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March 9th, 2018

Carrizo Oil & Gas, Inc.: (CRZO)

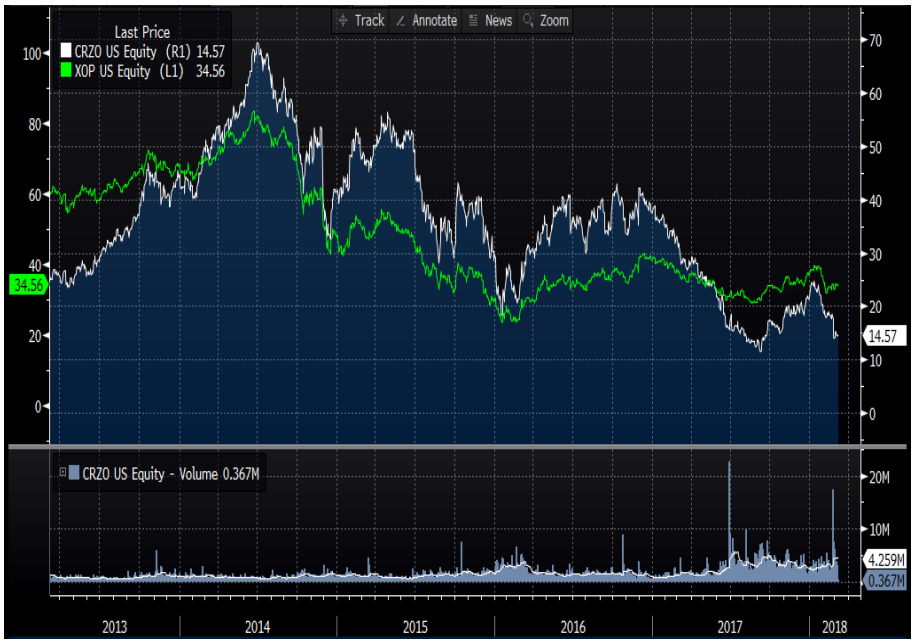
Keusseyan Nelson

Sector: Energy
Industry: Oil and Gas
Current Price: $14.57
Target Price: $16.48

Carrizo Oil & Gas explores and produces natural gas and crude oil. The company headquarters is located in Houston, Texas.

BUY

Current Price:	$14.57
Target Price:	$16.48
Market Cap:	1.1B
Beta:	1.243
EBITDA	507.8M
EBITDA Margin	67.38%
ROIC	13.15%
WACC	8.5%
EPS	$1.59



Thesis:

This report will explain why we should buy the stock of CRZO because after analysis of the company, the stock CRZO is undervalued. To support this position, the report will discuss how companies in the energy sector are affected by the prices of oil and gas, especially the company Carrizo. This report will describe how the prices of oil and gas are linked to the profitability of Carrizo Gas & Oil, as well as how the forecast of the production of the company will impact the revenue in the future along with the future of oil prices.

Catalysts:

- Short Term (within the year): The company just released the annual report of 2017.
- Mid Term (1-2 years): Oil price is going to increase. Thus, the growth profit is going to increase dramatically.
- Long Term: The company will expand its operation.

Business Description

Carrizo Oil and Gas was founded in 1993. It is an energy company based in Texas. The company is engaged in the exploration, development and production of oil and gas from resources in the United States. Its operations are located in the Eagle Ford Shale in South Texas, in the Delaware Basin in West Texas, the Utica Shale in Ohio, the Niobrara Formation in Colorado, and the Marcellus Shale in Pennsylvania. As of December 2017, the company's oil and gas reserves were 261.7 million barrels of oil, and it operated in 564 net productive oil and gas wells.

Development in 2017

During the third quarter of 2017, the company closed on an acquisition of 16,508 net acres located in the Delaware Basin (TEXAS) from ExL Petroleum management, LLC and ExL petroleum operating Inc. for an aggregate net consideration of 679.8 Million. Furthermore, the company agreed to a payment of 50.0 million per year if the price of the crude oil exceeded specified thresholds for the years 2018 until 2021 with a cap of 125 million. We'll call these operations the ExL operation.

The company closed on divestitures which was a big part of their assets in the Utica and Marcellus shales for 137.0 million. Moreover, the company could receive from the two divestitures up to 8.0 million per year with a cap of 22.5 million if crude oil and natural gas prices exceed specified thresholds for each year from 2018 until 2022. Furthermore, during the same quarter, the company received 382.8 million thanks to the sale of a big part of their assets in the Niobrara Formation and another part of their assets in the Eagle Ford. Carrizo Oil and Gas could receive 5.0 million per year if the crude oil prices exceed specified thresholds for each year from 2018 to 2020 as a part of the Niobrara Formation divestiture.

Industry Outlook

As shown by the chart below, the oil price at the beginning of 2015 was $53.45 and it collapsed to $34.73 at the end of the year. The drop off for the oil price during this period was a result of several factors. The price of the oil is determined by the supply and demand. Moreover, the demand is closely linked to the economic activity. Therefore, during this period the supply was much higher than the demand. The demand was low due to slowing global growth. Also, the American production increased thanks to unconventional hydrocarbon. Concerning the natural gas price in 2015 it followed the oil price for many reasons. First, the natural gas price is indexed by the oil price. This means if the oil price goes down the natural gas will go down and if the oil price goes up, the price of the natural gas will go up. However, oil price is not the only cause for the decrease of the natural gas. The natural gas price is linked by five other factors. First, the natural gas is driven by the outside temperature. Secondly, it is linked by electricity consumption. Thirdly, the price of natural gas is impacted by the supply. Fourthly, the natural gas follows the currency exchange rate of two currencies. Finally, the natural gas is driven by the global macro environment. As we can see from the chart, the natural gas went down in the

same way as the oil price for the reasons listed below. So, in the past two years, the company saw a drop in its revenue especially due to the drops in the oil and natural gas prices. So, energy producers are confined to two risks. The first risk is the price risk, and second risk is the volume of production. Thus, energy producers have to focus on these two risks when they have to choose a coverage strategy. The price risk can be covered by the derivative assets, while the volume risk can be covered by the weather derivatives.

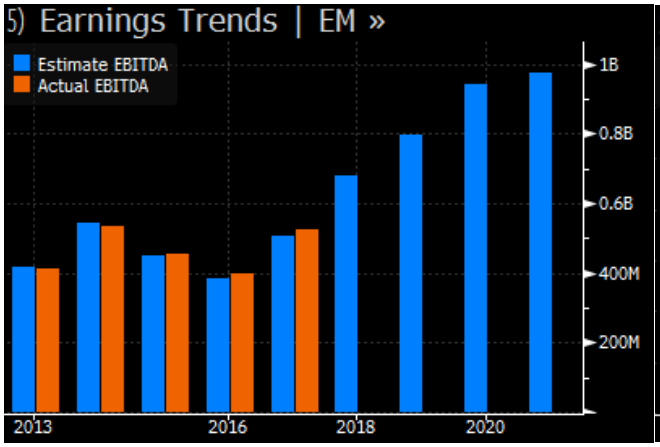
Segment

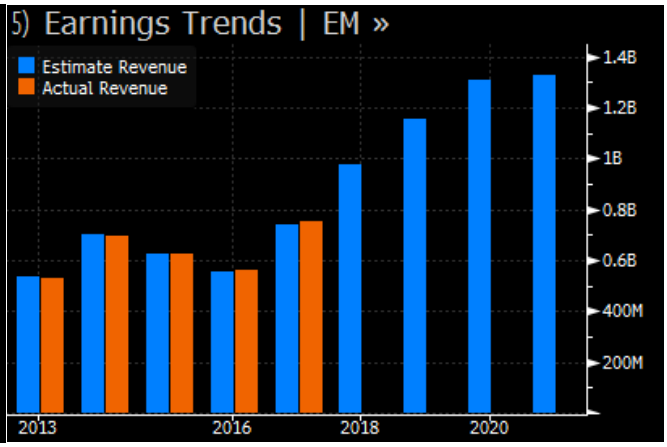
In Millions of USD except Per Share	2014 Y		2015 Y		2016 Y		2017 Y	
12 Months Ending	12/31/2014		12/31/2015		12/31/2016		12/31/2017	
Revenue	696.7	100.0%	623.5	100.0%	563.0	100.0%	753.7	100.0%
Crude Oil Production	610.5	87.6%	376.1	60.3%	378.1	67.2%	633.2	84.0%
Natural Gas Production	74.7	10.7%	37.5	6.0%	43.1	7.7%	65.3	8.7%
NGLs	25.1	3.6%	15.6	2.5%	22.4	4.0%	47.4	6.3%
Realized G/L Derivatives	-13.5	-1.9%	194.3	31.2%	119.4	21.2%	7.8	1.0%

The main activity for the company CRZO is from the Crude Oil Production. This represents more than 80% of their revenue each year except in 2015 and 2016 because of the collapsed of the oil and gas prices. Furthermore, the Natural Gas production represents approximately 9% of the company revenue. This paper will focus especially on the oil and gas (prices, production) due to the weight that it represents in the revenue of Carrizo Oil and Gas.

Earning Performance

After 6 years of net income growth, Carrizo Oil and Gas had a negative net income in 2015 and 2016. These negative net incomes were due to an increase of write downs of their assets. A write down is a reduction of the book value of an asset due to an overvaluation compared to the market. The write down in 2015 was 1,224.4 million and in 2016, it was 576.5 million. These write-downs in 2015 and 2016 affected the total cost and expenses. Furthermore, revenue decreased a little in 2015 and 2016 and were lower relative to other years. The company saw in 2015 a decrease of 10.5% for their revenue. According to the 10-K, the decrease of the revenue for 2015 is due to the decrease in crude oil and natural gas prices. Furthermore, the production for 2015 increased by 12% to 36,719 barrels of oil equivalent per day (Boe/d) compared to 32,816 Boe/d. Thus, even if the production has increased, the revenue was low because of the drop off for the oil and natural gas prices. The company has seen dark years compared to 2014. In 2016, the company's revenue decreased by 9.7% due to the decreased of the oil and natural gas prices. However, the net income for this year increased compared to 2015.In 2017, the company increased its revenue by 33.9% to reach 753.7 million. During this year, no write-downs were registered. Thus, the net income increased to reach 33.5 million while the net income for the previous year was -275.5 Million. This increase during 2017 was due to the rise of the oil and the natural gas and the production rise from 42,276 Boe/d in 2016 to 53,805 Boe/d. Concerning the EBITDA of the company, in 2015 and 2016 it saw a decrease because of the drop off of the oil and gas prices. The EBITDA forecast for the next three years for CRZO should increase to reach approximately 1 billion in 2021. Furthermore, each year the estimate and actual EBITDA are closely the same. The difference between estimate and actual EBITDA can be attributed to the prices of the oil and gas. Because of the importance of the oil and gas prices this paper will focus and the oil price and indirectly to the gas price.





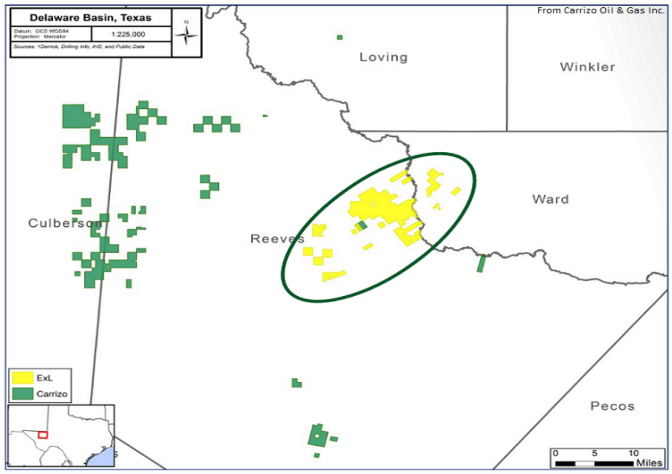
Potential Business Growth

According to the 10-K, the business strategy for Carrizo Oil & Gas is to increase value focused on growth thanks to the drill bit and with the acquisition of oil and gas properties while keeping a sound financial position. The company has competitive strengths which will help their efforts to succeed in their business strategy for the future. The company has several strengths. First, it is pursuing development of high quality resources. Furthermore, the company pursues a growth strategy in crude oil due to the attractive economics. Their drilling wells plan for 2018 and their infrastructure capital expenditure plan are currently being predominantly prospective for crude oil. Moreover, thanks to their advanced technology, which can detect microseisms, the

company could better define the geologic area risk and improve their drilling efforts. Because of their drilling program, the company has reduced their acreage positions in key resource plays. The company continues to focus their capital program in lower risk areas, such as the Delaware Basin and the Eagle Ford, both highest return areas in North America. Secondly, it focuses efficiencies to decrease their costs to find, develop, and produce oil and natural gas reserves. It means that the company has to be focused on their core areas, which allow them to optimize drilling and completion techniques as well as benefit from the economies of scale. The company has allocated a larger part of their capital expenditure plan for 2018 compared to the capital expenditure plan in 2017 located in the Delaware Basin due to the Exl acquisition while continuing their development in the Eagle Ford. Thirdly, the company is trying to limit their exposure to volatility in commodity prices by hedging a part of their forecast crude oil, natural gas and NGL (Natural gas liquid). Thus, their long-term strategy is to manage the exposure to the commodity volatility to reach to a predictable cash flow to support their current and future capital expenditure project. Fourthly, because of their experience, the company has developed a technical advantage. The company has already drilled 1,000 horizontal wells in various resources areas. It allowed their operations team to get significant experience in resources and create highly efficient drilling and completion operations. They look to allocate all their capital expenditure in the Eagle Ford and the Delaware Basin.

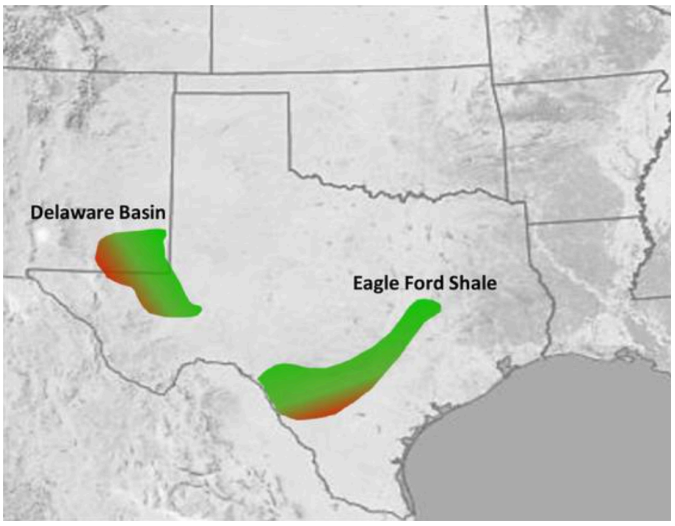
Delaware Basin:

According to the company, they began to build an acreage in the Delaware Basin in 2014 in Culberson and Reeves counties. In December, 31st, 2017, CRZO held interest of 42,117 Net acres in this area. For 2018, Carrizo Oil and Gas plans to get 43% of their drilling, completion, and infrastructure capital expenditure plan from the Delaware Basin.



Eagle Ford:

According to the 10-K, the Eagle Ford is the most significant operational area for the company. Their property is based in LaSalle County. In the end of 2017, CRZO held interest in approximately 127,123 gross acres (103,116 net) and after the divestiture 79,612 net acres. The company plans for 2018, 57% of drilling, completion and infrastructure capital expenditure in the Eagle Ford area. In 2018, the company entered a purchase and sale agreement with EP Energy E&P Company to sell a part of their assets in this area. The agreement of this deal was 245,0 million. Thus, December 11st, CRZO received 24,5 million and the January 31st, CRZO received 211,7 Million. Furthermore, at the beginning of 2018, the company received 10,0 Million.



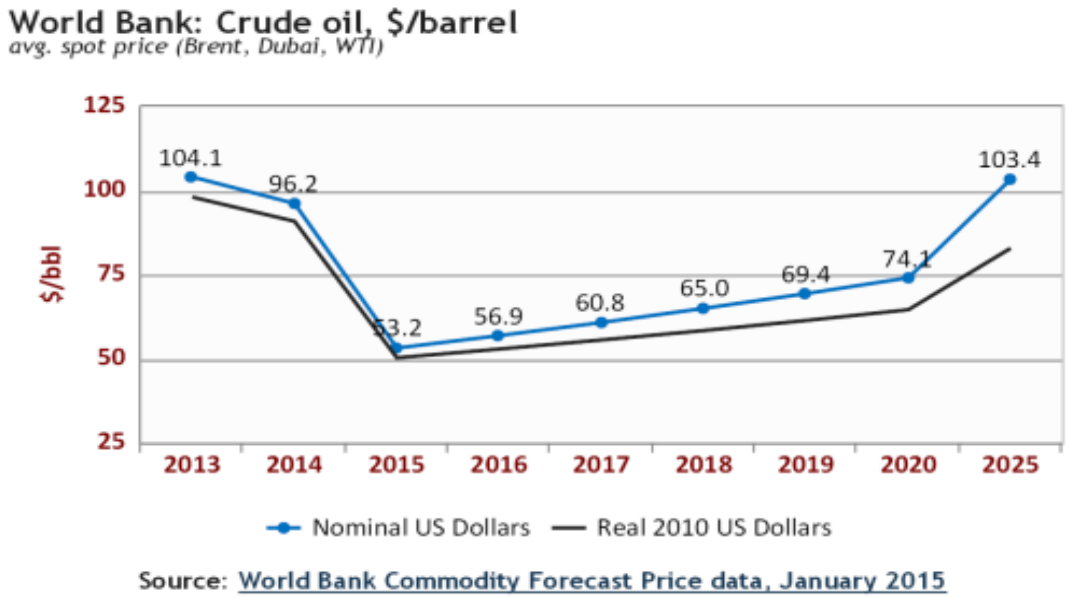
Profitability

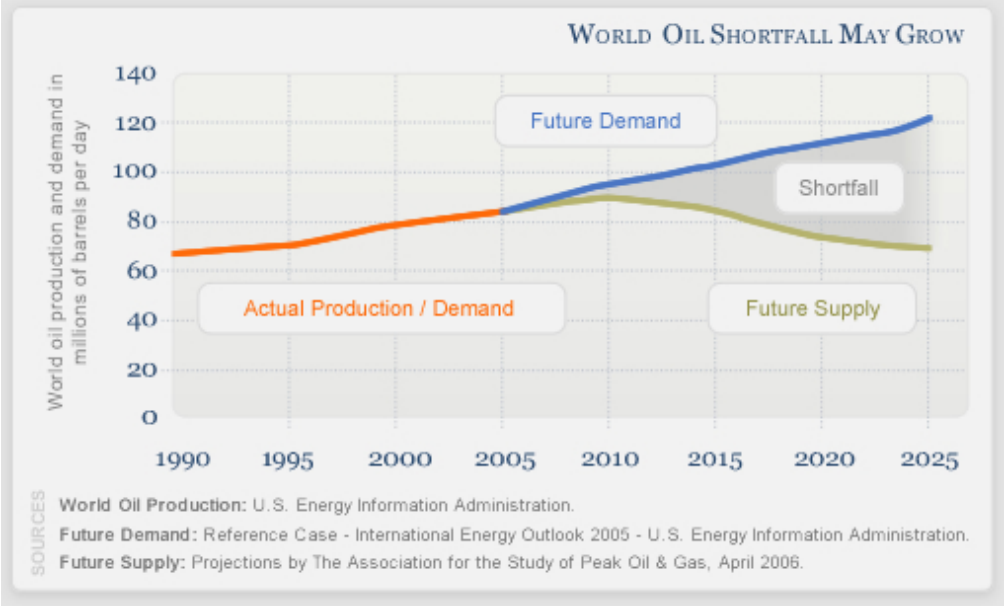
To compute a forecast of the revenue of Carrizo oil and Gas, the forecast oil price has to be taken into consideration. According to the 10-K and my own calculations:

Total volume production in M	2017	2018	2019	2020	2021
Crude oil	12,567	13,195.25	13,855.01	14,547.76	15,275.15
NGLs	2,327	2,327	2,327	2,327	2,327
Natural Gas	28,472	28,472	28,472	28,472	28,472
	2017	2018	2019	2020	2021
Crude oil Price	50.39	65	69.4	74	103
NGLs	20.37	20.37	20.37	20.37	20.37
Natural Gas	2.29	2.45	2.62	2.80	2.99
Total revenues in M	745,848	974,791	1,083,447	1,203,584	1,705,885

This chart from the World Bank provides the forecast for the oil price for the next three years, and we will assume that the production for the next three years will increase by 5%. I only changed the production of the oil because it is the main activity of the company. Thus, the table shows that the revenue of the company is

dependent on the oil price. Furthermore, the forecast for the natural gas was computed as follows: ln (2.85/2.66) with 2.85 for the price of the natural gas in March 1st, 2018 and 2.66 the natural gas price for December 29th, 2017.



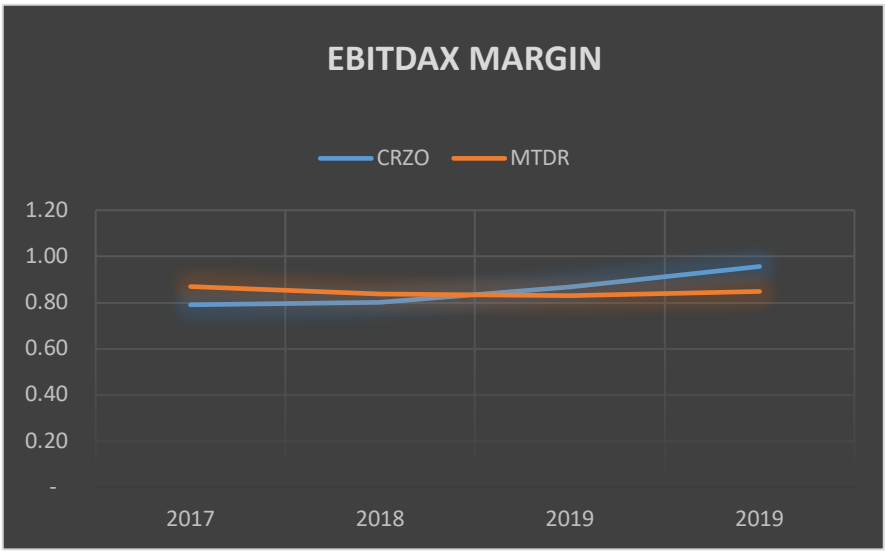


According to the chart, the demand of the oil will increase faster than the supply, so logically, the price of the oil will increase. It is going to be beneficial for CRZO. Furthermore, CRZO has to be compared to a competitor which is Matador Energy Company:

CRZO	2017	2018	2019	2020
EBITDAX MARGIN	0.79	0.80	0.87	0.96
Return on Invested capital	8.00%	11.00%	10.00%	10.00%
WACC	9.62%	8.79%	8.92%	9.00%
Return on equity	29.90%	35.80%	25.90%	21.90%
Capex	1275.50	728.10	770.50	901.00
Revenue	745,848	974,791	1,083,447	1,203,584
Revenue/Capex	**584.75**	**1,338.81**	**1,406.16**	**1,335.83**

MTDR	2017	2018	2019	2020
EBITDAX MARGIN	0.87	0.84	0.83	0.85
Return on Invested capital	8.00%	8.00%	9.00%	6.00%
WACC	11.03%	11.01%	11.04%	11.06%
Return on equity	13.90%	10.00%	10.80%	6.50%
Capex	820.30	583.40	634.30	757.80
Revenue	534,600.00	706,300.00	842,800.00	1,023,000.00
Revenue/Capex	**651.71**	**1210.66**	**1328.71**	**1349.96**

Taking into account my forecast concerning the revenue of CRZO and the forecast from Bloomberg for the others value, the table proves that CRZO is going to grow faster than Matador Resource. According to the table, CRZO is going to create value from 2018 to 2020 (Forecast from CAPITAL IQ and my own calculation). CRZO will be more profitable in 2018 than Matador Resource.



Debt

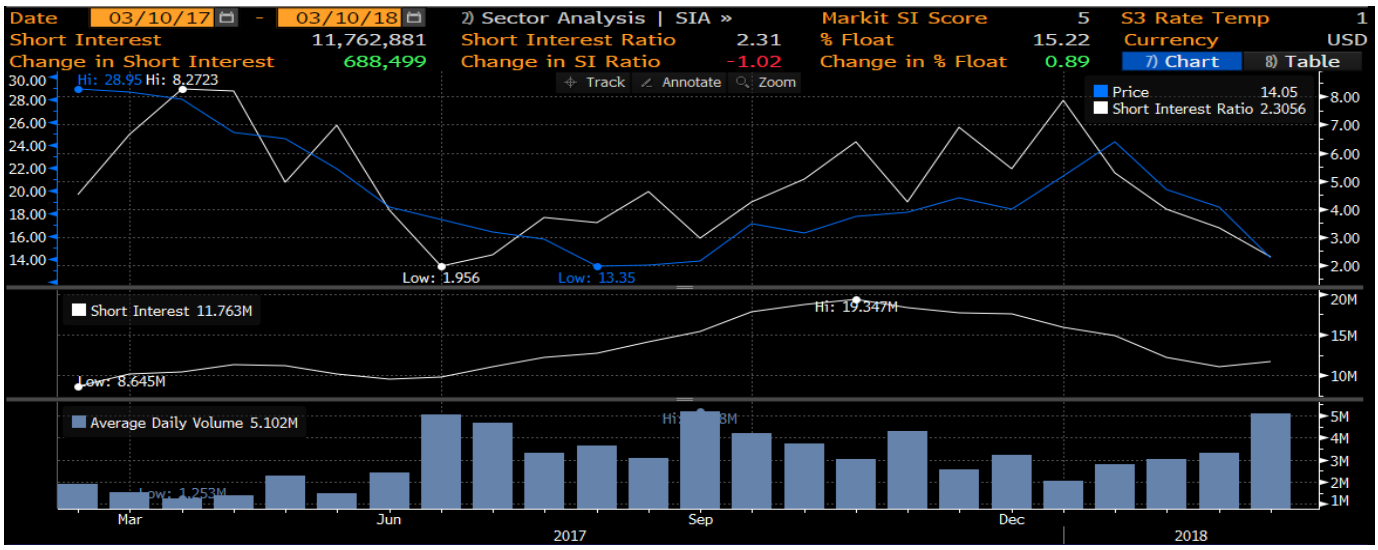
In the oil and gas industry, the financial analysis is mainly focused on the debt level. Companies in the energy sector have a high capital level and a high level of debt. High level of debt is bad for a company because it can affect the credit rating of the company. Thus, if a company has a low credit rating, it will be hard for it to finance

other capital projects. Concerning Carrizo Oil and Gas, the debt of the company for 2017 amounts to 1,629 million. The debt of the company is only Long-term debts (greater than or equal to 7 years). The amount of the debt for this company is particularly high because it needs money to invest and as it said earlier in this report, in 2017, it had invested a lot especially in the Eagle Ford area and in the Delaware Basin. Indeed, they invested in 2017 were mostly the acquisition of ExL and the acquisition of oil and gas properties in the Eagle Ford Shale from Sanchez Energy Corporation and SN Cotulla Asset, LLC. The PPE of the companies in 2017 was 2,635.8 Million. To know what amount of their debt is allocated to the capex we will used CAPEX/Net Debt. The Capex in 2017 for CRZO was of 1275.5. Thus, 1275.5/1,629 = 78.30% that it means, 78.30% of their Net Debt in 2017 was allocated for the Capex. The Capital expenditure in 2017 allowed the company to do the acquisition of the ExL.

Ownerships:

Ownership Type	03/26/17	Curr↓	Change
11) Investment Advisor	78.87	72.51	-6.36
12) Hedge Fund Manager	10.87	13.31	+2.44
13) Individual	4.70	3.26	-1.44
14) Corporation		3.18	
15) Private Equity	0.03	3.13	+3.10
16) Pension Fund	2.14	1.55	-0.59
17) Insurance Company	0.91	1.39	+0.48
18) Bank	1.82	0.81	-1.01
19) Government	0.24	0.23	-0.01
20) Endowment	0.05	0.23	+0.18
21) Sovereign Wealth Fund	0.26	0.20	-0.06

As the chart shows us, 72.51% in owned by Investment Advisor and 13.31% by Hedge Fund Manager. In less than one year, the percentage owned by Hedge Fund increased by 2.44%. It means that Hedge Fund Manager has an interest in buying the stock because they trust in this stock and in the company growth. Furthermore, the short interest ratio (SIR) of CRZO is 14.33, which shows that investors are bullish concerning this stock.



Conclusion:

Carrizo Oil and Gas is a company in the energy company specialized in the oil and gas production. As the paper demonstrated, the company is very sensitive to the price of the oil and gas. In 2015 and 2016, the revenue and the EBITDAX of the company decreased because of the drop off of the oil and gas prices. However, the forecasts of the production for the company and the forecast of the oil and gas prices should increase the revenue of CRZO and the EBITDA should increase too in a mid-term range. As the write-up showed the stock of CRZO will increase thanks to the rise of the oil and gas prices in few years.

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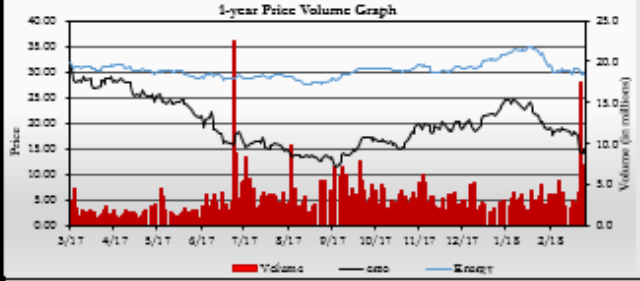
Carrizo Oil & Gas, Inc. (crzo)

CENTER FOR GLOBAL FINANCIAL STUDIES

NEUTRAL

Analysis by Al Capone	Current Price:	$14.57	Intrinsic Value	$14.27	Target 1 year Return: 13.08%
3/11/2018	Divident Yield:	0.0%	Target Price	$16.48	Probability of Price Increase: 59%



Description

Carrizo Oil & Gas, Inc., together with its subsidiaries, engages in the exploration, development, and production of crude oil, natural gas liquids, and gas from resource plays primarily in the United States.

General Information

Sector	Energy
Industry	Oil, Gas and Consumable Fuels
Last Guidance	February 12, 2018
Next earnings date	May 4, 2018

Market Assumptions

Estimated Equity Risk Premium	5.00%
Effective Tax rate	21%

Market Data

Market Capitalization	$1,187.01
Daily volume (mil)	3.77
Shares outstanding (mil)	81.47
Diluted shares outstanding (mil)	73.99
% shares held by institutions	109%
% shares held by investment Managers	93%
% shares held by hedge funds	9%
% shares held by insiders	5.13%
Short interest	13.59%
Days to cover short interest	3.37
52 week high	$32.00
52-week low	$11.10
Volatility	50.89%

Past Earning Surprises

Quarter ending	Revenue	EBITDA
12/31/2016	-10.57%	-25.20%
3/31/2017	-0.45%	54.74%
6/30/2017	-2.54%	44.77%
9/30/2017	-2.67%	-16.54%
12/31/2017	-1.59%	-33.73%
Mean	-3.56%	4.81%
Standard error	3.1%	9.8%

Market and Credit Scores

Recommendation (STARS) Value	3
Recommendation (STARS) Description	Hold
Quality Ranking Value	C
Quality Ranking Description	Lowest
Short Score	5
Market Signal Probability of Default % (Non-Rating)	4.798%
CreditModel Score (Non-Rating)	bb-

Industry and Segment Information

LTM Revenues by Geographic Segme	LTM Revenues by Business Segments
United States	100%
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Oil & Gas - Exploration & Production	100%
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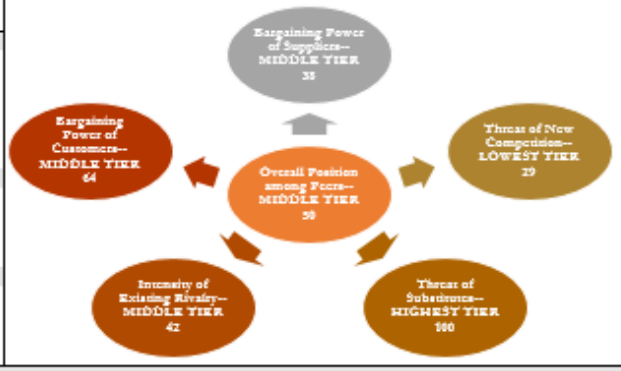
Management

Management	Position	Total Compensation Growth	Stock Price Growth During Tenure
Johnson, Sylvester	Chief Executive Officer, President and Directo	7.08% per annum over 5y	-1.02% per annum over 5y
Pitts, David	Chief Financial Officer and Vice President	8.86% per annum over 5y	-1.02% per annum over 5y
Fisher, J.	Chief Operating Officer and Vice President	7.55% per annum over 5y	-1.02% per annum over 5y
Morton, Gerald	Vice President of Business Development and Ge	13.58% per annum over 1y	26.27% per annum over 1y
Smith, Richard	Vice President of Land	7.14% per annum over 4y	19.67% per annum over 4y
Conaway, Gregory	Chief Accounting Officer and Vice President		0% per annum over 0y

Peers

RSP Permian, Inc.	Matador Resources Company
Sanchez Energy Corporation	Diamondback Energy, Inc.
PDC Energy, Inc.	Oasis Petroleum Inc.
Parsley Energy, Inc.	Callon Petroleum Company
Energen Corporation	Whiting Petroleum Corporation

Porter's 5 forces (Scores are percentiles)



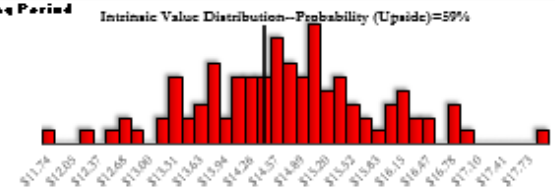
Profitability	crzo (LTM)	crzo Historical	Peers' Median (LTM)
Return on Capital (GAAP)	10.8%	6.25%	4.24%
Operating Margin	26%	27.45%	49.18%
Revenue/Capital (GAAP)	0.42	0.23	0.09
ROE (GAAP)	293.4%	11.4%	5.4%
Net margin	9.6%	15.2%	14.5%
Revenue/Book Value (GAAP)	30.41	0.75	0.37

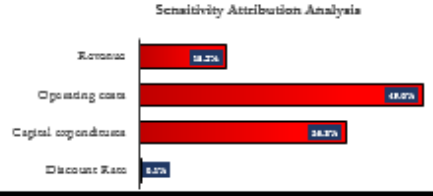
Invested Funds	crzo (LTM)	crzo Historical	Peers' Median (LTM)
Cash/Capital	0.4%	3.0%	9.3%
NWC/Capital	-5.5%	-11.4%	-2.9%
Operating Assets/Capital	105.1%	108.5%	93.6%
Goodwill/Capital	0.0%	0.0%	0.0%

Capital Structure	crzo (LTM)	crzo Historical	Peers' Median (LTM)
Total Debt/Market Capitalization	0.74	0.67	0.48
Cost of Debt	7.4%	8.2%	6.5%
CGFS Rating (F-score, Z-score, and default Probability	B		
WACC	9.6%	10.4%	9.5%

Valuation

Forecast Assumptions	Explicit Period (6 years)	Continuing Period
Revenue Growth CAGR	9%	2%
Average Operating Margin	55%	50%
Average Net Margin	13%	16%
Growth in Capital CAGR	6%	2%
Growth in Claims CAGR	1%	2%
Average Return on Capital	9%	9%
Average Return on Equity	14%	11%
Average Cost of Capital	9%	10%
Average Cost of Equity Ke	12%	12%





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