Analysis of Long-Term Shareholders Value Drivers: Evidence from UC RUSAL*

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Abstract. The article shows key business value drivers, their importance and applicability in investment decision-making process and in business efficiency analysis. It also shows the correlation between shareholders and stakeholders value. The article presents such approaches of business valuation as market capitalization approach, DCF and EVA approaches of fair value analysis, and fair multiples valuation model. The use of these models shows the main value drivers which enable detailed value creation analysis. The results of models created in this work are tested: we built a real model of business valuation and key value drivers analysis, with evidence from RUSAL Group.

Аннотация. В статье раскрываются ключевые факторы создания стоимости бизнеса, их важность и особенности применения в принятии инвестиционных решений, а также анализе эффективности бизнеса. Раскрывается взаимосвязь между акционерной и стейкхолдерской стоимостью бизнеса. Инструментарий, используемый для анализа, — это методы дисконтированных денежных потоков, добавленной экономической стоимости, а также анализ на базе справедливых мультипликаторов. В результате модификации и применения указанных моделей были проанализированы ключевые драйверы создания стоимости бизнеса. Результаты исследования были протестированы: была построена модель анализа стоимости бизнеса и выявлены ключевые драйверы роста стоимости бизнеса компании «РУСАЛ».

Key words: Business value, EVA, value drivers, business valuation, terminal value, value analysis, financial analysis, ROIC, cash flows, discounted cash flow approach, shareholders value.

1. INTRODUCTION

The value of business is one of the key performance indicators for different economic entities. Many business analysts consider it as the main indicator of company's success especially in long run. If company increases its intrinsic value, it means that it can generate enough cash flows not only to meet its operating needs (cover items of operating expenses) but also to invest in business expansion (cover capital expenditures items).

There are many different performance and efficiency indicators for companies such as revenue, EBITDA, free cash flow, net cash flow, different profitability ratios (return on assets, return on equity, return on invested capital etc.), different liquidity ratios, earnings per share. All these ratios are useful and meaningful in the process of investment decision-making but they also have one disadvantage: not all of them are specific. An investor needs some presumptive figure, which will help him to understand whether to invest in this business. The most appropriate one is the value of analyzed business.

Business valuation can be considered as a part of corporate finance studies. Many corporate finance theories like Modigliani and Miller capital structure theories (capital-structure irrelevance proposition with the assumptions about taxes absence, no transaction costs and no bankruptcy costs, symmetry of market information and similar costs of borrowing for companies and investors), the CAPM (capital assets pricing model) concept, introduced by Jack Treynor, William Sharpe, Lohn Lintner and Jan Mossin, the concept of modern portfolio theory and portfolio diversification, introduced by Harry Markowitz, made a large contribution to the development of business valuation study. These theories were the base for determining risk factors in the process of business valuation. As of determination of free cash flows, connection between earnings and cash flows, the works of R.Brealey and S.Myers such as "Principles of Corporate Finance" contributed a lot in the development of business valuation concepts.

Now we should mention economists who have been developing business valuation as an independent science. One of them is A.Damodaran. In his books about assets and business valuation, he examined the problem of calculating and analyzing business value, basic valuation concepts, different valuation

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approaches, like discounted cash flow methodology, market approach, assets-based approach. He also analyzed more complicated aspects of business value like different value drivers, special situations (venture capital valuation, early-stage companies' valuation, valuation of companies in the liquidation stages). Problems of valuing business were also analyzed by Jay E.Fishman, Shannon P.Pratt, William J.Morrison. However, in this article we will not analyze general aspects of business valuation; we will try to define key value drivers for business and to build some universal models, which should account the influence of the drivers developed. These problems are in line with the concepts of value-based management. We would mention two most important works dedicated to the business value drivers approach. The first is the economic value added approach, which was introduced by Bennett Steward in his books "The Quest for Value" and "Best-Practice EVA: The Definitive Guide to Measuring and Maximizing Shareholder Value". Another book is written by Tim Koller, the core leader of corporate finance practice at McKinsey & Company, "Valuation: Measuring and Managing the Value of Companies". Both authors pay special attention to the problem of ROIC, WACC, growth and NOPLAT, which are considered key value drivers. This problem will be developed in our article.

The importance of this investigation is not limited by the meaningfulness of business value for different groups of stakeholders but also in approaches used. We will use three approaches for valuation, such as discounted cash flow, discounted economic value added, and fair multiples approach.

2. THEORETICAL ASPECTS OF BUSINESS VALUE. THREE APPROACHES

Fair business value becomes more and more important in life of different societies. In XXI century, possession of useful economic information is one of the success factors. Fair business value is a specific type of information — not available to everyone. That is why it is very important for investors and other groups of stakeholders.. McKinsey & Company made a large research where they found that companies with value-based management are involved in creation of new jobs, increasing GDP and developing scientific progress. Despite the fact that traditionally scientists separate two types of value: shareholders' value and stakeholders' value (we will concentrate on the shareholders' value concept) we can prove that increasing value for shareholders leads to the increased utility for many other stakeholders. In the earlier-mentioned McKinsey & Company's research it was stated that value-oriented companies create healthy business environment and powerful economy, contributing to high standards of living and new opportunities for individuals.

In McKinsey & Company's research different correlations between value growth of large US companies and such factors as employment growth and technological advances were analyzed and found to be positive and strong. It can be proved by Figure 1, which shows this relationship.

If company cuts the costs and uses labor in excess of industry norms and at the same time tries to maximize its value, it will not succeed in the future be-

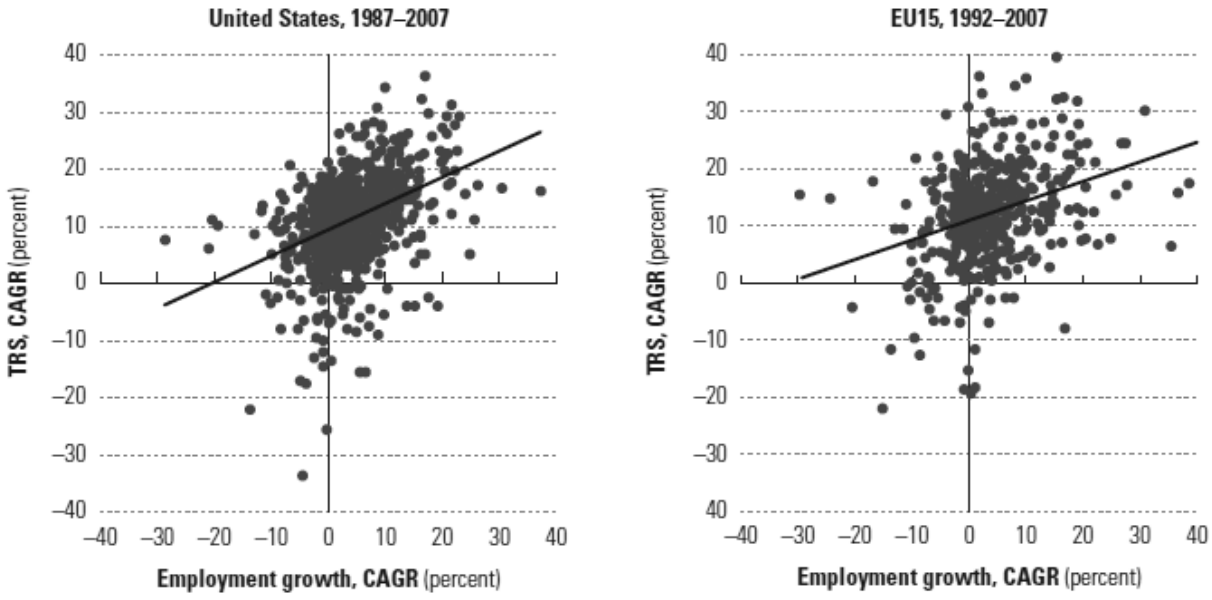

Figure 1. Correlation between value growth and employment growth in USA and Europe.

Source: http://www.mckinsey.com/insights.

cause useful and well-qualified human resources will leave the company and join its peers. This fact will give many competitive advantages for company peers but not for company itself. That is why successful companies offer high salary and bonuses to employees.

Another aspect to be analyzed is correlation between value growth and scientific progress development. McKinsey & Company also analyzed this issue. Results are similar to the previous test: strong positive correlation between the parameters mentioned. Figure 2 could prove this.

Research and development costs are very important for business expansion. They create new products, more effective or less expensive ways of producing goods or rendering services. That is why company oriented on increasing its value is interested in scientific development and progress.

Moreover, companies oriented on value growth in the long-term perspective have a higher level of social and corporate responsibility. They often organize such programs as small enterprises support like VTB or Sberbank in Russia. Value-oriented companies usually have more activities for environment protection. Therefore, we can conclude that companies oriented on the shareholders' value growth also give many benefits for other groups of stakeholders.

We have determined the importance and meaningfulness of increasing shareholders value. Now we will determine formulas and definitions of business value. If we take market capitalization as a beginning point, we can made some corrections and derive the enterprise value formula.

$$EV = Market\,Cap + Debt + Minority + Preffered\,Shares - Cash \quad (1)$$

Where EV — Enterprise value, Market Cap — market capitalization.

Nevertheless, markets are not always efficient and sometimes due to the market speculations, psychology, wrong information they value company in an unfair manner. Such situations are often related to shares' repurchases, mergers and acquisitions and financial engineering. In such cases, analysts need to calculate intrinsic value of business. In this article we will analyze three approaches to determine intrinsic value of business:

1) Discounted cash flow approach;
2) Discounted EVA approach;
3) Fair multiples approach.

2.1 DISCOUNTED CASH FLOW APPROACH

The most commonly used one is discounted cash flow approach. There are two types of cash flows used: free cash flow to equity and free cash flow to firm. The first one means cash flows available for company sharehold-

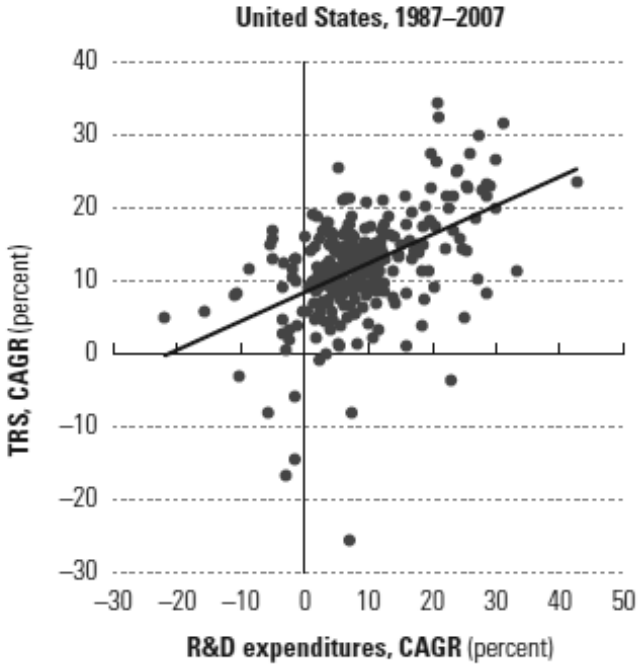

Figure 2. Correlation between value growth and research and development expenditures for US companies.

Source: http://www.mckinsey.com/insights.

ers after all the debt obligations are met, capital expenditures executed and working capital investments met. The second type is broader because it accounts not only shareholders claims but also creditors' claims (more stakeholders involved) and preferred shareholders claims. In our research we will use free cash flow to firm approach (because we don't know the debt and interest schedules for the company analyzed).

Aswath Damodaran in his book "Investment Valuation" defines free cash flow to firm as the sum of all the cash flows to all claim holders in the firm, including stockholders, bondholders and preferred stockholders[1].

There are two ways of calculating free cash flow to firm: from cash flows to equity (formula 2) and from operating income EBIT (formula 3):

$$FCF\left(FCFF\right) = FCFE + IE * \left(1 - T\right) + DPR - ND + D_{ps} \tag{2}$$

Where FCF (FCFF) — free cash flow to firm; IE — interest expenses; T — income tax rate; DPR — debt principal repayment; ND — net debt; D_{ps} — preferred shares dividends.

$$FCF\left(FCFF\right) = EBIT * \left(1 - T\right) + D\,\&\,A - CAPEX - Net\,ch.in\,WC \tag{3}$$

Where FCF (FCFF) — free cash flow to firm; EBIT — earnings before interest and taxes; T — tax rate; *D&A* — depreciation and amortization; CAPEX — capital expenditures; *Net ch.in WC* — net changes in working capital.

In our modelling process we will use the second formula.

The basic intrinsic value formula is presented as formula 4.

$$Value = \frac{FCF}{WACC - g} \tag{4}$$

Where WACC is weighted average cost of capital and g is organic growth.

We can do some simple mathematic transformations to get the formula which shows the key value drivers (formulas 5–7).

$$FCF = NOPLAT - Net\ Investment = NOPLAT - \left(NOPLAT * IR\right) = NOPLAT * \left(1 - IR\right) \tag{5}$$

$$g = \frac{Net\ Investment}{IC} = \frac{Net\ Investment}{IC} * \frac{NOPLAT}{NOPLAT} = IR * ROIC \tag{6}$$

So we got the model which shows key value drivers:

$$Value = \frac{NOPLAT * (1 - \frac{g}{ROIC})}{WACC - g} \tag{7}$$

But this formula assumes that company's growth rate is a constant in the long run. Commonly companies have two growth periods: unstable growth period (with high or low growth rates) and terminal growth (with steady growth rate). In terminal period company's growth rate is close to the growth rate of GDP in the economy where the company operates (fair value fundamentals concepts). The basic formula for terminal value calculation is presented as formula (8):

$$TV = \frac{FCF_{t+1}}{(WACC - g)^n} \tag{8}$$

We can modify this formula to the model which accounts key value drivers (see formula 9):

[1] A. Damodaran, *Investment Valuation: Tools and Techniques for Determining the Value of Any Asset*, 3rd Edition, p. 533.

$$TV = \frac{\frac{NOPLAT_{t+1} * \left(1 - \frac{g}{ROIC}\right)}{WACC - g}}{\left(1 + WACC\right)^n} \quad (9)$$

Now we can show the complex business model of company value including unstable growth rate period and terminal growth rate period, see formula 10:

$$EV = \sum_{i=1}^{t=n} \frac{FCF_t}{\left(1 + WACC\right)^t} + \frac{\frac{FCF_{t+1}}{WACC - g}}{\left(1 + WACC\right)^n} + Debt + MI + PS - C\,\&\,CE \quad (10)^2$$

If we show key value drivers, the formula will be transformed for the next view, see formula 11:

$$EV = \left(\sum_{i=1}^{t=n} \frac{NOPLAT_t * \left(1 - \frac{g}{ROIC}\right)}{\left(1 + WACC\right)^t} + \frac{\frac{NOPLAT_{t+1} * \left(1 - \frac{g}{ROIC}\right)}{WACC - g}}{\left(1 + WACC\right)^n} \right) + b \quad (11)$$

Where b = $Debt + MI + PS - C\&CE$.

In the formulas above we used the following abbreviations: EV — enterprise value; FCF — free cash flow; WACC — weighted average cost of capital; MI — minority interest; PS — preferred shares; C&CE — cash and cash equivalents.

As we see this model is based on the cash flows from business activity, but cash flows not always can represent the business situation. For example diminishing cash flow can occur in both cases: in poor performance and large capital expenditures. The alternative model is economic value added approach.

2.2 ECONOMIC VALUE ADDED APPROACH

Economic value added was presented by Bennett Steward in his book "The Quest for Value"[3] in 1991. The economic value added shows the value which was created by company over some definite time period over the capital invested. There are three key stones in the definitions of EVA: ROIC (return on invested capital), WACC (the cost of invested capital) and invested capital itself. We can show the formula 12 which presents relations between the exponents above:

$$EVA = IC * (ROIC - WACC) \quad (12)$$

Where IC is invested capital, ROIC and WACC are defined above.

The key advantage of EVA is that it shows the main value drivers, but it also has some disadvantages, for example financial managers of companies firstly couldn't apply EVA approach for vertical and horizontal comparisons with peers and also there are some difficulties with differences in scale. Some difficulties are also connected with using EVA as a KPI for bonus programs. In investment services the situation is quite different. For qualified investors EVA is one of key indicators of stable company development and future business potential. The first bulge bracket banks which started using EVA for companies' valuation are Goldman Sachs and Credit Suisse. Then Bennett Steward founded his own corporation EVA Dimensions[4] which aimed to develop value-based management techniques for different companies and EVA approaches for business valuation.

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[2] A. Damodaran, *Investment Valuation: Tools and Techniques for Determining the Value of Any Asset*, 3rd Edition. — p. 1500.
[3] G. Bennett Stewart, *The Quest for Value: A Guide for Senior Managers*, HarperCollins Publishers, New-York, 1999.
[4] http://www.evadimensions.com.

Business valuation based on the economic value added approach becomes more and more popular and useful. As mentioned above, this method allows determining key value drivers such as ROIC, WACC and organic growth. It as an analogue of discounted cash flow approach and should show the same results but with another specification. In our analysis we can prove it using some not very complicated mathematical transformations. We have already shown the transformation from common DCF approach to the approach with key value drivers, it was shown in formula 7:

$$Value = \frac{NOPLAT * (1 - \frac{g}{ROIC})}{WACC - g} \tag{7}$$

We can restate the formula 7 in the following way:

$$Value = \frac{IC * ROIC * (1 - \frac{g}{ROIC})}{WACC - g} = IC * \frac{ROIC - g}{WACC - g} \tag{13}$$

We will continue our mathematic transformations and add WACC to the numerator and then subtract it back in formula 14:

$$\begin{aligned} Value = IC * \frac{ROIC - g + WACC - WACC}{WACC - g} = \frac{IC * \left(ROIC - WACC\right)}{WACC - g} + \\ + \frac{IC * \left(WACC - g\right)}{WACC - g} = IC + \frac{IC * (ROIC - WACC)}{WACC - g} \end{aligned} \tag{14}$$

We got economic value added formula. It represents business value of the company with stable growth rate as a sum of invested capital and economic value added. Now let's develop the idea and show enterprise value in the two growth stages periods (unstable and stable growth rates). The common view of this formula id following:

$$Value = IC_0 + \sum_{i=1}^{t} \frac{IC_{i-1} * (ROIC_i - WACC)}{(1 + WACC)^i} + \frac{Terminal\,Value}{(1 + WACC)^t} \tag{15}$$

Where IC_0 is invested capital as of the date of valuation, t — projection period.

Terminal value is the present value of future cash flows beyond the projection period[5]. The key factors of terminal value calculation are terminal organic growth and terminal cost of capital (WACC). The analysis of terminal value calculation is presented in the formulas 16–18.

$$TV = EVA_{t+1} + EVA_{t+2} = \frac{IC_t * (ROIC_t - WACC)}{WACC} + \frac{PV(EVA_{t+2})}{WACC - g} \tag{16}$$

In the formula $PV(EVA_{t+2})$ is determined in the following way:

$$PV\left(EVA_{t+2}\right) = \frac{NOPLAT_{t+1} * \left(\frac{g}{ROIC}\right) * (ROIC - WACC)}{WACC} \tag{17}$$

[5] Tim Koller , Richard Dobbs , Bill Huyett, Value: *The Four Cornerstones of Corporate Finance by McKinsey & Company Inc.*, John Wiley & Sons, Inc., Hoboken, New Jersey, 2011, p. 213.

So we analyzed all the aspects of business valuation using economic value-added approach and can combine them in the resulting model:

$$Value = IC_0 + \sum_{i=1}^{t} \frac{IC_{i-1} * \left(ROIC_i - WACC \right)}{\left(1 + WACC \right)^i} + \\ + \frac{\frac{IC_t * (ROIC_t - WACC)}{WACC} + \frac{NOPLAT_{t+1} * \left(\frac{g}{ROIC} \right) * (ROIC - WACC)}{\frac{WACC}{WACC - g}}}{(1 + WACC)^t} \quad (18)$$

2.3 FAIR MULTIPLES APPROACH

Multiple is a ratio which shows relation between equity or enterprise value and parameter. There are different goals for calculating multiples: comparing current company value with its historical figures, with peers' value, or with sector figure. There is one more type of multiples: fair multiples or target multiples. Fair multiple presents maximum price which a knowledgeable investor is ready to pay with stated values of key value drivers and which allows the investor to get fair required rate of return (IRR analogue). Fair multiples help the investor or analyst to determine key value drivers and to analyze company in a proper way.

There are two ways how to calculate fair multiples, the choice depends on the growth stage of company. If company's growth rates are stable, and we have some adequate grounds for assuming that rated to be constant in the foreseeable future, the one-step model should be used. Nevertheless, in practice more common solution is to use two-step model, which divides foreseeable period on two stages: initial unstable growth stage and terminal steady growth stage. The second variant will be used in our analysis (the detailed analysis will be provided on the base of EV/NOPLAT, net operating profit less adjusted taxes multiple). We will start the common value formula from the first part.

$$Value = \frac{NOPLAT * (1 - \frac{g}{ROIC})}{WACC - g} \quad (7)$$

We will transfer it to the following model:

$$EV = \frac{NOPLAT * (ROIC - g)}{ROIC * (WACC - g)} \quad (19)$$

When using target multiples we assume that in the terminal period ROIC equals WACC (the concept of company growth with a zero value added). Based on this equation we will get the following model for terminal period:

$$TV = \frac{NOPLAT}{WACC} \quad (20)$$

Therefore, we got the base for calculating enterprise value. Formula 20 is a cash flow from period n. Using the concept of target multiples we can propose that cash flow as an annuity with n years' time horizon, see formula 21.

$$EV = \frac{NOPLAT * (ROIC - g)}{ROIC * (WACC - g)} * (1 - \frac{\left(1 + g\right)^n}{\left(1 + WACC\right)^n}) \quad (21)$$

We should also transform NOPLAT for the period n to $NOPLAT_{n+1}$ and then find present value of the terminal value used.

$$TV = \frac{NOPLAT*(1+g)^n}{WACC} * \frac{1}{(1+WACC)^n} \tag{22}$$

Now we will combine the whole model (two-stages):

$$EV = \frac{NOPLAT*(ROIC-g)}{ROIC*(WACC-g)} * \left(1 - \frac{(1+g)^n}{(1+WACC)^n}\right) + \frac{NOPLAT*(1+g)^n}{WACC} * \frac{1}{(1+WACC)^n} \tag{23}$$

For getting target multiple we should divide the whole model by NOPLAT:

$$\frac{EV}{NOPLAT} = \frac{(ROIC-g)}{ROIC*(WACC-g)} * \left(1 - \frac{(1+g)^n}{(1+WACC)^n}\right) + \frac{1}{WACC} * \frac{(1+g)^n}{(1+WACC)^n} \tag{24}$$

The similar logic was used for calculating EV/EBIT, EV/EBITDA, EV/Sales multiples. We will present only results:

$$\frac{EV}{EBIT} = \frac{(ROIC-g)*(1-T)}{ROIC*(WACC-g)} * \left(1 - \frac{(1+g)^n}{(1+WACC)^n}\right) + \frac{1}{WACC} * (1-T) * \frac{(1+g)^n}{(1+WACC)^n} \tag{25}$$

$$\frac{EV}{EBITDA} = \frac{(ROIC-g)*(1-T)(1-D)}{ROIC*(WACC-g)} * \left(1 - \frac{(1+g)^n}{(1+WACC)^n}\right) + \frac{(1-T)*(1-D)}{WACC} * \frac{(1+g)^n}{(1+WACC)^n} \tag{26}$$

$$\frac{EV}{Sales} = \frac{(ROIC-g)*(1-T)*M}{ROIC*(WACC-g)} * \left(1 - \frac{(1+g)^n}{(1+WACC)^n}\right) + \frac{(1-T)*M}{WACC} * \frac{(1+g)^n}{(1+WACC)^n} \tag{27}$$

Formulas above have some limitations when WACC equals growth. In that case we should add infinitesimal change to g, (0.0000001), such change does not affect the results but helps to avoid dividing by zero.

When analyzing business it is very important to choose the right multiple. McKinsey & Company decided that the best multiple for a variety of companies from S&P 500 is EV/EBITA. It is close to EBITDA but it takes into account depreciation expenses as a part of operating expenses necessary for company to maintain its fixed assets. We will provide a model for EV/EBITA target multiple, where A is the rate of depreciation.

Formula 28 presents one stage model:

$$\frac{EV}{EBITA} = \frac{(ROIC-g)*(1-T)(1-A)}{ROIC*(WACC-g)} * \left(1 - \frac{(1+g)^n}{(1+WACC)^n}\right) + \frac{(1-t)*(1-A)}{WACC} * \frac{(1+g)^n}{(1+WACC)^n} \tag{28}$$

Formula 29 presents two stage model:

$$\frac{EV}{EBITA} = \frac{(ROIC-g)*(1-T)(1-A)}{ROIC*(WACC-g)} * \left(1 - \frac{(1+g)^n}{(1+WACC)^n}\right) + \\ + \frac{(ROIC_{LT}-g_{LT})*(1-T)*(1-A)}{ROIC_{LT}*(WACC_{LT}-g_{LT})} * \frac{(1+g)^n}{(1+WACC)^n} \tag{29}$$

We analyzed the basic concepts of business valuation using value drivers approach and created models for three cases: discounted cash flow methodology, discounted economic value added and target multiples concept.

Now we will present the results of model testing evidence from UC RUSAL, the largest aluminum producing company in Russia, one of the world leaders.

3. UC RUSAL VALUATION AND ANALYSIS ON THE BASE OF MODELS DEVELOPED

3.1 DISCOUNTED CASH FLOW METHODOLOGY

The valuation was provided as of 30.06.2014, based on the macroeconomic assumptions as of 30.06.2014. For terminal growth rate, we used 4% GDP growth for Russia, a long-term estimation by Bloomberg.

The first step after determining assumptions (macro and micro ones) is revenue analysis and estimation. Revenue is the key element for estimating other elements of free cash flow. The results of revenue estimation are presented in the Table below:

The revenue was estimated using bottom-up approach. For calculations were used such parameters as historical company's revenue dynamics, aluminum price forecast, contraction in manufacturing data, provided by UC RUSAL, GDP growth estimations and PPI forecast (data provided by Bloomberg).

The next step in analysis is estimation of costs of goods sold. In analysis were used such data as PPI estimation, provided by Bloomberg, UC RUSAL contraction in manufacturing estimates, foreign exchange forecasts for USD/RUB provided by Bloomberg. The results are presented in Table 2.

For estimations the following expense structure was used: inventory — 55%, energy — 26%, salary — 10%, transportation — 6%, other — 3%. Such structure was provided by company management.

The next calculation is operating expenses, which were calculated as a percentage of sales. The results are presented in Table 3.

The next step is to calculate fixed assets, depreciation expenses and capital expenditures (the results are provided in Table 4).

The next step is net working capital estimation. Each of working capital components was estimated in accordance with its driver (revenue or COGS). The results are presented in Table 5.

The next step is free cash flow (to firm) calculation. The results are presented in Table 6.

The next step is weighted average cost of capital calculation, the results presented in Table 7.

In calculations we used beta which was calculated as a median line of peers' betas.

The present value of estimated cash flows using calculated WACC is 2 870.64 ml USD. We should correct this value for current debt level and cash position.

The terminal value of RUSAL will be calculated using Gordon growth model. We assume last year estimated cash flow to be equal to 868 ml USD, terminal WACC — 13.48%, growth rate — 4%.

$$TV = \frac{868}{13{,}48\% - 4\%} = 9\,160{,}46 \text{ ml USD.}$$

Present value of the figure received equals 4 868.72 ml USD. Current level of company debt is 10 892 ml USD, cash — 552 ml USD. Enterprise value can be calculated as following:

Table 1. UC RUSAL revenue estimation, ml USD.

Year	2013	2014	2015	2016	2017	2018
1	**7**	**8**	**9**	**10**	**11**	**12**
Revenue	**9760**	**9095**	**9982**	**10836**	**11181**	**11591**
Growth rate	90%	93%	110%	109%	103%	104%
Aluminum Price	1800	1898	1935	2065	2202	2315
Producers price index	87%	105%	102%	107%	107%	105%
Contraction in manufacturing	92%*	92%				
Real GDP dynamics (Russia), % (yoy)	101%	101%	102%	102%	102%	102%
Corrections for demand growth			101%	101%	101%	101%

Source: Calculated by author.

* www.rusal.ru

Table 2. US RUSAL costs of goods sold estimation, ml USD.

Year	2013	2014	2015	2016	2017	2018
1	**7**	**8**	**9**	**10**	**11**	**12**
COGS	**8312**	**6964**	**7477**	**8123**	**8386**	**8693**
Contraction in manufacturing	92%	92%				
Economy reserves	92%	92%				
Inventories	4538	3802	4160	4552	4981	5451
Energy	2184	1830	1992	2238	2616	2862
PPI	104%	110%	109%	109%	109%	109%
USDRUB	33	36	36	35	34	34
Change % yoy	108%	108%	100%	99%	97%	100%
Salary	852	714	750	787	826	866
Inflation	7%	6%	5%	5%	5%	5%
Transportation expenses	497	417	456	499	546	597
Other	240	201	212	222	233	245

Source: Calculated by author.

Table 3. UC RUSAL operating expenses estimation, ml USD.

Year	2013	2014	2015	2016	2017	2018
1	**7**	**8**	**9**	**10**	**11**	**12**
Operating expenses	**–404**	**1 037**	**1 138**	**1 235**	**1 275**	**1 321**
Revenue	9 760	9 095	9 982	10 836	11 181	11 591
OPEX as a % of revenue	–4%					
Median line (2008–2013)	12%					

Source: Calculated by author.

$$EV = 2870,64 + 10892 - 552 + 4868,72 = 18079,36\, ml\, USD$$

Today's UC RUSAL value equals 18–20 ml USD which lies in line with calculated figures.

3.2 DISCOUNTED ECONOMIC VALUE ADDED METHODOLOGY

The first step is to calculate invested capital, which is determined as a sum of net working capital, fixed assets, intangible assets and other operating assets less liabilities. The results are provided in Table 8.

The calculation uses as a percentage of sales estimation methodology.

The next step is EVA calculation. We used long term steady WACC provided by JP Morgan research (Global research 31/07/2014). The results are presented in Table 9.

Negative values of EVA are results of low aluminum prices, in the long-term negative EVA will turn to positive.

After discounting received EVA figures using current WACC we will get a sum of discounted EVA of –2 341.8 ml USD.

The next step is terminal value calculation. The results are provided below in accordance with 16–18 formulas.

$$EVA_{t+1} = \frac{IC_t * (ROIC_t - WACC)}{WACC} = \frac{23404 * (5\% - 7\%)}{7\%} = -3999,07 \text{ ml USD.}$$

Table 4. UC RUSAL capital expenditures estimation, ml USD.

Year	2013	2014	2015	2016	2017	2018
1	**7**	**8**	**9**	**10**	**11**	**12**
Fixed assets	**4887**	**4554**	**4998**	**5425**	**5598**	**5804**
As a % of revenue						
Median line	50,1%					
Change	-566	-333	444	427	173	205
Depreciation	**799**	**525**	**577**	**626**	**646**	**670**
As a % of revenue	8,2%					
Median line	5,8%					
Amortization	**13**	**13**	**14**	**15**	**15**	**16**
As a % of sales	0,0%					
Median line	0,0%					
Revenue	9760	9095	9982	10836	11181	11591
Capital expenditures	246	205	1035	1068	834	891

Source: calculated by author.

Table 5. UC RUSAL net working capital estimation, ml USD.

Year	2013	2014	2015	2016	2017	2018
1	**7**	**8**	**9**	**10**	**11**	**12**
Assets						
Cash and cash equivalents	300	300	300	300	300	300
Receivables	177	165	181	196	202	210
Median line (% of sales)	2%					
Inventories	2663	2231	2396	2603	2687	2785
Median line (% of sales)	32%					
Other operating assets	698	650	714	775	800	829
Median line (% of sales)	7%					
Assets	**3661**	**3182**	**3410**	**3677**	**3787**	**3914**
Liabilities						
Payables	838	781	857	931	960	996
Median line (% of COGS)	9%					
Other short-term liabilities	1130	947	1017	1105	1141	1182
Median line (% of COGS)	14%					
Sales	9760	9095	9982	10836	11181	11591
COGS	8312	6964	7477	8123	8386	8693
Liabilities	**1969**	**1728**	**1874**	**2035**	**2101**	**2178**
Net working capital	**1692**	**1453**	**1535**	**1642**	**1686**	**1736**
Change in net working capital	**–188**	**–239**	**82**	**107**	**44**	**51**

Source: calculated by author.

Table 6. UC RUSAL free cash flow calculation, ml USD.

Year	2013	2014	2015	2016	2017	2018
1	7	8	9	10	11	12
Sales	9760	9095	9982	10836	11181	11591
COGS	8312	6964	7477	8123	8386	8693
Gross profit	1448	2131	2506	2713	2795	2898
Operating expenses	–404	1037	1138	1235	1275	1321
EBIT	1852	1094	1368	1478	1521	1577
Depreciation	799	525	577	626	646	670
Amortization	13	13	14	15	15	16
EBITDA	2665	1632	1958	2119	2182	2262
NOPLAT	1482	876	1094	1182	1216	1261
Adjusted depreciation	639	420	461	501	517	536
Adjusted amortization	11	10	11	12	12	13
Change in net working capital	–188	–239	82	107	44	51
Capital expenditures	246	205	1035	1068	834	891
Free cash flow	**2073**	**1340**	**450**	**520**	**868**	**868**

Source: calculated by author.

Table 7. UC RUSAL WACC.

Category	Designation	Value	Source
1	2	3	4
Risk free rate, USD yield	Rf	5,50%	Bloomberg, eurobonds Russia-2028 REGS
Unlevered beta	βunlev	1,07	Bloomberg, peers analysis
Debt/Equity ratio	D/E	1,04	Bloomberg, peers analysis
Weight of debt	Wd	71%	Bloomberg
Weight of equity	We	29%	Calculation
Levered beta	βrelev	1,43	Calculation
Equity risk premium	ERP	6,97%	Calculation
Cost of equity	Ke (USD)	15,46%	Calculation
Eurobonds Russia 2028 yield	YTM USD	5,50%	Bloomberg, eurobonds Russia-2028 REGS
OFZ 2027 yield	YTM RUB	9,12%	Bloomberg, OFZ 2027
Cost of long-term debt	Kd (USD)	11,00%	Bloomberg
Income tax rate	t	20%	Internal Revenue Code
Weighted average cost of capital	**WACC (USD)**	**13,48%**	

Source: calculated by author.

Table 8. UC RUSAL invested capital, ml USD.

Year	2013	2014	2015	2016	2017	2018
1	**7**	**8**	**9**	**10**	**11**	**12**
Net working capital	1692	1453	1535	1642	1686	1736
Net fixed assets	4887	4554	4998	5425	5598	5804
Net intangible assets	3397	3209	3522	3823	3945	4090
Other	9126	9238	10140	11006	11357	11774
Invested capital	**19102**	**18454**	**20195**	**21897**	**22586**	**23404**

Source: calculated by author.

Table 9. UC RUSAL EVA calculation, ml USD.

Year	2013	2014	2015	2016	2017	2018
1	**7**	**8**	**9**	**10**	**11**	**12**
NOPLAT	1482	876	1094	1182	1216	1261
ROIC	8%	5%	5%	5%	5%	5%
WACC	7%	13%	8%	7%	7%	7%
EVA	**202**	**–1612**	**–600**	**–241**	**–252**	**–260**

Source: calculated by author.

In the process of EVA_{t+2} calculation we used the following estimations: long-term growth as 4%, long-term WACC as 6.55%, long-term ROIC as 8.5% as of the date of estimation, provided by JP Morgan.

$$EVA_{t+2} = \frac{PV\left(EVA_{t+2}\right)}{WACC - g} = \frac{\dfrac{NOPLAT_{t+1} * \left(\dfrac{g}{ROIC}\right) * \left(ROIC - WACC\right)}{WACC}}{WACC - g} =$$

$$= \frac{\dfrac{1312 * \left(\dfrac{4\%}{8.55\%}\right) * (8.5\% - 6.55\%)}{6.55\%}}{6.55\% - 4\%} = 7\,206.90\, ml\, USD$$

Enterprise value calculated on the base of EVA approach is calculated in the following way:

$$Value = IC_0 + \sum_{i=1}^{t} \frac{IC_{i-1} * (ROIC_i - WACC)}{(1 + WACC)^i} + \frac{Terminal\, Value}{(1 + WACC)^t} =$$

$$= 19102{,}08 + \left(-2341{,}8\right) + 1704{,}94 = 18\,465{,}21\, ml\, USD$$

As we can see the figure of calculated value using EVA approach is in line with the value figure from DCF approach.

3.3 TARGET MULTIPLES METHODOLOGY

We will use EV/EBITDA multiple in this approach. The formula used is provided below (from the first part of article):

$$\frac{EV}{EBITDA} = \frac{\left(ROIC - g\right) * (1 - T)(1 - D)}{ROIC * (WACC - g)} * \left(1 - \frac{\left(1 + g\right)^n}{\left(1 + WACC\right)^n}\right) + \frac{\left(1 - T\right) * (1 - D)}{WACC} * \frac{\left(1 + g\right)^n}{\left(1 + WACC\right)^n} \qquad (26)$$

We used the following fundamentals determined on the base of historical analysis and analysts reports: ROIC — 6%, amortization rate — 0.4%, depreciation rate — 10%, projected period growth — 6.3%, tax rate — 20%, projected period WACC — 6.6%, long-term WACC — 6.5%, long-term ROIC — 8.5%, long-term growth rate — 4%.

The results are following:

$$\frac{EV}{EBITDA} = \frac{(6\% - 6{,}3\%) * (1 - 20\%)(1 - 10\%)(1 - 0{,}4\%)}{6\% * (6{,}5\% - 6{,}3\%)} * \left(1 - \frac{(1 + 6{,}3\%)^5}{(1 + 6{,}5\%)^5}\right) +$$

$$+ \frac{(1 - 20\%) * (1 - 10\%)(1 - 0{,}4\%)}{6{,}55\%} * \frac{(1 + 4\%)^5}{(1 + 6{,}5\%)^5} = 9{,}74$$

Using the received multiple and 2013 EBITDA of 2 255 ml USD, enterprise value should be equal to 21 972.4 ml USD.

So we can conclude that using target multiples enterprise value should be equal to 22–23 ml USD without any significant crises and changes in global economic conditions.

The difference between value figures calculated using DCF approach, EVA approach and target multiples approach is insignificant. So the proposed models provide similar results close to reality and can be used for business value analysis.

4. FINDINGS AND CONCLUSION

In the article we presented new value drivers oriented valuation methodologies on the base of DCF, EVA and target multiples approaches. We proved that results from all three approaches are similar and can be used in practice. We created the universal approach which determines business value in terms of mixed influence of such value drivers as ROIC, WACC, NOPLAT, organic growth. This approached is proved in all three models presented. Moreover we can create a wider base of value drivers by decomposing and analyzing each of above-mentioned ones. For example ROIC can be decomposed using DuPont-analogue model in the following way: $ROIC = \frac{NOPLAT}{IC} = (1 - T) * \frac{EBIT}{Sales} * \frac{Sales}{IC} = ROS * Capital\ Turnover * (1 - T)$. Such types of analysis can be applied to other value factors.

So it shows that the proposed methodology presents traditional approaches such as DCF and created a scheme of developing them in terms of more accurate future value forecasting for meeting needs of different stakeholders classes.

Today the most common valuation practice is ordinary DCF analysis. Our approach enriches traditional DCF, proposes practical implementation of using EVA and target multiples approaches. The models can also be used in trading strategies algorithms: buying shares when the observed multiple below the target one and selling when the observed is above the target one.

The models were tested on the base of UC RUSAL, one of the world's largest aluminum producers. As of the beginning of estimation the company was valued by Bloomberg at 12 000 ml USD, 1.5 years after the company valuation was increased by 60–80% to near 20 000 ml USD.

The models created help to combine external investment analysis with detailed value drivers' analysis. Models help to determine the direction of future value dynamics, take effective investment decisions for direct and portfolio investments. The model recommendations were used for investment decisions by Gazprombank Asset Management and resulted in good profit figures.

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