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# MEASURING THE INTELLECTUAL CAPITAL OF INTERNATIONAL CARRIERS AS LOGISTIC OPERATORS

## ABSTRACT

*The age of knowledge has come and the enterprises present themselves as »knowledge enterprises« and their employees as sources of knowledge - »knowledge workers«. Knowledge has become a merchandise, to be on the knowledge market. In an enterprise knowledge becomes the capital, important for achieving competitive advantage on the market but it cannot be measured easily. The field of intellectual capital is very complex, mostly because it is difficult to categorize it. The important concepts and definitions for intellectual capital include an emphasis that intellectual capital is based on knowledge and is usable in any enterprise. Knowledge and skills determine the possibilities of an individual to actively influence the social development and ensure their quality of life.*

## KEY WORDS

*intellectual capital, an enterprise, tertiary logistics, balance of accounts, statement of business outcome*

## 1. INTRODUCTION

In any developing economy, traffic science, knowledge and administration knowledge in general, especially inter-disciplinary and multi-disciplinary knowledge, becomes the main factor for the success, efficiency and profitability of every logistic company. The Slovene economy is presently ineffective and overwhelmed by the impact of globalization. The fact is that the competition is increasing from day to day. Slovenia wants to be a modern society, founded on knowledge. This demands improvements in quality, an efficient educational system, and the improvement of knowledge submission as a competitive ability in the global markets.

There has been a lack of research within the context of these problems: In the Republic of Slovenia, as in other transitional states as well, there is still too lit-

tle theoretical investigation into intellectual capital and too little realization about its phenomena within the economy in general. This is also valid for business-carrier logistic companies.

In accordance with such problems, particularly those regarding scientific research, there is a need to: explore the actual theoretical and practical problems concerning the contemporary phenomena of intellectual capital on the successes of business-carrier logistic companies, which produce logistic products. To systematically and simply formulate the research results about the theoretical characteristics of intellectual capital, and provide important logistic guidelines, concerning the impact of intellectual capital on any improvements of business-carrier logistic companies as logistic carriers.

The problem and the subject of this research refer to two realistic stochastic researches which are the objectives: intellectual capital and carrier logistic company producing logistics products.

The subject and object of this research is to present, scientifically, a paradigm for formulating a scientific hypothesis: intellectual capital (human capital, structural capital and capital of clients) is a fundamental indicator of the success and profitability for carrier logistic companies. A value indicator for intellectual capital, enables suitable administration, creative and operative management, of all potentials and systems in carrier logistic companies.

## 2. THEORETICAL CHARACTERISTICS OF A CARRIER AS A LOGISTIC OPERATOR

The concept of logistics presents a uniform approach for a carrier as a logistical operator. It allows

them to integrate systems for the distribution of goods. It encapsulates objective business planning, the control and regulation of business and, therefore has an impact on quicker and more efficient working processes. Thus a logistic operator becomes a co-modeller of logistic service important and indispensable factor in the international exchange of goods.

## 2.1 CARRIERS DEVELOPMENT AND RECOGNITION AS A UNIVERSAL OPERATOR

The task of a carrier, as a logistic operator, is to coordinate all procedures, functions and activities at the start, in progress and at completion, thus ensuring the complete transport chain. All the tasks which a carrier as logistic operator performs are important, the influence of speed, accuracy, safety and time accessibility, when the goods are in transit. He must also know all the advantages and legalities regarding traffic requirements and multi-modal transport. He must use his advantages, he must know the law, he must correctly determine handling requirements and take responsibility for professionalism and coordinate the work of all participants within the transport chain. In this way he can have an influence on any market share of multi-modal transportation (Zelenika, R., 2005, p. 210).

A carrier, as a logistic operator, must strive to ensure that his goals are compatible with the goals of marketing, management, organization, all theory - read the goals of cybernetics and information sciences, because he must satisfy the needs of his customers. He must, at the same time, fully administer production, the distribution and selling of products, take care to generate as big an income as possible, whilst having as small production costs as possible.

## 2.2 TRANSFORMATION OF A CLASSIC CARRIER OPERATOR INTO LOGISTIC OPERATOR

Today a classic carrier agency, purely by its own activities, cannot essentially influence the flow of goods and with time it will become a troublesome or redundant chain link. The business policy of a logistic company or operator (large, middle or small) should include a definition of concrete goals over clear periods or policies, its principles, its type procedures and sources for forming business goals, thus ensuring growth and development.

The carrier, as a logistic operator, is a registered legal party entity, which, as a rule is registered in its own name and on its own account, performs and organizes the implementation of numerous logistic activities such as the organization, transport, transfer of raw materials, intermediate products, final products,

goods and live animals from the point of handing them over (raw base, storehouse, terminal, exporter) at the receiving point (producer, storehouse, buyers, importers). This needs to be done with the intention of maximizing market satisfaction (buyer, users, consumers).

The main characteristics for transforming of the carriers role is focusing on his work aims. To transform him from being merely a customs mediator to the organizer of a complete logistics service. The fact is that a lot of small, or "niche" classical carriers are involved only with customs mediation and just sometimes involve themselves with the organization of dispatch, deliveries and the transit of goods during the production of transport services in classical transport. Middle-sized carriers normally engage in the organization of dispatch, deliveries and transit and just sometimes appear as operators of combined and multi-modal transport. Large or mega-carriers engage in organizing dispatch, deliveries and transit in the production of transport services for all types of transport: in classical, in combined and multi-modal transport. Mega-carriers usually have their own transport capacities (road vehicles, coaches, or toll railway vehicles), mechanization (lifts, forked cranes), own storehouses and specialized terminals. Some mega-carriers have their own traffic, maritime and tourist agencies to get there, agencies for transport insurance. Such carriers appear in three statuses: in the status of commission agent, agent and independent businessman.

The best function, in which classic international carriers appear today, above all as mega-carriers and sometimes as middle-sized carriers too, is the function of multi-modal transport operator (MTO - Multi-modal Transport Operator). Together with the FIATA – Bill of Lading for multimodal transport, the operator of multi-modal transport combines the functions of classic organizer, for both the transport processes, and as carriers. In such instance the carrier is responsible for the selection and for the work of people included in the multimodal transport chain.

## 2.3 MEGA AND NICHE LOGISTIC OPERATORS

"Mega" carriers as logistic operators prevail in the world transportation systems. They are the proponents of accelerated traffic technical development, technologies, organization, economies, management and laws. They satisfy almost two thirds of the world's traffic market demand and dictate the "rules of the game" on the world's traffic market. For numerous reasons, a "mega" carrier, as a logistic operator, cannot offer high-quality and economic logistic service on numerous, small, local and specific traffic markets, on which, for many reasons, there are specific traffic requirements and traffic demand. "Niche" carriers as lo-

gistic operators have discovered their own business opportunity on such markets. They are actually small or middle-sized operators, normally specializing in certain types of logistic activity, on defined traffic routes and familiar with the local area. "Niche" carriers, as logistic operators are as a rule more flexible and competitive at their own specific tasks than "mega carriers as logistic operators". The incessant competition from strong and large logistic operators (mega carriers as logistic operators) has positive influence on their quality of service and on consolidating their business positions using a clearly defined course.

The most important task of the carriers as logistic operators is increasing the quality of their intellectual capital. They must incorporate it into activities of all types (production, trade, traffic or transport, storehouses and distribution ...), they must adapt their business policy to the needs of the users of logistic services and their information systems to the needs of active participants in the logistic chain.

## 3. MEASURING OF INTELLECTUAL CAPITAL IN CARRIER COMPANIES

### 3.1 METHODS OF MEASURING INTELLECTUAL CAPITAL

During the 1980s the development of invisible phenomena regarding economy arrived in the area of accounting science in order to strive for and measure the invisible economic assets. Companies, which have already started to measure invisible assets, are finding, that through these measurements they can reflect the actual value to each company. The best known and the most often used procedures during the measurement of intellectual capital are (Sveiby, K. E., 2002, p. 3):

- Direct methods of intellectual capital (Direct Intellectual Methods - DIC); we estimate the monetary values of invisible assets by finding their ingredients. Then we can, based on these only, directly evaluate them - individually or as a common coefficient.

- In the method of market capitalization (Market Capitalization Methods - CMC); we calculate them as the difference between the market capitalization of the company and its own capital (which is the value of the company invisible assets). This method is based on the market values of shares.

- The methods regarding return assets (Return on Assets methods - ROA); are the accounts methods. The gross profit of a company before taxes, which, over a certain period, must be divided by the mean value of the tangible fixed assets of the company over the same period. The resulting assets of the company are compared with the ROA in the

areas in which the company operates. We must multiply the difference by the tangible fixed assets of the company to get a mean annual profit from intangible fixed assets. If we divide this profit with the mean rate of interest of a company, we can derive the estimated value of the intangible fixed assets or of the intellectual capital of the company.

- Scoring methods (Scorecard Methods - SC); first we must find various ingredients of intangible fixed assets or of the intellectual capital. We can unite the pointers and indexes and present them on scorecards or on diagrams. These procedures are similar to direct procedures of intellectual capital; however, with the difference, that evaluation is not made with regard to the monetary value of the intangible fixed assets but we must define the individual ingredients of IC as non-finance parameters. For illustration we can finally make and show a common index for the calculated components.

Obviously, there are a lot of methods and different ways of measuring intellectual capital. But which method is most proper? None of these methods is perfect and no particular method is generally accepted. Every company must determine which procedure it will choose. A company can choose a suitable model in six steps, based on the research by Skyrme. D. (2002, p. 55). He studied numerous companies which had developed their own models for the measuring of intellectual capital. It is essential that we accede to choice, completely. A company should first develop, be conscious of, and understand knowledge, submission and nature of intellectual capital; it should concur about what brings success to the company; choose suitable pointers; develop a measuring model that includes these chosen pointers; introduce systems for measuring and for the entire business process. This leads to and upgrades the managers value; uses objective and knowledgeable consultants for the derivation of key points during the measuring process.

### 3.2 MEASURING OF INTELLECTUAL CAPITAL WITH PROCEDURES FOR MARKET CAPITALIZATION

The method of market and bookkeeping values belongs to a procedural group for market capitalization. This method calculates the value for intellectual capital as a difference between the market capitalization of the company and its bookkeeping value (Stewart, T., A., 1999, p. 255):

Intellectual capital =

= Market capitalization - Bookkeeping value    (1)

This method assumes that everything included in the balance sheet is part of the market value of the company, introduces nonmaterial property, and then compares it with the material property.

The method has tolerably few deficiencies and that is the reason why we, as an improvement to this method, use the **Tobin Q** method. This method has not been developed for measuring of intellectual capital; however, it turns out well regarding this function. Tobin Q compares the market value of a company with the substitution value of its assets or bookkeeping value (Edvinsson, L., 1997, p. 367). The Tobin Q method also belongs to the group of market capitalization (MCM) methods.

Tobin Q = Market value of company /
/ substitution value of assets    (2)

Since finding the substitution values of assets is a very difficult task, as stated by Mr. Edvinsson, we can use the bookkeeping value instead.

If the value of coefficient Q is smaller than 1, this means that the market value is lower than the cost of substitution, which means that such an investment for a company is not profitable. This method has, in comparison to previous descriptive methods for the market and bookkeeping values, the advantage that it neutralizes the effects of "creative accounting ". Yet, there is a problem of determining the market value, which changes from moment to moment, and the costs of substitution (Stewart, T., 1999, p. 227).

Mr. Valentinčič found out that, in Slovenia, the quotient between market and bookkeeping value, in the middle of the year 2002 surpassed value 1 for only eleven companies, out of thirty-four, registered at the stock exchange in Ljubljana. This, of course, does not mean that Slovene companies do not have intellectual capital. However, low values are probably the consequence of the proprietary transformation of companies, and of some specific characteristics of the Slovene market capital (flux of information about future cash flows, joint ownership with employees), high interest rates, limited condition of available assets, and lack of stimulation for savings (Valentinčič, A., 2002, p. 22).

In continuation the results of intellectual capital measurements are listed for some of the biggest car-

rier companies, which appear as mega-logistic operators, namely: Viator&Vector d. d., Intereuropa d. d. and Feršped d. d..

The calculation of intellectual capital using the Method of market and bookkeeping value for Viator & Vector d. d. can be seen in Table 1:

The movement of the intellectual capital value in Viator &Vector d. d., for the period 2002 to 2004, calculated on the basis of the suggested methods, is shown in Diagrams 1 and 2.

The difference between market and bookkeeping values does not say a lot, because all this is still not comparable with other companies, so Tobin Q will be calculated in such a way as suggested by Mr. Edvinsson. We will use the market value of a company as the numerator and the bookkeeping value as the denominator. We can see the movement of this quotient from the year 2002 to the year 2004 in Diagram 2.

Diagram 2 shows that the value of quotient Q is smaller than 1, which means that the market value is lower than the costs of substitution, and this means that such an investment for this company is not profitable. In comparison, we have also calculated the intellectual capital using the Method of market and bookkeeping value for Intereuropa d. d. (see Table 2).
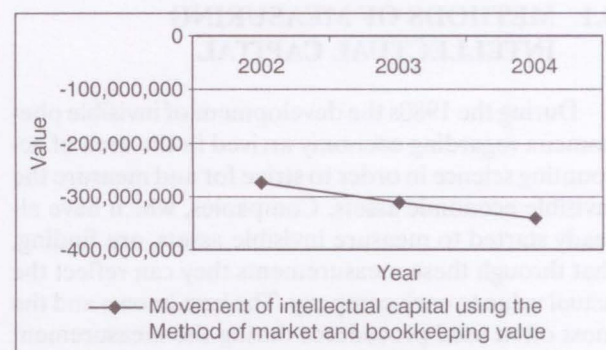


Diagram 1 - Movement of intellectual capital using Method of market and bookkeeping value of Viator &Vector d. d.

Source: According to data from Table 1

**Table 1 - Calculation of intellectual capital using the Method of market and bookkeeping value and Tobin Q for Viator &Vektor d. d.**

| Viator &Vektor d.d. | 2002 | 2003 | 2004 |
|---|---|---|---|
| No. of shares on the market | 18.039 | 18.632 | 18.791 |
| market value for a share in SIT (last business day of the year) | 23.040 | 23.191 | 23.191 |
| Bookkeeping value for a share in SIT | 38.295 | 39.897 | 41.283 |
| Market value of the company in SIT | 415.618.560 | 432.094.712 | 435.782.081 |
| Bookkeeping value of a company in SIT | 690.803.505 | 743.360.904 | 775.748.853 |
| Market – Bookkeeping Value = Intellectual capital | -275.184.945 | -311.266.192 | -339.966.772 |
| Market/Bookkeeping Value = Tobin Q | 0.60 | 0.58 | 0.56 |

Source: Annual report of company Viator &Vektor d. d, pp. 64-70

**Table 2 - Calculation of intellectual capital using Method of market and bookkeeping value for company Intereuropa d. d.**

| Intereuropa d.d. | 2002 | 2003 | 2004 |
|---|---|---|---|
| No. of shares on the market | 7.902.413 | 7.902.413 | 7.902.413 |
| market value for a share in SIT (last business day of the year) | 5.246 | 5.384 | 7.442 |
| Bookkeeping value for a share in SIT | 4.233 | 4.368 | 4.486 |
| Market value of the company in SIT | 41.456.058.598 | 42.546.591.592 | 58.809.757.546 |
| Bookkeeping value of a company in SIT | 33.450.914.229 | 34.517.739.984 | 35.450.224.718 |
| Market – Bookkeeping Value = Intellectual capital | 8.005.144.369 | 8.028.851.608 | 23.359.532.828 |
| Market/Bookkeeping Value =Tobin Q | 1.24 | 1.23 | 1.66 |

Source: Annual report of company Intereuropa, d. d., p. 103-107
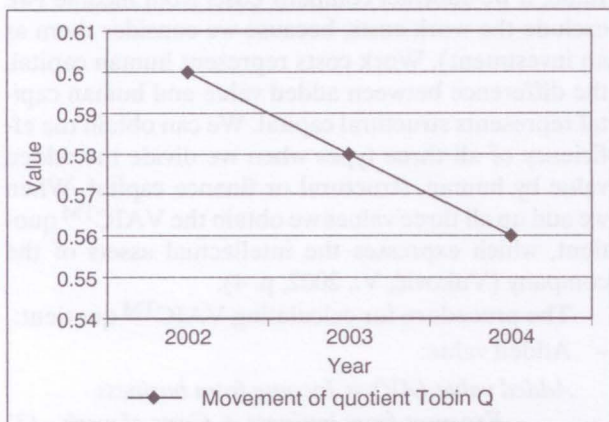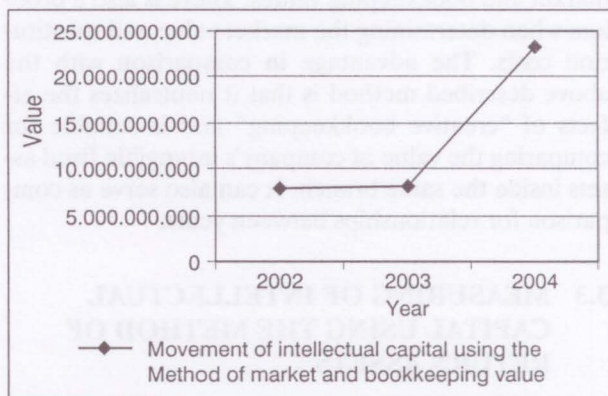


Diagram 2 - Movement of quotient Tobin Q for company Viator &Vector d. d.

Source: Developed by authors based on Table 1



Diagram 3 - Movement of intellectual capital calculated with Method of market and bookkeeping value of Intereuropa d. d.

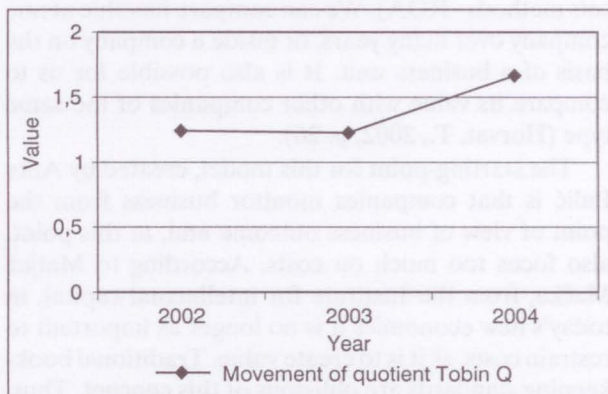Source: Developed by authors based on Table 2

In Diagrams 3 and 4 we can see the movement of intellectual capital value for the Intereuropa d. d. company over the last three years, calculated using the Method of market and bookkeeping values, and the Tobin Q method.

Because the differences between market and bookkeeping values do not say a lot we will calculate Tobin Q for the Intereuropa d. d. company. The movement of this quotient from 2002 to 2004 is shown in Diagram 4.

The value of quotient Q is bigger than 1, which means that the market value is bigger than the costs of substitution, and this means that such an investment for this company is profitable. The Intereuropa d. d. company is one of rare Slovene companies where the stock value on the Ljubljana stock exchange surpassed the value 1. We had planned to also make this same calculation for Feršped d. d. company. However, because of deficient annual company reports and difficult access to necessary data it was not possible to calculate the intellectual capital using the Method of market and bookkeeping values for this company.



Diagram 4 - Movement of quotient Tobin Q for the company Intereuropa d. d.

Source: Developed by authors based on Table 2

The Method of market and bookkeeping value is very quick, simple and logical, which are its advantages. However, it also has three big deficiencies. The first deficiency shows itself when determining the market value of a company, because fluctuations on the stock exchange are not in the hands of management. This fluctuation is at time of takeovers, shorter eco-

nomic cycles and other unpredictable factors, and very often indicates a swing in the basic intellectual capital of a company. What if company trades below its book-keeping value? It means that the company does not have intangible fixed assets. The second deficiency shows itself when determining the bookkeeping value, using various bookkeeping methods, procedures and standards. It reflects itself in various reviews of book-keeping categories. This reduces the credibility of the calculated values, and the possibility of comparisons (Stewart , T., 1999, p. 226).

The third deficiency of this method is that it does not offer any guidelines for improvement to the managers (Stewart, T., 1999, p. 227).

Tobin Q has equal deficiency to the Method of market and bookkeeping values. There is also a problem when determining the market value and substitution costs. The advantage in comparison with the above described method is that it neutralizes the effects of "creative bookkeeping" and is suitable for comparing the value of company's intangible fixed assets inside the same branch. It can also serve as comparison for relationships between years.

## 3.3 MEASURING OF INTELLECTUAL CAPITAL USING THE METHOD OF RETURN ASSETS

Intellectual quotient of the added value (VAIC$^{TM}$) is the only tool for finding the efficiency of intellectual capital which uses balance data and belongs to the methods of return assets (Return on Assets methods - ROA). We can compare its value at one company over many years, or inside a company on the basis of a business unit. It is also possible for us to compare its value with other companies of the same type (Horvat, T., 2002, p. 26).

The starting-point for this model, created by Ante Pulić is that companies monitor business from the point of view of business outcome and, at this point, also focus too much on costs. According to Matjaž Mačka, from the Institute for intellectual capital, in today's new economics it is no longer as important to restrain costs, as it is to create value. Traditional book-keeping standards are oblivious of this concept. Thus, the main question for the VAIC$^{TM}$ method is how to calculate this value using data from bookkeeping records. The economic theory is also a practice which looks on manual workers as costs. The VAIC$^{TM}$ method looks at costs as investment, the investment of a company in its own human capital, because that is the only way that a company can achieve its proper efficiency. It is necessary to control costs and reduce them, and regarding investments it is necessary to deal in such a way that will prove the most remunerative. We cannot look at non-specialists, even with the best

qualifications, as human capital, if they do not succeed in creating investment in itself, by its own contribution to creating value (salary, contributions, training, motivational programmes). If they invest their own knowledge and abilities in a company, it is not appropriate to consider them as costs. Just the opposite. In investment it is necessary to consider salaries, trainings and various benefits that the employers actually invest in their employees (Vuković, V., 2002, p. 4).

The quotient VAIC$^{TM}$ is the sum of three components, primarily the efficiency of human capital, then the efficiency of structural capital, and the efficiency of financial capital. In order to calculate the efficiency using these three types of capital, it is necessary first to calculate the added value. We can obtain the added value, if we subtract company costs from income (we exclude the work costs, because we consider them as an investment). Work costs represent human capital, the difference between added value and human capital represents structural capital. We can obtain the efficiency of all three types when we divide the added value by human, structural or finance capital. When we add up all three values we obtain the VAIC$^{TM}$ quotient, which expresses the intellectual assets of the company (Vuković, V., 2002, p. 4).

The procedure for calculating VAIC$^{TM}$ quotient:
- Added value:

$$\text{Added value (AV)} = \text{Income from business -}$$
$$- \text{Expenses from business} + \text{Costs of work} \quad (3)$$

- Capital efficiency:

$$\text{Structural capital (SK)} = \text{Added value -}$$
$$- \text{human capital} \quad (4)$$

$$\text{Human capital (HK)} = \text{Work costs} \quad (5)$$

$$\text{Fixed finance capital (FC)} = \text{Assets} \quad (6)$$

$$\text{Efficiency of finance capital (EFC)} =$$
$$= AV / FC \quad (7)$$

$$\text{Efficiency of structural capital (ESC)} =$$
$$= AV / SK \quad (8)$$

$$\text{Efficiency of human capital (EHC)} =$$
$$= AV / HK \quad (9)$$

- VAIC$^{TM}$ quotient that is, the general efficiency of added value creation:

$$VAIC^{TM} = EFC + ESC + EHC \quad (10)$$

We calculated the VAIC$^{TM}$ quotient from the annual report of Viator&Vector d. d. company based on the above defined procedure and data from the balance sheet and statements of business. Table 3 shows the individual components when calculating the quotient and value of VAIC$^{TM}$ for the past three years. For a clearer view we also added the degree of growth pointers.

Over the investigated period (2002-2004) the human capital of Viator &Vector d. d. (calculated by the Pulić[1] method 2001, p. 120), increased by 27%. There

**Table 3 - Calculation of VAICTM quotient in years 2002 - 2004 for Viator&Vector d. d.**

| (SIT) | 2002 | 2003 | 2004 | $I_{03/02}$ | $I_{04/03}$ | $I_{04/02}$ |
|---|---|---|---|---|---|---|
| Income from business | 17.351.656.000 | 19.771.483.000 | 16.616.221.000 | 14% | -15% | -4% |
| Costs from business | 16.531.189.000 | 19.132.202.000 | 16.609.348.000 | 16% | -13% | 0,5% |
| Work costs | 2.114.944.000 | 2.288.741.000 | 2.689.510.000 | 8% | 17% | 27% |
| Added value | 2.935.411.000 | 2.928.022.000 | 2.696.383.000 | 1% | -8% | -8% |
| Human capital | 2.114.944.000 | 2.288.741.000 | 2.689.510.000 | 8% | 17% | 27% |
| Finance capital | 16.816.750.000 | 22.374.448.000 | 23.217.212.000 | 33% | 4% | 38% |
| Structural capital | 820.467.000 | 639.281.000 | 6.873.000 | -22% | -99% | -99% |
| Efficiency of human capital | 1,38 | 1,28 | 1,00 | -7% | -21% | -27% |
| Efficiency of finance capital | 0,17 | 0,13 | 0,12 | -23% | -8% | -29% |
| Efficiency of structural capital | 3,58 | 4,58 | 392,31 | -23% | 8465% | 10858% |
| VAIC$^{TM}$ | 5,13 | 5,99 | 393,43 | 16% | 6468% | 7569% |

Source: Annual report of Viator &Vector d. d., pp. 64 -70

was also an increase in finance capital, namely from the years 2002 to 2004 of 38%. Structural capital 2002 to 2003, decreased by 22% and fell again the following year by 99%. We can see the movements in these three types of capital in Diagram 5. The created added value decreased over this period by 8%.
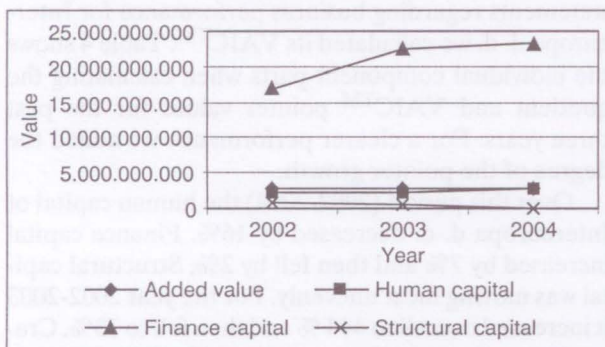


Diagram 5 - Movement of three types of capital and added value for company Viator &Vector d. d.

Source: Made by authors based on Table 3

Diagram 6 shows an analysis of the used sources efficiency over the years 2002 - 2004 for Viator & Vector d. d.

Table 3 shows that the efficiency of finance regarding human capital does not fluctuate significantly. In 2002 each SIT earmarked to employees created 1.38 SIT in value but in 2004 merely 1 SIT in new value. The efficiency of finance capital fell slightly because one currency unit injected into finance capital produced only 0.17 currency units in 2002 and only 0.12 in 2004.

The fall in structural capital efficiency in addition to the human capital section of the intellectual capital also had a decisive influence on the reduction in the entire efficiency of Viator&Vector d. d. (VAIC$^{TM}$)
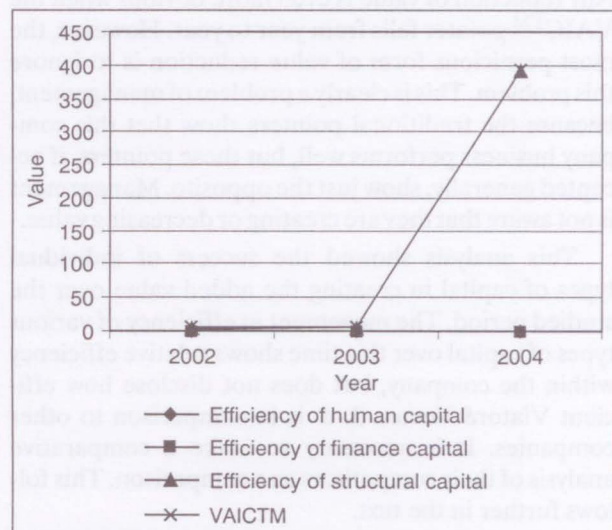


Diagram 6 - Movement of efficiency of three types of capital and of total efficiency of Viator &Vector d. d.

Source: Developed by authors based on Table 3

below the level of 2002. The efficiency in intellectual capital fell because of an increase in investments to structural capital, which failed to produce, as a consequence, a suitable increase in newly created value. We can see that in the case of Viator&Vector d. d., it is the efficiency of structural capital that determines the shape of the curve showing the entire efficiency.

From these pointers it can be seen that these three business resources (finance, human and structural capital) were inefficient in 2002 and 2003, because the entire efficiency (VAIC$^{TM}$) was very low but then grew rapidly in 2004. This means that for each input of one SIT in 2002 and 2003 a smaller value was created in 2004.

The fall in the efficiency of sources is a frequently used method of reducing value, but not the only one.

**Table 4 - Calculation of VAICTM quotient in years 2002 - 2004 for company Intereuropa d. d. (in SIT and %)**

| (in SIT) | 2002 | 2003 | 2004 | $I_{03/02}$ | $I_{04/03}$ | $I_{04/02}$ |
|---|---|---|---|---|---|---|
| Income from business | 31.153.031.000 | 30.467.803.000 | 30.638.166.000 | -2% | 1% | -2% |
| Costs from business | 30.818.568.000 | 28.647.457.000 | 30.143.985.000 | -7% | 5% | -2% |
| Work costs | 6.445.304.000 | 5.654.758.000 | 5.375.524.000 | -12% | -5% | -16% |
| Added value | 6.779.767.000 | 7.475.104.000 | 5.869.705.000 | 10% | -21% | -13% |
| Human capital | 6.445.304.000 | 5.654.758.000 | 5.375.524.000 | -12% | -5% | -16% |
| Finance capital | 45.692.042.000 | 48.741.419.000 | 47.831.733.000 | 7% | -2% | 5% |
| Structural capital | 334.463.000 | 1.820.346.000 | 494.181.000 | 444% | -73% | 48% |
| Efficiency of human capital | 1,05 | 1,32 | 1,09 | 26% | -17% | 4% |
| Efficiency of finance capital | 0,14 | 0,15 | 0,12 | 7% | -20% | -14% |
| Efficiency of structural capital | 20,27 | 4,11 | 11,88 | -80% | 189% | -41% |
| VAIC$^{TM}$ | 21,46 | 5,58 | 13,09 | -74% | 134% | -39% |

Source: Annually report for Intereuropa, d. d., p. 103-107

Any reduction of value is even more obvious when the VAIC$^{TM}$ pointer falls from year to year. However, the most pernicious form of value reduction is to ignore this problem. This is clearly a problem of management, because the traditional pointers show that this company business performs well, but these pointers, if accepted generally, show just the opposite. Management is not aware that they are creating or decreasing value.

This analysis showed the success of individual types of capital in creating the added value over the studied period. The movement in efficiency of various types of capital over this time shows relative efficiency within the company, but does not disclose how efficient Viator&Vector d. d. is in comparison to other companies. It is necessary to make a comparative analysis of their competitors as a comparison. This follows further in the text.

The main advantage of this method by Pulić is its simplicity, because it shows how much value in SITs is put into any individual source. In addition, all data are necessary for calculating the quotient in standard balances and reports about business. This is why additional research and the gathering of data is not necessary. In this regard the used procedure parameters are simple, they are understandable by the management of any company that generally does not have extensive bookkeeping knowledge. Because of this standard approach and of its objectivity it is also easier to compare with competitive companies (benchmarking). Another important advantage of this method is that it can be at all levels, from an individual department or production process within a company, to strategic business units (Sitar, A. S., 2003, p. 138)

On the other hand, this method has deficiencies. Though it identifies critical points concerning value creation, it does not give us a precise reflection about what action is necessary within a company and how to make it a better business. It does not show us the way forward. In spite of all this it is only a tool for the assessment of the value creation within a company. Company management must acquire the competence and carry it out in practice, thus accepting the decisions regarding change.

Based on the data from the balance sheet and the statements regarding business performance for Intereuropa d. d. we calculated its VAIC$^{TM}$. Table 4 shows the individual component parts when calculating the quotient and VAIC$^{TM}$ pointer values for the past three years. For a clearer performance we added the degree of the pointer growth.

Over this period (2002-2004) the human capital of Intereuropa d. d. decreased by 16%. Finance capital increased by 7% and then fell by 2%. Structural capital was moving most unevenly. For the year 2002-2003 it increased overall to 444 % and then fell to 73%. Created added value decreased by 13%. These movements can be seen in Diagram 7.
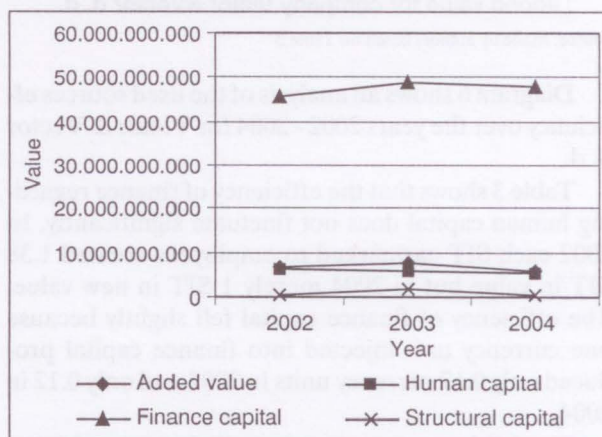


Diagram 7 - Movements of three types of capital and added value of company Intereuropa d. d.

Source - Developed by authors based on Table 4

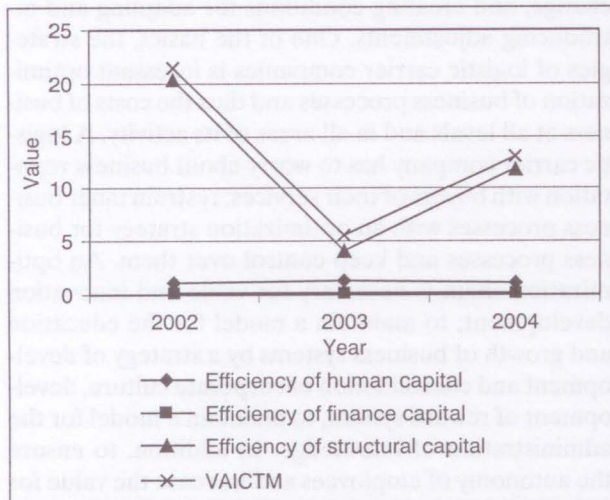In Table 4 we analysed also the efficiency of the used sources in the period from 2002 - 2004 (Diagram 8).



Diagram 8 - Movement of efficiency of three types of capital and of entire efficiency for company Intereuropa d. d.

Source: by authors based on Table 4

The most uneven movement in structural capital efficiency occurred because it first fell by 80% from 2002 to 2003 and then rapidly increased to 189%, but was still below the value of 2002. So, the efficiency in structural capital decreased by 41% from 2002 to 2004. The reason for such fluctuation hides in unequal increase in the structural capital and added value, because the added value decreased by 21% in 2004 in comparison to 2003, while the structural capital decreased by 73%. The efficiency in finance for human capital did not swing so strongly. In 2002 every SIT earmarked to employees created 1.05 SIT value and in 2004 1.09 SIT of new value. The fall in

the efficiency of intellectual capital occurred as investments in structural capital increased. It can be seen that the efficiency of structural capital shapes the curve for the entire efficiency of Intereuropa d. d.. There are in fact three sources of business that were ineffective, because the entire efficiency declined.

The data from the balance sheet and statement of business performance for Feršped d. d. were based on calculating VAIC$^{TM}$. Table 5 shows the individual components of calculation quotients and the values of the pointer VAIC$^{TM}$ over the past three years. For a clearer performance, the degree of the pointers growth was added.

Over this period (2002-2004) the human capital in Feršped d. d. increased by 17%. The finance capital decreased by 3 %. The structural capital decreased by 9%. The created added value declined by 12.6%. These movements can be seen in Diagram 9.
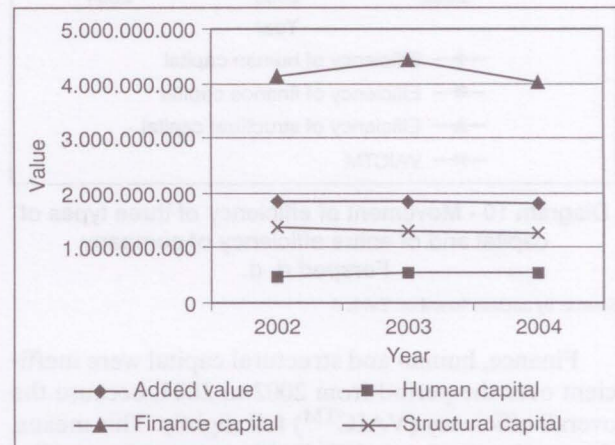


Diagram 9 - Movement of three types of capital and added value for company Feršped d. d.

Source: by authors based on Table 5

Table 5 - Calculation of quotient VAICTM in years 2002 to 2004 for company Feršped d. d. (in SIT and %)

| (in SIT) | 2002 | 2003 | 2004 | I$_{03/02}$ | I$_{04/03}$ | I$_{04/02}$ |
|---|---|---|---|---|---|---|
| Income from business | 16.815.699.000 | 17.665.344.000 | 14.549.277.000 | 5% | -0.17% | -13% |
| Costs from business | 15.426.738.000 | 16.356.959.000 | 13.289.867.000 | 6% | -0.18% | -14% |
| Work costs | 470.042.000 | 550.154.000 | 552.071.000 | 17% | 0,3% | 17% |
| Added value | 1.859.003.000 | 1.858.539.000 | 1.811.481.000 | -2.5% | -2.5% | -2.6% |
| Human capital | 470.042.000 | 550.154.000 | 552.071.000 | 17% | 0,3% | 17% |
| Finance capital | 4.132.513.000 | 4.413.288.000 | 4.016.856.000 | 7% | -0.09% | -3% |
| Structural capital | 1.388.961.000 | 1.308.385.000 | 1.259.410.000 | -6% | -0.04% | -9% |
| Efficiency of human capital | 3,95 | 3,37 | 3,27 | -14% | -3% | -17% |
| Efficiency of finance capital | 0,45 | 0,42 | 0,45 | -7% | 7% | 0% |
| Efficiency of structural capital | 1,33 | 1,42 | 1,44 | 7% | 1% | 8% |
| VAIC$^{TM}$ | 5,73 | 5,21 | 5,16 | -9% | -0,9% | -10% |

Source: Annual report of company Feršped d. d., pp. 103-107

Diagram 10 shows that finance efficiency, both human and of structural capital did not fluctuate strongly. In 2002 for every SIT earmarked to employees created 3.95 SIT of value, and in 2004 this was 3.27 SIT. The efficiency of finance capital fell a little from 2002 to 2003, because each unit put into finance capital produced 0.45 of that unit in 2002 and only 0.42 unit in a year 2003.
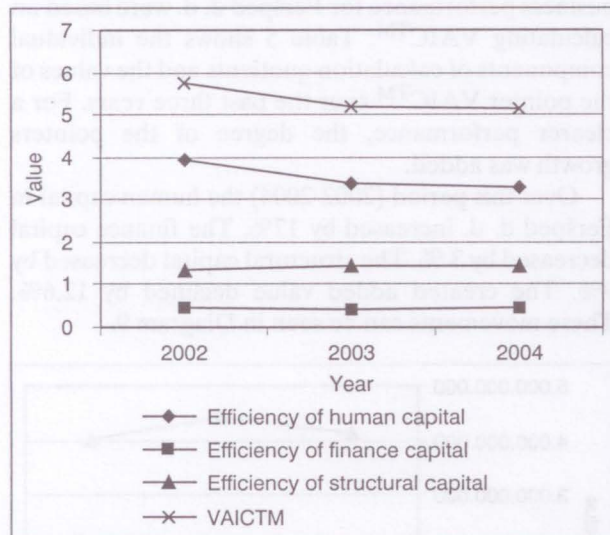


Diagram 10 - Movement of efficiency of three types of capital and of entire efficiency of company Fersped d. d.

Source: by authors based on Table 5

Finance, human and structural capital were inefficient over the period from 2002 to 2004, because the overall efficiency (VAIC$^{TM}$) fell slightly. This means, that an input of one SIT in 2004 created a smaller value than in 2002.

## 4. PROPOSAL FOR INTERNATIONAL CARRIERS ACTIVITIES FOR MORE SUITABLE ADMINISTRATION REGARDING INTELLECTUAL CAPITAL

Slovenia must, in addition to the intelligent use of space and materials capital, carefully use the potentials of its inhabitants. Slovenia is, in the fields of human capital, employment and labour market, at an average level in the EUROPEAN UNION, and with a relatively high degree of social security, often surpasses it. In its too rigid labour market, however, there are still too many structural disparities, the educational standard is too low and the percentage of low-key workplaces too high.

Every service company wishes to have a flexible and manageable system in all areas of its own activi-

ties. The strategy for business flexibility in this area is the monitoring of changes in business environments, assessment of their own abilities when adjusting to change, and creating conditions for adapting and introducing adjustments. One of the basics, the strategies of logistic carrier companies is incessant optimization of business processes and thus the costs of business at all levels and in all areas of its activity. A logistic carrier company has to worry about business reputation with buyers of their services; restrain inner business processes with an optimization strategy for business processes and keep control over them. An optimization chain is necessary for value and innovation development; to maintain a model for the education and growth of business systems by a strategy of development and consolidation of corporate culture, development of reward system, to maintain a model for the administration of knowledge. In addition, to ensure the autonomy of employees and increase the value for owners, with a strategy for growth in incomes and profitability, and by a strategy for cost efficiency growth.

Consequently, special attention must be devoted to education and to producing qualified creative and operational managers and experts specializing in the production of logistic services and the maintenance of traffic infrastructures and suprastructures. It is necessary to form a modern system of education for logistic workers at all levels: high schools and higher education institutions, faculties, postgraduate and doctoral studies for all titles and professions in the logistic area. Such an educational system should include specialization, courses, and practices, without which logistic workers cannot be successful and efficient in the production process of logistical services. When formulating an educational system, it is necessary to pay special attention to the fact that logistic science is interdisciplinary and multidisciplinary and refers to the investigation of complex phenomena: regarding the technology of traffic, traffic technology, traffic organization, the economy of traffic, traffic laws, intellectual capital, and sustainable traffic development. The logistic workers must have suitable knowledge about all these phenomena: realization, theories, laws and legality, without which they cannot deal with human potential, production processes, goods and passenger flow, information assessment, and proprietary requirements.

## 5. CONCLUSION

Today, knowledge is the central developmental factor regarding development. This knowledge provides a crucial strategic meaning to education; education carries the knowledge to the people and by its content and qualification procedure ensures conditions for its proper use in product creation which can,

in global markets, achieve competitive advantages. Logistics introduces a uniform approach to carriers as logistic operators in an integration system of goods distribution. Logistics objectively captures business planning, control and business regulations and influences quicker and more proficient performance of working procedures. Thus, the carrier as a logistic operator becomes, very important as a so-called modeller of logistic services and an indispensable factor in international exchange of goods. "Mega carriers as logistic operators" prevail in the world of traffic systems and they are the mediums for the accelerated development of traffic technics, traffic technology, traffic organization, traffic economics, traffic management, and traffic laws. Mega carriers as logistic operators satisfy almost two thirds of demand on the world traffic market and dictate "the rules of the game" on the world traffic market. The "niche" carriers as logistic operators are the small or middle operators; as a rule they are specialists in certain types of logistical activity, over certain traffic routes, usually of a local nature.

In this article we have measured intellectual capital using the Methods of market capitalization, and return assets, for three mega carriers as logistic operators in Slovenia, namely Viator & Vector d. d., Intereuropa d. d. and Feršped d. d.. We obtained the necessary data for calculation from annual reports for each company. When using the Methods of market capitalization or method of Tobin Q, for Viator & Vector d. d., the value of quotient Q is smaller than 1, which means that the market value is lower than the substitution costs, and this means that such an investment for this company is not remunerative. It is a different situation for Intereuropa d. d.. When using the Methods of market capitalization or the Method of Tobin Q the value of quotient Q is greater than 1, which means that the market value is higher than the substitution costs and such an investment remunerative for this company. Intereuropa d. d. is one of the rare Slovene companies whose stock value on the Ljubljana stock exchange surpassed 1.

The Methods of return assets or intellectual quotient of added value for Viator & Vector d. d. shows a fall in structural capital efficiency, has besides the human capital input into intellectual capital, a decisive influence on a fall in the entire efficiency of Viator& Vector d. d. (VAIC$^{TM}$) below the level of 2001. This fall in the efficiency of intellectual capital occurred because of increased investments in structural capital, which did not have, as a consequence, suitable increase regarding new value. It can be seen in the case of Viator&Vector d. d. that the efficiency of the structural capital factor is determined by the shape of curve for the entire efficiency. From the pointers that the three most inefficient sources of business in 2002 were (finance, human and structural capital) because the entire efficiency (VAIC$^{TM}$) became very low and increased much slower during 2003. They produced a smaller value for the input SIT in 2002 than in 2001.

By using the Method of return assets for Intereuropa d. d. the most concerned movement efficiency of structural capital, since it fell from 2002 to 2003 by 80% and then rapidly increased by 189%, but it is still below the 2002 value. The efficiency of structural capital fell from 2002 to 2004 by 41%. The reason for such a fluctuation hides an unequal increase in structural capital and added values, because the added value decreased in 2004 in comparison to 2003 by 21%, while its structural capital decreased by 73%. Finance efficiency regarding human capital did not fluctuate significantly. In fact, those three sources of business were ineffective because the entire efficiency decreased.

The finance, human and structural capital for Feršped d. d. did not fluctuate as strongly with The Method of return assets. In 2002 every SIT earmarked to employees created 3.95 SIT of value, but in 2004 slightly less, namely 3.27 SIT of new value. The efficiency of finance capital fell a bit from 2002 to 2003, because each input unit in finance capital in 2002 produced 0.45 units, but in 2003 only 0.42 unit. Finance, human and structural capital were ineffective in the period from 2002 to 2004, because the entire efficiency (VAIC$^{TM}$) was still slowly falling.

The real value of a company is in those people who, at 4 pm, clock-out and take home this precious value, though most companies still prepare their annual reports in which they carefully list only the value of machines, other equipment and their buildings and land. Nowadays, when capital in companies is unquestionable, they can compete using knowledge of their employees. Already numerous economic magazines of this decade have published different charts for companies, either by level of income, profit, trademark value, or number of employees. At the tops of these charts some rankings are already being provided for the same companies over a longer period of time (irrespective of whether Slovene or international chart). In these, the most important production means is small, grey and weighs approximately 1.3 kilogram. That is the brain.

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## POVZETEK

### MERJENJE INTELEKTUALNEGA KAPITALA MEDNARODNIH ŠPEDITERJEV KOT LOGISTIČNIH OPERATORJEV

Prišla je doba znanja in podjetja se vse bolj predstavljajo kot »podjetja znanj«, svoje zaposlene pa kot vire znanja »znanjske delavce«. Znanje je postalo blago, ki se menja na trgu znanja, v podjetju pa postaja kapital, ki je pomemben za doseganje konkurenčne prednosti na trgu, vendar ga je težko izmeriti. Področje intelektualnega kapitala je zelo kompleksno predvsem zato, ker gre za kategorijo, katero je zelo težko meriti. Pomembnejši koncepti in opredelitve intelektualnega kapitala vsebujejo poudarek, da je intelektualni kapital nekaj, kar bazira na znanju in je uporabno v podjetju. Znanje in veščine opredeljujejo možnosti posameznika, da dejavno vpliva na družbeni razvoj in si zagotavlja kakovostno življenje.

### KLJUČNE BESEDE

intelektualni kapital, podjetje, terciarna logistika, bilanca stanja, izkaz poslovnega izida.

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