

*Dr Magdalena M. Stuss*  
*The School of Banking and Management in Krakow*  
*The Jagiellonian University*  
*magdalena.stuss@uj.edu.pl*

## **VALUATION OF HUMAN CAPITAL IN A STOCK EXCHANGE COMPANY AS ILLUSTRATED BY THE PKN ORLEN S.A. COMPANY**

### **Introduction**

Human capital valuation, which is conducted within HRM, is a tool that provides information which is measurable, i.e. given in numerical values, and can be helpful in decision-making processes in companies.

Human capital is defined as a human element of organization, i.e. it includes the following factors that are linked together: intelligence, skills and expertise that give the organization its unique character. Human elements in a company are the ones that are capable of learning and changing. They are innovative and creative. When sufficiently motivated, they can guarantee a long-term durability of a company<sup>1</sup>.

Capital measurement is a tool that supports company valuation, especially when the valuation of company assets does not provide the expected data or when it is indispensable to consider both material and intangible assets of a company. Thus, present-day companies, and particularly stock-exchange companies require such data as the value of their human capital.

The aim of the article is to present the results of the investigation (illustrated by one company) in which the Author's research tool was applied. The tool in question, in a universal way and on the basis of external sources, can evaluate human capital in an entity under investigation. The analysis of the PKN ORLEN S.A. is a part of a more extensive research in the field of HCM in the manufacturing sector companies that are listed on the Warsaw Stock Exchange (GPW). The objective of the research, which has been conducted since 2010, is to develop a concept of HCM as one of the instruments of company value growth.

---

<sup>1</sup> A. Baron, M. Armstrong, *Zarządzanie kapitałem ludzkim*, Oficyna Wolters Kluwer business, Kraków 2008, pp.20-21.

## 1. Model of the research tool

Human capital measurement makes it possible to conduct several correcting and upgrading operations not only in the personnel area but also in the field of the whole company management.

For example, K.Sikorska presents the following objectives of human capital valuation<sup>2</sup>:

- to achieve competitive advantage by staff development as a strategic aim,
- to address the shortcomings in the education of the staff,
- to increase the significance of programmes aiming at the acquisition, keeping and developing talents and high-potential employees,
- to personalize development processes,
- to digitize training through e-learning, Internet seminars and virtual classes,
- to delegate the responsibility for education to employees themselves,
- to support mutual exchange of knowledge among the staff regardless of their positions as the increasingly important way of developing competencies;
- to increase the significance of managers and leaders,
- to introduce interactivity of training processes by the application of market games and business simulations,
- to increase the role of managers in staff development, from external to internal coaching.

The presented concept of human capital valuation combines the approaches of Armstrong<sup>3</sup> and Fitz-Enz<sup>4</sup> and consists of a three-stage human capital investigation: data collection, measurement of the value of human capital and the analysis of the results. Valuation measures that are practically applied to Polish and international companies were assigned to each of the stages and compared to the solutions included in the theory of human capital management (HCM). Out of numerous tools, the author selected the ones that are universal in character and can be used in the valuation of Polish stock exchange companies.

Thus, detailed measures were suggested to be applied in the investigation process (Table 1). Both quantitative and qualitative measures were taken into consideration. The measures were adjusted to the specific characteristics of Polish economy and the company valuations based both on external sources and company internal research.

---

<sup>2</sup> K. Sikorska, *Zarządzanie kapitałem ludzkim: 10 trendów*, www.eGospodarka.pl (Accessed: 4 January 2010)

<sup>3</sup> Zob. A. Baron, M. Armstrong, *Zarządzanie ...*, op.cit., p. 83

<sup>4</sup> Zob. J. Fitz-Enz, *Rentowność inwestycji w kapitał ludzki*, Dom Wydawniczy ABC, Kraków 2001, pp.51-66

**Table 1. The concept and measures of human capital valuation**

<b>DATA COLLECTION</b>	
Company effectiveness	sales or customer satisfaction • sales profitability ratio
	productivity • asset productivity index
	brand recognition and customer loyalty
	human capital income index
Company social responsibility	high ethical standards • employee loyalty index • number of employees who completed their career paths
	treatment of employees • code of business
Company customers	customer opinions and observations • customer satisfaction measure
	sales techniques • volume of customer complaints • volume of product returns • volume of maintenance services
Staff demography	age of employees
	staff seniority
	places of origin (in multinationals)
	female/male ratio
Staff development	changes in staff competencies • volume of trainings • number of training days per employee • registered participants of multi-stage trainings
	valuation tools of training effectiveness - expenditure on external/internal trainings - training evaluation frequency
	functioning of talent management processes
Staff opinion	employee satisfaction surveys
	leadership surveys
	staff assessment system and opinions on its functioning
	staff commitment survey
	organizational culture survey
	attitude survey
HRM	operational costs per employee
	income/profit per employee
	absentee rate
	temporary/permanent employee ratio
	average salary
	remuneration differentiation
	figures regarding recruitment and dismissals
	information on health and safety of work
	end-of-job surveys
<b>VALUATION OF HUMAN CAPITAL</b>	
• human capital economic value added	
• human capital value added	
• human capital return on investment	
<b>RESULT ANALYSIS</b>	

Source: Author's elaboration.

Moreover, for particular sectors several measures were collected which enable the development of the concept in individual valuations with regard to the specific features of entities under investigation. The decisions on what additional indexes are to be measured are made on the basis of the primary analysis of the universal solution and the measures obtained in that way.

When investigating the PKN ORLEN S.A. company, the following criteria were additionally valued: labour cost profitability, human capital profitability and labor cost - income ratio

## 2. Diagnosis of measures

The investigation involved the PKN ORLEN S.A. Stock Exchange company, which is a leader both in its sector and among all companies listed on the Warsaw Stock Exchange. The mission of the company is to “discover and process natural resources to fuel the future”. The company’s strategic targets to be reached in 2014-2017 are as follows <sup>5</sup>:

- Average annual LIFO-based EBIDTA of PLN 5.1 bn in 2014-2017,
- Average annual capital expenditure of PLN 4.1 bn,
- Financial leverage maintained below 30%,
- Stable growth of dividend by share.

It is clear that the objectives do not include a human aspect – a personnel function; such notions are to be found in the strategy of Corporate Social Responsibility.

In September 2012, PKN Orlen implemented a document entitled: *The core values and standards of conduct of PKN ORLEN* according to which *the decision to adapt a common approach to Values and the development of organizational culture based on ethical conduct strengthens the position of the corporation as a coherent organism. The values of the ORLEN GROUP are a link that unites and helps find a plane of understanding and cooperation which enables the achievement of common ambitions*<sup>6</sup>.

The aim of the research was not only to verify the correctness of the tool but also to answer the question whether the valuation of human capital is advisable and possible with the sole application of the commonly available data.

In the valuation of the human capital in PKN ORLEN S.A. the following sources of information were used:

- company statements: annual and quarterly financial statements, CSR reports,
- opinions of the trade unions,

---

<sup>5</sup> www.pknorlen.pl (15.04. 2015)

<sup>6</sup> Raport społecznej odpowiedzialności biznesu 2013 (Report on CSR 2013).

- general reports on the position, brand and functioning of PKN ORLEN S.A on the national and international markets that were prepared by various auditing institutions.

It was crucial for the research that the company does not value human capital on its own and does not put into practice the concept of human capital management. However, following numerous foreign investigations, it was assumed that the company can implement its strategy with the consideration of human capital even if it is not done purposefully on the basis of particular measures.

Moreover, market data from the company environment was collected. The research results as well as the conclusions are included in Table 2. Unfortunately, some measures could not be valued due to the lack of data in the accessible sources. That may imply the need for the verification of the research, i.e. a specification for particular industry sectors. The values obtained were analyzed multi-dimensionally; an attempt was made to indicate the causes of their volume, the change dynamics as well as their impact on HRM, etc.

Moreover, the research intended to indicate the causes or consequences of particular results as well as possible subsequent investigations.

## **Conclusion**

Nowadays, human capital management constitutes an increasingly significant factor in company management, especially in the companies listed on stock markets. The valuation of human capital provides important data, particularly quantitative data, which supplies knowledge indispensable to make decisions regarding the future of companies.

Table 2. Human capital valuation in PKN ORLEN S.A. for 2011-2013

	2011	2012	2013	analysis and conclusion
<b>DATA ON COMPANY EFFECTIVENESS</b>				
<b>sales profitability ratio</b>	0.018836544	0.01806796	0.000790493	The sales profitability ratio is decreasing although the asset profitability ratio increased significantly in 3 years, which testifies to a substantial investment in company assets: <ul style="list-style-type: none"> <li>• acquisition of the Canadian mining company - TriOil Resources</li> <li>• commencement of building a power station in Włocławek</li> </ul>
asset profitability	0.03430874	0.041230436	1.742700023	
<b>asset productivity index</b>	1.821392508	2.28196409	2.204573619	the index fluctuates rapidly but its changes do not influence negatively the company as it maintains stable financial liquidity
financial liquidity ratio III	1.520852562	1.706858579	1.536160991	(1,5 - 2)
<b>Brand recognition and customer loyalty</b>	<ul style="list-style-type: none"> <li>• for 3 years the ORLEN brand was valued at almost PLN 43.8 billion and it is the largest Polish company as regards income and the strongest Polish brand.</li> <li>• it is the best company as regards the quality of information policy and the observance of corporate governance (<i>Trusted Brand award</i>),</li> <li>• the titles of Best Managed Company in Poland in 2011 and Best CEE Company in 2013</li> </ul>			
<b>Human capital income index (in PLN thousands))</b>	4779.85	5470.10	5279.53	Income per employee fluctuated insignificantly but in the long-term it remains in the range of +- PLN 5 million
<b>DATA ON COMPANY SOCIAL RESPONSIBILITY</b>				
<ul style="list-style-type: none"> <li>– high ethical standards</li> <li>– employee loyalty index</li> <li>– number of employees who successfully completed their career paths</li> <li>– treatment of employees</li> </ul>	PKN ORLEN S.A. aims at the creation of the climate of confidence and equality of opportunities, of just treatment regardless of sex, age, position, seniority, membership to trade unions, religion, nationality, beliefs, appearance or sexual orientation .  The title of <i>Top Employers Polska 2013</i> ,			a 3-year period is insufficient for complete research in that area; however , micro-data are satisfactory
<b>code of business</b>	<ul style="list-style-type: none"> <li>• the code is in compliance with the rules of corporate governance</li> <li>• it is highly rated in annual CSR rankings</li> <li>• and is included in the RESPECT Index of companies that are considered socially responsible</li> </ul>			The solutions implemented as regards the governance are definitely more advanced than in other companies and worth following
<b>DATA ON COMPANY CUSTOMERS</b>				

<ul style="list-style-type: none"> <li>– <b>customer opinions and observations</b></li> <li>– <b>customer satisfaction measure</b></li> </ul>	<p>Customers value the services and products of the ORLEN brand for their availability and very good quality.</p> <p>The company continuously extends and improves the offer assigned to the ORLEN Premium standard, which includes richly-stocked shops at petrol stations as well as refreshment outlets and new services within the Flota (the Fleet) services.</p>			<p>The data are indirect and based on the information gained from the company itself; it would be advisable to conduct surveys among randomly selected customers to verify the collected variables</p>
<b>STAFF DEMOGRAPHY</b>				
<b>number of employees</b>	22 380	21 956	21 565	The changes in the employment structure (a decrease) were due to the restructuring processes which were implemented mainly in ORLEN Lietuva, Unipetro and Rafineria Trzebinia Groups in 2012, and in Unipetro and Rafineria Trzebinia Groups in 2013.
<b>age of employees</b>				The age structure of the staff remained unchanged in the subsequent years, which testifies to the stability of the recruitment and derecruitment policies.
<30	13.59%	12.10%	No data	
31–40	29.83%	30.10%		
41–50	25.58%	26.90%		
51–60	27.40%	26.80%		
>60	3.60%	4.10%		
<b>Female/Male ratio</b>				The number of female employees increased gradually; however, due to the character of company operations, the number of male workers will always exceed the number of women.
women	19.28%	18.90%	29.00%	
men	80.72%	81.10%	71.00%	
<b>education</b>				<ul style="list-style-type: none"> <li>• every year the number of employees with higher education is decreasing, which is contrary to the trends in the country,</li> <li>• the group of employees with vocational education is significantly growing; however, that is the case in the subsidiaries: Unipetro and ORLEN Lietuva Grups</li> </ul>
university	52.01%	53.20%	40.00%	
secondary	40.09%	39.30%	35.00%	
vocational	6.89%	6.50%	22.00%	
primary	1.01%	1.00%	3.00%	
<b>STAFF DEVELOPMENT</b>				
<b>volume of trainings</b>	9 000	7 000	9 000	Data too general to be interpreted
– <b>valuation tools of training effectiveness</b>	<b>2011</b>			No tools applied to value the effectiveness of trainings, neither

<p>– expenditure on external and internal trainings</p> <p>– training evaluation frequency</p>	<ul style="list-style-type: none"> <li>•courses for the management,</li> <li>•staff trainings in soft skills (communications, cooperation and negotiation skills),</li> <li>•obligatory courses and specialist certification trainings,</li> <li>•training and development programmes such as Liga Mistrzów (Champions League) and Energetyczne Przywództwo (Energetic Leadership),</li> <li>•development of career path schemes within internal recruitment,</li> <li>•development of IT tools to support staff trainings and development,</li> </ul> <p><b>2012</b></p> <ul style="list-style-type: none"> <li>• trainings for the management,</li> <li>• workshops on the role of the staff in developing organizational culture</li> <li>• development programmes for the management and operators were extended by a module on Management by Values.</li> </ul> <p><b>2013</b></p> <p>A multi-module academy of leadership development was implemented in the form of workshops to train managerial skills in the areas of team management, team potentials development, feedback and coaching , and lectures on the ideas of values.</p>	<p>internal nor external trainings are assessed from the point of view of effectiveness or their assessment is so superficial that it does not provide any information; such attitude – according to PARP (Polish Agency for Enterprise Development) – is common as regards the majority of trainings in the last few years.</p>
<p><b>Talent Management</b></p>	<p><b>2011 -2013</b></p> <p>ORLEN EkstraKlasa – a programme for high-potential employees, aiming at the selection of workers with high level of competences, good business thinking, a willingness to self-develop and with an outstanding motivation to work and gain additional business experience.</p>	<p>The concept of talent management is implemented in the company like in other similar companies abroad; however the range is narrower.</p>
<p><b>DATA ON STAFF OPINION</b></p>		
<p><b>leadership surveys</b></p>	<p>No data available on the effectiveness of the Academy of Leadership Development</p>	
<p><b>staff assessment system</b></p>	<p>99% of employees undergo assessment. All workers are regularly assessed as regards work quality. The assessments vary depending on the employee group. They include qualitative and quantitative criteria and are adjusted to the responsibility and independence levels of employees . Various bonus systems were introduced that include both regular and management positions at every level.</p>	<p>The implemented assessment system is based on corporate patterns. It would be worth investigating the effectiveness of the system and the decisions resulting from the appraisals obtained. It is a common mistake of corporations to conduct assessments for their own sake and not for the sake of the results.</p>

<b>DATA REGARDING HRM</b>				
<b>operational costs per employee (in PLN thousands)</b>	335.81081	305.59255	283.56133	dramatic fall in 2013
<b>Profit per employee (in PLN thousands)</b>	90.03588	98.833576	4.1734292	dramatic fall in 2013
<b>average salary – average monthly remuneration (in PLN thousands))</b>	92.89486	98.11327	98.58567	constant in time
<b>recruitment and dismissals</b>	192 (employed) 260 (dismissed)	160 (employed) 180 (dismissed)	204 (employed) 206 (dismissed)	considerable dynamics of change in the years under investigation
<b>information on health and safety of work</b>				In compliance with current standards; a decrease is visible, which testifies to the improvement and effectiveness of the health and safety standards implemented in the company
<b>industrial accidents</b>	15	10	6	
<b>sickness absences (number of days with sick leave)</b>	592	264	195	
<b>workplace accident severity rate (number of days per accident)</b>	39.5	26.4	32.5	
<b>end-of-job surveys</b>	No data			No research was carried out in that area; also the trade unions do not have any reports on the subject, which is surprising.
<b>HUMAN CAPITAL MEASUREMENT</b>				
<b>Human Capital Economic Value Added (in PLN)</b>	-2858.98	720.30	-94412.24	The value is negative , which implies that human capital made a loss of almost PLN 3 thousand a year in the first year, in time the value increased to PLN 94 thousand, which probably indicates over-employment in relation to company current needs.
<b>Human capital value added (in PLN)</b>	113584.18	116762.43	73545.09	The profitability of an average employee amounts to approx. PLN 113 thousand and decreases in the subsequent years to the level of PLN 73 thousand.
<b>Human capital return on investment (in PLN)</b>	1222.72	1190.07	746.00	The return on every currency unit invested in human capital is approx. 1200 and after an insignificant growth it drops to approx. 750
<b>Labour cost profitability (in PLN)</b>	969. 22	1007.34	42.33	The profitability of labour costs fluctuates significantly; however, its latest value is substantially lower than the previous ones, which may raise doubts as regards investing in human resources.
<b>Human capital profitability (in PLN)</b>	47 thousand	52 thousand	50 thousand	the human capital fluctuates significantly, however, it remains in the range of PLN 50 thousand. That constitutes a real value of a single employee as a component of human capital
<b>Total labour cost / income ratio</b>	2%	2%	2%	2% is a constant share of income allocated to labour costs

Źródło: opracowanie własne.

The possibility to compare the value of human capital to other capitals in a company is fundamental as regards investment, remedial and other processes.

The diagnostic research verified the accepted research tool. The general assumptions of a three-stage human capital investigation proved to be correct. However, as regards the selection of the measures, it must be admitted that it would be advisable to supplement the list of measures and to assign them to particular sectors of manufacturing companies that are listed on the Warsaw Stock Exchange.

That is due to the problems with the collection of output data, a varied significance level of particular measures depending on the unique features of a company under investigation and the different objectives of particular human capital valuations.

Moreover, the research enabled a valuation of human capital in a selected stock exchange company. The company invests in human capital value mainly through the implementation of a training system and the Talent Management concept. Unfortunately, it does not conduct valuations of the changes in its human capital value despite being aware of the problem, which is shown by publishing multi-criteria results regarding personnel function and their transparency.

Further research will be conducted firstly in stock exchange companies in the same industry sector with the aim to compare the values of particular measures and then in other manufacturing sectors.

## **Bibliography**

- [1] Baron A., Armstrong M., *Zarządzanie kapitałem ludzkim*, Oficyna Wolters Kluwer business, Kraków 2008
- [2] Fitz-Enz J., *Rentowność inwestycji w kapitał ludzki*, Dom Wydawniczy ABC, Kraków 2001
- [3] Sikorska K., *Zarządzanie kapitałem ludzkim: 10 trendów*, [www.eGospodarka.pl](http://www.eGospodarka.pl) (Accessed: 4 January 2010)
- [4] Raport społecznej odpowiedzialności biznesu 2013 (Report on CSR 2013).
- [5] [www.pknorlen.pl](http://www.pknorlen.pl) (15.04. 2015)

## **Abstract**

The article presents investigation results of human capital valuation based on the Author's research tools. The valuation was conducted in the PKO ORLEN S.A. company on the basis of external sources.