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Management of the enterprise wage fund in the context of the EAF Model

Abstract

This study aims to develop and verify in empirical applications an economic model for determining the real level of employee remuneration, human capital utilization, and managerial efficiency within enterprises. Amidst ongoing debates concerning wage structures and compensation systems, this research introduces the Economic Activity Function (EAF) as a tool for analyzing labor productivity and wage distribution.

A mixed-methods approach was employed, combining a literature review to establish the role of the economic constant a = 0.08 [1/year] in compensation analysis with an empirical case study of Komfort-Eko Ltd. Utilizing financial statement data, key indicators—including the Management Index (M) and the Labour Productivity Index (Q)—were calculated to assess wage fund allocation efficiency.

Findings reveal that the EAF framework enables the estimation of crucial managerial indicators, serving as a valuable instrument for evaluating corporate performance and optimizing remuneration structures. By forecasting labor productivity for subsequent periods, businesses can predict remuneration levels, including bonus allocations, thereby enhancing financial planning and employee motivation.

The implications of this study extend to policymakers and business leaders, providing a robust analytical framework for evaluating management quality, labor productivity, and remuneration fairness. The predictive capabilities of the EAF model facilitate financial scenario planning and decision-making, ultimately contributing to a more structured and data-driven approach to corporate wage management.

Keywords: EAF model, Management Index, Labor Productivity Index, wage fund.

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Zarządzanie zakładowym funduszem płac w kontekście modelu EAF

Abstrakt

Niniejsze badanie ma na celu opracowanie i weryfikację w zastosowaniach empirycznych modelu ekonomicznego umożliwiającego określenie rzeczywistego poziomu wynagrodzeń pracowników, stopnia wykorzystania kapitału ludzkiego oraz efektywności zarządzania w przedsiębiorstwach. W kontekście toczącej się debaty na temat struktury wynagrodzeń i systemów płacowych, wprowadzone zostaje pojęcie Funkcji Aktywności Ekonomicznej (EAF) jako narzędzia analizy wydajności pracy i dystrybucji wynagrodzeń.

W badaniu zastosowano metodologię mieszaną, obejmującą przegląd literatury w celu ustalenia roli stałej ekonomicznej a = 0,08 [1/rok] w analizie systemu wynagrodzeń oraz studium przypadku przedsiębiorstwa Komfort-Eko Sp. z o.o. Na podstawie danych ze sprawozdań finansowych obliczono kluczowe wskaźniki, w tym Wskaźnik Zarządzania (M) i Wskaźnik Wydajności Pracy (Q), celem oceny efektywności alokacji funduszu płac.

Wyniki badań wskazują, że model EAF umożliwia oszacowanie kluczowych wskaźników zarządczych, stanowiąc istotne narzędzie oceny efektywności przedsiębiorstwa oraz optymalizacji struktury wynagrodzeń. Prognozowanie poziomu wydajności pracy na kolejne okresy pozwala na przewidywanie wysokości wynagrodzeń, w tym funduszu premiowego, co usprawnia planowanie finansowe i motywację pracowników.

Implikacje badawcze obejmują zarówno decydentów politycznych, jak i liderów biznesu, dostarczając im rzetelnego narzędzia analitycznego do oceny jakości zarządzania, produktywności pracy oraz sprawiedliwości systemu wynagrodzeń. Możliwości prognostyczne modelu EAF ułatwiają planowanie scenariuszowe oraz podejmowanie decyzji strategicznych, przyczyniając się do bardziej ustrukturyzowanego i opartego na danych podejścia do zarządzania płacami w przedsiębiorstwach.

Słowa kluczowe: Model EAF, wskaźnik zarządzania, wskaźnik produktywności pracy, fundusz płac.

JEL: J24, J31, M11.

INTRODUCTION

The aim of this study is to develop and verify in empirical applications an economic model for determining the real level of employee remuneration, human capital utilization, and managerial efficiency within enterprises. To this end, the study will examine the existence and practical applicability of a constant magnitude in economic processes, with particular emphasis on its role in the management of a company's wage fund. The scope of the analysis includes both theoretical and empirical considerations, integrating economic modeling with business management practices. The primary research hypothesis is that a fundamental economic constant governs key financial variables, including wages, prices and profit rates, thereby serving as a crucial reference point for discount and interest rates, and that its inclusion in decision-making models allows for more effective management of the compensation fund, improved efficiency in the use of human capital, and more accurate strategic decisions in firms.

The motivation for addressing this research topic stems from the ongoing debate regarding the existence of invariant economic parameters, as well as the need for robust theoretical frameworks that improve managerial efficiency. While F. Neal and R. Shone (1976) contended that economic systems lack fixed constants analogous to those found in the physical sciences, subsequent empirical studies have provided compelling evidence to the contrary. This paper seeks to contribute to this discourse by presenting findings that substantiate the presence of a stable economic magnitude with tangible implications for business operations. The relevance of this research is underscored by the necessity for decision-makers to rely on scientifically grounded methodologies rather than arbitrary heuristics in financial management.

Literature Review

A growing body of empirical research suggests that economic processes exhibit a degree of regularity that can be captured through a constant magnitude influencing key financial indicators. This constant plays a pivotal role in determining the equilibrium dimensions of wages, prices, and profit rates, thereby informing strategic financial decisions. Its significance extends to the formulation of economic models that facilitate optimal corporate governance, provided that decision-makers adopt a scientific rather than discretionary approach to managerial problem-solving.

In particular, the constancy of the average rate of capital multiplication over a given period has been identified as a critical determinant in medium-term return analyses. The estimation of this parameter has enabled the development of the Economic Activity Function (EAF), a model designed to evaluate the efficiency of corporate management and wage fund allocation. By integrating this constant into decision-making frameworks, firms can enhance their capacity for long-term financial stability and sustainable growth. This study provides validation of the existence of a stable economic magnitude influencing business processes and managerial decision-making. By bridging theoretical economics with practical business applications, this research underscores the imperative of scientifically informed decision-making in contemporary economic environments.

The first studies related to the detection of a constant magnitude of periodic returns were based on large samples and involved the analysis of data on returns on stocks listed on the US (NYSE) over a period of about 80 years (Garrison, 2006; Dobija, 2007, pp. 89-114). The authors of these studies showed that the real rate of return on US stocks is ex ante 8%. These studies have shown that average annual stock returns, i.e. periodic capital gains in entrepreneurship, are specific and strongly correlated with a fixed quantity. In the past, this type of research has

manifested itself in the assessment of the "risk premium". This quantity, defined as the difference between the real return and the return on US Treasury bills, is a component of the CAPM model (Goetzmann, Ibbotson, 2006), which has lost much of its appeal in the current era (Chatterjee, Lubatkin, Lyon, Schulze, 1999). The novelty of the presented approach to the study of the "risk premium" was the disclosure of the constant magnitude with which the "risk premium" is associated. This is related to the recognition that, in an efficient market, periodic profits are, among other things, the result of natural forces. After all, employees receive a fair wage, depreciation of fixed assets increases costs, so it is the forces of nature that are also the source of periodic increases in invested capital. For this reason, a = 0.08 [1/year] is estimated as the real rate of return in an efficient market.

Further studies conducted by many authors, such as B. Kurek (2012), I. Gorowski and Kurek (2020), W. Koziol (2011), A. Mikos and Koziol (2020), M. Dobija and Renkas (2007, 2022, 2023), J. Renkas (2013, 2021, 2022), B. Oliwkiewicz (2020), I. Cieslak (2008), A. Jonkisz-Zacny (2017) and others, took into account the indispensable use of the magnitude a = 0.08 [1/year] in justifying the theses of the conducted studies. There was widespread amazement at the results of estimating the average value of this quantity, which always oscillated around a value very close to 8%.

B. Kurek (2012), on the other hand, studied the size of periodic profits in business units and their relationship with a constant. He conducted the study on a sample of financial statements of companies belonging to the Standard & Poor's 1500 index over a period of 20 consecutive years, determining the real rate of return on capital invested in entrepreneurship. He took into account the components of the index, i.e. the companies included in the Standard & Poor's 1000, Standard & Poor's 900, Standard & Poor's 600, Standard & Poor's 500, Standard & Poor's 400 indexes. The total number of observations was 22,952. The results of B. Kurek's statistical tests confirm the hypothesis of an average ex-post risk premium of 8.33%, which corresponds to an ex-ante risk premium of 8%. The test was performed at a confidence level of 0.999, giving a confidence interval of 8.25-8.89%, with a mean of 8.57%. Statistical inference was considered to be completely safe due to the low relative random error (3.75%). B. Kurek was concerned with the rate of capital multiplication in entrepreneurship. Therefore, unlike R.G. Ibbotson and W.N. Goetzmann, who looked for a risk premium in setting their targets, B. Kurek examined the real rate of return and confirmed the magnitude of a = 0.08 [1/year].

The magnitude of a = 0.08 [1/year] is also evident in the human capital account, as M. Dobija (2007) was the first to show. He confirmed this by calculating the minimum wage for a 17-year-old starting work in the USA. He made the calculations on the basis of three different quantities: 0.07 [1/year], 0.08 [1/year] and 0.09

[1/year]. The test rejected a constant value of 0.07 [1/year] and 0.09 [1/year], and using a value of 0.08 [1/year] guaranteed the closest approximation to the legal minimum wage in the USA.

W. Koziol (2011) carried out another of the studies on the magnitude of "a" based on the human capital account, analysing the wages of a large number of employees of the company ABM Solid SA and statistically confirming its magnitude at a = 0.08 [1/year], showing that the wages of workers are at 8% [1/year] in relation to the value of their human capital.

A study of actual salary expectations of job seekers in Ukraine (Renkas, 2021) also confirmed the empirical fact that there is a 100% correspondence between expected wages and those determined by the theoretical model (N = aH, where: N – the amount of the annual basic salary, a – the percentage of the payment of the employee's human capital at 0.08 [1/year], H – the value of the employee's human capital determined as the sum of the capitalised costs of living expenses, professional education and work experience) is ensured only by the use of a = 0.08 [1/year] in the theoretical model. The use of 0.07 or 0.09 for the capitalisation of costs showed a significant deviation in the percentage of compliance of the wages compared. The survey was based on the wage expectations of 3,920 jobseekers and is valuable in that those under unemployment pressure do not have exorbitant wage expectations but rather reckon with the ongoing cost of living.

The magnitude of a = 0.08 [1/year] has also been repeatedly confirmed in studies of statutory minimum wages in the USA (Dobija, 2011; Dobija, Renkas, 2021; 2022; 2023). Using a rate of return of a = 0.08 [1/year] in the model when analysing minimum wages in the USA resulted in 100% agreement between the statutory minimum wage and the theoretically calculated minimum wage for a young person with no vocational training or work experience. The authors of the study have repeatedly shown that rates other than 8%, such as 7.5% or 8.5%, are fundamentally different from the legal minimum wage in the US economy, which is considered fair.

Throughout history we also find traces of the manifestation of the magnitude a = 0.08 [1/year] in economic life. According to A. Pikulska-Robaszkiewicz (1999, pp. 41–42), in the Roman Republic the interest rate on loans was limited by law to 1/12 of the capital, i.e. 8.33% per annum. By maintaining this limit, Emperor Justinian freed contracts from unreasonable, ruinous interest. This decision was a reasonable compromise between humanitarianism and the necessary needs of circulation, which revealed the operation of the natural rate of capital multiplication. Later, the introduction of a similar limit on interest in maritime loans allowed the development of maritime trade. All this showed that economic development took place after the natural rate of capital multiplication was allowed to operate, i.e. the value of a = 0.08 [1/year].

Studies have also shown that, in addition to the above-mentioned extremely important areas of the constant, it determines the rate of the passage of time in the Earth's living system and sets the lower limit of biomass growth (Dobija, Renkas, 2023). It has also been revealed in the estimation of fair prices for agricultural products (Kurek, 2011; Renkas, 2019), as well as in studies on the evaluation of the natural level of depreciation of fixed assets (Jonkisz-Zacny, 2017). All the above-mentioned areas, in which the constant of potential capital growth a = 0.08 [1/year] was found, confirm the necessity of its inclusion in economic accounts.

It is noteworthy that the use of the constant a = 0.08 [1/year] leads to fair values. This constant has made it possible to develop models of the growth in the value of human capital (Renkas, 2022), so that in terms of wages we can speak of fair wages.

The constant a = 0.08 [1/year] presented above has its practical applications in many economic fields. An example of the practical use of the constant magnitude a = 0.08 [1/year] is its use in the algebraic representation of the costs and results of the manufacturing process, which led to the idea of the Economic Activity Function (EAF). This is a functional description of the production process, which naturally begins with the representation of the products and services produced in terms of the selling price as a function of the cost of production.

It is worth noting that the econometric models popular in economics, called production functions (such as R. Solow's model (Romer, 2000, pp. 23–53)), are characterised by the fact that the factors of production are measured in natural units rather than monetary units. However, the production process, which culminates in a market exchange, can be described taking into account the fact that production factors are concentrated in a product according to the principles of cost accounting. Therefore, the idea of the Economic Activity Function (EAF) is derived from cost accounting, from its algebraic description. In this description we can find all the necessary variables, and the data from the financial statements become an indispensable source of information.

METHODOLOGY

The starting point for developing the Economic Activity Function (EAF) is to represent the production process in realization prices as a function of production costs:

$$P = S + Z \tag{1}$$

where: P – value of manufactured products in a given year at realization prices, S – cost of manufactured products, Z – gross profit in the current reporting period.

If we take the cost (S) out of parentheses on the right side of the equation, we get the equation:

$$P = S\,(1 + Z/S) = S\,(1 + z) \tag{2}$$

where: z – cost-effectiveness (Z/S).

The magnitude of z = Z/S represents cost-effectiveness and in the literature (Goronzy, 1968; Certo, Kalm, LePine, 2020) is presented as a function of two variables: return on assets (ROA = Z/A) and a ratio that determines the turnover of assets relative to costs (A/S).

In turn, costs of manufacturing products (S) include W – labour costs and B – other (non-labour) costs, provided for by technology and the management process, so the above equation takes the form:

$$P = (W + B)\,(1 + z) \tag{3}$$

Taking the labour cost variable W out of parentheses, one gets:

$$P = W(1 + B/W)\,(1 + z) \tag{4}$$

As is well known, asset turnover is represented by the magnitude of S/A, from which can be derived the formula for asset turnover relative to non-wage costs:

$$b = B/A \tag{5}$$

where: B – non-wage costs, b – asset turnover ratio relative to non-wage costs.

This is how the amount of consumption of assets in relation to costs, less the amount of wage costs, is obtained. Then the variable B = bA, and formula (4) takes the form:

$$P = W(1 + bA/W)\,(1 + z) \tag{6}$$

where: A – assets at historical prices.

Labour costs W are derived from the human capital of the employed. M. Dobija presents a detailed study in this regard. He was the first to emphasized (Dobija, 1998) that the rate of return known for the profits made on the stock market (8%) should also apply when settling accounts with employees (the concept of a fair wage based on the value of the human capital of the employed applies here). M. Dobija concluded that the employer should pay the same percentage on the use of the employee's capital that applies as the average rate of return on investments, i.e. 8%.

Accordingly, in the algebraic treatment of company costs in the part of presenting the general wage fund, on the grounds of the fair wage model (Dobija, 1998; Renkas, 2022), the value of a = 0.08 [1/year] has its original application. Namely, using the relationship that N = aH (where: N – the total amount of accrued base wages for

the employees of the enterprise, a – the percentage of payment of human capital of employees at 0.08 [1/year], H – the value of the employee's human capital) and W = uH (where, W – the total fund of accrued wages in the enterprise (including bonus wages), u – the general percentage of payment of human capital), after appropriate substitutions in the denominator of equation (6), the formula (7) is obtained:

$$P = W(1 + bA/uH)\,(1 + z) \tag{7}$$

The difficulty of estimating the H variable can be avoided by calculating it from the transformed formula H = N/a. In this case, the value of the variable H can be measured using reporting data, which includes information on the basic wages of employees (N). As a result of converting the H variable into the N/a figure, the production model looks as follows:

$$P = W(1 + bAa/uN)\,(1 + z) \tag{8}$$

Using in turn the approximate equation: $1 + x \approx e^x$, the Economic Activity Function of the enterprise is derived from equation (8):

$$P = W(1 + bAa/uN)\,(1 + z) \cong W\, e^{bAaz/uN} = WQ \tag{9}$$

where: $Q = e^{bAaz/uN}$ and represents itself an unmeasured quantity, determining the level of labour productivity in the company.

The quantity Q is labour productivity, under which is understood the labour cost multiplier, determining the value of production. At the same time, it is the value of production, per unit of labour costs (Q = P/W). It is a function of a number of important variables that are well known in productivity management theory. This quantity at the macro level (Q = GDPR/W, where: GDPR – real GDP, W – wage fund in the economy) is also applicable to exchange rate theory (Jedrzejczyk, 2013). The parity of labour productivity determines the real exchange rate, and the disparity determines the need to take into account the size of Q in conversions. Also, the size of Q at the macro level has found wide application in the theory of integrating currency areas (Dobija, 2014).

In turn, the Economic Activity Function presented above finds its important application in the management of wages in the enterprise. A particularly important part of this management is the analysis and evaluation of the impact of labour productivity and the level of management in the enterprise on the formation of the size of employee compensation. For this purpose, it is necessary to carry out some transformations. Based on the Economic Activity Function (9), a production model is introduced with a synthetic Management Index M:

$$P = W\, e^{bAaz/uN} = W\, e^{AMa/N} \tag{10}$$

where: M – synthetic index determining the level of management.

The index M integrates the influences of all the previously presented variables related to decision-making. Namely, these are the variables of asset turnover (b), level of paid labour (u) and profitability (z). These variables are directly related to the day-to-day decisions of the business unit's management, so they add up to the Management Index M = M(b,u,z). This index can be determined based on information from the company's reporting system. This system generates the necessary data for its measurement.

Accordingly, the following relationships are obtained:

$$P = WQ = W\, e^{AMa/N} = W\, e^{TM} \tag{11}$$

where: T – labour equipment index.

The placement of the magnitude A in the exponent of a power indicates the enormous impact of assets on the impact of minimum action management. A similar effect is exerted by the Management Index M. On the other hand, the labour cost variable W refers to the magnitude a = 0.08 [1/year] and should not be set arbitrarily. The important fact is that the above model makes it possible to determine the real level of use and remuneration of human capital in the enterprise.

As a result of appropriate transformations of the EAF model, formulae are obtained for determining the Labour Productivity Index Q, the Management Index M and the general fund for the payment of labour in the enterprise (W) as a function of the data characterising the economic performance of the enterprise, as well as the bonus fund in accordance with the results obtained:

$$M = \frac{N ln Q}{Aa} \tag{12}$$

$$Q = \frac{P}{W} \tag{13}$$

$$Q = \frac{P}{W} \tag{14}$$

where: P – products produced for the year at realisation prices, A – carrying value of assets, M – management index, N – total amount of basic wages, W – total wage fund in the enterprise (W = N + hN), h – bonus as a percentage of basic wages.

As is well known, the structure of remuneration in an enterprise most often consists of a basic remuneration (remuneration set as payment for work performed in accordance with established labour standards) and additional, bonus remuneration (for work performed above the established standards), which depends on the financial results achieved by the enterprise. The size of the bonus

remuneration, as a forecast amount for the next year, can be calculated on the basis of the Economic Activity Function (EAF) presented above. This model makes it possible to determine the real level of usage and payment of human capital in the production process and also makes it possible to estimate and predict the size of the bonus fund, which is subject to distribution among employees in accordance with the bonus system established in the enterprise.

The total wage fund (W), and therefore the fixed and variable part of it, can be represented by the following formula:

$$W = uH = aH + hH \tag{15}$$

where: W – the total wage fund in the enterprise, u – the actual level of labour payment (u = a + h), a – fixed magnitude (0.08 [1/year]), h – the percentage of premium (bonus as a percentage of basic wages), H – the value of human capital of employees.

RESULTS

Using the above formula and the presented model of the Economic Activity Function, we will present an example of the process of analysing and evaluating the level of labour payment, planning the level of wages, measuring the level of Management Index M and Labour Productivity Index Q in a model manufacturing enterprise. The formula for labour productivity shows that its level is influenced by three basic factors: the value of assets, the level of wages and the Management Index M. The ratio of the value of assets to the value of human capital expresses the level of technical armament of labour. From the point of view of the decision-making process, the influence of management on the level of wages in the company is fundamental. If other factors remain unchanged (e.g. the value of assets), a corresponding increase in the level of wages will reduce the Labour Productivity Index and vice versa.

Therefore, an important condition for improving labour productivity in an enterprise is an increase in the level of management, which is expressed by the Management Index M. Although not in every case the increase in the level of Management Index M leads to an increase in the Labour Productivity Index Q, since it also depends on other factors (for example, on the value of assets). It is also worth noting that when analysing individual companies, we are dealing with different economic conditions of labour productivity. In a more thorough analysis, it is worthwhile to examine not only the magnitudes of individual variables, but also to analyse their significance.

Based on formulas (12), (13) and (14), Table 1. Calculation of Management Index M, Labour Productivity Index Q, and level of labour payment based on sample

financial data presents sample calculations of Management Index M and Labour Productivity Index Q based on the financial data of a sample company, along with a forecast for the next year. On the basis of the obtained indexes, the planned percentage of bonuses in relation to base wage in the following year was also calculated.

Table 1. Calculation of Management Index M, Labour Productivity Index Q, and level of labour payment based on sample financial data

Financial data	2023	2024
Realized production (P)	64,125,000.00	65,030,000.00
Value of assets (A)	56,904,000.00	56,936 000.00
Basic wage (N)	9,552,000.00	9,576,000.00
Labour payment fund (W)	11,011,000.00	11,173,540.00
Management Index (M)	3.70	3.70
Labour Productivity Index (Q)	5.82	5.82
Percentage of premium, [%]	15.27	16.68
Bonus wage	1,459,000.00	1,597,540.00

Source: own study.

The last column of Table 1. Calculation of Management Index M, Labour Productivity Index Q, and level of labour payment based on sample financial data shows the planned budget for the next year. The plan includes a few percent increase in production along with a small increase in costs. The Management Index M is not expected to decrease, as it includes profitability and asset turnover. Achieving the projected financial results will pay a bonus of 1,597,540, which is 16.68% on the amount of base wages. This bonus is a good incentive for employees to meet the projected budget. Such motivation will promote increased labour productivity in the future. Also important is the fact that in this way several variants of the development of the financial situation in the enterprise can be predicted.

The Economic Activity Function (EAF) presented above was used for analyse the financial data of Komfort-Eko Ltd. This enterprise is located in Rivne (Ukraine) and is engaged in the production of filters for wastewater treatment plants and their installation. Also, Komfort-Eko Ltd. provides various construction services. Table 2. Results of calculations of Management Index M, Labour Productivity Index Q and level of labour payment for Komfort-Eko Ltd. presents the results of calculating the Management Index M, Labour Productivity Index Q and the level of labour payment, which were determined on the basis of the data of the company's financial statements for 2022. For comparison, and in order to draw important conclusions about the management of Komfort-Eko Ltd., the next column shows the results of the calculation of individual variables for the year 2023.

Table 2. Results of calculations of Management Index M, Labour Productivity Index Q and level of labour payment for Komfort-Eko Ltd.

Financial data	2022	2023
Realized production (P), [UAH]	9,582,500.00	11,630,000.00
Value of assets (A), [UAH]	5,105,900.00	5,310,200.00
Basic wage (N), [UAH]	342,200.00	380,700.00
Labour payment fund (W), [UAH]	369,952.00	427,260.00
Management Index (M)	2.73	2.96
Labour Productivity Index (Q)	25.90	27.22
Percentage of premium, [%]	8.11	12.23
Bonus wage, [UAH]	27,752.00	46,560.00

Source: based on Komfort-Eko Ltd. financial statements.

The information presented in Table 2. Results of calculations of Management Index M, Labour Productivity Index Q and level of labour payment for Komfort-Eko Ltd. shows that in 2023 the company achieved an increase in the Management Index M. This shows that the level of management improved, which translated into better financial results. It is important to highlight the fact that the EAF model helps to show that it was the improvement in management performance that contributed to the better results and not, for example, a significant increase in the scale of production. In other words, we are not observing a quantitative improvement, but a qualitative one. This has also contributed to an increase in the Labour Productivity Index Q.

Achieving the results shown in Table 2. Results of calculations of Management Index M, Labour Productivity Index Q and level of labour payment for Komfort-Eko Ltd. in 2023 allowed to manage the bonus fund in the amount of UAH 46,560. This serves as an additional incentive for employees to achieve the company's goals for the following year. This example confirms the usefulness of the presented EAF model in the analysis of future scenarios of the company's financial development. In turn, trend analysis of the change in the Management Index M makes it possible to assess the effectiveness of management decisions.

Discussion, limitations and directions for further research

Using the Economic Activity Function (EAF), it is possible to analyse the level of the Management Index M and the labour remuneration system in each enterprise. These formulae express a general relationship: the higher the level of Labour Productivity Index Q in a unit, and if the upward trend of Management Index M is maintained, the higher the level of labour remuneration.

Comparing the above formal description of production with existing models of production and economic growth, such as those developed by J. Robinson (1953), R.G. Wright, W.A. Ruch and R.F. Gonzalez (1975), Y.M. Ebadi and R.J. Paul (1985) and others, it can be seen that the model presented is not one-dimensional, as the formula P = WQ might suggest. Paul (1985) and other authors, it can be confirmed that the model presented is not one-dimensional, as the formula P = WQ might suggest, since the Labour Productivity Index Q is a function of several variables, namely the technical equipment of the labour force (A/H), the turnover of assets, the return on assets (ROA) and the level of labour compensation. This leads to the presentation of the Labour Productivity Index Q as a synthetic measure for evaluating a company's operations, as indicated by the formula quoted above.

Since the level of compensation is inversely proportional to Q, the premise that the Labour Productivity Index Q cannot fall sets a limit to the increase in the wage bill. Therefore, the size of the total wage fund, as well as bonus wages, in an economic unit is determined by (and dependent on) the achieved level of the Labour Productivity Index Q or the management index M. The economic activity function clearly confirms the links between these indices in the labour process. The Labour Productivity Index Q can be increased by improving the technical equipment of labour (A/H) and by increasing the efficiency of management (variables b and z).

Particularly noteworthy is the variable u, which reflects the level of labour remuneration in the enterprise. The analysis of the economic activity function presented shows that a slight increase in the Labour Productivity Index Q can be achieved as a result of a reduction in labour costs. However, this will immediately lead to a decrease in demand (Say's law) and then it will already be more difficult to maximise asset turnover and the market rate of return z. In addition, it is worth noting the placement of the indicator of the level of labour compensation (u) in formula (9). This variable appears in the numerator, since W = uH, and in the denominator. This indicates the existence of its optimal size. This fact is already known from the thermodynamic theory of human capital, according to which a worker's basic wage should not be less than 8% of the value of his individual human capital (Renkas, 2022). Therefore, the question of a fair wage level requires an appropriate theory, in particular one based on the human capital account. The basic thesis in this case is the correspondence between the level of remuneration of labour and the value of its performance.

The above examples do not exhaust the possibilities of carrying out the various types of financial simulations allowed by the model of the Economic Activity Function presented. Moreover, it is even advisable to prepare several alternative scenarios that will allow the most favourable course of action to be chosen.

The possibility of forecasting provided by the concept of the economic activity function and the awareness of the existence of the magnitude a = 0.08 [1/year] is conducive to the expansion and improvement of the system of employee motivation in the company. It makes it possible to carry out an analysis of future scenarios of the development of the financial situation and to present the size of the bonus fund depending on the degree of implementation of the established plan. It also allows continuous monitoring of the trend in the change of the Management Index M, which indicates the effectiveness of the actions and decisions taken by management.

Of course, the Economic Activity Function (EAF) model presented has limitations that need to be taken into account in its practical application. First, in its current form, the model does not take into account possible changes in external economic conditions, such as inflation, changes in the labour market or global financial crises. It is applied to a stable economic unit that is not currently exposed to a crisis situation. In addition, the model is based on the assumption that an increase in the Labour Productivity Index Q and the Management Index M automatically leads to an increase in wages, which may not always reflect market reality, where other factors such as remuneration policy or socio-political factors may start to have a greater impact on wage levels.

Also, the approach to the Labour Productivity Index (Q) as a function of several variables (technical equipment of the workforce, turnover of assets) may lead to some simplifications that are not always accurate for certain industries where other indicators may be more relevant.

Further research could focus on developing the model of the economic activity function with additional variables that better capture the complexity of modern enterprises. Examples include variables related to new technologies, automation and the digitalisation of work, which have a significant impact on the Labour Productivity Index Q and the Management Index M.

In addition, research may focus on the inclusion of non-standard forms of employment and flexible remuneration systems in the model to better adapt it to modern economic conditions. An analysis of the impact of macroeconomic factors, such as inflation or monetary policy, on the relationships represented in the model could provide valuable insights into labour cost management.

It would also be worthwhile to carry out empirical studies to verify the application of the model in different sectors of the economy. Comparing the effectiveness of the model in companies with different technological levels and in different phases of the business cycle could provide new data on the effectiveness of the Management Index M and the Labour Productivity Index Q.

A further step could also be to develop the theory of fair pay based on the human capital account and test it in practice in different companies to confirm its effectiveness in increasing employee motivation.

Bibliography

Certo, S., Kalm, M., LePine, J. (2020). Time to unpack: Industry, corporate, and business segment effects on the components of ROA. *Proceedings, 2020*(1), 13587. DOI: 10.5465/AMBPP.2020.13587abstract.

Chatterjee, S., Lubatkin, M., Lyon, E.M., Schulze, W. (1999). Toward a Strategic Theory of Risk Premium: Moving Beyond Capm. *The Academy of Management Review, 24*(3), 556–567. DOI: 10.5465/amr.1999.2202137.

Cieslak, I. (2008). Value of human capital and wage disparities. In: I. Gorowski (ed.), *General accounting theory. Evolution and design for efficiency* (pp. 289–303). Warsaw: Academic and Professional Publishers.

Dobija, M., Renkas, J. (2021). How the inclusion of thermodynamic principles recovers economic sciences. *International Journal of Accounting and Economics Studies*, *9*, 21–31. DOI: 10.14419/ijaes.v9i2.31608.

Dobija, M., Renkas, J. (2022). The Thermodynamic Nature of Time and Economic Income. *Modern Economy*, *13*, 1346–1366. DOI: 10.4236/me.2022.1310072.

Dobija, M., Renkas, J. (2023). Thermodynamic Approach to the Discount Rate and Discounted Cash Flow Method. *Risks*, 11(7), 1–18. DOI: 10.3390/risks11070118.

Dobija, M. (1998). How to place human resources into the balance sheet. *Journal of Human Resource Costing & Accounting*, *3*(1), 83–92. DOI: 10.1108/eb029044.

Dobija, M. (2007). Abstract Nature of Capital and Money. In: M. Linda Cornwall (ed.), *New developments in banking and finance* (pp. 89–114). New York: Nova Science Publishers.

Dobija, M. (2011). Labour productivity vs. minimum wage level. *Modern Economy*, *2*, 780–787. DOI: 10.4236/me.2011.25086.

Dobija, M. (2014). The theoretical foundation of an integrating currency area: The dilemmas of introduction euro currency in Poland. *Social Inequality and Economic Growth*, *39*(3), 110–133.

Ebadi, Y., Paul, R. (1985). The analysis of product/operations management: A review of best selling production/operations management texts. *The Academy of Management Review*, *10*, 629–638. DOI: 10.5465/amr.1985.4279080.

Garrison, R.W. (2006). Natural and Neutral Rates of Interest in Theory and Policy Formulation. *Quarterly Journal of Austrian Economics*, *9*, 57–68. DOI: 10.1007/s12113-006-1024-y.

Goetzmann, W.N., Ibbotson, R.G. (eds.). (2006). *History and the Equity Risk Premium. In the Equity Risk Premium: Essays and Explorations*. Oxford: Yale School of Management, Oxford University Press.

Goronzy, F. (1968). A multivariate analysis of selected variables of manufacturing business enterprises. *Academy of Management Journal, 11*(3), 351–352. DOI: 10.5465/amj.1968.25998373.

Gorowski, I., Kurek, B. (2020). Importance of Gender, Location of Secondary School, and Professional Experience for GPA – A Survey of Students in a Free Tertiary Education Setting. *Sustainability*, *12*(21): 9224, 1–15. DOI: 10.3390/su12219224.

Jedrzejczyk, M. (2013). *Exchange rate and the equivalent translation of economic values*. Warsaw: Difin.

Jonkisz-Zacny, A. (2017). Optimizing the value of fixed assets in the depreciation process. *Journal of Management and Finance*, *15*, 49–60.

Koziol, W. (2011). Constant of potential growth in the calculation of human capital. *Social Inequality and Economic Growth*, *19*, 252–260.

Kurek, B. (2012). An Estimation of the Capital Growth Rate in Business Activities. *Modern Economy*, *3*(4), 364–372. DOI: 10.4236/me.2012.34047.

Kurek, B. (2011). Testing the fairness of agricultural prices using the economic constant of potential growth. In: M. Dobija (ed.), *Human capital in an economic perspective* (pp. 41–45). Krakow: KUE Publishing House.

Mikos, A., Koziol, W. (2020). The Measurement of Human Capital as an Alternative Method of Job Evaluation for Purposes of Remuneration. *Central European Journal of Operations Research*, *28*, 589–599. DOI: 10.1007/s10100-019-00629-w.

Neal, F., Shone, R. (1976). *Economic model building.* Palgrave: Palgrave HE UK.

Oliwkiewicz, B. (2020). Salary expectations vs. fair wages of economics graduates. In: D. Fatula (ed.), *Managing the sustainability of the organization* (pp. 67–94). Krakow: AFM Publishing House.

Pikulska-Robaszkiewicz, A. (1999). *Usury in the state and law of Republican Rome*. Lodz: University of Lodz Publishing House.

Renkas, J. (2013). Wage expectations in light of human capital measurement theory. *Argumenta Oeconomica Cracoviensia*, *9*(9), 29–42. DOI: 10.15678/AOC.2013.0902.

Renkas, J. (2021). An Econometric versus Thermodynamic Approach to Modeling Wage Expectations. In: K.S. Soliman (ed.), *Innovation Management and Information Technology Impact on Global Economy in the Era of Pandemic* (pp. 5879–5887). Cordoba: International Business Information Management Association.

Renkas, J. (2019). Measurement of human capital – the basis for fair remuneration. In: M.G. Wozniak, M. Dobija (eds.), *The economy of Poland 1918–2018. Towards decent wages and labour productivity growth* (pp. 117–169). Warsaw: PWN.

Renkas, J. (2022). *Thermodynamic model of human capital measurement in applications to employee compensation formation*. Warsaw: Difin.

Robinson, J. (1953). The production function and the theory of capital. *Review of Economic Studies, 21*(2), 77–89.

Romer, D. (2000). *Macroeconomics for the advanced*. Warsaw: PWN.

Wright, R.G., Ruch, W.A., Gonzalez, R.F. (1975). Integrating the production function: An experiential course in production systems. *Academy of Management Proceedings, 1*, 86–88. DOI: 10.5465/ambpp.1975.4980899.