Assessment of the level of management and labour productivity on the basis of accounting report data

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Abstract: The aim of following work is to present the level of management and labour productivity indicator as tools of assessing the work of company administration and its effectiveness as a whole. These indicators have been derived from production function whose form reflects the natural process of composing generative factors. These factors include traditionally understood assets and human resources. Consequently, the applied production model uses both the data of traditional calculation of costs and the calculation of human capital, which is a very dynamically developing area of economical science. Additionally, this model allows assessing the contribution of human capital in the economical effect of an enterprise, and consequently enables determining the level of remuneration of the human capital. The latter functionality, together with the theory of basic salary adequate to the value of individual human capital, is the basis for the system of bonuses based on financial effects of a unit. The above assumptions have been verified in the work on the basis of a practical example.

Key words: production function, base salary, bonus salary, level of management, labour productivity, capital, human capital

1. Introduction

The main objective of modern management systems is to maximize the effects of the activities and efforts to achieve sustainable economic effects, such as a strong market position or prestige brand innovation and readiness to take on new business challenges. A key prerequisite for achieving this goal is efficient use of existing physical and human resources in production process.

Effective management of an enterprise requires not only suitable methods and tools of management but also coherent methods allowing a reliable measurement of the effectiveness of managing the enterprise. The aim of the work is to present two synthetic measures of enterprises effectiveness: the level

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of management and labour productivity variable. While realizing the aim of the study, a case study was applied. The values of both indices were calculated based on the values coming from the financial statements of one of the Polish companies. Shape of these measures are based on properly formulated form of the production function. The applied model of the production function reflects natural mechanisms of making a product, in this connection it uses data from the accounting system of an enterprise, especially from the domain of cost calculation. In addition, using the concept of measurement of individual human capital of the employed allows including this extra category of resources into this analysis, right next to the resources which are a subject of accounting, especially subject of classical cost accounting.

The above mentioned cost accounting enables only the valuation of the degree of usage of traditionally understood assets and capital. Suitable transformation of production function allows determining the real indicator of human capital usage, and thus allows giving proper payment of human capital by the employed at the disposal of an enterprise.

2. The function of production in economy

The production process is a creative transformation of generative factors, aiming at making produce which satisfies the needs and demand of the market. Over more than two centuries of economy development there have arisen many models describing the process of using particular production factors to make a stream of products. These models with regard to their bestowed mathematical form are called production functions.

The issue of modelling the production process has been known for many years and have been solved in many attempts, especially macroeconomical and econometrical. It was Adam Smith who, in his work about the wealth of nations, presented a model of growth in a form of resources of labour (L), capital (C) and the land (T). According to this rule, the growth of a product is possible due to the growth of population, capital investments, growth of land resources and general productiveness. This kind of general deliberation is essential to the classical theory of growth, modified by consecutive authors. Since Smith's times, the key element of macroeconomical analysis has become production function, whose general form can be presented by the following formula: $P = f(L, C, T, \ldots)$.

An important moment in the development of production modelling was formulating the production function mathematically by Philip Wicksteed in 1894. Half a century earlier, J. von Thunen, regarded as the author of marginal analysis, formulated a postulate that while modelling a production process one should take care to define labour, capital and land in precisely uniform units. He simultaneously assumed that the chances of fulfilling this condition in practice are small (Humpherey, 1997, p. 51).

Von Thunen's output was ahead of the achievements of his followers. He first used differential calculus in the theory of productivity. He also created a model of production incredibly similar to the one created by P. Douglas and Ch. W. Cobb. However, as he noticed, this model did not allow the possibility of work contributing to creating a product. The effect of this observation was a modification of the model. Thanks to this discovery, J. von Thunen is considered the only scientist who took up the production function allowing lack of capital in the production process (Wetzstein, 2013, p. 244).

In the economy of the main trend, the turning point is considered to be formulating the form of production function by two scientists, P. Douglas and Ch. Cobb in 1928. Originally it was a function of two variables, capital (K) and labour (L) (Romer, 2000, p. 27):

$$P = a \cdot K^{\alpha} \cdot L^{\beta} \qquad K, L \geq 0$$

where:
a—scale parameter,
α, β—parameters of production flexibility.

The Cobb-Douglas function, due to the possibility of modification, became a basis of many other econometrical models.

Analyzing the issue of modelling the production process, one can notice that a repetitive problem is a question of technology. Among many concepts of production function there are two dominant attitudes, the first one analyzes the technical-organizational efficiency, the other allocative efficiency. Most frequently, there is one attitude assumed, that technical-organizational issues concerning the creation of a product are solved, which allows not to take them into consideration and concentrate on analyzing allocative efficiency. Among others, it was due to this reason why production function is defined as a relation between input and production effects, assuming maximum use of available technology. In theoretical and practical assumptions one usually does not give the assumption that a function shows the highest possible production level and that the cost of input is the lowest possible. Such an attitude does not take into account the real process of making a product, as it does not take into consideration unavoidable errors and losses in the production process. In other words, the production function in its traditional form is not a model of business process, as it ignores the importance of management level, the existence of the costs of unfortunate decisions and it does not include the division into general and unstable costs (Mishra, 2007, p. 1).

In today's economical literature, the issue of including in production function widely understood technology and knowledge is dominated by the concept of *TFP* variable (Total Factor Productivity). It is a variable influencing the production but it is not a generative factor, like labour or capital. *TFP* is hard to present in uniform units (countability difficult to count) as opposed to capital and labour. The nature of *TFP* is enclosed between technology and human knowledge. The formulas presented below show the general form of the *TFP* factor and the possibility of its consideration in the Cobb-Douglas function (Hulten, 2000, p. 3):

$$P = F(K, L, TFP)$$
$$P = TFP \cdot C^{n} \cdot L^{1-n}$$

In reality the *TFP* is a residual value, which means it is calculated as the difference between product and expense.[2] The precision of measuring the factor depends on the precision of valuation of other factors of the production function. According to American research institutes, 50%–60% of changes in the gross domestic product in the USA is a result of the *TFP* index.

[2] The author of the concept of Total Factor Productivity is R. Solow, and that is why this factor in the economy literature is called Solow residual.

Robert Lucas advises carefulness not to conclude anything like that, hastily suggesting that residual changes in the dynamics of GDP are a result of changing human capital. Lucas's views are confirmed by researching of the causes of differences in GDP per capita depending on a country. The results showed that apart from accumulation of capital, the key element is the value of the human capital. The rest of Solow or *TFP* explains only 27% of differences in the national income per capita (Manuelli and Seshadri, 2007).

Judging by the effect, the issue of production modelling is divided into the functions of a single product, multi-assortment production and aggregate functions (Mishra, 2007, p. 4). A great number of works from that period, especially the ones resultant in the first period of work over the issue of production modelling, are the concepts assuming a single product (eliminating coupled production). An example of the above can be Wicksteed's model P. However, since 1960s there have also emerged concepts of the process of multi-assortment production. Nevertheless, those concepts are quite rare, and they were developed to cater for the needs of the economy of agricultural production. On the other hand, the aggregate production function is an area of the problem of modelling rich in arguments and discussions. The source of the problem is the fact, that the production process takes place in particular enterprises, where the product is made as a result of composing of expenditure, with a use of certain technology and individual scale effect. Formulating either branch or macroeconomical production function requires aggregating its elements. Thus there appears a question: to what extent the aggregated production function reflects reality, to what extent it does reflect the process of production in majority of enterprises.

The problem of aggregation was being solved by scientists into many different, conventional ways, which were a subject of strong criticism, especially from the side of the so-called Sraffa's School represented by, among others, P. Sraffa and J. Robinson from the Cambridge University. Because of the scientific genealogy of the adversaries and the subject of the dispute, the discussion starting at the end of the 60s of the twentieth century is called the *Cambridge Capital Controversy*.

The representatives of the Sraffa's School objected to seeing capital and work as abstract quantities, which are defined by recognition and what is more, regardless of the proper level of payment and interest rates.[3] The adversaries of the neoclassical production function thought that it is impossible to construct a good production model without the previous knowledge of balance prices. Rates of return used in neoclassical attitude were deprived of any normative undertone, they thought that they were shaped as a resultant of technology, scarceness of resources or tastes. Sraffa and Robinson assumed that production model ought to picture only practical use of the production factors and enable, judging on this basis, making a system of income division adequately to the expenditure. A majority of neoclassical

[3] The violent character of the discussion is being testified by the quotation from J. Robinson' publication: 'the production function has been a powerful instrument of miseducation. The student of economic theory is taught to write $Q = f(L, K)$ where L is a quantity of labor, K a quantity of capital and Q a rate of output of commodities. He is instructed to assume all workers alike, and to measure L in man-hours of labor; he is told something about the index-number problem in choosing a unit of output; and then he is hurried on to the next question, in the hope that he will forget to ask in what units K is measured. Before he ever does ask, he has become a professor, and so sloppy habits of thought are handed on from one generation to the next' (Robinson, 1953, p. 81).

models assumes measurement of work input and capital in natural units which disqualifies them from being a basis to an income distribution model. Those scientists thought that a way of income distribution (e.g. return rate) determines the quantity of engaged capital, and not vice versa. A proper division of income thus favours raising allocate efficiency, whilst traditional production model is not able to play a useful role in this field (Robinson, 1953).

After an almost twenty-year-old argument, critics of the traditional model point out that the established methodology led to disadvantageous results for the development of neoclassical theory, especially in the area of research on the nature of capital, production and employment (Lavoie, 2001). Pertinently summing up this twenty-year-old argument, C. Bliss puts the adversaries down many rightful remarks, but also notices that within almost a quarter of century they have not suggested any new ideas (Bliss, 2005, p. 60).

3. Capital and human capital in economic processes

The starting point for formulating a proper theory of capital is the statement that capital—unlike specific and heterogeneous assets—is abstract, aggregated and homogenous in character (Dobija and Dobija, 2003). This differentiation is reflected in the five-century-old accounting principle of asset-capital dualism. Capital defined as the ability to perform work is represented by resources, while capital concentration in a given facility determines its value.

Capital is a dynamic category, and its understanding requires identifying the factors which have an impact on changes to its value, especially the time factor. A dynamic model of capital changes is presented by formula (Dobija, 2004):

$$C_t = C_0 \, e^{rt} = C_0 \, e^{(p-s+m)t}$$

Capital is subject to three key environmental factors: natural capital flow subdued to spontaneous diffusion (s), factors diminishing the impact of destructive forces as a result of work and management (m), and an 8% natural potential growth (p). The level of 8% economic constant of potential growth is confirmed by a number of research studies, especially in the area of rates of return in capital markets where it is reflected in risk premiums in the analysis of rates of return on human capital and agricultural products (Dobija, 2004).

These factors can increase the initial value of capital (C_0) or lead to its dispersion. Another important implication of the presented model is the fact that capital does not originate from 'nothing'—it originates from initial capital (C_0).

Human capital is based on capitalized resources necessary to build the economic potential aimed to perform work by humans. In the first place, it includes the costs of professional education increased by the costs of living. It is necessary to incur the costs of living to prepare the physical carrier of human capital—the human body. Costs are incurred in time (t), which is necessary to prepare people to perform a given profession—from the time of birth to the moment of starting a professional career. If the human body is well prepared and a young person completes his/ her education as planned, it indicates that capital diffusion (s) is compensated for by parents' efforts (parameter m). A formula of capital can be developed for employee

(H_t), where initial outlays are represented by (H_0), constant economic value (p) and capitalization time (t) (Dobija, 2004):

$$H_t = H_0 \, e^{pt}$$

This human capital model can be further extended to represent capital as the sum of capitalized costs of living (K) and education expenditures (E). These outlays lead to the ability to perform work, and this ability increases in the course of gaining experience. The supplementary formulas represent the development of human capital based on the costs of living K and education costs E:

$$H(T) = (K + E) \cdot (1 + Q(T))$$

In the case of annual capitalization the particular human capital components can be presented in the following way:

$$K = k \cdot 12 \frac{e^{pt} - 1}{p} \qquad E = e \cdot 12 \frac{e^{pt} - 1}{p}$$

where:
k—monthly costs of living,
e—monthly education costs and the remaining values as presented above.

The process of gaining work experience can be graphically presented as a learning curve. This concept assumes a slower pace of an increase in the work potential in the course of subsequent work cycles (repetitions). It can be assumed that an employee performs a given task in the following year with greater efficiency (%), but efficiency increases slower in the course of time. The adjustment of the learning curve to the needs of the human capital model facilitates estimation of increased human capital in the course of work (gaining experience). This additional value of human capital is subject to valuation and is integrated into the human capital structure as capital combined with experience. Experience factor [$Q(T)$] is expressed by the function of years:

$$Q(T) = 1 - T^{\frac{\ln(1-w)}{\ln 2}}$$

where:
w—learning factor,
T—years of work experience T>1.

The ability of assets to perform work is a prerequisite for their existence. Retaining the value of capital embedded in assets requires taking action counteracting destructive forces (s). This statement refers particularly to human capital. Human capital is subject to natural dispersion and this fact is the basis of fair compensation theory. Research indicates that fair compensation must balance human capital dispersion, it needs income determined by mentioned above 8% economic constant of potential growth and human capital value of the worker.

Fair compensation theory is one of the factors which make the alternative human capital research programme different from the programme undertaken by T. Shultz and G. Becker.

A carrier of capital, including human capital, is affected by the capital dispersion process expressed in the general model as e^{-st}. Human capital retention is conditioned by an appropriate flow of income which compensates for human capital dispersion. In the case of humans, losses result from the nature of life (aging). Retaining the value of human capital (understood as the ability to perform work) requires incurring compensation costs resulting from preparing future generations to perform work of the same value. In other words, fair compensation should maintain the ability to perform short- and long-term work. The loss rate expressed by random variable s is at average level $p = E(s) = 0.08$/year. Simultaneously, it represents the constant economic value indicating the level of fair compensation (W):

$$W = H(T) \cdot p$$

Lower compensation levels decrease human capital value. In practice, it manifests itself in the parents' difficulties in ensuring the same level of education for their children. A compensation system based on human capital measurement requires individualized knowledge about employees' competences. Information on education and experience is essential in setting the level of fixed compensation components. Human capital measurement is a key component of compensation systems.

4. The concept of analytical production function

The existing achievements in the field of modelling the production function apply only to describing economic reality at the mecroeconomic level and then mainly the analysis of economic growth or global product. The use of classical economics on the achievements of the production function to optimize the productivity of individual companies, meaning at the micro level, is practically impossible. In modern scientific papers, reservations concerning the classical form of the production function were formulated, which will help eliminate consideration of their imperfections and expand the possibility of their use in the analysis of the production of individual companies (Dobija, 2004; 2012).

Firstly, the barrier to the use of classical models of product development is the valuation of the production function arguments in natural units. As it is known, money—goods economy allows measurement of all factors of production using monetary units. Thus, the production volume modelling requires the presentation of the factors of production, such, for example, as labour cost and the use of materials in monetary terms.

Another drawback of the production function developed by the followers of classical economics is not taking into account the economic nature of the production process. Production in fact results from the summation of inputs, for example, Cobb-Douglas model takes the form of arguments that multiplied.

Presented analytical production function uses a natural approach based on cost calculation. It presents the production function with seven specified arguments. The analytical form of production function divides operating costs into compensation understood as labour costs (W) and non-compensation costs (Km) decreased by risk-related costs (Kr). This differentia-

tion introduces the annual asset turnover rate (z), the asset impairment rate (s), and the level of pay for human capital (u). Therefore, the production function equation can be expressed in the following way (Dobija and Dobija, 2003; Dobija, 2011):

$$P = (W + Km - Kr) \cdot (1 + r)$$

$$\frac{Km}{A} = z \qquad \frac{Kr}{A} = s$$

$$Km = z \cdot A \qquad Kr = s \cdot A \qquad W = u \cdot H$$

where:
Km—costs resulting from the use of assets,
Kr—risk-related costs,
W—compensation (labour costs),
A—value of assets,
H—staff's human capital,
u—level of pay for human capital,
z—asset turnover to non-labour costs ratio,
s—random loss in production processes.

The analytical production function corresponds to the actual process of developing products. It describes the composition of production factors in the production process. The market value of products, on the other hand, represents the historical cost of manufacture adjusted to the cost profitability ratio (r). As a result, the system of arguments determines all significant variables, and the basic analytical form of the function, unlike in the case of other popular models, does not require parameter estimations. According to the model, the market value of production can be presented as the function of the sum of outlays. The transformed formula and the inclusion of the company's intellectual capital (I) leads to the extended function:

$$P = (W + z \cdot A - s \cdot A) \cdot (1 + r) \cdot (1+I)$$

where:
I—intellectual capital.

The transformed formula for presenting production effect (P) as the function of labour costs results in the following formula:

$$P = W \cdot [1 + \frac{A}{W} \cdot (z - s)] \cdot (1 + r) \cdot (1 + I)$$

The use of the human capital concept in the analytical production function model allows for expressing labour costs ($W = u \times H$) as a derivative of human capital value:

$$P = W \cdot [1 + \frac{A}{H} \cdot \frac{z - s}{u}] \cdot (1 + r) \cdot (1 + I)$$

The presented concept is a general form of the cost account and it includes the category of natural loss (s) related to any business activity. Consequently, the model reflects the actual production process, being a useful management tool.

The model facilitates calculation of the actual use of human capital in the production process and an appropriate level of compensation. As a result, the presented methodology for bonus compensation can be a basis for setting up a bonus fund based on a company's adopted bonus system. The level of pay for work (*W*), i.e. the level of total compensation composed of fixed and variable components, can be presented as follows (Dobija, 2011):

$$W = u\,H(T) = p\,H(T) + m\,H(T)$$

where:
u—variable representing actual pay for human capital,
p—8% economic constant of potential growth,
m—bonus (%).

Although the amount of a bonus fund is calculated as m-% of a company's human capital value, it is labour productivity and a company's profitability that provide that additional value. The transformation of the analytical function for the purpose of the use of the successive approximation method results in a formula which determines a variable indicating the actual pay for human capital (*u*) (Dobija and Dobija, 2003; Dobija, 2011):

$$P = u\left(\frac{L}{p} + \frac{A(z-s)}{u}\right)e^{r} \qquad u = \varphi(u) = \frac{Pe^{-r}}{\frac{L}{p} + \frac{A(z-s)}{u}}$$

where:
L—total value of fixed compensation components.

The numerical solution of the functional equation is based on the use of the iteration algorithm which assumes the existence of one point fulfilling the condition $j(x) = x$. A fixed point can be determined with any small error applying the method of successive iterations and starting with any initial value u_0. As a result, the fixed point is convergent to sequence: $u, j(u), j(j(u)), \ldots$

The use of the successive approximations method allows for estimating the value of variable (*u*). If the obtained value of the variable which indicates the level of pay for human capital (*u*) is smaller than or equal to the constant economic value (*p*), employees do not deserve additional compensation above their base pay. On the other hand, when the value of (*u*) exceeds the value of an 8% economic constant of potential growth, the amount of a bonus fund is calculated as follows:

$$F = \frac{u-p}{p}L$$

where:
F—value of bonus fund.

5. Indicators of level of management and labour productivity

The fact that the amount of bonus fund depends on the achieved economic values can be used at the stage of financial planning. The preparation of the financial plan for the next year also allows for the planned amount of bonus fund, which will depend on the scope of the plan. The development of such plan should also include the expected level of management. This level reflects management variable (Z), which is expressed by the following parameters: assets turnover ratio (z), random loss (s), level of human capital remuneration (u), and the increase in the cost of product to the market value (r). Thus, the variable (Z) can be summarized as follows (Dobija, 2004):

$$Z=F(s, r, z, u)$$

Then the production function takes the form:

$$P=W\, e^{(A/H)Z}$$

$$Z = \frac{L}{A \cdot p} \cdot \ln \frac{P}{W}$$

The relation between the value of a product (P) and total salary (W) is possible to calculate and it is a very popular and at the same time authoritative indicator of work productivity (Q). Using the function connection between the work productivity indicator (Q) and management indicator (Z), the relation between these quantities can be shown in the following way:

$$Z = \frac{L}{A \cdot p} \cdot lnQ$$

In the context of the above equations, variable (Z) describes the degree of effectiveness use of resources involved, its value is possible to estimate on the basis of financial data. Thus, knowledge of level of management (Z) and its dynamics over the last few periods allows the assessment of the quality of business management. Level of management can also be calculated based on planned economic data and so on the basis of the budget for the next year. Thus, the production function can be used to analyze the future of the company, depending on the level of achievement of planned financial values. For example, what will be the increase in production due to the amount of the bonus salary, assuming that the level (Z) is constant, or how it should develop level (Z) to the level of bonus salaries has not changed.

The indicator of the management level (Z) and labour productivity (Q) have been counted on the basis of report data for ZAT in Tarnów taken from the official website of this enterprise. In Table 1, the financial data have been presented.

Table 1. Financial data and management factor (*Z*) and labour productivity (*Q*) (in PLN millions)

Financial data	2012	2013	2014	2015* (Budget 1)	2015* (Budget 2)	2015* (Budget 3)
Sales (*P*)	2006	1852	1852	2000	2000	2000
Value of assets (*A*)	2888	5376	5401	5401	5401	5401
Compensation and social benefits (*L*)	155	163	172	180	180	180
Loss rate (*s*)	0.02	0.02	0.02	0.02	0.02	0.02
Labour pay variable (*u*)	10.75%	13.2%	13%	11.6%	12.8%	14.7%
Bonus fund (% of base compensation)	34%	65%	63%	45%	59%	84%
Management factor	1.52	0.73	0,75	0,85	0,81	0.75
Labour productivity	9.66	6.88	6.61	7.7	7.0	6.0

* The forecast

S o u r c e: Authors' own study based on report data.

As it comes out of Table 1, in 2013 there was great growth of the value of assets, which is the proof of the investments done by the company. The growth of the value of wealth was not accompanied by the growth of employment (labour costs are comparable to the ones from 2012), and the effects of investment did not appear immediately, which is proven by little fall in the sale income.

The delay of income growth resulting from the previous investment caused worsening of assets rotation and consequently the fall of the value of management variable (*Z*) in 2013 from the level of 1.52 to the level of 0.73. In the next year this tendency slightly improved—there was an increase in the level of management from 0.73 to 0.75. One ought to pay special attention to the fact that in 2013 there was a great increase in the level of gratification of human capital. This phenomenon shows that the model of production spotted the increased contribution of human capital in the achieved result of the company.

The model of production function applied at work can also be applied in financial planning. In Table 1 three versions of forecast for 2015 are presented. The first one—optimistic—assumes a reasonable growth of the level of management up to 0.85. The second—realistic—growth of the level of management up to 0.81 and the pessimistic one—meaning maintaining the hitherto level of management (0.75). In a typical situation, maintaining the last year's level of management is treated as a neutral variant, however, in the case of the analyzed enterprise, one expects considerable improvement because of the previous significant investments in 2012 and 2013. It is also worth noticing, that together with the improvement of the level of management the value of the bonus fund goes down. A higher level of management means that the resources, including human capital, are used more effectively and that there is a fall in the degree of their usage.

As it can be seen, the presented concept of production function is not only a tool for sustainable and effective management of a company, but can also be a starting point for the implementation of the concept of corporate social responsibility (CSR) in the company in the area of fair remuneration. Studies indicate that a broad implementation of CSR practices can contribute to building a long-term competitive advantage of the company (Sahinidis and Kavoura, 2014).

6. Conclusions

Today's enterprises exist in conditions which require innovative actions, allowing to achieve the highest level of effectiveness of the owned resources usage. However, optimizing the economic processes requires getting to know the nature of making a product and modelling it with a help of monetary units. The presented in the above article analytical production function fulfills this postulate. It allows the analysis of many ways of achieving an assumed economic purpose (e.g. proper level of sale) and choosing the most advantageous one. An important application of analytic production function is the possibility of determining synthetic indicator of management level, representing the general level of managing an enterprise and work productiveness indicator. These indicators are a very useful tool in the hands of the managing staff, allowing to predict the future level of productiveness and preparing the organization for the expected changes. Another, not less important area of application of analytical production function is the possibility of determining the contribution of the human factor in the product made by an enterprise. For this aim there is the indicator of level of human capital remuneration, which, together with the theory of fair base salary, allows to give the bonus indicator.

One can show that the presented production function fulfils two important and simultaneously logically coherent postulates put for the production function by the representatives of the Sraffa's School. The first of them says that the formula of the production function should reliably describe the process of making a product. The second says that when the production function reliably describes the composing of generative factors, then it should be possible to determine gratification of these generative factors. On the basis of the research undertaken the postulates of this well-known economic school can be extended by another one, namely by the ability of using the production function to financial planning. The possibility of giving a reliable way of division of the benefits elaborated by the company will be beneficial for the growth of allocative efficiency. This remark concerns especially the issue of allocative efficiency of the human capital.

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Ocena poziomu zarządzania i produktywności pracy na podstawie danych sprawozdawczych

Abstrakt: W artykule przedstawiono zmienną zarządzania oraz wskaźnik produktywności pracy jako narzędzia oceny pracy kierownictwa firmy i jej efektywności jako całości. Wskaźniki te zostały wyprowadzone z funkcji produkcji, której postać odzwierciedla naturalny proces komponowania czynników wytwórczych. Do czynników tych zalicza się tradycyjnie rozumiane aktywa oraz zasoby ludzkie. Zastosowany model produkcji wykorzystuje zarówno dane pochodzące z tradycyjnego rachunku kosztów, jak i z rachunku kapitału ludzkiego, stanowiącego obecnie dynamicznie rozwijającą się dziedzinę nauk ekonomicznych. Dodatkowo model ten pozwala na ocenę udziału kapitału ludzkiego w efekcie ekonomicznym przedsiębiorstwa, a w konsekwencji umożliwia określenie poziomu wynagrodzenia kapitału ludzkiego. Ta ostatnia funkcjonalność, w połączeniu z teorią płac zasadniczych adekwatnych do wartości kapitału ludzkiego, stanowi podstawę systemu premiowania opartego na efektach finansowych jednostki. Powyższe założenia zostały w pracy zweryfikowane na praktycznym przykładzie.

Słowa kluczowe: funkcja produkcji, płaca zasadnicza, premia, wskaźnik poziomu zarządzania, wskaźnik produktywności pracy, kapitał, kapitał ludzki