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VALUATION OF GOODWILL USING WEIGHTED AVERAGE RETURN ON ASSETS: ASSESSMENT OF AVERAGE TRANSPORT AND STORAGE ENTERPRISE IN THE CZECH REPUBLIC

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Abstract. The paper deals with intangible assets - the goodwill of a company and its valuation using the Weighted Average Return on Assets (WARA) method. The paper aims to determine the value of goodwill of an average enterprise in the Transport and Storage sector in the Czech Republic for the period 2016-2020 and then to consider the use and benefits of the WARA method. The data are obtained from the Cribis database of Crif - Czech Credit Bureau, s.r.o. for the period 2016 - 2020; for the paper, an average enterprise in the selected sector was selected, from which the individual items of the financial statements were defined for the preparation of the balance sheet and profit and loss statement. The difference between the income valuation of the company using the net income capitalisation method and the equity valuation was used to calculate the goodwill of the average company, which was then modified using the WARA method. The resulting goodwill value of the average enterprise in the order of hundreds of millions, on the one hand, indicates a long-standing and prosperous enterprise with a sound business name, providing quality services; on the other hand, with such a high value, a possible error in the data can be considered, as the vast data sample provided was difficult to analyse by averaging the data to define the average enterprise in the sector. Further research could be directed again towards the valuation of goodwill by the WARA method, as this research field needs to be strengthened.

Keywords: intangible assets; goodwill; WARA; weighted average return on assets; enterprise; transportation and warehousing

1. Introduction

Society is changing, and so is the competitive model. The era of innovation is dawning, where the input of intangible assets plays a decisive role in companies' long-term development. This intellectual capital largely determines the value of an enterprise (Li et al., 2019). Thus, knowledge of the critical indicators of the importance of intangible assets contributes to the effective management of the enterprise and the growth of its market value (Podhorska et al., 2019). Intangible assets create synergistic effects and are a source of sustainable enterprise value creation (Da Silva et al., 2015) and a kind of standard for measuring the comprehensive quality of an enterprise. Assuming that an enterprise wants to survive in a competitive environment, it must systematically and effectively manage its intangible assets.

The long-standing traditional notion of Chinese enterprises that "tangible assets are assets and intangible assets are not assets" has resulted in the management of intangible assets not being given sufficient

attention by enterprise management, resulting in most enterprises currently underperforming in the operation of intangible assets (Jiang and Zhou, 2019). Based on the above, the sources of business success in almost every industry stem not only from tangible assets but mainly from the intangible components of the business.

From a valuation perspective, the components of intangible assets can include set-up expenses, software, valuable rights, intangible research and development results, goodwill, preferential limits and emission allowances (Svacina, 2010). In the current literature, there is a small amount of material containing an understanding of the value of an enterprise based on knowledge-intensive activities, i.e. the value of intangible assets. Almost wholly absent is the matter of quantifying a businss'sof the intangible components of a business using the Weighted Average Return on Assets (WARA) method, (Osinski et al., 2017). The WARA method is a method that values the goodwill of a business as the difference between the purchase price of the company and the net asset value in a weighted return concept, where the average weighted return on assets corresponds to the average weighted return on capital from the perspective of liabilities WACC (WARA = WACC) (Svačina, 2010).

The paper will focus on the valuation of intangible components of the business of Czech companies operating in the transport and warehousing sector, or goodwill itself, in an income approach, analysing the rate of return on intangible assets using the WARA method. The transport sector deals with transport, one of the most essential and pivotal activities created during the development of human civilisation (Petruf et al., 2015; Antosko et al., 2015). Modern transport is the total of all activities leading to the long-distance transport of raw materials, products and people or information, including the intangible and tangible means leading to such transport (Gavurova et al., 2021). Transport is place-specific and differentiated. Within the European countries and the Czech Republic, which are generally small in size, national transport predominates, especially road transport, which competes strongly with rail transport. The importance of air transport tends to be less important on a national scale, given the size of the territory and the variety of communication routes (Gavurova et al., 2020; Kelemen et al., 2021). However, the situation is different in countries with a large land area, such as the United States, Canada, Australia or Russia. Here, air transport is usually the most advantageous. Transport in China is quite specific. This country has the most extensive high-speed railways with a standard travel speed of 300-350 km/h. It is also intensively developing magnetic levitation trains, which should reach speeds of around 600 km/h. Maritime transport accounts for approximately 40% of the world's total transport capacity and is the dominant mode of transport for bulk cargo (e.g. oil, coal, liquefied gas).

The Panama and Suez canals, the Nile and Mississippi rivers and the large lakes on the Canada-US border are economically crucial for waterborne transport. Transport, like other economic and geographic activities, is unevenly spread throughout the world and goes hand in hand with the economic level of each country (Melnikova et al., 2016; Polischuk et al., 2019). In developed countries and countries in the affluent North, transport networks are incomparably denser than in countries with low economic levels and low development of local transport networks (Dobrylovsky, 2021).

The paper aims to express and quantify the intangible components of companies operating in the Transport and Storage sector in the Czech Republic for the period 2016–2020 in an income approach, using the WARA weighted average return on assets method. To meet the stated objective, two research questions are defined:

VO1: What is the total value of intangible assets – the goodwill of companies in the Transport and Storage sector in the Czech Republic for 2016-2020 determined using the WARA method?
VO2: Why was the WARA method chosen to express and quantify the intangible components of business intangibles in the Transport and Storage sector in the Czech Republic for the period 2016-2020 and is this method suitable for the purpose or not?

2. Literary research

The function and importance of the transport, logistics and warehousing sector have evolved from its historical origins in antiquity to the current decade of the 21st century, which more than any previous stage in history is characterised by uncertainty and the impossibility of prediction. The importance and relevance of a given sector depend not only on the subject of the business but also on the size of the enterprise, its location, the availability of resources and the end customer. Head of Logistics Škoda Auto, a. s. Ing. J. Cee once stated concerning the role of transport, logistics and warehousing in business that "logistics is the artery of the car company and the individual processes are its blood, without which it could not live" (Jurová et al., 2016). A similar theme is also viewed by Rowland et al. (2021). In general, the transport and warehousing sector in the Czech Republic shows financial health and prospects. The process of globalisation in terms of economic and political has caused transport companies to strive to meet the highest standards of leading companies (Vochozka et al., 2016).

The economic literature is increasingly witnessing an increased interest in intangible assets, knowledge assets, intellectual capital and other related concepts. Many books, studies and articles have been written on this topic and these concepts. Still, these have not produced any consensus, and none of the published valuation methods has become the method used globally (Pastor et al., 2017). A similar theme is also viewed by Novakova et al. (2022). The perception of intangible assets by companies worldwide varies according to statistically significant factors such as geographic region, industry sector and size of the organisation (Axtle-Ortiz, 2013). The intensification of intangible asset exploitation within global value chains has created new sources of market power (Cédric & Milberg, 2020).

Ionita and Dinu (2021) state that every company should perceive the essential role of intangible assets, maintain awareness of their importance to the business and invest in the various sub-components. Thus, business managers are advised to invest in intangible assets to achieve managerial goals and strategically use three key contributors such as R&D, advertising and human capital (Seo et al., 2020; Wang et al., 2021; Škare et al., 2021; Streimkiene et al., 2021). The Vochozka et al. (2020) also dealt with a similar issue in predicting future Brent oil prices. This is the only way to ensure the long-term and sustainable development of the company. Every company has assets. These assets can be divided into tangible, intangible and financial assets. According to Krulický et al. (2020), valuing intangible assets is challenging for companies. In some cases, this obligation stems directly from the law, in the Czech Republic from Act No. 563/1991 Coll. on Accounting (Czech Republic, 1991). Valuation issues are dealt with in the field of valuation by experts for a variety of reasons (Rowland et al., 2019). The valuation of property in the Czech Republic is regulated by Act No. 151/1997 Coll. on the Valuation of Property and on Amendments to Certain Acts (the Valuation of Property Act). This Act also applies to the valuation of intangible assets (Czech Republic, 1997). Similar topics were also dealt with Sun et al. (2022).

Intangible sources of wealth creation are represented by intellectual capital (Sanchez-Segura et al., 2014). Baranes (2020) defines intangible assets from a balance sheet perspective as identifiable and non-identifiable, further arguing that identifiable intangible assets most often take the form of patents, trademarks, copyrights, licensing agreements and other forms of intellectual property and are associated with specific product line or a specific product. These assets are initially measured at a cost but at fair value on purchase and sale and are amortised over their useful lives. Unidentifiable tangible assets are generally known as 'goodwill' and are not linked to a specific product line or product (Škare & Riberio Soriano, 2021; Wang et al., 2022; Škare et al., 2022). Intangible assets are rarely valued on their own. They are usually used in conjunction with other assets, according to Pratt and Grabowski (2014), primarily as part of an existing business in the context of a group of assets. The company's reported book value does not consider investments in intangible assets. However, intangible assets can be estimated and added to the business's book value (Amenc et al., 2020). Vochozka et al. (2021) also take a similar perspective on this issue.

According to Zéghal and Maaloul (2019), intangible assets are increasingly important in a company's capital and are becoming more important than tangible assets. According to economists, this theory expresses the transition of the current industrial economy to a new "knowledge-based" economy. As the knowledge-based economy develops rapidly, intangible assets become more valuable to enterprises, and their valuation attracts much research in the field of technology management (Chiu, 2007). Knowledge-based economies emphasise increasing the value of a company by creating a competitive advantage by putting up barriers to imitation. This advantage represents the company's intangible assets, and the importance of valuing intangible assets should already be perceived here (Hanafizadeh, Hosseinioun & Khedmatgozar, 2015). There are three approaches to the valuation of intangible assets - income, cost and market. According to Crane (2019), the income approach is based on the principle of expected economic benefits, the market approach is anchored on the principle of substitution, whereby alternatives are considered and substitutes are sought, and the cost approach is based on the principle of determining the costs incurred for a given asset. Bryan, Rafferty and Wigan (2017) note that the balance sheet has not been found to be an appropriate place to account for intangible assets, so valuation issues are left to the income statement. Since the nineteenth century, the economic phenomenon of goodwill – a particular type of intangible asset – the goodwill, prestige, brand, image, and reputation of a company has attracted the attention of economic experts, both in the field of identification and quantification (Kliestik et al., 2018). Its value is still a topical issue for the scientific community in the valuation and verification of corporate goodwill (Podhorska et al., 2019 a). Knowledge of the critical indicators of goodwill value contributes to the growth of the market value of a company and its effective management (Podhorska et al., 2019 b). According to Dohnal, Hanusová and Lipovská (2019), the value of goodwill changes over time, so it is necessary to detect its evolution from its very growth to its decline and the emergence of bad will (bad reputation). Generally, the value of goodwill is determined as the difference between book value and market price (Zadorozhnyi et al., 2018), while Goodman (2016) once stated that goodwill could not be bought; goodwill must be earned.

From an accounting perspective, goodwill is valued as a residual amount, i.e., the excess over the fair values of the net assets acquired at the acquisition date. This residual amount does not need to be separately reported in the financial statements and captures the fair value of the assets (Pratt & Grabowski, 2014). To quantify this value, goodwill must be considered in its entire context, which may be, for example, a group of assets or a business enterprise as such with the intrinsic values of identifiable intangible assets and the aggregate value of all assets of the enterprise, including non-identifiable intangible assets (e.g., purchase price or fair value). One approach that can be used to determine the value of goodwill is the Weighted Average Return on Assets (WARA) method (Schüler, 2020). According to Pratt and Grabowski (2014), this approach addresses the rate of return on unidentifiable intangible assets by comparing the weighted average return on all assets with the WACC or internal rate of return (IRR). The overall WARA calculation is then embedded in the subtraction of the fair value of the entity's identifiable assets from the fair value of the entity (e.g. purchase price).

3. Materials and methods

For the quantification of the value of intangible assets – goodwill using the Weighted Average Return on Assets (WARA) method, Czech enterprises in the Transport and Storage sector that can be classified according to the CZ NACE classification of economic activities in section "H" will be selected for the period from 2016 to 2020 (CZSO, 2022 a). The necessary financial and accounting data for the valuation will be drawn from the Cribis database from Crif – Czech Credit Bureau, s.r.o.

The actual data processing will be done by adjusting the aggregate of all data for companies that have unacceptable values in their data (negative values of assets, fixed assets, intangible fixed assets, tangible fixed assets, financial fixed assets, current assets, inventories, long-term receivables, short-term receivables, short-term financial assets, trade receivables, share capital, equity, capital funds, reserves, provisions, sales proceeds, depreciation and amortisation, proceeds from the sale of fixed assets, proceeds from the sale of materials, residual value of fixed assets sold, profit or loss after tax and undertakings in

liquidation or inactive). The aggregate data will be further disaggregated by 2016-2020, and all available data will be averaged each year. From this disaggregated data, the financial statements of an average enterprise – balance sheet and profit and loss account - will be defined. It will then proceed to determine the values necessary for the income valuation of the average enterprise using the capitalised net income method, namely the permanently withdrawable net income, the calculated interest rate, the risk-free return, the risk premium for business risk, the risk premium for financial stability and the risk premium for enterprise size. The permanently withdrawable net return, i.e. the amount that could be withdrawn from the average undertaking without undermining the overall substance of the undertaking, will be calculated according to the following formula:

Table 1. Calculation procedure for permanently withdrawable net income

Profit before tax
(+) Depreciation
(-) Financial income
(-) Proceeds from sale of fixed assets
(+) Cost of fixed assets sold
(+) Extraordinary personnel costs - restructuring
(-) Extraordinary income
(+) Extraordinary expenses
Adjusted profit/loss before depreciation, amortisation and tax of UVH
Chained price index
Price index base year 2020
UVH adjusted for inflation (UVH/base c. index)
Scales
Inflation-adjusted UVH x weights
TOTAL
Permanently withdrawable net income before depreciation
Permanently withdrawable net income before tax
Tax base (with last year's depreciation)
Tax (19%)
Permanently withdrawable net income after tax before adjustment

Source: Mařík 2007, Own processing

The calculated interest rate for the capitalised net income method represents, in principle, the cost of equity or the return on alternative use of capital and will be determined using the modular method using data published by the Ministry of Industry and Trade of the Czech Republic according to the following formula:

Equation 1: Formula for calculating the interest rate using the modular method

$$r_e = r_f + r_{pod} + r_{finstab} + r_{la} \tag{1}$$

where:
re   cost of equity
rf   risk-free yield (10year government bond yield)
rpod   risk premium for business risk (sector riskiness)
rfinstab   risk premium for financial stability (sector riskiness)
rla   risk premium for size (sector riskiness)

Source: Mařík 2007, Own Elaboration

From the investor's point of view, the risk-free return is subject to several requirements, such as minimum illiquidity risk, no risk of default, accessibility to investment, etc., which will be determined using the normal interest rate for a relatively risk-free investment customary in the country. For the valuation, according to the established practice in the Czech Republic, the development of the yield of a 10 year Czech government bond will be considered. In contrast, the interest rate of these bonds already

incorporates all potential risks and corresponds to the local market situation. The interest rate on government bonds is based on the rating of the economy in question by internationally recognised rating agencies and the level of interest rates announced by the CNB.

Table 1. In the development of the yield of the ten-year government bond of the Czech Republic in 2020

Year	Moon	Value
2020	Following	1,62
2020	February	1,47
2020	March	1,28
2020	April	1,28
2020	May	0,92
2020	June	0,86
2020	July	0,86
2020	August	0,95
2020	September	0,98
2020	October	0,94
2020	October	1,12
2020	December	1,26

Source: Kurzy.cz 2022, Own processing

The risk premium for business risk expresses the riskiness of a given sector in relation to other sectors of the economy. It is determined on the website of the Ministry of Industry and Trade of the Czech Republic according to the sector of activity of the enterprise. In this case, it will be determined by the Transport and Storage sector, classified according to the CZ NACE classification of economic activities in section "H", for Q1-Q4 2019 under the financial analyses for 2019. The risk premium for financial stability and the risk premium for size will be determined identically by searching by the sector on the website of the Ministry of Industry and Trade of the Czech Republic (MIT, 2022).

Then, an income valuation of the average company will be carried out using the capitalised net income method, taking into account the deduction of the long-term inflation rate, which is 2% according to the CNB (CNB, 2022). The income valuation will be based on the following formula, with the necessary values of the permanently withdrawable net income and the calculated interest rate determined above:

Equation 1: The formula for calculating the yield value of the enterprise

$$HP = \frac{T\check{C}V}{ik} \qquad (2)$$

where:
HP   Enterprise Value
TCH   permanently removable net income
and $_{the}$ calculated interest rate

Source: Mařík 2007, Own processing

Next, based on the accounting data from the 2020 balance sheet, the company's assets will be valued by adding up the items of tangible fixed assets, current tangible assets, inventories and financial assets and deducting the liabilities from the sum of these items.

The value of goodwill will be determined as of 31 December 2020 as the difference between the enterprise value determined by the income approach and the enterprise value determined by the equity valuation of the business.

The values necessary for calculating the weighted average return on assets, the 'WARA', the return on equity and the required return on equity will then be determined, and the values for the necessary

calculations will be entered in separate tables. The required ROE (Return on Equity) will be determined according to the following formula:

Equation 2: Formula for calculating the required return on equity called ROE

$$ROE = \frac{\text{profit after tax}}{\text{equity}} \quad (3)$$

Source: Mařík 2007, Own processing

The required return on foreign capital will be determined using the following formula:

Equation 3: Formula for calculating the required return on foreign capital

$$rCK = \frac{bank\ loans}{interest\ expense} \quad (4)$$

Source: Mařík 2007, Own processing

This will be followed by the compilation of a table in which the data needed to calculate the average weighted return on WARA assets according to the following formula will be entered:

$$WARA = r_{VK} * \frac{VK}{K} + r_{CK} * (1 - d) * \frac{CK}{K} \quad (5)$$

where:
rVK   required return on equity
VK   equity
K   the total value of invested capital (gross, i.e. VC + CK)
rCK   required return on external capital
d   income tax rate (19 %)
CK   foreign capital
CK/K   debt ratio

Source: Mařík 2007, Own elaboration

Finally, a table will be drawn up presenting the value of goodwill determined on the basis of accounting data by the difference between the income and equity valuation of the average company, the value of goodwill determined using the calculated WARA coefficient and the resulting value of goodwill according to the following formula:

Equation 4: The formula for calculating the value of intangible assets – goodwill

*+/- Goodwill value = Goodwill value determined on the basis of accounting data + (Goodwill value determined on the basis of accounting data * WARA)*

Source: Mařík 2007, own processing

4. Results

First, an analysis of all financial data available from the Cribis database was carried out. This data was adjusted for companies with unacceptable values in their data (negative values for assets, fixed assets, intangible fixed assets, tangible fixed assets, financial fixed assets, current assets, inventories, long-term receivables, short-term receivables, short-term financial assets, trade receivables, share capital, equity, capital funds, reserves, provisions, sales proceeds, depreciation and amortisation, proceeds from the sale of fixed assets, proceeds from the sale of materials, residual value of fixed assets sold, profit or loss after tax and undertakings in liquidation). The aggregate of the remaining data was then broken down by each year from 2016 to 2020, and all available data were averaged in each year. From this disaggregated data, the financial statements – balance sheet and profit and loss account – were defined.

1) Income valuation of the average company using the capitalised net income method

In view of the need to determine the values necessary for the income valuation of the average enterprise using the capitalised net income method, namely, the permanently withdrawable net income, the calculated interest rate, the risk-free return, the risk premium for business risk, the risk premium for financial stability and the risk premium for enterprise size, the following values were calculated in stages. The permanently removable net income was calculated according to Table 1 of the methodology.
The results are shown in Table 3.

Table 2. Calculation of permanently removable net income (CZK thousand)

Period	2016	2017	2018	2019	2020
Profit or loss before tax	2 986	6 005	8 352	8 322	10 194
(+) Copies	167	401	166	313	150
(-) Financial income	0	0	0	0	0
(-) Revenues from the sale of fixed assets	145	148	15	101	19
(+) Remaining price of sold fixed assets	111	125	18	34	56
(+) Extraordinary personnel costs - restructuring	0	0	0	0	0
(-) Extraordinary income	0	0	0	0	0
(+) Extraordinary costs	0	0	0	0	0
Adjusted result of UVH before depreciation and tax	3 119	6 383	8 521	8 568	10 381
Chain price index	1,019	1,033	1,014	1,004	1,003
Price index basic relative to 2020	0,948	0,979	0,993	0,997	1,000
Inflation-adjusted UVH (UVH/basic c. index)	3 290	6 520	8 581	8 594	10 381
Libra	1	2	3	4	5
INFLATION ADJUSTED UVH * Weights	3 290	13 040	25 743	34 376	51 905
SUM	128 354				
Permanently removable net income before depreciation (SUM/15 – sum of weights)	8 557				
Permanently removable net income before tax	8 557				
Tax base (with depreciation from the last year in the amount of 151 thousand.)	8 708				
Tax (19%)	1 655				
Permanently removable net income after tax before correction	7 053				

Source: data from Cribis database, Own processing

The chained price index was determined according to the rule 1 + inflation rate for each year 2011–2015/100 (for 2016 the inflation rate for 2011 - 1.9%, for 2017 the inflation rate for 2012 - 3.3%, for 2018 the inflation rate for 2013 - 1.4%, for 2019 the inflation rate for 2014 - 0.4% and for 2020 the inflation rate for 2015 - 0.3%) of the inflation rate for each year (CZSO, 2022b).
The 2020-based price index was determined as follows:

2016 = 1/(1,033 * 1,014 * 1,004 * 1,003) = 0,948
2017 = 1/(1,014 * 1,004 * 1,003) = 0,979
2018 = 1/(1,004 * 1,003) = 0,993
2019 = 1/(1,003) = 0,997
2020 = 1,000

According to the profit and loss account, depreciation from the last year amounted to CZK 151 thousand. CZK. The amount of permanently deductible net income after tax was determined at CZK 7,053 thousand. CZK. This fact confirms the fulfilment of the going concern principle.

In order to determine the enterprise value, the calculated interest rate (cost of equity) was calculated in accordance with Equation 1 of the methodology.

With regard to the formula for calculating the calculated interest rate, the risk-free yield was first determined using the normal interest rate for a relatively risk-free investment in a given country. In contrast, for the valuation, the development of the yield on the 10-year Czech government bond in 2020 was considered. According to Table 2 of the methodology, the yield of the 10-year Czech government bond in 2020 ranged from 0.92% to 1.62%. Due to the valuation date, the yield of the 10-year government bond for December 2020 will be considered at 1.26%.

To calculate the interest rate using the modular method, the amount of the risk premium for the business risk was also determined based on the field of activity of the company under assessment, the Transport and Storage sector, classified according to the CZ NACE classification of economic activities in section 'H', for the 1st to 4th quarters of the year. The risk premium for the financial stability of 1.95% and the risk premium for enterprise size of 0.28% (see Table 4) were found in the same way on the website of the Ministry of Industry and Trade of the Czech Republic (MIT, 2022).

Table 3. Calculation of the calculated interest rate (cost of equity)

R_f – risk-free rate	1,26 %
R_{pod} – Risk premium for business risk	2,65 %
$R_{finstab}$ – Risk premium for financial stability	1,95 %
R_{la} — Risk premium for the size of the enterprise	0,28 %
Calculated interest rate	6,14 %

Source: Ministry of Industry and Trade 2022, Own processing

The calculated interest rate was set at 6.14%.

On the basis of the determination of the necessary values, it was at this stage possible to proceed to the actual income valuation of the average company using the capitalised net income method.

The value of the average enterprise determined using the net income capitalisation method was thus determined in accordance with Equation 2 of the methodology, with the interest rate calculated at constant prices and the assumed long-term target inflation rate set at 2 % according to the CNB. Table 5 shows the calculation of the equity value of the average company using the net income capitalisation method.

Table 4. Calculation of the value of the equity of an average enterprise using the net income capitalisation method

Calculated interest rate (r_e)	6,14 %
Projected long-term inflation	2,0 %
Calculated interest rate (r_e excluding inflation)	4,14 %
Operating value of equity (permanently removable net income/calculated interest rate excluding inflation)	CZK 170 362K
Valuation of non-operating assets	CZK 815K
Value of equity according to KČV	CZK 171 177K

Source: Data from the Cribis database, own processing

The calculated interest rate of 6.14% was reduced by the assumed long-term inflation target of 2%. The operating value of equity was determined by the proportion of the value of the permanently withdrawable net income after tax of EUR 7 053 thousand. The operating value of equity thus amounts to CZK 170 362 thousand, i.e. a value of 4,14 %. CZK. The value of non-operating assets (tangible fixed assets in progress, long-term securities) amounts to CZK 815 thousand. CZK. The value of the average enterprise determined by the income method of capitalised net income amounts to CZK 171 177 thousand.

2) Asset valuation of the average company

To determine the goodwill value of the average business, a property valuation of the business was subsequently performed using data from the 2020 balance sheet by summing the items of tangible fixed assets, current tangible assets, inventories and financial assets. From the sum of these assets, the liability item was deducted. Thus, on the basis of the book value, the asset value of the undertaking was determined. The selected items and the calculation result are presented in Table 6.

Table 5. Property valuation of an average holding

Item	Value (CZK thousand)
(+) Tangible fixed assets	17 559
(+) Tangible assets of short duration	27 899
(+) Stocks	5 507
(+) Financial assets	786
(-) Accounts payable	21 905
Calculation of the assets of the enterprise	
(DHM+KHM+Z+FM) – Payables	29 846

Source: Data from the Cribis database, own processing

By summing up all assets that are used for the operation of business activities and subtracting the item of liabilities, the m and property value of the average enterprise was determined by the amount of **CZK 29,846,000**.

3) Determination of the goodwill value of an average holding

The value of goodwill was determined from the point of view of accounting as the difference between the yield value of an average enterprise and its asset value.
The value of goodwill of an average company = CZK 171,177,000 – CZK 29,846,000 = CZK 141,331,000.
The value of goodwill amounted to CZK 141,331,000 as of **31.12.2020.**

4) Determination of goodwill by the WARA method

With regard to the values required by the WARA calculation formula, the cost of equity was calculated according to Equation 3, and the cost of foreign capital was calculated according to Equation 4. The cost of equity was determined by the ratio of profit after tax to equity to the average enterprise. Cost of equity is presented in Table 7. The cost of foreign capital was determined by the ratio of bank loans to interest expenses. The cost of foreign capital is presented in Table 8.

Table 6. Calculation of the cost of equity

Item	Value (CZK thousand)
Profit after tax	7 103
Equity	28 841
Cost of equity (%)	
Profit after tax/equity	0,246

Source: Data from the Cribis database, own processing

Table 7. Calculation of the cost of foreign capital

Item	Value (CZK thousand)
Bank loans	960
Interest expense	173
Cost of foreign capital (%)	
Bank loans/interest expenses	5,549

Source: Data from the Cribis database, own processing

In order to determine the WARA coefficient, Table 9 was drawn up, containing all the values necessary for the calculation, namely the total value of the invested capital, the required return on equity, equity, the equity ratio/total market value of the invested capital, the required return on foreign capital, the income tax rate, the value of the foreign capital and the level of indebtedness.

Table 8. Calculation of WARA – intangible components of business in the transport and storage sector within the Czech Republic for the period 2016 – 2020

	Pointer	Value
K	Total value of invested capital (brutto, i.e. VK + CK)	52 292 thousand CZK
rVK	Required return on equity	0,246
Ic	Equity	28 841 thousand CZK
VK/K	Equity/total market value of invested capital	0,551
rCK	Required return on foreign capital	5,549
d	Income tax rate	0,19
(1 – d)	1 – Income tax rate	0,81
CK	Value of foreign capital	23 452 thousand CZK
CK/K	Debt ratio	0,448

Source: Cribis database, own processing

The calculation was constructed according to Equation 5 given in the methodological section as follows:

$$WARA = r_{VK} * \frac{VK}{K} + r_{CK} * (1 - d) * \frac{CK}{K} = 0,246 * \frac{28\,841}{52\,292} + 5,549 * (1 - 0,19) * \frac{23\,452}{52\,292}$$
$$= 0,246 * 0,55153 + 5,549 * 0,81 * 0,44848 = 0,13568 + 2,01578 = \mathbf{2,15}$$

The resulting WARA value is 2.15% as of 31.12.2020**.** This value represents the average weighted return on assets, which will be further applied throughout the concept of calculation, based on the calculation from the point of view of accounting, and the resulting values will be multiplied by the value of WARA, as presented in Table 10.

Table 9. Calculation of goodwill in the WARA concept

Pointer	Value (in thousands CZK)
Goodwill value	141 331
Hodnota goodwill x WARA	3 039
Resulting goodwill value	144 370

Source: Cribis database, own processing

The value of goodwill was determined by the WARA weighted return method as of 31.12.2020 at the amount of **CZK 144,370,000.**

5. Discussion of results

The results were intended to answer two research questions, namely:

VO1: What is the total value of intangible assets – the goodwill of companies in the Transport and Storage sector in the Czech Republic for 2016–2020 determined by the WARA method?

VO2: Why was the WARA method chosen to express and quantify the intangible components of business intangibles in the Transport and Storage sector in the Czech Republic for the period 2016-2020 and is this method suitable for the purpose or not?

The research question under consideration is "Which items (segments) predominantly comprise the intangible assets of enterprises in the transport and storage sector in the Czech Republic for the period 2016-2020?" was finally not included in the conducted research due to the extensiveness of the given matter, which will be the subject of further separate research.

The processed data was used to define the book value of goodwill of an average enterprise as of 31.12.2020 using an income valuation using the capitalised net profits method and an equity valuation of CZK 141 331 000. A subsequent calculation was used to determine the WARA percentage. By multiplying this value by the defined carrying amount of goodwill, an amount of CZK 3 039 000 was determined and added to the carrying amount of goodwill. The resulting value of goodwill of the average Czech company in the Transport and Storage sector for the period 2016-2020, determined using the WARA method, was set at CZK 144 370 000. The resulting value can be assessed as being very, if not disproportionately, high. This fact indicates a long-established and prosperous company with a good business name. However, because of the disproportionate value, a possible data error can also be inferred. The data sample provided was so broad that it was difficult to analyse it based on averaging the data to define an average undertaking in the Transport and Storage sector. However, this assumption cannot be substantially confirmed or refuted. However, the accuracy of the result depends not only on the quantity and quality of the data provided by the evaluator on a particular undertaking, but also on the possibility of predicting the evolution of the market economy.

Because of the above, however, one cannot disagree with the assertion of Vochozka, Rowland and Vrbka (2016), who conclude that the transport and storage sector in the Czech Republic shows financial health and prospects. Regarding the second research question, it can be stated that the WARA method was chosen to express the intangible components of business - goodwill in the Transportation and Warehousing sector within the Czech Republic in order to strengthen the research in the field of intangible asset valuation using the Weighted Average Return on Assets concept method, as it can be stated that scientific research has not been sufficiently focused on this method to date. There is only a limited amount of published material dealing with this method. The WARA method can be found to be appropriate for the purpose of valuation of intangible assets – goodwill, in particular, because of the summarisation and comprehensiveness of the overview of accounting data needed for its calculation.

6. Contribution of the work

The contribution of the thesis can be generally considered as pointing out the importance of intangible assets in the field of ongoing intense competition in all industries around the world with the aim of realising the value of intangible assets and the necessity of increasing it by investing in intangible assets already owned, but also in their acquisition. A company's goodwill expresses the economic individuality of the entity, its activities and products, and is, above all, about the company's reputation. In terms of the evolution of the value of goodwill, unlike other types of intangible assets, its value increases over time. The longer the existence of an enterprise, the higher the value of its goodwill due to its increasing credibility. Last but not least, the value of goodwill as such can also be considered as a benefit, as its value is not derived from accounting, but knowing its value can not only in the transport and storage sector,

influence the behaviour of shareholders, managers, but also potential investors, as a high goodwill value signals a long-running and prosperous company with a good reputation for providing quality services.

The paper can also be considered a contribution of the work dealing with the valuation of intangible assets using the weighted average return on assets method, the so-called WARA, as this area has not been intensively researched until now and is faced with very few available resources. Further research could again be directed towards the valuation of goodwill using the WARA method, as there is a need to strengthen this research field. Furthermore, the segments that predominantly comprise the intangible assets of companies in the Transport and Storage sector could be specified. Finally, it should be added that future research should consider the economic impact of the Covid-19 pandemic in 2020-2022 and the ongoing war of Russia against Ukraine in 2022. Furthermore, the research results can be the basis for further study in the sector.

7. Conclusion

The paper aimed to express and quantify the total value of intangible assets – the goodwill of an average company in the Transport and Warehousing sector in the Czech Republic for the period 2016-2020 using the weighted average return on assets WARA method, including the reason and appropriateness of using the WARA method in this case.

By processing and modifying the data set from the Cribis database of the Czech Credit Bureau, s.r.o., the provided data was cleaned of unacceptable values, averaged and followed by the preparation of the financial statements – balance sheet and profit and loss statement for the average enterprise. Subsequently, it proceeded to determine and define the values required for calculating the income valuation of the assets of the average enterprise using the capitalised net income method, the property valuation and the WARA value calculation. After obtaining all the necessary information and values, according to the procedure defined by the methodology of this work, the value of goodwill of an average enterprise in the Transport and Storage sector for the period 2016-2020 was determined by the WARA method in the amount of CZK 144 370 000. The resulting high value of goodwill of an average enterprise, on the one hand, indicates a long-running and prosperous enterprise with a sound business name providing quality services; on the other hand, with such a high value, a possible error in the data can be considered, as the provided extensive data sample was difficult to analyse based on averaging the data to define an average enterprise in the sector. The research has shown that to successfully determine the goodwill value of an enterprise, a reasonable and adequate amount of data is needed to achieve a more accurate research result.

In general, the thesis's contribution highlights the importance of intangible assets in the field of intense competition in all industries worldwide, pointing out the necessity of investing in acquiring and maintaining these assets. Another contribution is the quantification of the value of goodwill itself for knowledge of its value by managers, shareholders and investors. Another contribution of the paper is using the weighted average return on assets method, called WARA, due to the need for more research and the scarcity of available resources on this matter. In future research on applying the WARA method to the valuation of corporate goodwill, it would be appropriate to consider the economic impact of the Covid-19 pandemic in 2020-2022 and the ongoing war of Russia against Ukraine in 2022. Given the above, it can be concluded that the objective of the thesis has been met.

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