well as non-financial performance measures predictor variable was entered into the model, at the second step, attention focusing predictor variable was added to the model, at the third step, monitoring predictor variable was added to the model, at the fourth step, strategic decision making predictor variable was added to the model and at the fifth step, legitimization step was added to the model. Also in Table 5, column B shows the coefficients (called Beta Coefficients) associated with each predictor, "sig." column shows the significant levels and the "Exp(B)" column shows the odds ratios. The *odds* ratio is defined as the probability of the outcome event occurring divided by the probability of the event not occurring and the odds ratio for a predictor tells the relative amount by which the odds of the outcome increase (odds ratio greater than 1.0) or decrease (odds ratio less than 1.0) when the value of the predictor value is increased by 1.0 units. In the model, the "B" coefficient was -2.395 for monitoring, p value was 0.001 and the model was statistically significant ($p < .05$). The odds ratio was 0.091 and indicated that a one unit increase in monitoring variable increases 11.989 ($1/0.091$) times the odds of having control values. The beta coefficient of attention focusing was 3.425 and p value was 0.000 ($p < .05$). The odds ratio of attention focusing predictor was 30.732 and this statistic indicated that a one unit increase in attention focusing variable increases 30.732 times the odds of having flexibility values. The beta coefficient for support strategic decision making was 1.643 and p value was 0.011 ($p < .05$). The odds ratio of strategic decision making was 5.172 and indicated that a one unit increase in strategic decision making predictor variable increases 5.172 times the odds of having flexibility values. The beta coefficient for legitimization was -2.045 and p value was 0.006 and significant at 0.05 level. The odds ratio of legitimization was 0.129 and indicated that a one unit increase in this independent variable increases 7.75194 times the odds of having control values. However, the beta coefficient for non-financial performance measures was 1.942 and p value was 0.000 ($p < .05$). The odds ratio of non-financial performance measures predictor was 6.971 and indicated that a one unit increase in this independent variable increases 6.971 times the odds of having flexibility values, controlling for other variables in the model. But, financial performance measures are not associated with cultural typology.

Table 5: Results of Logistic Regression for Cultural Values									
		B	S.E.	Wald	Df	Sig.	Exp(B)	95,0% C.I. for EXP(B)	
								Lower	Upper
Step 1 (a)	Non-Financial Performance Measures	1,799	,390	21,311	1	,000	6,042	12,968	2,815
	Constant	-6,434	1,444	19,860	1	,000	,002		
Step 2 (b)	Attention focusing	1,201	,456	6,945	1	,008	3,325	8,126	1,361
	Non-Financial Performance Measures	1,339	,418	10,238	1	,001	3,814	8,659	1,680
	Constant	-9,757	2,013	23,498	1	,000	,000		
Step 3 (c)	Monitoring	-2,222	,655	11,490	1	,001	,108	,392	,030
	Attention focusing	2,552	,646	15,608	1	,000	12,835	45,529	3,618
	Non-Financial Performance Measures	1,581	,452	12,206	1	,000	4,858	11,791	2,001
	Constant	-6,488	2,286	8,059	1	,005	,002		

Step 4 (d)	Monitoring	-2,516	,690	13,305	1	,000	,081	,312	,021
	Attention focusing	2,329	,676	11,861	1	,001	10,263	38,619	2,727
	Strategic decision making	1,109	,535	4,295	1	,038	3,033	8,660	1,062
	Non-Financial Performance Measures	1,417	,452	9,824	1	,002	4,124	10,003	1,700
	Constant	-8,173	2,518	10,532	1	,001	,000		
Step 5 (e)	Monitoring	-2,395	,714	11,261	1	,001	,091	,369	,023
	Attention focusing	3,425	,883	15,055	1	,000	30,732	173,393	5,447
	Strategic decision making	1,643	,648	6,421	1	,011	5,172	18,435	1,451
	Legitimization	-2,045	,751	7,413	1	,006	,129	,564	,030
	Non-Financial Performance Measures	1,942	,514	14,298	1	,000	6,971	19,074	2,548
	Constant	-9,153	2,671	11,745	1	,001	,000		

a Variable(s) entered on step 1: Non-Financial Performance Measures.

b Variable(s) entered on step 2: Attention Focusing.

c Variable(s) entered on step 3: Monitoring.

d Variable(s) entered on step 4: Strategic Decision Making.

e Variable(s) entered on step 5: Legitimization.

The success of the logistic regression can be assessed by looking at the classification table. Table 6 shows correct and incorrect estimates. The columns are the two predicted values of the dependent, while the rows are the two observed (actual) values of the dependent. According to this table, the 72.7% of firms which have control values, 84.6% of firms which have flexibility values were appointed correctly. The analysis correct classification rate was found to be 79.2%.

Table 6: Classification Table of Logistic Regression for Cultural values

		Predicted		Percentage Correct
		Cultural values		
		0	1	
Observed Cultural values	0	40	15	72,7
	1	10	55	84,6
Overall Percentage				79,2

The cut value is ,500

5. Discussion and Results

This paper which is aims to present as empirical the relationship between the organizational culture and two attributes of PMS (multiple performance measures and using aim of PMS) confirm the aforementioned hypothetic relationship. To test this relationship, the study surveyed the data related to 122 manufacturing firms placed in the top 500 in Turkey. By examining a relatively new area where there has been a lack of empirical work, study has led to a greater understanding of the influence of organizational culture on the design and use of performance measurement systems. Thus the study is consistent with the previous management accounting literature following the contingency theory approach.

The results show that there is a noticeably positive and significant relationship between the flexibility value firms and use of PMS for organizational attention and strategic decision making and non-financial

performance measures, as proposed. According to this, these results support the idea that the organizational strategy which takes into consideration the usage of multiple performance measurement system to focus organizational attention and to support strategic decision making is necessary to follow up the changes in an organizational culture which was directed by flexibility values.

Extensive analysis has been conducted on the control and flexibility value firms to present the relationship clearly. The logistic regression analysis which was done for this purpose put forth that the PMS and the nature of use can appear in both firms, but can be in different degrees from the point of view of preponderance and mixture. According to these results which were obtained from the classification made are summarized below.

When the logistic regression model was examined, it was seen that the use of PMS for attention focusing, strategic decision making and non-financial performance measures are effective on firms that have flexibility values. In the study, the odds rate related to the monitoring use are found as 0.091. This odds rate shows a one unit increase in using of PMS for monitoring increases 10.989 times the odds of having control values. The odd rate related to the use of PMS to focus organizational attention is determined as 30.732. The obtained results put forth that flexibility values firms' use of PMS for attention focusing is 30.732 times higher than control value firms. The odds ratio of use of PMS to support strategic decision making was 5.172 and indicated that a one unit increase in strategic decision making predictor variable increases 5.172 times the odds of flexibility value firms. However, the odds ratio of use of PMS to legitimate action was 0.129 and indicated that a one unit increase in this independent variable increases 7.75194 times the odds of control value firms. Furthermore, the odd rate related to non-financial performance measures is determined as 6.971. The obtained results put forth that flexibility values firms using of non-financial performance measures is 6.971 times higher than control value firms. But, financial performance measures are not associated with cultural typology. The overall correct classification percentage of this logistic regression model was found to be 79.2%.

Generally, the results of this study show that it is not possible to obtain the same results in all organization in terms of using the aims and measures of PMS. When the literature related to PMS is reviewed,

it is seen that different cultural environments require a different PMS to increase organizational success. Therefore, managers have to define organizational culture and design convenient PMS to existing organizational culture, because if there is an incompatibility between PMS and organizational culture, a designed system can never reach any success for business. So, top management must provide an appropriate PMS to the decision-making needs and organizational culture.

Turkey, as a developing country, simultaneously experiences the global technological and competitive effects with the other developed countries, so practical importance and necessity of the studies on PMS and organizational culture can be evaluated more clearly. At this juncture, this study can be accepted as a contribution to the local academic accumulation of knowledge on this subject.

Also, a number of limitations of this study can be mentioned. Firstly, the sample was composed of only top managers (general manager or vice general managers) of the top 500 manufacturing firms in Turkey. Therefore, a more comprehensive sample may be useful for future studies. Also, this study examined the relationship between an organizational culture and a performance measurement system. Future researches may include variables such as four different types of organizational culture (clan, adhocracy, hierarchy and market), diagnostic and interactive using of PMS, sub dimensions of BSC, four sub dimensions of management accounting system (scope, timeliness, aggregation, integration), advanced manufacturing and management techniques (CAM, JIT and TQM), competition, organizational performance and national culture.

In this context, future researches may test how sub dimensions of BSC and using aims of PMS affect organizational performance, depending on four different types of organizational culture. They may examine whether using aims of PMS are associated with sub dimensions of management accounting system, the intensity of market competition, the applications of advanced manufacturing and management techniques (BDÜ, JIT and TQM). They may also explore whether these relationships affect organizational performance, depending on organizational culture. However, future researches may test different contingency factors affecting organizational culture using different research methods. Future research may be designed to compare the findings in this study with findings that relate to companies in other countries.

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