



## EVALUATION OF THE ROLE OF PARTICIPATORY MANAGEMENT IN PRODUCTIVITY OF IRANIAN TOBACCO COMPANY, WITH THE HELP OF DATA ENVELOPMENT ANALYSES (DEA)

Mohsen Vaez Ghasemi <sup>a</sup>, Seyed Javad Asadi Bijaeyeh <sup>b\*</sup>

<sup>a</sup> Department of Mathematics, Faculty of Basic Sciences, Islamic Azad University of Rasht Branch, Rasht, IRAN.

<sup>b</sup> Faculty of Business Management, Islamic Azad University of Rasht Branch, Rasht, IRAN.

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### ABSTRACT

This article assessed the role of Participatory Management in productivity of Iranian Tobacco Company with the help of data envelopment analyses (DEA) in 2016-17. Our research method was descriptive-analytic and comparative. At first Guilan Tobacco Company was selected as accessible sample statistical society among seven provinces that have agricultural, productive and distributive units of tobacco and cigarettes. There are public productive units of an Iranian tobacco company (ITC) and private productive sections that have been set up by the Japan tobacco industry (JTI) in Iranian Tobacco Company. Japan is one of the pioneers in the application of participatory management. The two sections are directed and controlled by the Iranian Tobacco Company. The method of collecting data was through completing questionnaires, Correspondence, Interviews with Managers of different units of Guilan Tobacco Company and then 40 employees were selected as sample society by the accessible method and asked to respond the questionnaires that were contented questions about important indices for three periods, namely before 2009 and 2009-2013 and after 2013 periods. Then collected data were analyzed with data envelopment analysis (DEA) method. It showed that rank scores in periods 2009-13 and after 2013 were better than before 2009 periods. The finding confirms that Participatory Management has a role and impact on the productivity of Tobacco Company by mediatory variables.

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## 1. INTRODUCTION

Shared leadership has been defined as "a dynamic interactive influence process among individuals in groups for which the objective is to lead one another to the achievement of group or organizational goals or both. Under the shared leadership approach, leadership is

also viewed as a shared responsibility among members working within a formal or informal team structure or as a set of role functions that can be accomplished by multiple individuals. As such, the actions and decisions of a team are not the results of single leader acting toward the team, but of the team itself, and leadership can be distributed around the team equally, unilaterally, or in any other way. It suggested that this form of leadership may be particularly powerful and potentially successful especially in a cross-functional team setting which either lacks hierarchical authority or has a formally appointed leader but is highly dependent on the team members' unique knowledge, skills, abilities, and backgrounds [1].

In recent year, collective leadership approaches have attracted the attention of both researchers and organizations. One of the most prominent forms of collective leadership is shared leadership. Research has repeatedly demonstrated that shared leadership responsibilities are related to positive organizational outcomes such as performance and satisfaction. Teams have access to a larger knowledge pool than do individuals and team members' commitment increases. Thus, teams with shared leadership can better respond to the demands of today's knowledge-based, creative and complex work environment. However, little is known about the causal effects of shared leadership. Moreover, it is necessary to consider more carefully the conditions under which shared leadership operates most effectively and researchers have noted that deeper insights into moderating factors are required. Shared leadership, which is hierarchical leadership's counterpart, focuses on conjoint management by the work team itself. Shared leadership emphasizes the team unit as a whole; it does not focus exclusively on a single leader. Therefore, shared leadership adds a more interactive and independent component to the team. Accordingly, team members' contributions are acknowledged, and they feel more valued. Moreover, the combined knowledge and competencies of individual team members lead to the high-performance potential for teams with shared leadership [2].

Participatory management is an integrated systematic process of an organization which includes participation in goal setting, participation in decision making, participation in solving problems and participation in the transformation to achieve organizational goals professionalism [3].

Productivity represents the relationship between the amount of produced goods and services and the number of resources used in the production of goods and services. There are two approaches to measure productivity. The first approach is the partial productivity index which is the ratio of production input to output. The second approach measures productivity is in terms of the production function. In this approach, productivity is measured by a parametric or non-parametric method. Nonparametric methods estimate the total factor productivity index to produce without explicit production function. The parametric estimation methods are growth accounting and numerical indices in order to calculate the total productivity factor. In the numerical index method, productivity is obtained by dividing the quantitative index of the output by the quantitative index of the input [4].

In [5], it results that works councils have a positive impact on the productivity effects

of productive units' participation. Establishments with a works council, for example, top-level participation, can derive a higher productivity effect from shop floor employee participation. The endogeneity of the introduction of works councils again is taken into account by using an instrumental variable approach with one external instrument, the presence of profit sharing and employee share ownership.

In [6], the results showed that specific policies and programs, such as providing counseling and guidance, providing information and completing a contract, could successfully encourage individuals to participate in programs. Highly educated individuals have a greater incentive to active and collective participation at managerial levels.

Data Envelopment Analysis (DEA) is non-parametric linear programming (LP) based technique that objectively assesses the relative efficiency of a set of decision-making units (in this case cigarettes production units) according to a set of inputs and outputs. These units perform the same function by transforming multiple inputs into multiple outputs. DEA identifies the efficient and inefficient ones and for the latter group provides improvement targets. These improvement targets are taken as a starting point to carry out a process retrofit that seeks to enhance the efficiency level of the inefficient technologies through tailored modifications. DEA has been used in many application schemes. It is recognized decision support tools in multi-criteria analyses that do not require any prior assumptions on the underlying functional relationship between inputs and outputs. DEA, in fact, does not require defining weighting factors for the inputs, as it does not assume any articulation of preferences. Furthermore, compared to multi-criteria optimization, (DEA) focuses more on providing insight into how to improve the inefficient (suboptimal) units. Hence, multi-criteria optimization generates optimal solutions, while DEA identifies, from a set of alternatives, which are optimal and how the suboptimal ones can be improved [7].

## **2. RESEARCH HYPOTHESES**

The essential question of this study is that« does the participatory management have a role in the productivity of Iranian Tobacco Company? And then based on this question, we inform this Hypothesis: Does participatory management lead to improvement of productivity of Iranian Tobacco Company?

## **3. MATERIALS AND METHODS**

Our research method was descriptive-analytic a kind of data-comparative. In this research among seven provinces that have agricultural and productive units of tobacco and Cigarettes, Guilan province was selected as sample statistical population because of data having been accessible. Then the weights of indexes were collected about important indices by interviews and responding to questionnaires contented important indices by managers of different sections of tobacco company and then 40 employees were selected as sample society by accessibility method and then data were collected by responding to questionnaires

that contented important indices for three periods namely before 2009 and 2009-2013 and after 2013. The collected data were analyzed with data envelopment analysis (DEA) method. These indices are as follow [8]:

- Index 1. Sharing knowledge and information and work-related experiences, mutually, between executives and company employees.
- Index 2. Represent of undisclosed capabilities of employees.
- Index 3. Providing the necessary conditions for employees' job satisfaction.
- Index 4. Increasing mutual respect and confidence between employees and management.
- Index 5. Providing the necessary conditions to reduce conflicts and create a pleasant atmosphere in the organization.
- Index 6. Providing the necessary conditions for creating an affiliation with the organization's goals and aligning the workforce.
- Index 7. Providing necessary conditions to develop employees' motivation for doing work better.
- Index 8. Providing conditions to expose efficient and inefficient personnel.
- Index 9. Providing conditions for employees to benefit the results of their works and efforts in the form of material and spiritual rewards.
- Index 10. Providing conditions to increase the organization's strength for coping with unstable environmental conditions.

## 4. RESULTS AND DISCUSSION

### 4.1 RANKING OF PERIODS

Anderson and Petersen [9] introduced their proposed model for ranking efficient DMUs. It is assumed that  $N$  decision maker units ( $DMU_j$ ) ( $j = 1, \dots, N$ ) with  $x_j$  input vector; produce the  $y_j$  output vector, and  $x_j, y_j$  ( $j=1,2,\dots,N$ ) at least have a positive element. DEA efficiency ( $\theta$ ) of the  $k^{th}$  DMU.

$$k = \{j \mid DMU_j \text{ efficient}\}$$

$$\theta^{*k} = \min \theta^k$$

St:

$$\theta^k x_k \leq \sum_{\substack{j=1..N \\ j \neq k}} \lambda_j x_j;$$

$$y_k \geq \sum_{\substack{j=1..N \\ j \neq k}} \lambda_j y_j;$$

$$\lambda_j \geq 0, j \in k$$

$\theta^{*k}$  is called cloud-efficiency and  $\lambda_j$  is the weight of DMUs.

**Results of Table 1:** indicates that the tenth index score is the maximum in the second periods.

**Results of Table 2:** shows the weights of indices.

**Results of Table 3:** it results that the first period was less efficient and the Second and

third periods have been more efficient.

**Results of Table 4:** it shows that the second period was the most effective and, we went away from the goal after the implementation of the program.

**Table 1:** the scores of indices.

indices	1	2	3	4	5	6	7	8	9	10
First period	77	87	97	95	94	96	86	79	87	93
Second period	89	87	93	101	91	97	92	83	96	104
Third period	93	84	98	96	89	98	91	81	89	101

**Table 2:** Limitations of weighted

Index 4	3.5
Index 5	3.3
Index 1	3.2
Index 6	3.2
Index 3	3.1
Index 10	2.9
Index 7	2.8
Index 2	2.7
Index 9	2.7
Index 8	2.5

**Table 3:** Efficiency of model

First Period	0.98
Second Period	1
Third Period	1

**Table 4:** Period ranking.

First Period	0.983
Second Period	1.052
Third Period	1.005

According to the research literature that has been quoted in the text of the research by various researchers, and according to the results of the Tables 1-4, we can conclude that participatory management through sub-factors (mediating variables), effects on productivity of tobacco company.

## 5. CONCLUSION

Regarding to the findings and research results of various researchers about the positive and unpredictable impact of participatory management it is recommended to all managers of organizations, companies and institutions, to set aside the traditional management methods and select the new collaborative management approach for proving their loyalty to Islamic and national values by increasing the effectiveness and efficiency of organizations. The point to be considered in this study is that in the second period, namely, during the period 2009-2013, when the project was being implemented, the company's status in term of effects of indices was better than the period before 2009. Therefore, this issue alerts

administrators that it is necessary, after the implementation of any plan, to monitor the performance of the plan at the specific time periods and If it is needed, retraining the employees and do the necessary attention and actions. The finding confirms that Participatory Management has a role and impact on the productivity of Tobacco Company by mediatory variables.

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**Dr. Mohsen Vaez Ghasemi** is an Assistance Professor, Department of Mathematics, Faculty of Basic Sciences, Islamic Azad University of Rasht Branch, Rasht, IRAN. He got his Bachelor's Degree in Industrial Engineering Systems Planning and Analysis, from Islamic Azad University. He earned his Master's Degree in Industrial Engineering, Mazandaran University of Science and Technology, Iran, and his PhD Degree in Applied Mathematics from Islamic Azad University, Science and Research Branch of Tehran. His research work focuses on Strategic Management, Leadership, Strategic Planning, Applied Mathematics, Industrial Engineering, Operation Research and Data Envelopment Analysis.



**Seyed Javad Asadi Bijaeyeh** is an M.A. student of Faculty of Business Management, Islamic Azad University of Rasht Branch, Rasht, Iran.

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