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Article

Approaches to Sustainable Enterprise Value

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Abstract: Over the last two decades, business has taken a more systematic approach to understanding its impact on all of its stakeholders. Companies are striving to operate in a more sustainable way to improve the environmental, social and economic impact of their activities. Even today, the interest in determining the value of a company or parts of a company has not waned. As the economy continues to evolve, there are reasons and impulses that encourage companies to find out what their value is. The new approach is dependent on re-thinking value creation. There has been a growing understanding that sustainability requires a more comprehensive view of value that includes economic, social and environmental benefits. The aim of this paper is to propose a methodology for determining the sustainable value of an enterprise with respect to the factors influencing its value. This study is based on information that was gathered through an extensive literature review (research publications and research studies; the company's financial statements with notes) using Internet and research databases and the authors' own experiences. Methods of analysis, comparison, selection, abstraction, induction, deduction and statistics were used. The main findings of this study are as follows: the stakeholders require a company's sustainable value; the modification of the EVA method with the sustainable value approach brings a different perspective to the issue of determining the value of an enterprise. In addition to the positives, the proposed methodology has limitations that can be removed or improved with further research.

Keywords: sustainability; enterprise; value; methodology



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1. Introduction

A business valuation is the process of developing the economic value of a company, and includes using recognized valuation methodologies, for both public and closely held businesses. It represents the objective worth of a business. However, it is not as straightforward as totaling up the value of equipment and unsold inventory or applying a multiple to EBITDA. Depending on what the company is trying to do, different valuation approaches and methodologies may be applied (Redpath and Company 2024).

Essentially, there are three recognized approaches to value (Hollis 2023):

- The market approach,
- The income approach,
- The asset approach (also called the cost approach).

Each of these approaches uses different data to estimate the value of the subject company, which inevitably results in slight disparities between the outcomes. To come to a consensus on value, the analyst must decide how to weight each outcome (Gottlieb 2016).

There is no official formula for calculating weights in business valuation. In fact, Revenue Ruling 59–60 of the Internal Revenue Code states (Gottlieb 2016): “Because valuations cannot be made on the basis of a prescribed formula, there is no means whereby the various applicable factors in a particular case can be assigned mathematical weights in deriving the fair market value. For this reason, no useful purpose is served by taking an average of

several factors (for example, book value, capitalized earnings and capitalized dividends) and basing the valuation on the result. Such a process excludes active consideration of other pertinent factors, and the end result cannot be supported by a realistic application of the significant facts in the case except by mere chance”.

The market approach as a valuation method is used to find the value of a business by comparing it to other similar businesses that have sold recently. For the market approach to be successful, it is critical to ensure that all companies being used for comparison are similar to the subject company or that premiums and discounts are applied for divergent features. Moreover, the market approach can only work effectively if the number of other similar businesses to compare with is adequate. For this reason, it is difficult to assign a value to a sole proprietorship purely on the basis of market value (CFI Team 2024). However, a market approach also allows the valuation analyst—and/or users of a business valuation opinion—to examine how the marketplace reacts to companies within the same or a similar industry as the subject company, based on varying levels and types of economic incomes (Hollis 2023).

The income approach uses a company’s past or future performance to predict future earnings and places a value on the company based on this result. This approach attaches value to a company’s ability to generate cash flow, forming a relationship between the value of the company and its earnings. The main advantage of this approach is that it can be used for companies of various types and stages; it simulates a market price even if there is no active market and places a value on the company’s tangible and intangible assets. However, it can be difficult to calculate sustainable benefit streams that will be used for this method, especially for smaller and/or newer companies. Also, it can be difficult to choose the capitalization and discount rates necessary to calculate the benefit stream because this requires subjective professional judgement (Gottlieb 2016).

The asset approach (the cost approach) places a value on a business based on the value of the business’s assets net of liabilities, adjusted to fair market value. This approach values net tangible assets more reliably than the other two approaches and most accurately reflects the economic balance sheet of the subject company (Gottlieb 2016). The main disadvantages of the asset approach are that value is determined from a static viewpoint, which, therefore, does not consider the company’s possible future evolution, time value of money, the industry’s current environment, human resources or organizational problems, contracts, etc. As Rosenbaum and Pearl (2013) indicate (Bartleby Research 2024), “Since a company’s book value represents the shareholding worth, comparing book value with the market value of the shares can serve as an effective valuation technique when trying to decide whether shares are fairly priced”.

According to the above approaches, the value is commonly understood as monetary value only. The value of an enterprise is not only its assets, financial structure or earnings, but also the impact of the environment in which it operates. The resulting enterprise value does not only serve the internal needs of the enterprise, but it is also a source of information for the various stakeholders who are interested in becoming part of the enterprise. Businesses strive to operate in a more sustainable way to improve the impact of their activities with respect to environmental, social and economic areas that are key factors for sustainability (Brozović et al. 2020). As environmental and resource scarcity issues continue to come to the fore, there is increasing pressure to implement sustainability into the enterprise value process. The new ways of creating value refer to human capital, intellectual capital, information, goodwill, etc., which give the opportunity to contribute to the sustainable development of society and thus to value creation (Vidrascu 2015). Businesses and other organizations themselves are also contributing to the promotion of sustainability by trying to use the growing popularity of the concept to their advantage and gain a competitive edge, although in some cases this is just using a buzzword without any real action in this area (Ruggerio 2021).

How may sustainability generate opportunities for value creation? Over the last two decades, business has taken a more systematic approach to understanding its impact on all

of its stakeholders. Part of this new approach is dependent on rethinking value creation. Business creates value by using inputs which it transforms to create outcomes. In the past, business may have been focused on financial returns alone as being the compensation for the value that they are creating (Greer 2019). The ten elements of value creation provide an excellent example of how business ought to visualize the outcome of its activities (Greer 2019):

- Value creation takes place within a context;
- Financial value is relevant, but not sufficient, for assessing value creation;
- Value is created from tangible and intangible assets;
- Value is created from private and public/common resources;
- Value is created for an organization and for others;
- Value is created from the connectivity between a wide range of factors;
- Value creation manifests itself in outcomes;
- Innovation is central to value creation;
- Values play a role in how and what type of value is created;
- Measures of value creation are evolving.

There has been a growing understanding that sustainability requires a more comprehensive view of value that includes economic, social and environmental benefits (Evans et al. 2014; Yang et al. 2017). According to Hoedeman (2023), it is about systems thinking, in which organizations take into account the impact of their activities on the environment, society and future generations; sustainable value creation is not only a moral obligation, but also a strategic opportunity for organizations to differentiate, innovate and strengthen their competitive position. According to a study by Hart and Milstein (2003), organizations pursuing sustainable value creation can reap four types of benefits: cost and risk reduction; reputation and legitimacy enhancement; innovation and differentiation capability; and growth and market potential (Hoedeman 2023).

In this area, many studies were developed (Hart and Milstein 2003; Figge and Hahn 2004; Petrescu and Apostol 2009; Kuosmanen and Kuosmanen 2009; Figge and Hahn 2009; Ang and Van Passel 2010; Porter and Kramer 2011; Figge and Hahn 2012; Figge and Hahn 2013; Kocmanová et al. 2015; Kassem et al. 2015; Kocmanová et al. 2016; Kassem et al. 2016; Miljenovic 2018; Miljenovic 2019; Jankalová and Kurotová 2020; Brozović et al. 2020; Zhang and Jin 2022; Acosta-Prado et al. 2023; Chomać-Pierzecka 2023). Sustainable value approaches point out that the measurement of sustainable value cannot be performed through traditional enterprise value methods, which typically focus on the assets and liabilities of the business, which make up a larger part of the final value of the business. For this reason, sustainable value approaches focus on three areas of sustainability (social, economic and environmental) from which resources are aggregated into a monetary assessment. According to Cardoni et al. (2020), the clearest definition of sustainable value is proposed by Hart and Milstein (2003) in the much-cited “Creating sustainable value” (Hart and Milstein 2003): “Hart and Milstein (2003) defined sustainable value as strategies and practices that contribute to a more sustainable world while simultaneously driving shareholder value”. Figge and Hahn (2004) were early pioneers in this field. Their sustainable value approach focuses on the three core areas of sustainability; on the analysis of their effective use from the perspective of the enterprise being evaluated; and on their contribution to sustainable value creation. A strong reaction to Figge and Hahn’s approach has been made by the Kuosmanens (Kuosmanen and Kuosmanen 2009). They argued that it is not appropriate to focus only on the theoretical object; the focus must also include the calculation or determination of the value. Other approaches that address the issue of sustainable value are discussed by Bocken et al. (2013); Kocmanová et al. (2016); Evans et al. (2017); Kurotová and Jankalová (2020); Hoedeman (2023).

Authors Hart and Milstein (2003) have developed a framework of sustainable value that makes the connection between the societal challenges of global sustainability and value creation (Nekhoda et al. 2018). The Sustainable Value Framework highlights how individual global challenges that have a link to sustainability can help identify and apply

appropriate strategies and practices (Malys 2023). These strategies and practices help to contribute to a more sustainable world while increasing value for the shareholders or investors of the business (Ruggerio 2021).

The improved method of Sustainable Value Added has incorporated an Economic Value Added (EVA) indicator into its calculation (Kassem et al. 2016). The latter is the most important indicator that combines all the essential components needed to describe the economic situation of an enterprise (Wang and Qiu 2023). The EVA indicator can be used to determine the value of not only large enterprises, but also small and medium enterprises (Makhija and Trivedi 2020; Tripathi et al. 2022). For this reason, gross value added (VA) is substituted for Economic Value Added in order to more effectively describe the financial situation of the enterprise being evaluated (Sharma and Kumar 2010). In (Jankalová and Kurotová 2020) the paper focuses only on the one dimension of the Sustainable Value Added concept—economic dimension. We assume that the Sustainable Value Added can also be calculated by transforming the economic indicator (economic growth; the gross value) through the Economic Value Added (EVA). The reason? Economic Value Added, as one of the most important and useful financial indicators, is used to determine the company's value (Kislingarová 2000; Markovič et al. 2016; Murni 2019; Behera 2020). From the perspective of financial management, it combines all the basic components required to describe the economic situation of the company (Vidrascu 2015). EVA is recognized as an important tool of performance measurement and management all over the world, particularly in advanced economies where it is adopted as corporate strategy (Daraban 2017). The EVA method, through the beta coefficient, takes into account the industry environment of the enterprise, and by its structure and method of calculation provides information on the financial situation of the enterprise as well as on the asset structure of the enterprise. In addition, the EVA ratio is also beginning to be used in approaches to determining the sustainable value of an enterprise.

Therefore, we see a need for further research in two directions:

- on the one hand, to identify the most important factors that have the same impact on sustainability and the Sustainable Value Added creation regardless of the company's size or of the branch in which it deals,
- on the other hand, to describe the link between the Economic Value Added (EVA) and the sustainable value.

The paper is organized as follows: Section 2 describes the methodology approach; Section 3 describes the design of a methodology for determining the sustainable value of the company, taking into account the factors influencing its value; Section 4 discusses the main findings, including the link between the Economic Value Added (EVA) and the sustainable value.

2. Materials and Methods

The main objective of the paper is to propose a methodology for determining the sustainable value of an enterprise with respect to the factors influencing its value. The fulfilment of the aim of this paper is preceded by the following:

- analysis of research studies about the business valuation and sustainable value approaches (see Section 1),
- identification of factors influencing the value of the company (see Section 3),
- analysis of the Economic Value Added (EVA) indicator regarding its use in determining the sustainable value of the company (see Sections 1 and 3).

This study is based on information that was gathered through an extensive literature review (research publications and research studies; the company's financial statements with notes) using Internet and research databases (e.g., Web of Science, Scopus, RePEc, EconBiz, DATAcube, Damodaran ONLINE) and the authors' own experiences. To fulfil the aim of the paper, methods of analysis, comparison, selection, abstraction, induction, deduction and statistics (exploratory factor analysis) were used. The basic methods of

scientific investigation were used in obtaining and collecting information, processing the information and then in evaluating and interpreting the results.

2.1. Identification of Factors Influencing Value of the Company

The exploratory factor analysis was used to identify the factors influencing the value of the company. Factor analysis provides an overview of a reduced number of financial ratios (affecting the value of the enterprise), which are grouped into factors. The reduced number of ratios representing the factors highlights the selected financial ratios that have the greatest impact on enterprise value. The exploratory factor analysis proceeds in the following steps:

1. Identification of variables
2. Application of factor analysis
3. Determination of several factors
4. Eigenvalue and variability of identified factors
5. Factor matrix of all components
6. Interpretation of outputs.

The form of the mathematical model of factor analysis is a set of p posterior variables or random variables X_1, X_2, \dots, X_p that have a multivariate distribution with a p -parameter vector of means μ_X and a covariance matrix Σ_p of rank p . The general factor analysis model assumes that there are q background common factors F_1, F_2, \dots, F_q which are less than p (preferably significantly less). These factors allow the j -th observable random variable X_j , $j = 1, 2, \dots, p$ to be expressed as follows:

$$X_j = \mu_j + a_{j1}F_1 + a_{j2}F_2 + \dots + a_{jq}F_q + \varepsilon_j, \quad (1)$$

where ε_j , $j = 1, 2, \dots$, are random (error) components referred to as factory specific; a_{jq} —factor weights (costs, saturations, loadings) that express the influence of the k -th common factor on the variable X_j (Stankovičová and Vojtková 2007).

The assumptions for the factor analysis model are as follows:

- P1: The common factors F_k , $k = 1, 2, \dots, q$ are independent and identically distributed random variables with zero means $E(F_k) = 0$ and unit variance $D(F_k) = 1$.
- P2: The specific factors ε_j , $j = 1, 2, \dots, p$ are random variables with zero mean ranks $E(\varepsilon_j) = 0$ and variances $D(\varepsilon_j) = e$, which are pairwise independent, i.e., $cov(\varepsilon_i, \varepsilon_j) = 0$.
- P3: The factors F_k and ε_j are independent random variables for each combination of $k = 1, 2, \dots, q$ and $j = 1, 2, \dots, p$, i.e., $cov(\varepsilon_i, \varepsilon_j) = 0$ (Hebák et al. 2007).

A factor analysis model satisfying all the assumptions above is called an orthogonal factor model. It is specific to this model that the factors are not correlated with each other. The orthogonal factor model, with all assumptions satisfied, takes the following form via a matrix form:

$$\Sigma_X = \text{cov}(X) = \text{cov}(\mu_X + AF + \varepsilon) = A \text{cov}(F)A^T + \text{cov}(\varepsilon) = AI_qA^T + E = AA^T + E \quad (2)$$

where Σ_X represents the covariance matrix; A represents the matrix of factor loadings; E represents the covariance matrix of the specific factors (Stankovičová and Vojtková 2007).

The basis of the principal components method is the decomposition of the covariance (correlation) matrix Σ . The covariance matrix has p eigenvalues $\lambda_1 \geq \lambda_2 \geq \dots \lambda_p \geq 0$ and to each of them there is an eigenvector e_i , (Stankovičová and Vojtková 2007). Then, the following is obtained:

$$\Sigma = \lambda_1 e_1 e_1' + \lambda_2 e_2 e_2' + \dots + \lambda_p e_p e_p' = [\sqrt{\lambda_1} e_1 \sqrt{\lambda_2} e_2 \dots \sqrt{\lambda_p} e_p] [\sqrt{\lambda_1} e_1' \sqrt{\lambda_2} e_2' \sqrt{\lambda_p} e_p'] \quad (3)$$

The above equation meets the covariance structure for a factor analysis model that has just as many factors as there are variables ($m = p$) and specific variances $\psi_i = 0 \forall i$ (Stankovičová and Vojtková 2007). The factor model $EX = AA^T + E$ does not uniquely

determine the matrix of factor weights A (except when $q = 1$). If some matrix A satisfies factor analysis, then for a matrix $B = AT$, where T is an orthogonal matrix (its columns are orthogonal with norm 1), the following holds: $E_X = BB^T + E$. Matrix B is also the solution of the factor analysis. We say that we obtained it by orthogonal rotation of the matrix A (Stankovičová and Vojtková 2007; Hebák et al. 2007). The results of the factor analysis were obtained through a statistical program PSPP. The data used in the application of the factor analysis were collected over a period of 12 years (2010–2021). Figures for each factor are given as an average for the European Union as a whole.

2.2. Methodology for Determining the Sustainable Value

The development of the methodology was carried out in the following steps:

1. Analysis of the two-stage model of the economic value-added method, which according to Mařík et al. (2011) takes the following form:

$$H_n = NOA_0 + \sum_{t=1}^T \left(\frac{EVA_t}{(1 + WACC)^t} \right) + \frac{EVA_{T+1}}{WACC * (1 + WACC)^T} - D_0 + A_0, \quad (4)$$

The two-stage model of the economic value-added method can be described in more detail as follows:

$$H_n = NOA_0 + \sum_{t=1}^T \left(\frac{NOPAT_t - (WACC * NOA_{t-1})}{(1 + WACC)^t} \right) + \frac{NOPAT_{T+1} - (WACC * NOA_T)}{WACC * (1 + WACC)^T} - D_0 + A_0, \quad (5)$$

where H_n = value of equity (of the company); NOA_0 = net operating assets in the year for which the value is determined; NOA_{t-1} = net operating assets in year $t - 1$; NOA_T = net operating assets in year T ; T = number of years for which the indicator EVA is calculated; $WACC$ = weighted average cost of capital; $NOPAT_t$ = net operating profit after tax in the year t ; $NOPAT_{T+1}$ = net operating profit after tax in the year $T + 1$; D_0 = value of debts with interest; A_0 = other (non-operating) assets.

2. Characteristics of the individual indicators that are part of the two-stage model of the economic value added method.

Economic Value Added (EVA)

$$EVA = NOPAT - (WACC * NOA), \quad (6)$$

where $NOPAT$ = net operating profit after tax; $WACC$ = weighted average cost of capital; NOA = net operating assets.

Net operating profit after tax (NOPAT)

$$NOPAT = \text{operating profit} * (1 - \text{tax rate}), \quad (7)$$

where operating profit is also referred to as earnings before interest and taxes (EBIT).

Weighted average cost of capital (WACC)

$$WACC = r_d * (1 - t) * \frac{D}{C} + r_e * \frac{E}{C}, \quad (8)$$

where r_d = total cost of debt; t = income tax rate; D = value of total debt; r_e = total cost of equity; E = value of total equity; C = total value of the company's combined debt and equity or $D + E$; D/C = percentage of financing that is debt; E/C = percentage of financing that is equity.

Net operating assets (NOA)

$$NOA = \text{assets of a business directly related to its operations} - \text{all liabilities directly related to its operations}, \quad (9)$$

3. Analysis of the improved method of Sustainable Value Added.

The improved method of Sustainable Value Added takes the form of the following:

$$SVA = EVA_c - \sum_{i=1}^n \left(\frac{EI_{i,c}}{EI_{i,b}} * EVA_b \right) - \sum_{j=1}^m \left(\frac{SI_{j,c}}{SI_{j,b}} * EVA_b \right) - \sum_{l=1}^k \left(\frac{GI_{l,c}}{GI_{l,b}} * EVA_b \right), \quad (10)$$

where SVA = Sustainable Value Added; EI = value of environment indicators; SI = value of social indicators; GI = value of governance indicators; b = benchmark of the company; c = studied company; EVA = economic value added.

4. Design of the methodology for determining the value of the enterprise through the selected method of determining the value of the enterprise.

3. Results

3.1. Identification of Factors Influencing Value of the Company

Exploratory factor analysis was used to identify the factors influencing the value of the business and was carried out in the following six steps.

1. Identification of variables

The variables that affect the enterprise and influence its value were identified through secondary research, using the literature that deals with the issue of determining the value of the enterprise (Mařík et al. 2011; Harumová 2016; Jakubec and Kardoš 2016). The identified variables represent the financial ratios acting on the enterprise and its value. The individual financial ratios are part of the income and other methods of determining the value of an enterprise, where they are used as necessary variables in the determination of value.

The variables identified are market risk premium, return on investment, beta coefficient, cost of equity, cost of debt, tax rate, cost of capital, return on equity, return on invested capital, inflation and country risk premium. These are variables that greatly affect the value of the business. The data on the variables were obtained through a database that is regularly produced every year by Professor Damodaran, an American expert in the field of enterprise value. The professor is dedicated to the prediction and analysis of various indicators that are essential in determining the value of an enterprise and can affect the value of the enterprise. For the variables in question, data were collected over a period of 12 years, 2010–2021 (Damodaran 2023). For data collection, those data that focused on the service sector and on the selected sectoral environment were important, since the paper is concerned with the service enterprise. The data for each factor are presented as an average for the whole European Union.

2. Application of factor analysis

Before the actual implementation of the factor analysis, it was necessary to create a database (set) of input data necessary for the implementation of exploratory factor analysis. Table 1 lists all the variables that are listed in the columns of that table and the rows list their measured values as of each year under study. Row 1 represents the year 2021 and row 12 represents the year 2010.

Once the database with data was created, factor analysis was conducted. The original settings of the software in which the factor analysis was carried out were modified. The covariance matrix analysis was changed to a correlation matrix. This change was made because factor analysis makes greater use of the analyzed variables in a normalized form, and the particular factor solution (even if there is a direct failure to convert the analyzed variables into a normalized form) is based on the correlation matrix or its estimation. Based on the above, the interpretation of the results through the correlation matrix more closely matches the idea and the subsequent steps that factor analysis implements, compared to the covariance matrix. Among other things, the correlation matrix represents the only possibility and this is on the basis that only in rare cases are all the variables analyzed expressed in the same units.

Another modification was to adjust the display of the results. The scree plot option, otherwise known as a scatter plot, was chosen to display them because of the simple way

of displaying the significance of the factors. For the factor rotation section, the varimax method was chosen, along with the display of rotation solutions.

Table 1. Factor analysis database.

Variable	Market Risk Premium	Return on Investment	Beta Coefficient	Cost of Equity	Cost of Debt	Tax Rate	Cost of Capital	Return on Equity	Return on Invested Capital	Inflation	Country Risk Premium
1	0.0604	0.0151	0.0106	0.0831	0.0436	0.1300	0.0596	0.0993	0.0566	0.0207	0.0331
2	0.0714	0.0182	0.0104	0.1007	0.0511	0.1300	0.0701	0.1112	0.0605	0.0268	0.0445
3	0.0606	0.0214	0.0107	0.0850	0.0443	0.1300	0.0622	0.1023	0.0540	0.0152	0.0357
4	0.0690	0.0303	0.0640	0.0900	0.0400	0.1300	0.0612	0.0717	0.0432	0.0134	0.0446
5	0.0486	0.0284	0.0600	0.0941	0.0400	0.1300	0.0627	0.0683	0.0400	0.0110	0.0457
6	0.0520	0.0304	0.0680	0.0950	0.0400	0.1300	0.0609	0.0946	0.0500	0.0009	0.0418
7	0.0549	0.0259	0.0720	0.0973	0.0600	0.1300	0.0633	0.0827	0.0500	0.0002	0.0431
8	0.0730	0.0324	0.0104	0.0853	0.0326	0.1319	0.0680	0.0691	0.0415	0.0085	0.0361
9	0.0728	0.0217	0.0095	0.0880	0.0387	0.1400	0.0700	0.0536	0.0500	0.0222	0.0336
10	0.0628	0.0200	0.0100	0.0872	0.0429	0.1400	0.0700	0.0219	0.0140	0.0275	0.0325
11	0.0600	0.0125	0.0100	0.0893	0.0415	0.1400	0.0700	0.0465	0.0368	0.0220	0.0353
12	0.0710	0.0150	0.0100	0.0853	0.0400	0.1400	0.0800	0.0341	0.0189	0.0093	0.0476

3. Determination of several factors

The following figure represents the real number of potential factors, which is expressed by means of a scree plot (Figure 1). The scree plot is used to determine other interpretable factors with their own numbers and variances. The Y-axis expresses the eigenvalue, which represents the eigenvalue. The eigenvalues obtained represent the results obtained by populating the database through the input data. The eigenvalue represents the number of a particular factor, which tells us how much variability the factor accounts for out of the total system of observed variables. On the X-axis, the factors are arranged from the largest to the smallest factor.

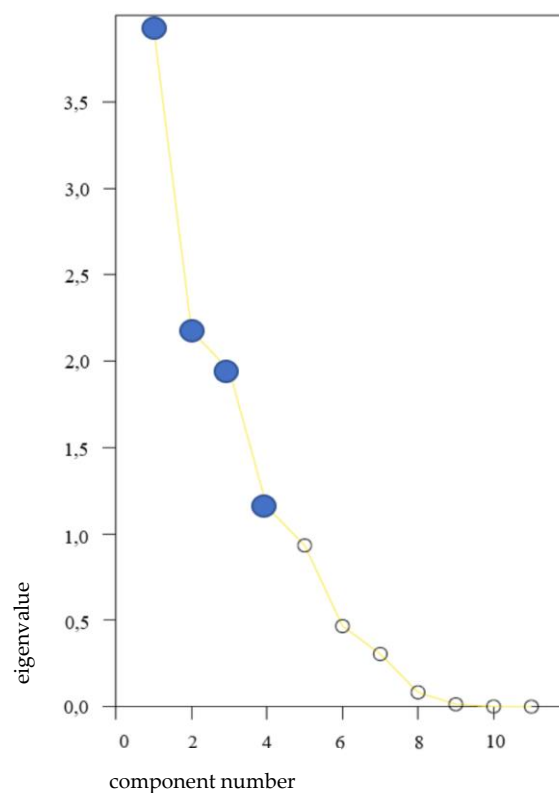


Figure 1. Scree plot (horizontal axis = component number; vertical axis = eigenvalue).

In this case, Figure 1 identifies eleven potential factors. If $y = 1$, the eleven potential factors would give us four significant factors, which are highlighted in blue (Hebák et al. 2007). The factors can be considered significant if their value is higher (greater) than 1.

4. Eigenvalue and variability of identified factors

Table 2 lists all identified factors in the component column. The number of identified factors is 11, but they have different amounts of eigenvalue, which is reported in the total eigenvalue column. The % of variability column tells us what percentage of variability is accounted for by a particular factor. The last column contains the cumulative percentage of that identified factor.

Table 2. Arranging factors by eigenvalues—Part 1.

Component	Total Eigenvalue	Initial Eigenvalues % of Variability	Cumulative %
1	3.92	35.65	35.65
2	2.17	19.74	55.39
3	1.95	17.72	73.12
4	1.16	10.51	83.63
5	0.93	8.48	92.11
6	0.47	4.24	96.35
7	0.30	2.77	99.12
8	0.08	0.75	99.87
9	0.01	0.12	99.99
10	0.00	0.01	100.00
11	0.00	0.00	100.00

In the factor analysis, the criterion $\lambda = 1$ was set, also in accordance with the theory by Stankovic and Vojtkova, which means that the program should display factors whose value is more than 1 (Stankovičová and Vojtková 2007). In Table 3, it can be noticed that of the eleven factors identified, only four have an eigenvalue greater than 1.

Table 3. Arranging factors by eigenvalues—Part 2.

Component	Total Eigenvalue	Initial Eigenvalues % of Variability	Cumulative %
1	3.92	35.65	35.65
2	2.17	19.74	55.39
3	1.95	17.72	73.12
4	1.16	10.51	83.63

The first factor reaches its eigenvalue of 3.92 and explains 35.65% of the variability. The first factor can be described as the most significant factor of all, based on its high eigenvalue. The second factor is smaller by 1.75 of the total eigenvalue than the first and its eigenvalue is at 2.17, accounting for 19.74% of the variability. The third factor has an eigenvalue of 1.95 and 17.72% variability. The last, fourth factor reached an eigenvalue of 1.16, representing 10.51% of the variability. The total percentage of variability explained by these factors, which is found in the cumulative % column, is quite high. The given factors reach an overall percentage of variability of 83.63%, which can be considered as a rather high percentage. In terms of the results obtained, this is a positive aspect, because the more variability is explained, the better it is possible to reduce the original variables.

5. Factor matrix of all components

In the factor matrix, the factor charge, the saturation for each component or factor, is given. The given matrix represents the most important output of the whole factor analysis. Table 4 shows the factor matrix of all the identified factors, where it is possible to notice for each component what its variability in that factor is. The variability provides an overview of how strongly a given component is represented in a given factor through its high absolute loading value.

Table 4. Factor matrix.

	Component			
	1	2	3	4
Market risk premium	−0.62	0.14	−0.62	−0.04
Return on investment	0.79	−0.47	−0.03	−0.30
Beta coefficient	0.88	0.24	−0.25	−0.19
Cost of equity	0.13	0.04	−0.57	0.00
Cost of debt	0.32	0.59	−0.02	0.73
Tax rate	−0.74	−0.49	−0.31	0.02
Cost of capital	−0.72	−0.08	−0.60	0.11
Return on equity	0.52	−0.50	−0.22	0.65
Return on invested capital	0.13	−0.93	−0.03	0.12
Inflation	−0.71	0.18	0.45	0.04
Country risk premium	0.42	0.37	−0.69	−0.20

As mentioned above, factor loadings range from -1 to 1 . An inverse relationship, or the highest negative correlation, is represented by a value of -1 , a non-existent correlation is represented by a value of 0 , and a value of 1 represents the highest positive correlation, which means that a given variable better saturates a given factor.

The next step that was implemented was the rotation of the factor matrix. The rotated factor matrix (Table 5) is used to better interpret the results obtained and to remove biases in the variance of the loadings of the individual factors identified.

Table 5. Factor matrix rotation.

	Component			
	1	2	3	4
Market risk premium	0.84	−0.25	0.18	−0.02
Return on investment	−0.59	0.48	0.44	−0.40
Beta coefficient	−0.57	0.03	0.77	0.10
Cost of equity	0.26	0.09	0.52	0.05
Cost of debt	−0.15	0.00	0.12	0.97
Tax rate	0.80	0.21	−0.27	−0.35
Cost of capital	0.94	−0.03	0.02	−0.04
Return on equity	−0.10	0.91	0.20	0.32
Return on invested capital	0.02	0.85	−0.11	−0.41
Inflation	0.25	−0.41	−0.71	0.03
Country risk premium	0.04	−0.17	0.88	0.12

6. Interpretation of outputs

From the eleven variables that were analyzed through factor analysis, four main factors can be constructed. The four factors represent the relationship between the variables analyzed. In the following section, the characteristics of the factors that were obtained through factor analysis are presented.

Factor number 1 achieved an eigenvalue of 3.92, representing 35.65% of the variability. The factor contains the following variables: market risk premium, tax rate, cost of capital and inflation. All these individual factors have positive values ranging from 0.25 to 0.94. The factor mentioned above has reached the largest eigenvalue and can therefore be said to consist of variables that are important and have a significant impact in the area of enterprise value. In terms of factor loading, it can be said that it is a significant factor whose absolute value is greater than 0.5; namely, it is a value of 0.71.

The second factor consists of variables such as return on investment, return on equity and return on invested capital. These variables constituting factor number 2 have positive values ranging from 0.48 to 0.91. Factor number 2 obtained an eigenvalue of 2.17, representing a variability of 19.74%. As for the obtained factor loading value, the factor loading

for factor number 2.77 reaches an eigenvalue of 0.75 for the variables, which represents an eigenvalue greater than 0.5, implying that it is a significant factor.

The third factor reached an eigenvalue of 1.95, accounting for 17.72% of the variability. The factor is made up of variables such as the beta coefficient, the cost of equity capital and the country risk premium. These three variables have positive values ranging from 0.52 to 0.88. In terms of factor loadings, the third factor has reached its absolute value of 0.72, indicating that it is also a significant factor.

The last factor reached an eigenvalue of 1.16, representing 10.51% of the variability. The fourth factor is made up of only one variable, namely the cost of debt. The cost of debt variable reaches a value of 0.97. By the fact that the last factor, which came out through factor analysis, is made up of only one variable, the factor loading of that factor is at 0.97 through absolute value. As with the remaining three factors, this is a significant factor.

From the results obtained from the factor analysis, it is possible to say that the eleven variables that represent external factors influencing the value of the enterprise were classified into four factors, which consist of these individual identified variables. Considering sub-objective 1, it can be concluded that the following factors influence the enterprise and its value: return on investment, market risk premium and beta coefficient, which are part of factors 1, 2 and 3. These are financial ratios that also take into account the industry environment in which the company operates. The indicators use precisely calculated values that are linked to a specific sector, e.g., the banking sector, the construction sector, the retail sector, the wholesale sector, the information services sector, etc. In addition to the above variables, the proposed methodology also reflects the tax rate variable (Factor 1), which has the same impact on the value of the enterprise. The identified factors are reflected in the proposed methodology for determining the value of the enterprise. Some factors are directly quantified in the individual calculations required for the enterprise value process and some factors are part of a specific value.

3.2. Methodology for Determining the Sustainable Value of the Company

The proposed methodology for determining the sustainable value of the company is based on a modification of the two-stage model of the economic value added method (4), (5) and of the improved method of Sustainable Value Added (10). The interpretation of the results is in accordance with the procedure set out in Section 2 “Materials and Methods”.

The improved method of Sustainable Value Added is considered to be a simple and appropriate approach in terms of time and labor. It works in conjunction with the financial statements of the enterprise being assessed, together with information on the contributions the enterprise is making to sustainability. In terms of the industry environment, it is an approach that reflects the specificities of the industry in which the company operates. Its application is universal and can be applied to any enterprise, regardless of its size. In its calculation, it includes an Economic Value Added (EVA) indicator. EVA is considered to be the most important indicator that combines all the basic components necessary to describe the economic situation of an enterprise. Through the beta coefficient, it takes into account the industry environment of the enterprise and, through its structure and method of calculation, provides information on the financial situation of the enterprise as well as on the enterprise’s asset structure (Kassem et al. 2016; Sharma and Kumar 2010).

From the improved method of Sustainable Value Added (10), the following is used to propose a methodology for determining the sustainable value of a business:

$$SVA = EVA_c - \sum_{i=1}^n \left(\frac{EI_{i,c}}{EI_{i,b}} * EVA_b \right) - \sum_{j=1}^m \left(\frac{SI_{j,c}}{SI_{j,b}} * EVA_b \right) - \sum_{l=1}^k \left(\frac{GI_{l,c}}{GI_{l,b}} * EVA_b \right), \quad (11)$$

The individual sustainability indicators were chosen because the proposed methodology focuses on the quantification of sustainable value, as traditional methods of determining enterprise value do not take sustainability into account in the final enterprise value. These are the sum of the environmental, social and governmental or economic indicators.

The indicator EVA_b is calculated in the sustainable value approach through a universal EVA calculation and this procedure will be maintained in the proposed methodology for enterprise value assessment.

The two-phase model of the economic value added method has undergone a real-world modification by extending the methodology to quantify individual sustainability indicators, as traditional methods of determining the value of an enterprise do not take sustainability into account in the final value of the enterprise. Consequently, the enterprise value in the form of sustainable added value of the enterprise is quantified on the basis of the following relationship (12):

$$UPH = NOA_0 + \sum_{t=1}^T \left(\frac{EVA_t}{(1+WACC)^t} \right) + \frac{EVA_{T+1}}{WACC * (1+WACC)^T} - D_0 + A_0 - \left(\sum_{a=1}^n \frac{EI_{a,P}}{EI_{a,B}} * EVA_B - \sum_{b=1}^m \frac{SI_{b,P}}{SI_{b,B}} * EVA_B - \sum_{c=1}^k \frac{GI_{c,P}}{GI_{c,B}} * EVA_B \right) \quad (12)$$

where UPH = sustainability value added of the company; NOA_0 = net operating assets in the year for which the value is determined; NOA_{t-1} = net operating assets in year $t - 1$; NOA_T = net operating assets in year T ; T = number of years for which the indicator EVA is calculated; $WACC$ = weighted average cost of capital; $NOPAT_t$ = net operating profit after tax in the year t ; $NOPAT_{T+1}$ = net operating profit after tax in the year $T + 1$; D_0 = value of debts with interest; A_0 = other (non-operating) assets; $EI_{a,P}$ = corporate environment responsibility indicator for the year; $EI_{a,B}$ = corporate environment responsibility indicator – benchmark; $SI_{b,P}$ = corporate social responsibility indicator for the year; $SI_{b,B}$ = corporate social responsibility indicator – benchmark; $GI_{c,P}$ = corporate governance (economic) responsibility indicator for the year; $GI_{c,B}$ = corporate governance (economic) responsibility indicator – benchmark.

The determination of the value of sustainable indicators includes, in each area, the contributions that the company makes to sustainability and thus also impacts its sustainable value. The selection of individual sustainability contributions is based on the TBL concept and the article by [Slaper and Hall \(2011\)](#). Values that the company has already achieved are marked with a P. Planned contributions, the company's benchmark, are marked with a B. The company demonstrates how it plans to improve its individual sustainability contributions in the coming year. The benchmark is based on a subjective decision by the company as to how much it would like to spend on the selected contributions. The performance of each sustainable contribution is the ratio of the present value of the sustainability contribution (P-value) and the company's benchmark (B-value) for that particular contribution. The individual results are then aggregated to obtain an indicator related to the respective sustainability area.

The indicators and their importance in determining the sustainable value of a company are summarized in Table 6.

Table 6. Overview of the indicators applied in the methodology for determining sustainable enterprise value.

Indicator	Description
EVA	provides the business manager with information on the economic performance of the business in a given year
NOPAT	by means of the indicator, the manager of the enterprise finds out what is the value of the net operating profit after tax of the evaluated enterprise
WACC	is used to determine at what rate the present and future free cash flow of the enterprise being evaluated will be discounted

Table 6. Cont.

Indicator	Description
NOA	provide the business manager with information on the assets (property) of the enterprise that are necessary for the enterprise to carry out its business activities
EI _{b,P}	represents a sustainable environmental indicator at present (and in the future) that will provide the business manager with information on the extent to which it is making (and intends to make) environmental contributions that have an impact on sustainability
SI _{b,P}	represents a sustainable social indicator at present (and in the future) that will provide the business manager with information on the extent to which he/she is making (and intends to make) social contributions that have an impact on sustainability
GI _{b,P}	represents a sustainable governance (economic) indicator in the present (and in the future) that will provide the business manager with information on the extent to which he/she is making (and intends to make) governance (economic) contributions that have an impact on sustainability

4. Discussion and Conclusions

4.1. Discussion about the Main Findings of This Study

The main findings of this study are as follows:

- FINDINGS 1: In determining the value of an enterprise, it is necessary to take into account the factors that significantly affect its value.

Currently, there are various approaches that can be used to determine the value of an enterprise. However, not all of them are able to take into account the factors that have a significant impact on a business and thus influence its value.

From the results obtained from the factor analysis, it can be said that the eleven variables that represent external factors affecting the value of the enterprise were classified into four factors, which consist of these individual identified variables. In relation to the main objective of the paper, it can be stated that taking into account the industry environment and also taking into account the chosen method of determining the value of the enterprise intended for modification, the following factors affect the enterprise and its value: return on investment, market risk premium and beta coefficient, which are part of factors no. 1, 2 and 3. These are financial ratios that affect the value of the business and also take into account the industry environment in which the business operates. These ratios use precisely calculated values that are linked to a specific industry, e.g., the banking industry, the construction industry, the retail industry, the wholesale industry, the information services industry, etc. In addition to the above variables influencing the value of the enterprise, the proposed methodology also reflects the variable tax rate (factor 1), which also has an impact on the value of the enterprise.

Finally, the identified factors influencing the value of the enterprise are reflected in the proposed methodology for determining the value of the enterprise. Some factors are directly quantified in the individual calculations required for the enterprise value process and some factors are part of a specific value.

- FINDINGS 2: The stakeholders require a more comprehensive view of value that includes economic, social and environmental benefits. They require the sustainable value.

Sustainable added value is a new way of measuring the individual contributions businesses make to sustainability. It represents the extra value that is created as a result of the use of economic, environmental and social resources. The value is expressed in absolute monetary terms (Jankalová and Kurotová 2020; Kocmanová et al. 2016) and displays information about the environmental and social efficiency of the sub-enterprise, the benchmark and the economic performance of the enterprise (Tur-Porcar et al. 2018).

Finally, businesses are gradually coming to terms with the need to operate on the principle of sustainability while focusing on promoting sustainable development (Lapinskaite et al. 2017). The sustainability of an enterprise is assessed by its economic,

social and environmental performance (Jankalová and Jankal 2018). Such an approach contributes to a more sustainable world while increasing value for the shareholders or investors of the business (Ruggerio 2021).

- FINDINGS 3: There is a link between the Economic Value Added (EVA) and the sustainable value.

Nowadays, many experts such as Figge, Hahn, the Kuosmanens and Kassem, who have developed sustainable value approaches (Jakubec and Kardoš 2016; Figge and Hahn 2004; Kuosmanen and Kuosmanen 2009; Kassem et al. 2016; Figge and Hahn 2008; Figge 2008; Kassem et al. 2015), have been working on the issue of sustainability. Kassem et al. (2016), in their publication *Sustainability Assessment using Sustainable Value Added*, incorporate the EVA indicator into the sustainable value approach, through which the sustainable value of an enterprise can be determined. The link between sustainable value and the EVA indicator offers huge potential for collaboration. As one of the most important and useful financial indicators, EVA is used to determine the value of an enterprise (Jankalová and Kurotová 2020). EVA is an indicator that measures the performance of a business and focuses on maximizing the profit of the business. The basic idea behind the indicator is that the invested capital should benefit the enterprise more than the cost that has been spent on it. The EVA ratio, which is part of the enterprise value approach and the sustainable value approach, has found popularity with Mařík (Mařík et al. 2011), Harumová (Harumová 2016) and Kassem (Kassem et al. 2015). However, the EVA indicator also has its detractors like Vasilescu and Popa (Vasilescu and Popa 2011). Jankalová and Kurotová (2020) cite the calculation of net operating assets and the calculation of the weighted average cost of capital as negatives. Kocmanová, Pavláková Dočekalová, Škapa and Smolíková (Kocmanová et al. 2016) found that “The link between sustainable value and EVA provides enormous potential for synergy”. The study by Friede et al. (Friede et al. 2015) claims that 90% of the results of existing research show a non-negative relationship between EVA and sustainable rank-value. According to Orlitzkeho et al. (Orlitzky et al. 2003), the relationship between EVA and sustainable value is simultaneous and bidirectional. According to Amin and Salehnezhad (2020), sustainable value has a significant positive impact on EVA in the growth and maturity stages of a business. Brogi and Lagasia (Brogi and Lagassio 2019) observed a positive between EVA and sustainable value in firms in the industrial and financial sectors.

Improved sustainable performance can increase competitiveness and reduce risks in the long term through efficient and sustainable capital allocation. Meeting growing stakeholder demands for transparency and sustainable development drives a company's reputation and financial performance. Evidence suggests (Blasi et al. 2018; López-Arceiz et al. 2018) that integrating socially responsible corporate behavior increases total stock returns and reduces financial risks. Social performance consistently drives economic performance, while environmental factors also have a statistically significant and positive impact, but to a lesser extent (Sila and Cek 2017). Alsayegh et al. (2020), drawing on a sample of Asian firms, reported a statistically significant and positive relationship between environmental, social and economic sustainable performance, and confirmed the interdependence between sustainable value creation and economic value.

Finally, the relationship between EVA and sustainable value can be understood as meaning that companies that effectively implement sustainable practices can increase their EVA in the long run. Sustainable practices can reduce costs, open up new markets, improve company reputation and reduce risks associated with environmental and social issues, which can ultimately lead to better financial performance and higher economic added value (Blasi et al. 2018). Conversely, ignoring sustainable aspects can lead to increased costs and risks, negatively affecting EVA. Therefore, it is important to integrate sustainable strategies into the overall management and planning of the business in order to optimize not only EVA but also the contribution to sustainable value (López-Arceiz et al. 2018).

- FINDINGS 4: The modification of the EVA method with the sustainable value approach brings a different perspective to the issue of determining the value of an enterprise.

The proposed methodology takes into account the ownership structure of the company and the factors influencing the resulting value of the company, taking into account its industry environment. The resulting enterprise value performs the following functions:

- reflects the value determined at a specific date, which takes into account the capital structure of the enterprise;
- provides an overview of the current state of the business as a whole, giving the business an insight into the individual sustainability activities it is undertaking;
- provides an overview of the individual operating assets and the net operating profit achieved by the company for the selected period.

The selection and application of universal methods of determining the value of an enterprise is always made on the basis of a certain reason, e.g., because of the liquidation of the enterprise being valued. The proposed methodology for determining the value of an enterprise is not limited by this fact and can be used for various purposes regardless of the size and time span of the enterprise being valued, since even a small enterprise can create value.

4.2. Research Limitations and Contributions of This Study

The proposed methodology has limitations that can be removed or improved with further research:

- Limiting factor 1:

The process of determining the value of an enterprise is itself very demanding in terms of time and work, and therefore any method or approach, even the proposed methodology, is characteristic in its difficulty, as it is an activity that requires thorough preparation and analysis of corporate information.

- Limiting factor 2:

The methodology works primarily only with the assets of the enterprise and does not take into account the name (brand) of the enterprise. Often it is the name or brand of the company that is the biggest factor on which the final value of the company depends.

- Limiting factor 3:

The value of the enterprise is affected by the management of the enterprise, which influences the value through its activities and knowledge. In the proposed methodology, this fact is absent, as it is difficult to quantify to what extent the management of the enterprise contributes to its value.

- Limiting factor 4:

Calculation of the net operating assets of an enterprise is a limiting factor, since, as is evident from their characteristics, it is difficult to define the individual items that are referred to as net operating assets. The selection of individual assets is based on the subjective decision of the person responsible.

Despite these limitations, the benefits of the study are summarized in Table 7.

Future development of the issue under study and the proposed methodology could continue to establish normative weights for the indicators against which the enterprise's terminal value would be judged. The issue of norm weights has been addressed by [Kocmanová et al. \(2016\)](#), who established weights for sustainable indicators, which they used to determine sustainable enterprise value. The norm weights would improve the interpretation of the results obtained and during the process of determining the value of the enterprise, the business manager would know what the situation of the enterprise being evaluated is and which selected areas need to be focused on in the future. Alternatively, standard weights could be assigned to indicators whose values are less or more critical to the enterprise and its operations. A further solution to the problem under study could focus on the analysis of financial ratios. Financial ratios play an important role in determining the value of an enterprise and their classification and quantification for a selected industry

can help in the process of determining the value of an enterprise. Many financial ratios are taken into account in the determination of enterprise value in terms of a value that is not related to the sectoral environment, but is reflected as a general value, which can be seen as a negative.

Table 7. Contributions of this study.

Contributions	Description
Theoretical contributions	<ul style="list-style-type: none"> • Analysis of research studies about business valuation and sustainable value approaches. • Emphasizing the importance of sustainability in the process of determining the value of the company (the stakeholders require the sustainable value). • Identification of the link between the Economic Value Added (EVA) and the sustainable value.
Practical contributions	<ul style="list-style-type: none"> • Identification of factors influencing the value of the company. • Design of the methodology for determining the sustainable value of the company. • The modification of the EVA method with the sustainable value approach brings a different perspective to the issue of determining the value of an enterprise.

Finally, most of the universal methods of determining the value of an enterprise, such as the equity method, the CF ROI method, profit capitalization, etc., fail to take into account the industry environment of the enterprise in the process of determining the value and at the same time quantify its sustainable value. The starting point is a proposal in the form of a modification of the EVA method with a sustainable value approach, since sustainability represents the ability of an enterprise to remain productive over time and to maintain its potential in terms of long-term profitability.

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