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MODEL OF ORGANIZATIONAL STRUCTURE OF THE SELFMANAGED FIRM*

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1. INTRODUCTION

It is well known that mathematical models can be of great help in the economic theory of organization. The purpose of this paper is to modify Beckmann's model [1] to obtain the framework for an investigation into some properties of the organizational structure of the selfmanaged firm.

There has been made no precise distinction in economic literature among the terms selfmanaged, labour-managed and worker-managed firm. Each of them has to emphasize that it is a firm where member-workers are jointly engaged in the production of goods and services, where control is exercised by members, in that the firm's important policy decisions reflect the desires of its members and where the members' income depends on the firms' residual or surplus [9].

These general characteristics of the selfmanaged firm do not imply an unstructured organization of »equal members who make all decisions in a democratic way«. Enterprise democracy should not be confused with political democracy. Within the enterprise we are faced with subordination relationships as empirical fact [1]. The unavoidable hierarchical structure of the firm is, at least, the result of technical requirements of production, internal and external uncertainty of production, inherent hierarchical job structure and unequal distribution of information among various groups within the firm [10]. The factors mentioned are constraints which make a democratic way of decision-making in the political sense unfeasible and unappropriate within the firm. Selfmanagement is a method which should broaden the framework of enterprise democracy but it has to be achieved in a way which is consistent with the hierarchical structure of its organization.

In a selfmanaged firm society is the owner and all the workers are society's representatives appearing as collective entrepreneur.

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Entrepreneurship implies the coordination of all activities in the firm and has to be carried out at all organizational levels. In the case of the selfmanaged firm coordination entails technical coordination, control, supervision and selfmanagement. To answer the questions, how workers' productivity is affected by the size of the organization, whether a systematic relationship between the span of control and size of organization is possible or how the optimal span of control is determined, an approach in the economic theory of management has been supplied [1] for the capitalist firm. By means of the necessary modifications, we attempt to investigate some properties of the organizational structure of the selfmanaged firm.

The paper proceeds as follows. In section 2. Beckmann's model of the management production function is modified to provide the framework for investigation of the optimal allocation of factors of production under selfmanagement, given in section 3. In section 4. the allocation of the factors is analysed by minimizing the average costs. The impact of change in the organizational size is covered in section 5., while in section 6. some conditions for the optimal size of the selfmanaged firm are given.

2. PRODUCTION FUNCTION UNDER SELFMANAGEMENT

In order to evaluate the impact of selfmanagement on the efficiency of organization, it may be assumed that there is a competition in the markets of output and of capital.

It is also assumed that labour costs are valued according to reference wages [7]. In a selfmanaged firm, where all workers appear as enterpreneurs, the influence of selfmanagement on the allocation of labour is important. While in a labour-managed firm which operates in a capitalist environment, the price of labour is known from the competitive labour market, in a pure or modified form, in the case of a selfmanaged firm in a socialist environment there is no such mechanism as the labour market. The wage of any administrative level is not the result of competition among labour but it could be a calculated price of labour [6]. In that sense the reference wages might be taken as representing the costs of labour input. They may be treated as accounting part of personal income, which expresses the opportunity cost of a particular type of work according to the knowledge and skill required, responsibility, complexity of work and so on [8]. In that sense we assume in our analysis that wages depend on administrative level or rank.

Let us consider organization of a selfmanaged firm with well-defined administration levels $r = 0, 1, \dots, R$. Let $r = 0$ be the level of production workers or operators and R the presidential or top level which also denotes the firm's organizational level.

The output of managers is described in such a way that managers at level r exercise supervision or managerial control y_r over managers at the next lower level $r - 1$, so that managerial control is treated as an intermediate product of the selfmanaged firm. Control from above is used as an input and combined with labour and selfmanagement to produce managerial control for the next lower level, so that output y_r of each control level is a function of labour, selfmanagement and supervisory input for that level. It can be formulated as

$$y_r = F_{r+1} \; (x'_r, x''_r, y_{r+1})$$

where r denotes level, $r = 0, 1, \ldots, R-1$, y_r managerial control at level r for next lower level $r-1$, which is the result of control of their own labour, x'_r, their selfmanagement x''_r and supervisory input for that level y_{r+1}. Through successive substitution we have

$$y_o = F_1 (x'_o, x''_o, F_2 (x'_1, x''_1, F_3 (\ldots F_R (x'_{R-1}, x''_{R-1}, x'_R, x''_R)) \ldots)$$

where y_o denotes management's output of effective labour units which is the result of inputs of operative labour x'_o, supervisory labour $x_1, \ldots, x_R$, selfmanagement of operative labour x''_o and of various supervisory levels $x''_1, x''_2, \ldots, x''_R$.

The final output q of the selfmanaged firm is the result of a combination of this effective labour y_o with capital k, so that we can define the production function

$$q = F_o (k, y_o)$$

or

$$q = F_o (k, \; F_1 (x'_o, x''_o, F_2 (\ldots F_R (x'_{R-1}, x''_{R-1}, x'_R \; x''_R) \ldots)$$

We concentrate on the production function specified by

$$F_o = a_o k^{\gamma} y_o^{\delta} \tag{2.1}$$

and sequences of selfmanagerial control functions

$$F_r = a_r x^{\alpha}_{r-1} x^{\xi}_{r-1} \; y^{\beta}_r \qquad r = 1, \ldots, R$$

$$F_r = a_r x^{\alpha+\xi}_{r-1} y^{\beta}_r \qquad r = 1, \ldots, R$$

(2.2)

As is easily seen, it is assumed that output elasticities α, ξ and β are the same at all levels, and that output quantities a_r per unit inputs may be different at different levels. Thus we obtain the following composite production function of the selfmanaged organization,

$$q = a_o a_1^{\delta} \; a_2^{\delta\beta} \ldots a_R^{\delta\beta^{R-1}} k^{\gamma} x_o^{\delta(\alpha+\xi)} \quad x_1^{(\alpha+\xi)\delta\beta} \ldots x_{R-1}^{(\alpha+\xi)\delta\beta^{R-1}}$$

or (2.3)

$$q = A_R k^{\gamma} \prod_{r=0}^{R-1} x_r^{(\alpha+\xi)\delta\beta^r}$$

where

$$A_R = a_o \prod_{r=1}^{R} a_r^{\delta\beta^{r-1}}$$

The composite production function (2.3) is homogeneous of degree η_R in the variable inputs k, $x_o, \ldots, x_{R-1}$ where

$$\eta_R = \gamma + \alpha\delta \sum_{r=0}^{R-1} \beta^r + \xi\delta \sum_{r=0}^{R-1} \beta^r = \gamma + (\alpha + \xi)\delta \sum_{r=0}^{R-1} \beta^r =$$

$$= \gamma + (\alpha + \xi)\delta \left(\frac{1-\beta^R}{1-\beta} \right). \tag{2.4}$$

(i) If it is assumed that all the F_r, $r = 0, 1, \ldots, R-1$, are linear homogeneous, so that $\alpha + \xi + \beta = 1$, $\gamma + \delta = 1$, we have

$$\eta_R = \gamma + \delta(1-\beta^R) = 1 - \delta\beta^R. \tag{2.5}$$

The degree of homogeneity of the organizational production function is less than one and depends on the level of organization R.

(ii) It is also reasonable to assume that the selfmanagement production function of every level is such that $\alpha + \beta = 1$. In that case selfmanagement appears as the component of the organization structure which makes the selfmanagement production function of every level homogeneous higher than unit. That implies increasing returns to scale due to selfmanagement. Then we have,

$$\eta_R = \gamma + \delta(1-\beta^R) + \xi\delta \left(\frac{1-\beta^R}{1-\beta} \right) =$$

$$= 1 + \delta \left(\xi \frac{1-\beta^R}{1-\beta} - \beta^R\right) \tag{2.6}$$

so that the degree of homogeneity of the composite organizational production function depends on the level of organization R and on relation between parameters ξ and β.

We suppose that the selfmanaged firm maximizes its income [6] so that the efficiency of organizational structure may be considered in two ways. It may be treated as minimization of the selfmanagement organization's cost of delivering a given output q or for the given budget of cost C, maximizing selfmanagement organization's output. We use here a first method of consideration.

3. EFFICIENCY OF THE SELFMANAGED FIRM

We discuss efficient organizational structure in terms of changes in minimizing costs. By efficiency is meant that the organization's costs of delivering a given output q are minimized.

According to the dimension of changes four cases are involved: (I) when only labour at one administrative level is increased, (II) when labour at all levels except the president's can be increased, (III) when both capital stock and labour at all except the president's level may be adjusted and (IV) when the size of the organization is changed. These cases may be connected with traditional very short-run, short-run, medium-run and long-run analysis in the theory of costs.

Let us consider case (I). In order to simplify our analysis it is assumed that only labour input at the operative level, $r = 0$, is changed. This type of change is connected with very-short run analysis.

The production function may be written as

$$q = \tilde{q}\left(\frac{x_o}{\tilde{x}_o}\right)^{(\alpha + \xi)\,\delta}$$

where $\tilde{q}$ denotes the original output and $\tilde{x}_o$ the associated input of operative labour. The output elasticity of operative labour is $(\alpha + \xi)\,\delta$ which is in the general case lower than unit. Comparing this elasticity to the one for the capitalist firm (2) we may conclude that it is higher due to the selfmanagement factor.

Changes in operative labour will affect cost so that we have

$$C = \tilde{C} + w_o\,(x_o - \tilde{x}_o) = \tilde{C} + w_o\tilde{x}_o\left(\frac{x_o}{\tilde{x}_o} - 1\right) =$$

$$= F_o + C_o q^{\frac{1}{(\alpha + \xi)\,\delta}}$$

where F_o denotes all costs ohter than operative labour costs and C_o is the proportionality factor. In view of this consideration it is interesting to note that in spite of the fact that selfmanagement does not affect costs directly, it alters costs indirectly. The expression obtained implies that selfmanagement lowers the costs based on the elasticity of selfmanagement as we have

$$\frac{1}{(\alpha + \xi)\,\delta} < \frac{1}{\alpha\delta} \qquad \text{for } \xi > 0.$$

The effects of increase of operative labour on costs will be smaller as the elasticity of selfmanagement is higher.

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Let us now consider case (II) which may be connected with short-run analysis when selfmanagement organization may change labour inputs at all levels $r = 0, 1, \ldots, R-1$ except the president's Rth, The organization's production function becomes

$$q = \tilde{q} \prod_{r=o}^{R-1} \left(\frac{x_r}{\tilde{x}_r} \right)^{(\alpha + \xi) \delta\beta^r} \tag{3.1}$$

and the cost function

$$C = \tilde{C} + \sum_{r=o}^{R-1} w_r (x_r - \tilde{x}_r) = F_1 + \sum_{r=o}^{R-1} w_r x_r \tag{3.2}$$

where F_1 is fixed cost.

In order to minimize the cost function C for given output q let us consider the following Lagrangean function,

$$G_1 = F_1 + \sum_{r=o}^{R-1} w_r x_r + \lambda \left[q - \tilde{q} \prod_{r=o}^{R-1} (x_r/\tilde{x}_r)^{(\alpha + \xi) \delta\beta^r} \right]$$

Thus, by differentiation, we have obtained the following condition

$$\frac{\partial G_1}{\partial x_r} = w_r - \lambda\tilde{q} \prod_{i=o}^{R-1} \left(\frac{x_i}{\tilde{x}_i} \right)^{(\alpha + \xi) \delta\beta^i} \frac{(\alpha + \xi) \delta\beta^r}{x_r} = 0$$

that is the nceessary and sufficient condition for the minimum of function C since the function G_1 is a convex function in the x_r, $r = 0, 1, \ldots, R-1$.

In view of organization production function (2.3) it implies that optimal input x_r of labour at rth level should be

$$x_r = \lambda q \frac{(\alpha + \xi) \delta\beta^r}{w_r}. \tag{3.3}$$

Substitute the result obtained (3.3) into organization production function (3.1) and cost function (3.2), after some manipulations, we obtaine costs as a function of output when all labour is adjusted optimally

$$C(q) = F_1 + C_1 q^{\frac{1-\beta}{(\alpha + \xi) \delta (1-\beta^R)}}$$

which represents the cost curve, where F_1 is fixed cost and C_1 depends on the initial output $\tilde{q}$ and on the initial labour inputs $\tilde{x}_r$, $r = 0$, 1, . . . , R — 1. It should be noted that no assumption about optimality of initial inputs $\tilde{x}_r$ has existed [1].

The span of control is defined as the number of immediate subordinates per administrator [1]. The average span of control for level r is

$$s_r = \frac{x_{r-1}}{x_r}$$

and for minimizing cost function according to the result (3.3) the average span of control for the selfmanaged firm should be

$$s_r = \frac{1}{\beta} \quad \frac{w_r}{w_{r-1}} \; .$$

Comparing the elasticity of variable costs in the case when only operative labour is increased with the case when an increase at all administrative levels except the president's is allowed it implies that

$$\frac{1-\beta}{(\alpha+\xi)\,\delta\,(1-\beta^R)} < \frac{1}{(\alpha+\xi)\;\delta} .$$

Thus we may conclude that for the given change in output a smaller change in cost is demanded in the second case compared to the first one. We may also consider two special cases, (i) when $\alpha + \xi + \beta = 1$ and (ii) when $\alpha + \beta = 1$. So we have for (i) the elasticity defined with $\frac{1}{\delta\,(1-\beta^R)}$, while for (ii) it is defined with $\frac{\alpha}{(\alpha+\xi)\,\delta\,(1-\beta^R)}$.

Comparing the results obtained for the selfmanaged firm to those of its capitalist conunterpart [2] we may conclude that in a selfmanaged firm a given change in output requires a smaller change in cost, as it is

$$\frac{1-\beta}{(\alpha+\xi)\,\delta\,(1-\beta^R)} < \frac{1-\beta}{\alpha\delta\,(1-\beta^R)} .$$

A comparison of the average span of control reveals similar results for the selfmanaged and capitalist firms. It seems that the span of control is not affected by selfmanagement directly since it is concerned with the control. The difference may be based only on the different amount of parameter between the two types of firms.

Let us now consider case (III) usually connected with medium-run analysis when inputs of capital and all levels of management of labour r = 0, 1, . . . , R — 1, may be adjusted, except the highest level of organization R.

The production function for this case may be written as,

$$q = \tilde{q} \left(\frac{k}{\tilde{k}} \right)^{\gamma} \prod_{r=o}^{R-1} \left(\frac{x_r}{\tilde{x}_r} \right)^{(\alpha + \xi)\, \delta\beta^r} \tag{3.4}$$

where $\tilde{q}$ denotes original output, $\tilde{k}$ and $\tilde{x}_r$, $r = 0, \ldots, R-1$, associated inputs of capital and all ranks of labour except president's.

The cost function becomes

$$C_2 = F_2 + ik + \sum_{r=o}^{R-1} w_r x_r \tag{3.5}$$

where F_2 is the fixed cost and i the price of capital service (interest rate plus depreciation).

In order to minimize the cost function C_2 for given output α, we again consider the Lagrangean function,

$$G_2 = F_2 + ik + \sum_{r=o}^{R-1} w_r x_r + \lambda \left[q - \tilde{q} \left(\frac{k}{\tilde{k}} \right)^{\gamma} \prod_{r=o}^{R-1} \left(\frac{x_r}{\tilde{x}_r} \right)^{(\alpha + \xi)\, \delta\beta^r \cdot} \right]$$

Thus, by differentation we obtain the following conditons

$$\frac{\delta G_2}{\delta k} = i - \lambda\gamma\tilde{q} \left(\frac{k}{\tilde{k}} \right)^{\gamma} \prod_{r=o}^{R-1} \left(\frac{x_r}{\tilde{x}_r} \right)^{(\alpha + \xi)\, \delta\beta^r} k^{-1} = 0 \tag{3.6}$$

$$\frac{\delta G_2}{\delta x_r} = w_r - \lambda\tilde{q} \left(\frac{k}{\tilde{k}} \right)^{\gamma} \prod_{r=o}^{R-1} \left(\frac{x_i}{\tilde{x}_i} \right)^{(\alpha + \xi)\, \delta\beta^i} \frac{(\alpha + \xi)\, \delta\beta^r}{x_r} = 0.$$

These are the necessary and sufficient conditions for the minimum of cost function C_2, since G_2 is the convex function in k and x_r, $r = 0, 1, \ldots, R-1$.

After some manipulation the conditions (3.6) yield the following results

$$\begin{aligned} x_r &= \lambda q\, (\alpha + \xi)\, \beta\delta^r / \, w_r \\ k &= \gamma x_o w_o / \, (\alpha + \xi)\, \delta i \\ s_r &= w_r / \beta\, w_{r-1} \, . \end{aligned} \tag{3.7}$$

In practice the wages of different administrative levels w_r, $r = 0, 1, \ldots, R-1$ are often interrelated, based on the wage for the operative level. In that sense the relationship may be defined as

$$w_r = w_o g^r \qquad r = 1, \ldots, R-1 \qquad (3.8)$$

where g is the incremental wage factor so that wages form the geometric progression [1]. If the stated (3.8) holds, the span of control at all levels becomes constant,

$$s_r = s = g/\beta \qquad (3.9)$$

so that there is no direct dependence between selfmanagement and the optimal span of control which is proportional to the incremental wage factor g and inversely proportional to the output elasticity of supervision.

Combining the results (3.7) with the organization production function (3.4) and the cost function (3.5), the last one may be expressed in the form

$$C(q) = F_2 + C_2 q^{1/\eta_R} \qquad (3.10)$$

where according to settled terms the fixed cost F_2 consists only of the president's wage w_R, and the proportional factor C_2 depends on the initial inputs $\tilde{k}, \tilde{x}_o, \ldots, \tilde{x}_{R-1}$.

The elasticity of the cost function in this case is smaller than that of the previous one since

$$\frac{1}{\gamma(1-\beta) + (\alpha+\xi)\,\delta\,(1-\beta^R)} < \frac{1}{(\alpha+\xi)\,\delta\,(1-\beta^R)}$$

and the comparison of this result to the one for the capitalist firm [1] leads to the conclusions previously obtained.

4. THE MINIMIZED AVERAGE COST

Starting from previous considerations we attempt to formulate the average cost for the selfmanaged firm to investigate its properties. As has been shown the production function of the selfmanaged firm (2.3) may be connected with the cost function of producing output $C(q) = F + cq^{\eta}$, where F denotes fixed cost, c proportionality factor determined by the initial inputs and η the elasticity of variable cost. The average cost of producing output q may be written in the form

$$\overline{C}(q) = F/q + cq^{\eta - 1} .$$

The main point to note is that the average cost curve C (q) has to be U-shaped. Since $\eta > 1$, in case (i) according to the results of the previous section the condition is obviously fulfilled. In case (ii) it implies

$$\xi < \frac{1 - \beta}{\beta^{-R} - 1}$$ for appropriate behaviour of the average cost curve.

Let us examine the characteristics of the average cost when the total cost for given output q is minimized. We consider the case when the capital and labour of all administrative levels are variable except the level of organization R, which is given The proportions of all inputs may be determined and fixed so as to minimize the total cost of production for given output q. The scale of output is then determined by choosing the magnitude of any input. It may be the number of subordinates of the highest R-level, x_{R-1}, which is equivalent to the president's span of control as it is assumed that $x_R = 1$. In terms of this variable we may express output q and the total cost according to the conditions for minimizing costs for the given level of output q (3.7). From (3.7) we have $w_r = s_r w_{r-1}$, $r = 0, 1, \ldots, R - 1$, so that conditions of minimization may be set so that

$$x_r = \frac{w_{R-1}}{w_r} \beta^{(r+1-R)} s_R \qquad r = 0, 1, \ldots R - 1 \tag{4.1}$$

and

$$k = \left(\frac{\gamma}{(\alpha + \xi)\delta} \right) \left(\frac{w_{R-1}}{i} \right) \beta^{(1-R)} s_R .$$

Using (4.1) our expression of the production function (2.3) now becomes

$$q = A_R \left(\frac{\gamma}{(\alpha + \xi)\,\delta} \frac{w_{R-1}}{\mathrm{i}} \beta^{1-R} s_R \right)^{\gamma} \prod_{r=o}^{R-1} \left(\frac{w_{R-1}}{w_r} \beta^{r+1-R} s_R \right)^{(\alpha + \xi)\,\delta\beta^r} . \tag{4.2}$$

If it is assumed, (i), that the production function at every level is linear homogeneous, so that $\alpha + \xi + \beta = 1$ and $\gamma + \delta = 1$, we have

$$q = d_R\, s_R^{1-\delta\beta^R} \tag{4.3}$$

where

$$d_R = A_R \left(\frac{\Upsilon}{(\alpha+\xi)\,\delta i}\right)^{\Upsilon} w_{R-1}^{1-\delta\beta^R}\, \beta^{1-R} \prod_{r=o}^{R-1} \left(\frac{\beta^r}{w_r}\right)^{(\alpha+\xi)\,\delta\beta^r}. \tag{4.4}$$

The total cost

$$C = ki + \sum_{r=o}^{R} w_r x_r \tag{4.5}$$

in view of (4.1) may be expressed as

$$C_R = w_{R-1}\, s_R \beta^{1-R}\, \frac{1-\delta\beta^R}{(\alpha+\xi)\,\delta} + w_R. \tag{4.6}$$

Hence we see that the average cost or unit cost of output in terms of s_R is

$$\bar{C}_R = \frac{C_R}{q_R} = \frac{w_{R-1}}{d_R}\, s_R^{\delta\beta^R}\, \beta^{1-R}\, \frac{1-\beta^R}{(\alpha+\xi)\,\delta} + \frac{w_R}{d_R}\, s_R^{\delta\beta^R-1} \tag{4.7}$$

It can be easily seen that in expression (4.7) the first term increases from zero to infinity and the second term decreases from infinity to zero, as s_R increased from zero. This implies that there is some positive level s_R, for which the average cost must have a unique finite minimum.

In order to obtain that minimum we differentiate (4.7) and equate it to zero,

$$\frac{\delta\bar{C}_R}{\delta s_R} = \delta\beta^R \frac{w_{R-1}}{d_R}\, \delta^{1-R}\, s_R^{(\delta\beta^R-1)}\, \frac{1-\delta\beta^R}{(\alpha+\xi)\delta} + (\delta\beta^R-1)\, \frac{w_R}{d_R}\, s_R^{(\delta\beta^R-2)} = 0 \tag{4.8}$$

so that we get

$$s_R = \frac{(\alpha+\xi)}{\beta}\, \frac{w_R}{w_{R-1}} \tag{4.9}$$

which implies that the president's span of control should be made smaller by a factor $(\alpha + \xi)$ compared to any subordinate's span of control for the same wage ratio in order to minimize the average cost of output. It turns out that selfmanagement might make the president's span of control bigger than that in the capitalist counterpart since in the latter case s_R is given by (α/β) (w_R/w_{R-1}), [1].

It is reasonable to assume that the presidential wage is slightly different from the relation (3.8),

$$w_R = w_o g^{R-1} h \tag{4.10}$$

where h defines a different wage step at the president's level (1).

In view of (3.8) and (4.10) the spans of control for different administrative levels may be expressed as

$$s_r = g/\beta \qquad r = 1, \ldots, R-1$$

$$s_R = (\alpha + \xi)\, h/\beta, \tag{4.11}$$

where the president's span of control under minimization of average cost is large (smaller) compared to that of any other rank when $((\alpha + \xi)\, h$ is larger (smaller) than g. It is interesting to note that the results obtained (4.11) reveal that only the president's level implies the influence of selfmanagement on the span of control. As we have mentioned earlier, for all other administrative ranks, selfmanagement is not directly concerned with spans of control.

If it is assumed, (ii), that the selfmanagement production function at every level is such that $\alpha + \beta = 1$ and $\gamma + \delta = 1$; (4.2) becomes

$$q' = d_R s_R^{(1 - \delta\beta^R + \xi\delta(1 - \beta^R)/\alpha)} \tag{4.12}$$

or

$$q' = d_R s_R^{\eta_R}$$

where

$$d'_R = A_R \left(\frac{\gamma}{(\alpha + \xi)\,\delta i}\right)^{\gamma} w_{R-1}^{\eta_R}\ \beta^{(1-R)\eta_R} \prod_{r=o}^{R-1} \left(\frac{\beta^r}{w_r}\right)^{(\alpha + \xi)\,\delta\beta^r} \tag{4.13}$$

and

$$\eta_R = 1 - \delta\beta^R + \frac{\xi\delta}{\alpha}(1 - \beta^R).$$

The total cost (4.5) in this case is

$$C_R = w_{R-1}\ s_R\ \beta^{1-R}\ \frac{\eta_R}{(\alpha + \xi)\,\delta} + w_R \tag{4.14}$$

and the associated average cost

$$\bar{C}_R = \frac{w_{R-1}\,\beta^{1-R}\ \eta_R}{d_R\,(\alpha + \xi)\,\delta}\ s_R^{\ 1-\eta_R} + \frac{w_R}{d_R}\ s_R^{\ -\eta_R}. \tag{4.15}$$

From (4.15) we get that optimal president's span of control which minimized average cost in this case is given by,

$$s'_R = \frac{(\alpha + \xi)\,\delta}{\beta^{1-R}\,(1 - \eta_R)}\ \frac{w_R}{w_{R-1}}$$

or

$$s'_R = \frac{(\alpha + \xi)}{\beta\,[1 + \frac{\xi}{\alpha}\ (1 - \beta^{-R})]}\ \frac{w_R}{w_{R-1}} \tag{4.16}$$

5. CHANGES IN THE SIZE OF ORGANIZATION

Let us consider the case when all inputs may be changed, including the change of the organization's structure of the selfmanaged firm. Particularly let the level of the organization R be increased to R + 1 and the inputs be changed in such a way that average costs are again minimized. Based on previous considerations, by an increase in the size of organization we mean that one additional layer of $s_{R+1} = (\alpha + \xi)/\beta\, h$ administrators has been added below the new presidential level R + 1 and that all inputs, the capital and labour of various administrative levels x_r, have been expanded by the same factor $s = 1/\beta$, implied by the same span of control for all organizational levels r, r = 0, . . , R — 1.

In order to investigate how this change affects minimum average costs, let us express the production function and cost function as functions of R. The total cost in the case of the minimum average cost is,

$$C_R = w_{R-1} s_R\, \beta^{1-R} \left(\frac{1 - \delta\beta^R}{(\alpha + \xi)\,\delta} \right) + w_R =$$

$$= w_{R-1} \left(\frac{(\alpha + \xi)}{\beta} \right) \left(\frac{w_R}{w_{R-1}} \right) \beta^{1-R} \left(\frac{1 - \delta\beta^R}{(\alpha + \xi)\,\delta} \right) + w_R = w_R/\delta\beta^R \tag{5.1}$$

using (4.6), (4.9) and (3.7).

The associated inputs are

$$x_r = (\alpha + \xi) \frac{w_R}{w_r} \beta^{r-R}$$

$$k = \frac{\gamma}{i\delta} \frac{w_R}{\beta^R} \tag{5.2}$$

and output

$$q_R = A_R \left(\frac{\gamma}{\delta i}\right)^{\gamma} \left(\frac{w_R}{\beta_R}\right)^{1-\delta\beta^R} (\alpha + \xi)^{\delta (1-\beta^R)}$$

$$\prod_{r=o}^{R-1} \left(\frac{\beta^r}{w_r}\right)^{(\alpha+\xi)\delta\beta^r} \tag{5.3}$$

so that we may rewrite the average cost, for the case (i), as

$$\overline{C}_R = \frac{C_R}{q_R} = \frac{1}{A_R} \frac{1}{\delta} \left(\frac{i}{\delta\gamma}\right)^{\gamma} (\alpha + \xi)^{-\delta (1-\beta^R)} \left(\frac{w_R}{\beta^R}\right)^{\delta\beta^R} .$$

$$. \prod_{r=o}^{R-1} \left(\frac{w_r}{\beta^r}\right)^{(\alpha+\xi)\delta\beta^r} \tag{5.4}$$

where we assume that $\alpha + \xi + \beta = 1$ and $\gamma + \delta = 1$.

It is possible to determine the total wage cost according to the assumptions about the wage scale (3.8) and (3.9),

$$C_{wR} = w_R + s_R \sum_{r=o}^{R-1} s_r^{R-1-r} w_o g^r = w_o g^{R-1} h \left[1 + (\alpha+\xi) \frac{1-\beta^R}{1-\beta} \beta^{-R}\right] =$$

$$= w_o g^{R-1} h \beta^{-R} = w_R / \beta^R \tag{5.5}$$

Total wage expenditure depends increasingly on the number of administrative levels R, as the consequence of assumption (i) about the production function. A relation may be set between the total production cost and the wage expenditure, according to (5.1) and (5.5) so that we have

$$C_R = C_{wR} \, \delta^{-1} \tag{5.6}$$

where wage expenditure appears as the constant part δ of the total cost.

The output that minimizes average cost may be expressed in the form

$$q_R = A_R \left[\left(\frac{\gamma}{(\alpha+\xi)\,\delta}\right)\left(\frac{w_o}{i}\right) s_R s^{R-1}\right]^{\gamma} \prod_{r=0}^{R-1} \left(s_R s^{R-1-r}\right)^{(\alpha+\xi)\delta\beta^r} \tag{5.7}$$

$$q_R = A_R \left(\frac{\gamma}{(\alpha+\xi)\,\delta}\;\frac{w_o}{i}\right)^{\gamma} s_R^{\,1-\delta\beta^R}\; s^{\,R-1+\frac{\delta\beta(\beta^{R-1}-1)}{(\alpha+\xi)}}.$$

If we assume that the output quantities a_r, r = 1, . . . , R, per unit inputs are the same for all different levels so that $a_r = a$, r = 1, . . . , R in the function of the selfmanagement organization (2.3), we have that

$$A_R = a_o a^{\left(\delta \frac{1-\beta^R}{1-\beta}\right)}.$$

The average cost is then

$$\overline{C}_R = \frac{C_R}{q_R} =$$

$$\frac{w_o g^{R-1} \quad h/\delta\beta^R}{a_o a^{\delta\frac{1-\beta^R}{1-\beta}} \left(\frac{\gamma}{(\alpha+\xi)\,\delta}\;\frac{w_o}{i}\right)^{\gamma} s_R^{\,1-\delta\beta^R}\; s^{\,R-1+\frac{\delta\beta(\beta^{R-1}-1)}{(\alpha+\xi)}}} =$$

$$= \frac{w_o^{\delta}\, i^{\gamma}}{a_o a^{\frac{\delta}{(\alpha+\xi)}}\, g^{\frac{\delta\beta}{(\alpha+\xi)}}\, (\alpha+\xi)^{\delta}\, \delta^{\delta}\, \beta^{\frac{\delta\beta}{(\alpha+\xi)}}}$$

$$\left[a^{\frac{1}{(\alpha+\xi)}}\left(\frac{\beta}{g}\right)^{\frac{\beta}{(\alpha+\xi)}}\left(\frac{(\alpha+\xi)\,h}{g}\right)\right]^{\delta\beta^R} = c\cdot m^{\delta\beta^R}. \tag{5.8}$$

The minimum average cost of production approaches a constant value c as R grows large since in that case $\delta\beta^R$ falls to zero. The limiting value of minimum average cost c may be expressed in the form,

$$c = w_o^{\delta}\, i^{\gamma}\, a_o^{-1} \left[(\alpha+\xi)\delta\right]^{-\delta} \left(a^{\delta} g^{\delta\beta} \beta^{\delta\beta}\right)^{-1/(\alpha+\xi)} \tag{5.9}$$

so that it is easily seen that it depends on all parameters of production, on capital cost and wage structure. The limiting value of minimum average cost reveals that the large selfmanaged firm is as efficient as a very large one.

In comparing small firms with large ones the value of m is crucial. If $m < 1$ then small firms have lower average costs but if it is m > 1 then minimum average costs decrease with R. If m = 1 then there are no economies of scale in administration that distinguish large firms from smaller ones. The condition m = 1 implies

$$g = a\beta^{\beta} [(\alpha+\xi) h]^{(\alpha+\xi)} = G. \tag{5.10}$$

The wage scale defined by G in (5.10) makes returns to scale in administration approximately constant for all ranks. If the real incremental reference wage factor g is such that g > G then m < 1 so that smaller firms have lower average costs than larger ones, and if g < G then efficiency increases with R and minimum average costs decrease with R, so that larger firms have lower average costs compared to smaller ones.

In view of (5.10) we may also conclude that the greater difference in the wage scale is not in contradiction with selfmanagement. Namely, the higher elasticity of selfmanagement implies a higher incremental wage factor g. On the other hand, for some given factor g, an increase in the elasticity of selfmanagement implies an increase of efficiency in larger selfmanaged firms.

As in the previous sections, it is easily seen that a change in the size of organization may be also analysed in case (ii) when we assume $\alpha + \beta = 1$ and $\gamma + \delta = 1$.

6. THE OPTIMAL SIZE OF THE SELFMANAGED FIRM

In order to formulate the conditions underlying the optimization of the size of the selfmanaged firm, let us consider the problem of income maximization. The income of the selfmanaged firm may be defined as

$$Ic = pq\,(k, x_o, x_1, \ldots, x_{R-1}) - ik - \sum_{r=o}^{R-1} w_r x_r - w_R \tag{6.1}$$

or for our production function (2.3)

$$Ic = p\,A_r k^{\gamma} \prod_{r=o}^{R-1} x_r^{(\alpha+\xi)\,\delta\beta^r} - ik - \sum_{r=o}^{R-1} w_r x_r - w_R \tag{6.2}$$

where p is the price of the output, i the price of capital service (interest rate plus depreciation), w_r the opportunity cost of labour or wage on the rth organizational level, and w_R the wage for the highest president's level. It is assumed that $x_R = 1$.

This is a concave function in the variables k, $x_o, \ldots, x_{R-1}$ so that for a maximum the necessary and sufficient conditions are

$$\frac{\delta Ic}{\delta k} = 0 \qquad \frac{\delta Ic}{\delta x_r} = 0 \qquad r = 0, \ldots, R-1$$

which yield the following results

$$\gamma p k^{-1} q - i = 0 \Rightarrow k = \frac{\gamma p q}{i}.$$

$$(\alpha+\xi)\,\delta\beta^r p q x_r^{-1} - w_r = 0 \Rightarrow \; x_r = \frac{(\alpha+\delta)\,\delta\beta^r p q}{w_r},$$

$$r = 0, \ldots, R-1 \tag{6.3}$$

The maximum income obtained is

$$Ic_R = pq - \gamma pq - (\alpha+\beta)\,\delta\, pq \sum_{r=o}^{R-1} \beta^r - w_R =$$

$$= pq \left[(1 - \gamma - (\alpha+\xi)\,\delta \left(\frac{1-\beta^R}{1-\beta} \right) \right] - w_R =$$

$$= pq\,(1 - \eta_R) - w_R. \tag{6.4}$$

where η_R is the degree of homogeneity of the production function in the variables k, $x_0, \ldots, x_{R-1}$, according to (2.4). If we assume (i) that $\alpha + \xi + \beta = 1$ and $\gamma + \delta = 1$, then it follows from (2.5)

$$Ic_R = \delta\beta^R pq - w_R \tag{6.5}$$

and if we assume (ii) that $\alpha + \beta = 1$ and $\gamma + \delta = 1$, then is follows from (2.6)

$$Ic_R = \left(\delta\beta^R - \delta\xi \frac{1-\beta^R}{1-\beta} \right) pq - w_R. \tag{6.6}$$

The relation (6.6) involves the previously given condition $\xi < \dfrac{1-\beta}{\beta^{-R} - 1}$ in section 4. It is easily seen that income in both cases may be treated as a percentage of sales and that it decreases with the organizational level R.

In order to examine the income functions in greater detail let us determine the optimum output q of the selfmanaged firm. Substitution of (6.3) in the production function (2.3) leads to

$$q = A_R \left(\frac{\gamma pq}{i} \right)^{\gamma} \prod_{r=o}^{R-1} \left(\frac{(\alpha+\xi)\,\delta\beta^r pq}{w_r} \right)^{(\alpha+\xi)\,\delta\beta^r}$$

and after some manipulations we get

$$q = A_R^{\;1/(1-\eta_R)}\,\gamma^{\gamma/(1-\eta_R)}\,((\alpha+\xi)\delta\,p)^{\eta_R/(1-\eta_R)}\,i^{-\gamma/(1-\eta_R)}$$

$$\prod_{r=0}^{R-1}\left(\frac{\beta^r}{w_r}\right)^{(\alpha+\beta)\,\delta\beta^r/1-\eta_R}$$

$$q \sim p^{\;\eta_R/(1-\eta_R)}\; i^{\;\gamma/(1-\eta_R)}\;\prod_{r=0}^{R-1} w_r^{\;-\frac{(\alpha+\xi)\,\delta\beta^r}{1-\eta_R}}. \tag{6.7}$$

If we assume (i) then $\eta_R = 1 - \delta\beta^R$ so that

$$q \sim p^{\;1/\delta\beta^R - 1}\; i^{\;\gamma/\delta\beta^R}\;\prod_{r=0}^{R-1} w_r^{\;-(\alpha+\xi)\,\beta^{r-R}} \tag{6.8}$$

We may conclude that in this case elasticities of supply with respect to the output price, price of capital service and opportunity costs of labour are constant. All elasticities increase as R is increased. It is easily seen that selfmanagement directly affects neither the elasticity of the output price nor the elasticity of capital cost. Compared to the capitalist counterpart [1] it appears that elasticity of wages is higher due to the selfmanagement factor.

If we assume (ii) then

$$\eta_R = 1 + \delta\left(\frac{1-\beta^R}{1-\beta}\,\xi - \beta^R\right)$$

so that

$$q \sim p^{\;1/\delta\,(\beta^R - \xi\,(1-\beta^R)/(1-\beta))^{-1} - 1}\; i^{\;-\gamma/\delta\,(\beta^R - \xi\,(1-\beta^R)/(1-\beta))^{-1}} \tag{6.9}$$

$$\prod_{r=0}^{R-1} w_r^{\;-(\alpha+\xi)\,\beta^R\,(\beta^R\,(\beta^R - \xi\,(1-\beta^R)/(1-\beta))\,)^{-1}}.$$

In this case selfmanagement has a direct influence on elasticity of supply with respect to the output price, capital cost and opportunity costs of labour.

In order to investigate how the level organization R affects the maximum income, let us express the selfmanagement production function and income function as functions of R.

If we assume that the output quantities a_r, $r = 1, \ldots, R$, per unit inputs are the same for all different levels so that $a_r = a$, $r = 1, \ldots, R$ in the function of selfmanagement organization (2.3), we have that

$$A_R = a_o a^{\delta (1 - \beta^R)/(1 - \beta)}$$

so that using (6.3), (6.4), (3.8) and (4.11) the selfmanaged supply function, which maximizes the income, may be rewritten in the form,

$$q_R = a_o^{1/(1 - \eta_R)} a^{\delta (1 - \beta^R)/(1 - \beta)(1 - \eta_R)} \left(\frac{\gamma}{i} \right)^{\gamma/(1 - \eta_R)}$$

$$\left(\frac{(\alpha + \xi)\, \delta}{w_o} \right)^{(\gamma - \eta_R)/(1 - \eta_R)} p^{\eta_R/(1 - \eta_R)}$$

$$\prod_{r=o}^{R-1} \left(\frac{\beta}{g} \right)^{(\alpha + \xi)\, \delta \beta^r/(1 - \eta_R)} \tag{6.10}$$

and the value of income

$$Ic_R = (1 - \eta_R)\, p q_R - w_R \,. \tag{6.11}$$

In case (i) we have

$$Ic_R = \delta \beta^R a_o^{\frac{1}{\delta \beta^R}} a^{\frac{\beta^{-R} - 1}{1 - \beta}} \left(\frac{\gamma}{i} \right)^{\frac{\gamma}{\delta \beta^R}} \left(\frac{(\alpha + \xi)\, \delta}{w_o} \right)^{\beta^{-R} - 1}$$

$$p^{\frac{1}{\delta \beta^R}} \left(\frac{\beta}{g} \right)^{-R + \frac{\beta^{1-R} - \beta}{1 - \beta}} - w_R$$

or

$$Ic_R = w_o a^{-\frac{1}{1 - \beta}} \left(\frac{\beta}{g} \right)^{-\frac{\beta}{1 - \beta}} (\alpha + \xi)^{-1} g^R \left(\frac{p}{c} \right)^{\beta^{-R}} - w_R \tag{6.12}$$

where c represents the limiting value of minimum average cost for a selfmanaged firm for R large enough (5.9).

It appears that the ratio of the output price and limiting value of minimum average cost is crucial for the optimal size of the self-managed firm and for the dynamics of industry. According to the result obtained (6.12), the income is determined by the factors $g^R (p/c) \beta^{-R}$ so that we may discuss three cases.

(1) In case that the output price is higher than the limiting value of minimum average cost $p > c$, the income increases with the size of organization, because then g^R and $(p/c)\beta^{-R}$ go to infinity as R increases. We may conclude that in this case the optimal size of the selfmanaged firm is the maximum size and the growth of income may be based on a rapid growth of organization.

In the next case (2) when $p < c$, the income function (6.12) has a finite maximum with respect to R since g^R is increasing and (p/c) is decreasing with R. Treating R as continuous variable [1] the condition for maximization of Ic_R implies

$$\frac{\delta Ic_R}{\delta R} = 0$$

which yields

$$\ln g - \ln (p/c)\beta^{-R} \ln\beta = 0$$

so that

$$R = \left[\frac{\ln [\ln (p/c) \ln\beta / \ln g]}{|\ln\beta|} \right] \qquad (6.13)$$

where [ ] denotes integer of the expression (6.13).

The third case is the one when the output price equals the limiting value of minimum average cost, $p = c$. Nothing can be precisely said concerning the optimal size of the firm on the basis of income function. It turns out that in this case any organization size may coexist as the result of adjustment between the president's wage w_R and returns to scale.

Comparing these results to the ones for the capitalist firm we may conclude that they are formally equal but the limiting value of minimum average cost and incremental wage factor differ due to selfmanaging activities.

Suffice it to state here that a similar analysis of optimal organizational size can be given in case (ii) when $\alpha + \beta = 1$ and $\gamma + \delta = 1$.

CONCLUDING REMARKS

It is well-known that the organizational structure of a firm is the result not only of technical relations but of the social and economic choice.

In that sense we have focused on modelling the organizational structure of the selfmanaged firm. Internal conditions prevailing in enterprise have been taken into account in order to understand elements that constitute entrepreneurships in the selfmanaged case and to investigate how the organization is affected by selfmanagement.

The organization of the selfmanaged firm has to obey its hierarchical structure since within the enterprise we are faced with subordination relationships as an empirical fact. The hierarchical structure is the result of technical requirements of production, internal and external uncertainty, the inherent hierarchical job structure and unequal distribution of information.

In order to investigate the organizational structure of the selfmanaged firm we extend an approach made in the economic theory of management. Although this extension has its obvious limitations we hold that it provides a suitable starting-point for the understanding of some theoretical problems concerning the organization and management in the selfmanaged firm.

Managerial control is treated as an intermediate product of the selfmanaged firm. At every control level, control from above is used as an input and combined with labour and selfmanagement to produce managerial control for the next lower level, so that output of each control level is a function of labour, selfmanagement and supervisory input for that level. On that basis the composite production function of the selfmanaged firm is defined as the framework for the analysis of the efficiency of organization in the selfmanaged firm.

Suffice it to give here some comments on the results obtained without any attempt to summarize them.

Comparing the results obtained with those for the capitalist firm let us note that, in spite of the fact that selfmanagement does not affect the costs directly, it alters costs in an indirect way. It appears that selfmanagement cuts costs based on the elasticity of selfmanagement so that the effects of the increase of labour on the costs will be smaller when the elasticity of selfmanagement is higher, or in other words in the case of the selfmanaged firm a given increase in output requires a smaller increase in costs.

It is also interesting to note that the results obtained reveal that only the president's level is affected by selfmanagement as far as the span of control is concerned. For all other lower administrative levels, selfmanagement is not directly concerned with the span of control.

The analysis of efficiency of the organizational structure of the selfmanaged firm also shows that the greater difference in the reference wage scale is not in contradiction with selfmanagement. Namely, the higher elasticity of selfmanagement implies a higher incremental wage factor. On the other hand, an increase of elasticity of selfmanagement implies for a given incremental wage factor an increase of efficiency in larger selfmanaged firms.

The supply function of the selfmanaged firm reveals that selfmanagement affects directly neither the elasticity of the output price nor the elasticity of capital cost when it is assumed that the management production function of any level is linear homogeneous. Compared to the capitalist counterpart it appears that the elasticity of reference wages is higher due to the selfmanagement factor. If increasing returns to scale are assumed due to selfmanagement then it affects the elasticity of supply with respect to output price, capital cost and opportunity costs of labour.

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MODEL ORGANIZACIONE STRUKTURE SAMOUPRAVNOG PREDUZEĆA

Vesna PASETTA

Rezime

Poznato je da matematički modeli mogu biti od velike pomoći u ekonomskoj teoriji. Svrha ovog rada je da modifikuje Beckmann-ovu proizvodnu funkciju upravljanja i ispita na toj osnovi neke osobine unutrašnje strukture samoupravnog preduzeća.

Opšte karakteristike samoupravnog preduzeća kao institucije gde radnici zajednički organizuju proizvodnju dobara i usluga, gde je upravljanje povereno svim radnicima a dohodak radnika zavisi od dohotka preduzeća, ne podrazumevaju nestruktuiranu organizaciju »međusobno jednakih članova koji sve odluke donose demokratskim putem«. U okviru preduzeća postoje odnosi subordinacije kao empirijska činjenica [14]. Neizbežna hijerarhijska struktura preduzeća proizilazi iz tehnoloških uslova proizvodnje, interne i eksterne neizvesnosti poslovanja, hijerarhijske strukture poslova u okviru preduzeća i neravnomerne distribucije informacija među pojedinim grupama radnika [10]. Navedeni faktori su ograničenja koja proces donošenja demokratskih odluka u političkom smislu čine neprimenjivim i neadekvatnim unutar preduzeća. Stoga, mada samoupravljanje pretpostavlja proširenje demokratije u okviru preduzeća, ona se može realizovati samo na način koji je konzistentan sa njegovom unutrašnjom strukturom.

U cilju analize organizacione strukture samoupravnog preduzeća u odeljku 2. modifikovana je proizvodna funkcija upravljanja koja daje osnovu za analizu optimalne alokacije faktora proizvodnje izvedene u odeljku 3. U odeljku 4. ispitivane su osobine funkcije prosečnih troškova pri optimalnoj alokaciji faktora proizvodnje, a u odeljku 5. efekti promene veličine organizacije. Najzad, u odeljku 6. dati su neki uslovi njene optimalnosti.

Model pretpostavlja samoupravno preduzeće u kome postoje organizaciono definisani nivoi upravljanja od najnižeg operativnog nivoa, preko niza hijerarhijski raspoređenih upravljačkih nivoa do naj-

višeg, predsedničkog nivoa. Upravljačke aktivnosti sa višeg nivoa tretirane su kao inputi za posmatrani nivo te zajedno sa radnim i samoupravnim aktivnostima definišu upravljanje sledećem nižem hijerarhijskom nivou. Tako se rezultat upravljanja svakog nivoa javlja kao funkcija radnih i samoupravnih aktivnosti posmatranog nivoa i upravljačkih aktivnosti njemu nadređenog nivoa. Polazeći od najvišeg ka operativnom nivou upravljanja, kroz kompletnu hijerarhijsku strukturu preduzeća, definiše se složena funkcija upravljanja u samoupravnim uslovima čiji je rezultat »proizvodnje« efektivni rad. On u sebi sadrži ukupne radne i samoupravne aktivnosti kolektiva i ujedno izražava njegovu hijerarhijsku strukturu. Proizvodnja samoupravnog preduzeća se dalje javlja kao funkcija tako dobijenog efektivnog rada i kapitala. Dobijena složena proizvodna funkcija upravljanja činila je osnovu za ispitivanje efikasnosti organizacije samoupravnog preduzeća i njegovo poređenje sa klasičnim kapitalističkim preduzećem.

Mada je izvesno da izvedeni model ne može odgovoriti na sva pitanja koja se postavljaju u teoriji samoupravnog preduzeća, on sigurno čini osnovu za bolje razumevanje i razjašnjenje nekih teorijskih problema koji se odnose na organizaciju i upravljanje u samoupravnom preduzeću. Istaknimo ovde samo neke dobijene rezultate bez pretenzije da se oni kompletno predstave.

Rezultati analize optimalne alokacije faktora pokazuju da se samoupravne aktivnosti javljaju kao element koji utiče na nivo angažovanja radnika na svim nivoima upravljanja kao i na obim angažovanja kapitala. Varijacije su tu, naravno, moguće prema vremenskoj dimenziji analize, odnosno prema tome da li se optimizacija vrši na veoma kratak, kratak, srednji ili dugi rok.

Interesantan je odnos između samoupravnih i upravljačkih aktivnosti koji se na osnovu modela može detaljnije ispitivati kao i rezultat da, obzirom na optimalni domen upravljanja, samo najviši nivo trpi određene uticaje samoupravnih aktivnosti. U odnosu na sve ostale niže hijerarhijske nivoe upravljanja samoupravne aktivnosti ne bi trebalo da imaju direktnog uticaja na domen upravljanja.

Rezultati analize pokazuju da viši nivo samoupravljanja ne vodi ka egalizaciji primanja radnika. Upravo obrnuto, ukoliko su efekti koje samoupravne aktivnosti nose bolji, utoliko će razlike u obračunskim osnovicama primanja radnika između susednih hijerarhijskih nivoa biti veće.

Funkcija ponude samoupravnog preduzeća pokazuje da samoupravne aktivnosti direktno ne utiču na elasticitet cene proizvoda niti na elasticitet troškova kapitala ako se ona izvede uz pretpostavku o linearnoj homogenosti upravljačke proizvodne funkcije na svakom nivou upravljanja. Poredeći sa klasičnom kapitalističkom firmom proizilazi da je elastičnost primanja radnika veća zahvaljujući samoupravnom faktoru. Ako se pretpostavi da samoupravljanje čini upravljačke funkcije na svakom nivou upravljanja homogenim sa stepenom homogenosti većim od jedinice, tada ono direktno utiče na elastičnost ponude u odnosu na cenu proizvoda, troškove kapitala kao i obračunske troškove radne snage.