# MEASURING THE IMPACT OF CREATIVE MANAGEMENT CONTROL ON THE SMES AND FREE ENTERPRISES (PROFESSIONS) PERFORMANCES

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**Abstract:** "This work was supported by CNCSIS – UEFISCSU, project number 861/19.01.2009, PNII – IDEI code 393/2008". Value creation is an issue that raises a growing interest today in many areas of science management: strategic management, business finance, accounting, management control, marketing, organization, human resources management. Under the practical aspect, value creation issue became a concern of managers of large companies because it allows development of activities and uses. Socio-economic theory of organizations and its diagnosis and evaluation method based on the study of dysfunctional activity constitutes a possible mean of measuring the organizational value creation as a result of reducing hidden costs. To meet its purpose, in our opinion should act primarily on variable costs whose optimization can be achieved using various methods including the linear programming.

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**Key words: value added, cost variables, mathematical modeling, optimization results, management control**

## 1. INTRODUCTION

While in nature, the entropy process is self produced, the economic process is directly dependent on human activity where the consumption of goods entails the entropy, meaning degradation, by disturbances which occur in this process.

Based on the law of entropy, we can say that simple consumption of energy is not enough to develop and maintain order, is needed information about how energy is used.

By analogy with irreversible degradation of energy, we started from the idea that, in enterprise management, energy is the ability to achieve decisive acts effectively compared with business objectives. Energy degradation is given by depreciation of information same as waste of human, technical and financial resources which are an important part of hidden costs and activities of adjustment disruptions, affecting business performance. In this context, based on empirical testing of explicative variables in determining success factors using multiple regression method, we tried to emphasize a series of failures that occur in the SMEs and free enterprises and how to reduce them.

The conclusion we reach is that socio-economic theory of organizations and its method of diagnosis and evaluation based on the study of dysfunctional activity is a possible means of measuring the organizational value creation as a result of reducing hidden costs.

## 2. OBJECTIVES

To meet its purpose, in our opinion we have to act primarily on variable costs whose optimization can be achieved using various methods including the linear programming. The starting point is to maximize profit objective-function which admits a dual model aimed at minimizing resource consumption. In our approach, the problem should not be solved in general but deepened by decomposing the total value of resources consumed on components. Furthermore, through removing major inconsistencies that may occur between forecast and actual achievements due to the unforeseen consumption, using linear programming we can determine the likelihood of such consumption according to optimize the objective function. Although we propose mathematical models difficult to achieve, this aspect is offset by the possibility of using software.

## 3. DEVELOPING A MODEL FOR MEASURING ORGANIZATIONAL VALUE

Value creation is an issue that raises a growing interest today in many areas of science management: strategic management, business finance, accounting, management control, marketing, organization, human resources management. Under the practical aspect, value creation issue became a concern of managers of large companies because it allows development of activities and uses. The concept of organizational value, defined as high performance and business management (Cappelletti and Khouatra, 2004), can be put into correspondence with other conceptual approaches, particularly those issued by Swedish authors who have attempted to determine the causes for the hidden roots of the value by studying the intangible capital. In this context, appeared the Sveiby model (1986) which integrates the measuring indicators of each component of the intangible capital, as well as the models Edvinsson and Malone (1997) which proposed the well-known instrument "Skandia Navigator".

Socio-economic theory of organizations and its diagnosis and evaluation method based on the study of dysfunctional activity constitutes a possible mean of measuring the organizational value creation as a result of reducing hidden costs (Iacob, 2006). This aspect can be achieved, according to the concept of this research, through an indicator called "Hour contribution to added value on variable costs"; a measuring indicator of the global added value realized by all stakeholders of the enterprise. The calculation allows the achievement of a transversal evaluation reported to the structural cutting up of the enterprise.

Hour contribution to added value on variable costs (COVACV) represents the average value of one working hour of activity performed in the enterprise, functional or operational, by the employees which is obtained by relating the added value divided through variable costs, at the number of recorded hours by the staff, according to the relation:

$$COVACV = \frac{MCV}{NO}$$

where:

MCV = Margin on variable costs (Turnover - Variable costs)

NO = number of hours achieved

The calculation allows for a cross evaluation compared with structural cut-enterprise. The main problem is to know to create economic value of working time invested in the business work. The value of each hour of work is intended to cover not only wages but also expenditures of structure and results. Therefore, this calculation option serves to demonstrate what is expected of every actor who has actively contributed to the creation of economic outcome. If in EU the hour contribution to added value on variable costs stands for an average about 53 euros, the studied devices found that this indicator is very low which means, on the one hand, a high level of variable costs and on the other hand, low labor productivity.

## 4. DEVELOPMENT OF AN OPTIMIZATION MODEL OF VARIABLE COSTS

In its ongoing effort about knowledge of the surrounding reality, man invented the "tools" becoming more sophisticated that would facilitate work. Modeling is a process of knowledge based on a "tool" with special features: the model. In the development of modern science, model-reality analogies are important tools, sometimes irreplaceable, about phenomenon knowledge and processes of the real world.

In general, research can be done by deductive or experimental way. The deductive approach, the real world phenomena are observed, analyzed and, following a process of abstraction, it is constructing a theory (a system of axioms or postulates). Based on the rules of logic are derived theorems and lemmas which lead to certain conclusions. These are interpreted and give rise to conclusions about the real world.

The experimental approach is based on a theory (system of axioms and postulates), which leads to certain conclusions. Designing an experiment and obtain data (information, observations) that are interpreted statistically, allowing to reach certain conclusions regarding the real phenomenon.

Most of the times a combined research it`s done, both deductive and experimental. There are areas of reality in which the experiment is forbidden (due to the characteristics of the phenomenon or the prohibited cost). The need for knowledge solved this problem by modeling. Regarding this phenomenon, the actual system subjected to research, we can say that a model is built for it, on which experiments are made, conclusions are drawn and all these are reflected over the actual phenomenon. Things stand In this manner also in the economic field.

If models are appropriate, then from the knowledge of their solutions we can deduce the behavior of the modeled phenomena. Although it is said that each model has its own nonlinear theory, they have common features, unifying, the strange behavior of their solutions have correspondance in the appearance of the modeled phenomenon. The fact that this behavior has not yet been reported is due to the complexity of linear problems, whose systematic study began only a few decades ago.

Any management implies a strategy which defines the general orientation of the work to be done at each stage and also a delimitation tactic stating the forms and means that can be used for objectives accomplishment. Therefore, a correct strategic decision involves both present and past knowledge of reality as complex and multifaceted investigation of future development trends.

Taking into consideration the models offered by Direct-Costing Method for calculation and analysis of profitability and that the physical volume of production is scientifically determined at the level of the economic entity, shows that must be acted primarily on variable costs. Variable cost optimization can be achieved using various methods, including linear programming.

Starting from the objective function "benefit of the enterprise", the mathematical relationship can be written:

$$\max B = \max \sum_{j=1}^{m} b_j x_j \quad (1)$$

with the restriction:

$$\sum_{j=1}^{n} a_{ij} x_j \leq d_i \quad , \quad i = 1, \ldots, m$$

$$x_j \geq 0 \quad , \quad j = 1, \ldots, n$$

where:

$b_j$ = benefit of the product unit $S_j$ ;

d = resource available $R_i$;

$a_{ij}$ = specific consumption of resource $R_i$ for realization of $S_j$;

$x_j$ = levels of activity;

This objectiv-function admits a dual model aimed at minimizing resource consumption. Therefore:

$$\min Ch_{R_i} = \min \sum_{i=1}^{m} a_{ij} P_i \quad (2)$$

with the restriction:

$$\sum_{i=1}^{m} a_{ij} P_i \leq b_j \quad , \quad i = 1, \ldots, m$$

$$b_j \geq 0 \quad , \quad j = 1, \ldots, n$$

$$\sum_{i=1}^{m} a_{ij} P_i = \text{total value of resources consumed for } S_j$$

where:

$P_i$ = specific consumption price $a_{ij}$

Taking into consideration the random variable nature of some expenditure items, results that in the above restriction must be introduced a parameter "$\lambda$" depending on which to achieve the optimization problem. In this sense, the model takes the following form:

$$\sum_{i=1}^{m} a_{ij}(\lambda) P_i \leq b_j \quad (3)$$

$$P_i \geq 0 \quad , \quad i = 1, \ldots, m$$

$$b_j \geq 0 \quad , \quad j = 1, \ldots, n$$

$$z \leq \lambda \leq y$$

Noted, however, that the problem must not be solved in general, but should be deepened by decomposing the total amount of resources consumed components (raw materials, consumables auxiliary materials, salaries, rank of achieving high levels of activity etc). By solving these parametrical problems are obtained several solutions, the best being the one that most satisfies the condition placed.

In order to remove major inconsistencies that arise between projected and actual costs due to the unexpected emergence of consumptions, using linear programming can be determined the likelihood of consumption according to the optimization of the objective function. Therefore, if we start from the general cost model that we want to optimize:

$$\text{opt } f(x) = \sum_{j=1}^{n} c_j x_j \quad (4)$$

with the restriction:

$$\sum_{i=1}^{m} a_{ij} x_j \le d_i \ , \ i = 1, ......, m$$

$$x_j \ge 0 \ , \ j = 1, ......, n$$

(notations are the same mentioned above).

In a more synthetic form can be noted:

$$\text{opt } f(x) = CX$$
$$AX = D$$
$$x \ge 0$$

where the matrix can be partitioned as follows:

$$M = \left| \begin{array}{cccc|c} a_{11} & a_{12} & ... & a_{1n} & d_1 \\ a_{21} & a_{22} & ... & a_{2n} & d_2 \\ . & . & . & . & . \\ a_{m1} & a_{m2} & ... & a_{mn} & d_m \\ \hline c_1 & c_2 & ... & c_n & 0 \end{array} \right| = \left| \begin{array}{c|c} A & D \\ \hline C & C \end{array} \right| \quad (5)$$

If part or all parameters are discrete random variables, each with a finite number of possible values, results the existence of a finite number of possible cases of matrix occurrence:

$$M_k \ , \ k = 1, 2, ......, N \quad \text{of the form:}$$

$$P_k = \left| \begin{array}{c|c} A_k & D_k \\ \hline C_k & 0 \end{array} \right| \quad (6)$$

where:

$P_k$ - probability of occurrence matrix $M_k$ and $\sum_{k=1}^{N} P_k = 1$

Under these conditions:

$$\text{opt } M f(x) = \sum_{k=1}^{N} P_k C_k X \quad (7)$$

where:

$$\left|\begin{array}{ccc} A_1X & = & D_1 \\ A_2X & = & D_2 \\ . & . & . \\ A_NX & = & D_N \\ X & = & 0 \end{array}\right.$$

Often, some parameters are known prior to the determination of other values.

If, for example, elements of the column "j" from matrix "M" are known before the final decision regarding the optimal value of the variable "$x_j$". Under these conditions, "$M_k^C$" is that part of the matrix "$M_k$" by replacing the random variabelelor in all columns except column "j" by * (unknown elements). In this case:

$x_{jk}$ - value associated with the variable $x_j$

$x_k$ - vector $\begin{pmatrix} x_{1k} \\ x_{2k} \\ \cdots \\ x_{nk} \end{pmatrix}$

the model regarding the following form:

$$\text{opt } M\, f(x) = \sum_{k=1}^{N} P_k C_k X_k \quad (8)$$

If some restrictions are violated, but with small enough possibilities in the model:

$$\text{opt } f(x) = \sum_{j=1}^{n} C_{ij} x_j \quad (9)$$

must be provided the condition:

$$P\left(\sum_{j=1}^{n} a_{ij} x_j \le d_i\right) \ge \xi_i \quad , \; i = 1, \ldots\ldots, m$$

$$x_j \ge 0 \; , \; j = 1, \ldots\ldots, n$$

where $\xi_i$ data are constant ($\xi_i \le 1$).

Free terms "$d_i$" as normal random variables known with equal average values "$m_i$" with mean square deviation "σ", and some coefficients of the efficiency function "μ" independent random variables "$d_i$", the model becomes:

$$\text{opt } M\, f(x) = \sum_{j=1}^{n} M(c_{ij}) x_j \quad (10)$$

must be provided the condition:

$$\sum_{j=1}^{n} a_{ij} x_j \le m_i + \mu_i \sigma_i \quad , \; i = 1, \ldots\ldots, m$$

$$x_j \ge 0 \quad , \; j = 1, \ldots\ldots, n$$

where "$\mu_i\sigma_i$" is determined from the equality:

$$\int_{-\infty}^{\mu_i} \mu_i \sigma_i = \frac{1}{\sqrt{2\pi}} \cdot e^{\frac{-t^2}{2}} dt = 1 - \xi_i$$

Although the presented models, are difficult to accomplish this aspect is offset by the possibility of their implementation through computer software.

## 5. Conclusions

Many free enterprises as family medical cabinets, dental clinics, notarial offices, law offices, pharmaceutical units now require, more than ever, implementing a management system for tracking costs, boost human resources and their strategic development. In other words, free enterprises need as large companies, an effective and efficient management control system tailored to their specific features.

These companies, generally with fewer than 10 employees are subject, during the last years, to severe political constraints which may be exceeded only by the leader's quality of expertise. For example, doctors, pharmacists, dentists need to reduce operating cost structure while maintaining, at the same time, the quality of their care, lawyers need to develop new products in order to meet the legal proceedings and competition fierce. Finally, they need to improve management control.

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