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Equity valuation: Magnitogorsk Iron & Steel Works

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Abstract

The proposal of this dissertation is valuating Magnitogorsk Iron & Steel Works company with the recommendation of the company's share price.

For reaching the value of the price of the shares, three methods were used: the discounted cash flow model (DCF), the dividend discount model (DDM) and the market multiples. By the DCF it was obtained the price of 9,87$, by the DDM – 9,26$, by the multiples – 9,91$. As the result, the target price is 9,68$, which is the average.

To achieve the fair value, a lot of accurate assumptions regarding the company, country economics and industry were made in the models. As well it was conducted the sensitivity analysis to show the impact of changes in the assumptions.

In the end of the dissertation there is the comparison with the real investment company's report on the Magnitogorsk Iron & Steel Works share price.

Key words: valuation, DCF, DDM, multiples, share price, equity value

Abstrato

Esta dissertação propõe avaliar a empresa Magnitogorsk Iron & Steel Works usando o preço de uma ação como referência.

O preço de uma ação foi calculado usando três métodos: o modelo de fluxo de caixa descontado (FCD), o modelo de desconto de dividendos e os múltiplos de mercado. Através do FCD foi calculado o preço 9,87$, pelo modelo de desconto de dividendos – 9,26$ e pelos múltiplos – 9,91$. Em consequência, o preço final é 9,68$, que é a média.

Para obter o preço correcto, um número de proposições tiveram que ser assumidas em relação à empresa, à Economia do país e à indústria. Foi também conduzida uma análise da sensibilidade para mostrar o impacto de mudanças nas hipóteses iniciais.

No final da dissertação faz-se uma comparação com o relatório de investimento da empresa sobre o preço de ação da Magnitogorsk Iron & Steel Works.

Palavras-chave: valuation, DCF, DDM, multiples, share price, equity value

Executive summary

Magnitogorsk Iron & Steel Works continues to show positive dynamics in its income statements. As well the Russian Economy is continuing to start the economic growth for the next years. With the improvement of the results of the company and stable growth of the company, the possibilities to explore new market and increase the influence of the existing ones, I give the recommendation to buy Magnitogorsk Iron & Steel Works with the upside potential of 15%.

ticker:	MAGNq.L
current price:	8,45
potential price:	9,68
potential:	15%
reccomendation:	BUY

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1.Introduction

"Valuation lies at the heart of much of what we do in finance" (Damodaran, 2006).

In the finance world, the valuation of a company is an important tool for understanding the success of a company. For a company´s managers it is the key for estimating the rightness of the strategy they apply and for investors it is the key for their investment decisions. Nowadays it´s possible to find a valuation for almost all listed companies made by investment banks, but to be truly successful a person in the finance world should be able to make his own, correct valuation.

According to Damodaran (2006), "analysts use a wide spectrum of models, ranging from the simple to the sophisticated". The most difficult part of a valuation is to make the correct assumptions and to choose the right models. According to Young, Sullivan, Nokhasteh and Holt (1999), "one reason why such a variety of approaches to valuation has been developed is that different approaches make different aspects of the valuation problem clear at the expense of obscuring other aspects". We can use the same assumptions for different approaches, so by making a wrong assumption in one model, the mistake will carry over in all the models, based on the wrong assumption. "The more approaches there are, the weaker the message" (Young, Sullivan, Nokhasteh and Holt, 1999). For every analyst, it should be clear that depending on the type of company and market, one valuation models is more suitable than others.

Damodaran (2006) states that "There are four approaches to valuation. The first, discounted cash flow valuation, relates the value of an asset to the present value of expected future cash flows on that asset. The second, liquidation and accounting valuation, is built around valuing the existing assets of a firm, with accounting estimates of value or book value often used as a starting point. The third, relative valuation, estimates the value of an asset by looking at the pricing of 'comparable' assets relative to a common variable like earnings, cash flows, book value or sales. The final approach, contingent claim valuation, uses option pricing models to measure the value of assets that share option characteristics. This is what generally falls under the rubric of real options."

To Luehrman (1997), "most companies use a mix of approaches to estimate value". Therefore, to achieve a correct valuation, we must pick the right approaches and make several valuations for the particular company in order to get the right result. To do so, we should look at the different approaches and learn in which cases we should use one or the others.

2.Valuation methods

2.1.Discounted cash flow valuations

2.1.1.Discounted Cash Flows Model (DCF)

According to Luehrman (1997), the discounted cash flow model became the standard of valuation. "DCF valuation methodologies are built on a simple relationship between present value and future value".

In this method we obtain the present value of the company, taking into account the projections of future years in a company´s statements, based on assumption obtained from historical performance.

Basically, the formula for the DCF valuation is the following:

$$Present\ value = \sum_{t=0}^{n} \frac{CF_t}{(1 + WACC)^t}$$

where:

CFt = Expected Cash Flows

WACC – Weighted Average Cost of Capital

So, in this model we take projections of future cash flows of the company and discount them by Weighted Average Cost of Capital (WACC) to maintain the risk and get the present value, due to the uncertainty of the future.

The DCF model is a sense making method. It is possible to make correct calculations of future cash flows, and this model is simple to understand. But it has a big disadvantage: the model is dependent on making correct assumptions. These assumptions are very subjective. First of all, we assume that in the explicit period the company will not change a lot from the last year. What will be the growth of the revenues of the company? What will be with the economy of the country? What is the WACC? What is the cost of the debt? There are much more questions for the model for making all the assumptions and only if we answer all these questions correctly, we will get the right present value of the company.

The Russian market is an emerging market. According to James and Koller (2000), the DCF is the preferred method to use in emerging markets. It is important to focus on emerging markets´ risks. "Those risks may include high levels of inflation, macroeconomic volatility, capital controls, political changes, war or civil unrest, regulatory change, poorly defined or enforced contract and investor rights, lax accounting controls, and corruption" (James and Koller, 2000). To do a correct

valuation of my company, I should estimate the importance of every kind of these risk factors and take them into consideration while making my assumptions.

2.1.2.Adjusted Present Value Model (APV)

According to Luehrman (1997), the alternative for DCF is APV: "APV always works when WACC does, and sometimes when WACC doesn´t, because it requires fewer restrictive assumptions… APV can help managers analyze not only how much an asset is worth but also where the value comes from".

The formula for APV is the following:

$$APV = PV_{of\ cash\ flows\ from\ assets} + PV_{of\ all\ financing\ side\ effect}$$

In the first part of the equation we take the PV of the company as if it was financed entirely with equity. In the second part we consider different effects: interest tax shields, subsidies, cost of financial distress, hedges, issue costs and other costs. So, after we get discounted cash flow from the assets, we evaluate the financing side effects and sum them to get the APV. In other words, we separate the DCF model into two parts.

"APV is flexible. A skilled analyst can configure a valuation on whatever way makes most sense for the people involved in managing its separate parts" (Luehrman, 1997).

My company doesn´t plan to change its capital structure in the near future, so this model is not applicable for valuation now.

2.1.3.Dividend Discount Model (DDM)

"The dividend discount model´s primary attraction is its simplicity and its intuitive logic" (Damodaran, 2006). When an investor creates his portfolio, besides the estimation of the share prices, trends, financial results, he also wants to receive some dividends. The first thing he will then do is to look for historical dividend payment statistics. Dividends always have an affect on the price of the company's share. Therefore, investors are interested in two things: the price of the share at the beginning and at the end of the holding period, and on the dividends he will get throughout this period. The DDM model can be described by the following formula:

$$Value\ per\ share\ of\ stock = \sum_{t=1}^{t=\infty} \frac{E(DPS_t)}{(1+K_e)^t}$$

where:

$E(DPS_t)$ = Expected dividends per share

K_e= Cost of equity

According to Damodaran (2006), "there are two basic inputs to the model – expected dividends and the cost of equity". In the two-factor Dividend Discount Model we assume that in the nearest N years there will be higher growth of the dividends, and after that there will be the stable growth (e.g. assumed country economy growth). So, this model, as well as the DCF, can include the risks of the emerging markets, and also very depended on the subjective assumptions. The company for my valuation pays dividends, so it is a good idea to apply this model for my valuation.

2.2.Liquidation and accounting valuation models

According to Damodaran (2006), "a financial balance sheet provides a good framework to draw out the differences between valuing a business as a going concern and valuing it as a collection of assets". Here are some methods of valuation, e.g. Book Value, Book Value plus Earnings, Fair Value Accounting.

For example, the Book Value plus Earnings approach is based on that "the value of equity in a firm is the sum of the current book value of equity and the present value of the expected excess returns to equity investors in perpetuity" (Damodaran, 2006):

$$Value\ of\ Equity_0 = Book\ Value\ of\ Equity_0 + \frac{\sum_{t=1}^{t=\infty}(Net\ Income_t - Cost\ of\ Equity_t * Book\ Value\ of\ Equity_{t-1})}{(1 + Cost\ of\ Equity_t)^t}$$

The model doesn´t estimate emerging market's risk as much as, for example, DCF and DDM model do, and this risks are really important for the Russian market. Moreover, the model is usually applied for the valuation of the banks. So I won't use this model in my valuation.

2.3.Relative valuation

Market multiples are widely used for valuation purposes because it is one of the easiest ways to do a valuation by comparing the company with other similar firms – its peer group. The

most important part of this type of valuation is to find the right peer group. According to Foushee, Koller and Mehta (2012), "as companies with high total returns to shareholders know, executives should focus on the amount of value they create – with regard to growth, margins, and capital productivity". Hence, when choosing our peers, we should focus on the whole business the company conducts and not only on the company's report.

As Goedhart, Koller and Wessels (2005) state, "multiples are often misunderstood and, even more often, misapplied". Correctly chosen multiples lead to a more accurate valuation, when the analyst comes up to the average result of different valuation approaches. The authors come up with a conclusion that suggests using four basic principles, which will help apply multiples properly:

- Use peers with similar prospects for ROIC and growth
- Use forward-looking multiples
- Use enterprise-value multiples
- Adjust the multiples for non-operating items

When we have a suitable peer group and we use the right multiples, we will get an accurate valuation result.

2.4.Contigent Claim Valuation

This valuation approach is based on option models. To Copeland & Keenan (1998), "Recognizing real options can help decision makers assess the profitability of new projects and understand whether and when to proceed with the later phases of projects that have already been initiated, particularly when they are close". Options theory is very useful for companies who sell commodities, because we can obtain a lot of data for such companies (e.g. market prices for commodities). Option pricing theory is very good for evaluating opportunities for a company. "The key to valuing a corporate investment opportunity as an option is the ability to discern a simple correspondence between project characteristics and option characteristics" (Luehrman, 1997). In this case we have the following formula:

$$FIRM\ VALUE = NPV_{of\ cash-flow\ from\ normal\ operations} + NPV_{of\ cost\ restrucruing\ measures\ and\ synergies} + NPV_{of\ growth} + NPV_{of\ options+flexibility}$$

It's not so easy to estimate the options. According to Luehrman (1997), "some companies use a formal DCF-based approval process but evaluate strategic projects with special rules". For example, such rules can be a lower hurdle rate or conducting option valuations outside the common DCF system.

To Leslie and Michaels (1997), "such a valuation would recognize the importance of uncertainty". A Company's options valuation provides us with the fair value of the company.

2.5.Terminal Value

The essential part of every valuation is the Terminal Value. Terminal value is the present value of all future cash flows. We assume the perpetuity growth rate for the company and discount all the cash flows for this value and get our Terminal Value:

$$TV_t = \frac{Cash\ flow(t+1)}{Discount\ rate - growth\ rate}$$

2.6.WACC

Fernandez (2010) states that "The WACC is just the rate at which the Free Cash Flows must be discounted to obtain the same result as in the valuation using Equity Cash Flows discounted at the required return to equity (Ke) The WACC is neither a cost nor a required return: it is a weighted average of a cost and a required return. To refer to the WACC as the "cost of capital" may be misleading because it is not a cost".

WACC is one of the important parts of the DCF model. So we should carefully calculate it without making any mistakes. The formula is the following:

$$WACC = \frac{E}{V} * R_e + \frac{D}{V} * R_d * (1 - t)$$

where:

E = Market Value of Equity

V= Market Value of the Firm

R_e = Cost of Equity

D = Market Value of Debt

R_d = Cost of Debt

t= Tax Rate

To avoid mistakes, mainly we should use in our calculation the correct tax rate, which relates to Expected Equity Cash Flows and Free Cash Flows; do not use book values of equity and debt; use the outstanding and forecasted debt.

2.7.Cost of equity

Companies have two sources of capital: equity and debt.

The cost of equity is the return which shareholders of the company require to get as a risk compensation for investing in the company. It is calculated by the following formula:

$$R_e = r_f + (r_m - r_f) * \beta$$

where:

r_f = Risk-free rate

r_m = Market Risk Premium

β = Equity Beta

As Bodnar, Dumas and Marston (2003) say, "the firm must estimate future free cash flows just as in a domestic project, but choosing an appropriate discount rate is a particular challenge". If the company operates on the international market, the question arises about which risk market premium to use. We should adjust the domestic market risk premium for the world risk.

Regarding the risk-free rate, it is a theoretical rate when we make our investments with zero risk. Usually we take the U.S. Treasury Bills rate as the risk-free rate. Due to the fact, that the Russian market is an emerging market, here I should take the Russian government bond rate as a risk-free rate.

As for Beta, it gives us the understanding of the volatility of an asset compared to the market.

We can obtain Beta with the following formula:

$$\beta = \frac{Cov(r_i, r_m)}{r_m}$$

2.8.Cost of debt

The cost of debt is the return which debtholders require for lending money to the company. As Davis (2014) says, "use of actual debt cost rather than an assumed maturity debt cost changes the relevance". To obtain the market cost of debt, it is needed for the company to calculate how

much interest the company pays for all its debt (calculating it separately for each element of debt) and then divide it by the total amount of debt.

2.9.Conclusion

As it was mentioned above, my company operates in an emerging market, which has many market risks. Moreover, the company pays stable dividends. Furthermore, in the domestic market the company has similar competitors to make relative valuations. Based on these facts, I will make the valuation of the company by using DCF and DDM models, and Market Multiples.

3.Economic and political overview

According to the World Bank, "After almost two years of recession, Russia has entered a path to recovery". Russia is the country which depends a lot on the prices of oil and gas. Due to the agreements between the countries about regulating oil prices, the price of Brent is rising this year, so the economy of the Russian Federation is recovering. The recession was continuing in Russia after the fall of oil prices and sanctions, which were introduced against Russia in 2014. It also affected the currency exchange rate, than the price for US dollars and Euros became double higher in the short period of time. The Russian Central Bank is providing flexible exchange rate policy, changing the rate very often. Also, there are expenditure cuts in real and bank recapitalization, what helps the government to support current economic situation.

Graph 1 - USDRUB exchange rate. Souce: tradingeconomics.com

Due to these regulations, the real GDP just contracted by 0.2% (and in 2015 it was the decrease of 2.8%) and the expectation for 2017 GDP growth rate is 1.5%. Regarding the inflation, in 2015 it was 12.91%, 2016 – 5,38%, and this year the Ministry of Economics expects to reach the 4% target.

Graph 2 - Inflation rate in Russia. Source: tradingeconomics.com

But, Russia has very big political risks. The country is still under the sanctions, the relationship with the key partners are not stable and clear. While Russia has the problems and misunderstandings with US and Europe, it tries to develop relations with China, United Arab Emirates and other countries. Also, the next year is the year of president elections, The new president will be elected for 6 years. For the country this is the biggest political risk, because the president of Russia has a lot of responsibilities regarding domestic and foreign policy.

4.Capital market overview

According to official website moex.ru, "Moscow Exchange provides exhaustive and convenient access to the Russian financial markets. Today, Moscow Exchange is the main liquidity and price discovery center for Russian instruments. Moscow Exchange hosts trading in equities, bonds, derivatives, currencies, money market instruments and commodities". Securities of over 700 issuers are admitted to trading on the equity and bond markets of Moscow Exchange. The Exchange is also a leader in driving modernization of Russia's financial markets infrastructure and promoting Moscow as an international financial center. 46% of capital invested in Russian stock market is belonging to foreign investors. Retail investors are having 34% share.

5.Steel market overview

According to Deloitte report, in 2016 we could the growth for steel output by 0,8% and for steel consumption by 1,3%. But, in Russia the growth for steel output was just 0,3% while the consumption fell by 3.9%.

The 2017 year in the world (mainly – China, USA, Russia and India) starts with a stable growth in both output and consumption.

Figure 1 - World steel output. Source: deloitte.com

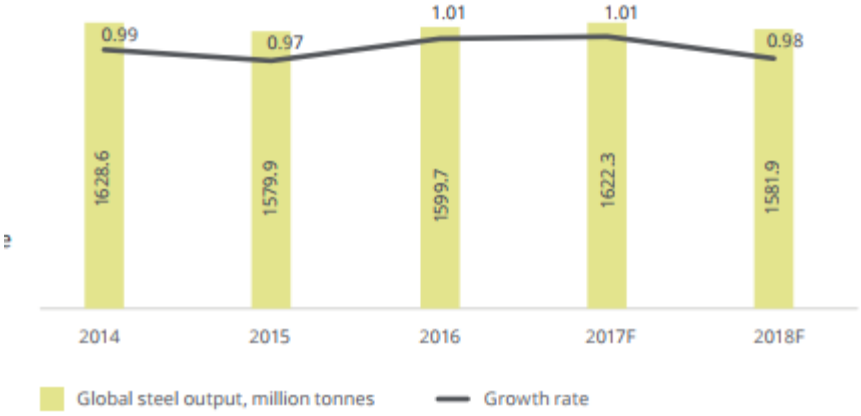
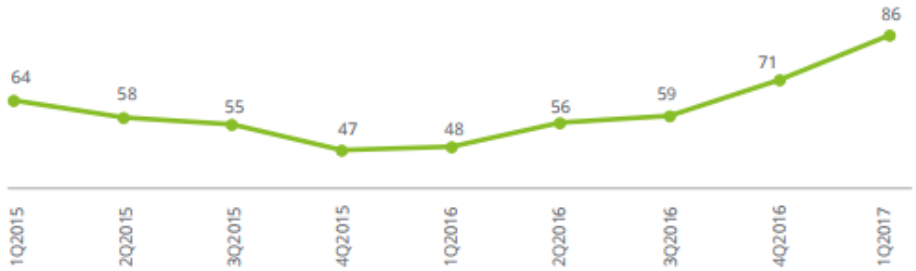


Figure 2 - World steel consumption. Source: deloitte.com

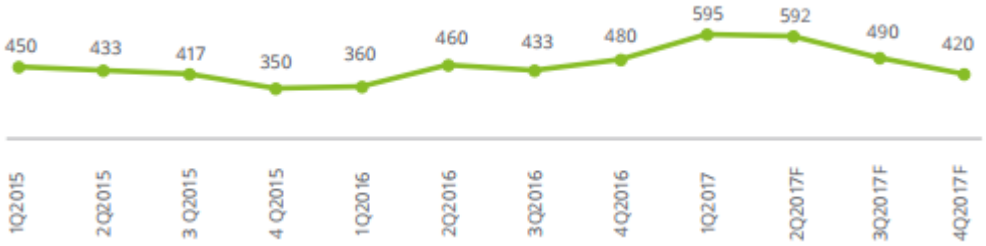
As for the commodities, we can see the raise of Iron Ore by more than 50% in the recent two years. It is very high volatility for this commodity what makes some barriers for new companies, so Magnitogorsk Iron & Steel Works PJSC nowadays have big chances to achieve good results and profits. From the other side, such fluctuation is a good signal for price decrease.



Graph 3 - Iron Ore spot price (USD per tonne). Source: WorldSteel Association

The most probable option is the continued stable growth of output and consumption with the commodity price decreasing in the following years in the world.

Regarding the steel price, it is stable with about 20% volatility. As Deloitte analysts say, "most iron and steel producers and consumers are quite comfortable with the current price corridor". They state that "a positive dynamic on the market contributes to less intense competition".



Graph 4 - Steel spot price (USD per tonne). Source: EIU

As for Russian market of Iron and Steel, due to the consumption decrease, the companies will ramp on the exports. In the recent years in Russia there is an estimation of slow decrease in demand. Russian Federation needs to make more attractive trade agreements with its partners to increase the export and cover the losses from the domestic market consumption decrease.

Regarding the export market, the major partners of the Magnitogorsk Iron & Steel Works PJSC are the companies in the European Union (mostly – Italy). Nowadays the steel consumers operating in the European Union are taking benefits from monetary support of European Central Bank, because money borrowing is easier now what makes the demand for steel higher. As well, due to rise in automotive sector and decrease in unemployment in Europe led the demand to increase in both automotive and house building industries. The Asia is also partner for Russian companies in the steel market. Here we can observe we decrease in the demand due to fall in the

production in the automotive industry. But this decrease is compensated by the increase in the demand due to huge infrastructure investments. The problem is that in the Asian countries the interest rates are increasing what makes more difficult to support stable growth in the steel demand. Perhaps, the Asia is not so big partner for the Magnitogorsk Iron & Steel Works PJSC as EU, but still it's necessary to take the Asian risk into the consideration. To sum up, nowadays the Magnitogorsk Iron & Steel Works PJSC has all the possibilities to increase its profits on both domestic and export markets. Even with the decrease of demand on the domestic market, the company can earn profits from high spot prices, especially on Iron Ore. As for the export, there is the increase in demand, so the company can generate higher profits in the next years.

6.Company overview

Magnitogorsk Iron & Steel Works PJSC is one of the largest in the world and the biggest in Russia steel producer. The company has the full production chain and offers to its customers the big variety of steel & iron products.

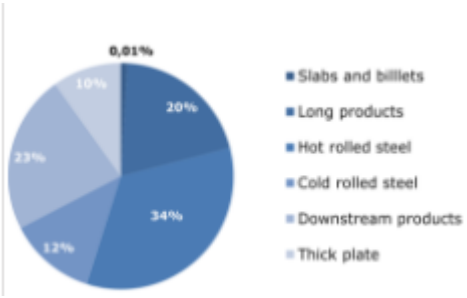


Figure 3 - sales breakdown by products, 2016. Source: mmk.ru

The manufacturing is based in Magnitogorsk city, Russia. As the Magnitogorsk Iron & Steel Works PJSC defines, **"**our mission is to produce and sell high-quality steel products that meet our customers' requirements, to achieve earning that place us among global leaders, and to implement reasonable social policies." The shares of the company are traded on two stock exchange: Moscow Exchange and London Stock Exchange.

Looking into sales breakdown, 73% of sales are made on the domestic market and 15% in the Europe.

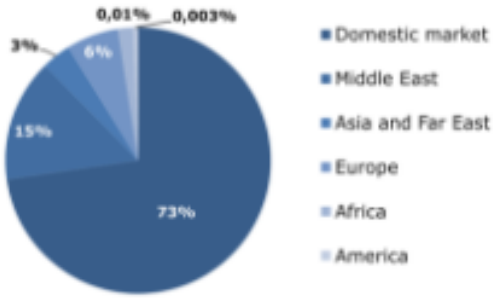


Figure 4 - regional sales strcuture, 2016. Source: mmk.ru

Regarding company results, first of all it is possible to observe the stability in finished products dynamics. Moreover, we can see that the company has the stable share (from 40 to 50%) of the HVA – high-value added products (the steel products which are important for the Russian economy and lead to the increase of the revenues of the company due to the importance of these products)

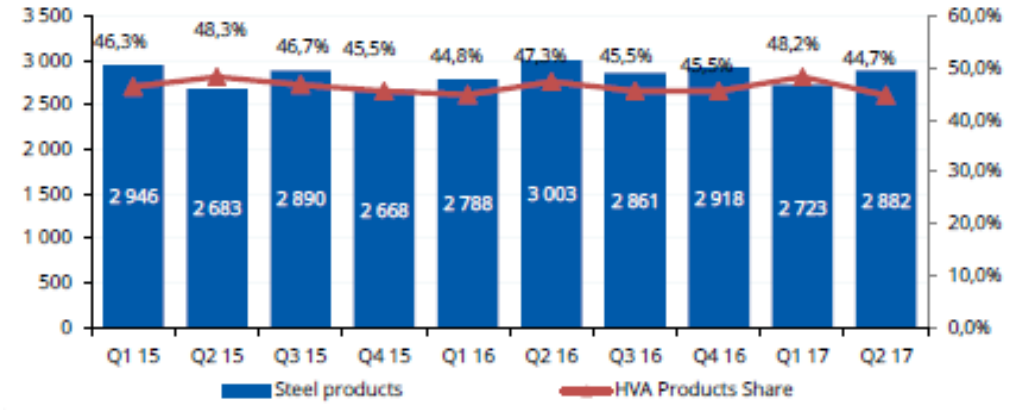


Figure 5 - finished products dynamics (thousands tonnes). Source: mmk.ru

As well, there is quite of stability in the shares of domestic and export sales:

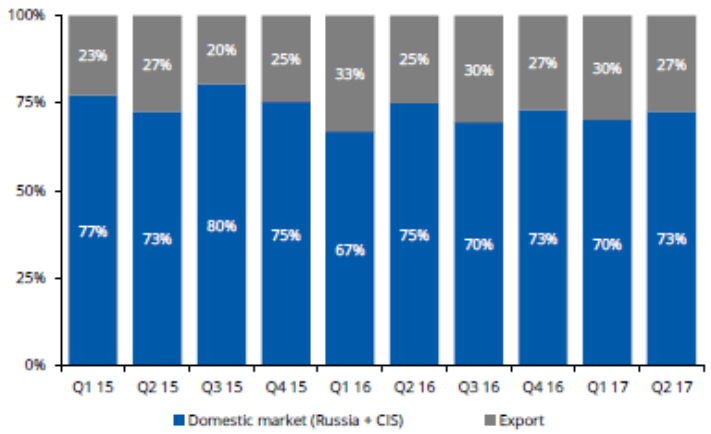


Figure 6 - sales share by market (thousands of tonnes). Sourse: mmk.ru

As for the steel revenues, the dynamics is the following: after recession in Russian economics (what leaded to decrease in revenues) now we can see that the revenues are rising again:

Figure 7 - steel segment revenue (mln USD). Sourse: mmk.ru

As well Net Profits are stable and rising in the last quarters:

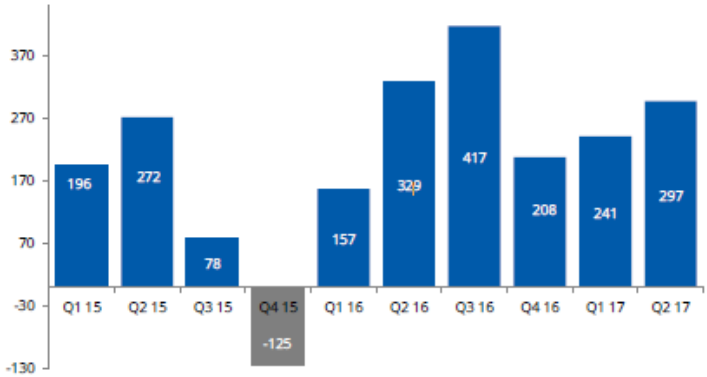


Figure 8 - net profits (mln USD). Source: mmk.ru

Moreover, the company is decreasing its total debt every year, even during the recession time. The company's management says that the Debt to Equity Ratio shouldn't exceed 1:1. But as it is possible to observe, now this ratio is about 1:9. The company doesn't disclosure the future plan regarding the debt. The company has no any bonds issued, so the total debt of the company is presented only by the loans:

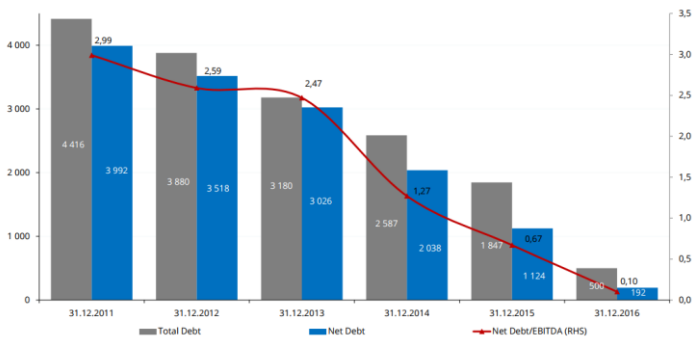


Figure 9 - debt dynamics (mln USD). Source: mmk.ru

Regarding the main competitors of the company on the Russian market, there are three main competitors: "Evraz", "Severstal" & "Novolipetsk Steel". As for the sales breakdown, the Magnitogorsk Iron & Steel Works has the leading position on the steel and iron ore market, but the competitors has the advantage having its own mining processes for getting the raw materials needed in the manufacturing processes while the Magnitogorsk Iron & Steel Works buy these materials from other companies, mainly from the Kazakhstan. But due to the cheap price of raw materials nowadays the Magnitogorsk Iron & Steel Works offers the produced products to the customers by the cheaper price than the main competitors, that's why it has the leading positions now, and according to the deloitte report, it will have the position in the nearest years.

To conclude, the Magnitogorsk Iron & Steel Works PJSC Group is a stable company with the potential to growth which has the leading position in the Russian market and one of the biggest positions in the world.. The company had stable sales during the recession, and now with the upcoming economic growth we can expect the sales growth as well as the growth of the market share of the company. With the increasing net profits and decreasing net debt we can expect the future stable growth of the company with the possibilities for developing the relations with its

existing partners, build relation with the new ones and get into the new markets and strengthen positions in the world.

7.Valuation

7.1.Wacc

The Weighted Average Cost of Capital is the discount factor for the valuation model. So, it is very important to use the correct values and did correct calculation. In order to calculate WACC, we need to know Market Value of Equity, Market Value of Debt, Cost of Equity, Cost of Debt and Effective Tax Rate. All the calculations will be made in USD, because of the following points: firstly, the original report of the company in USD, so it is possible to work with original numbers. Secondly, the Magnitogorsk Iron & Steel Works PJSC is one of the biggest steel producer in the world. Thirdly, in a steel market USD is dominating. Moreover, it is expected the fall of sales in domestic market and raise in the export one.

The result is the following:

Market Value of Equity	$ 3 205 135 959,07
Market Value of Debt	$ 469 670 012,24
Cost of Equity	12,08%
Cost of Debt	4,83%
Effective Tax Rate	23,11%
WACC	**11,01%**

Table 1 – WACC. Source: own calculations.

7.1.1.Effective Tax Rate

Effective Tax Rate for each year can be found by dividing income tax paid on net income before taxes. After that, we can get the average effective tax rate which will be used in the WACC calculation. For year 2012 the tax rate was negative because of the Impairment of Assets. The value is very low, so I decided to exclude this year from the average calculation:

Year	2010	2011	2012	2013	2014	2015	2016
Effective Tax Rate	22,83%	13,33%	-34,07%	12,75%	23,26%	45,71%	20,79%
Average Effective Tax Rate	**23,11%**						

Table 2 - effective tax rate. Source: own calculations.

7.1.2.Cost of Debt

The Magnitogorsk Iron & Steel Works PJSC has no debt traded in the market. The total debt is represented by the loans in three currencies: Russian Ruble, USD and Euro. In the annual

report of the company it is described the percentage rate for all the loans. To obtain Cost of Debt, I calculated the interest paid per each loan, then divided the total sum of interest paid by the total debt amount (the values are in Millions of Dollars):

Sum of the loan, mln USD	Interest Rate, %	Interest Paid
2	4%	0,08
140	10%	14
36	1%	0,36
1	2%	0,02
24	1%	0,24
63	1%	0,63
207	3%	6,21
25	10%	2,5
Cost of Debt	**4,83%**	

Table 3 - cost of debt calculations. Source: own calculations.

7.1.3.Cost of Equity

One of the way to compute Cost of Equity is using of Capital Assets Price Model (CAPM). The model doesn't need any specific limitation, so it is simple and very understandable. As for the risk-free rate, I used the rate of 10 years US Bonds on the 31st of December. To calculate the Beta, I used 5 Years monthly returns for the Magnitogorsk Iron & Steel Works PJSC company and MOEX index itself. Then it is important to adjust the Beta. To do so, it was used the Bloomberg suggestion: to sum 2 of 3 of obtained Beta and 1 of 3 of 1. For market rate of return it was used data from Damodaran website, where it is possible to find the value for all the countries, including Russia. I am using risk-free rate of US and market risk premium of Russia because the company reports in USD, but it is trading and operating in Russian stock market.

Risk-free Rate	2,31%	US 10Y Bond
Beta	1,28	5Y Monthly Data of MMK and MOEX (index)
Adjusted Beta	1,18	2/3*beta+1/3*1
Market Risk Premium	8,25%	Damodaran
Cost of Equity	**12,08%**	CAPM model

Table 4 - cost of equity calculations. Source: own calculations.

7.1.4.Market Value of Equity

Market Value of Equity is the market cost of all the outstanding shares. From the balance sheet it is taken the weighted average number of shares outstanding, then it is multiplying by the share price. But, for the Magnitogorsk Iron & Steel Works PJSC it should be used one more step:

it is needed to calculate share price in USD by the currency rate of Central Bank of the Russian Federation. Due to the fact, that I was using average number of outstanding shares, I decided to use average exchange rate for the 2016.

Total Shares Outstanding	11173899000
Price of the Share, RUR	19,27
Exchange Rate	67,18
Price of the Share, USD	0,286841322
Market Value of Equity	$ 3 205 135 959,07

Table 5 - market value of equity calculations. Source: own calculations.

7.1.5.Market Value of Debt

As it was mentioned above, there is no any bonds used. In order to obtain the Market Value of Debt, the non-listed debt should be treated as a bond. To do so, the first step is to obtain market cost of debt, depending on the company credit rating. With the spread for the BBB- rating (taken from the Fitch rating agency), obtained on the Damodaran website, it was calculated the market cost of debt:

Market Cost of Debt	4,31%	US risk-free rate + 2% spread for BBB- company (Damodaran)

Table 6 - market cost of debt result. Source: own calculations.

From the company report it was taken the repayment plan of the company. It is important to say that nowadays the company is significantly decreasing its debt outstanding. For now, the company do not announce any plans for the future capital structure, but the policy of the company is that the Debt to Equity ratio should not exceed 1:1. Nowadays the company has this ratio about 1:9. Probably, I can do the assumption, that the company will attract investments for some projects after paying of current debt and will have a new debt which will be much higher. As for repayment, we need to obtain the interest paid in the future years. The logical way is to use the same cost of debt as it was in the 2016, because it is present situation of the economy, but this value avoids the fluctuation of the Russian economy in the recent years. Also, in the last years the Central Bank of Russia was increasing the interest rate, and in the end of 2015 it started to decrease it and continues to do it nowadays, that's why the cost of debt was increasing till 2015 and started to decrease in 2016.So it was calculated the average cost of debt of the company for the last five years to take the uncertainty risk of the future economic growth and interest rate changes into account. Moreover, according to Russian analysts the historical average cost of debt of the Magnitogorsk Iron & Steel Works is a good proxy for the future debt cost.

Historical cost of debt	
2012	5,64%
2013	5,70%
2014	6,00%
2015	7,26%
2016	4,83%
Average	**5,88%**

Table 7 - histocicatl cost of debt. Source: own calculations.

Then we can obtain future cash flows for the debt repayment as the sum of the amount of the debt and interest paid on that debt:

Repayment Plan	Amount	Interest	Total
2017	295	17	312
2018	108	6	114
2019	67	4	71
2020	1	0	1
2021 and thereafter	2	0	2

Table 8 - repayment plan. Source: company report

Now the final step is to discount these Cash Flows by the Market Cost of Debt to obtain the Market value of Debt, using the Net Present Value formula (where the average cost of debt is the discount factor):

Market Value of Debt	**$ 469 670 012,24**

Table 9 - market value of debt result. Source: own calculations.

After that we calculate the WACC. The results of the calculation are presented above.

7.2.Long-term growth rate

As it was mentioned in the economic overview, nowadays Russia is going into the economic growth stage. Moreover, the Magnitogorsk Iron & Steel Works PJSC has some opportunities for growth now. The world bank expects the GDP growth of 1.5% per year. But due to the stability of the country and the company, decreasing of total debt of the Magnitogorsk Iron & Steel Works PJSC, opportunities at the export market, good situation at the steel market, I would like to use 2% long-term growth rate. As well this value (2%) is presented in the company annual report as the forecasted growth rate.

7.3.DCF

We need to make a lot of assumptions and calculations to obtain the correct value of share price in discounted cash flows model. The first assumption I did was the revenue growth rate. As it was told before, the Russian economy is having some stability right now. In the past it is possible to see the fluctuation in revenues of Magnitogorsk Iron & Steel Works PJSC, which had negative dynamics. It was connected by different reasons: uncertainty of the Russian economy, rapidly changing currency rate, political risks of the country etc. Due to the fact, that now these problems are almost avoided, for the future projections I assume that there will be small, but stable growth. For such, I use revenue growth of -2% in 2017, 0% in 2018, 1% in year 2019, and 2% in the 2020 and 2021 (and the following years, the same as the long-term growth rate):

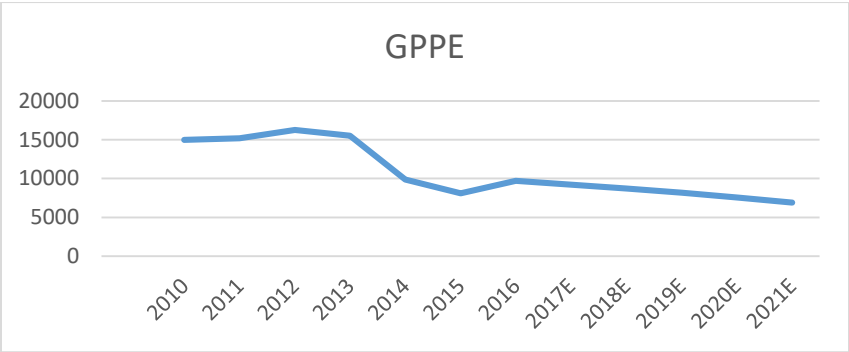
DCF Model	2017E	2018E	2019E	2020E	2021E
(+) Revenue	5517	5517	5573	5684	5798
Revenue growth rate	*-2%*	*0%*	*1%*	*2%*	*2%*

Table 10 - MMK projected revenues. Source: own calculations.

For now, the main event which can affect the assumed growth rates is the cancellation of the sanctions against Russia. In this case the growth rate can be more, and this case will be presented in the sensitivity analysis. But, hardly ever this event will occur in the next 5 years.

As for the Depreciation calculation I use historical ratio of Depreciation/Last Year's GPPE, and calculate the Depreciation based on the average of this ratio (multiplying the ratio on the projected GPPE).

On the balance sheet of the company it is possible to see that GPPE as well as NPPE are slowly decreasing. It is connected because of the sale of the assets abroad which are under the sanctions. The main procedures of the sales were made in the 2013. But the company still has some assets and they are selling it, so the CAPEX is negative. It is well known that in long term period CAPEX should not exceed the depreciation. Depreciation is calculated as the average portion of the GPPE in the last 7 years. GPPE will be slowly decreasing every year, due to the sales of the assets:



Graph 5 - GPPE dynamics. Source: company report

Regarding the CAPEX, I assume that with the policy of the company in the last year of my projections the CAPEX will be the same as depreciation value:

Extra Calculation	2017E	2018E	2019E	2020E	2021E
Revenues	5517	5517	5573	5684	5798
Depreciation	15	14	13	13	12
GPPE	9194	8723	8193	7543	6907
GPPE dynamics	*94,87%*	*94,87%*	*93,93%*	*92,06%*	*91,57%*
Depreciations/Last Year's GPPE	*0,16%*	*0,16%*	*0,16%*	*0,17%*	*0,17%*
CAPEX	-400	-300	-200	-100	-12

Table 11 - Depreciation & CAPEX calculastions. Source: own calculations.

As for the unusual income and other operating income, future values are based on the average historical ratios: unusual income/revenue and other operating income/revenue. For the projected years the values of these two elements are the portions of the projected revenues. There is no big range in these values in the past, so the average is the best method to use for that assumptions. Instead of average I use the median formula to exclude the outstanding values in 2013. I assume that the ratios of unusual income/revenue and other operating income/revenue will be the same during my projection period. So the values we get are stable what is proved by the assumption regarding the stability of the economy as well as company sales growth.

Regarding operating expenses, they are calculated as the average portion of the revenue of the last 3 years when it was possible to see the stability of the Magnitogorsk Iron and Steel Works. It's impossible to take more years into account due to the fluctuating currency rate, impairment of assets and very high margins. The margin that we have now (83%) is the same amount as the company predicts for the future years.

With knowing that values we can come, firstly, to the EBITDA (Revenue – Operating Expenses), then to the EBIT (EBITDA – Depreciation + Unusual Income + Other Operating Income):

DCF Model	2017E	2018E	2019E	2020E	2021E
(+) Revenue	5517	5517	5573	5684	5798
Revenue growth rate	*-2%*	*0%*	*1%*	*2%*	*2%*
(-) Operating Expenses	4579	4579	4625	4718	4812
Operating Margin	*83%*	*83%*	*83%*	*83%*	*83%*
(=) EBITDA	938	938	947	966	986
(-) Depreciation	15	14	13	13	12
(+) Unusual Income (Expenses)	20	20	20	21	21
Unusual Income/Revenue	*0,36%*	*0,36%*	*0,36%*	*0,36%*	*0,36%*
(+) Other Operating Income (Expenses)	-21	-21	-21	-21	-22
Other Operating Income/Revenue	*-0,38%*	*-0,38%*	*-0,38%*	*-0,38%*	*-0,38%*
(=)EBIT	923	923	933	953	973

Table 12 - EBIT obtained by the DCF model. Source: own calculations.

For the tax rate I use the average tax obtained in the WACC calculations. Obviously, it was very high fluctuation in the past, due to the currency rate jumps and impairment of assets and the tax rate was changing every year. But I assume stable currency rate (according to the World Bank and Russian Ministry of Economy predictions) and no impairments of assets (according to the company's information) in the nearest 5 years and find the average value as a fair one for the current economic situation.

Regarding changes in the deferred taxes, there are no such taxes in the past, so I assume they won't appear in the future projections.

Calculations of changes in the Net Working Capital are based on the average values of the ratios for the last 7 years such as Inventories/Revenues; Accounts Receivable/Revenues, Other Current Assets/Revenues, Accounts Payable/Revenues; Accrued Expenses/Revenues. There is no high fluctuation in these values, that's why I decided to use averages of the last 7 years for my future projections:

Net Working Capital Calculation	2017E	2018E	2019E	2020E	2021E
Revenues	5517	5573	5684	5798	5972
Inventories	-83	-62	-12	-32	-48
Inventories/Revenues	*-1,50%*	*-1,11%*	*-0,21%*	*-0,55%*	*-0,81%*
Accounts Receivable	-15	-23	-23	-36	-46
Accounts Receivable/Revenues	*-0,27%*	*-0,42%*	*-0,41%*	*-0,62%*	*-0,77%*
Other Current Assets	21	13	7	7	7
Other Current Assets/Revenues	*0,38%*	*0,23%*	*0,12%*	*0,11%*	*0,12%*
Working Capital Assets	**-77**	**-72**	**-28**	**-62**	**-87**
Accounts Payable	71	67	53	62	78
Accounts Payable/Revenues	*1,29%*	*1,20%*	*0,93%*	*1,07%*	*1,31%*
Accrued Expenses	-147	-159	-152	-158	-143
Accrued Expenses/Revenues	*-2,67%*	*-2,86%*	*-2,68%*	*-2,73%*	*-2,39%*
Working Capital Liabilities	**-76**	**-92**	**-100**	**-96**	**-65**
Net Working Capital	**-1**	**20**	**71**	**35**	**-22**
Change in NWC	**125**	**21**	**51**	**-37**	**-57**

Table 13 - net working capital projections. Source: own calculations.

Knowing all the assumption and values need for the model, we can come to the FCFF (EBIT + Depreciation – Tax on EBIT + Changes in deferred taxes - Changes in NWC – CAPEX):

DCF Model	2017E	2018E	2019E	2020E	2021E
(=)EBIT	**923**	**923**	**933**	**953**	**973**
(+)Depreciation	15	14	13	13	12
(-)Tax on EBIT	213	213	216	220	225
(+)Changes in deferred taxes	0	0	0	0	0
(-)Changes in NWC	125	21	50	-36	-56
(-)CAPEX	-400	-300	-200	-100	-12
(=)FCFF	**999**	**1003**	**881**	**881**	**828**
WACC	11,01%	11,01%	11,01%	11,01%	11,01%
Discount Factor	90,08%	81,15%	73,10%	65,85%	59,32%
Discounted FCFF	**900**	**814**	**644**	**580**	**491**

Table 14 - dicsounted free cash flow to the firm. Source: own calculations.

Discounting it by the WACC, we come to the explicit period value and can obtain the share price:

Explicit period value	3429
Terminal Value	5557
Value of Operations	8987
Net Debt	500
Equity Value	8487
SHARE PRICE	**9,87**

Table 15 - share price obtained by the DCF model. Source: own calculations.

7.4.Sensitivity analysis

To do the sensitivity analysis, we need to assume the possible values of WACC and growth rate. Even with the assumption of stable economic growth, the economy of Russia can fluctuate a little bit, as well as bond rates are always fluctuating. So I use the WACC range from 9,5 to 12,5% and growth rate from 1,25% to 2,75%. In the result we can see that it doesn't affect a lot to the share price: in the worst case the price will be 8,55 and in the best case it will be 12,10.

SENSITIVITY ANALYSIS	WACC							
Growth Rate	*9,87*	*9,50%*	*10%*	*10,50%*	*11,01%*	*11,50%*	*12%*	*12,50%*
	1,25%	10,42	10,02	9,66	9,33	9,05	8,79	8,55
	1,50%	10,66	10,23	9,85	9,50	9,21	8,93	8,68
	1,75%	10,91	10,45	10,05	9,68	9,37	9,08	8,81
	2,00%	11,18	10,69	10,26	9,87	9,54	9,23	8,96
	2,25%	11,46	10,94	10,49	10,07	9,72	9,40	9,11
	2,50%	11,77	11,21	10,73	10,29	9,91	9,57	9,26
	2,75%	12,10	11,50	10,98	10,51	10,12	9,75	9,43

Table 16 - sensitivty analysis of the share price. Source: own calculations.

7.5.Dividend Discount Model

Dividend discount model is the model which is based on the assumption of the high growth period in the nearest N years and stable growth after. To find the high growth rate, I calculated current EPS, current Dividend per Share, current payout ratio and current ROE. Current payout ratio multiplied by current ROE gives us the high growth period value. For stable period growth rate I use my assumption of 2%, which was explained above. So I can get payout ratio in the stable

period. Cost of equity is the discount factor for the model which was obtained in the WACC calculations. So we get the following:

Current EPS	1,29
Current Dividends/Share	0,44
Cost of Equity	12,08%
Current Payout Ratio	33,75%
Current ROE	23,67%
High growth rate	7,99%
Stable growth rate	2%
Payout ratio in stable period	91,55%

Table 17 - the assumptions of the dividend discount model. Source: own calculations.

The calculated assumption of high growth period rate of 8% can be also be proved by the changes in company's dividend policy: the company promises to pay at least 50% of the net profit for the dividends in the next years. The analytics estimate the raise of dividends for 50% in 5 years. With obtained rate of 8%, in 5 years it gives us 46% raise in dividends.

Now, when all assumptions are calculated, we can obtain the present value of future dividends, terminal value and finally share price. Terminal value calculated as DPS in period N divided by (cost of equity – stable growth rate):

Year	**1**	**2**	**3**	**4**	**5**	**N**
Growth Rate	8%	8%	8%	8%	8%	2%
EPS	1,396	1,507	1,628	1,758	1,898	1,424
DPS	0,471	0,509	0,549	0,593	0,641	1,303
Cumulative Cost of Equity	1,121	1,256	1,408	1,578	1,769	
PV of dividends, per year	0,420	0,405	0,390	0,376	0,362	
PV of dividends at high growth phase, sum	1,95					
Terminal value	12,93					
PV of Terminal value	7,31					
Share price	**9,26**					

Table 18 - the projections of the dividends and the result for DDM. Source: own calculations.

7.6.Market multiples

According to the Thomson Reuters, the peer group of the Magnitogorsk Iron & Steel Works PJSC is following:

Company Name	EV / EBITDA	Price / Revenue
MMK	4,25	1,19
Novolipetsk Steel	5,89	1,53
Severstal'	5,15	1,65
GMK Noril'skiy nikel'	6,12	2,54
EVRAZ	4,88	0,58
United Company RUSAL	7,51	0,96
Xinxing Ductile Iron Pipes Co	9,30	0,38
Steel Authority of India	11,60	0,55

Table 19 - potential peer group. Source: thomson reuters

. It is important to choose the correct peer group. I use EV/EBITDA and Price/Revenue as the important factors to sort out the companies which suit the peer group. As it is possible to see from the table, Xinxing Ductile Iron Pipes and Steel Authority of India have very high value for EV/EBITDA while GMK Noril'skiy nikel' has too high Price/Revenue value. Moreover, as for the companies, which are operating in Russia (all except last two companies in the Table), there is the same perspective for the economic growth, while the last two company tend to have higher growth (as well as ROIC) for the next years. So for the calculation of the share price I will take only the following companies: Novolipetsk Steel, Severstal, EVRAZ and United Company RUSAL. All the companies are Russian trading in different stock exchanges. There is no sense to take any international companies into the peer group due to the Russian Economy features mentioned above. Also, as we can observe from Thomson Reuters, there is no any international company which can suit the peer group.

To do the valuation, I will use the following ratios: EV/EBITDA, Price/Revenue, Price/EPS and P/BV. These ratios, by my point of view, are the best which suit the case of Magnitogorsk Iron & Steel Works PJSC, because, e.g. enterprise value includes both debt and equity, and due to the fact, that the Magnitogorsk Iron & Steel Works PJSC had D/E ratio 1:9, one ratio for the treatment of the debt is enough. Other three ratios are taking into account all what we need: the revenues of the companies, which show us the growth, the earnings per share, which show us the net profits,

potential dividends policy and investment decisions, and book value of equity which is good for comparison with the market value of equity. The ratios are extracted from the Thomson Reuters based on the 2016 FY reports of the companies:

Company Name	EV / EBITDA	Price/Revenue	Price / EPS	P/BV
Novolipetsk Steel	5,89	1,53	10,06	2,11
Severstal'	5,15	1,65	7,40	3,58
EVRAZ	4,88	0,58	6,54	2,94
United Company RUSAL	7,51	0,96	6,04	1,74
AVERAGE	5,86	1,18	7,51	2,59

Table 20 - market multiples. Source: own calculations.

After getting the average values of these ratio, we can make Equity Value estimation of Magnitogorsk Iron & Steel Works PJSC based on these four ratio and the share price. Using the average, we get the enterprise value of the Magnitogorsk Iron and Steel Works:

MMK Estimated	6905,35	6638,86	8344,59	12171,21
AVERAGE EV	8515,00			
SHARE PRICE	9,91			

Table 21 - peer analysis. Source: own calculations.

Based on the three valuation methods, which were described in the literature review (and it was given explanation why I choose exactly these models), we can come to the conclusion of the fair share price of Magnitogorsk Iron & Steel Works PJSC:

DCF	DDM	Multiples
9,87	9,26	9,91
Average	**9,68**	

Table 22 - Equity valuation result. Source: own calculations.

8. Comparison

For the comparison of my result I was using the report by Aton Investment Company (based in Moscow, Russia) from the august where the analysts were taking into consideration the 1H2017 result of the Magnitogorsk Iron & Steel Works. In this report Aton reiterate the BUY rating for the company and raise potential share price to 10$ with 25% upside potential because of the good performance, 3.7x EV/EBITDA multiple, strong FCF yield and possibility to be included in the MSCI index. Relative to other Russian steelmakers, MMK has the lowest integration in raw materials and is favorably positioned in the current high steel-over-bulks premium environment, in our view.

Regarding the comparison of the result, we difference is 3% of 32 cents. It can be considered with different reasons. First of all, the rates which are used for the WACC calculation could be taken from different dates. The Aton Investment company doesn't disclosure the revenue growth assumptions. Moreover, probably assumptions made by the investment company are more accurate due to the professionalism and experience of the analysts.

If we take a look at sensitivity analysis, it is possible to find the result which will be the same with the different WACC and growth rate.

To conclude, it is impossible to find the certain reason of the difference in the results due to the lack of information about the assumptions made in the investment company's report.

9. Conclusion

To sum up, firm valuation is very powerful tool for making investment decisions. It is very important to choose the correct methods for different companies. From the literature review it is possible to see that there is very big range of methods which are used for different type of companies, countries, economics. But choosing right methods is not enough. Every model is based on subjective assumptions which the analyst makes. A small change in these assumptions leads to the different results in valuation.

From the results of valuation made for Magnitogorsk Iron & Steel Works it is possible to see that different methods used provide us with different share price of the company. Thus, the DCF model gave the result of 9.87$ per share, the DDM model gave the result of 9,26$ per share, the market multiples model gave the result of 9.91$ per share. To give a recommendation it was used the average of these three results, and the final recommendation is BUY with the target price of 9.68$.

In this thesis it were observed the fundamentals of the firm valuation and was done valuation itself with step-by-step explanation for the better understanding. All assumptions were explained as well.

From all the information, company reports and the valuation it is possible to see that the Magnitogorsk Iron & Steel works is a strong company with the growth potential.

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11. Appendices

Appendix 1 – Income Statement

Income Statement Annual Standardised in Millions of U.S. Dollars, Consolidated	2010	2011	2012	2013	2014	2015	2016
Period End Date	31-Dec-2010	31-Dec-2011	31-Dec-2012	31-Dec-2013	31-Dec-2014	31-Dec-2015	31-Dec-2016
Revenue	7 719,0	9 306,0	9 328,0	8 190,0	7 952,0	5 839,0	5 630,0
Net Sales	7 719,0	9 306,0	9 328,0	8 190,0	7 952,0	5 839,0	5 630,0
Other Revenue, Total	--	--	--	--	--	--	--
Total Revenue	7 719,0	9 306,0	9 328,0	8 190,0	7 952,0	5 839,0	5 630,0
Cost of Revenue, Total	5 952,0	7 868,0	7 984,0	7 048,0	6 267,0	4 106,0	3 855,0
Cost of Revenue	5 952,0	7 868,0	7 984,0	7 048,0	6 267,0	4 106,0	3 855,0
Gross Profit	1 767,0	1 438,0	1 344,0	1 142,0	1 685,0	1 733,0	1 775,0
Selling/General/Admin. Expenses, Total	1 035,0	919,0	993,0	1 025,0	836,0	599,0	596,0
Selling/General/Administrative Expense	1 035,0	646,0	697,0	741,0	609,0	465,0	474,0
Labor & Related Expense	--	273,0	296,0	278,0	220,0	126,0	120,0
Advertising Expense	--	--	--	6,0	7,0	8,0	2,0
Research & Development	--	5,0	4,0	5,0	3,0	2,0	2,0
Depreciation/Amortization	25,0	23,0	24,0	22,0	19,0	17,0	18,0
Depreciation	25,0	23,0	24,0	22,0	19,0	17,0	18,0
Interest Expense, Net - Operating	--	--	--	--	--	--	--
Interest/Investment Income - Operating	--	--	--	--	(28,0)	(6,0)	(3,0)
Investment Income - Operating	--	--	--	--	(28,0)	(6,0)	(3,0)
Interest Expense(Income) - Net Operating	--	--	--	--	--	--	--
Interest Exp.(Inc.),Net-Operating, Total	--	--	--	--	(28,0)	(6,0)	(3,0)
Unusual Expense (Income)	126,0	111,0	135,0	2 666,0	29,0	180,0	15,0
Impairment-Assets Held for Use	--	41,0	17,0	2 456,0	(20,0)	179,0	5,0
Loss(Gain) on Sale of Assets - Operating	159,0	70,0	118,0	79,0	57,0	15,0	14,0
Other Unusual Expense (Income)	(33,0)	0,0	--	131,0	(8,0)	(14,0)	(4,0)
Other Operating Expenses, Total	(29,0)	56,0	(61,0)	(294,0)	3,0	4,0	(310,0)
Other Operating Expense	--	--	--	(4,0)	--	--	--
Other, Net	(29,0)	56,0	(61,0)	(290,0)	3,0	4,0	(310,0)
Total Operating Expense	7 109,0	8 982,0	9 079,0	10 472,0	7 129,0	4 902,0	4 173,0
Operating Income	610,0	324,0	249,0	(2 282,0)	823,0	937,0	1 457,0
Interest Expense, Net Non-Operating	--	(269,0)	(224,0)	(187,0)	(178,0)	(149,0)	(117,0)
Interest Expense - Non-Operating	--	(269,0)	(224,0)	(187,0)	(178,0)	(149,0)	(117,0)
Interest/Invest Income - Non-Operating	(13,0)	(11,0)	55,0	(143,0)	(608,0)	(134,0)	74,0
Investment Income - Non-Operating	(13,0)	(11,0)	55,0	(143,0)	(608,0)	(134,0)	74,0

Interest Income(Exp), Net Non-Operating	--	--	--	--	--	--	--
Interest Inc.(Exp.),Net-Non-Op., Total	(13,0)	(280,0)	(169,0)	(330,0)	(786,0)	(283,0)	(43,0)
Gain (Loss) on Sale of Assets	--	--	--	--	--	--	--
Other, Net	(307,0)	(185,0)	(143,0)	(123,0)	(91,0)	(41,0)	(72,0)
Other Non-Operating Income (Expense)	(307,0)	(185,0)	(143,0)	(123,0)	(91,0)	(41,0)	(72,0)
Net Income Before Taxes	290,0	(141,0)	(63,0)	(2 735,0)	(54,0)	613,0	1 342,0
Provision for Income Taxes	58,0	(16,0)	31,0	(306,0)	(10,0)	192,0	231,0
Net Income After Taxes	232,0	(125,0)	(94,0)	(2 429,0)	(44,0)	421,0	1 111,0
Minority Interest	22,0	5,0	3,0	29,0	1,0	(1,0)	0,0
Equity In Affiliates	--	--	--	--	--	--	--
U.S. GAAP Adjustment	--	--	--	--	--	--	--
Net Income Before Extra. Items	254,0	(120,0)	(91,0)	(2 400,0)	(43,0)	420,0	1 111,0
Accounting Change	--	--	--	--	--	--	--
Discontinued Operations	--	--	--	--	--	--	--
Extraordinary Item	--	--	--	--	--	--	--
Tax on Extraordinary Items	--	--	--	--	--	--	--
Total Extraordinary Items	--	--	--	--	--	--	--
Net Income	254,0	(120,0)	(91,0)	(2 400,0)	(43,0)	420,0	1 111,0

Appendix 2 – Balance Sheet

Annual Standardised in Millions of U.S. Dollars, Consolidated

	2010	2011	2012	2013	2014	2015	2016
Period End Date	31-Dec-2010	31-Dec-2011	31-Dec-2012	31-Dec-2013	31-Dec-2014	31-Dec-2015	31-Dec-2016
Assets ($ Millions)							
Cash and Short Term Investments	708	471	424	171	557	728	316
Cash	326	--	--	56	207	93	130
Cash & Equivalents	189	424	362	98	120	276	136
Short Term Investments	193	47	62	17	230	359	50
Accounts Receivable - Trade, Net	547	481	560	507	494	329	487
Accounts Receivable - Trade, Gross	690	641	652	549	520	346	507
Provision for Doubtful Accounts	(143)	(160)	(92)	(42)	(26)	(17)	(20)
Total Receivables, Net	948	922	926	761	660	436	607
Receivables - Other	401	441	366	254	166	107	120
Total Inventory	1 236	1 776	1 674	1 478	1 007	877	1 067
Inventories - Finished Goods	351	608	489	488	353	288	290
Inventories - Work In Progress	149	180	203	206	133	108	159
Inventories - Raw Materials	677	941	908	809	549	530	555
Inventories - Other	59	47	74	(25)	(28)	(49)	63
Prepaid Expenses	93	82	59	51	36	23	49
Other Current Assets, Total	--	15	16	15	0	--	--
Discountinued Operations - Current Asset	--	15	16	15	0	--	--
Total Current Assets	2 985	3 266	3 099	2 476	2 260	2 064	2 039
Property/Plant/Equipment, Total - Gross	14 985	15 204	16 275	15 536	9 859	8 098	9 691
Land/Improvements - Gross	3 775	4 186	4 673	4 529	2 916	2 405	2 818
Machinery/Equipment - Gross	8 387	9 054	10 133	9 729	6 200	5 095	6 017
Construction in Progress - Gross	2 309	1 453	893	772	453	382	601
Natural Resources - Gross	308	305	323	256	136	87	99
Other Property/Plant/Equipment - Gross	206	206	253	250	154	129	156
Property/Plant/Equipment, Total - Net	12 226	11 792	11 831	8 618	5 072	3 764	4 345
Accumulated Depreciation, Total	(2 759)	(3 412)	(4 444)	(6 918)	(4 787)	(4 334)	(5 346)
Goodwill, Net	290	274	290	0	0	--	--
Intangibles, Net	34	29	43	39	24	18	22
Intangibles - Gross	75	76	105	102	--	--	--
Accumulated Intangible Amortization	(41)	(47)	(62)	(63)	--	--	--
Long Term Investments	1 080	816	870	832	353	216	9

LT Investment - Affiliate Companies	29	31	0	2	1	2	6
LT Investments - Other	1 051	785	870	830	352	214	3
Note Receivable - Long Term	--	--	--	--	--	--	--
Other Long Term Assets, Total	123	118	159	183	148	95	86
Defered Income Tax - Long Term Asset	106	110	152	171	144	65	75
Other Long Term Assets	17	8	7	12	4	30	11
Total Assets	16 738	16 295	16 292	12 148	7 857	6 157	6 501
Liabilities ($ Millions)							
Accounts Payable	569	625	616	614	387	339	416
Payable/Accrued	--	--	--	--	--	--	--
Accrued Expenses	67	85	117	102	59	46	57
Notes Payable/Short Term Debt	0	0	0	0	161	41	25
Current Port. of LT Debt/Capital Leases	1 087	1 334	1 631	1 010	702	852	296
Other Current liabilities, Total	361	507	535	339	299	143	273
Dividends Payable	16	5	103	2	2	1	1
Customer Advances	201	351	302	185	190	87	154
Income Taxes Payable	82	88	91	78	75	35	86
Other Payables	36	26	18	49	21	8	19
Other Current Liabilities	26	37	21	25	11	12	13
Total Current Liabilities	2 084	2 551	2 899	2 065	1 608	1 421	1 067
Total Long Term Debt	2 461	3 068	2 236	2 163	1 722	954	179
Long Term Debt	2 454	3 067	2 236	2 163	1 722	954	178
Capital Lease Obligations	7	1	0	--	--	--	1
Total Debt	3 548	4 402	3 867	3 173	2 585	1 847	500
Deferred Income Tax	1 464	1 157	1 254	851	487	323	373
Deferred Income Tax - LT Liability	1 464	1 157	1 254	851	487	323	373
Minority Interest	429	159	155	33	32	13	18
Other Liabilities, Total	43	71	83	208	98	139	171
Reserves	18	44	51	181	88	126	155
Pension Benefits - Underfunded	25	27	32	27	10	13	16
Total Liabilities	6 481	7 006	6 627	5 320	3 947	2 850	1 808
Shareholders Equity ($ Millions)							
Redeemable Preferred Stock, Total	--	--	--	--	--	--	--
Preferred Stock - Non Redeemable, Net	--	--	--	--	--	--	--
Common Stock, Total	386	386	386	386	386	386	386
Common Stock	386	386	386	386	386	386	386

Additional Paid-In Capital	1 109	1 110	1 108	1 020	995	969	969
Retained Earnings (Accumulated Deficit)	10 552	10 155	9 963	7 612	7 458	7 772	8 703
Treasury Stock - Common	(176)	(176)	(175)	(30)	(13)	(1)	0
ESOP Debt Guarantee	--	--	--	--	--	--	--
Unrealized Gain (Loss)	680	539	596	618	224	121	0
Other Equity, Total	(2 294)	(2 725)	(2 213)	(2 778)	(5 140)	(5 940)	(5 365)
Translation Adjustment	(2 294)	(2 725)	(2 213)	(2 778)	(5 140)	(5 940)	(5 365)
Total Equity	10 257	9 289	9 665	6 828	3 910	3 307	4 693
Total Liabilities & Shareholders' Equity	16 738	16 295	16 292	12 148	7 857	6 157	6 501

Appendix 3 – DCF model

DCF Model	2010	2011	2012	2013	2014	2015	2016	2017E	2018E	2019E	2020E	2021E
(+) Revenue	7719	9306	9328	8190	7952	5839	5630	5517	5517	5573	5684	5798
Revenue growth rate		*21%*	*0%*	*-12%*	*-3%*	*-27%*	*-4%*	*-2%*	*0%*	*1%*	*2%*	*2%*
(-) Operating Expenses	6987	8787	8977	8073	7103	4705	4451	4579	4579	4625	4718	4812
Operating Margin	*91%*	*94%*	*96%*	*99%*	*89%*	*81%*	*79%*	*83%*	*83%*	*83%*	*83%*	*83%*
(=) EBITDA	**732**	**519**	**351**	**117**	**849**	**1134**	**1179**	**938**	**938**	**947**	**966**	**986**
(-) Depreciation	25	23	24	22	19	17	18	15	14	13	13	12
(+) Unusual Income (Expenses)	126	111	135	2666	29	180	15	20	20	20	21	21
Unusual Income/Revenue	*1,63%*	*1,19%*	*1,45%*	*32,55%*	*0,36%*	*3,08%*	*0,27%*	*0,36%*	*0,36%*	*0,36%*	*0,36%*	*0,36%*
(+) Other Operating Income (Expenses)	-29	56	-61	-294	3	4	-310	-21	-21	-21	-21	-22
Other Operating Income/Revenue	*-0,38%*	*0,60%*	*-0,65%*	*-3,59%*	*0,04%*	*0,07%*	*-5,51%*	*-0,38%*	*-0,38%*	*-0,38%*	*-0,38%*	*-0,38%*
(=)EBIT	**804**	**663**	**401**	**2467**	**862**	**1301**	**866**	**923**	**923**	**933**	**953**	**973**
(+)Depreciation	25	23	24	22	19	17	18	15	14	13	13	12
(-)Tax on EBIT	184	88	-137	315	200	595	180	213	213	216	220	225
(+)Changes in deferred taxes	0	0	0	0	0	0	0	0	0	0	0	0
(-)Changes in NWC	0	-610	825	-426	73	165	-34	125	21	50	-36	-56
(-)CAPEX	-2219	-1162	-681	-630	-506	-352	-474	-400	-300	-200	-100	-12
(=)FCFF	**2864**	**2370**	**418**	**3230**	**1114**	**910**	**1212**	**999**	**1003**	**881**	**881**	**828**
WACC								11,01%	11,01%	11,01%	11,01%	11,01%
Discount Factor								90,08%	81,15%	73,10%	65,85%	59,32%
Discounted FCFF								**900**	**814**	**644**	**580**	**491**

Appendix 4 – DCF calculations

Extra Calculation	2010	2011	2012	2013	2014	2015	2016	2017E	2018E	2019E	2020E	2021E
Revenues	7719	9306	9328	8190	7952	5839	5630	5517	5517	5573	5684	5798
Depreciation	25	23	24	22	19	17	18	15	14	13	13	12
GPPE	14985	15204	16275	15536	9859	8098	9691	9194	8723	8193	7543	6907
GPPE dynamics		*101,46%*	*107,04%*	*95,46%*	*63,46%*	*82,14%*	*119,67%*	*94,87%*	*94,87%*	*93,93%*	*92,06%*	*91,57%*
Depreciations/Last Year's GPPE		*0,15%*	*0,16%*	*0,14%*	*0,12%*	*0,17%*	*0,22%*	*0,16%*	*0,16%*	*0,16%*	*0,17%*	*0,17%*
CAPEX	-2219	-1162	-681	-630	-506	-352	-474	-400	-300	-200	-100	-12

Net Working Capital Calculation	2010	2011	2012	2013	2014	2015	2016	2017E	2018E	2019E	2020E	2021E
Revenues	7719	9306	9328	8190	7952	5839	5630	5517	5517	5573	5684	5798
Inventories	-330	-688	205	103	-36	-75	-32	-83	-61	-12	-31	-47
Inventories/Revenues	*-4,28%*	*-7,39%*	*2,20%*	*1,26%*	*-0,45%*	*-1,28%*	*-0,57%*	*-1,50%*	*-1,11%*	*-0,21%*	*-0,55%*	*-0,81%*
Accounts Receivable	60	-45	101	31	-203	60	-119	-15	-23	-23	-35	-44
Accounts Receivable/Revenues	*0,78%*	*-0,48%*	*1,08%*	*0,38%*	*-2,55%*	*1,03%*	*-2,11%*	*-0,27%*	*-0,42%*	*-0,41%*	*-0,62%*	*-0,77%*
Other Current Assets	107	94	16	4	1	0	0	21	13	7	6	7
Other Current Assets/Revenues	*1,39%*	*1,01%*	*0,17%*	*0,05%*	*0,01%*	*0,00%*	*0,00%*	*0,38%*	*0,23%*	*0,12%*	*0,11%*	*0,12%*
Working Capital Assets	**-163**	**-639**	**322**	**138**	**-238**	**-15**	**-151**	**-77**	**-71**	**-28**	**-60**	**-84**
Accounts Payable	147	292	-8	-47	191	34	94	71	66	52	61	76
Accounts Payable/Revenues	*1,90%*	*3,14%*	*-0,09%*	*-0,57%*	*2,40%*	*0,58%*	*1,67%*	*1,29%*	*1,20%*	*0,93%*	*1,07%*	*1,31%*
Accrued Expenses	-103	-382	-218	-421	-210	-111	-69	-147	-158	-149	-155	-138
Accrued Expenses/Revenues	*-1,33%*	*-4,10%*	*-2,34%*	*-5,14%*	*-2,64%*	*-1,90%*	*-1,23%*	*-2,67%*	*-2,86%*	*-2,68%*	*-2,73%*	*-2,39%*
Working Capital Liabilities	**44**	**-90**	**-226**	**-468**	**-19**	**-77**	**25**	**-76**	**-91**	**-98**	**-94**	**-63**
Net Working Capital	**-119**	**-729**	**96**	**-330**	**-257**	**-92**	**-126**	**-1**	**20**	**70**	**34**	**-22**
Change in NWC		**-610**	**825**	**-426**	**73**	**165**	**-34**	**125**	**21**	**50**	**-36**	**-56**