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MARKET-BASED MEASURES OF BUSINESS VALUE CREATION AND VALUE FOR SHAREHOLDERS

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Abstract

Measurement of value creation is not simple. The increase in shareholder value will not necessarily mean its creation, because the creation of shareholder value can be defined more or less rigorously. The article focuses attention on market metrics of value: market value added (MVA) and total shareholder return (TSR), as measures most directly related to the concept of creation of value for shareholders. It also describes a distinction between the concept of value creation and value creation for shareholders, discussing their excess forms as well.

JEL classification: G11, G31, G34

Keywords: market value added (MVA), market value added for shareholders (MVA_E), excess MVA_E, market value loss (MVL)

Introduction

Creating value for shareholders means to overcome investors' expectations as to the return on their investment. The measures of value offer a possibility of a meaningful correlation between the ability of companies to generate cash and the expectations of shareholders as well as the creation of owners' wealth. Market value added (MVA) and total shareholder return (TSR) seem to be the most directly correlated with shareholders' value.

This article presents the market measures of value creation on the example of the results achieved by the oil sector companies listed on the Warsaw Stock Exchange. It also pays attention to the issue rarely raised in the literature concerning the distinction between the concept of value creation and shareholder value creation, discussing their excess forms as well.

Market value added (Market Value Added - MVA) and its form of excess market value added

Market Value Added (MVA) is a measure of value, created by Stern Stewart & Co., remaining in close connection with Economic Value Added. In contrast to EVA, which describes a company's internal situation, MVA is determined by its external condition, i.e. how the market assesses the company on the basis of the difference between the market value

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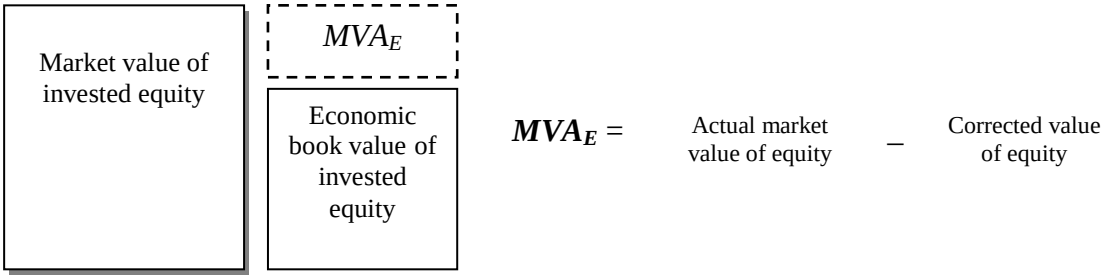
of its stock and the amount of capital that was supplied by investors, which contains equity and debt. Thus, "**MVA is a kind of a bonus added on the market to the capital invested**"(Cwynar & Cwynar, 2002, p. 90). Like the EVA, MVA is calculated using the value of equity and debt. Analysis and evaluation of the process of creating shareholder value require introducing the definition of **market value added for shareholders (MVA_E),** which presents the difference between the market value of the firm's stock and the amount of equity capital that was supplied by shareholders (Cwynar & Cwynar, 2002, p. 176):

$$MVA_E = MV_E - IE \quad (1)$$

where MVA_E = market value-added for shareholders,
MVE = the market value of equity,
IE = the value of equity capital supplied by shareholders.

MVA_E illustrates the difference between the amount of cash which investors would receive if they sold their shares, and the capital which they have invested in the company. The application of MVA_E in the research will provide for an assessment of which companies are increasing shareholders' value, and which ones are reducing it. It will be also a starting point to study the effects of shareholder value creation.

Figure 1: Market value added for shareholders (MVA_E)



Source: Own

EVA represents the economic surplus generated in a single period, while MVA, measuring the value created on the market in relation to the invested capital base, represents the expected value of all future economic surpluses which the company will generate over the period of its life (Michalski, 2001, p.104). This relationship can be shown as follows:

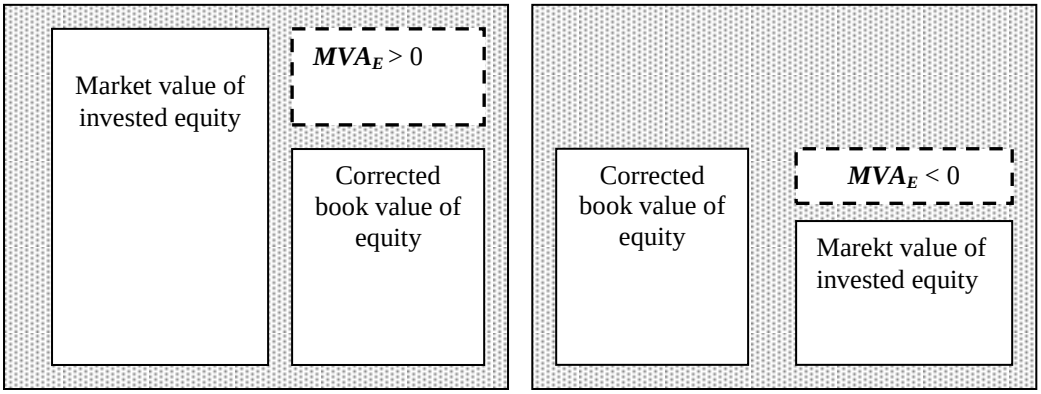
$$MVA = \sum_{t=1}^{\infty} \frac{EVA_t}{(1+WACC)^t}.$$

Due to the fact that the market value added is the sum of discounted future EVA, to achieve the market value of invested capital above its adjusted book value the company needs to generate positive EVA over its economic life. These in turn will be generated when the return on invested capital (ROIC) will outweigh the long-term cost of capital. However, if the market value of a business is less than the capital base through which it operates, the MVA is

negative and we can call it the **loss of market value** (MVL – Market Value Loss.) In this case, the sum of discounted EVA is negative (Cwynar & Cwynar 2002, p.90).

The focus on shareholders' value, as adopted in this article, requires the reconstruction of EVA and MVA into economic value added for shareholders (EVA_E) and market value added for shareholders (MVA_E). In this way MVA_E will be positive, which means the market value of equity exceeds the adjusted book value, if the company generates positive EVA_E over its life - if the rate of return on equity outweighs its cost in the long term.

Figure 2: Positive and negative market value added for shareholders (MVA_E)



Source: Own

MVA_E is an external measure of a company's ability to create additional value, providing a clear way to measure it. It depends on the verification of the company made on the capital market, based on the evaluation of development opportunities and achieving positive EVA_E in the future. However, we can specify certain restrictions of applying the criterion of maximizing its market value as the main purpose of the company (Nyiramahoro & Shooshina, 2001, p. 50).

Firstly, the design of the measure means that it cannot be used to determine the directions of the undertaken decisions. This is due to the fact that the value of the measure to a large extent depends on the overall situation on the capital market, which remains beyond the reach of managerial decisions.

Secondly, MVA can be calculated only in the case of public companies.

Thirdly, the measure can be determined only at the consolidated level, and not at the level of business units.

The fundamental question arises - what measure can be considered as an indicator of value creation for shareholders? Is MVA_E a proper measure in this regard? There is no doubt that positive MVA_E means that shareholder value has increased, but the basic problem lies in the question of whether this increase is satisfactory from the shareholders' perspective. The value of the measure itself does not refer to any threshold quantity, ignoring the cost of capital, which represents the minimum required rate of return expected by shareholders (Escalona, 2002, p. 17).

Moreover, the point of reference is the book value of invested capital, while the base to which investors refer their overall rate of return is the market value of shares being in their possession.

In addition, MVA_E does not include all the elements that create the return to shareholders. This measure focuses exclusively on capital gains, ignoring dividends and other distributions of cash to shareholders. For these reasons, in the area of MVA_E, it makes sense to measure the effects of shareholder value creation using the growth of MVA_E (ΔMVAE) during the given period, expressed as the difference between MVA_E at the end of the period and MVA_E at the end of the preceding period.

It should be noted, however, that the change in MVA_E does not measure shareholder value in the strict sense. The formula ΔMVA_E introduces a condition of MVA_E growth in subsequent years in order to describe value creation, but does not answer the question of whether this growth rate is satisfactory from the perspective of the owners. It is because this growth does not refer to a certain "threshold MVA_E", ensuring shareholders reach the minimum required rate of return (Cwynar & Cwynar, 2005).

Nevertheless, we can try to determine the expected market value for shareholders as the difference between the expected market value of equity and the equity invested, assuming that in a given year, investors expect the growth of the market value of equity at a level that would cover at least the cost of equity:

$$thresholdMVA_{Et} = MV_{Et-1}(1+C_{Et}) - IE_t \qquad (2)$$

where MVA_E = market value added to equity,
C_E = cost of equity,
IE = invested equity,

On this basis it is possible to construct some kind of excess market value for shareholders in accordance with the following formula:

$$excessMVA_{E_t} = MVA_{E_t} - thresholdMVA_{E_t}.$$

Total shareholder return (Total Shareholders' Return – TSR) and the excess TSR

As we can see the measurement of shareholder value creation is not simple. The interpretation of the concept of "shareholder value creation" is a real intellectual challenge.

Total shareholder return (TSR) seems to refer to the concept of shareholder value creation in the most direct way. It should be noted that it measures not only shareholder value but also their wealth, which includes changes in the market value of equity, and cash distributions from the company to shareholders in the form of dividends or share repurchases. In this context TSR measures the total return to shareholders which includes equity capital appreciation, dividends or other cash payments to shareholders. It can be described by the following formula:

$$TSR = \frac{(P_t - P_{t-1}) + DPS + CP}{P_{t-1}} \times 100\% \qquad (2)$$

where P_{t-1} = share market price at the beginning of measurement,

P_t	=	share market price at the end of the period of measurement,
DPS	=	Dividend Per Share,
CP	=	Cash Payment.

This formula uses the price of one share, therefore it becomes a bit problematic to take into account in the situation of share repurchase. In such case, it is possible to present the total return to shareholders using market capitalization of companies and all payments made to shareholders (Fernandez, 2001, p. 3-4.)
From the standpoint of the modern interpretation of the concept of value creation for shareholders, there is a need to refer the TSR to a minimum return required by investors.
Rappaport points out that an adequate measure of value creation for shareholders in this regard is **Excess Return** (Rappaport, 1986, p. 104) or **Abnormal Return** (Badicore, Boquist, & Thakor, 1997, p. 172):

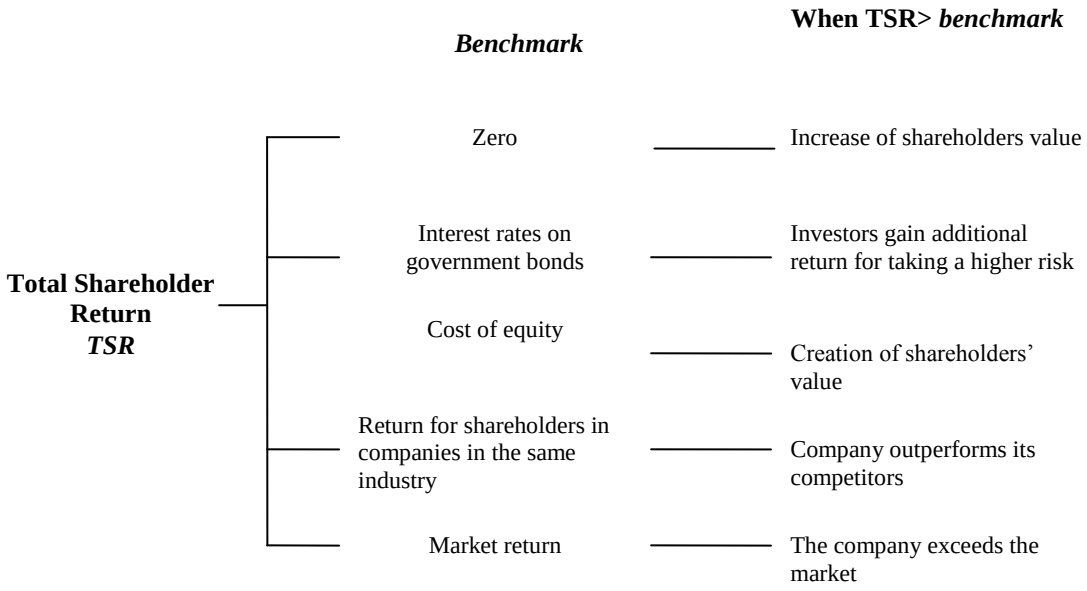
Excess TSR = actual TSR - expected TSR.

Expected TSR can be referred to the cost of equity. A company creates value for shareholders only in a situation where the actual total shareholder return is higher than expected TSR, determined by the cost of equity. That is why TSR appears to be an appropriate measure of shareholder value creation
However, some authors pose an additional question of whether the creator of value can be a company that provides excess TSR, but lower than that achieved by the other companies. They suggest using the concept of **relative TSR**, which is the result of comparing the actual TSR of a company with TSR of the group adopted as the base (market, industry and major competitors):

Relative TSR = TSR of the company – TSR of the basic group.

A positive difference means that a company generates an above-average rate of return (Superior Shareholder Return). However, the authors noted that the creation of shareholder value is also in a situation when shareholders are achieving excess return, even if it does not have the above average (superior) character. The use of relative TSR enables a reliable and objective assessment of the board's performance against the competitors, industry or market as a whole. P. Fernandez suggests that TSR may be compared with other threshold benchmarks (figure 3).

Figure 3: TSR and threshold benchmarks



Source: Fernandez P. A Definition of Shareholder Value Creation, Retrieved from http://www.ssrn.com.

TSR is a market measure and therefore it does not reflect a company's operating results but only the expectations of their future volumes, reflected in the price of shares, which may not always be accurate. This measure, by virtue of its design, is very sensitive to changes on the capital market. The dynamic growth on the capital market caused by more favorable macroeconomic conditions, may be reflected in an increase in TSR, as a result of share price growth. In turn, a fall in the stock market can cause the reverse situation.
The share price, as a basic component of TSR, is determined by many non-managerial factors. This results in a far-reaching restriction on the use of this category in the management process and in the development of incentive pay systems. Adoption of TSR as the sole measure of evaluating the achievements of managers may in fact lead to a situation in which they will be rewarded or penalized for events being beyond their control.
Despite the limitations mentioned above, there is no doubt that the achievement of positive TSR increases the value for shareholders. Moreover, the presence of the threshold rate of return (rate of return expected by investors) in the excess TSR formula, and the opportunity to compare this rate with the rate of return achieved by the market undoubtedly raises the reliability of TSR as a measure of the effects of shareholder value creation. Indeed, it offers a clear, transparent and logical approach to the problem.

Market-based measures of shareholder value creation. The example of fuel companies

MVA and TSR

The oil sector is extremely important for the entire economy. There is no doubt that the changes occurring in the European and world markets have caused many challenges for the

fuel sector companies. The problems with the diversification of oil supplies, strategic directions of the companies from the sector or under-investment in fuel logistics are just some of the most pressing problems of the Polish oil market. The creation of widely understood value is undoubtedly a big challenge on the grounds of financial management of the companies. This article attempts to assess the value creation of companies from WIG-fuel. On 4 June 2010 the index comprised of the following companies:

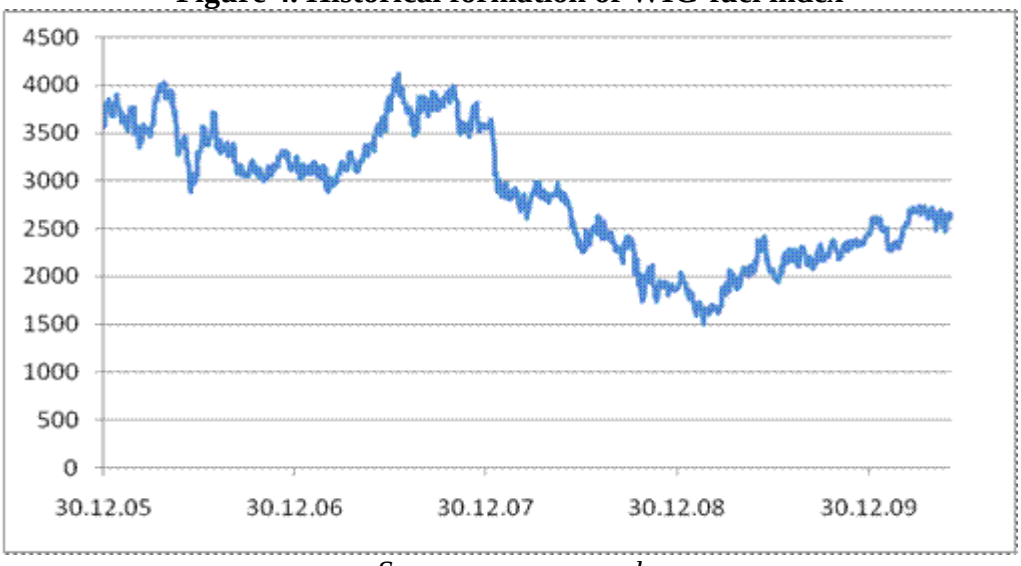
Table 1: WIG-fuel index

Lp	Company	ISIN Code	Share price on session** (PLN)	Holding	Market value of holding (PLN)	Daily change of share price (%)***	Share in the index (%)	Influence on index**** (%)	Participation in shares' turnover and right to shares on session (%)
1	PKNORLEN	PLPKN0000018	37,50	309 999 000	11 624 962 500	- 2,2	60,083	- 1,32	4,68
2	PGNIG	PLPGNIG00014	3,43	900 000 000	3 087 000 000	- 0,3	15,955	- 0,05	1,10
3	LOTOS	PLLOTOS00025	31,40	60 797 000	1 909 025 800	- 1,8	9,867	- 0,18	0,56
4	BOGDANKA	PLLWBGD00016	75,40	13 424 000	1 012 169 600	- 0,3	5,231	- 0,02	0,02
5	NEWWORLDR	NL0006282204	35,75	22 031 000	787 608 250	- 2,3	4,071	- 0,09	0,08
6	KOV	CA5012401058	2,20	201 614 000	443 550 800	- 3,1	2,292	- 0,07	2,32
7	MOL	HU0000068952	260,00	1 039 000	270 140 000	- 5,8	1,396	- 0,08	0,40
8	PETROLINV	PLPTRLI00018	13,60	13 277 000	180 567 200	- 1,5	0,933	- 0,01	0,98
9	CPENERGIA	PLCPENR00035	1,98	16 755 000	33 174 900	- 2	0,171	---	0,01
TOTAL			---	---	**19 348 199 050**	---	**100**	---	**10,15**

Source: www.gpw.pl

The index was created in 2005, and its historical formation is presented in figure 4.

Figure 4. Historical formation of WIG-fuel index



Source: www.gpw.pl

For the purpose of this article, the market effects of shareholder value creation have been examined only for the four companies registered in the index: PKN Orlen, PGNiG, Lotos and MOL. The limitation of the study subjects is due to the fact that these companies have been in the index since its inception.

PKN ORLEN is a Polish company and one of Central Europe's largest refiners of crude oil. It specializes in processing crude oil into world-class unleaded petrol, diesel, heating oil, and aviation fuel as well as plastics and other petroleum related products. PKN ORLEN operates 7 refineries, of which 3 are located in Plock, Trzebinia and Jedlicze (Poland), another 3 in Litvinov, Kralupy and Pardubice (the Czech Republic) and 1 in Mazeikiu (Lithuania). The total deep processing capacity of the refineries reaches 31.7 million tonnes per annum (PKN ORLEN share). PKN ORLEN's retail network comprises approximately 2,700 outlets offering services in Poland, Germany, the Czech Republic and Lithuania. In Poland petrol stations operate under three brands: ORLEN (premium brand), Petrochemia Plock and BLISKA (economy brand). Clients in Germany are served at stations branded ORLEN and STAR, and in the Czech Republic at outlets bearing standard Benzina and premium Benzina Plus logos. Petrol stations in Lithuania operate under the ORLEN Lietuva and Ventus logos.
PKN ORLEN's retail network is efficiently supported by a logistics infrastructure comprising ground and underground storage depots, a network of pipelines as well as sea reloading facilities in Poland and Lithuania.
Refineries belonging to PKN Orlen (in Plock, Trzebinia Jedlicze) account for about 70 percent of the Polish refinery capacity. PKN Orlen sells about 60 percent of the wholesale fuel in Poland, retail sales reach almost 40 percent. The company has the largest network of stations in Central Europe, located in Poland, Germany, the Czech Republic and Lithuania. PKN Orlen Group comprises more than 80 companies At the end of 2009 the ORLEN Group employed 22,535 workers, of which 4,482 accounted for PKN ORLEN's employees (mother company), 4,343 for the Unipetrol Group in the Czech Republic, 3,025 for ORLEN Lietuva in Lithuania and 115 for ORLEN Deuschland in Germany.

Figure 5: Share price of PKN Orlen

Source: Own calculations

The PGNiG Group is the leader of the Polish natural gas market, as well as the only vertically integrated gas company in Poland. Its parent enterprise is Polskie Górnictwo Naftowe i Gazownictwo. The formation of the Group has enabled coordination of the upstream and downstream operations - from exploration and production to storage to trade and distribution of gaseous fuels. The roots of the companies forming PGNiG date back to the 19th century - to the beginning of the Polish and world oil industry. The company has been operating under the name PGNiG since 1982. In 1996, the state-owned company PGNiG was transformed into a joint stock company. The company owes its competitive edge on the gas market (which is now in the process of deregulation), chiefly to natural gas and crude oil production. The core business of the PGNiG Group includes trade in and distribution of natural gas. Following the separation of its gas trading business from the operation of the gas distribution network - completed in 2007 - the entire trading business was taken over by PGNiG, while the distribution is now handled by six Distribution System Operators belonging to the PGNiG Group.

Figure 6: Share price of PGNiG

Source: Own calculations

LOTOS Group is a vertically integrated oil corporation whose core branches are crude oil production and refining as well as oil products distribution. The company provides the market with such high quality goods as unleaded gasoline, diesel fuel, jet fuel and lubricants. Furthermore LOTOS has the leading position in motor oils, bitumens and paraffins trade in Poland. Grupa LOTOS holding group consists of Grupa LOTOS S.A. (parent company, it manages Gdansk refinery), LOTOS Czechowice, LOTOS Jaslo, E&P company LOTOS Petrobaltic, as well as several subsidiaries bearing LOTOS sign. Grupa LOTOS employed (end of June,2009) 4,886 people in its units located all over Poland.

Figure 7: Share price of LOTOS

Source: Own calculations

MOL is the leading integrated company in the oil and gas sector in Central Europe and the largest company in Hungary in terms of value sales. The company is engaged in exploration and extraction of oil and gas (such as deposits in Russia and Kazakhstan), petroleum refining and the wholesale and retail sale of refinery products. MOL controls Slovnaft Slovak refinery, IES in Italy, and it has shares in INA Croatian oil company.

Figure 8: Share price of MOL

Source: Own calculations

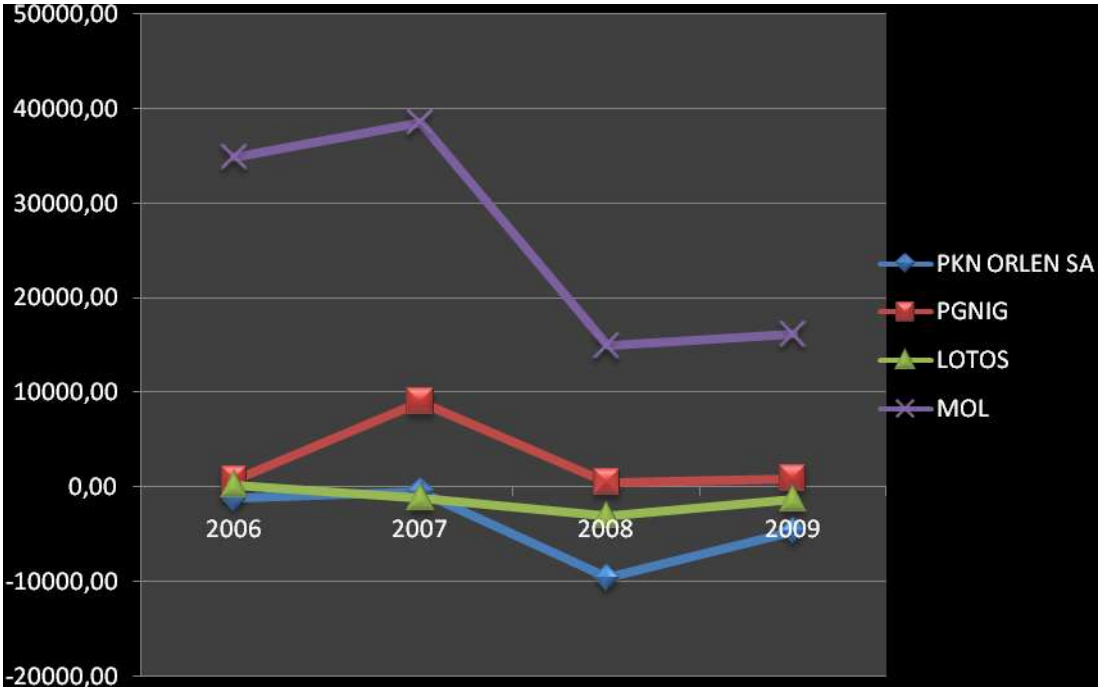
The measurement of the effect of market value creation in the oil sector companies described above is summarized in the table 2.

Table 2: TSR and MVA_E n the fuel companies n 2006-2009[2]

	2006		2007		2008		2009	
	TSR	**MVA**	**TSR**	**MVA**	**TSR**	**MVA**	**TSR**	**MVA**
PKN ORLEN SA	-23,59	-1052965072	8,10	-421266734	-41,90	-9527045860	55,30	-4620023013
PGNIG	8,30	795000000	40,43	9068000000	-25,50	524000000	5,30	959000000
LOTOS	49,3	203467000	-8,89	-1091268000	-73,20	-3041096000	166,10	-1217746600
MOL	14,05	34890233000	30,91	3,8567E+10	-48,95	14932587000	-82,90	16174007000

Source: Own calculations

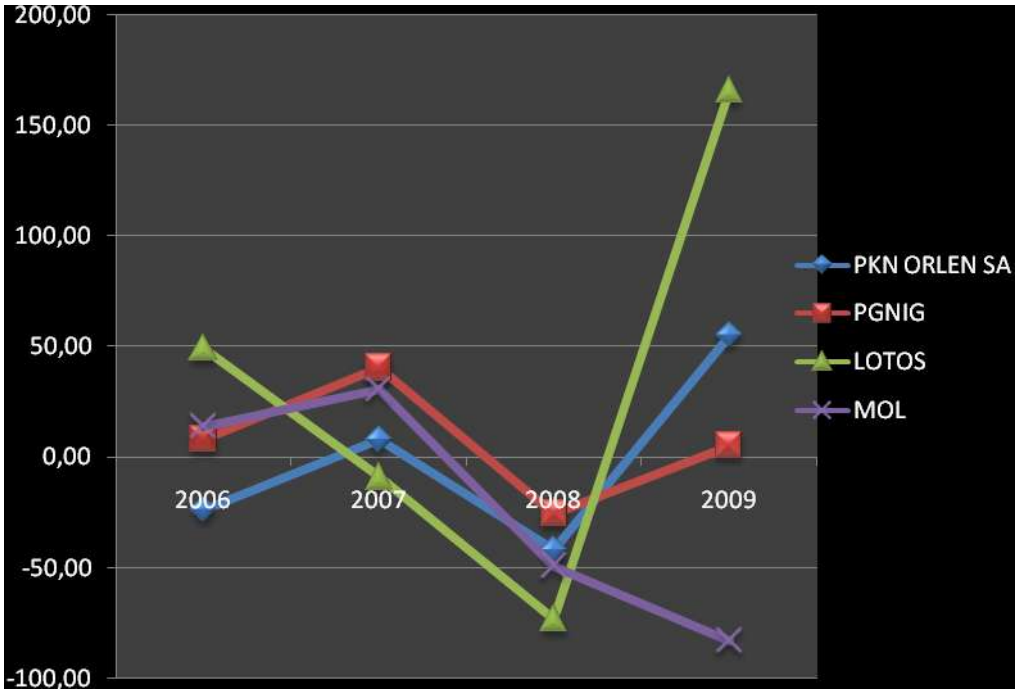
Figure 9: MVA_E in oil sector companies in 2006-2009 (in millions of PLN)



Source: Own calculations

[2] Volumes were calculated according to formulas presented previously.

Figure 10: TSR of the oil sector companies in 2006-2009 (in%)



Source: Own calculations

The table and graph presented above clearly show that two companies: MOL and PGNiG reached positive MVA_E throughout the period of testing. In the case of Orlen Group we can talk about continuous falling value, but the reduction of the lost value since 2008 is undoubtedly a positive trend. Similar trends occur in the case of LOTOS SA, with one difference: in 2006 the company achieved a positive MVA_E.

It seems that the TSR followed the market trends and the financial crisis influenced the rates of return.

The economic crisis that seized the entire world has led to a drastic decline in oil prices, and dynamic repricing of the Polish currency. These factors had the greatest impact on the companies' performance in 2008, including the results of value creation.

Figure 11: Decline in oil prices

Source: www.money.pl

In the case of PGNiG, another reason for this was a valid model of regulation of gas prices, resulting in the fact that the tariffs approved by the Energy Regulatory Office did not reflect the actual acquisition costs of imported gas, but also did not reflect the necessary capital expenditure for exploration and mining, warehousing and distribution of energy.
It seems that the oil sector companies have never dealt with such a rapid deterioration of external conditions, whose impact in any way could not have been effectively predicted.
A positive trend is noticeable in increases in TSR observed in 2009.

Excess MVA and excess TSR

As mentioned above, the measurement of shareholder value creation requires the identification of some kind of threshold, the achievement of which is demanded by investors. Threshold MVA_E was defined as the difference between the expected market value of equity and the equity invested, assuming that in a given year, investors expect the growth of the market value of equity at a level that would cover at least the cost of equity.
Threshold MVA_E for the oil sector companies is presented in the following table.

Table 3: Threshold MVA_E (in mln PLN)

threshold MVA_E	**2007**	**2008**	**2009**
PKN ORLEN SA	-23798,056	-21010,18	-32463,03
PGNIG	-20157,84	-11162,86	-20857,56
LOTOS	-5922,93	-5603,48	-8822,16
MOL	36906,73	41966,35	5544,40

Source: Own calculations

The measurement of threshold MVA_E required the calculation of cost of equity for each company. The Capital Asset Pricing Model was used for that purpose. Formula of CAPM is as follows:

$$C_e = r_f + \beta(r_m - r_f) \qquad (3)$$

where rf = rate of return on risk-free,
rm = the average return on the stock market,
(rm-rf) = the average premium for market risk,
β = the risk index, reflecting the volatility of a company's returns in respect to changes in market returns, systematic risk of equity

The application of the CAPM model in practice requires estimates of three components: risk-free interest rate, market risk premium and the coefficient β

The risk-free rate is defined by a financial instrument that is the basis for calculating risk premiums. In the article the average profitability of 52-week treasury bills was adopted as a measure of the risk free rate

The market risk premium, which is the difference between the return on the stock market and the rate of return on risk-free, is derived from the real returns in the past. The main problem is to determine the length of the calculation. In practice it is rarely less than 10 years, and many authors believe that the most appropriate solution is the maximum extension of time, which objectivises the results of the calculations, eliminating fluctuations in return over time (Alexander, 1995, p.32-34),. The study assumed arbitrarily a market risk premium of 5%.

Coefficient beta measures the volatility of the security, relative to the asset class. The share with a beta of 0 means that its price is not at all correlated with the market. A positive beta means that the asset generally follows the market. A negative beta shows that the asset inversely follows the market; the asset generally decreases in value if the market goes up and vice versa. The study determined the beta coefficients as the ratio of the variance of the rates of return on equity and the variance of the rates of return on WIG-fuel index. The cost of equity for each company is shown in the table 4.

Table 4: Cost of equity (in%)

Cost of equity	2006	2007	2008	2009
PKN ORLEN SA	10,95	11,94	13,51	12,9
PGNIG	4	8,7	5,35	3,9
LOTOS	12,7	12,05	10,3	14,25
MOL	7,1	8,05	11,7	12,9

Source: Own calculations

The calculation of the threshold MVA_E enables the calculation of the excess market value for shareholders, as shown in table 5.

Table 5: Excess MVA_E (in mln PLN)

Excess MVA_E	2007	2008	2009
PKN ORLEN SA	23376,79	11483,13	27843,01
PGNIG	29225,84	11686,86	21816,56
LOTOS	4831,67	2562,38	7604,41
MOL	1660,26	-27033,77	10629,61

Source: Own calculations

The results of excess MVA_E may seem surprising. Indeed, the question arises whether the company creating shareholder value (excess $MVA_E > 0$) can be the one that noticed negative MVA_E? It should be noted that the positive excess MVA_E results from the fact that investors expected much worse MVA_E than that achieved by the company.
It is worth noting that there can be some resistance to consider the company with negative but declining MVA_E as a value creator.
Some authors say that in such cases we are dealing with some kind of a handicap – the equalization of opportunities for strong and weak companies, in some sense discrimination of companies that achieve positive MVA_E.
The ability of companies to exceed market expectations was tested using the excess TSR, according to the formula presented above. Results are shown in the table below

Table 6: Excess TSR (in %)

Excess TSR	2006	2007	2008	2009
PKN ORLEN	-34,54	-3,84	-55,41	42,40
PGNIG	4,30	31,73	-30,85	1,40
LOTOS	36,60	-20,94	-83,50	151,85
MOL	6,95	22,86	-60,65	-95,80

Source: Own calculations

The comparison of TSR and the cost of capital leads to the conclusion that to beat market expectations is not so easy. In our case, the companies with positive TSR beat market expectations and they created value for shareholders. However, it must be noticed that when a company is not able to exceed investors' expectations, there is always the negative correction in share prices, and shareholders' wealth is destroyed. This regularity can lead to unexpected situations in which the company providing 30% return on equity may have a lower market valuation than the company providing a 15% rate of return.
This is conditioned by expectations of the achieved rate of return. If, in the first case, investors expected a company to achieve 40% rate of return, undoubtedly providing a 30% rate of return will lead to the decline in share prices, because the company did not meet investors' expectations. If expectations for other companies were at the level of 10%, then a 15% rate of return beat market expectations, and consequently the share price and shareholders' wealth increases.

Conclusions

The measures presented in the article are market measures of shareholder value creation, which means they are very sensitive to factors affecting the situation on the capital market, (to be kept in mind when interpreting the results). It is therefore advisable to refer them to the internal measures of value, like economic value added (EVA). A short analysis of the effects of shareholder value creation by the oil sector companies presented in this paper, rather inclines us to think that these companies follow the path of value destruction (undoubtedly largely due to the macroeconomic situation and the situation on capital markets). The Fitch Ratings Agency expects that the Central European companies of oil and gas sector will continue efforts to maintain the level of free cash flow in 2010 by continuing tight control of operating costs and capital expenditure. The year 2010 is likely to be another difficult year for the oil and gas sector, despite the moderate economic recovery in many market segments. Hence, expectations for value creation for shareholders of companies of the oil sector must also be moderate.

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