MEASURING EFFICIENCY OF INTELLECTUAL CAPITAL IN AGRICULTURE SECTOR OF VOJVODINA

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Abstract: During three-hundred-year history of the market economy, the main sources of wealth creation have changed from the natural resources (mainly land and relatively unskilled labor with the exception of the master craftsman), tangible material assets (buildings, machinery and equipment, funds) to intangible assets (knowledge and information of all types) that may be contained in the people, organizations, or physical resources. In the later period of the twentieth century, science has acquired the features of direct production force. The term direct implies that unlike the relationship which existed between science and production in the IXX century, where scientific advances was incorporated through the physical labor in the tools, which, in turn, created new value through the physical labor, the relationship between science and production has become all direct, immediate, because the scientific advances allowed the funds to be produced with less labor and allowed funds itself to become "smarter" and as such to require less human intervention and human physical labor in the final production process. As a result, the need for physical labor continuously declined with time, and the application of labor is moved from direct production to processes of preparing and organizing production. Also, a large part of today's knowledge that is used in production is not embodied in machinery, and the effects of this are immense.

Key words: agricultural industry, Vojvodina, intellectual capital, efficiency, valorisation

Introduction

By the middle of 1990s, the economic academic and expert literature introduced the term **"knowledge based economy"** in to a wide use as a framework term describing a new social-economic paradigm that is the consequence of significant and intensive changes that arose by the end of the 20th century. Those changes were essentially caused by tremendous increase in the overall social fund of knowledge and greater social distribution of knowledge. New technologies affected changes of previous linear and sequential matrixes of innovating into a new interactive, dynamic and network matrix of innovation processes, which enabled fast and intensive production of new knowledge and enhancement of the existing one, where innovators were provide easier access to knowledge of their predecessors (*Foray, D., B.A Lundvall,* 1996.). In addition, knowledge started spreading more quickly and easily and it became more accessible to wider social layers. Knowledge and human capital have become the basic resources in process of value creation and generation of sustainable competitive advantages of companies and nations. This resulted with shifting of traditional perspective of comprehension of economy of the industrial age to comprehension of economy from the aspect of new reality of the information era and knowledge based economy.

It has been noted that the speed of changes and transformation depend more and more on accessibility of new knowledge and quality of knowledge. Naturally, technology played an important role here. The technology is the driving engine of changes and knowledge is the fuel (*Drucker, P.* 1993). At the beginning of the industrial revolution knowledge was applied to tools, processes, and products. In later stages, knowledge was applied to productivity increase. Nowadays, knowledge is applied to knowledge itself. This revolution produced more accelerated and sustainable changes which represent the most significant forces that shape today's society.

Subject and objectives of research

Subject of this paper includes the studying significance and role of knowledge (theoretical and empirical aspects) as strategic resource in agrifood sector of Vojvodina.

The objective of this research is measure of efficiency of use of intellectual capital by Vojvodina companies operating within this field.

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Methodology and data sources

In contest of rising importance of knowledge and competencies as key strategic resources and regarding that Industrial Age measures of firm performance focus mainly on the financial criteria as the gauge for success, autors use ***Value added Intelectual Capital Coefficient – VAIC*** as a method for measuring business performance which is more suitable for understanding subject and objectives of their research. VAIC measure belongs to *Output Oriented-Process Methods* of measuring intellectual capital. This methodology attempt to measure the amount of intellectual capital output from a defined amount of input related to a specific type of driver(s) underlying a company's physical and intellectual capital. VAIC is built on the premise that value creation is derived from two primary resource bases: (1) physical capital resources (i.e., the tangible and financial capital employed by the firm to create wealth); and (2) intellectual capital resources (i.e., the value created by a firm's human and the structural capital resources – items emancipating from the firm's human capital resources such as organization structure, patents, brand, customer relationships). To determine the efficiency of value created each major resource base is linked to the creation of value added. VAIC provides an indication of the total efficiency of value creation from all resources employed. An important subset term, *ICE* (sum of *HCE* and *SCE*) reflects the efficiency of value created by the intellectual capital employed.

Data for analysis were obtained from the National Bank of Serbia and they were generated from annual financial reports of companies, namely, balance sheets and profit and loss statements for the year 2007[4].

Knowledge based economy – theoretical approach

Modern society can be described as a society based on a deep and broad penetration of scientific and technological knowledge in all spheres of social life and its institutions. By the mid-twentieth century society and economy were primarily understood in the context of physical resources and physical labor. As such, these concepts have long been present in sociological,economic and political theories. However, in modern society one perceives the tendency of decreasing importance of physical resources and physical labor as the basic factors of production and sources of value creation. Although until recently these factors represented fundamental determinants of terms of property and labor.Today, the concept of property and labor is extended to intangible elements of their structure.The traditional characteristics of property and labor did not disappear. However, what is new is that property and labour, more than ever before, embedded in them the intangible component - **knowledg**e. Therefore, the knowledge society phenomenon indicates the significant structural economic changes and the transition of the industrial economy to economy intensively based on knowledge. Consequently, grouping of economic sectors in those intensively based on high-tech and knowledge becomes less and less meaningful, because now the so-called traditional economic sectors (manufacturing, textile, food, etc.), are as based on knowledge and the outputs of tangible and intangible technological knowledge as so-called high technology sectors[5]. Since OECD clasifications of high tehnology industries, medium tech and low tech industries rests on only one indicator, namely intramural R&D, this is open to two important objections. First, it is by no means the only measure of knowledge-creating activities. Second, it ignores the fact that the knowledge that is relevant to an industry may be distributed across many sectors or agents: thus a low-R&D industry may well be an major user of knowledge generated elsewhere. Also, the definitions of R&D in the OECD's *Frascati Manual*, which structure R&D data collection in OECD economies, exclude a wide range of activities that involve the creation or use of new knowledge in innovation[6].

Modern innovation theory sees knowledge creation in a much more diffuse way. Firstly, innovation rests not on discovery but on learning. Learning need not necessarily imply discovery of new technical or scientific principles, and

[4] Because of shortage of avalable and sistematized data for long time period Authors coud not conduct research of the phenomenon within a longer period that would provide much more realistic picture of success of business operations of those companies. We analysed the data only for one year (2007). Therefore, results from analysis should be except with reserve.

[5] In much policy analysis it is common to use the terms 'high-technology' or 'knowledge intensive industries' in a somewhat loose way, as though in fact they are both meaningful and interchangeable terms. The term 'high technology' is a recent invention, and that its meaning is far from clear. The standard approach in this area rests on a classification developed by the OECD in the mid-1980s.The OECD distinguished between industries in terms of R&D intensities, with those (such as ICT or pharmaceuticals) spending more than 4% of turnover being classified as high-technology, those spending between 1% and 4% of turnover (such as vehicles or chemicals) being classified as medium-tech, and those spending less than 1% (such as textiles or food) as 'low tech'. But, the OECD discussion of this classification was rather careful, and offered many qualifications. Chief among these is the point that direct R&D is but one indicator of knowledge content, and that technology intensity is not mapped solely by R&D. Unfortunately the qualifications were forgotten in practice, and this classification has taken on a life of its own; it is widely used, both in policy circles and in the press, as a basis for talking about knowledge-intensive as opposed to traditional or non-knowledge intensive industries.

[6] The Frascati Manual's definition of research, if taken seriously, would have to include things like market research, which often involve rather sophisticated social investigation. The development definition, on any reasonable interpretation, should include more or less all activities related to innovation. However the Frascati Manual contains a list of exclusions. All improvements in production processes are excluded from R&D. Engineering development and trial production may be R&D or may not – it is rather arbitrary. Trial production is included 'if it implies...further design and engineering'. Trouble shooting, patent and license work, market research, testing, data collection and development related to compliance with standards and regulations are all excluded. See about: OECD, Proposed Standard Practice for Surveys of Research and Experimental Development 'Frascati Manual' OECD, Paris, 1993

can equally be based on activities which recombine or adapt existing forms of knowledge; this in turn implies that activities such design and trial production (which is a form of engineering experimentation) can be knowledge-generating activities (*Lundvall, B.Å.* 2003). A second key emphasis in modern innovation analysis is on the external environment of the firm. Firms interact with other institutions is a range of ways; these include purchase of intermediate or capital goods embodying knowledge. The installation and operation of such new equipment is also knowledge creating. Then there is the purchase of licences to use protected knowledge. Finally, firms seek to explore their markets. Given that innovations are economic implementations of new ideas, then the exploration and understanding of markets, and the use of market information to shape the creation of new products, are central to innovation. These points imply a more complex view of innovation in which ideas concerning the properties of markets are a framework for the recombination and creation knowledge via a range of activities; in this framework R&D is important, but tends to be seen as a **problem-solving activity** in the context of innovation processes, rather than an initiating act of discovery (*Lundvall, B.A., S. Borras.* 1997).

Relevant knowledge base for many industries is not internal to the industry, but is distributed across a range of technologies, actors and industries[7]. These inter-agent or inter-industry flows conventionally take two basic forms, 'embodied' and 'disembodied'. Embodied flows involve knowledge incorporated in to machinery and equipment. Disembodied flows involve the use of knowledge, transmitted through business cooperations, scientific and technical literature, consultancy, education systems, movement of personnel ect. The basis of embodied flows is the fact that most research-intensive industries (such as the advanced materials sector, the chemicals sector, or the ICT complex) develop products that are used within other industries. Such products enter as capital or intermediate inputs into the production processes of other firms and industries: that is, as machines and equipment, or as components and materials. When this happens, performance improvements generated in one firm or industry therefore show up as productivity or quality improvements in another. The receiving industry must of course **develop the knowledge, skills and competences to use these advanced knowledge-based technologies**. Competitiveness within 'receiving' industries depends heavily on the ability to access and use such technologies.

Agrifood industry is one of the largest manufacturing industries in all OECD economies, and certainly is one of the largest industries in Europe. Clearly many different kinds of skills, scientific disciplines and knowledge areas are involved in the functions and activities in this industry. The core knowledge areas of the food processing industry are food science, including food related chemistry, biology and physics, and food technology including biotechnology, electronics, instrumentation and engineering. Despite the fact that this is an industry with relatively low levels of internal R&D, it might well be claimed that this is one of the most knowledge-intensive sectors of the entire economy.

Intellectual capital performance measure – VAIC

In current economy the predominant activity is no longer the production of goods but the production of knowledge, which is then built into goods and services. This is the starting point of every further economical analysis. As far as capital is concerned, economic thought defines quite precisely what that implies. Capital is only the money or property – buildings, machinery, raw materials – that is used to create new value. The same kind of analogy can be done with knowledge. The power of knowledge still refers to its manifestation in the business environment, and that is **intellectual capital**. In the new economy the concept of intellectual capital is used as a synonym for that part of knowledge which is transformed into market value. From an economic point of view it is possible to conclude that only such knowledge becomes intellectual capital, that it is transformed into value identifiable on the market, or in other words, into benefits for the customer. As money, which doesn't serve the purpose of creating value, is not capital, in the same way isn't the knowledge that fails to fulfil the same function. Intellectual capital is the ability to transform and build knowledge into wealth creating goods. Because people are the main carriers of knowledge following the same logic as before, we can say that only these employees, who know how to use their knowledge in order to create value for themselves, their companies or society are human capital. If we all agree on the fact that employees are the key resource of 21.century and that knowledge is today what once were land and money, than it would be only logical to give this resource the status it deserves: to be investment and not cost any more (*Pulic, A.* 2000).

There has been growing concern with traditional performance measures since the shift from the Industrial Age to the new economic era based on knowledge. In the Industrial Age the measurement of systems were based on the notions of mass with a concentration on the number of units consumed in the creation of a product. Industrial Age measures of firm performance focus mainly on the financial criteria as the gauge for success. If a firm shows an increase in earnings, for example, this is generally seen as positive. As the underlying features of intellectual capital, namely knowledge and information technology, have replaced labour and capital as the driving production factors of wealth-creation calls for new measures have intensified. Under the new economic era of intellectual capital, the demand for customization has resulted in a shift to a focus on the

[7] A distributed knowledge base is a systemically coherent set of knowledges, maintained across an economically and /or socially integrated set of agents and institutions.

relationship of resources used in the production of an item. Furthermore, the emphasis is now on the efficiency with which the relationship between the resources employed and the item produced are performed. This is not to say that the traditional value propositions of cost, quality and time have become redundant. Rather, measures that capture these notions are necessary but now longer sufficient for policy makers to make the best decisions on the allocation of scarce resources so as to meet the challenges of a new dynamic world.

The efficiency of value added methodology (VAIC) developed by Professor Ante Pulic is one intellectual capital based measurement system that offers to fill the expanding void evolving within the growing demand for better mechanisms to evaluate firm performance in the new economic era. Intellectual capital, consisting of two basic components, human and structural capital. The human capital of a company is represented by its workforce and, in accounting terms, by the expenditures for employees. As the quantity of products produced in a given time expressed the productivity of manual work, intellectual capital efficiency can be used as an expression of knowledge workers productivity.

VAIC is a valuable tool that can enable stakeholders to detect weaknesses and strengths in the value creation (*Pulić, A.* 2004). Developing an understanding of the value creation process is important for many stakeholders.

Value added and Efficiency Calculation

The business result is value added, which is calculated as the difference between output and input. The basic definition is as follows: **VA (**value added for company) **= OUT** (total Sales) **– IN (**cost of bought – in materials, components and services)

Human capital efficiency coefficient (**HCE)** is received as a result: **VA** (value added) **/ HC** (total salaries and wages for company)

Structural capital **SC** as the second component of IC is calculated as following:

VA (value added) **– HC (**total salary and wage duty's for company)

Structural capital efficiency coefficient (**SCE**) is calculated in the following manner: **SCE = SC / VA**

By adding up the partial efficiencies of human and structural capital the ***Intellectual Capital Efficiency coefficient*** (ICE) is obtained. **ICE = HCE + SCE**

Capital Employed Efficiency coefficient (**CEE**) is calculated in the following manner **= VA / CE** (book value of the net asset for a company)

In order to enable comparison of overall value creation efficiency all three indicators need to be added: **VAIC = ICE + CEE**

Where:

VAIC = value added intellectual coefficient
ICE = intellectual capital efficiency coefficient (HCE + SCE)
CEE = capital employed efficiency coefficient

This aggregated indicator indicates the overall efficiency of a company and indicates its intellectual ability. In simple words VAIC indicates how much new value has been created per invested monetary unit in each resource. For example if a VAIC value of 2.500 is reported, this can be interpreted as meaning that for every euro of resource employed 2.50 euros of value added is created. The interpretation of VAIC is quite simple. The limit values of indicators point to different levels of efficiency in value added creating and use of intelectual capital.

Efficiency	***Description of efficiency level***
2,50	(Or more) is the sign of highly successful business operations
2,00	It is the minimum for succesful conducting of business operations in most sectors (sufficient value is created to satisfy the needs of employees, depreciation, interests to banks, taxes to the state, dividens to owners)
1,75	Business operations are in a relatively good condition, but they do not guarantee a long-term security
1,25	The reason for concern, does not create enough to ensure development
1,00	The reason for serious concern, insufficient to satisfy all the inputs that are necessary for operational buisness activities

The higher the VAIC and ICE values the better management has utilized the existing potential in the resources employed in creating value. A certain efficiency level tells us how much investment in resources, financial and intellectual capital, is necessary in order to create a certain mass of value added.

The results of research and discussion

The analysis includes companies dealing within the main agricultural industry sub-groups: agriculture and food industry. The sample in the field of agriculture consists of 17 companies and the sample in the field of food industry includes 20 companies. The companies were selected according to the criterion of the total revenue amount, which represents one of the most traditional indices of successfulness of business operations. However, the accomplished high revenue does not automatically mean that company's business operations are efficient and profitable and that it creates added value.

The first column of Table 1 in Appendix represents the rank of companies in agricultural industry according to the realised total revenue, the second according to realised profit, the third according to value added amount, the fourth according to intellectual capital (IC) efficiency, the fifth according to physical and financial capital (CEE) efficiency while the last column shows the rank according to efficiency of use of all resources, namely overall efficiency (VAIC). If the company failed to create added value, which is the

Table 1: Rank matrix of companies in agricultural sector according to realised revenue, value added, and all VAIC resource use efficiency indicators in 2007

Revenue	Profit	VA	ICE	CEE	VAIC	Name of the company	Revenue	Profit	VA	ICE	CEE	VAIC
1	1	1	1	1	1	AGROZIV AD PANČEVO	13.046.933,00	1.306.381,00	1.492.933,00	66,21	7,833	74,05
2	0	2	13	10	13	PIK-BEČEJ-POLJOPRIVREDA AD BEČEJ	3.650.833,00	0,00	903.027,00	0,91	0,264	1,18
3	0	0	0	0	0	FARME PILIČA DOO ZITISTE	2.066.449,00	0,00	0,00	0,00	0,000	0,00
4	0	3	14	13	14	MITROSREM AD SREMSKA MITROVICA	1.780.092,00	0,00	408.383,00	0,27	0,185	0,46
5	4	10	3	3	4	ULJARICE-BAČKA DOO NOVI SAD	1.739.083,00	60.634,00	74.378,00	7,41	0,924	8,34
6	0	0	0	0	0	POBEDA DOO VLADIMIROVAC	1.521.920,00	0,00	0,00	0,00	0,000	0,00
7	5	7	6	9	6	SAVACOOP DOO NOVI SAD	1.473.412,00	58.402,00	81.120,00	6,10	0,353	6,45
8	11	14	9	7	9	MILENIJUM ZADRUGA BANATSKO NOVO SELO	1.365.107,00	9.995,00	24.707,00	3,07	0,426	3,50
9	2	4	7	11	7	AGROUNIJA AD IN CIJA	1.160.717,00	210.161,00	392.536,00	4,74	0,195	4,94
10	3	9	2	4	2	AGRAR FM DOO NOVI SAD	1.124.921,00	68.637,00	75.796,00	14,84	0,713	15,55
11	9	15	8	8	8	POLO DOO VRSAC	1.089.207,00	12.736,00	23.638,00	4,21	0,406	4,62
12	0	13	15	14	15	TEHNOOPREMA DOO ZRENJANIN	918.975,00	0,00	40.485,00	0,00	0,181	0,18
13	7	12	5	2	3	VISNJA PRODUKT DOO NOVI SAD	635.255,00	37.988,00	51.551,00	6,94	4,425	11,37
14	6	8	4	5	5	RAN-KOMERC DOO SUBOTISTE	541.591,00	55.024,00	80.526,00	7,40	0,669	8,07
15	12	5	12	6	12	GRADSKO ZELENILO JP NOVI SAD	493.262,00	5.846,00	317.125,00	1,12	0,549	1,67
16	8	6	10	12	10	JUZNI BANAT AD BELA CRKVA	486.547,00	21.211,00	152.192,00	1,90	0,187	2,09
17	10	11	11	15	11	SEME-TAMIS AD PANČEVO	461.955,00	11.445,00	67.579,00	1,70	0,089	1,79

precondition for calculation of other indicators, it has been omitted from further ranking.

Based on the available statistical data (Table 1) it can be noted that 17 companies from the sample of agriculture accomplished an exceptionally high total efficiency level (VAIC) of 8,48 on the average, as well as above the average level in intellectual capital (IC) efficiency of 7,46 and a high coefficient of property management (physical and financial resources) efficiency of 1.02. If we take into account that the level of the accomplished VAIC coefficient exceeding 2.5 represents the parameter of exceptionally successful business operations, the mean of the observed companies makes an excellent result. Ten companies contributed to such a high average total efficiency (VAIC) coefficient, which makes more than a half of the analysed sample. All of those ten companies reached the VAIC coefficient values that are considered above the average according to the parameters of this method and that point to exceptionally high efficiency in management of all company's resources.

According to the results of all indicators, the Company "Agroziv" takes the first place. In relation to other companies, Agroziv realised the revenue and profit that is above the average, as well as exceptionally high total efficiency (VAIC) coefficient, the value of which reaches even 74.05. Taking into account that the value of VAIC coefficient of 2.5 points to exceptionally successful business operations, this company is the example of excellence in business. It should be taken into account that Agroziv operates with only 49 employees while the average number of employees for the analysed 17 companies is 290. In other words, this company uses its human and intellectual capital in the most efficient way possible.

However, the Company PIK Becej – Poljoprivreda AD Becej confirms that realised revenue does not have to imply successful and efficient business operations. According to the realised revenue, it takes the second place; it did not record any profit in 2007; it takes the second place according to the value added indicator and according to total efficiency coefficient, it takes the 13th place (VAIC of 1.18). The reason for such unfavourable results of efficiency indicator is the fact that PIK Becej employs 2.241 people. The amount of created added value (the structure of which includes salaries of employees and depreciation because there was the negative difference between the revenues and expenses) is not sufficient for accomplishment of higher efficiency. Since the value of this coefficient is below 1.25, the company will not be able to ensure further development with such business operations.

The Company "POBEDA DOO Vladimirovac", which takes the 6th place, did not create the added value and it was therefore excluded from further analysis. This shows that total revenue cannot represent the indicator of successful business operations. For example, despite the fact that the Company "Agrar FM DOO Novi Sad" takes the 10th place according to total revenue it takes the 2nd place according to total efficiency coefficient with VAIC of 15.55, which makes the result exceeding the average. The Company "Visnja Produkt DOO Novi Sad" takes the 13th place according to realised revenue while it takes the 3rd place according to total efficiency coefficient with VAIC of 11.37.

Contrary to the companies Agrar and Agroziv, which owe their high total efficiency coefficient primarily to efficient intellectual capital (IC) management, the Company "Visnja Produkt DOO Novi Sad" recorded a high total efficiency rate

thanks to expert physical and financial resources (CEE) management. Within the observed sample, out of 17 companies in total, there was one company – PIK Becej – that recorded the result showing that their business operations were in the condition raising concern, which implied that they did not create sufficient value added to ensure further development, while the results of two companies – "Mitrosrem" and "Tehnooprema" – showed very poor condition of their business operations, which implied that their value added was not sufficient to cover all the inputs necessary for functional operations. In any case, the overview of efficiency of business operations of companies belonging to the analysed sample from agricultural sector provides a surprisingly positive picture of skills of our company in efficient management with their tangible and intangible assets.

The analysis of the rank matrix produced for the sample of twenty companies in food industry sector shows that the value of VAIC coefficient in those companies is much more balanced compared to the scope of deviations of VAIC coefficient values in companies from agricultural sector sample (see in Appendix Table: 2.) No extreme deviations can be noted, as in the case of "Agroziv", and maximum values of VAIC coefficient do not exceed the limit of 8.03,which is the highest coefficient value in the observed sample. Consequentially, the average VAIC coefficient value is much lower than the one in agricultural field and it makes 3.36. However, it is an excellent result since each value above 2.5 points to an above average efficiency in management with company's tangible and intangible resources. In the observed sample, out of 20 companies in total, 13 of them realised the value of the total efficiency coefficient that is above the average. Two companies did not create added value and they were excluded from further analysis. Two companies – "Vital AD Vrbas" and "Dijamant AD Zrenjanin" – with VAIC of 2.04 and 2.45 respectively, are on the border of successful business operations in the sense that they create sufficient amount of added value to cover the costs of employees, depreciation, interests to banks, taxes to the state and dividends to owners. Other three companies recorded the VAIC coefficient value below 2.00, which points to the fact that their business operations are in a relatively good condition although such business operations do not guarantee long-term security – as it is the case with the Company "Sunce A.D. Sombor", or in a poor condition raising concern since they do not create enough to ensure future development – as it is the case with companies "Neoplanta"and "Victoria Group".

The first place among this group according to total efficiency coefficient (VAIC) value belongs to the Company "Victoriaoil AD Sid". This Company employs 199 people, which is significantly below the average number of employees for companies belonging to the subject sample (579). It can also be noted that the Company recorded such high total efficiency primarily due to above average efficient management with its intellectual capital with the ICE coefficient value of 7.79. On the other hand, this Company takes the 13th place according to CEE coefficient value of

Table 2: Rank matrix of companies in food industry sector according to realised revenue, value added, and all VAIC resource use efficiency indicators in 2007.

Revenue	Profit	VA	ICE	CEE	VAIC	Name of the company	Revenue	Profit	VA	ICE	CEE	VAIC
1	3	5	3	14	3	SOJAPROTEIN AD BEČEJ	14.251.169	1.075.596	1.566.111	5,35	0,24	5,59
2	1	1	10	8	10	APATINSKA PIVARA AD APATIN	11.680.955	1.633.292	4.485.819	3,11	0,42	3,53
3	10	8	13	11	14	DIJAMANT AD ZRENJANIN	9.004.861	401.415	1.506.459	2,16	0,29	2,46
4	2	4	2	6	2	MATIJEVIĆ DOO NOVI SAD	6.909.738	1.293.768	1.811.001	5,57	0,51	6,08
5	17	18	17	18	18	VICTORIA GROUP DOO NOVI SAD	6.683.285	6.319	147.085	1,40	0,11	1,50
6	5	6	8	7	9	CRVENKA AD CRVENKA	6.045.786	810.862	1.552.209	3,24	0,43	3,68
7	6	3	7	1	7	CARLSBERG SRBIJA DOO ČELAREVO	5.808.754	684.900	1.898.503	3,27	0,59	3,86
8	4	7	4	9	4	NECTAR DOO BAČKA PALANKA	5.579.146	905.024	1.529.262	4,98	0,38	5,36
9	16	15	16	10	15	VITAL AD VRBAS	5.387.320	24.353	567.677	1,70	0,34	2,04
10	7	2	14	4	13	CARNEX AD VRBAS	5.317.939	606.695	2.040.930	2,00	0,56	2,55
11	8	11	1	13	1	VICTORIAOIL AD SID	4.750.893	529.627	760.501	7,79	0,24	8,03
12	13	14	9	2	8	TE-TO AD SENTA	4.611.081	216.048	604.525	3,24	0,59	3,83
13	9	9	5	3	5	SAJKASKA AD ZABALJ	3.093.984	507.727	860.880	3,99	0,58	4,57
14	11	10	11	16	12	MLEKARA AD SUBOTICA	2.931.606	396.761	858.189	2,96	0,24	3,20
15	12	12	12	5	11	SOMBOLED DOO SOMBOR	2.896.919	296.071	705.632	2,85	0,52	3,37
16	18	13	18	15	17	NEOPLANTA AD NOVI SAD	2.692.560	-	617.929	1,29	0,24	1,53
17	15	16	15	17	16	SUNCE AD SOMBOR	2.478.552	44.128	462.358	1,81	0,16	1,97
18	0	0	0	0	0	PIVARA MB DOO NOVI SAD	2.411.166	-	-	-	-	-
19	0	0	0	0	0	AGROZIV-YUKO DOO ZITISTE	2.166.576	-	-	-	-	-
20	14	17	6	12	6	BANAT AD NOVA CRNJA	1.920.517	149.775	331.233	3,81	0,29	4,10

0.24, which points to the level of efficiency of management with physical and financial resources. According to the total revenue this Company takes the 11th place and it takes the 9th place according to realised profit, which points to the fact that revenues and profit as traditional success indicators for business operations are not sufficient to recognise successfulness and capacities of the company to allocate efficiently its tangible and intangible resources and manage them efficiently.

Conclusion

Based on the results obtained in the analysis of the sample of companies in agri food sectors we can conclude next:

The average value of VAIC coefficient of companies in both of the observed samples falls above the value of 2.5 and that points to the fact that most analysed companies manage their tangible and intangible resources efficiently. If we consider the overall rank matrix, we can see that intellectual capital efficiency is crucial for overall success since there is a higher matching between the rank lists according to ICE and VAIC indices than according to CEE and VAIC indices. Thus, this analysis confirmed that intellectual potential in business operations of the analysed companies is a significant element for generating overall success of their business operations. Such a high success indicator of business operations in 2007 can be explained with tradition, experience, intensive human capital use, and their good positioning at domestic and foreign markets. However, such high values of IC coefficient in the selected companies should still be accepted with reserve. (Because analysed data is only for one year/ 2007)

The results of the analysis also show that the amount of revenue and profit is not mandatory the sign of efficiency in use of resources. That is because the companies that ranked among first ten (within two observed samples) according to VAIC coefficient also include companies that are according by total revenues ranked in the middle or near the bottom of the scale. Emphasising smaller companies that were not ranked as the most successful according to quantitative indices, the analysis confirms the applicability of VAIC in providing a clear picture on qualitative aspect of business operations of companies within the observed period.

At the end, Authors of this paper would like to point at importance for further studying the role of knowledge in agrifood sector and continuous and systematic measuring of its IC potential for value creation.

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