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Value Added as a Measurement of the Effectiveness of Business Enterprises

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1. Introduction

The success of today's business depends heavily on the investment in the development of intellectual capital (knowledge-based intangible assets), that is professional trainings tailored to employees' needs, information infrastructure and software, research and development, including novel patents, copyright, creating breakthrough products (process innovations), as well as relationship establishment based on the global customer data base. Each company possesses unique knowledge, skills, values and solutions, which can be transformed into value added on the market. Intellectual capital enables a company to achieve a competitive advantage, productivity growth, as well as market value, and the ability to manage intellectual capital becomes a must in today's business. Closely related to intellectual capital management is its measurement, results of which allow for more effective allocation of resources within the company as well as better understanding of the relationship between intellectual capital, competitive advantage, and profitability of the company, including its operational effectiveness.

The primary purpose of this article is to evaluate the operational effectiveness of the company from the angle of the generated value added in relation to its tangible resources (physical capital) and intangible resources (human capital) compared with the financial success of its European competitors. The measurement of value added and matching indicators, which will be presented here, are based on the financial data of *Budimex*, a company operating in the construction and engineering industry, listed at the Warsaw Stock Exchange. The results obtained will then be analysed in the context of the competitive construction industry in Europe, which will then enable the author to state whether the company is operating on the effectiveness level that is higher or lower than the average level.

2. Value added as a measurement of the company's success.

Value added constitutes the fundament of the Porter's value chain[1], which views the company as a system of providing the customer with value. Value creation takes place with the aid of basic functions (that is supply and distribution logistics, procurement and sales, services and production) as well as support functions (that is human resources management, technology development, supply), related to the so-called organizational infrastructure[2]. Organizational infrastructure is understood here as specific processes and business activity systems, which transform tangible and intangible assets into a bundle of assets that enable the company to create value from all the above-mentioned types of assets, establish a competitive advantage, as well as ensure stable cash flows.

The source of value added for the company is the price that a customer pays for the benefits gained from the purchase. In order to obtain value added it is imperative to connect that value with the physical, financial, and intellectual capital that is necessary to create this value. The growth of value added results from the productive employment of the tangible and intangible resources of the company. Finally, value added is the difference between the revenue obtained from the sales of the company's products to the target customer and the expenditures incurred. By offering its customers new products highly valued by them on the market the company increases its sales volume, on the condition that the purchased goods and services needed for the production have been used effectively (provided that production processes have been efficient and losses have been minimal). One has to be aware that it is the essence of the company's existence to create value added, and not to sell, which reflects the resale of expensive components that the company had purchased earlier.

Thus, value added understood in this way is at the same time a sort of the richness of the company distributed to all providers of the capital: shareholders and stockholders, in the form of dividends and interest; the government, in the form of taxes; and employees, in the form of salaries as the employees' contribution in the generation of value (profit division). It is important to point out that today's company should focus on creating value, should know who is responsible for its creation and where it is created (or destroyed), as well as which resources (tangible and intangible) contribute most to added value creation.

Value added can be calculated in the following way[3]:

VAi = OPi + ECi + A + D
where:
VAi – value added of a company
OPi – operational profit of a company
ECi – employment costs of a company (salaries and social security costs)
A – amortization (depreciation and impairment charges on acquisition goodwill and intangible assets
D – depreciation (depreciation and impairment charges on owned assets)

In order to measure the effectiveness of creating value, all company's resources, physical and intellectual capital, which create human capital and structural capital[4], are related to value added. Structural capital is explicit knowledge, the company's skills reflected in the form of intellectual property, data bases, management processes, technical infrastructure as well as corporate culture. B. Lev[5] views structural capital in a similar way, stating that it enables the company to effectively create significant economic value from physical, financial, and human capital as well as from intangible assets.

Value added grows with the effective employment of the company's resources; therefore, the company should create as much value added as possible, having specific physical and intellectual capital at its disposal. Both forms of capital are viewd as investment and constitute a function in creating value. The company can create bigger or smaller value from the same resources.
One of the basic value-added-based indicators is the measurement of labour efficiency on the micro or macro scale, namely[6]:

P = VAi / ENi
where:
VAi – total value added of a company (national economy)
ENi – number of employees of a company (national economy)

This indicator is used to a limited extent by companies operating in different monetary zones (sensitivity to currency exchange rate fluctuations[7]) and in cases of the lack of precise data related to the number of part-time employees. It describes labour efficiency or the amount (monetary) of value added created per one employee.

Other indicators of the effectiveness of creating value added (P_2) and human capital (HCE):
P_2 = VAi / HCi + A or
HCEi = VAi / HCi[8]
where:
HCi – human capital of a company
Ai – amortization

According to L. Edvinnson[9] and K. Sveiby[10], the value of human capital stands for the total expenditures connected with salaries, training (total payroll salaries and labour costs). This indicator (in percentage) allows for the comparative analysis irrespective of currency exchange rate fluctuations. The indicator of the effectiveness of human capital shows the amount of value added created by spending a mon-

etary unit on one employee. The relationship between value added (VA) and human capital (HC) expressed by the accumulation of expenditures incurred on employees describes the capability of human capital to create value in the company.

Because intellectual capital comprises human capital and structural capital, the value of structural capital, which is the difference between value added (VA) and human capital (HC), must be computed first as:
$SCi = VAi - HCi$[11]
where:
SCi – structural capital of a company

The effectiveness of structural capital (SCEi) in creating value added is described by the ratio of the value of structural capital (SC) to value added (VA):
$SCi = SCi / VAi$

Human capital is inversely proportional to structural capital in creating value added, which means that if the share of one capital increases, the share of the other decreases. The less human capital participates in the creation of value, the more structural capital is involved in creating this value. Thus obtained indicator indicates the share of structural capital in creating value added. If added value is totally ascribed to human capital, then, the value added from structural capital equals zero. If half of the value of intellectual capital is ascribed to human capital, the remaining part will belong to structural capital. The reverse will be true if human capital does not create value added; then, the added value of the company's intellectual capital will be totally ascribed to structural capital.

Summing two indicators: the effectiveness of human capital (HCEi) and the effectiveness of structural capital (SCEi), a measurement of the effectiveness of intellectual capital (intellectual capabilities) of the company (ICEi) results:
$ICEi = HCEi + SCEi$

The calculation of the company's intellectual capabilities provides a general picture of the level of involvement of human capital and intellectual capital in the company's operations. Thus obtained result indicates the amount of value the company created from intellectual capital for each invested zloty; it evaluates the quality of the company's operations, which is assessed on the basis of the effectiveness of creating value in relation to the invested resources. It is not sufficient, however, to evaluate the company on the basis of obtained results. It is necessary to pay attention to the relationships between the results and the invested resources. In today's business value is created if the effectiveness of resources is increased. If the effectiveness of creating value decreases, value is destroyed.

3. Case study companies

The object of the analysis is *Budimex PC*, a brand that has been very well-known both in Poland and abroad for over thirty years now. The group *Budimex*, comprising *Budimex PC*, is continuing the operations of the Trade Headquarters of Foreign Construction Industry Budimex, founded in 1968. The Group was established for the purpose of exporting construction services, particularly to the developing markets of Asia and Africa, as well as to the countries of the former socialist block. The political changes of the 1980s and 1990s have contributed significantly to the leading position of *Budimex* on the Polish market. In 1992 the company was privatized, and two years later it was transformed into a joint-stock company. Since 1995 *Budimex* has been a listed public company – its shares are traded on Warsaw Stock Exchange.

Pursuing the strategy of creating a strong construction group, *Budimex PC*, has been investing its capital in several leading Polish companies in the construction industry, gradually increasing its shares, until a complete merger. Today, it constitutes one of the few construction groups operating throughout Poland, represented in the regions of the highest level of construction investments, imcluding *Budimex Poznań*, *Budimex Unibud*, *Dromex*, *Mostostal Kraków*, and *Budimex Olsztyn*. *Budimex Group* has around 5 percent of the Polish construction market.

Since 2000 a Spanish group *Ferrovial* has been *Budimex*'s strategic investor, owning over half of the share capital and votes in the AGM. The strategic partnership with *Ferrovial* has enabled *Budimex* to become the leader on the Polish construction market and to considerably extend the range of its operation. The combination of the investment potential of *Ferrovial*, its know-how, as well as its position on the international market, with the experience and business connections of *Budimex* both on the Polish market and on the Middle and Eastern Europe markets, offers new possibilities of expansion.

During a period of over 30 years of its history, *Budimex* has concluded over 3000 contracts in 23 countries of Europe, Asia and Africa. The erection of complete buildings or their parts as well as land and water engineering (classification according to PKD 45.2) constitute the core of the Company's activity. *Budimex* serves as a counseling, managing and financial center in the Group. The following are the main aims resulting from the three functions:

– fast communication flow within the Group structure;
– reinforcement of financial and monetary economy of a particular company;
– strengthening the Group's position on the market.

According to the statute, the following are the subjects of activity of the dominant unit:

- architecture and engineering;
- preparing the area for construction works;
- erecting complete buildings or their parts; land and water engineering;
- fixing building system installations;
- finishing works;
- renting real estates at the company's cost;
- ordered real estate services;
- ordered wholesale;
- wholesale of personal and home use products;
- retail sale in shops with no specialization;
- the remaining retail sale of new products in shops with specialization;
- performing research and technical analysis;
- legal services, accounting, counseling, holding management;
- gravel, sand and clay mining;
- hotel services;
- other services, not classified elsewhere.

The performance of other 44 construction & building companies in Europe constitute a base for comparison with the performance of *Budimex*. The quoted records[3] include data concerning the performance of 600 companies from 34 sectors and 22 European countries. Obviously, value added or the number of employees in each of the companies cannot be the subject of comparison, which are incomparably bigger. What needs to be compared is the efficiency rates of the value added from invested resources.

4. Results and their analysis

Building industry is one of the more important sectors of national economy. During the years 1997-1998[12] it was evident that the building and installation production became much higher. At that time the rate of increase of building and installation production was significantly higher than the production dynamics of industrial sold production in the whole industry. The share of this section in GDP raised from 6,4% in 1995 to 7,4% in 1998. Nevertheless, from the year 1999 there was a slump in the economic situation in building industry, which was influenced by the decrease in the investment demand. For the first time since 1994 the building and installation production was lower than in 2000 year. The economic situation of the building industry is significantly influenced by the amount of capital expenditure for erecting or modernizing buildings, as well as for machines equipment installation.

Significant fragmentation of its economic subjects is the characteristic feature of building sector. Only two capital groups: *Exbud* and *Budimex* are able to obtain more than 3% share on the market. As it comes to the amount of their own capital, Polish building companies are usually small, which prevents them from contesting the greatest and most prestigious contracts. Companies belonging to this sector of industry experience high competition, from other companies both national and international (e.g. *Skanska*, *Porr International*, *Hochtief*, *Strabag*). As a result the tendency of decrease in margins on executed contracts is being observed.

The years 2000 – 2003 constitute the time span for analysis of *Budimex* and the years 2001/2002; 2002/2003; and 2003/2204 for the European sector of construction & building. The following table shows the performance of Budimex:

Table1. ***Budimex*** financial results (PLN)

	2000	**2001**	**2002**	**2003**
1. Employees number	1222	1189	1260	916
2. Net income from sales of goods and products	600815	498232	690133	555554
3. Value added	253282	122156	147865	113418
4. Operating profit (loss)	121271	2156	9290	(12385)
5. Wages and salaries	102804	93545	107844	97182
6. Social security costs	21724	21902	28248	24877
5 + 6	124528	115447	136092	122059
7. Amortisation	7483	4553	2483	3744
5 + 6 +7	132011	120000	138575	125803

Source: calculation made on company's materials

The unstable economic situation of the building sector in Poland can be observed together with the fluctuations in the number of employees in *Budimex*. These meant the rise in the number of employees in the year 2002 (up to 1260 people) in comparison with 1222 in 2000, and the following fall in their number to 916 people in 2003. The company experienced the increase in income in 2002, which amounted to 690.133 thousand PLN, and fell to 555.554 thousand PLN in 2003. Although the number of employees as well as its income differed at that time, the overall efficiency of the company seems to be increasing systematically (Table 2):

Table 2. Efficiency of the ***Budimex*** company

	2000	2001	2002	2003
P_1: VA/Employees number (PLN)	207,3	102,7	117,4	123,8
P_2: VA/Wages and amortisation (%)	191,9	101,8	106,7	90,2
VA/Sales (%)	42,2	24,5	21,4	20,4
HCE=VA/HC	2,03	1,06	1,09	0,93
SC=VA – HC	128754	6709	11773	-8641
SCE=SC/VA	0,51	0,05	0,08	-0,08
ICE=HCE+SCE	2,54	1,11	1,17	0,85

The efficiency of employees (P_1) decreased from 207.3 PLN in 2000 to 123.8 PLN in 2003, measured by value added per one employee.
A similar downfall was recorded while efficiency in obtaining value added was measured (P_2). It meant that value added amounted to 192% in 2000, decreasing to 90% in 2003. The sales share in value added amounted to 42.2% in 2000, falling down to merely a half of this in 2003, i.e. 20.4%. On the other hand, the efficiency of (HCEi) constitutes 2.03 PLN of the value added obtained from investment in human capital in 2000, but in 2003 the value added obtained from aech invested PLN in the human capital amounted to almost 1 PLN (0.93).
Intellectual capital efficiency of *Budimex* (ICEi) shows 2.58 PLN of the produced value added from the invested intellectual capital in 2000 and a very significant decrease to 0.85 during the negative efficiency of the structural capital of the company in 2003.

All of the above mentioned values have steadily been going down during the last 3 years, however, the decreases does not seen to be significant. It is worth noticing that the Polish building sector is tying to keep up with the growing degree of national and foreign competitiveness and to adjust to EU standards.

European building companies of this sector do not have the above mentioned problems, as they have been active in this sector from several years, which makes them stronger and more successful due to their *know how* abilities when it comes to concluding profitable contracts. As compared to the performance of Budimex, the performance of 44 European companies belonging to the construction & building section are the following (Table 3):

Table 3. Financial results of the European construction & building sector (GBP)

	2001/2002	2002/2003	2003/2004
1. Employees number	1463999	1533568	1556751
2. Net income from sales of goods and products	165528	193769	197526
3. Value added	54561	60911	62406,7
4. Operating profit (loss)	12445	12461	12554
5. Wages and salaries	33951	38386	40252
6. Amortisation	6834	7645	7343
5 + 6	40242	46031	47595

Source: based on *The top 800 UK & 600 European companies by value added*, Departament of Trade and Industry, Great Britain 2003, 2004 i 2005.

The results shown in Table 3 are optimistic, showing regular increase in all of the values presented in the table. Lets think of how the performance of Budimex look in comparison with the European building sector.

In 2002 this sector's share in total value added of 600 European companies was 4.3%, which means that it increased by 10% in comparison with the previous year. In 2003 the construction & building sector produced 4.6% of value added (an increase of 5%), being seventh out of 10 sectors, producing over 2,6% of this value. The degree of concentration of the sector amounted to 20% [5]. In 2004 the sector's share in creating the value added was 4,4%, reaching the 6th position (with 19%degree of concentration). The remaining rates are shown in Table 4.

Table 4. Efficiency of the European construction & building sector

	2001/2002	2002/2003	2003/2004
P_1: VA/Employees number (PLN)	37,3	39,7	40,1
P_2: VA/Wages and amortisation (%)	135,6	132,3	131,1
VA/Sales (%)	33	31,4	31,6
HCE=VA/HC	1,61	1,59	1,55
SC=VA – HC	20610	22525	22154,7
SCE=SC/VA	0,38	0,37	0,36
ICE=HCE+SCE	1,98	1,96	1,91

The efficiency of employees (P_1) and its increase (decrease) is connected with human capital investment. The increase (decrease) of human capital investment measured by the costs of employment per year (salaries, working costs and other

benefits for the employees), meaning increase (decrease) in efficiency, that is ineffective usage of facilities or materials for production by the workers. We notice this type of dependence in *Budimex* as well as in the whole sector.

The efficiency of the work force in the given sector fluctuates from £ 37.3 to £ 40.1, which forms an average level of efficiency in the given sector. A high level of workers' efficiency means £ 65 per employee, and a low one - below £ 35 - of the produced value added per person. The produced value added by a company or sector is evaluated relatively according to the tangible and intangible resources (human capital) used in the course of production processes. During the years 2002-2004 an average value of P_1 for 600 European companies amounted respectively to the following: £ 47.6; £ 48.5, and £ 51.5, which means regular growth, somewhat bigger in annual rate than in case of the sector investigated.

For 600 European companies the efficiency of added value (P_2) amounted to the following: 141%, 135%, and 144%. The P_2 level fluctuated between 135.6 and 131.1% for the investigated sector. This means that the European construction & building sector did much better in creating value added from the invested resources than the investigated *Budimex* company, whose P_2 rate was on a low level of 191.9% in 2000, 101.8% in 2001, 106.7% in 2002, and 90.2% in 2003, which is in relation to a low lever of operational activity of the company. Reducing investments can help achieve a high level of P_2 in a short time. Nevertheless, companies which are able to effectively form a high level of value added and are able to retain it in the future thanks to the increase in value added can maintain their domination in the market. Their strategy is based on innovation and R&D.

The ratio between value added and sales refers to the level of vertical integration of a given company (sector), on which components and materials are transformed into ready for sale products is measured by the relation of value added to the sold value. The pharmaceutical and bio-technological sectors are most integrated vertically (over 60%), meaning that such functions as production, research and product development, and marketing are internalized inside of the company. The level of vertical integration of the investigated sector fluctuates between 31 and 33%, indicating on the fact that the companies of this sector must divide the produces value added between suppliers and cooperators. The similar situation takes place in case of Budimex, which makes use of services of external cooperators and suppliers at a greater degree than its European competitors, especially in 2003, when value added amounted to 20 % in relation to sales.

Value added as a percentage share in the sales differs greatly from company to company which have to pay great sums of money for materials and external serv-

ices (small share). Nevertheless, the companies who are integrated vertically have a much greater share of value added in the sales.

The rate of value added compared to the operating profit shows how effectively the companies transform value added into the operating profit. If P_2 is lower than 100%, a company cannot get any profit. This means the loss of operational activity. Otherwise the produced value added wouldn't cover the depreciation and employment costs.

The effectiveness of the human capital in producing value added (HCEi) of the construction & building companies shows a slight downfall each year. However, during the years 2001, 2002, and 2003 this sector produced respectively 1.61; 1.59; and 1.55 of value added from the invested resources which is more than Budimex did in the similar period (1.06; 1.09; 0.93 respectively). The calculation of the intellectual capabilities of a company (ICEi) shows how much of the intellectual capital *Budimex* has produced from the invested resources (human and structural capital). The results for the years 2001-2003 are the following: 1.11; 1.17; 0.85. Intellectual Capital Efficiency (ICE), on the other hand, levels at 1.98; 1.96; and 1,91 for the given sector, that is much better results than the analysed company.

5. Conclusions

The aim of this research was to compare the results achieved by companies belonging to the building sector in Europe with the *Budimex* company, active on both Polish as well as on international markets from the perspective of value added. We were concerned with the results especially in the areas where the comparisons were possible. The building sector does not seem to belong to the companies "based on knowledge", like the pharmaceutical, biotechnological or software sectors, however, a contemporary company should increase value added as much as possible in order to achieve competitive advantage, and use its knowledge for innovations of products or processes. In order to obtain a fuller view of the presented rates the efficiency of creating value added from the human capital (HCE) and from structural capital (SCE) should be measured and evaluated basing on the whole population of 44 companies of the investigated sector both in Poland and Europe.

I would like to highlight the fact that the compounding factors have not been fully analyzed here. Due to the lack of available data I was forced to downgrade the presentation and analysis of the results to the ones shown above. It would be worth to widen the scope of investigation to measuring the efficiency of producing values from different resources: physical (financial) capital and various products and

services; to identify creation of values as it comes to the search of processes, activities and projects which referring to products and services making a value for the company, or not; to determining the weakest point of value creation. On the other hand, it is not easy to find and analyze the place where the value is being destroyed. Detecting the place would help raise the efficiency of the physical capital in this place. Unfortunately, the cause and effect do not go together in the contemporary economy, and possible weak points are the effect of the chain (or rather net) reaction of destroying values. Some independence must be defined in order to seek the causes, meaning also the improvement of efficiency in the company. Therefore, an intro-functional cooperation could play a crucial role here, especially in monitoring the efficiency by the processes of product production, services, and (marketing and logistical) activities.

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(Footnotes)

1 M.E. Porter, *Competitive advantage*, The Frez Press, New York 1985, s. 87.

2 B. Lev, *The importance of organizational structure (OI)*, "Financial Executive Magazine", July/August 2002.

3 The way of measuring added value is based on A. Pulic, *Intellectual capital – does it create or destroy value?*, Measuring Business Excellence, 1/2004, pp 62-68.

4 L. Edvinsson and M.S. Malone's basic classification of intellectual capital has been referred to, according to *Intellectual capital. The proven way to establish your company's real value by measuring*

its hidden brainpower, Piatkus, London 1997, and *Developing intellectual capital at Skandia*, "Long Range Planning" 3/1997, pp 266-373.

5 B. Lev, S. Radhakrishnan, *Structural capital*, http://www.baruch-lev.com 26 April 2005.

6 *The top 800 UK & 600 European companies by value added*, Departament of Trade and Industry, Great Britain 2004, p. 33.

7 Sensitivity to currency exchange rate fluctuations is mentioned here because the financial results of *Budimex* are expressed in Polish zloties (PLN) while the financial results of the European companies in the construction industry are expressed in British pounds (GBP).

8 A. Pulic, *Intellectual capital*…, op. cit.

9 L. Edvinsson, *Developing intellectual capital at Skandia, "Long Range Planning"* 30/3, 1997, pp 266-373.

10 K. Sveiby, *Methods for measuring intellectual capital*, www.sveiby.com 26 April 2005

11 A. Pulic, *Intellectual capital*…, op. cit.

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