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Research paper

The EAF model as a tool for company wage fund management

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Abstract

This article aims to address recent debates on wage increases, the flattening wage structure, and effective labor remuneration systems by developing a model that assesses real wage levels, human capital utilization, and management quality within a company. Using mixed meth-ods, including a literature review and a case study of Komfort-Eko Ltd., the study highlights the importance of the constant a = 0.08 [$1/year$] in analyzing wage systems. Key findings led to the development of the Economic Activity Function (EAF), which estimates the Management Index M, the Labour Productivity Index Q, and the overall wage level based on financial data, providing a new framework for evaluating management performance and forecasting future remuneration levels. The EAF model enables simulation of financial scenarios, aiding policymakers and managers in optimizing remuneration strategies and enhancing employee motivation systems. This study contrib-utes to human resource management literature by deriving the Management Index M and refining a model for labor productivity measure-ment, supported by the theoretical role of a constant parameter, while using the EAF to forecast future wage funds, including bonuses.

Keywords: *EAF Model; Management Index; Wage Fund.*

1. Introduction

In 1976, the authors F. Neal and R. Shone argued that there are no fixed quantities in the economy, similar to physical constants. However, a number of empirical studies have challenged this view, demonstrating the existence of a constant in economic processes that determines fair levels of wages, prices and profit rates, and serves as a reference for discount and interest rates. Such a constant makes it possible to create effective economic models that are also useful for business management, provided that decision-makers rely on scientific theory rather than arbitrary judgement. As this constant primarily represents the average rate of capital growth over a given period of time, studies of medium-term returns have provided insights into determining its value and usefulness in management models. This article presents research that confirms the existence of such a constant in economic processes and highlights its practical importance in the development of the Economic Activity Function, a tool that is mainly used to assess the quality of corporate management and to analyse the company's wage fund.

2. Literature review on the field of constant value a = 0.08 [1/year]

Initial studies investigating the presence of a stable rate of periodic returns focused on large datasets, analyzing U.S. stock returns over an extensive period of 80 years (Garrison, 2006; Dobija, 2007). Researchers identified an average real return rate of approximately 8% for U.S. stocks, revealing a close correlation with a constant rate of return that aligns with periodic capital gains in entrepreneurship. These findings brought attention to the “risk premium,” defined as the difference between real returns and returns on U.S. Treasury bills. This concept was integrated into the CAPM model (Goetzmann & Ibbotson, 2006), though it has lost some prominence over time (Chatterjee et al., 1999). A key contribution of this line of research was identifying the fixed rate of return at 8%, suggesting that in an efficient market, this rate reflects the natural forces at work in the economy—where employees receive fair wages, assets depreciate, and capital grows periodically.

Subsequent studies, conducted by authors such as Kurek (2012), Gorowski (2020), Koziol (2011), Mikos (2020), and others, consistently observed this 8% rate. These studies expanded the analysis to include sectors beyond stock markets, examining corporate returns and human capital. Kurek's (2012) research analyzed financial statements from companies within the Standard & Poor’s 1500 index over 20 years, focusing on periodic profits in business units. His tests confirmed an ex-post risk premium of approximately 8.33%, corresponding closely with an ex-ante premium of 8%, thereby validating the constant a = 0.08 [1/year] as a recurring rate in entrepreneurship and capital multiplication.

This constant also appears in human capital assessments. Dobija (2007) showed that an assumed rate of 0.08 [1/year] accurately estimated minimum wages for young U.S. workers, aligning closely with the legal minimum wage. Koziol (2011) further analyzed wage data from

ABM Solid SA, finding that worker wages represented about 8% of their estimated human capital value. Additionally, Renkas (2021) examined wage expectations among Ukrainian job seekers, confirming that applying the 0.08 [1/year] rate to calculate annual salaries from human capital yielded results consistent with real wage expectations.
This constant rate of 8% has also played a role in determining fair minimum wages in the U.S., as illustrated by multiple studies (Dobija, 2011; Dobija & Renkas, 2021). When models use the 8% rate, they show close alignment with statutory minimum wages, demonstrating this rate's fairness in economic assessments. Historical evidence also supports its importance; in the Roman Republic, laws limited loan interest to 8.33% per annum, a policy carried through the Byzantine Empire under Emperor Justinian (Pikulska-Robaszkiewicz, 1999). The rate balanced economic circulation needs with fair, sustainable loan rates, revealing its significance in economic stability.
In addition to these applications, the constant 8% rate has influenced fields such as biomass growth, agricultural pricing, and depreciation rates for fixed assets (Dobija, Renkas, 2023; Kurek, 2010). This rate, termed a = 0.08 [1/year], remains a critical factor in economic calculations and modeling. Its application ensures fair valuations across various domains, including models of human capital growth, enabling consistent and justifiable economic predictions.
An example of its utility is the Economic Activity Function (EAF), a model describing production processes by correlating selling prices with production costs. This model, rooted in cost accounting, contrasts with traditional production functions, such as Solow's model, by representing production factors in monetary terms rather than natural units (Romer, 2000). The EAF provides a framework that uses financial statements to measure production efficiency, fair wage determination, and the impact of periodic returns, thus underscoring the importance of the 8% rate in practical economic assessments.

3. Summary of main results

The Economic Activity Function model allows us to examine and evaluate wage levels, plan salaries, and calculate both the Management Index (M) and the Labor Productivity Index (Q) within a model manufacturing company. In this context, labor productivity is determined by three fundamental factors: the value of assets, the wage level, and the Management Index (M). The asset-to-human capital ratio represents the level of technical resources available to employees, which directly impacts productivity. From a managerial standpoint, understanding the influence of wage levels on productivity is essential, as changes in wages, while other factors remain constant (such as asset values), directly affect the Labor Productivity Index (Q). An increase in wages, for instance, generally lowers Q, while a decrease in wages may raise it.
To improve labor productivity in the enterprise, focusing on enhancing the quality of management (reflected in the Management Index M is key. Although increasing M does not always guarantee a rise in the Labor Productivity Index Q, this is because productivity outcomes also depend on other factors, such as asset values and the technological equipment accessible to employees. Therefore, while a high M indicates strong management, its effect on productivity must be assessed within the broader context of the company's resource allocation and operational conditions.
In practice, the interplay between wage levels and productivity can vary significantly across companies, each operating under unique economic conditions. A more comprehensive analysis involves not only calculating the absolute values of individual variables but also assessing their specific impacts. For instance, companies with higher technical equipment or asset value may achieve productivity gains without significantly increasing wages, while companies with lower asset values may need to focus on optimizing wage levels and management quality to sustain productivity.
Through suitable transformations of the Economic Activity Function (EAF) model, formulas are derived for calculating the Labour Productivity Index Q and the Management Index M. These are functions of data that reflect the economic performance of the business, as well as the bonus fund based on achieved results:

$M=N\ln Q/Aa$ and $Q=P/W$

Where:
P – total value of products produced annually at market prices, A – book value of assets, M – management index, N – total basic wage amount, W – total wage fund in the enterprise.
Table 1 showcases an example calculation for the Management Index M and the Labor Productivity Index Q, based on the financial data of a sample company. These calculations also include a forecast for the following year, enabling management to set informed wage targets and expectations. Based on these projections, a planned percentage of bonuses relative to base wages was calculated, providing a framework for setting incentive plans that align with productivity goals for the coming year. This predictive approach can help management adjust strategies for labor efficiency, balancing wage costs with productivity outcomes, and aligning employee compensation with corporate objectives.

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
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

Source: own study.

The final column in Table 1 presents the projected budget for the upcoming year, which outlines a slight increase in production and a modest rise in costs. The Management Index M, encompassing profitability and asset turnover, is expected to remain steady. This incentive aims to encourage employees to reach the forecasted budget, fostering higher productivity in the long term. Additionally, this approach enables the anticipation of multiple potential outcomes for the company's financial trajectory.

4. Conclusions

The Economic Activity Function (EAF) allows for the analysis of both the Management Index M and the labor remuneration system within each enterprise. These formulas reflect a general principle: as the Labor Productivity Index Q in a unit increases, and if the Management Index M continues to show an upward trend, the level of labor remuneration will also rise.
The examples above do not encompass all the financial simulations possible with the Economic Activity Function model. Creating multiple alternative scenarios can help identify the best approach. The forecasting ability of this model, along with the parameter $a = 0.08$ [1/year], aids in enhancing the employee motivation system. It enables analysis of future financial scenarios and helps determine bonus fund size based on plan achievement. Additionally, it supports continuous tracking of trends in the Management Index M, which reflects management's effectiveness.

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