

# ***THE VALUE ADDED INTELLECTUAL COEFFICIENT – POSSIBLE INDICATOR OF MEASUREMENT IN THE KNOWLEDGE BASED ECONOMY***

**ANNA UJWARY-GIL \***

## **Summary**

The purpose of this article is a fundamental re-evaluation of the method of VAIC<sup>TM</sup>, which is very often used by researchers around the world, often in major studies assessing the value added produced mainly in the banking sector and in listed companies. It is questionable whether this method deserves such recognition, and whether it should be used for the general studies of the effectiveness of the use of resources both tangible and intangible in creating value for the company. This critical analysis was then presented in the article.

Key words: value added, market value, intellectual capital, efficiency

## ***1. Introduction***

The issue of intellectual capital and its measurement is now widely discussed, particularly in the context of the impact of intangible assets on the economic market value of enterprises. If it could be accepted that the market value of a company is its book value plus the value of its intellectual capital and if we knew its value, it would be possible to price the market value without the need to be active on a capital stock exchange. The biggest difficulty, however, in achieving this objective is concerned with defining the intellectual capital, with the difficulties of its measurement, and with the challenge of determining the value of derivatives (such as value-added accounting, market-consistent, firm, company etc). The aim of the presented method is not intended to question the value of intellectual capital, but only to evaluate the efficient use of tangible and intangible resources. However, it is possible to link the effectiveness of the use of tangible and intangible resources with the market value of the company, which in turn gives the possibility to assess its functioning on the capital market.

The purpose of this article is a fundamental re-evaluation of the method of VAIC<sup>TM</sup>, which is very often used by researchers around the world<sup>1</sup>, often in major studies assessing the value added produced mainly in the banking sector and in listed companies. It is questionable whether this method deserves such recognition, and whether it should be used for the general studies of the effectiveness of the use of resources both tangible and intangible in creating value for the company.

### ***1.1. The VAIC<sup>TM</sup> Method***

This method was developed by Ante Pulić, an Austrian researcher in 1998 at the Austrian Research Center of Intellectual Capital (Pulić A., 1998, 2000, 2002, 2004, 2006). The important element of the VAIC<sup>TM</sup> method is the interpretation of income as the value added

---

\* Dr., Wyższa Szkoła Biznesu – National-Louis University w Nowym Sączu, [ujwary@wsb-nlu.edu.pl](mailto:ujwary@wsb-nlu.edu.pl)

<sup>1</sup> Index of articles can be found in the inventory literature (No. 2-3, 5-11, 18-21).

created by the company and as a result of its key resources. This value (including the efficiency of intellectual capital) is expressed in financial terms, which appear to be more objective due to their widespread use in traditional accounting systems. It is advisable that the results should be seen in the context of a particular market or industry or the national economy, in which the firm operates. As a result, it is possible to determine whether the firm operates at a higher efficiency level or lower than the accepted average. One of the criteria for the evaluation of activities of the company is the value added, for which intellectual capital is one of the factors determining its development.

The value tree of the VAIC™ method (Figure 1) illustrates the calculation procedure that was adopted, as well as data that are necessary to make these calculations.

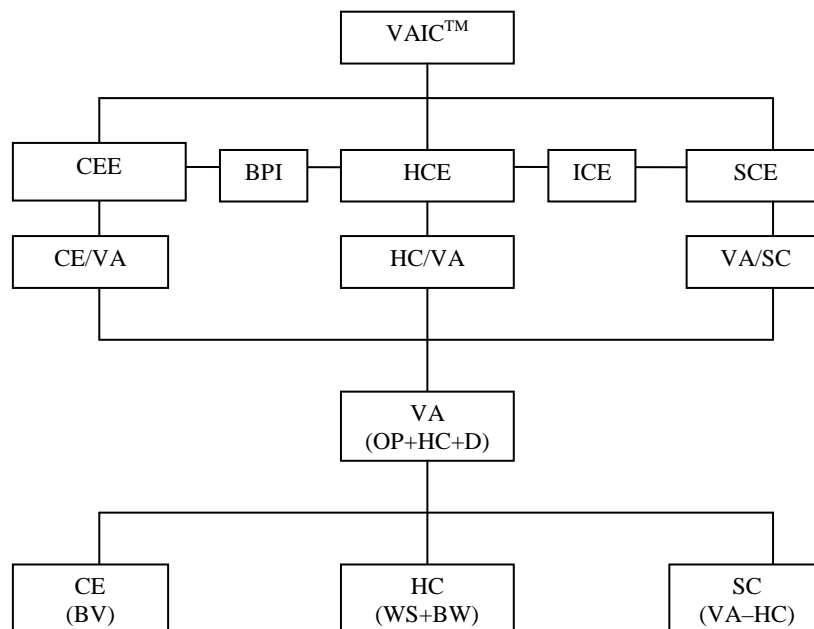


Figure 1. The value tree of the VAIC™ method

Legend:

- VAIC™ – name of the method and its main indicator (Value Added Intellectual Coefficient)
- CEE – Capital Employed Efficiency
- HCE – Human Capital Efficiency
- SCE – Structural Capital Efficiency
- BPI – Best Practice Index
- ICE – Intellectual Capital Efficiency
- VA – Value Added

OP – Operational Profit  
D – Depreciation  
CE – Capital Employed  
BV – Book Value  
HC – Human Capital  
SC – Structural Capital  
W – Wages and Salaries  
BW – Benefits for Workers

(Source: The development on the basis of A. Pulić, *Intellectual Capital – Does it Create or Destroy Value?*, “Measuring Business Excellence” 2004, nr 1(8), s. 62-68; A. Pulić, *Intellectual Capital. Efficiency on National and Company Level*, Croatian Chamber of Economy 2002, [www.vaic-on.net](http://www.vaic-on.net), (May 2006); D.G. Mavridis, *Intellectual Capital Performance Determinants and Globalization of Greek Listed Firms*, “Journal of Intellectual Capital”, 2005, nr 1(6), s. 127-140).

As outlined above, the rate of value added intellectual coefficient (VAIC) is the sum of its three sub-indicators: effectiveness of physical capital (CEE), human (HCE) and structural (SCE). The main component of each of them is the value added, which is the sum of operating profits (OP), wages (W), benefits for workers (BW) and the depreciation cost (D). Physical capital (CE) is the book value of net assets (BV), and human capital (HC) is the sum of the value of wages and salaries (W) and benefits for workers (SW). In turn, structural capital is the difference between the value added (VA) and human capital (HC). Aggregating the rate of physical capital efficiency (CEE) and human capital efficiency (HCE), created the best indicator of business practice (BPI). In contrast, the sum of human capital efficiency (HCE) and structural capital efficiency (SCE) is the index of ICE, which was called “the intellectual capacity of the company”. In view of the fact that all the data used in the method are based on information from the accounts (balance sheet) and the standard financial documents, calculation can be considered reliable and it can be verified (checked) by standard accounting methods. In addition, the method is easy to use for both the internal and external stakeholders (investors).

### ***1.2. The VAIC<sup>TM</sup> method – an example of a telecommunication company***

The market dominant position of telecommunications services in Poland is still occupied by the main operator, Telekomunikacja Polska SA (TP SA). Although this position appears to be slowing down due to increased competition from other mobile telephony operators. Using its well-known trademarks, access to greater financial resources, technical, marketing and long-term relationships with customers allows TP SA to maintain its market position in relation to new entrants. The gradual expansion of the scope of services that may be provided in the fixed telephony market by alternative operators is translated into declining market shares of TP SA. The liberalization of the market place, however, is sluggish, and TP SA effectively blocks the subsequent stages. Therefore, it is also important to introduce new offer for local calls, and enabling the transfer of telephone numbers between operators, which will allow alternative operators to effectively compete with TP SA.

Figure 2 presents performance indicators contributing to the creation of a physical and intellectual capital of TP SA. Despite the fact that the company recorded a significant increase in both physical capital (book value of net assets) and structural capital, it has used them inefficiently. In 2005 the book value of assets was higher than in previous years of

analysis and amounted to more than 16 billion PLN, while the efficiency index of physical capital (CEE) has decreased by almost 0.10 PLN compared to the year 2004. TP SA in 2008 created the added value of 3.16 PLN from human capital, and this was an increase of 0.34 PLN, as compared to the year 1999. Despite the reduction in investment in human capital and decline in employment in the years 2001-2008 the effectiveness of the use of human capital in creating value-added increased significantly. The use of structural capital (SCE) for the period 1999-2008 ranged between 0.61 and 0.73. An important organizational change was a reduction in the number of the levels of management, simplifying the structure and its change from the structure of geographically oriented to market-oriented (for individual and business clients).

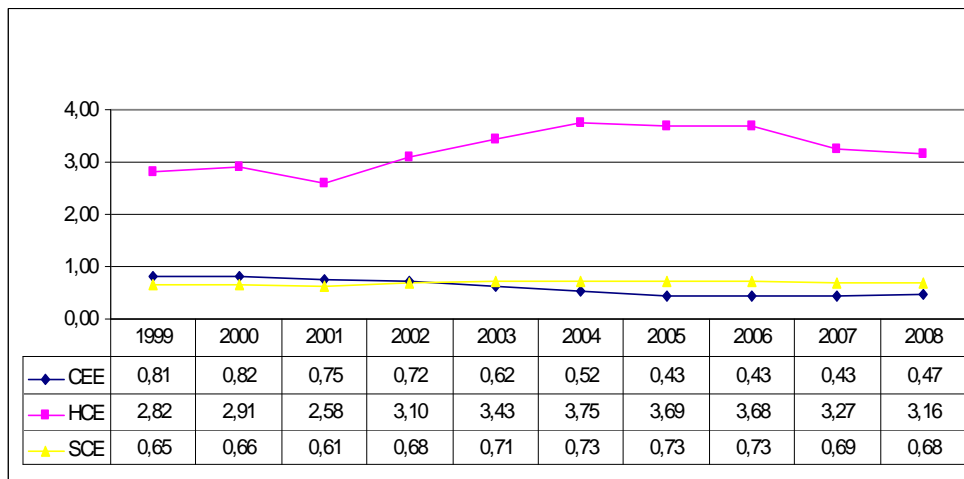


Figure 2. Performance indicators of Telekomunikacja Polska S.A. (in PLN)

Legend:  
 CEE – Capital employed efficiency  
 HCE – Human capital efficiency  
 SCE – Structural capital efficiency  
 (Source: own study)

Telekomunikacja Polska SA in the period of 1999-2004 applied a consistent policy of restructuring the employment type and costs (salaries and benefits to employees) and noted an increase in the use of intellectual capital in creating value-added. Figure 3 presents indicators: the rate of intellectual value-added (VAIC), intellectual capital efficiency (ICE) and the index of best practice (BPI), which confirms the change of direction. To this end, to commence the liquidation of jobs, supported by voluntary departures (including retirements), also the program "Jobs for work" was introduced. TP S.A. proposed to the external partners, within the framework provided by TP SA long-term contracts, to employ part of their workers. As a result of implementing this program 5 384 people were employed in the external companies.

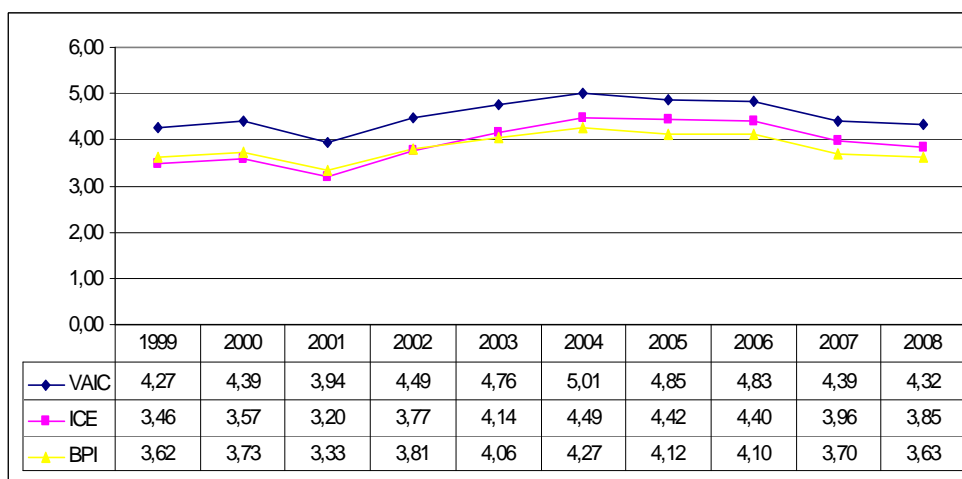


Figure 3. Intellectual value-added indicators (VAIC), intellectual capacity (ICE), and best business practices (BPI) in the creation of value-added of Telekomunikacja Polska SA (in PLN)

Legend:  
 VAIC – Value added intellectual coefficient  
 ICE – Intellectual capital efficiency  
 BPI – Best practice index  
 (Source: own study)

In a view of the planned changes in the organization to provide services and customer services, the company's Executive Board took action in 2003 to further improve the efficiency of employment. As a result of the employment action at the end of 2003, the number of employees was 36 171, which represents about 12% reduction compared to the state of employment at the end of 2002. As a result, reduction in the level of employment is a reduction in labor costs, which in comparison to the costs in 2002 were lower by about 18%. The restructuring of employment led in addition to a reduction in the number of posts. As a result of changes the level of qualifications of staff employed was observed up. This brought an improved efficiency and better adaptation to the personnel needs of business and, consequently, the needs and expectations of customers. Positive results of these changes were reflected in, inter alia, a systematic increase in the use of intellectual capital in creating value added starting in 2001.

### ***1.3. The Value Added Intellectual Coefficient (VAIC) and a simple example of a market value of a Polish telecommunication company***

From the point of view of capital market, rising the efficiency of the company tends to increase investors' interest to acquire its shares and increase the growth of a company rates. The current share price reflects investors' expectations of the benefits they could obtain because of their ownership of shares and investments. It is believed that investment in fixed assets, the qualifications of staff and new products are all important data for the investors.

Therefore, an increase in market value is not a consequence of the analysis of short-term profits, but rather an assessment of cash flow streams generated by new, innovative products or services. According to A. Pulić, the aggregate rate of value added intellectual coefficient (VAIC) corresponds to the market value of companies. This means that an increase in VAIC will lead to the growth of the market value of the company. Research carried out in 1997-1999 on 70 companies listed on the Vienna stock exchange has confirmed that there was a positive correlation between the effectiveness of the creation of physical and intellectual capital (human and structural capital) and the market value of companies.

It is argued that a major factor shaping the market value is an increase or decrease in share prices in the capital markets. If the share price fell and the company has not issued new shares at that time, market value - defined as the product of the price and number of shares - was also reduced. The share price results from a number of factors, which can be divided into three groups relating to (Ellis J., Williams D., 1997, s. 291-326):

- macroenvironment, including: national economy, international context, the level of stock prices, dividend prospects, alternative investments, equities,
- industry/sector, including: changes in competitive forces, phase cycle, changes in exchange rates, and tax and legal changes,
- the company, including: quality of the management, market products and services.

The development of the national economy is one of the key factors influencing the profitability of enterprises and the amount paid in dividends. Prosperity fosters investment, and the pursuit of higher profits, and the possibility of payment of dividend, all make the shares attractive to investors. Assessing the impact of the macroenvironment on stock prices, you must also bear in mind the development of exchange rates, particularly if the company invests abroad, and interest rates. Typically, economic benefits and economic information increase the share price, while negative ones cause its reduction. When the shares of companies do not indicate any prospects for achieving high-income and equity returns, investors may consider investing in alternative investments, for example, government bonds or cash deposits. The attractiveness of these two forms of capital investment depends primarily on the level of interest rates, inflation, as well as the level of public debt.

In the case of telecommunication company listed on the Polish stock market – the indicator of the relationship between value added intellectual coefficient and market value of the main telecom company is as follows:

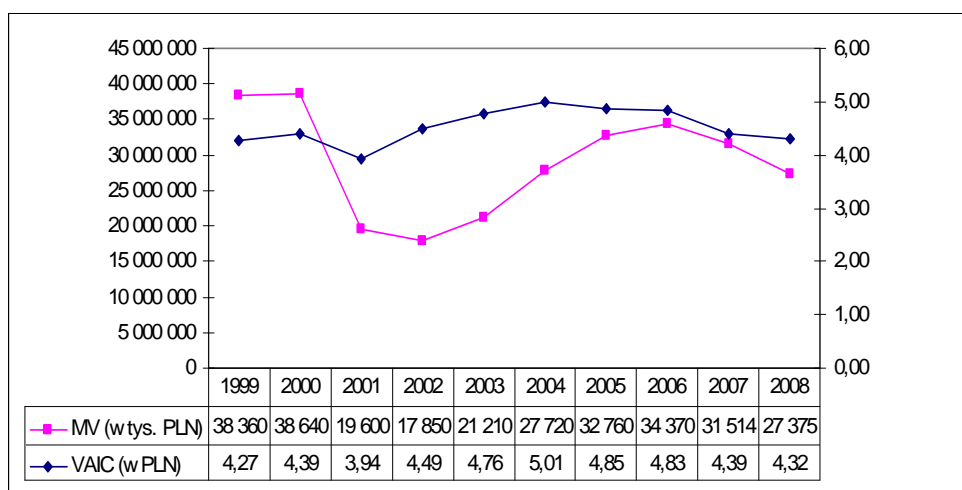


Figure 4. VAIC and MV of Telekomunikacja Polska SA

Legend:

VAIC – Value added intellectual capital

MV – Market value

(Source: own study)

In the case of TP SA, an increase in the VAIC index is observed and the change in market value (MV) in the same direction in the initial period, i.e. in 1999-2008 and the last three years of analysis, except for the years 2001-2002 and 2004-2005. During that period the reduction of the market value has not been accompanied by a decrease of VAIC, which at that time went up. The activity of TP SA in 2002 was influenced by three main elements, namely unemployment, deregulation of the telecommunications industry and competition from mobile phone operators. In 2002, unemployment reached 18%, and the growth rate was 1.3%. In the face of low domestic demand dynamics, household incomes do not increased. The company noted a decline in revenue from the sale resulting in a smaller number of new subscribers. In addition, intense competition from mobile operators meant that some customers opted for a mobile phone and resigned from the traditional phone service. At that time, shares at the end of 2002 cost 12.75 PLN, compared to 14.00 PLN at the end of 2001. Despite adverse macroeconomic conditions the company noted an increase in the VAIC (intellectual value-added indicator), mainly because it reduced the number of employees by 29% and salaries by 15% during this period. Reduction in the number of employed workers was accompanied by an increase in the efficiency of utilization of human capital.

From A. Pulic's point of view, the VAIC<sup>TM</sup> method provides investors with a number of important indicators for the analysis of companies, in the case of the intellectual potential used in relation to invested resources. The market appreciates also the efficient use of physical capital, because they produce more value added. Similarly, an increase in the efficiency of human capital promotes the growth of physical capital of the company. Another issue is the publicity about job losses in companies - especially in weaker

economic times. Difficulty to reconcile the interests of employees with that of the shareholders, for which the exemption of workers (treated as an expense) is usually linked to an increase in the exchange market share. The release of workers will be very especially in high-tech industries (e.g. telecommunications), where the share of knowledge in the product is high. In addition, investors in assessing a company in the market generally believe that the efficiency of its operation is possible either by increasing the efficiency of human capital, or assets of the company.

#### ***1.4. Evaluation of the VAIC<sup>TM</sup> method***

The VAIC<sup>TM</sup> method allows the measurement and monitoring of the effectiveness of added value in the company. This allows us to manage human, physical and intellectual capital, and on an ongoing basis to monitor the effectiveness of their use. This method is focusing on three areas of value-added efficiency and allows the management to assess the effectiveness of physical capital (the CEE), structural capital (the SCE) and human CO? (HCE indicator). The contribution of workers to the operation of a business should not be counted as an expense, but as an essential part of the value added generated equivalent financial capital.. Employees can monitor their own effectiveness in creating value. On the other hand – a method should determine the general area of performance of companies, through the cumulative rate of VAIC, which is the sum of three indicators (CEE, HCE and SCE).

The method can be used to assess the effectiveness of invested resources and the results of the accompanying policy of the company. Executives can see this method as a specific kind of tool for the analysis of the creation of value - they may receive information where in the enterprise the value is created or destroyed. This applies equally to the required knowledge about the processes (products, services, projects), activities (logistics, marketing, production) and the units that create or destroy the added value of using their resources.

It seems that this is possible through the use of spreadsheet tools in the form of VAIC<sup>TM</sup> Software. Its advantage is in creating a possibility of an ongoing (not just periodic) monitoring of relevant financial data in the process, the level of enterprises the industry sector, regional or national economy. The financial data can be entered into the system annually, quarterly or even monthly. This allows the user to keep track, for example, of the falling trend of the effective use of physical capital, which gives managers the opportunity to act quickly, identify the cause of this decline in efficiency and design a strategy for its prevention. This analysis can identify its position in relation to domestic and foreign competitors and the industry average for the test. Moreover - companies can compare the results achieved in creating or destroying value by a particular business unit (department, branch or plant). An important element of the usefulness of the method in the functioning on the enterprise market is the use of computer simulation, which allows some value analysis and thus better decision-making related to the location and type of investments in the development of certain products (services). In this respect, it may be treated as one of the strategic tools used in the enterprise.

The method is based on publicly available financial data, and standard financial documentations, and its use is less costly and does not result in additional administrative costs. This may be a part of a, so-called, benchmarking tool for the company, because of its



ability to compare the achievements and activities of competitors. Constant monitoring of the efficiency of the production inside the company allows an appropriate intervention in the area of operations (processes and activities), where value is destroyed, and maintain or create more value elsewhere. It is a bridge between the traditional reporting of results in the "traditional" companies, and emerging accounting reporting for enterprises based on knowledge or strongly benefiting from this knowledge.

Closer analysis of the results obtained, however, forced a deeper reflection on their accuracy and interpretation, as well as the methodology, which requires a slight transformation of the earlier designs. Here are some of them<sup>2</sup>:

- Assume that the amount of human capital corresponds to a structural capital:  $HC = SC$ , in which case you would expect the performance indicators of their use in creating added value to be equal or similar. Nevertheless, the use of human capital efficiency (HCE) is typically four times higher source of info than the efficiency of structural capital (SCE). What are the reasons?
- The author of the method assumed, that the value added (VA) is equal to the sum of operating profits (OP) and human capital (HC). If so, the equation will look like this:  
 $HCE = VA/HC = (HC + OP)/HC = OP/HC + 1$  and it may happen that the company did not produce any value-added ( $OP < 0$ ) although it can show a positive efficiency of human capital, resulting from a controlled comparison of  $OP/HC$  with a value of 1 (no possibility of interpretation of the properties of the equation).
- If, in turn, added value is greater than the operating profit ( $VA > OP$ ), in each case the rate of efficiency of structural capital is greater than unity ( $SCE < 1$ ) except where the value added is negative ( $VA < 0$ ).
- If the value added is greater than zero and is positive ( $VA > 0$ ), and operating profit is less than zero ( $OP < 0$ ), in each case the rate of efficiency of structural capital is less than zero ( $SCE < 0$ ).
- If, in turn, value added is less than zero ( $VA < 0$ ) an indicator of efficiency of structural capital is then always greater than unity ( $SCE > 1$ ).
- The efficiency of capital will be greater than a structural indicator of human capital efficiency ( $SCE > HCE$ ), if the value added is less than zero ( $VA < 0$ ).

This relationship between the value added (VA) and operating profit (OP) and their influence on the development of high performance indicators of physical, human and structural capital (CEE, HCE and SCE) show that the results obtained by using the indicators presented in the method VAIC<sup>TM</sup> may only be the result of mathematical calculations, rather than an assessment from the creation or destruction of value added by the company point of view.

In yet another case, it is possible that VAIC will be represented in a way that exaggerated the importance of intellectual capital in creating value-added.. Suppose that the company achieved the following results for the year (in thousands PLN):

---

<sup>2</sup> For other arguments see: D. Andriessen, *Making Sense of Intellectual Capital. Designing a Method for Valuation of Intangibles*, Elsevier 2004.

- 1) VA = 15 696,00
- 2) OP = 6 543,00
- 3) CE = 95,00                      so        CEE = VA/CE = 165,3
- 4) HC = 2 241,00                so        HCE = VA/HC = 7
- 5) SC = 13 455,00              so        SCE = SC/VA = 0,86
- 6) VAIC = CEE + HCE + SCE = 173,16

In this situation, high level of intellectual performance of the company (VAIC) is mainly a contribution of physical capital (95.46% of the rate of VAIC). This is because the value of the physical capital (CE) involved in the creation of value added is very low and we characterized the enterprise based on a very high degree on the information and knowledge. For companies such physical capital efficiency (CEE) will be much higher than the intellectual capital efficiency (HCE + SCE).

Another controversial point is the lack of the interpretation of the essence of structural capital (SC). According to A. Pulić, structural capital is the difference between the value added (VA) and human capital (HC). In addition to presenting a model for structural capital, the author does not explain the adopted foundation itself. In this case, if the value added is the sum of OP (operating profit), HC (wages and benefits to employees) and D (depreciation), we can therefore obtain:

$$SC = VA - HC = OP + D - HC = OP + D$$

The transformation of this formula shows that the structural capital is the sum of operating profits and depreciation (or only operating profits, if depreciation is not included in the value-added).

In addition, A. Pulić finds that human capital is inversely proportional to the structural capital, which means that when one of them participated in the creation of value added and is growing – other decreased. By a reverse proportionality of these two types of capital A. Pulić understands the development of the two figures as were presented at Figure 5:

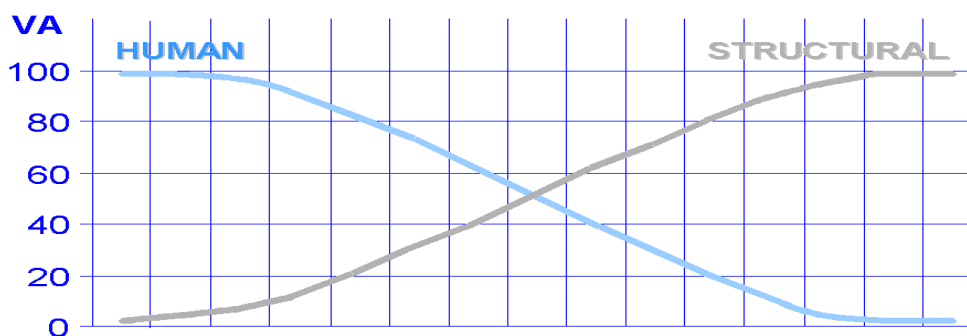


Figure 5. Human capital and structural capital (inverse proportionality)

Legend:  
 VA – Value added  
 HUMAN – Human capital  
 STRUCTURAL – Structural capital

(Source: A. Pulić, VAIC™ - An Accounting Tool for IC Management, [www.vaic-on.net](http://www.vaic-on.net) (May 2006))

Figure 6 presents the amount of human capital and structural capital of TP S.A. In the case of TP SA and an adopted from A. Pulić assumption of inverse proportionality of human capital (HC) with regard to structural capital (SC) it can be observed mainly in the years of 2000-2004.

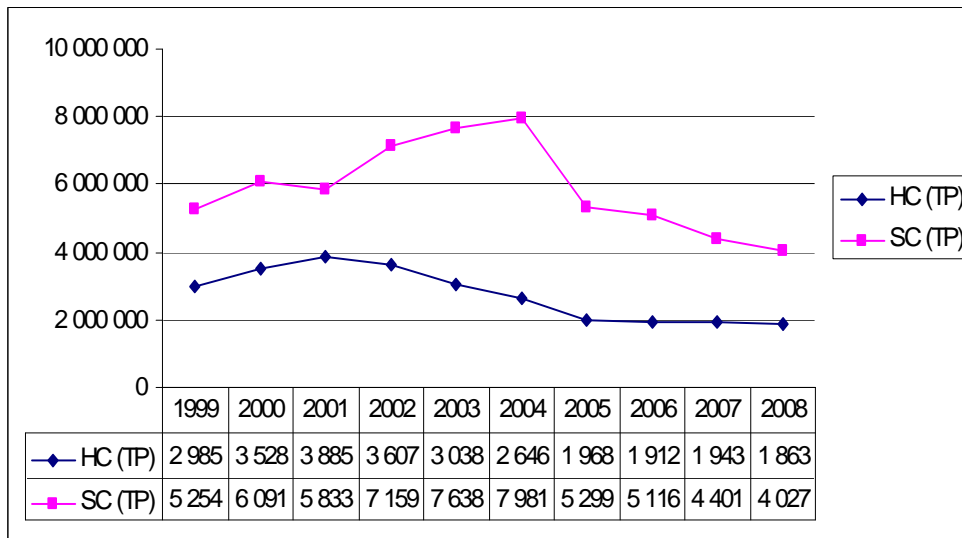


Figure 6. Human capital and structural capital undertakings in a telecommunication company (in thousands PLN)

Legend:

HC (TP) – human capital of Telekomunikacja Polska S.A.

SC (TP) – structural capital of Telekomunikacja Polska S.A.

(Source: own study)

Then the fall in value of human capital was accompanied by an increase in the value of structural capital. This dependence the author discusses in the following way: if the value added (VA) is shaped primarily by human capital, the value of structural capital should be zero. In cases where the value added is produced with the participation of human capital, structural capital is equal to the value-added. Since structural capital is defined as a difference between the value added and human capital, human capital is completely eliminated and can not be part of structural capital. In addition, the main component of value added is an operating profit (or loss suffered), which are reflected in a decisive way in the volume of value-added and the development of the methods' indicators. Based on the shape and size of human capital, structural, and highlighted their progress in the picture it is not possible to confirm the assumptions of the inverse proportionality of human capital (HC) with regard to structural capital (SC).

Of course this requires that the tests should be carried out on a larger scale, using more of the companies surveyed. Thus, not fully understood is the structural capital efficiency,

which is based on the reverse of the relationship of HC and SC: is in the form of an  $SCE = SC / VA$ . Other indicators of the efficiency of physical capital (CEE) and human (HCE) are added to the relationship of physical capital ( $VA / CE$ ) and human ( $VA / HC$ ).

Another controversial point of the method is a simple nonsense, resulting from the conversion of the following simple formula:

$$\begin{aligned} IC &= HC + SC \\ IC &= HC + (VA - HC) \\ IC &= VA \end{aligned}$$

If, as assumed by A. Pulić and other authors, elements of intellectual capital (IC) are human (HC) and structural (SC) capital, by knowing the value of these two types of capital (expressed as money), it is possible to estimate the value of intellectual capital. It turns out that the calculated value of IC was just the size of generated value added (VA).

The VAIC<sup>TM</sup> method of measuring the effectiveness of the use of physical and intellectual capital shows which part of the new value is reflected in every monetary unit. The advantages of this method is however more evident in the comparative analysis of companies and in evaluating whether a company creates or destroys value.

It is difficult to clearly assess this method. Of course this requires more calculations, using a number of different business sectors of the national economy. However, it is worth underlining that this method is recognized among researchers from different parts of the world, resulting in a large number of studies, looking at all the economic sectors and industries.

## ***2. The conclusions of this study***

To manage the creation of value in the enterprise, you need to specify where the value is created, who creates it, and what tangible and intangible resources contribute to value creation in the enterprise. The following method's contributions should be noticed:

- make a general diagnosis of the business in terms of value creation or destruction
- determine the effectiveness of the value of physical and intellectual capital,
- analyze the value creation in terms of exploration of these processes, activities and projects that create or destroy company value,
- find the weakest points of value,
- monitor the effectiveness of product and service creation and operation (marketing, production and logistics),
- simulate the process of creating value by using the method and the results of the calculations as a tool for making strategic and operational decisions
- used in an enterprise or industry in relation to the overall efficiency of used resources (eg, the average for the industry).

It seems that the evaluation of the intellectual capital effectiveness and its use in the enterprise is much more complicated. It is not enough to measure the rate or the level of intellectual capital efficiency in an enterprise, but it is also necessary to use this knowledge to improve the competitive position of the company on the market. To achieve this goal, managers need to develop tools that would enable them to find the answer to the following basic questions:

- why is the level of intellectual capital now lower (higher) than it was last year?

- what or who caused the value of intellectual capital to increase or decrease?
- what (who) is the key "generator" to create (destroy) the value of intellectual capital in the enterprise?
- where the capital is created or destroyed?
- how to increase the value of intellectual capital?

These and other questions of a diagnostic nature may be useful in the management of the company. Indicators presented in the article assessing the effectiveness of the use of intellectual capital and its relationship with the physical evidence of the resources may constitute a complementary source of information for stakeholders and investors - in addition to traditional indicators to assess the company. The VAIC™ method therefore measured how much and how effectively intellectual capital and physical capital employed created value, and whether they are critical to the success of the company. This method assesses the overall effectiveness of the company, which is estimated on the basis of the efficiencies of added value as compared to the invested resources (physical and intellectual capital). In today's business value is created only if it raises the efficiency of resources. If the efficiency value decreases, then value is destroyed, even if the company achieves a profit.

If the markets were fully efficient and there was no asymmetry of information between stakeholders, investors and company managers, the cost of capital available would be definitely lower, as well as any transactions would be associated with lower risk. The high cost of capital and the risks involved are particularly noticed with high-tech enterprises based mainly on knowledge and intellectual capital. Reliable measurement of both intangible and intellectual capital, would reduce the uncertainty arising from disparities between this book and the market value of the company. Knowledge of what constitutes the essence of intellectual capital and how it is used in the company, would give managers an opportunity to better manage and control its attractiveness on the capital market. This article describes a method for assessing intellectual capital in the creation or destruction of value-added. Indicating the possibility of practical application of the method, I also highlight a number of difficulties, ambiguities, and some methodological shortcomings and limitations in their use to evaluate companies. The main issue for discussion is whether the results obtained for the evaluation of the effectiveness of the use of intellectual capital in creating value-added could become the basis for investment decisions in terms of functioning of Polish enterprises. Specially, when this method is very little or not at all known to the Polish reader.

#### **Literature:**

1. Andriessen D., *Making Sense of Intellectual Capital. Designing a Method for Valuation of Intangibles*, Elsevier 2004.
2. Chang W.S., Hsieh J.J., *A Human Capital-Driven Framework and the Role of Technological Capital in Measuring Intellectual Capital* ([http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1182782](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1182782)) July 2008
3. Chen M.C., Cheng S.J., Hwang Y., *An Empirical Investigation of the Relationship Between Intellectual Capital and Firm's Market Value and Financial Performance*, "Journal of Intellectual Capital" 2005, nr 2(6).

4. Ellis J., Williams D., *Strategia przedsiębiorstwa a analiza finansowa. Pozycja na rynku kapitałowym*, FRR, Warszawa 1997.
5. Goh P.C., *Intellectual Capital Performance of Commercial Banks in Malaysia*, "Journal of Intellectual Capital" 2005, No. 3(6).
6. Kamath G. B., *The Intellectual Capital Performance of the Indian Banking Sector*, "Journal of Intellectual Capital" 2007, No.1(8).
7. Kujansivu P., Lönnqvist A., *Investigating the Value and Efficiency of Intellectual Capital*, "Journal of Intellectual Capital" 2007, No. 2(8).
8. Mavridis D.G., *Intellectual Capital Performance Determinants and Globalization Status of Greek Listed Firms*, "Journal of Intellectual Capital" 2005, No.1(6).
9. Mavridis D.G., Kyrmizoglou P., *Intellectual Capital Performance Drivers in the Greek Banking Sector*, "Management Research News" 2005, No. 5(28).
10. Mavridis D.G., *The Intellectual Capital Performance of the Japanese Banking Sector*, "Journal of Intellectual Capital", 2004, No. 1(5).
11. Nik Maheran Nik Muhammad, Filzah Md Isa, Nik Rozhan Nik Ismail, *Intellectual Capital Efficiency Level of Malaysian Financial Sector: Panel Data analysis (2002-2006)*, ([www.nikmaheran.com/v1/attachments/030\\_Intelectual\\_capital.pdf](http://www.nikmaheran.com/v1/attachments/030_Intelectual_capital.pdf)), November 2008
12. Pulić A., *Do We Know If We Create or Destroy Value?* [www.vaic-on.net](http://www.vaic-on.net) (May 2006).
13. Pulić A., *Intellectual Capital – Does it Create or Destroy Value*, "Measuring Business Excellence", 2004, No. 1(8).
14. Pulić A., *Intellectual Capital. Efficiency on National and Company Level*, Croatian Chamber of Economy 2002, [www.vaic-on.net](http://www.vaic-on.net), (May 2006).
15. Pulić A., *Measurement and Management of Intellectual Capital: An Introduction*, International Federation of Accountants (IFAC), New York 1998.
16. Pulić A., *MVA and VAICTM Analysis of Randomly Selected Companies from FTSE 250*, Graz-London April 2000.
17. Pulić A., *VAIC™- an Accounting Tool for IC Management*, [www.vaic-on.net](http://www.vaic-on.net) (May 2006).
18. Razafindrambinina D., *An Empirical Research on the Relationship between Intellectual Capital and Corporate Financial Performance on Indonesian Listed Companies*, ([www.lby100.com/ly/200806/P020080627326310290656.pdf](http://www.lby100.com/ly/200806/P020080627326310290656.pdf) ), East China University of Science and Technology, China 2008
19. Saengchan S., *The Role of Intellectual Capital in Creating Value in the Banking Industry*, ([www.bus.tu.ac.th/uploadPR/ADV3\\_11\\_2008/9.%20ศรภษ.pdf](http://www.bus.tu.ac.th/uploadPR/ADV3_11_2008/9.%20ศรภษ.pdf)) November 2008
20. Williams S.M., *Is Intellectual Capital Performance and Disclosure Practices Related?*, "Journal of Intellectual Capital" 2001, No. 2(3).
21. Yalama A., Coskun M., *Intellectual Capital Performance of Quoted Banks on the Istanbul Stock Exchange Market*, "Journal of Intellectual Capital" 2007, No. 2(8).