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VALUATION OF RUSSIAN ENERGY COMPANIES
CASE ROSNEFT

Bachelor's Thesis

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1 INTRODUCTION

Everything has value, whether it is emotional or economic value. In economics and business life, this raises the question how the value of an asset should be determined. Value of an asset is relevant to many different interest groups, such as investors, analysts, public authorities, companies and their executives. Basically, the value of an asset is defined every time an asset is sold and bought.

But the need for valuing does not rise only from buying and selling assets. In economic theory, it is widely held that the single most important function of a company is to maximize shareholder value. In order to do this, a company's top management must understand what affects shareholder value and how exactly value is created. As a result, valuation is important not just for financial analysts and investors, but for everyone somehow engaged in business life.

Due to its importance, valuation has been widely studied. However, most studies focus on Western companies, which by and large are privately owned and publicly traded companies. Russia, instead, regards the energy sector as a matter of national interest intervening in many ways. Not only does the State of Russia own Russian energy companies, it also levies taxes on the sector through export customs and transportation tariff and restricts foreign ownership in the companies by law. Therefore, valuation of Russian companies differs from that of Western companies.

Most of the abovementioned factors are taken into account when determining the discount rate. Depending on the valuation model, the discount rate is either the cost of capital or cost of equity. The market risk premium is adjusted according to the political and other risks and for Russian companies it should be considerably higher than for Western companies. As an ordinary citizen or foreign investor has no power or possibility to influence the company's operational policy, we apply a minority investor's point of view to valuation.

The study introduces the most common methods used to determine value of a company and examines how these methods should be applied when valuing a Russian company operating in the oil and gas industry. The study introduces the following methods:

1) Balance Sheet Approach
2) Dividend Discount Model
3) Discounted Cash Flow Models
4) Economic Value Added Model.

In addition, each method is applied in practice by using the Russian oil company Rosneft as a case company. Listed in the RTS, Rosneft is a state-owned integrated oil company, which conducts exploration and production of oil and gas as well as refining and marketing of outputs.

The value of Rosneft is particularly interesting as the State of Russia – currently holding circa 75 per cent of the company shares – is planning to privatize major part of the company by selling approximately 15 per cent of the shares by the year 2015 (Itar Tass, YLE October 20, 2010). On January 11, 2012, Vice Prime Minister Igor Sechin, who's responsible for the energy sector, suggested that the government should not rush its privatization program and stated that he believes major Russian energy companies, including Rosneft, are currently undervalued. Mr. Sechin is suggesting the Rosneft public offering should take place at the price of 11 USD (RT, January 11, 2012). The Rosneft share currently trades at around 7 USD.

Mr. Sechin receives support from the analyst side. According to 4-Traders (June 3, 2012), the current consensus recommendation for the Rosneft share is *outperform* with the average target price of 8.69 USD. In addition, Groven & Partners (2012) state that Russian energy companies are undervalued, and HSBC (Investment Europe, 2012) believe Russian equities to be undervalued.

The current market price may not be a reliable indicator of the company's true value, as only 15 per cent of shares are currently in free-float and there are major restrictions for international ownership. Keeping in mind the last time Russian national property was privatized with throwaway prices during the 90s, the need for alternative valuation methods arise as the new wave of privatization comes closer. This being the case, the valuation of Rosneft is a matter of public interest and concerns every Russian citizen. Thus, the objective of the study is to determine fair value for the Rosneft stock.

2 VALUATION METHODS

2.1 Balance Sheet Approach

The balance sheet approach offers three concepts that can quite easily be used to determine a company's value:

1) Book value
2) Liquidation value
3) Replacement cost (Bodie et al 2005, 606-608).

Book value is the net worth of a company as reported on its balance sheet. However, when applying book value, one has to keep in mind that book value is an accounting concept and does not necessarily reflect the fair value of the company's assets. Usually book value is applied by comparing the company's market price to book value ratio to the ratios of the company's peers (Bodie et al 2005, 606-607).

Liquidation value represents the amount of money that could be realized by breaking up the company, selling its assets, repaying its debt and distributing the remaining cash among shareholders. Should a company's market price be lower than its liquidation value, profit could be made by acquiring the company and selling off its assets. Consequently, liquidation value is generally considered to represent the floor for market price (Bodie et al 2005, 607).

Another balance sheet indicator of value is the **replacement cost** of assets less liabilities. According to some analysts, replacement cost should form a roof for a company's market price. This is because if a company's market price remained higher than the replacement cost of its assets for a long time, other firms would try to replicate the company. This would increase competition in the industry, which would eventually drive down market prices of all companies until they reached replacement cost. The ratio of market price to replacement cost of assets is called **Tobin's Q**. In the long run, Tobin's Q should tend toward 1, although it may differ significantly from 1 for a very long time (Bodie et al 2005, 608).

As the balance sheet approach offers a static measure of value and does not take into account the future cash flows generated by the company, it is an inadequate method of determining fair value of a company. Thus, the balance sheet approach should only be used alongside with other methods to provide additional information.

2.2 Dividend Discount Model

The Dividend Discount Model (DDM) is based on the premise that the only cash flows returned to the shareholders are dividends. Thus, the value of a stock equals to the present value of future dividends to infinity and can be calculated by discounting the future dividends to present moment as follows (Kallunki & Niemelä 2004, 103):

$$V_0 = \frac{D_1}{1+k_e} + \frac{D_2}{(1+k_e)^2} + \frac{D_3}{(1+k_e)^3} + \cdots + \frac{D_\infty}{(1+k_e)^\infty} \qquad \text{(Eq. 1)}$$

where,
V_0 = Value of the stock
D = Dividend at year 1, 2, 3 etc.
k_e = Cost of equity.

Usually, dividends are forecasted only 5-10 years onwards, after which the annual dividend is expected grow at a stable rate *g* to infinity. In this case, the value can be calculated by adding a terminal value component to the model (Kallunki & Niemelä 2004, 104):

$$V_0 = \frac{D_1}{1+k_e} + \frac{D_2}{(1+k_e)^2} + \frac{D_3}{(1+k_e)^3} + \ldots + \frac{D_t}{(1+k_e)^t} + \frac{D_t(1+g)}{k_e-g} \qquad \text{(Eq. 2)}$$

where,

D_t = Dividend at year t

g = Dividend growth rate from year t onwards.

Despite being theoretically the correct method, the DDM is somewhat problematic in practice. Firstly, as the dividends from year t onwards are expected to grow at a certain rate, any mistake made in forecasting dividend on year t compound in the terminal value. In addition, the model is sensitive to inaccuracy in the expected dividend growth rate (Kallunki & Niemelä 2004, 104). Secondly, the model fails to take into account the fact that firms may use an alternative way of returning funds to their owners by buying back their own shares (Damodaran 2002, 351). Thirdly, we may end up undervaluing companies that constantly pay out less than they could afford and accumulate cash in the process. As a result, the model is best suited for companies growing at a stable growth rate equal to or lower than the nominal growth rate of the economy, and that have an established and stable dividend policy which includes paying considerable dividends (Damodaran 2002, 325).

2.3 Discounted Cash Flow Models

Discounted cash flow (DCF) models are based on the idea that a firm's value equal to the net present value of the future cash flows the company will generate (Damodaran 2002, 11). Since the cash flows appear in the future and are uncertain, they must be discounted to the present using a discount rate that not only takes into account the time value of money, but also the risk involved with the cash flows (Sharpe et al. 1999, 523). The discount rate is discussed more closely in Chapter 3.

Technically it is not difficult to apply DCF models. However, the calculations are always based on subjective views on the future development of the company and the economy as a whole. Depending on whether the calculations are done by the seller or the buyer, the premises might vary drastically. In addition, forecasting errors might affect the output considerably. To minimize the harm done by mistakes caused by forecasting errors it is advisably not to apply DCF valuation method as the sole valuation method, but rather to use DCF valuation aside other methods, such as relative valuation. (Blomquist et al. 2001, 111-112)

Models based on free cash flow (FCF) are usually more equip than the dividend discount model since free cash flow is not affected by accounting practices (Kallunki et al. 1999, 86). The following chapters 2.3.1 and 2.3.2 introduce the valuation models based on free cash flow.

2.3.1 Free Cash Flow to the Firm

Free cash flow to the firm (FCFF) valuation model determines the value of the whole company as the present value of its future free cash flows to infinity (Damodaran 2002, 387):

$$V_0 = \frac{FCFF_1}{1+WACC} + \frac{FCFF_2}{(1+WACC)^2} + \frac{FCFF_3}{(1+WACC)^3} + \cdots + \frac{FCFF_\infty}{(1+WACC)^\infty} \qquad \text{(Eq. 3)}$$

where,

V_0 = Value of the firm

FCFF = Free cash flow to the firm at year 1, 2, 3 etc.

WACC = Weighted average cost of capital

Since it is difficult to forecast cash flows many years into the future and the present value of these cash flows diminish the further they appear, the formula is usually simplified by forecasting the cash flows to year t and assuming that they grow at a steady rate from year t onwards. After this, a terminal value component is added to the formula:

$$V_0 = \frac{FCFF_1}{1+WACC} + \frac{FCFF_2}{(1+WACC)^2} + \frac{FCFF_3}{(1+WACC)^3} + \cdots + \frac{FCFF_t}{(1+WACC)^t} + \frac{TVFF_t}{(1+WACC)^t} \qquad \text{(Eq. 4)}$$

where,

$TVFF_t$ = Value of free cash flow to the firm from moment t onwards

The terminal value can be opened as follows:

$$TVFF_t = \frac{FCFF_t}{WACC-g} \quad \text{(Eq. 5)}$$

where,
g = Growth rate after terminal year to infinity.

Since FCFF model calculates the value of the whole company – and not just the equity of the company – weighted average cost of capital is used as the discount rate. The V_0 produced by the formula describes the present value of future cash flows that both equity and debt investors get from the company (Damodaran 2002, 382-385). In order to determine the value of equity, one must subtract the market value of debt from V_0 (Kallunki et al. 2002, 145).

There are several ways to calculate free cash flow to the firm. According to Damodaran (2002, 382-383), FCFF can be calculated as follows:

FCFF = EBIT(1-Tax rate) + Depreciation
– Capital expenditures – ΔWorking capital (Eq. 6)

2.3.2 Free Cash Flow to Equity

Free cash flow to equity (FCFE) model determines the value of company's equity directly. Thus, there is no need to subtract the value of debt. However, FCFE model is less used since it is more vulnerable to forecasting errors. When using FCFE model, one must forecast changes in the capital structure, which can be rather challenging. Errors in forecasting capital structure can have drastic effects on the outcome. (Kallunki et al. 1999, 87)

In the FCFE model the free cash flow to equity is discounted to the present using the cost of equity as the discount rate (Kallunki et al. 1999, 87):

$$V_0 = \frac{FCFE_1}{1+k_e} + \frac{FCFE_2}{(1+k_e)^2} + \frac{FCFE_3}{(1+k_e)^3} + \cdots + \frac{FCFE_\infty}{(1+k_e)^\infty} \quad \text{(Eq. 7)}$$

where,

V_0 = Value of equity

FCFE = Free cash flow to equity at year 1, 2, 3 etc.

k_e = Cost of equity.

As with the FCFF model, the terminal value component is usually added after year t, which allows us to present the formula in the following form:

$$V_0 = \frac{FCFE_1}{1+k_e} + \frac{FCFE_2}{(1+k_e)^2} + \frac{FCFE_3}{(1+k_e)^3} + \cdots + \frac{FCFE_t}{(1+k_e)^t} + \frac{TVFE_t}{(1+k_e)^t} \quad \text{(Eq. 8)}$$

where,

$TVFE_t$ = Value of free cash flow to equity from moment t onwards.

$$TVFE_t = \frac{FCFE_t}{k_e - g} \quad \text{(Eq. 9)}$$

where,

g = Growth rate after terminal year to infinity

According to Damodaran (2002, 352), free cash flow to equity can be calculated as follows:

FCFE = Net income – (Capital expenditures – Depreciation)

– (Change in noncash working capital)

+ (New debt issued – Debt repayments) (Eq. 10)

Since the target is to determine free cash flow to shareholders, net income is used instead of EBIT. After this, capital expenditures, depreciation and changes in working capital are taken into account as in the FCFF model. In addition, FCFE model takes into account new debt issued as well as debt repayment in order to determine the cash flow which can be paid out as dividends to shareholders. (Damodaran 2002, 352)

2.4 Economic Value Added Model

The economic value added is a measure of the surplus value created by the firm. It is computed as the product of the excess return made on an investment and the capital invested in that vestment. Thus, economic value added can be calculated as follows (Damodaran 2002, 864):

EVA = (Return on capital invested – Cost of capital) * Capital invested
= After-tax operating income
– (Cost of capital * Capital invested) (Eq. 11)

When applying the economic value added (EVA) model, the value of equity can be determined by adding the present value of future economic value added on each year to the book value of equity as follows (Damodaran 2002, 866):

$$V_e = BV_e + \frac{EVA_1}{1+WACC} + \frac{EVA_2}{(1+WACC)^2} + \frac{EVA_3}{(1+WACC)^3} + \cdots + \frac{EVA_\infty}{(1+WACC)^\infty} \quad \text{(Eq. 12)}$$

where,
V_e = Value of equity
BV_e = Book value of equity
EVA = Economic value added at year 1, 2, 3 etc.
WACC = Weighted average cost of capital

3 COST OF FINANCING

When applying DCF models, the value of a company can be calculated as the present value of the future cash flows the company will generate. Since money has time value and cash flows that appear further in the future are more uncertain than cash flows that appear in the near future, future cash flows must be discounted to the present moment. This is done by using the expected return of both equity and debt investors. From the viewpoint of the firm, the expected return is the cost of equity and debt. The expected return should also reflect the uncertainty involved with the future cash flows (Kallunki et al. 1999, 106).

3.1 Cost of Debt

Determining the cost of debt is relatively easy, since the schedule of future payments by the company to debt investors are known (Knüpfler & Puttonen 2004, 27). If the company has issued bonds to the market, the cost of debt can be estimated by using the average yield of outstanding bonds issued by the company. If the company has not issued any bonds, the cost of debt can be estimated by using the yields of bonds issued by a similar company operating in the same industry and having to same risk level (Niskanen & Niskanen 2000, 129-132).

3.2 Cost of Equity

The cost of equity for a firm equals to the expected return investors demand in order to invest in the stock of the company. Determining the cost of equity for a company is somewhat trickier than determining the cost of debt, since there is no fixed flow of cash to the share holders that is agreed upon. The cost of equity can be determined using the Capital Asset Pricing Model (CAPM) (Copeland et al. 2000, 214).

Using the CAPM, the expected return can be determined as follows:

$E(r_i) = r_f + \beta\ [E(r_m) - r_f]$ (Eq. 13)

where,

$E(r_i)$ = expected return for the stock

r_f = risk free rate

β = company’s beta coefficient measuring systematic risk

$E(r_m)$ = expected return for the market portfolio.

According to Bruner et al. (Damodaran 2002, 219), over 80 % of companies use the CAPM to estimate the cost of equity. In addition, circa 70 % of companies use the yield of Treasury bonds of 10 years or longer maturity as the risk-free rate.

3.3 Cost of Capital

Once both the cost of debt and the cost of equity are determined, the cost of capital can be calculated using the following formula (Kallunki et al. 1999, 144):

$$\text{WACC} = \frac{E}{D+E} R_E + \frac{D}{D+E} R_D * (1 - T_C) \qquad \text{(Eq. 14)}$$

where,

WACC = weighted average cost of capital

E = the value of equity

D = the value of debt

R_E = the cost of equity

R_D = the cost of debt

T_C = corporate tax rate.

When assigning weights for equity and debt in Equation 14, market value of both equity and debt should be used instead of book value since the book value does not necessarily reflect the economic or fair value of the capital. If the company is publicly listed, the market value of equity can be calculated by multiplying the share price by the number of outstanding shares. Similarly, the market value of debt can be calculated by summing up the market value of the all outstanding bonds issued by the company. The alternative and quite common solution is to use the desired capital structure for the long run, especially if the company has publicly announced its target capital structure (Kallunki et al. 1999, 143).

4 ROSNEFT BUSINESS MODEL

Rosneft is an integrated energy company involved with exploration and production of oil, gas and hydrocarbons, production of petroleum products and petrochemicals and marketing of outputs. The company is engaged in exploration and production in all major hydrocarbon regions in Russia. In addition, the company has exploration projects in Kazakhstan and Algeria, and owns 50% of Ruhr Oel GmbH which holds stakes in four refineries in Germany. (Rosneft 2012)

For the analysis, we divide the company's operations into two parts:

1) Production and sales of oil and gas
2) Refining and sales of petroleum products.

The segments have slightly different value drivers, which are discussed more closely below.

4.1 Reserves and Production

Unlike many of its competitors, Rosneft holds vast oil and gas reserves compared to its annual production. Currently, the company's proved reserves-to-production ratio is 21 years for oil and 68 years for gas. If probable reserves are included, the ratios for oil and gas are 32 and 101 years, respectively. The company's strategy includes the aim to steadily increase both oil and gas production. The company has also managed to increase production capacity over the last years. (Rosneft 2012)

On short-term, the sizable reserves do not form a limit for production. The future output capacity is more depended on the rate at which the annual production capacity grows. Over the last years the company has increased its capital expenditures in order to expand its production and refining capacity. The increases in capital expenditures are in line with the company strategy of steady growth of production. The vast reserves of both oil and gas, the recent investments in production facilities and the fact that the company has successfully managed to increase its production capacity in the past back the assumption that the company is able to maintain the growth rate over the upcoming years as well.

4.2 Petroleum Sales

The main driver for Rosneft's petroleum sales is the Russian economy and the rate at which the country's GDP grows. The company is able to acquire raw materials from the markets if necessary, which means the company's own production does not form a limit for petroleum sales. In addition, the company has recently invested in refining capacity to guarantee supply of petroleum products. Thus, the Russian GDP growth rate can be used as the driver when estimating future petroleum sales.

5 DETERMINING FAIR VALUE OF ROSNEFT

In this chapter we approximate the fair value of Rosneft using the following methods:

1) Balance Sheet Approach
2) Dividend Discount Model (DDM)
3) Free Cash Flow to Equity (FCFE) Model
4) Free Cash Flow to the Firm (FCFF) Model.
5) Economic Value Added (EVA) Model

For the models, we use the cost of financing and the future cash flows projected in Chapters 4.1 and 4.2 as the input. The valuation date is April 18, 2012. However, the balance sheet approach is based on the date December 31, 2011 since this is the newest possible balance sheet data.

5.1 Estimating Cost of Financing

Cost of finance – either weighted average cost of capital or cost of equity, depending on the model – serves as the discount rate in the valuation models and is supposed to take into account the uncertainty and risk involved with the projected cash flows. This is why we estimate the cost of finance conservatively. The determinants of weighted average cost of capital (WACC) and cost of equity are shown in Table 1.

Table 1. Determinants of WACC and cost of equity.

WACC	8,49 %
Risk free interest rate	3,00 %
Cost of Debt	6,50 %
Beta	1,00
Market risk premium	7,50 %
Cost of Equity	10,50 %
Target D/(D+E)	38,00 %
Tax rate	20,00 %

As mentioned in Chapter 3.2, approximately 70% of companies use the yield of 10 year Treasury bonds as the risk free rate. After the downgrade of US credit rating from AAA to AA, the common benchmark for risk free rate could be German 10 year government bonds. However, due to the European debt crisis German 10 year government bonds currently trade at record-low yields at 1.7%. This can hardly be considered the long-term risk free rate since it does not even account for the inflation in the Eurozone. This is why the risk free rate of 3.0% is used as a basis in determining WACC.

Since most of Rosneft's debt consists of bank loans, no market yield for the debt is available. Therefore, the cost of debt is calculated using by comparing the historical level of the company long-term debt and the interest expenses the company has paid. Since the company has gradually lowered its debt level during the last years, the historical interest expenses should provide some margin of safety when determining the cost of the current debt. By using the historical interest expenses, we end up with cost of debt of 6.5%.

In determining cost of equity, we use a beta of 1.00, which is derived from the average beta of integrated petroleum companies (1.18) and the average beta of oil and gas distribution companies (0.96) according to Damodaran (2012).

The market risk premium should take into account the political and other uncertainties involved with investing in Russia. Thus, we use the market risk premium of 7.50 % which is the average market risk premium used for the Russian market (Fernandez et al 2011). As a result, we end up with the cost of equity of 10.5%.

When calculating WACC, Rosneft is assumed to target the current debt to assets ratio of 38 %, since the company already possesses a rather healthy capital structure and is unlikely to need any further adjustments to its debt level. Finally, the corporate income tax rate of 20% is taken into account.

5.2 Forecasting Future Revenues

Apart from the cost of financing, another major value driver is future revenues. For integrated oil and gas companies, future cash flows primarily are based on the amount of oil and gas they are able to produce using the reserves available, as well as the market price and the production cost per barrel (for oil) or cubic meter (for gas). In the analysis, revenues are forecasted for years 2012-2016.

Rosneft's revenues can be divided into two major components: 1) sales of oil and gas 2) sales of petroleum products. When it comes to sales of oil and gas, they are directly subject to fluctuations in the global market price of oil, whereas the business of petroleum sales is not as vulnerable to price fluctuations in the oil price. In addition, the oil and gas reserves held by the company form a limit to the sale of oil and gas. Rosneft currently holds proven oil reserves for the equivalent of 21 years of production and proven natural gas reserves of 68 years. When taken into account probable reserves as well, the figures are 32 years and 101 years, respectively. Thus the limitation to annual production growth within the forecasting period is the pace at which proven reserves can be utilized and commercialized.

The revenues are forecasted on the premise that the maximum production capacity (in barrels or cubic meters) forms a basis for sales of oil and gas. The maximum production capacity is expected to grow by 3% per annum from 2012 to 2016. The estimate of 3% is based on the rate at which the company managed to increase its production over the years 2008-2011 (3.08 % compound average growth rate, CAGR). Given the company's strategy of steadily raising production capacity and the investment already made in production facilities, the estimate is rather conservative.

Since the annual global demand for oil is growing by more than 3%, we assume that there is demand for all additional production capacity. Once the amount of annually produced oil and gas is forecasted, this is transformed into dollar denominated sales with the assumption that oil price will remain at its current level of approximately 120 USD. The assumption is based on the support oil price receives from rising demand in the emerging markets, especially China, as well as on rising production costs globally.

The assumption receives some support from international organizations. For example, in its baseline scenario, IMF expects oil price to be at 114.71 USD per barrel in 2012 and the price to decrease to 110 USD in 2013. During 2014-17, IMF forecasts oil price to decline further by an average of -4.6% per annum (IMF 2012).

The petroleum sales are expected to grow by approximately 5% per annum between 2011 and 2016. For petroleum sales, the production growth of oil or gas does not form a limit, as the company is able to buy the additional raw material needed to produce petroleum products, if necessary. The projected revenues are shown in Tables 4 and 5 and serve as a basis for the different valuation models.

Over the years 2008-2011, Rosneft managed to increase its petroleum sales by approximately 4.9% (CAGR) (Rosneft 2012). Over the same period, the Russian GDP grew by 3.4% (CAGR) (Bofit, 2012).

According to Bofit (2012), the Russian economy is expected to grow by 3.7% in 2012, and further 3.7% and 3.4% in 2013 and 2014, respectively. Thus, the estimates for general economic development in Russia support the assumption of the 5% growth rate.

5.3 Balance Sheet Approach

Two different balance sheet approach methods are applied to approximate the value of Rosneft's share: book value and liquidation value.

5.3.1 Book Value per Share

Book value for Rosneft is calculated by subtracting total liabilities and minority interest from the company's total assets (see Table 2). Rosneft's book value per share is 6.83 USD or 201.52 RUB which is relatively close to the current market price of 7.15 USD or 211.10 RUB.

Table 2. Determining Rosneft's book value per share.

	Million USD
Total assets	105 658
Total liabilities	39 166
Minority interest	1 041
Book value of equity	65 451
Shares outstanding (million)	9 588
Book value per share (USD)	6,83
Book value per share (RUB)	201,52

5.3.2 Liquidation Value

Since liquidation value is supposed to represent the absolute floor for the value of the company, one ought to be extremely conservative when valuing the company's assets. Therefore, the value of many assets that might and should have actual value is assumed to be zero. For example, such assets of equipment and plants are assumed to have no value, as it might be the case that the company might not be able to sell them in the markets if they indeed tried to. Major part of the market value consists of oil, gas and hydrocarbon reserves owned by the company, as well as cash and cash equivalent, which are relatively easy to realize if needed. As represented in Table 3, Rosneft's liquidation value is 4.11 USD or 121.34 RUB forming a floor the company's share price.

Table 3. Determining Rosneft's liquidation value per share.

	Million USD
Market value of assets	79 615
Total liabilities	39 166
Minority interest	1 041
Liquidation value	39 408
Shares outstanding (million)	9 588
Liquidation value per share (USD)	4,11
Liquidation value per share (RUB)	121,34

5.4 Dividend Discount Model

Dividends are estimated for years 2012-2016 based on forecasted earnings per share using the payout ratio of 10%, which is the publicly announced dividend policy. After year 2016, the annual dividend is expected to grow at the rate of 5% to infinity. The relatively high growth rate is justified, if we take into account the profitability of the company and the fact that currently the company is paying out considerably less than it could afford. Partly the current payout ratio can be explained by the company's investment activities, but at some point the company must start paying out more generous dividends instead of just piling up retained earnings. If the company does not start to pay increasing dividend, it will end up with piles of retained earnings which will gradually lower the company's return on equity.

Historically Rosneft's annual general meeting has taken place in June and the dividend has been paid in late June. For this reason the model assumes annual dividends to be paid out at the end of June of each year.

Table 4. Dividend discount model (DDM) for Rosneft.

	2005	2006	2007	2008	2009	2010	2011	2012E	2013E	2014E	2015E	2016E
USD per share												
Earnings	0,46	0,37	1,30	1,16	0,68	1,08	1,30	1,11	1,15	1,20	1,25	1,30
EPS growth rate		-19,6 %	251,4 %	-10,8 %	-41,1 %	58,2 %	20,4 %	-14,7 %	4,1 %	4,1 %	4,1 %	4,1 %
Dividend	0,05	0,05	0,07	0,06	0,08	0,10	0,13	0,11	0,12	0,12	0,12	0,13
Dividend growth rate		10,6 %	28,8 %	-7,5 %	27,4 %	26,6 %	30,0 %	-14,7 %	4,1 %	4,1 %	4,1 %	4,1 %
Payout ratio	10,2 %	14,1 %	5,2 %	5,3 %	11,6 %	9,3 %	10,0 %	10,0 %	10,0 %	10,0 %	10,0 %	10,0 %
Present value of future dividends								0,11	0,10	0,10	0,09	0,09
Present value of terminal value												1,55
Dividend terminal growth rate								5,0 %				
Value per share								2,04				

The DDM calculations are shown in Table 4. Using the cost of equity of 10.5% to discount future dividends, the model produces a share price of 2.04 USD or 60.17 RUB, which is considerably less than the current market price. This can, however, be explained by the somewhat original dividend policy. If we assume that the company changes its dividend policy and pays out 50% of its earnings on financial year 2016 and thereafter, the model ends up with the share price 8.60 USD or 253.84 RUB which is approximately 20% above the current market price. The payout ratio of 50% is used as a benchmark ratio since many profitable companies, which are at a mature stage of their lifecycle, typically pay out 40-60% of their earnings as dividends.

5.5 FCFE and FCFF Models

In the FCFE model, the capital structure is assumed to remain the same as it currently is. Thus, no net of new debt and debt repayments is marked as zero. Most of the expenses are expected to grow in relation to the revenues.

Capital expenditures are expected to remain high as the company is developing its existing reserves. Although exploration costs themselves form a relatively small proportion of costs, it is worthwhile to notice that major part of the company's capital expenditures come from the upstream division.

The terminal growth rate of free cash flow to equity is assumed to be zero. This is because in the long run the company's growth opportunities are limited by the reserves it holds. By assuming FCFE to grow at a zero rate after 2016, we are putting less emphasis on the cash flows that appear further in the future, creating margin of safety for the fair value produced by the model. The same assumptions apply to the FCFF model as well.

The calculations for the FCFE and FCFF models are shown in Tables 5 and 6. Both models produce similar results and indicate the current market price to be undervalued. According to the FCFE model, the fair price for the Rosneft share is 10.04 USD, whereas the FCFF model produces the fair price of 10.41 USD. The corresponding prices in Russian rubles are 296.32 RUB and 307.30 RUB, respectively. The discounted cash flow models produce perhaps the most reliable results out of the used models since they are the only models which are based purely on future cash flows.

Table 5. Free cash flow to equity (FCFE) model for Rosneft. The figures for years 2007-2011 are based on Rosneft Analyst Databook Q4/2011.

Rosneft Million USD	2007	2008	2009	2010	2011	2012E	2013E	2014E	2015E	2016E
REVENUES										
Oil and gas sales	29 902	36 102	24 820	34 767	47 417	53 734	55 346	57 006	58 716	60 478
Growth rate		*21 %*	*-31 %*	*40 %*	*36 %*	*13 %*	*3 %*	*3 %*	*3 %*	*3 %*
Petroleum products and processing fees	18 531	31 470	20 736	26 660	43 020	45 147	47 379	49 721	52 179	54 759
Growth rate		*70 %*	*-34 %*	*29 %*	*61 %*	*5 %*	*5 %*	*5 %*	*5 %*	*5 %*
Support services and other sales	783	1 419	1 270	1 620	1 538	1 539	1 540	1 541	1 542	1 543
Growth rate		*81 %*	*-11 %*	*28 %*	*-5 %*	*0 %*	*0 %*	*0 %*	*0 %*	*0 %*
Total revenues	49 216	68 992	46 825	63 048	91 976	100 420	104 264	108 268	112 437	116 779
Growth rate		*40 %*	*-32 %*	*35 %*	*46 %*	*9 %*	*4 %*	*4 %*	*4 %*	*4 %*
EXPENSES										
Production and operating expenses	3 870	4 572	4 024	4 792	6 540	7 591	7 881	8 184	8 499	8 827
Growth rate		*18 %*	*-12 %*	*19 %*	*36 %*	*16 %*	*4 %*	*4 %*	*4 %*	*4 %*
Cost of purchased oil and petroleum products and refining	1 610	2 942	1 890	2 386	10 058	10 981	11 402	11 840	12 296	12 770
Growth rate		*83 %*	*-36 %*	*26 %*	*322 %*	*9 %*	*4 %*	*4 %*	*4 %*	*4 %*
Selling, general and administrative expenses	1 341	1 632	1 416	1 584	1 785	2 524	2 621	2 721	2 826	2 935
Growth rate		*22 %*	*-13 %*	*12 %*	*13 %*	*41 %*	*4 %*	*4 %*	*4 %*	*4 %*
Pipeline tariffs and transportation costs	4 226	5 673	5 414	6 980	7 329	9 522	9 887	10 266	10 661	11 073
Growth rate		*34 %*	*-5 %*	*29 %*	*5 %*	*30 %*	*4 %*	*4 %*	*4 %*	*4 %*
Exploration expenses	162	248	325	439	448	515	535	556	577	599
Growth rate		*53 %*	*31 %*	*35 %*	*2 %*	*15 %*	*4 %*	*4 %*	*4 %*	*4 %*
Depreciation, depletion and amortization	3 286	3 983	4 350	5 597	5 996	7 458	7 744	8 041	8 351	8 673
Growth rate		*21 %*	*9 %*	*29 %*	*7 %*	*24 %*	*4 %*	*4 %*	*4 %*	*4 %*
Accretion expense	78	120	87	107	146	170	177	183	190	198
Growth rate		*54 %*	*-28 %*	*23 %*	*36 %*	*16 %*	*4 %*	*4 %*	*4 %*	*4 %*
Taxes other than income taxes	10 890	14 810	8 061	10 920	16 911	19 384	20 126	20 899	21 704	22 542
Growth rate		*36 %*	*-46 %*	*35 %*	*55 %*	*15 %*	*4 %*	*4 %*	*4 %*	*4 %*
Export customs duty	13 032	22 006	12 131	16 743	26 882	28 131	29 208	30 329	31 497	32 714
Growth rate		*69 %*	*-45 %*	*38 %*	*61 %*	*5 %*	*4 %*	*4 %*	*4 %*	*4 %*
Total expenses	38 495	55 989	37 697	49 550	76 100	86 278	89 580	93 020	96 602	100 332
Growth rate		*45 %*	*-33 %*	*31 %*	*54 %*	*13 %*	*4 %*	*4 %*	*4 %*	*4 %*
Earnings before interest and taxes (EBIT)	10 721	13 003	9 128	13 498	15 876	14 141	14 684	15 248	15 835	16 447
Growth rate		*21 %*	*-30 %*	*48 %*	*18 %*	*-11 %*	*4 %*	*4 %*	*4 %*	*4 %*
Taxes on EBIT	4 906	1 904	2 000	2 644	3 117	2 828	2 937	3 050	3 167	3 289
Net interest income (+) / expenses (-)	-1 256	-737	-89	-33	338	-355	-355	-355	-355	-355
Net other income (+) / expenses (-)	8 324	851	-520	-150	-512	-220	-220	-220	-220	-220
Minority interest	21	95	5	272	137	106	106	106	106	106
Net income	12 862	11 118	6 514	10 399	12 448	10 632	11 066	11 518	11 987	12 476
Growth rate		*-14 %*	*-41 %*	*60 %*	*20 %*	*-15 %*	*4 %*	*4 %*	*4 %*	*4 %*
Capital expenditures	6 240	8 732	7 252	8 931	13 246	13 936	14 470	15 025	15 604	16 207
Growth rate		*40 %*	*-17 %*	*23 %*	*48 %*	*5 %*	*4 %*	*4 %*	*4 %*	*4 %*
Depreciation, depletion and amortization	3 286	3 983	4 350	5 597	5 996	7 458	7 744	8 041	8 351	8 673
-/+ Increase/Decrease in working capital	-19 674	-6 060	-3 839	-3 542	-11 872	-7 339	-3 341	-3 479	-3 623	-3 774
Net New debt issued (+) / Debt repayments (-)		-3 108	-658	48	-264	0	0	0	0	0
Free cash flow to firm (FCFE)	29 582	9 321	6 793	10 655	16 806	11 493	7 682	8 013	8 358	8 717
Growth rate		*-68 %*	*-27 %*	*57 %*	*58 %*	*-32 %*	*-33 %*	*4 %*	*4 %*	*4 %*
Corporate tax rate						20 %	20 %	20 %	20 %	20 %

Determining price per share (April 18, 2012)			2012E	2013E	2014E	2015E	2016E
Present value of future cash flows	86 421	Present value of FCFE	10 713	6 480	6 117	5 774	5 448
Excess cash	5 289	Present value of Terminal Value					51 889
Marketable securities	4 561	Terminal value FCFE growth rate					0,00 %
Equity value	96 271						
		Cost of equity		10,50 %			
Shares outstanding (million)	9 591	Risk free interest rate		3,00 %			
Price per share (USD)	10,04	Beta		1,00			
Price per share (RUB)	296,32	Market risk premium		7,50 %			
USDRUB (April 18, 2012)	29,521	Cost of Equity		10,50 %			

Table 6. Free cash flow to firm (FCFF) model for Rosneft. The figures for years 2007-2011 are based on Rosneft Analyst Databook Q4/2011.

Rosneft Million USD	2007	2008	2009	2010	2011	2012E	2013E	2014E	2015E	2016E
REVENUES										
Oil and gas sales	29 902	36 102	24 820	34 767	47 417	53 734	55 346	57 006	58 716	60 478
Growth rate		*21 %*	*-31 %*	*40 %*	*36 %*	*13 %*	*3 %*	*3 %*	*3 %*	*3 %*
Petroleum products and processing fees	18 531	31 470	20 736	26 660	43 020	45 147	47 379	49 721	52 179	54 759
Growth rate		*70 %*	*-34 %*	*29 %*	*61 %*	*5 %*	*5 %*	*5 %*	*5 %*	*5 %*
Support services and other sales	783	1 419	1 270	1 620	1 538	1 539	1 540	1 541	1 542	1 543
Growth rate		*81 %*	*-11 %*	*28 %*	*-5 %*	*0 %*	*0 %*	*0 %*	*0 %*	*0 %*
Total revenues	49 216	68 992	46 825	63 048	91 976	100 420	104 264	108 268	112 437	116 779
Growth rate		*40 %*	*-32 %*	*35 %*	*46 %*	*9 %*	*4 %*	*4 %*	*4 %*	*4 %*
EXPENSES										
Production and operating expenses	3 870	4 572	4 024	4 792	6 540	7 591	7 881	8 184	8 499	8 827
Growth rate		*18 %*	*-12 %*	*19 %*	*36 %*	*16 %*	*4 %*	*4 %*	*4 %*	*4 %*
Cost of purchased oil and petroleum products and refining	1 610	2 942	1 890	2 386	10 058	10 981	11 402	11 840	12 296	12 770
Growth rate		*83 %*	*-36 %*	*26 %*	*322 %*	*9 %*	*4 %*	*4 %*	*4 %*	*4 %*
Selling, general and administrative expenses	1 341	1 632	1 416	1 584	1 785	2 524	2 621	2 721	2 826	2 935
Growth rate		*22 %*	*-13 %*	*12 %*	*13 %*	*41 %*	*4 %*	*4 %*	*4 %*	*4 %*
Pipeline tariffs and transportation costs	4 226	5 673	5 414	6 980	7 329	9 522	9 887	10 266	10 661	11 073
Growth rate		*34 %*	*-5 %*	*29 %*	*5 %*	*30 %*	*4 %*	*4 %*	*4 %*	*4 %*
Exploration expenses	162	248	325	439	448	515	535	556	577	599
Growth rate		*53 %*	*31 %*	*35 %*	*2 %*	*15 %*	*4 %*	*4 %*	*4 %*	*4 %*
Depreciation, depletion and amortization	3 286	3 983	4 350	5 597	5 996	7 458	7 744	8 041	8 351	8 673
Growth rate		*21 %*	*9 %*	*29 %*	*7 %*	*24 %*	*4 %*	*4 %*	*4 %*	*4 %*
Accretion expense	78	120	87	107	146	170	177	183	190	198
Growth rate		*54 %*	*-28 %*	*23 %*	*36 %*	*16 %*	*4 %*	*4 %*	*4 %*	*4 %*
Taxes other than income taxes	10 890	14 810	8 061	10 920	16 911	19 384	20 126	20 899	21 704	22 542
Growth rate		*36 %*	*-46 %*	*35 %*	*55 %*	*15 %*	*4 %*	*4 %*	*4 %*	*4 %*
Export customs duty	13 032	22 006	12 131	16 743	26 882	28 131	29 208	30 329	31 497	32 714
Growth rate		*69 %*	*-45 %*	*38 %*	*61 %*	*5 %*	*4 %*	*4 %*	*4 %*	*4 %*
Total expenses	38 495	55 989	37 697	49 550	76 100	86 278	89 580	93 020	96 602	100 332
Growth rate		*45 %*	*-33 %*	*31 %*	*54 %*	*13 %*	*4 %*	*4 %*	*4 %*	*4 %*
Earnings before interest and taxes (EBIT)	10 721	13 003	9 128	13 498	15 876	14 141	14 684	15 248	15 835	16 447
Growth rate		*21 %*	*-30 %*	*48 %*	*18 %*	*-11 %*	*4 %*	*4 %*	*4 %*	*4 %*
Taxes on EBIT	4 906	1 904	2 000	2 644	3 117	2 828	2 937	3 050	3 167	3 289
+/- Increase/Decrease in accumulated deferred taxes	1 058	-1 490	-106	-253	-189	0	0	0	0	0
Net operating profits less adjusted taxes (NOPLAT)	6 873	9 609	7 022	10 601	12 570	11 313	11 747	12 199	12 668	13 157
Depreciation, depletion and amortization	3 286	3 983	4 350	5 597	5 996	7 458	7 744	8 041	8 351	8 673
Gross Cash Flows	10 159	13 592	11 372	16 198	18 566	18 772	19 491	20 240	21 019	21 831
-/+ Increase/Decrease in working capital	-19 674	-6 060	-3 839	-3 542	-11 872	-7 339	-3 341	-3 479	-3 623	-3 774
Capital expenditures	6 240	8 732	7 252	8 931	13 246	13 936	14 470	15 025	15 604	16 207
		40 %	*-17 %*	*23 %*	*48 %*	*5 %*	*4 %*	*4 %*	*4 %*	*4 %*
Investment in intangibles	278	394	132	-44	-65	0	0	0	0	0
Investment in goodwill	3 628	718	0	0	0	0	0	0	0	0
Free cash flow from operations	19 687	9 808	7 827	10 853	17 257	12 174	8 363	8 694	9 039	9 398
Non-operating cash flows	7 068	114	-609	-183	-174	0	0	0	0	0
Free cash flow to firm (FCFF)	26 755	9 922	7 218	10 670	17 083	12 174	8 363	8 694	9 039	9 398
Growth rate		*-63 %*	*-27 %*	*48 %*	*60 %*	*-29 %*	*-31 %*	*4 %*	*4 %*	*4 %*
Corporate tax rate						20 %	20 %	20 %	20 %	20 %

Determining price per share (April 18, 2012)	
Present value of future cash flows	114 320
Excess cash	5 289
Marketable securities	4 561
Firm value	124 170
Short-term debt	4 734
Market value of long-term debt	18 557
Minority interest	1 041
Equity value	99 838
Shares outstanding (million)	9 591
Price per share (USD)	10,41
Price per share (RUB)	307,30
USDRUB (April 18, 2012)	29,521

	2012E	2013E	2014E	2015E	2016E
Present value of FCFF	11 496	7 279	6 975	6 685	6 405
Present value of Terminal Value					75 480
Terminal value FCFF growth rate					0,00 %

WACC	8,49 %
Risk free interest rate	3,00 %
Cost of Debt	6,50 %
Beta	1,00
Market risk premium	7,50 %
Cost of Equity	10,50 %
Target D/(D+E)	38,00 %
Tax rate	20,00 %

5.6 EVA Model

For the economic value added model, the net income projections for the FCFE serve as a starting point. The book value of equity is calculated as presented in Chapter 4.3.1 and the cost of equity is used to calculate the economic value required by the investor. Similarly as in the discounted free cash flow models, the growth rate of EVA from year 2016 onwards is assumed to be zero.

Based on the EVA model, Rosneft's fair value is 9.59 USD or 283.12 RUB per share, which indicates upside potential compared to the current market price. Roughly 2/3 of the value of equity is composed of the current book value whereas the remainder is formed by the present value of EVA for years 2011-2016 and the terminal value. The EVA calculations are shown in Table 7.

Table 7. Economic value added (EVA) model for Rosneft.

Rosneft Million USD	2012E	2013E	2014E	2015E	2016E
Net income	10 632	11 066	11 518	11 987	12 476
Book value	65 451	89 466	92 891	96 458	100 173
Cost of equity	6 872	9 394	9 754	10 128	10 518
Economic value added (EVA)	3 760	1 672	1 764	1 859	1 958
Present value of EVA	3 550	1 672	1 764	1 859	1 958
Terminal value of EVA					15 729
Cumulative PV of EVA	26 533				
Book value	65 451		Terminal growth rate of EVA		0,00 %
Value of equity	91 984				
Shares outstanding	9 591				
Price per share (USD)	9,59				
Price per share (RUB)	283,12				
USDRUB (April 18, 2012)	29,521				

6 CONCLUSIONS

The objective of the study was to determine the fair value of Rosneft from the minority shareholder's point of view. This was done by applying different valuation methods, which at first sight give somewhat mixed results. However, if we look at the results presented in Table 8 more closely we can see that the valuation models that measure the present value of either future cash flows or economic value added give similar results.

Table 8. Summary of results for Rosneft's fair value using different valuation methods.

Valuation date: April 18, 2012	Fair value per share		Upside (+) / Downside (-)
	USD	RUB	
Book Value	6,83	201,52	-4,5 %
Liquidation Value	4,11	121,34	-42,5 %
Dividend Discount Model (DDM)	2,04	60,17	-71,5 %
Free Cash Flow to Firm (FCFF) Model	10,41	307,30	45,6 %
Free Cash Flow to Equity (FCFE) Model	10,04	296,32	40,4 %
Economic Value Added (EVA) Model	9,59	283,12	34,1 %
Market value per share	7,15	211,10	
USDRUB exchange rate	29,521		

Book value or liquidation value cannot be considered to represent the present value of the company as they are based on static measure of the company's assets. The value of the company assets is relevant only if the owners are planning to shut down the company's operations and sell the assets, which is not the case. All the same, liquidation value can be considered to form an absolute floor or a pessimistic value for the fundamental value of the company.

The shocking fair value produced by the dividend discount model (DDM) can be explained with the company's dividend policy. Despite being profitable, the company currently posts a lousy dividend yield of 1.3%, which is in line with the company's long-term dividend policy of paying out approximately 10% of net earnings. If we, however, assume that the company will raise its payout ratio to a more usual figure of 50% in 2016, the model produces a fair value of 8.60 USD per share indicating a small upside on the current market price.

Given that the abovementioned methods do not form a reliable approximation of Rosneft's fair value, we are left with the discounted cash flow models and the economic value added model, which all imply that Rosneft is currently undervalued and possesses an upside of 35-45%. The value is, however, vulnerable to fluctuations in oil and gas prices. The presented results are based on the premise that the price of Urals quality oil will remain at the current level of approximately 120 USD per barrel and that the natural gas price will correlate with the oil price. Should the price rise above the mentioned level, it would give the company even greater upside. Although the oil price may fluctuate in the short-term, in the long-term the risk of oil price sliding well below the 120 USD level can be considered to be relatively low, as the price is backed up by increasing demand especially in China and other emerging markets and by rising production costs.

Consequently, the study concludes that the Rosneft share can be considered undervalued. The study also contributes to the problem of whether the State of Russia should privatize parts of the company by selling some of its share. Given the results of this study, doing so at the current market price would be against the national interest and the State should wait until the market price of the company is closer to the fair value of the company.

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