

**RESEARCH/
WHITEPAPER****Oil & Gas Exposure in Cash Flow Arbitrage CLO's**

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Highlights¹

- » Oil & Gas Exposure is slightly less than \$16 billion equivalent or about 3.4% of the total CLO holdings.
- » The vast majority or about \$15.6 billion is in the US CLO market.
- » The exposure in the Euro CLO market is less than 0.5%.
- » The marks on the US Oil & Gas holdings are significantly lower than those for the Euro CLOs.
- » Two US CLO managers have approximately 10% exposure to Oil & Gas across all the US CLOs they manage.
- » The largest Oil & Gas exposure in any one deal is almost 15%. The top five CLO's from three different managers have more than 13% exposure.

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With the volatility of oil and gas prices, CLO exposure to the Oil & Gas industry could indicate future credit risk or conversely present a buying opportunity. However, not all Oil & Gas investments have the same risk. This report will look at the exposure within both broadly syndicated and middle market CLO's in both the US and Europe. The focus will be on collateral designated in deal surveillance reports as either the Moody's Industry group of Corp - Energy: Oil & Gas or Corp - Utilities: Oil & Gas². There is approximately \$15.9bn equivalent of exposure in the 2 markets with the vast majority of it in the USD market. We will also review the market levels of the collateral where available.³

US CLO Market

The US CLO market exposure to Oil & Gas is about \$15.6bn or 3.4% of the total CLO market (almost all of which is in the form of loans). That exposure varies both across managers as well as between CLO's. Some of the exposure is characterized by strong credit ratings and high pricing while other is under stress given the current status of the energy market. The next few tables will outline and compare these exposures.

Table 1: Top Ten CLO Managers based upon Oil & Gas Exposure.

Manager	CLO's	Investments	\$ Eq Balance (mm)	Oil & Gas Percentage	Average Oil & Gas Loan Prices	Average Manager Loan Price	Oil & Gas vs. Overall Loan Prices	Min Market Price
Halcyon Loan Investors LP	12	136	515.6	9.9%	73.5	96.2	76.5%	39.4
CIFC Asset Management LLC	31	355	487.3	3.9%	82.8	96.9	85.4%	42.5
Credit Suisse Asset Management	22	166	477.9	3.5%	83.9	97.4	86.2%	15.9
Ares Management, LLC	21	158	470.6	4.3%	89.1	94.2	94.6%	49.6
Apollo Credit Management LLC	20	231	421.8	3.6%	84.6	97.9	86.4%	59.4
MJX Asset Management LLC	17	384	416.1	4.6%	80.0	96.6	82.8%	26.5
Man Group plc	9	96	403.7	10.5%	80.2	95.4	84.1%	20.7
CVC Credit Partners LLC	18	267	382.6	5.0%	83.2	97.5	85.3%	20.7
Octagon Credit Investors, LLC	15	234	372.8	4.3%	85.5	97.7	87.5%	42.4
Babson Capital Management LLC	16	168	368.3	5.6%	82.1	97.2	84.4%	15.9

Source: Moody's Analytics Structured Finance Portal

While Halcyon has the largest balance (and a high percentage) invested in Oil & Gas, MJX and CIFC have the most individual investments across their CLO's. It should be noted that the managers with the most assets under management ("AUM") would tend to have the greatest dollar amount of Oil & Gas exposure.

Table 2 is a list of managers with the highest Oil & Gas exposure as a percentage of their CLO AUM. The table includes managers who average over 6% and have at least \$500mm of CLO AUM. Man Group and Halcyon are in both tables 1 and 2, but the other names differ. Only Man Group averages over 10% Oil & Gas exposure, but five managers have at least one CLO with over 10% exposure.

The volatility in the Oil & Gas sector is evident from the generally lower average loan prices for Oil & Gas loans compared to prices for other loans in CLO portfolios. With the exception of Halcyon, the average mark⁴ of the Oil & Gas loans are in the 80's and lowest priced loans are typically marked below 40 (with the exception of Ares, CIFC, Octagon and Apollo). The vast majority of the very low priced loans are

2 Different managers may classify the same loan as different industries. Also, the Moody's and other rating agencies' industry may be listed as different in the monthly report. The same loan indicated as Oil & Gas by one manager but not another will be included for the first manager but not the second. Please see the Appendix for an example.

3 Markit pricing taken from the Moody's Analytics Structured Finance Portal was used for this purpose.

4 The average is not a weighted average.

second liens. It is also apparent that the valuations on the Oil & Gas loans are significantly below that of the managers' loans overall. Ares' Oil & Gas loans are marked the closest to their total weighted average loan price.

Table 2: Managers with Oil & Gas Exposure Averaging Over 6% & \$500mm of AUM.

Managers	CLO's	Total Par (mm)	Energy: Oil & Gas \$ Par (mm)	Utilities: Oil & Gas \$ Par (mm)	Total Oil & Gas \$ Par	Energy: Oil & Gas %	Utilities: Oil & Gas %	Total Oil & Gas %	Max CLO Oil & Gas %
Man Group plc	9	3,839.3	385.7	18.0	403.7	10.05%	0.47%	10.51%	13.50%
Halcyon Loan Investors LP	12	5,185.9	332.2	183.3	515.6	6.41%	3.54%	9.94%	14.90%
Ballyrock Investment Advisors LLC	2	804.3	66.4	5.2	71.6	8.25%	0.65%	8.90%	9.00%
Allianz Global Investors Capital LLC	4	1,753.9	131.2	10.9	142.2	7.48%	0.62%	8.10%	10.48%
Prospect Capital Corporation	1	1,598.2	120.7	-	120.7	7.55%	0.00%	7.55%	7.55%
Credit Value Partners, LP	2	900.3	65.9	-	65.9	7.32%	0.00%	7.32%	7.68%
TCW Asset Management Company	6	1,185.9	74.4	11.8	86.2	6.28%	1.00%	7.27%	7.58%
Angelo, Gordon & Company LP	6	2,877.7	103.3	99.8	203.1	3.59%	3.47%	7.06%	7.57%
Seix Investment Advisors LLC	9	3,352.4	214.8	12.9	227.6	6.41%	0.38%	6.79%	14.61%
H.I.G. WhiteHorse Capital LLC	7	2,508.6	163.9	6.0	169.8	6.53%	0.24%	6.77%	11.16%
MP Senior Credit Partners L.P.	4	1,365.1	67.2	23.4	90.7	4.92%	1.72%	6.64%	7.32%
Kingsland Capital Management LLC	6	2,102.4	139.1	-	139.1	6.62%	0.00%	6.62%	9.45%
Regiment Capital Management LLC	4	1,602.7	103.6	-	103.6	6.46%	0.00%	6.46%	7.69%
Kramer Van Kirk Credit Strategies LP	8	3,971.3	192.9	63.7	256.6	4.86%	1.60%	6.46%	9.44%
Telos Asset Management LLC (AKA Tricadia CDO Management LLC)	6	1,800.5	41.7	72.2	113.9	2.32%	4.01%	6.32%	8.25%

Source: Moody's Analytics Structured Finance Portal

Table 3 shows exposure to the issuers of loans marked below 40 that the top 10 managers (table 1) own along with their overall exposure across the US CLO market as indicated by the number of managers and CLO's that own obligations from these issuers. While the top ten managers (see table 1) own slightly more than their pro rata share of low priced Oil & Gas loans, these investments are also held by a large number of managers across many CLO's.

Table 3: Lowest Priced Loans held by the Manager from Table 1.

Issuer	Managers	CLO's	\$ Eq Balance (mm)	Average Balance (mm)	Average Oil & Gas Loan Prices
Vantage Drilling Company	16	44	106.5	2.4	39.4
Samson Resources Corporation	18	64	101.6	1.6	15.9
Sabine Oil & Gas Corporation	6	32	46.6	1.5	20.7
Ascent Resources, LLC	8	33	15.9	0.5	26.5
Walter Energy, Inc.	1	1	2.3	2.3	39.2
Grand Total			273.0	1.6	24.9

Source: Moody's Analytics Structured Finance Portal

The average Moody's WARF⁵ is about 2560 (slightly stronger than B2) and the weakest Oil & Gas credit for each of these managers is Caa2 or below (a Moody's WARF of 6500 or below), with several being Ca or weaker. For four of the managers, the Oil & Gas WARF is weaker than the manager's overall WARF with MJX showing the greatest negative differential. Alternatively, the WARF for the Ares Oil & Gas exposure is significantly stronger than that overall with about a quarter of their positions rated Ba3 or higher and the average rating stronger than B1 as compared to about B2 for the overall pool.

Table 4: Oil & Gas WARF⁶

Manager	Average Oil & Gas Moody's WARF	Manager Average CLO WARF	Oil & Gas vs. CLO Overall WARF	Max of Moody's WARF
Halcyon Loan Investors LP	3,067	2,817	109%	8,070
CIFC Asset Management LLC	2,455	2,716	90%	8,070
Credit Suisse Asset Management	2,790	2,719	103%	10,000
Ares Management, LLC	2,121	2,782	76%	10,000
Apollo Credit Management LLC	2,536	2,904	87%	6,500
MJX Asset Management LLC	3,035	2,704	112%	10,000
Man Group plc	2,507	2,597	97%	10,000
CVC Credit Partners LLC	2,762	2,764	100%	10,000
Octagon Credit Investors, LLC	2,408	2,527	95%	8,070
Babson Capital Management LLC	2,780	2,614	106%	10,000

Source: Moody's Analytics Structured Finance Portal

About 22% of the US loan exposure to Oil & Gas is marked below 70, 11% is below 60 and 8% is below 50. Table 5 shows a breakdown of the Oil & Gas loans within CLO's marked below 70.

Table 5: Oil & Gas loans marked below 70.

Issuer	Investments	Managers	\$ Balance	Average \$ Balance	Average Oil & Gas Loan Prices	Average of Moody's WARF	Max of Moody's WARF
Ameriforge Group, Inc.	67	14	90,437,745	1,349,817	69.2	4,684	8,070
Ascent Resources, LLC	150	27	273,020,794	1,820,139	52.1	3,458	10,000
Coldren Resources LP	3	1	6,917,450	2,305,817	47.6	3,490	3,490
Energy Transfer Equity, L.P.	1	1	3,970,000	3,970,000	46.6	4,700	4,700
Fieldwood Energy LLC	150	29	226,679,585	1,511,197	42.5	2,660	2,720
Floatel International Ltd	66	23	126,679,315	1,919,384	69.8	2,720	2,720
FTS International Inc.	107	25	232,282,262	2,170,862	42.4	6,240	6,500
Hgim Corp.	87	20	239,936,363	2,757,889	69.9	2,773	3,490
Ocean Rig Udw Inc.	136	33	403,481,162	2,966,773	69.0	2,730	3,490
Paragon BC, ULC	125	33	258,278,616	2,066,229	56.3	1,949	3,490
Preferred Proppants, LLC	4	2	9,454,742	2,363,685	65.0	4,700	4,700
Prowler Acquisition Corp	1	1	1,000,000	1,000,000	60.0	6,500	6,500
Quicksilver Resources Inc.	5	2	18,586,500	3,717,300	45.2	10,000	10,000
Regent Purchaser Investments Inc.	16	5	29,179,500	1,823,719	46.7	4,925	6,500
Sabine Oil & Gas Corporation	32	6	46,618,000	1,456,813	20.7	8,236	10,000
Samson Resources Corporation	63	18	101,597,440	1,612,658	15.9	7,732	10,000
Seadrill Limited	284	59	933,997,746	3,288,724	67.9	1,787	2,220
Templar Energy, LLC	113	21	267,899,960	2,370,796	49.6	3,449	3,490
Vantage Drilling Company	107	22	230,324,640	2,152,567	40.6	7,942	8,070
Walter Energy, Inc.	1	1	2,300,000	2,300,000	39.2	4,700	4,700

Source: Moody's Analytics Structured Finance Portal⁷

⁵ The Moody's WARF is the numeric equivalent of the credit rating as determined by Moody's Investor Services.

⁶ Averages are not weighted averages. Manager WARF's exclude defaulted collateral while individual and Oil & Gas WARF's do not exclude defaults.

⁷ Quicksilver is in default and a WARF of 10,000 is being shown here.

The average mark of this collateral is 55 with the lowest priced collateral in the very low double digits. In most cases, the credit (seniority, etc) and price of the specific issues from these issuers are the same. The notable exception is for Ascent Resources where the 2nd lien is marked at about ½ the level of the 1st lien loan. The differential between the average and max WARF is also typically due to the lien position.

The ten largest Oil & Gas investments by issuer are in table 6 and represent slightly less than 40% of the total Oil & Gas exposure. Five of these are marked on average in at least the mid 80's. Fieldwood energy is marked at the most distressed level. Petroleos de Venezuela is noteworthy for its average close to par mark despite its relatively low average rating. The table shows a slight difference in the investments vs. number of CLO's in a few cases. This results from some CLO's owning more than one position of the indicated issuer.

Table 6: Top Ten Oil & Gas Investments in the US CLO Market.

Issuer	Investments	CLO's	Managers	\$ Balance	Average \$ Balance	Average Oil & Gas Loan Prices	Min Oil & Gas Loan Prices	Average Moody's WARF
Seadrill Limited	284	283	59	933,997,746	3,288,724	67.9	67.9	1,787
Energy Transfer Equity, L.P.	419	359	72	915,581,857	2,185,160	97.5	46.6	1,371
Ocean Rig Udw Inc.	352	269	54	906,078,685	2,574,087	73.7	69.0	2,737
Meg Energy Corp.	204	200	39	617,643,269	3,027,663	94.0	94.0	1,143
Fieldwood Energy LLC	345	223	47	536,173,577	1,554,126	68.9	42.5	1,992
Petroleos De Venezuela, S.A.	234	187	41	519,120,318	2,218,463	100.0	99.7	3,991
Southcross Holdings LP	322	238	50	509,608,618	1,582,635	86.1	78.5	2,464
Expro International Group Ltd	131	131	34	420,835,722	3,212,486	83.0	83.1	2,371
Pacific Drilling S.A.	174	170	38	410,322,701	2,358,176	70.4	70.4	3,527
Sheridan Investment Partners I, LLC	139	108	20	360,638,916	2,594,525	77.9	77.5	2,328

Source: Moody's Analytics Structured Finance Portal

European CLO Market

The Oil & Gas exposure in the European market is much smaller than in the US. Only 20 managers have any exposure and the total is about \$260mm equivalent. Overall the exposure is about ½ percent. Beside the limited extent of the exposure, there are some other interesting differences between the US and European Oil & Gas investment.

Table 7: Top 5 Euro CLO Oil & Gas Exposure by Manager.

Manager	CLO's	Investments	\$ Equivalent Balance	Average \$ Eq Balance	Oil & Gas Percentage	Average Price of Oil & Gas Loans	Min Price of Oil & Gas Loans
GSO / Blackstone Debt Funds Management	8	31	51,374,050	1,657,227	0.7%	98.5	98.5
Chenavari Investment Management	2	2	23,711,100	11,855,550	2.5%	98.5	98.5
BNP Paribas	6	10	23,278,227	2,327,823	2.2%	99.3	99.3
IKB Capital Corporation	3	5	21,138,651	4,227,730	4.0%	98.5	98.5
3i Group plc	3	3	21,076,255	7,025,418	0.4%	94.3	94.3

Source: Moody's Analytics Structured Finance Portal

The top five managers own over 50% of the Oil & Gas exposure as compared to about ½ that for the top ten US managers. While two of the top five managers have moderate total exposure to Oil & Gas, BNP, IKB and Chenavari hold significantly more than the Euro market as a whole (0.5%) with 2.2% to 4%

investment. This is much higher relative investment than the ratio for US managers. The Oil & Gas marks ranged from 94.3 to almost par (as compared to the 80's) for the US market.

Table 8 displays the Moody's WARF. Where rated (and unlike the US market), the Moody's WARF of the Oil & Gas exposure is generally stronger than that for the manager's entire Euro CLO portfolio. The exception is IKB, but their CLO's have significantly amortized. The lowest rated Oil & Gas collateral among this group is 2720 or B2.

Table 8: Oil & Gas WARF⁸

Manager	\$ Equivalent Balance	Average Moody's WARF	Manager Overall WARF	Oil & Gas vs Overall WARF	Max Moody's WARF
GSO / Blackstone Debt Funds Management	51,374,050	2,297	2,709	84.8%	2,720
Chenavari Investment Management	23,711,100	2,720	2,798	97.2%	2,720
BNP Paribas	23,278,227	NA	3,739	NA	NA
IKB Capital Corporation	21,138,651	2,720	1,688	161.1%	2,720
3i Group plc	21,076,255	2,220	2,699	82.3%	2,220

Source: Moody's Analytics Structured Finance Portal

The Oil & Gas investment in the Euro CLO market is much more concentrated within the top five managers with their investment representing over 70% of the total. EFR and Safety Global are both held by several managers across many CLO's and are marked close to par (see table 9). Three of these investments are in 3 or fewer CLO's controlled by no more than two managers. Bibby Offshore is unique in that it is both almost 6% of Euro Oil & Gas exposure and is held by only one CLO. It also has no listed Moody's credit rating in the surveillance report⁹.

Table 9: Five largest Euro Oil & Gas Investments

Issuer	Investments	CLO's	Managers	\$ Equivalent Balance	Average \$ Eq Balance	Average Price of Oil & Gas Loans	Average Moody's WARF
EFR GROUP B.V.	46	16	6	108,393,600	2,356,383	98.52	2,387
SAFETY GLOBAL LUX S.A R.L.	16	15	4	38,733,719	2,420,857	99.26	NR
RENAISSANCE PARENT CORP	3	3	1	21,076,255	7,025,418	94.29	2,220
BIBBY OFFSHORE HOLDINGS LTD	1	1	1	15,051,498	15,051,498		NR
TOKHEIM CORPORATION	4	3	2	12,670,401	3,167,600		NR

Source: Moody's Analytics Structured Finance Portal

Conclusion

Oil & Gas exposure varies greatly among CLO managers with some over 10% exposed on average (with deals close to 15%) while others have little or no exposure. Different investments are marked at varying levels with a range of credit ratings. Some managers likely feel there is an opportunity with the reduced price of the Oil & Gas collateral while others may be worried about the greater default potential if energy prices remain low. Potential investor level of concern with Oil & Gas exposure is typically a function of their forecast for the energy markets. Understanding managers' styles and exposures should help investors determine if those management strategies are consistent with their objectives.

⁸ Moody's does not have a public rating on some of the collateral.

⁹ Bibby is rated B+ (2220 equivalent) by S&P. Some of the monthly reports show an S&P rating of B (2720 equivalent) for Safety Global while others are blank.

Appendix – Same Issuer, Different Industry Designation

Collateral managers use their judgment in determining the industry classification of their investments. As a result, different managers sometimes consider an issuer to be in different industries. For example, I looked at one issuer where this was common (see the table below). This could be a result of different underlying securities of the issuer being exposed to different industry factors or collateral.

About \$500 million of the issuer's obligations are held by CLO's. The Moody's Investor Service industry is taken from the surveillance report, though I combined related industries to simplify the chart¹⁰. As you can see, about 67% are labeled as Oil & Gas while the remainder is primarily Transportation. Interestingly, in a few cases, the same manager has indicated different industries for the same issuer (see #13 & #34 below).

As the prior analysis is based upon the industry listed in the deal surveillance report, the 33% not labeled Oil & Gas is not included in this base document's data.

The balances in the table are in \$ millions.

Managers	Industry Analysis Capital Equipment			Oil & Gas			Transportation			Total Count	Total Balance
	Count	Balance	Percentage	Count	Balance	Percentage	Count	Balance	Percentage		
1			0%	3.0	6.9	100%		-	0%	3	6.9
2			0%		-	0%	4	6.7	100%	4	6.7
3			0%	5.0	9.6	100%		-	0%	5	9.6
4			0%	17.0	61.4	100%		-	0%	17	61.4
5			0%	1.0	1.0	100%		-	0%	1	1.0
6			0%	3.0	17.7	100%		-	0%	3	17.7
7			0%		-	0%	4	16.3	100%	4	16.3
8			0%	2.0	4.9	100%		-	0%	2	4.9
9			0%	20.0	36.4	100%		-	0%	20	36.4
10			0%	2.0	8.9	100%		-	0%	2	8.9
11			0%		-	0%	2	6.9	100%	2	6.9
12			0%		-	0%	5	14.5	100%	5	14.5
13			0%	1.0	3.0	64%	1	1.7	36%	2	4.7
14			0%		-	0%	2	1.9	100%	2	1.9
15			0%	9.0	22.8	100%		-	0%	9	22.8
16			0%	2.0	3.0	100%		-	0%	2	3.0
17			0%	9.0	41.8	95%	1	2.0	5%	10	43.8
18			0%		-	0%	4	13.3	100%	4	13.3
19			0%	5.0	9.3	100%		-	0%	5	9.3
20			0%	6.0	13.4	100%		-	0%	6	13.4
21			0%		-	0%	9	24.3	100%	9	24.3
22			0%	1.0	2.0	100%		-	0%	1	2.0
23			0%		-	0%	3	8.3	100%	3	8.3
24			0%	6.0	4.2	100%		-	0%	6	4.2
25			0%	8.0	33.2	100%		-	0%	8	33.2
26			0%	5.0	15.4	100%		-	0%	5	15.4
27			0%	4.0	13.0	100%		-	0%	4	13.0
28	1	0.4	3%		-	0%	6	12.1	97%	7	12.5
29			0%	3.0	13.5	100%		-	0%	3	13.5
30			0%		-	0%	8	15.5	100%	8	15.5
31			0%		-	0%	5	19.7	100%	5	19.7
32			0%		-	0%	2	1.4	100%	2	1.4
33			0%		-	0%	2	7.9	100%	2	7.9
34			0%	13.0	15.9	57%	5	12.0	43%	18	27.9
Grand Total	1	0.4	0.08%	125.0	337.3	67%	63	164.6	33%	189	502.2

¹⁰ The Utilities: Oil & Gas and Energy: Oil & Gas industries were combined for this table.

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