ECONOMIC VALUE ADDED IN RELATION TO THE CREDIBILITY MODEL: AN EMPIRICAL STUDY IN TEXTILE ENTERPRISES

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Abstract

An economic evaluation of an enterprise's performance allows an objective assessment of how effectively the enterprise is using its resources to continue to grow. The most appropriate indicator is economic value added (EVA), which provides a more detailed picture of whether an enterprise is creating value for its owners. Credibility indicators are used due to the complexity of the calculation, which predict value creation for the owners of the enterprise. The aim of the paper is to assess whether the credibility indicator IN 99 correctly characterizes the creation of economic value added. The empirical analysis is performed on Czechia's textile enterprises. In order to deepen the analysis, companies were classified based on their size. The study confirmed that value-creating companies achieve higher labour productivity and higher return on return on equity (more 20 %) than non-value-creating companies. The results of the analysis show that the IN99 model has a certain ability to distinguish companies that do not create value, but its ability to correctly predict companies that do create value is significantly limited.

Key words: economy value added, credibility indicator, textile industry

JEL Code: M21, D22

Introduction

In the current dynamic business environment, the key issue is not only achieving profitability, but above all the ability to create long-term value for owners and other stakeholders. Traditional performance indicators such as profit or return on investment often do not reflect the true economic reality because they do not take into account the cost of capital or the efficiency of its use. This shortcoming has led to the development of modern performance indicators, in particular the economic value added (EVA) indicator, which has become a popular tool in corporate financial management in recent years. Due to the complexity of the calculation, more use is now made of reliability indicators such as the indicator known as IN 99, which predicts value creation for the owners of the business. The aim of this paper is to assess whether the IN

99 confidence indicator correctly characterizes economic value creation with a focus on the textile industry.

Measuring business performance is considered a key component of strategic financial management. Recently, however, attention has shifted from purely accounting indicators to indicators that attempt to capture actual economic value creation (Young & O'Byrne, 2001). One of the key objectives of a business should be its long-term ability to generate value for its owners. According to Koller et al. (2020), this ability is fulfilled when the return on invested capital exceeds the cost of that capital—that is, when the return is higher than the WACC (Weighted Average Cost of Capital). The value of a company is created only if the company earns more than the cost of its capital. EVA is based on the assumption that accounting profit is not a sufficient measure of performance, as it ignores the cost of equity that the company incurs in order to create value. The EVA indicator has been introduced into practice in some companies, although its wider use is limited by the unavailability of market data, particularly for calculating the cost of equity. A few factors influence the size of EVA, such as the industry, region (Dusek, 2024) pandemics (Safr et al., 2024), and the economic cycle (Cermakova, et al., 2021).

Traditional performance indicators such as ROA (return on assets), ROE (return on equity), and ROS (return on sales) are based on accounting figures, which can lead to a distortion of economic reality. In contrast, new approaches, such as EVA (Economic Value Added), take into account both debt and equity costs, providing a more accurate picture of a company's actual performance (Stern et al., 2002). At the same time, this indicator is being used to assess other new aspects of business performance, such as a firm's Environmental, Social, and Governance (ESG) performance (Makhija et al., 2025).

Complex models such as Altman Z-Score, Kralicek Quick Test, IN 99, and others are used to assess a company's economic performance, financial situation, and bankruptcy risk (Schönfeld et al., 2018). The IN99 indicator was originally designed as a tool for predicting financial difficulties, but in practice it is often used as an indicative measure of a company's performance and its ability to generate value. The IN 99 index is designed as an alternative to economic value added (EVA) due to its simplicity of calculation. The IN indicator belongs to a group of credibility models, i.e., it assesses whether a company creates value for shareholders or not. A similar interpretation of results is also characteristic of economic value added. On the other hand, however, these indicators do not have the same basis; the IN 99 index is based on accounting firms, while economic value

belongs to a group of modern measures of company performance that do not take accounting data into account, but rather economic data, including opportunity costs (Beranová et al., 2014).

According to Chen et al. (2023) and Mařík (2011), while traditional indicators often show performance through the lens of the past and accounting values, modern indicators work with economic reality and allow for the prediction of future value creation capabilities. However, the application of modern methods is more demanding in terms of data and methodology, which can be an obstacle to their use in smaller companies or when analyzing larger data sets.

1 Data and methodology

The article deals with the economic value added of textile companies, the IN99 indicator, and an assessment of the reliability of the IN99 indicator in predicting economic value added. The empirical analysis was carried out on 136 textile companies in 2022 and 2023 (the main activity is classified according to NACE CZ 13 – Manufacture of textiles). Two years were chosen in order to increase the informative value. For a more detailed analysis, the analysis was carried out by dividing companies according to size (European Commission recommendation (2003/361/EC)). The data was drawn from financial statements via the European Orbis database. In addition to Economic Value Added (EVA) and the IN99 indicator (below), the Return on Equity (ROE) and labor productivity (Sales/Costs of employee) indicators were also determined.

$$IN99 = -0.017 * T1 + 4.573 * T2 + 0.481 * T3 + 0.015 * T4 \quad (1)$$

where T1 denotes assets over liabilities, T2 denotes EBIT over assets, T3 denotes revenue over assets and T4 is the ratio of current assets over the sum of short-term liabilities (Machek, 2014). The companies were divided according to their level of value creation in Table 1.

Tab. 1: Classification of Companies according to Index IN99

IN 99 Value	Company Classification
IN > 2.070	Company creates economic profit
1.420 < IN ≤ 2.070	Company probably creates economic profit, but the situation is not quite clear
1.089 ≤ IN ≤ 1.420	Indecisive situation
0.684 ≤ IN < 1.089	Company probably does not create economic profit
IN < 0.684	Company realizes economic loss

Source: Beranová et al., 2014.

The EVA (Economic Value Added) indicator was calculated using the entity approach, with NOA (Net Operating Assets) used to express invested capital.

$$EVA=NOPAT-NOA\times WACC, \quad (2)$$

where

NOPAT (Net Operating Profit After Taxes): NOPAT = earnings before interest and taxes * tax effect = EBIT×(1−t)

NOA (invested capital): Operating assets − Operating liabilities.

Operating assets mainly include tangible and intangible fixed assets, inventories, short-term and long-term trade receivables, and other assets used for the main business activity (e.g., receivables from operating relationships).

Operating liabilities include trade payables (short-term and long-term), liabilities to employees, liabilities to social security and health insurance institutions, tax liabilities (not related to interest), and other operating liabilities.

$$WACC \text{ (Weighted Average Cost of Capital)} = \frac{E}{E+D} * r_e + \frac{D}{E+D} * r_D * (1-t) \quad (3)$$

where

E = value of equity (from accounting); D = value of interest-bearing debt, r_e = cost of equity (estimated using CAPM, for example), rd = cost of debt (effective interest rate), t = tax rate.

The cost of equity (r_e) was estimated using the CAPM (Capital Asset Pricing Model):

$$r_e = r_f + \beta * (r_m - r_f) \quad (4)$$

r_f = risk-free rate of return (using the average half-yearly yield on Czech government bonds for the period 2014-2024, i.e. 2.27%)

β (beta) = sector risk – sector beta used for cyclical industries, which includes the textile industry in the Czech Republic 1.3

r_m- r_f = market risk premium (8%).

The cost of debt capital (rd) was determined as the ratio of interest expense to interest-bearing debt capital. Classification analysis was used for the analysis, which involves constructing a contingency table:

• Actual EVA > 0 Actual EVA ≤ 0

IN99 predicts > 0 True Positive (TP) False Positive (FP)

IN99 predicts ≤ 0 False Negative (FN) True Negative (TN)

The following metrics were used for the evaluation:

- Sensitivity (true positive rate) indicates the model's ability to correctly identify companies that actually generate economic value added (EVA > 0).
- Specificity (true negative rate) measures the ability to correctly identify companies that do not generate value.
- Accuracy expressing the total proportion of correctly classified cases (Japkowicz & Shah, 2011)

2 Results

The first step was to calculate the Economic Value Added and IN99 indicator for individual textile companies. The frequency of companies according to the results is shown in Table 2.

Tab. 2: Number of companies by EVA creation and IN99 indicator (2022/2023)

	IN99 – the company creates value	IN99 – the company does not create value	Grey area
EVA>0	22/19	29/27	13/11
EVA<0	2/4	70/73	0/2
Total	24/23	99/100	136/136

Source: Own calculations

Table 3 illustrates selected indicators in companies by size, divided according to EVA value, i.e., companies that create value (EVA>0) and companies where value is destroyed (EVA<0).

Tab. 3: Selected indicators in textile companies by size and economic value added in 2023

Company size	Indicator	EVA<0	EVA>0
micro	Labour productivity in CZK/ CZK costs of employee	10.132	52.028
	ROE v %	-3.929	20.625
	IN99	-0.001	1.668
small	Labour productivity in CZK/ CZK costs of employee	8.420	5.203
	ROE v %	-175.926	15.275
	IN99	12.024	20.298
medium	Labour productivity in CZK/ CZK costs of employee	4.886	5.925
	ROE v %	-55.823	27.798
	IN99	0.541	1.375
Large	Labour productivity in CZK/ CZK costs of employee	9.009	14.881
	ROE v %	1.023	22.604
	IN99	3.161	2.852
Total	Labour productivity in CZK/ CZK costs of employee	8.397	28.646
	ROE v %	-61.098	19.918
	IN99	0.315	1.419

Source: Own calculations

Table 3 shows that value-creating companies achieve higher labor productivity (on average, CZK 28 in sales per CZK 1 in personnel costs, i.e., approximately 3.4 times higher than non-value-creating companies). Value-creating companies achieve an average return on equity (ROE) of almost 20%, while the second group of companies has a negative ROE on average. The average IN99 value for value-creating companies is at the threshold of indicated EVA creation. In terms of company size, medium-sized and large value-creating companies achieve the best results in terms of ROE and IN99.

Subsequently, a classification analysis was performed to determine whether the IN99 indicator correctly predicts value creation in 2022 and 2023. Table 4 shows the basic statistics of the classification matrix: sensitivity, specificity, accuracy, positive predictive value (PPV), and negative predictive value (NPV).

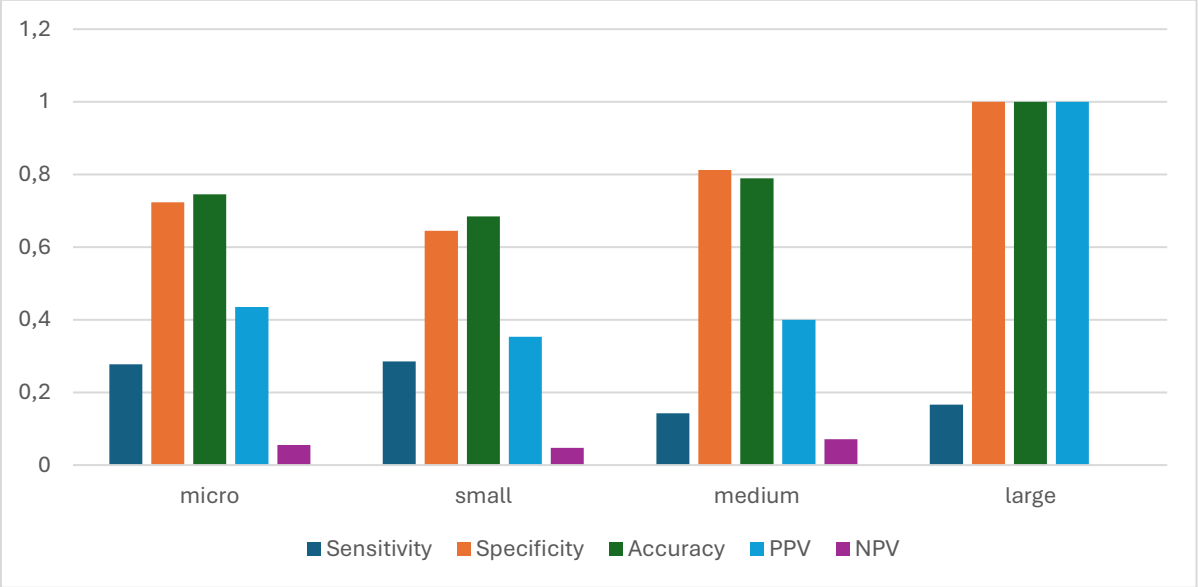
Tab. 4: Classification analysis

Year	Sensitivity	Specificity	Accuracy	PPV	NPV
2022	31%	71%	75%	43%	3%
2023	25%	73%	75%	41%	5%

Source: Own calculations

The following Figure 1 compares the monitored indicators by company size category. Sensitivity values of 31% (2022) and 25% (2023) indicate a low ability to correctly detect positive cases. Specificity values above 70% indicate higher success in detecting negative cases. Accuracy, expressing the total proportion of correctly classified cases, reaches 75% for both years, which indicates solid performance but may be distorted by data imbalance (most companies do not contribute to the value).

Fig. 1: Metrics for evaluating EVA predictions in 2023 by company size



Source: Own calculations

Precision (PPV) values of around 41–43% indicate relatively low reliability of positive predictions. NPV is very low (3–5%), which means that almost all companies labelled as "not creating value" actually do not create value—but at the cost of a large number of false negative results.

Sensitivity values with respect to business size are higher for micro and small enterprises. On the other hand, medium and large enterprises have the highest specificity values (i.e. they indicate a high success rate in detecting negative cases. Precision values (PPV) of around 80-100 % for medium and large enterprises indicate high reliability of positive predictions. The NPV is 100 % for large enterprises, which means that all enterprises identified as 'non-value creating' are indeed non-value creating.

Conclusion

The aim of the paper is to assess whether the credibility indicator IN 99 correctly characterizes the creation of economic value added. Economic value added (EVA) shows whether a company is generating profits above and beyond its cost of capital. It helps reveal which parts of the company are actually generating value. The problem with strategic decision-making can be the complex calculation of this indicator (Chen et al., 2023), which is why simpler alternatives are often sought, such as the IN99 indicator. Overall, the results of the study show that the IN99 model has a certain ability to distinguish companies that do not create value, but its ability to correctly predict companies that do create value is significantly limited. It has been shown in a sample of textile companies that company size plays a significant role in the success of the

prediction. In contrast, the study by Beranová et al. (2014) demonstrated a high degree of interdependence between the values of the IN 99 index and economic value added in agriculture companies.

The main limitations of the study include the short time period and the focus only on the one sector of the economy.

Acknowledgment

This paper was supported by the Grant Agency of the University of South Bohemia GAJU 068/2024/S.

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