

10 July 2013 | 39 pages

Chemicals - Major (Citi)
North America

Momentive Performance Materials Inc. (MOMENT)

Initiating Coverage

Emerging From a Silicone Valley

- **EBITDA to Rebound from Trough Conditions** — Since purchased by Apollo in 2006 MOMENT's results have certainly had their ups and downs. We expect EBITDA to continue to rebound from trough earnings reached in late 2012 as demand growth absorbs excess supply of silicone and the quartz segment benefits from an eventual rebound in the semiconductor end market. We forecast 2013 and 2014 EBITDA of \$255mm and \$320mm, respectively which would reduce net leverage through the OpCo to 12.0x and 9.9x from 12.8x at 1Q13 (HoldCo:15.3x and 12.9x from 16.2x at 1Q13). Despite the improved earnings outlook we still expect \$200mm for 2013 and 2014 combined. We estimate MOMENT should approach cash flow break-even at EBITDA levels north of \$400mm.
- **We initiate with a Marketweight** — Our Marketweight weighting on the issuer reflects our belief results will improve from trough-like conditions reducing high leverage and cash burn over the next several years.
- **Buy on 1st & 1.5 Lien Notes** — We initiate with a **Buy** on the 8.875% 1st Lien Notes due 2020, the 10.0% 1.5 Lien Notes due 2020 and the 9.0% 2nd Lien Notes due 2021.
- **Neutral on Senior Subordinated Notes** — We initiate with a **Neutral** on the 11.5% Senior Subordinate notes due 2016.
- **Key Investor Debates (Pg.12)** — Is liquidity adequate? Is the capital structure viable? What is asset coverage? What levers does management have? What will drive earnings improvement? Will HXN and MOMENT capital structures merge?

James P Finnerty

+1-212-816-9599
james.p.finnerty@citi.com

Victoria X Li

+1-212-816-4448
victoria.x.li@citi.com

Momentive Performance Materials (MOMENT)

HY Chemicals

Cpn (%)	Description	Maturity	Moody's / S&P	Amt Out (\$)	Current Prices		
					Bid	YTW (%)	Z-Sprd (bp)
8.875	1st Lien Nts	10/15/20	B1/CCC+ (NEG)	\$1,100.0	\$104.50	7.81%	616
10.000	1.5 Lien Nts	10/15/20	B2/CC (NEG)	\$250.0	\$103.75	9.08%	745
9.000	2nd Lien Nts	01/15/21	Caa1/CC (NEG)	\$1,161.0	\$84.75	12.16%	996
9.500	2nd Lien Nts	01/15/21	Caa1/CC (NEG)	€ 132.8	80.00	13.87%	1,246
11.500	Sr Sub Nts	12/01/16	Caa3/CC (NEG)	\$381.90	\$76.50	21.64%	2,069

Note: Pricing as of 10 July 2013.

See Appendix A-1 for Analyst Certification, Important Disclosures and non-US research analyst disclosures.

Citi Research is a division of Citigroup Global Markets Inc. (the "Firm"), which does and seeks to do business with companies covered in its research reports. As a result, investors should be aware that the Firm may have a conflict of interest that could affect the objectivity of this report. Investors should consider this report as only a single factor in making their investment decision.

Table of Contents

Credit Positives	4
Risks	5
Investment Thesis	6
Investment Universe	7
Rating Agency Summary	10
Key Investor Debates	12
<ul style="list-style-type: none">• Is liquidity adequate?• Is the capital structure viable?• What levers does management have?• What will drive earnings improvement?• Will HXN and MOMENT capital structures merge?	
Company Overview	18
<ul style="list-style-type: none">• Silicones• Quartz	
Organizational Overview	24
Capital Structure & Covenants	27
Summary Financial Projections	29
Exhibits	31
<ul style="list-style-type: none">• Relative Value Tables• Key Industry Terms	

Credit Positives

- **Leading Market Share** — Momentive is a top 3 global producer of silicones and silicone derivatives (16%), ranking second to Dow Corning (37%) and tied with Wacker Chemie (16%). MOMENT is also the largest manufacturer of quartz products for the semiconductor end-market, the 2nd largest manufacturer of quartz products for fiber optics, as well as a leader in several ceramic materials end markets, including cosmetic additives, noting the Quartz segment only accounted for ~9% of LTM sales.
- **Barriers to Entry** — Consolidated silicone industry structure (top 3 = ~70%), technical knowledge and product customization serve as barriers to entry.
- **Geographic Diversity** — As of YE12 MOMENT had 22 global production sites which supplied customers in over 100 countries with mostly locally produced product. 2012 sales split evenly between Americas (38%), Europe (31%) and Asia (31%).
- **Customer Diversity** — Serves over 5,500 customers between Silicones and Quartz segments (i.e. Procter & Gamble, 3M, Goodyear, Unilever, Saint Gobain, Motorola, L'Oreal, BASF, the Home Depot and Lowe's). In 2012 top 20 customers accounted for less than 22% of revenues with no single customer representing more than 3% of total revenues.
- **Manageable Debt Maturity Profile** — The last round of refinancing in October 2012 removed financial covenants and left the \$382mm Senior Subordinated notes due in December 2016 as the next sizeable maturity.
- **Benefits of Merger with HXN** — The October 2010 merger between MOMENT and HXN has created one of the largest specialty chemicals in the world.
 - **Synergies:** At the time management highlighted they planned to generate \$100mm of synergies from a Shared Services Agreement consisting of raw material & indirect procurement (\$49mm), corporate/SG&A (\$37mm) and logistics optimization (\$14mm). As of 1Q13 they had realized approximately \$63mm in cost savings on a run-rate basis as a result of the Shared Services Agreement with HXN.
 - **IPO:** The greater scale and diversity of the combined company formed what management believes is a more viable IPO candidate. At the time of the merger management estimated the combined company had Proforma Revenue and EBITDA of \$7.47B and \$1.24B respectively (based on 1H10 annualized results and \$100mm in estimated synergies and HXN's \$70mm of in process savings). Currently we see LTM Revenue and EBITDA (segment) of \$7.05B and \$683mm. The drop in EBITDA has been driven mainly by weaker results from MOMENT.
- **Exposure to High Growth End Markets** — Management has expanded its emerging market presence via major investments in Asia. In 2012 36% of revenue was generated from Asia-Pacific (31%) and Mexico & Brazil (5%). Global silicone demand demonstrated ~6% CAGR from 2003-2010.
- **Operating Leverage** — Has historically shown a high degree of operating leverage.

Risks

- **Overcapacity in Silicones** — A significant amount of new capacity came online in 2011. Two new facilities came online in China which added over 18% to global capacity. A MOMENT joint venture with Xinan added 50k metric tons/yr and a joint venture owned by their 2 largest competitors, Dow Corning and Wacker-Chemie, added an additional 200k metric tons/yr. The new capacity combined with lower than anticipated demand levels has led to an overcapacity which industry participants have stated will take a couple of years to be absorbed.
- **Semiconductor Sector Weakness** — Semiconductor industry has experienced an extended period of weakness.
- **Reliant on One Segment** — Substantially all sales and EBITDA are generated by Silicone segment, despite it serving a diverse number of end markets/customers.
- **Exposure to Cyclical End Markets** — Key end markets (automotive, construction and electronics) are cyclical and account for over 50% of sales.
- **Key Competitors Have Stronger Balance Sheets** — Dow Corning is a 50/50 joint venture between Dow Chemical (Baa2/BBB/BBB) and Corning (A3/BBB+ POS/A-). Wacker-Chemie has debt/EBITDA of ~1.5x.
- **Highly Levered Capital Structure** — Leverage is 16.7x through the HoldCo. In 2006 Apollo paid a high multiple on what has ended up being closer to peak results than to trough conditions. In addition GE was issued \$400mm 11% PIK notes in 2006 that have grown to \$788mm as of 1Q13. Based on our estimates MOMENT won't generate enough cash flow to delever meaningfully over the coming years.
- **Challenged Liquidity Position** — Finished 1Q13 with liquidity of \$301mm, consisting of \$116mm of cash and cash equivalents (\$113mm in foreign jurisdictions) and \$185mm of borrowing capacity under a senior secured credit facility which was refinanced in April 2013. Pro-forma the April refinancing liquidity fell to \$290mm, which reflected a drop in borrowing availability to \$174mm from \$184mm. An 8-k filed in May announced they had entered into a new purchase and sales agreement with an affiliate of GE for which MOMENT received a one time payment of \$101.8mm.
- **Significant Cash Outflows** — Company guiding 2013 outflows of ~\$442mm.
 - **Cash Interest:** Expects 2013 Cash Interest of approximately **\$288mm** (~\$61mm in 1Q13 & 3Q13 and ~\$83mm in 2Q13 & 4Q13). In their 1Q13 10Q Management guided \$294mm in annual cash interest payments (\$284mm related to fixed rate obligations) which didn't take into account the possibility for subsequent borrowings on the credit facility.
 - **Principal and Interest on ABOC Loan:** Principal (due semi-annually) and interest (due quarterly) on a loan from Agricultural Bank of China of approximately **\$8mm** and **\$3mm**.
 - **Cash Taxes:** Estimates **\$19mm** of income tax payments in 2013.
 - **CAPEX:** Guiding FY13 CAPEX of **\$90-100mm** (\$20mm spent in 1Q13).
 - **Restructuring Payments:** Approximately **\$17mm** in payments in 2013.
 - **Pension:** Approximately **\$7mm** in pension fund contributions.
- **Raw Materials** — Exposed to silicon metal, siloxane, methanol and quartz sand.
- **Unionized Work Force** — At YE12 45% of their employees were either unionized or covered by collective bargaining agreements.
- **Underfunded Pension Plans** — At YE12 U.S. defined benefit plans and Non-U.S. plans were underfunded by \$87mm and \$128mm respectively.

Investment Thesis

We forecast EBITDA to rebound from current trough conditions over the next 2-3 years as silicone overcapacity is absorbed by demand growth.

We initiate coverage of Momentive Performance Materials (MOMENT) with a Marketweight rating. Since purchased by Apollo in 2006 MOMENT has consistently been one of the yieldiest names in the high yield chemicals sector as a result of starting high leverage, lack of free cash flow and a greater degree of earnings volatility than expected by most. Recent large siloxane capacity additions combined with weaker than anticipated demand has led to depressed operating rates and trough like earnings for its key silicones segment. Nevertheless we anticipate that silicone demand growth, which has historically grown at 2 to 3 percentage points above global GDP, and limited new supply additions should help return industry operating rates to the low 90s over the next couple of years which should help boost EBITDA closer to \$400mm.

8.875% 1st Lien Secured Notes due 10/15/20 (B1/CCC+)

We initiate with a **Buy** on the MOMENT 8.875% 1st Lien Secured Notes due in 2020. Bonds are the lowest levered in the capital structure at 4.9x and offer a yield to worst of 7.8% which sits between Citi's High Yield Single B index (6.7%) and CCC index (9.7%). Current trading levels reflect the structural seniority and solid asset coverage (specialty chemical companies have historically sold at multiples ranging from 6 to 10 times).

10.00% 1.5 Lien Secured Notes due 10/15/20 (B2/CC)

We initiate with a **Buy** on the MOMENT 10.00% 1.5 Lien Secured Notes due in 2020. The 1.5 lien notes are a small \$250mm tranche which have only an additional 1.1x turns of leverage compared to the 1st lien bonds. Yield to worst of 9.1% is off recent tights of inside 8% and offers a yield just inside of the Citi High Yield CCC index (9.7%).

9.000% 2nd Lien Secured Notes due 01/15/21 (Caa1/CC)

We initiate with a **Buy** on the MOMENT 9.000% 2nd Lien Secured Notes due in 2021. Leverage through this level is elevated at 11.6x and subsequently yield approximately 300bps more than the Citi CCC index at 9.7%. Affiliates of Apollo own 45.3% of this issue. Since these bonds were issued we have viewed them as the fulcrum security and continue to believe this to be the case even post the May S-1 filing highlighted that Apollo owned ~33% of the subordinated notes.

11.500% Senior Subordinated Notes due 12/01/16 (Caa3/CC)

We initiate with a **Neutral** on the MOMENT 11.50% Senior Subordinated Notes due in 2016 which are the lowest bonds in the capital structure and are levered 13.3x. Bonds are currently trading in the mid to upper 70s after having rallied some 20 points (~\$60 to ~80) post an S-1 filing on May 7th highlighted that affiliates of Apollo owned 32.6% (\$124.3mm) of this issue. We believe some viewed the filing as an affirmation from Apollo that the bonds were undervalued or that Apollo could seek to refinance the bonds at higher levels to reward themselves. However we highlight that Apollo may very well have owned these bonds for a number of years and had to file an S-1 in order to have the ability to sell bonds. Our simple asset coverage (waterfall) analysis suggests bonds are covered 70% only when applying bullish assumptions of 7.5x multiple to an EBITDA level of \$400mm.

The bullish thesis for owning these bonds focuses on their high coupon (11.5%), short maturity (2016), substantial discount to par, and asset coverage looking better when using the market value of bonds rather than the notional value.

Investment Universe

Figure 1. Momentive Bond Summary

Description	Outstanding (mm)	Maturity	Moody's & S&P	Date	Price	Bid	YTW (%)	Z-SPRD (bp)	Segment EBITDA
8.875% 1st Lien Secured Notes	\$1,100.0	10/15/20	B1/CCC+ (NEG)	10/15/15	\$106.66	\$104.50	7.81%	616	4.9x
10.0% 1.5 Lien Secured Notes	\$250.0	10/15/20	B2/CC (NEG)	10/15/15	\$107.50	\$103.75	9.08%	745	6.0x
9.0% 2nd Lien Secured Notes	\$1,161.0	01/15/21	Caa1/CC (NEG)	01/15/16	\$104.50	\$84.75	12.16%	996	11.6x
9.5% 2nd Lien Secured Notes	€ 132.8	01/15/21	Caa1/CC (NEG)	01/15/16	104.75	80.00	13.87%	1,246	11.6x
11.5% Senior Subordinated Notes	\$381.9	12/01/16	Caa3/CC (NEG)	12/01/13	\$103.83	\$76.50	21.64%	2,069	13.3x

Source: Citi Research, Company Filings. Pricing as of 07/10/13.

Figure 2. MOMENTIVE Bonds YTW (%) vs. Citi Indices

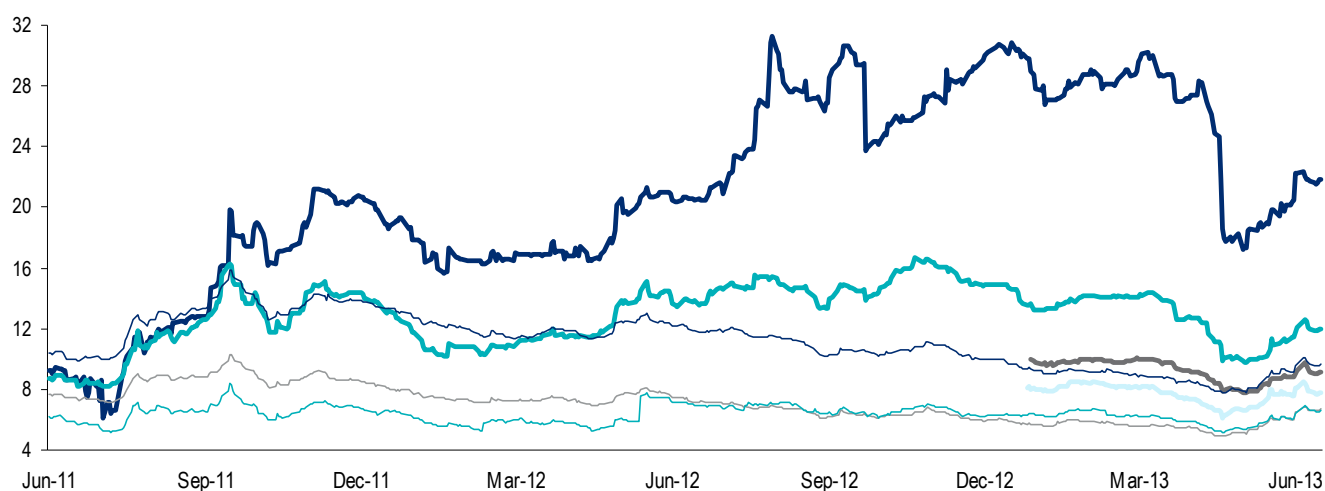
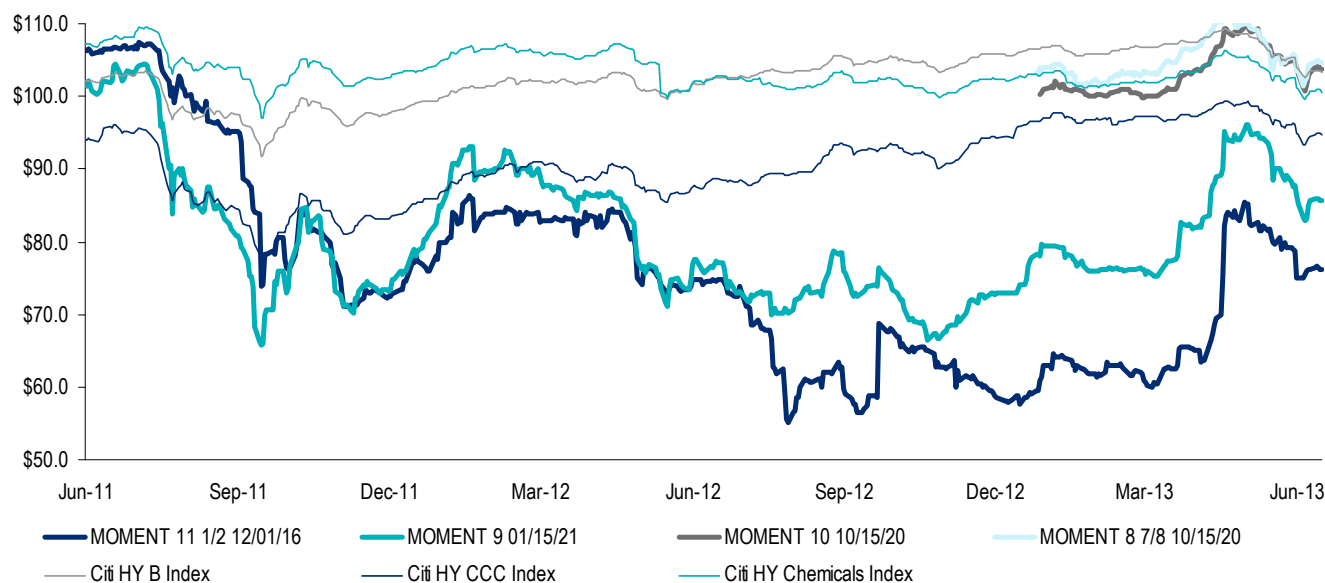
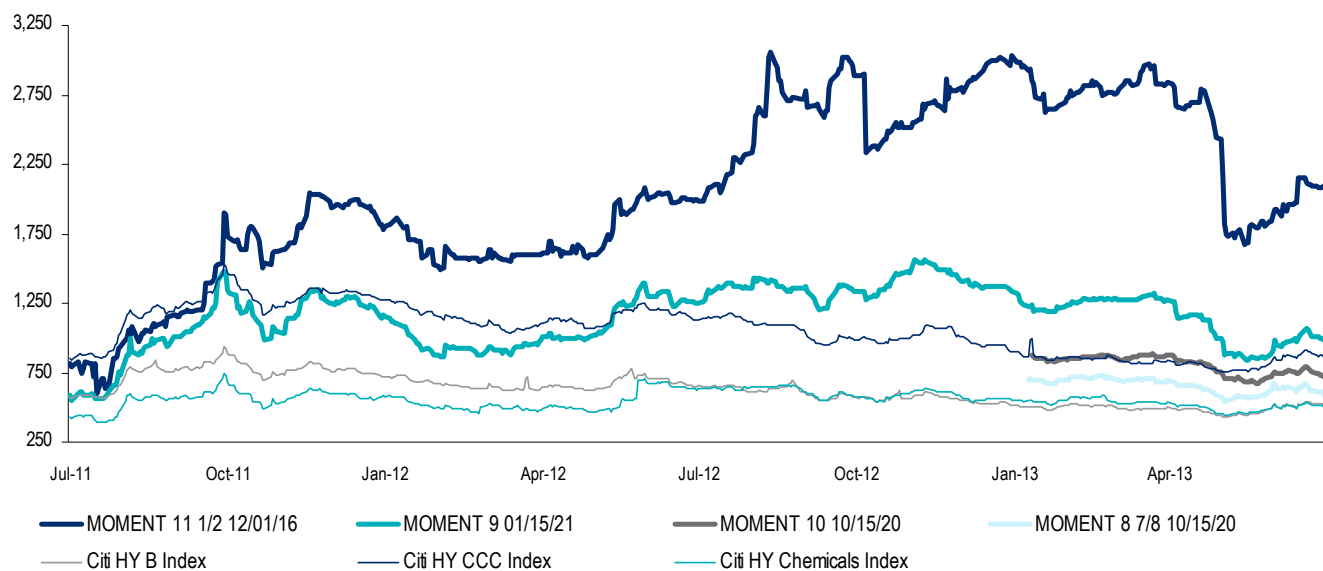


Figure 3. MOMENTIVE Bonds Price vs. Citi Indices



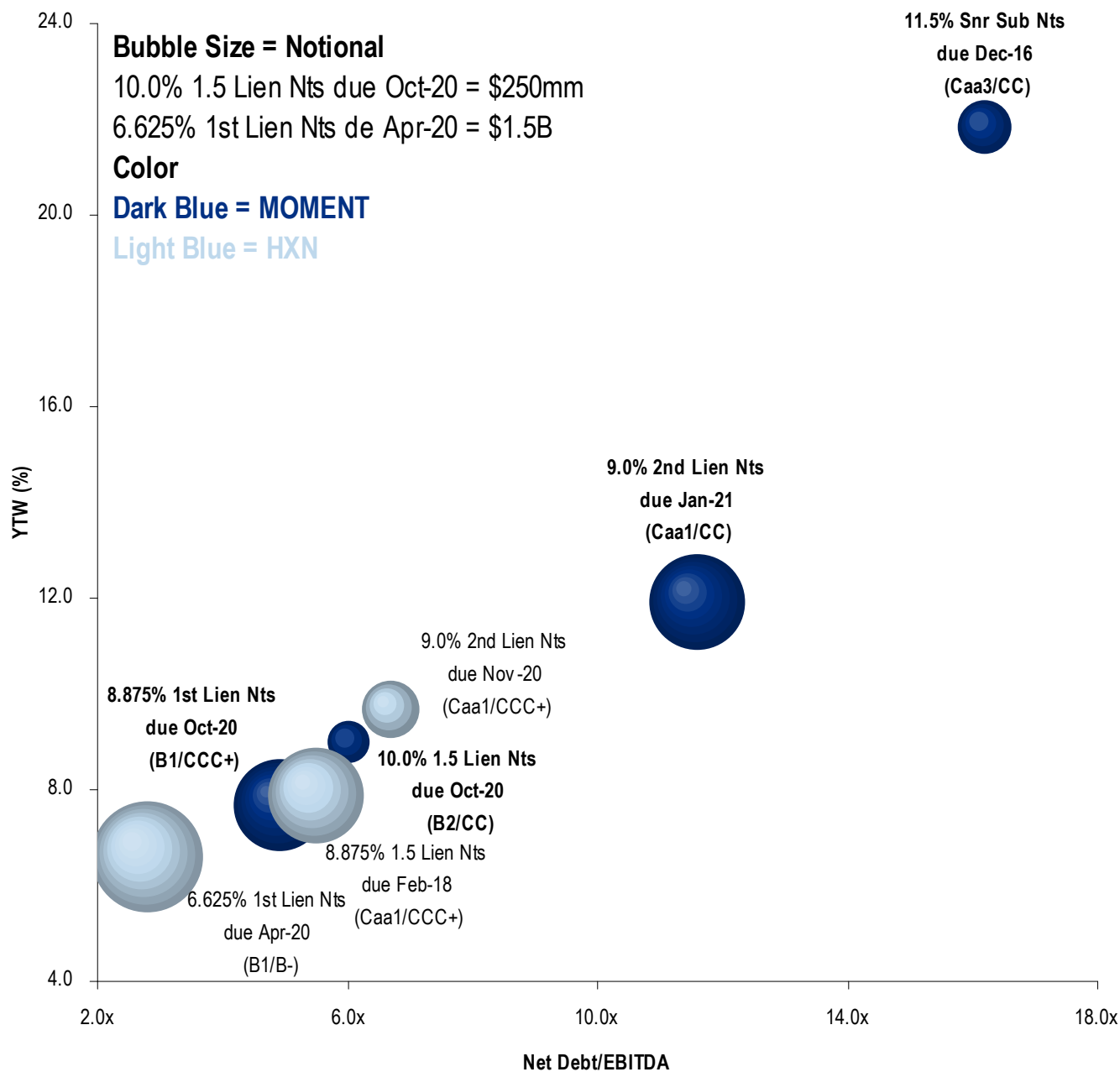
Source: Citi Research, Citi Velocity, and Citi Index.

Figure 4. MOMENTIVE Bonds OAS (bp) vs. Citi Indices



Source: Citi Research, Citi Velocity, and Citi Index.

Figure 5. Momentive Performance Materials (MOMENT) and Momentive Specialty Chemicals (HXN) Bubble Chart



Source: Citi Research, Company Reports

Rating Agency Summary

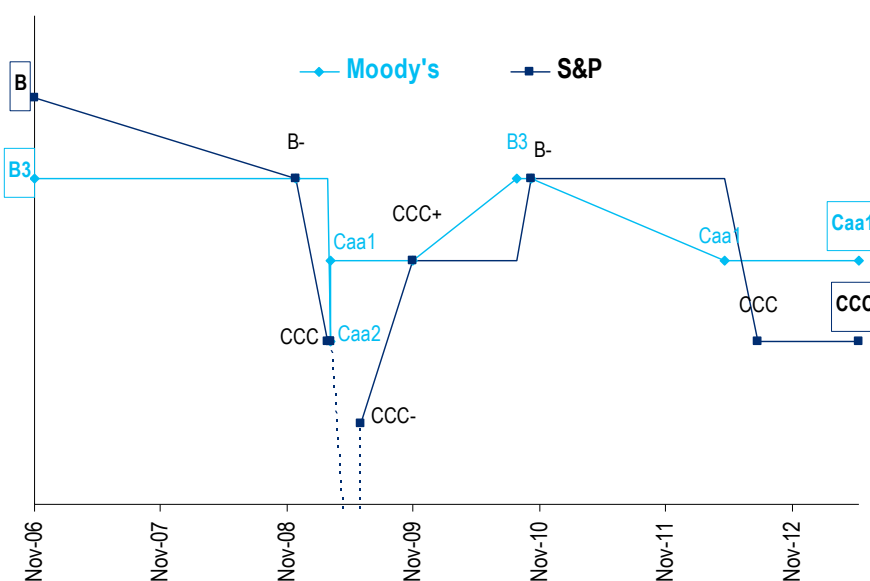
Figure 6. Momentive Performance Ratings Summary

	Moody's	S&P
Outlook	Stable	Negative
CFR/CCR	Caa1	CCC
1st Lien	B1	CCC+
2nd Lien	Caa1	CC
Sr. Sub	Caa3	CC

Source: Citi Research, Moody's and S&P.

Current ratings reflect a weak financial profile (highly leveraged capital structure and challenged liquidity) which offset a solid business profile.

Figure 7. Momentive Performance Corporate Ratings History



Note: In June 2009 S&P declared a **Selective Default** as a result of a distressed exchange offer.

Source: Citi Research, Moody's and S&P.

Moody's

In their latest credit opinion dated May 17, 2012, Moody's highlighted their positive view of MOMENT's business profile scoring its business position (Baa), revenue size (Ba), stability of EBITDA (Ba) and EBITDA margin (Baa). The over levered state of the balance sheet was evident in the scoring of several key credit metrics as 'Ca': Debt/Cap of 159.7%, Debt/EBITDA of 12.5x, RCF/Debt of 0.5% and FCF/Debt -1.8%.

Moody's last published on MOMENT in October 2012 when it assigned a B1 rating to the company's new 1st lien notes. At the time they stated the Caa1 CFR reflected the expectation that 2013 EBITDA would remain below \$300mm and poor credit metrics. Moody's stated an upgrade would not be considered until it reached EBITDA of \$450mm and they would focus on FCF/Debt above 2% and RCF/Debt above 6% on a sustainable basis.

S&P

S&P last published on MOMENT in December 2012 when it lowered the ratings on the company's 1.5 lien notes to 'CC' from 'CCC' post the issuance of \$1.1B of 1st lien bonds in October 2012. S&P viewed MOMENT's financial profile as "*highly leveraged*", the business profile as "*fair*" and liquidity as "*weak*". S&P stated the negative outlook reflected the expectation that silicone overcapacity and a weak global economy would cause the company's free operating cash flow to be negative for at least several quarters adding that a downgrade was likely in 2013 unless earnings improved enough to stem the cash burn. The outlook could be stabilized if earnings and cash flow improve enough to bring liquidity and leverage to appropriate levels. S&P noted the leverage was unsustainable absent a meaningful recovery in earnings and that this could also hurt its competitiveness with peers with stronger balance sheets.

Bottom Line

We believe ratings are not likely to go any higher in the near to medium term with both agencies indicating significant earnings and cash flow improvement as requirements for upgrades. As with most CCC credits ratings really aren't a near-term driver for MOMENT.

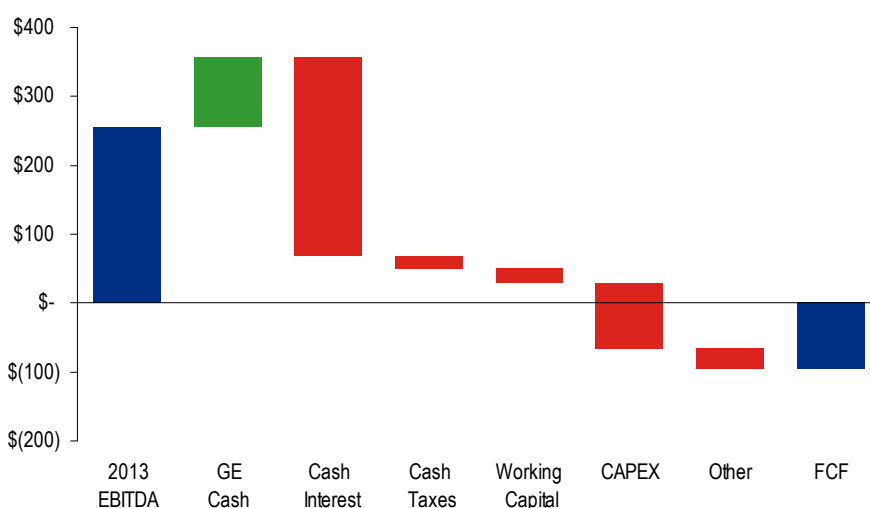
Key Investor Debates

Is Liquidity Adequate?

We estimate it will be cash flow negative, based on the current capital structure, until EBITDA reaches ~\$450mm.

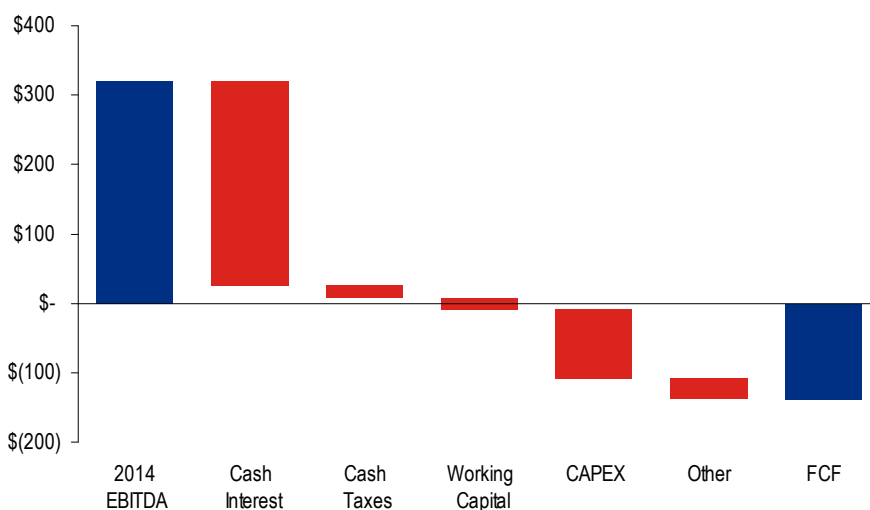
Based on our assumptions MOMENT's liquidity profile will remain challenged for the next couple of years assuming the current capital structure remains in place. Pro-forma the April 2013 refinancing liquidity fell to \$290mm, which reflected a drop in borrowing availability to \$174mm from \$184mm and cash and cash equivalents at quarter end of \$116mm. We estimate MOMENT will use cash approaching \$200mm through YE14, even taking into account \$101.8mm received from GE post the renegotiation of a PSA agreement per an 8K filed in May 2013. Consequently we do not see MOMENT reaching a break-even cash flow, based on current capital structure until it generates EBITDA closer to \$450mm. It does benefit from limited near-term debt maturities (first in Dec-16) and a lack of financial covenants.

Figure 8. Estimated EBITDA and FCF for 2013



Source: Citi Research, Company Filings

Figure 9. 2014 Estimated EBITDA and FCF



Source: Citi Research, Company Filings

Is the Current Capital Structure Viable in Long Term? What is Asset Coverage?

Subordinated notes have positive asset coverage once EBITDA exceeds \$400mm.

We believe MOMENT's current capital structure is not viable over the longer term based on the purchase price being too high and it being partially financed with a large PIK seller note accruing at 11% per year. Below we examine asset coverage via a simple waterfall analysis using a reasonable range of EBITDA and multiples.

Figure 10. Asset Coverage Through the Capital Structure

		Multiple			
		5.50x	6.50x	7.50x	8.50x
Enterprise Value (\$ in mm) EBITDA	\$ 200.0	1,100	1,300	1,500	1,700
	\$ 250.0	1,375	1,625	1,875	2,125
	\$ 300.0	1,650	1,950	2,250	2,550
	\$ 350.0	1,925	2,275	2,625	2,975
	\$ 400.0	2,200	2,600	3,000	3,400
	\$ 450.0	2,475	2,925	3,375	3,825
	\$ 500.0	2,750	3,250	3,750	4,250
		5.50x	6.50x	7.50x	8.50x
1st Lien Asset Coverage	\$ 200.0	96%	114%	131%	149%
	\$ 250.0	120%	142%	164%	186%
	\$ 300.0	144%	170%	197%	223%
	\$ 350.0	168%	199%	229%	260%
	\$ 400.0	192%	227%	262%	297%
	\$ 450.0	216%	256%	295%	334%
	\$ 500.0	240%	284%	328%	371%
		5.50x	6.50x	7.50x	8.50x
1.5 Lien Asset Coverage	\$ 200.0	0%	62%	142%	222%
	\$ 250.0	92%	192%	292%	392%
	\$ 300.0	202%	322%	442%	562%
	\$ 350.0	312%	452%	592%	732%
	\$ 400.0	422%	582%	742%	902%
	\$ 450.0	532%	712%	892%	1072%
	\$ 500.0	642%	842%	1042%	1242%
		5.50x	6.50x	7.50x	8.50x
2nd Lien Asset Coverage	\$ 200.0	0%	0%	8%	23%
	\$ 250.0	0%	17%	36%	55%
	\$ 300.0	19%	42%	64%	86%
	\$ 350.0	40%	66%	92%	118%
	\$ 400.0	60%	90%	120%	150%
	\$ 450.0	81%	114%	148%	182%
	\$ 500.0	101%	139%	176%	214%
		5.50x	6.50x	7.50x	8.50x
Sub Notes Asset Coverage	\$ 200.0	0%	0%	0%	0%
	\$ 250.0	0%	0%	0%	0%
	\$ 300.0	0%	0%	0%	0%
	\$ 350.0	0%	0%	0%	63%
	\$ 400.0	0%	0%	70%	174%
	\$ 450.0	0%	50%	167%	284%
	\$ 500.0	5%	135%	265%	394%
		5.50x	6.50x	7.50x	8.50x
GE Seller Note Asset Coverage	\$ 200.0	0%	0%	0%	0%
	\$ 250.0	0%	0%	0%	0%
	\$ 300.0	0%	0%	0%	0%
	\$ 350.0	0%	0%	0%	0%
	\$ 400.0	0%	0%	0%	36%
	\$ 450.0	0%	0%	33%	90%
	\$ 500.0	0%	17%	80%	144%

Source: Citi Research

What Levers Are Available to Management?

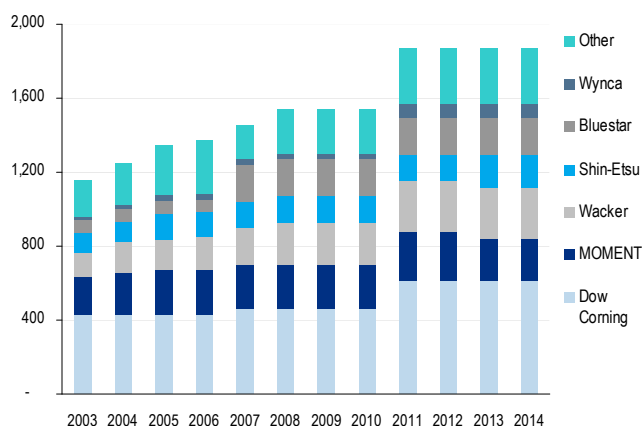
- To Bolster Liquidity:
 - MOMENT has ~\$100mm first lien capacity available post the April refinancing.
 - Management could lower annual CAPEX spend to maintenance levels of \$45 to \$50mm (averaged \$118mm since 2007).
 - Apollo could inject more cash.
- To Address Balance Sheet:
 - The \$382mm of subordinated notes due Dec-16 can be refinanced with secured debt after they go current in December 2015 (1 year prior to maturity) based on limitations on restricted payments in secured bonds.
 - Management could offer to refinance \$382mm of 11.5% subordinated notes due 2016 and \$788mm 11% HoldCo PIK seller notes due 2017 with securities convertible into equity in the case of an IPO, as we have seen in other highly levered private equity owned company's.
 - Management could seek to reduce debt via distressed exchanges.

What Will Drive Earnings Improvement?

Results should improve as demand in key end markets (housing, automotive and electronics) rebounds.

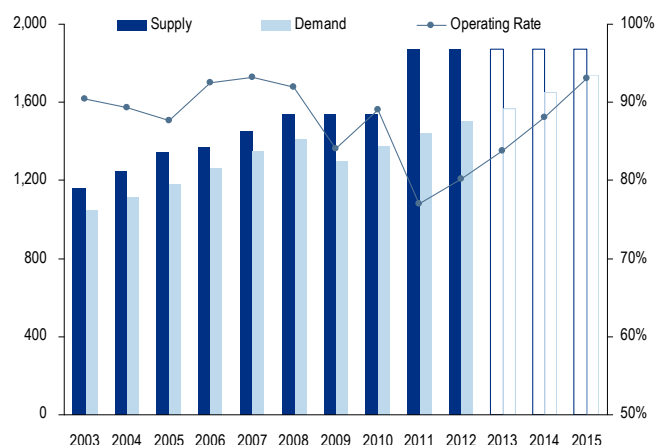
Siloxane market is currently oversupplied as a result of 18% increase in capacity in 2011 combined with demand tracking below industry expectations since the 2008/09 financial crisis. We believe demand needs to grow at historical rates (typically 3% above global GDP) in order to get operating rates back to the 90% level where companies have better pricing power. We estimate this will occur sometime in 2015 based on Citi economist's global GDP forecast of 2.6%, 3.2% and 3.4% in 2013, 2014 and 2015 respectively. End markets are quite diverse for the silicones industry, however construction and automotive do account for approximately 1/3rd of demand.

Figure 11. Siloxane Supply by Producer (Thousand Metric Tons)



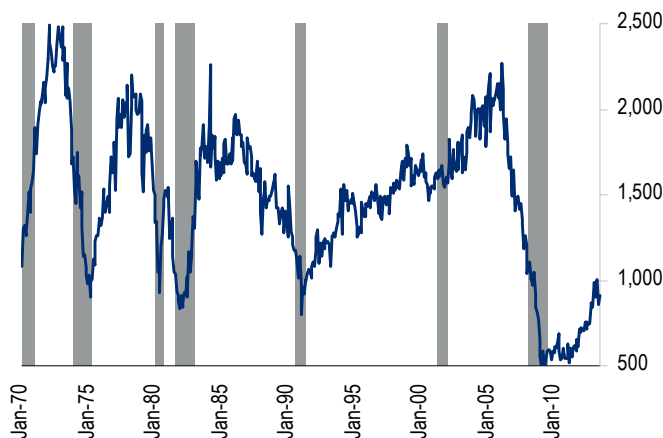
Citi Research, SRI consulting, Chemical Week, Company Reports

Figure 12. Siloxane Supply, Demand Operating Rates



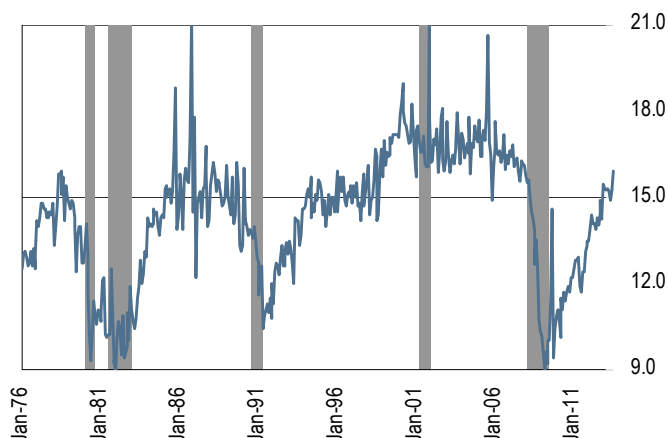
Source: Citi Research, SRI consulting, Chemical Week, Company Reports

Figure 13. U.S. Housing Starts (SAAR, thousands)



Source: Citi Research and U.S. Census Bureau

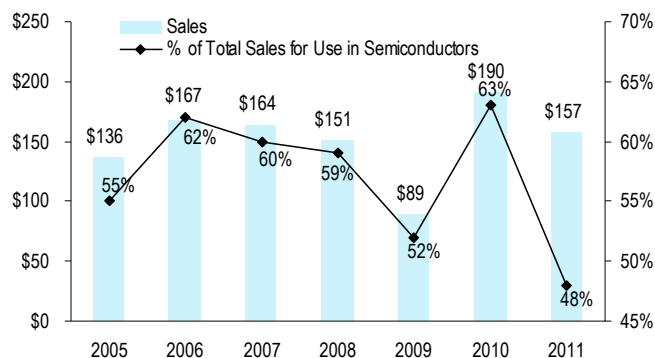
Figure 14. U.S. Auto Sales (Saar, millions)



Source: Citi Research and Bloomberg

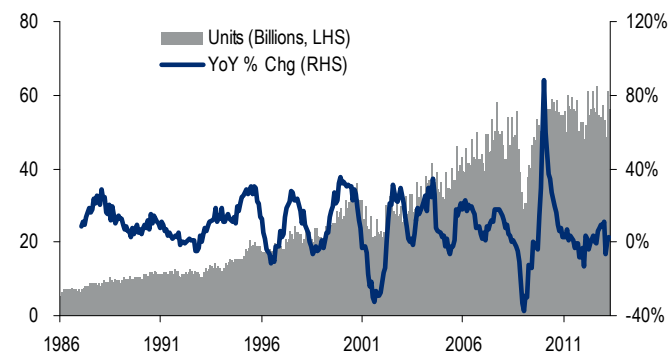
A key driver for the Quartz segment is the cyclical semiconductor industry which serves the consumer electronics and computing end markets. These two markets have historically accounted for ~60% of all semiconductors sold. The Consumer Electronics Association expects 2013 global electronic sales to be up 2.7% in 2013 while the general outlook for the PC industry is more benign. The use of semiconductors in other end markets such as automotive, aerospace, construction and healthcare is also growing.

Figure 15. Quartz Segment Sales into Semiconductor Industry



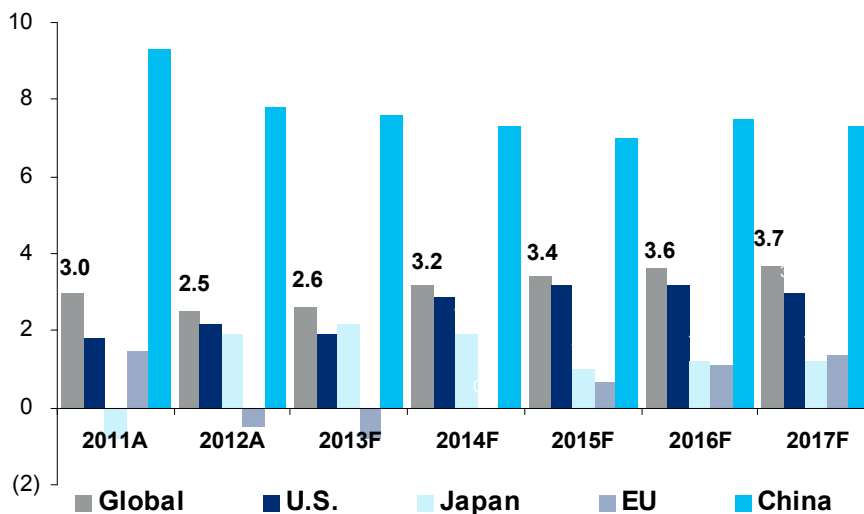
Source: Citi Research, Company Filings

Figure 16. Global Semiconductor Production (Units)



Citi Research and SIA.

Figure 17. Global GDP: Historical and Forecasted



A= Actual. F= Forecasted.

Source: Citi Research

Will HXN and MOMENT Capital Structures Merge?

Merger of capital structure appears unlikely in the near term.

Assuming a merger occurred today MOMENT bond holders would benefit at the expense of HXN investors.

We believe it is unlikely that the capital structures will be merged in the near-term given MOMENT's poor performance and highly leveraged balance sheet. We believe the capital structures won't be merged until MOMENT's EBITDA improves dramatically and steps are taken to make the capital structure more viable (debt exchange, refinancing etc...). We also believe debt incurrence covenants (2.0x fixed charge coverage ratio) in HXN's bonds could be an obstacle to merging the structures.

If contrary to our belief the capital structures were merged in the near-term MOMENT bonds holders, especially those at the 2nd lien level and below would be the biggest beneficiaries.

Figure 18. Proforma Merged Capital Structure as of 1Q13

	MOMENT	HXN	MOMENT + HXN	MOMENT Impact	HXN Impact
Revenues	\$2,334.0	\$4,712.0	\$7,046.0		
EBITDA	234.0	449.0	683.0		
EBITDA Margin	10.0%	9.5%	9.7%		
Cash	\$116.0	\$397.0	\$513.0		
1st Lien	\$1,144.2	\$1,561.0	\$2,705.2		
Net 1st Lien	1,028.2	1,164.0	2,192.2		
Total Debt/EBITDA	4.9x	3.5x	4.0x	-0.9x	0.5x
Net Debt/EBITDA	4.4x	2.6x	3.2x	-1.2x	0.6x
1.5 Lien	\$1,394.2	\$2,761.0	\$4,155.2		
Net 1.5 Lien	1,278.2	2,364.0	3,642.2		
Total Debt/EBITDA	6.0x	6.1x	6.1x	0.1x	-0.1x
Net Debt/EBITDA	5.5x	5.3x	5.3x	-0.1x	0.1x
2nd Lien	\$2,731.2	\$3,335.0	\$6,066.2		
Net 2nd Lien	2,615.2	2,938.0	5,553.2		
Total Debt/EBITDA	11.7x	7.4x	8.9x	-2.8x	1.5x
Net Debt/EBITDA	11.2x	6.5x	8.1x	-3.0x	1.6x
Unsecured	\$2,731.2	\$3,660.0	\$6,391.2		
Net Unsecured	2,615.2	3,263.0	5,878.2		
Total Debt/EBITDA	11.7x	8.2x	9.4x	-2.3x	1.2x
Net Debt/EBITDA	11.2x	7.3x	8.6x	-2.6x	1.3x
OpCo	\$3,116.2	\$3,765.0	\$6,881.2		
Net OpCo	3,000.2	3,368.0	6,368.2		
Total Debt/EBITDA	13.3x	8.4x	10.1x	-3.2x	1.7x
Net Debt/EBITDA	12.8x	7.5x	9.3x	-3.5x	1.8x
HoldCo	\$3,904.2	\$3,765.0	\$7,669.2		
Net HoldCo	3,788.2	3,368.0	7,156.2		
Total Debt/EBITDA	16.7x	8.4x	11.2x	-5.5x	2.8x
Net Debt/EBITDA	16.2x	7.5x	10.5x	-5.7x	3.0x

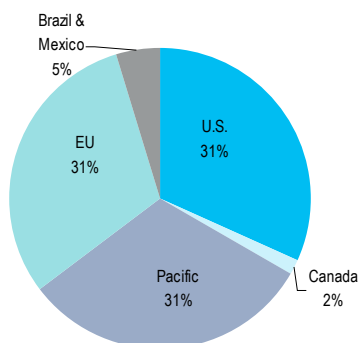
Source: Citi Research, Company Reports

Company Overview

Momentive is a leading silicones producer and top manufacturer of quartz and ceramic products globally. As of March 31, 2013, LTM sales and segment EBITDA was \$2,334mm and \$234mm (11.9% EBITDA margin), respectively. Company revenues are diversified geographically (figure 20) and by end market (figure 21). Momentive operates in two segments; Silicones and Quartz with Silicones accounting for 91% and 85% of LTM sales and segment EBITDA respectively.

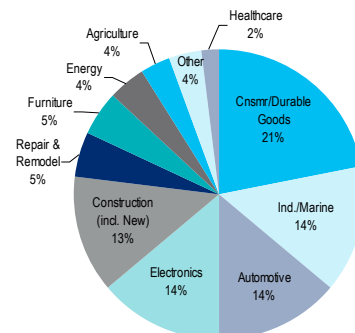
MOMENT benefits from geographic and end market diversity.

Figure 19. Sales by Geography (2012)



Source: Citi Research, Company Filings

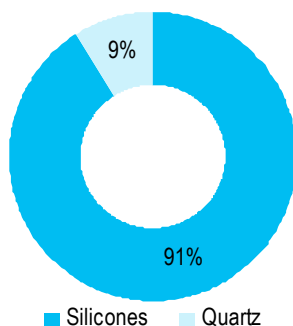
Figure 20. End Market Sales



Source: Citi Research, Company Filings.

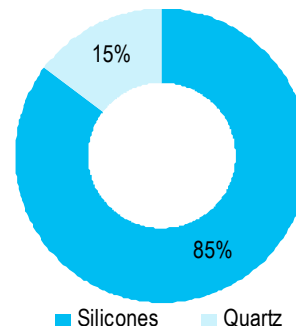
Nevertheless it is heavily dependant on a rebound in silicone segment earnings with it account for vast majority of sales and earnings.

Figure 21. Segment Sales (2012)



Source: Citi Research, Company Filings

Figure 22. Segment EBITDA (2012)



Source: Citi Research, Company Filings

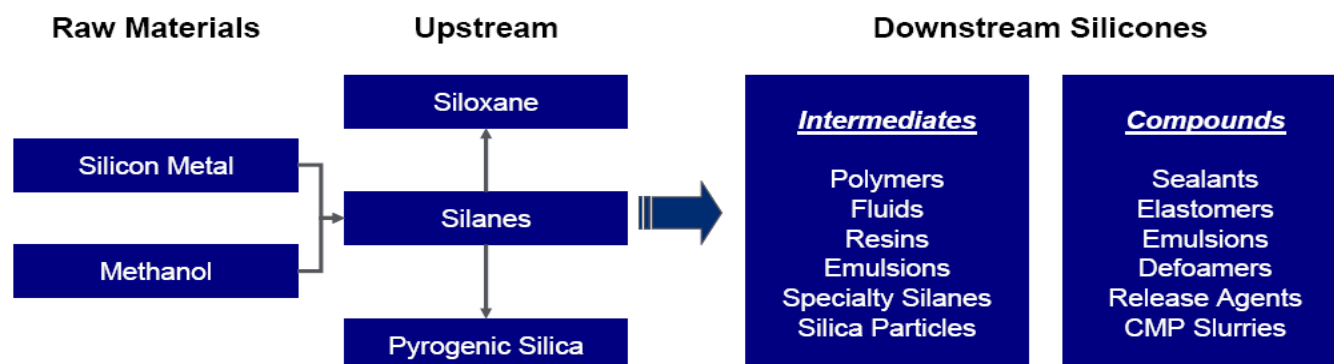
Silicones

The **Silicones** business manufactures, sells, and distributes silanes, specialty silicones and urethane additives, serving end markets in building and construction, transportation, electronics, personal care, as well as in healthcare. The company last broke out its sales by product in 2011: fluids (27%), silanes and resins (14%), intermediates (2%), elastomers (18%), engineered materials (15%), urethane additives (12%), as well as consumer and construction sealants (12%). Key raw materials are silicon metal, siloxane, and methanol.

History

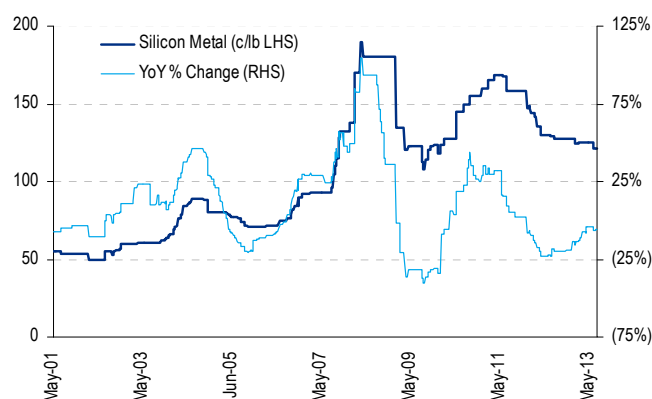
The silicone industry is not new with industrial production of silicones dating back to the 1940s. Early applications included eye glass cleaners, waterproofing for leather, adhesives and hand lotion. 'Silicones' is a general term used to describe compounds of organic molecules (i.e. oxygen) and silicon. Once combined with different organic compounds silicones take on a range of properties including resistance to chemicals, extreme temperatures and weather; water repellence; adhesiveness; lubricity; releasability; foam control and electrical insulation. Some of the better known applications are bath and shower caulk, joint sealants in buildings, binders for coatings, primers, pressure-sensitive adhesive labels, foam products, cosmetics and tires.

Figure 23. Simple Silicone Flow Chart



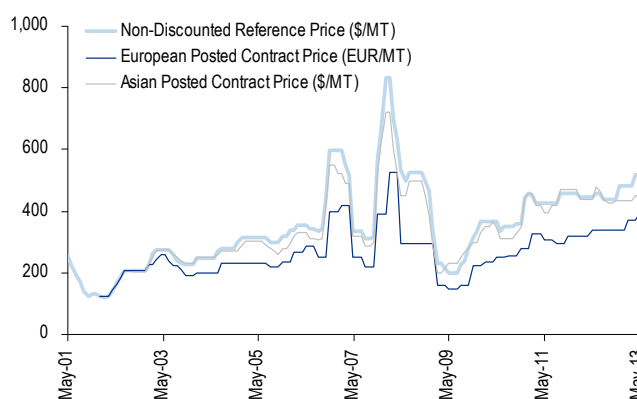
Source: Citi Research, Wacker- Chemie, Company Reports

Figure 24. Silicon Metal Price (c/lb)



Source: Citi Research and Metal Bulletin.

Figure 25. Global Methanol Prices



Source: Citi Research and Methanex.

Raw Materials

Silicon Metal and Methanol are the 2 key raw materials in the production of downstream silicone products. They are used to make silanes and siloxanes which are used to make a variety of intermediates and compounds.

Silicon Metal: Momentive is not vertically integrated into silicon metal. Two major competitors acquired assets in North America and Europe in 2009/10 timeframe which made them vertically integrated for a portion of their supply requirements and reduced the amount of independent suppliers. In addition the U.S. imposes dumping duties of up to 139.5% on silicon metal producers in China and Russia, effectively blocking imports. Momentive purchases silicon metal under contracts in the U.S. and Europe and in the spot market in Asia.

Silicon metal prices increased through 2010 before peaking in early 2011 and leveling out by the end of 2012. Weaker demand from the solar industry has negatively impacted demand. In 2012 the cost of silicon metal accounted for approximately 25% of the total raw material costs for silicone. **Key silicon metal producers:** Ferro Atlantica, Elkem, Globe Specialty Metals, Advanced Metallurgical Group, Rima, Simcoa and various smaller producers.

Methanol: Is a key raw material for the production of methyle chloride, which is used to produce chlorosilanes. Methanol is sourced through a mix of annual and quarterly contracts. Increased demand and low inventories have led prices to increase since mid 2009 (U.S. and EU +166%, Asia +96%). Key methanol producers are Methanex, MHTL and SABIC (via Innovative Plastics).

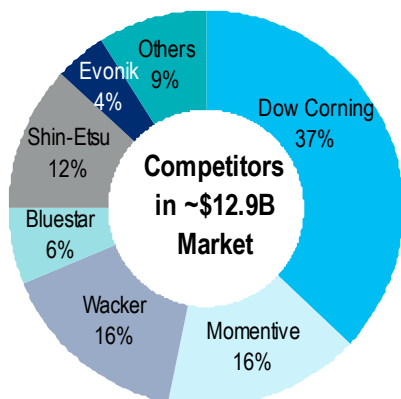
Siloxane: Siloxane is a key intermediate product for the Silicones segment that is derived from Silicon Metal. MOMENT produces enough siloxane at its internal sites and a Chinese JV to meet the vast majority of its needs; however they also sourced a portion from a former affiliate of GE under an off-take agreement. On May 17, 2013 Shin-Etsu consolidated this affiliate of GE (50/50 JV) and signed a new long-term off-take agreement with Momentive with a maturity of 2026 and an option to extend it to 2036. Momentive received \$101.8mm from GE as a result of the above mentioned transactions.

Silicone market is consolidated (top 3 producers = ~70% of capacity) and serves diverse end markets.

Competition and End Markets

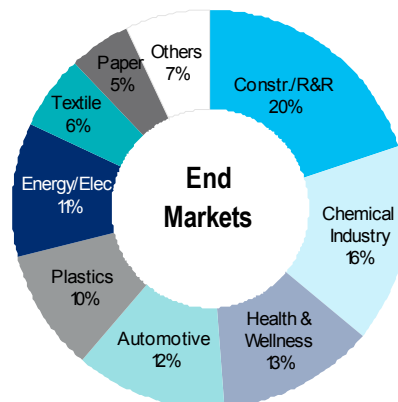
Poor market fundamentals (overcapacity, competitive pressures, volatile demand and poor profitability) in the 1996 to 2002 time frame led to consolidation (i.e. Bayer and GE formed a joint venture which is now owned by MOMENT). Today the silicone industry is relatively consolidated with the top 3 producers representing ~71% of capacity (figure 8). Its end markets remain relatively diverse (figure 9) and companies have added new capacity in higher growth locations (i.e. China).

Figure 26. Silicone Producers by Sales 2012



Source: Citi Research and Wacker-Chemie

Figure 27. Silicone End Markets by Sales



Source: Company Reports

Supply and Demand

Supply and demand for siloxane remained very tight during the mid 2000s which led industry participants to plan supply expansions ahead of the global credit crisis in 2008 as forecasts indicated demand growth from emerging market economies would lead to shortages. Two large facilities, a Momentive JV and Dow-Corning/Wacker JV, came online in 2011 and added ~18% to global capacity which led to oversupply weaker operating rates and margin compression (see figure 27 and 28). Industry participants have indicated that it could take several years for demand growth to absorb this excess capacity.

Another challenge is the uncertainty to how much siloxane supply has and will be added in China. China's 12th five year plan included goals of investing in new materials that do not generate large amounts of waste. Given that China has access to silicon metal and is a huge consumer of silicone products it would not be surprising to see capacity additions by local companies over the next decade.

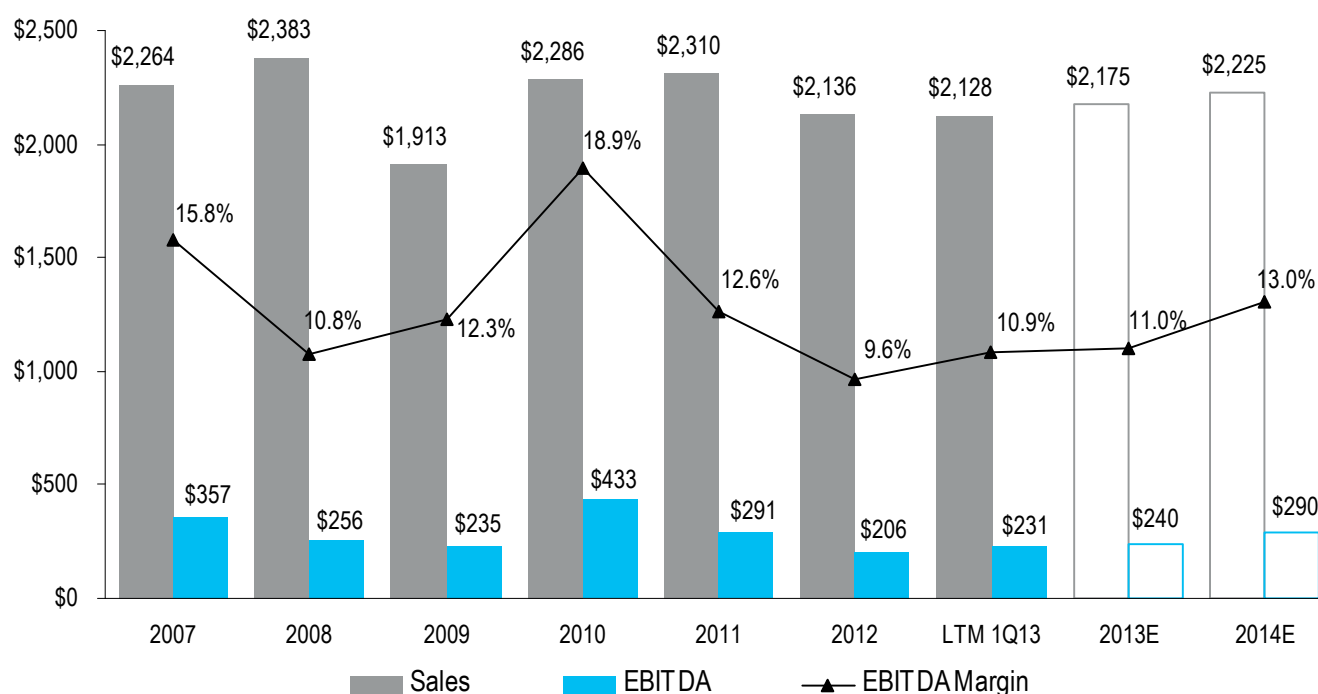
Seasonality

Though not significant, sales are typically stronger during the second and fourth quarters due to increased industrial activity.

Financial Performance

After peaking at \$433mm in 2010 segment EBITDA has dropped by over 50% as new capacity weighed on results. We forecast sales and EBITDA to slowly recover over the next couple of years as demand growth helps absorb excess capacity. We see current conditions as trough-like and expect a return to mid teens margins over the longer-term.

Figure 28. Silicone Segment Historical and Projected Sales and EBITDA



Source: Citi Research and Company Reports.

Quartz

The **Quartz** business develops and manufactures fused quartz and ceramic materials. Commercial applications are used in industries such as semiconductor, lamp tubing, manufacturing, packaging, cosmetics, and fiber optics. In FY11, top 20 customers accounted for approximately 56% of total segment revenue with no single customer at more than 7% of the division total.

Raw Materials

Quartz Sand: Key raw material is quartz sand, supplied by Unimin Corporation, which is the only mine in the world currently identified as having high quality quartz required for semiconductor applications and controls more than 90% of the market. MOMENT has historically sourced its supply under a contract with Unimin. The long-term purchase contract expired at YE12 and a new agreement has yet to be announced.

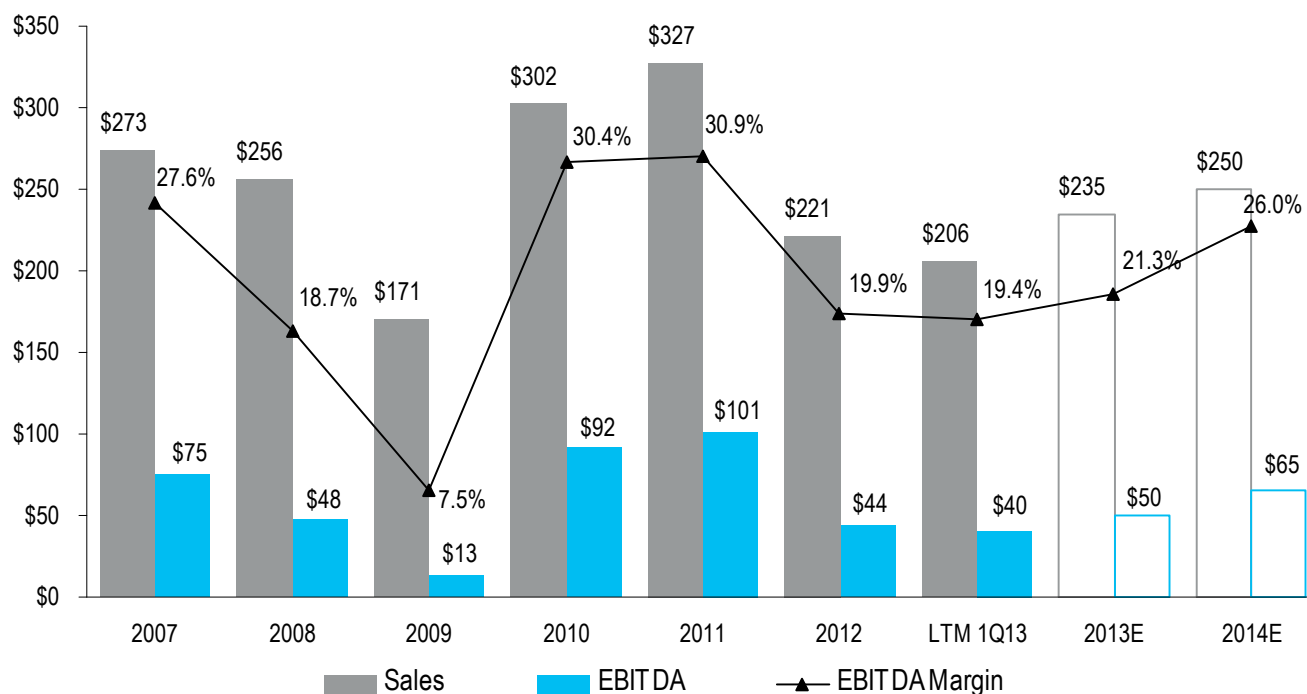
Seasonality

Though not significant, sales are typically stronger during the second and fourth quarters due to increased industrial activity.

Financial Performance

Quartz segment EBITDA has fallen by over 50% since it peaked at \$101mm in 2011 as a result of weak demand from the key semiconductor end market. We forecast gradual increases in sales and EBITDA over the next couple of years based on a gradual recovery in that end market.

Figure 29. Quartz Segment Historical and Projected Sales and EBITDA



Source: Citi Research and company reports.

Organizational Overview

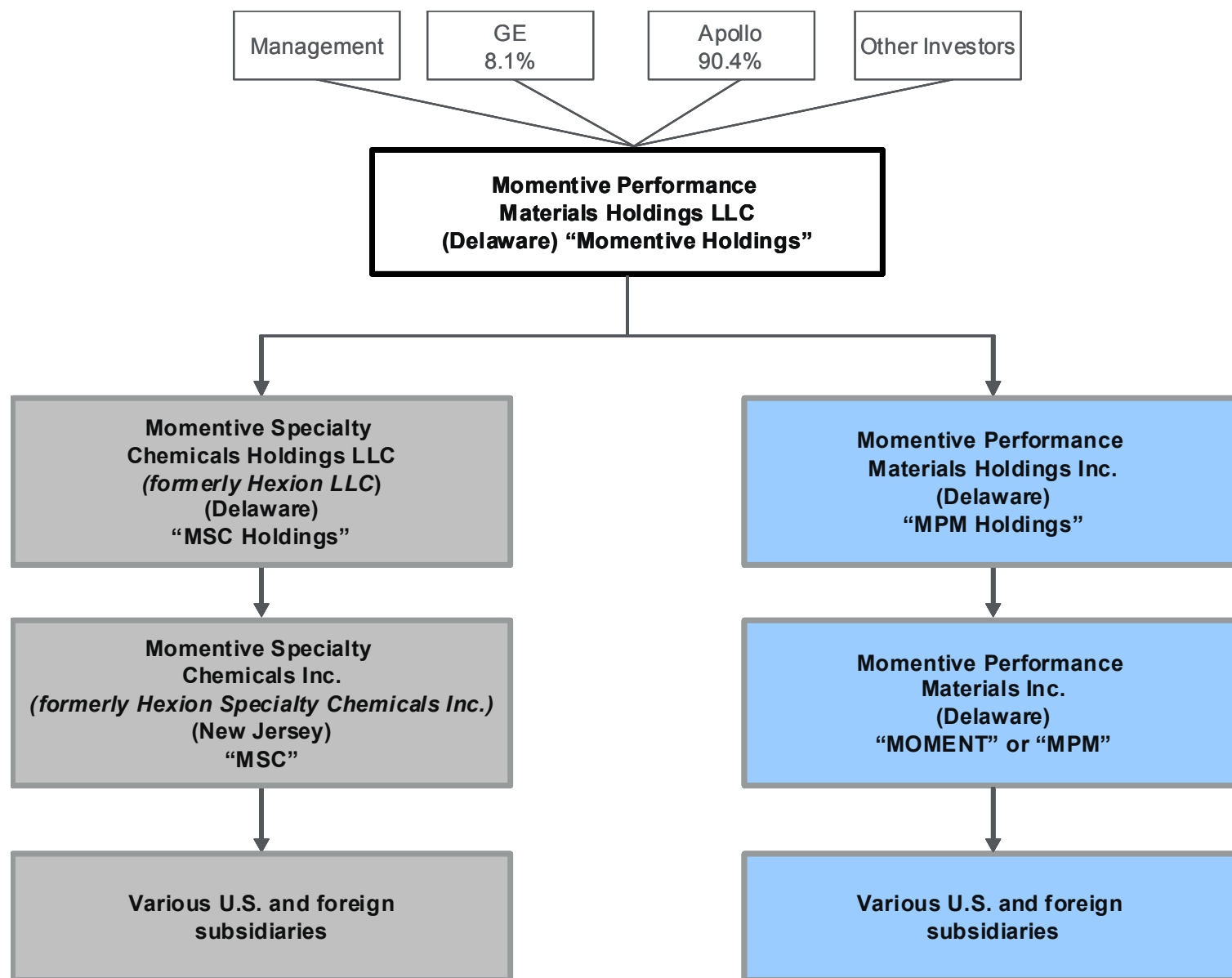
Momentive Performance Materials is the second largest producer of silicones and silicone derivatives as well as a global leader in the development and manufacture of products derived from quartz and specialty ceramics. As of March 31, 2013, LTM Sales and segment EBITDA was \$2,334mm and \$234mm (11.9% EBITDA margin), respectively.

MOMENT was formed in December 2006 when Apollo purchased GE Advanced Materials from GE for ~\$3.78B (~9x LTM EBITDA). GE still owns 10% of the company and was issued a \$400mm 11.0% Holdco PIK note maturing December 2017 (seller note).

On October 1, 2010, MPM Holdings merged with Momentive Specialty Chemicals LLC (formerly known as Hexion LLC), forming Momentive Performance Materials Holdings LLC (Momentive Holdings) as the surviving entity in a transaction known as the Momentive Combination. Momentive Holdings is the ultimate parent company of Momentive Performance Materials Inc. and Momentive Specialty Chemicals Inc., both operating subsidiaries under the current structure.

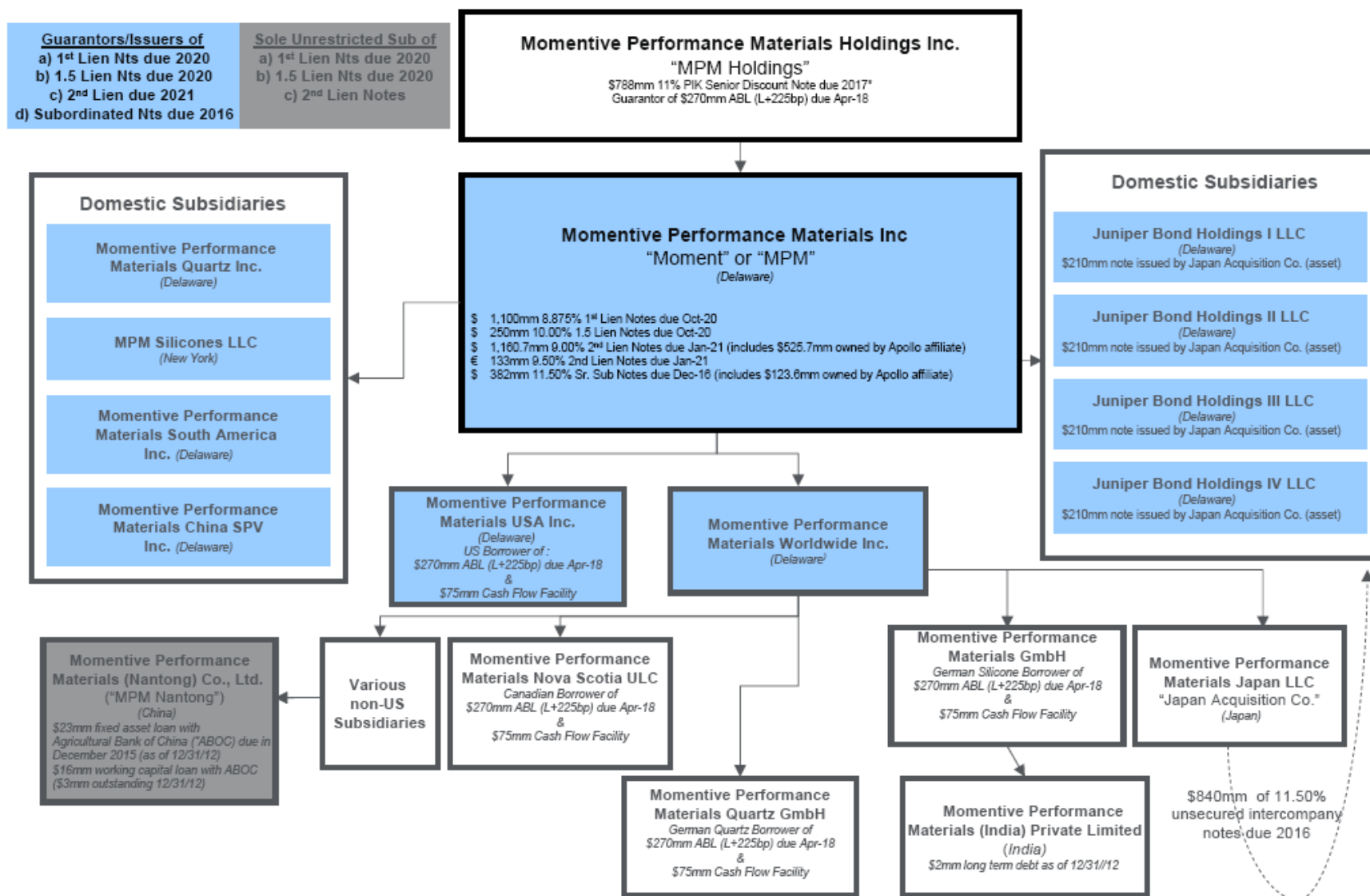
Momentive equity holders (Apollo, General Electric and management) were given 65% of the equity of the newly formed MPM Holdings which appeared to indicate that MOMENT was viewed to be the more valuable asset. As of 5/01/13, Apollo Funds owned 90.4% of the equity, GE owned 8.1% with the remainder held by management, executive officers and directors.

Figure 30. Momentive Performance Holdings LLC Simple Organizational Structure



Source: Citi Research, Company Filings.

Figure 31. Momentive Performance Materials Holdings Inc. Organizational Structure



Source: Citi Research, Company Filings.

Capital Structure & Covenants

Figure 32. MOMENT Capitalization Table (as of 3/31/13)

		Gross Leverage	Net Leverage	Bid Price	Offer YTW	Rating
LTM Adj. Segment EBITDA	\$234					
Debt						
ABL Facility (\$270mm, L+ 225bp, Apr 2018)	0					
8.875% 1st Lien Notes (\$1,100mm, Oct 2020)	1,100			\$104.50	7.81%	BUY
Total 1st Lien Debt	1,100	4.7x	4.2x			
10.00% 1.5 Lien Notes (Oct 2020)	250			\$103.75	9.08%	BUY
Total 1st & 1.5 Lien Debt	1,350	5.8x	5.3x			
ABOC Asset Loan due 2015	42					
India Bank Medium Term Loan 06/20/15	2					
Total Secured Debt	1,394	6.0x	5.5x			
9.0% 2nd Lien Nts (Jan 2021) (a.)	1,161			\$84.75	12.16%	BUY
9.5% 2nd Lien Nts (€133mm, Jan 2021)	170					
Total Debt Through 2nd Lien	2,724.9	11.6x	11.1x			
11.50% Sr. Sub. Notes (Dec 2016) (b.)	382			\$76.50	21.64%	NEUTRAL
Total Opco Debt	3,106.8	13.3x	12.8x			
GE Seller PIK Note (11%, Jun 2017)	788					
Total Holdco Debt	3,894.8	16.6x	16.1x			
U.S. Pension (underfunded) as of Dec-12	87					
Non U.S. Pension (underfunded) as of Dec-12	128					
OPEB (underfunded) as of Dec-12	91					
Total Debt + Other Liabilities	4,200.8	18.0x	17.5x			
Liquidity						
Cash (\$113mm in foreign jurisdictions) (c.)	\$116					
Revolver Availability (d.)	174					
Total	\$290					

(a.) Affiliate of Apollo owns \$525.7mm of 9.0% 2nd Lien Nts due 2021 per S-1 filed on 5/7/13.

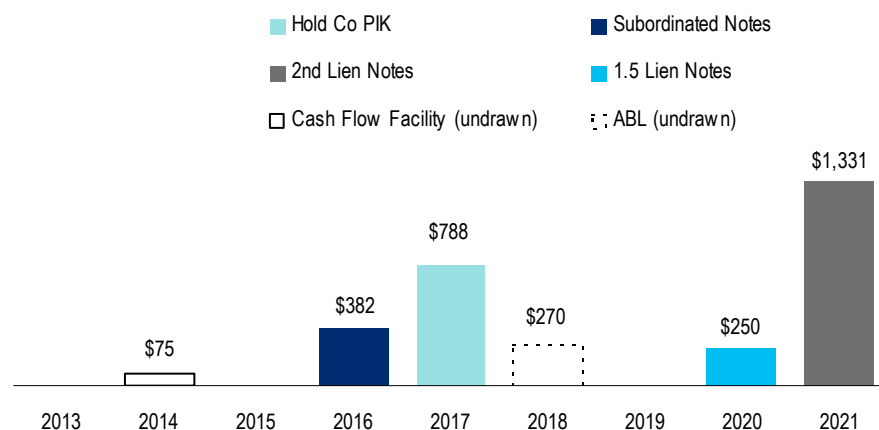
(b.) Affiliate of Apollo owns \$124.3mm of 11.5% Sr. Sub Notes due 2016 per S-1 filed on 5/7/13.

(c.) Doesn't take into account \$101.8mm one time payment received on 5/17/13 from new PSA agreement.

(d.) Liquidity pro forma April 2013 refinancing of credit facilities.

Source: Citi Research, Company Reports.

Figure 33. MOMENT Maturity Profile



Note: Pro-forma April 2013 refinancing of RCF with ABL (due Apr-18) and Cash Flow Facility (due Dec-14).

Source: Citi Research, Company Reports

Figure 34. Momentive Bond Covenant Summary

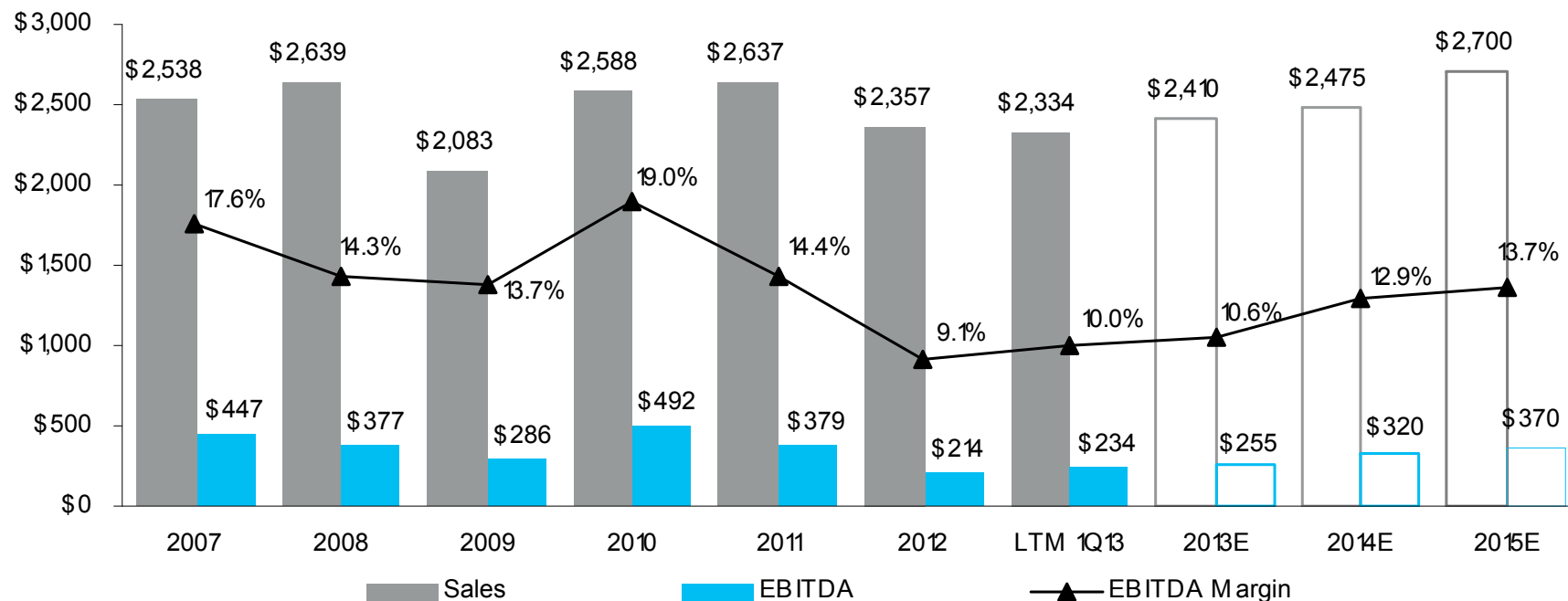
Coupon	8.875%	10.000%	9.000%	9.500%	11.500%
Level	1st Lien Secured	1.5 Lien Secured	2nd Lien Secured	2nd Lien Secured	Senior Subordinated
Maturity Date	10/15/20	10/15/20	01/15/21	01/15/21	12/01/16
Issue Date	01/24/13	01/11/13	06/14/11	06/14/11	01/29/08
Notional	\$1,100.0	\$250.0	\$1,161.0	€ 132.8	\$381.9
Notional Owned by Apollo	\$0.0	\$0.0	\$525.7	€ 0.0	\$124.3
% Owned by Apollo			45.3%		32.6%
Optional Redemption					
Call Schedule	10/15/15: \$106.656 10/15/16: \$104.438 10/15/17: \$102.219 10/15/18: \$100.000	10/15/15: \$107.500 10/15/16: \$105.000 10/15/17: \$102.500 10/15/18: \$100.000	01/15/16: \$104.500 01/15/17: \$103.000 01/15/18: \$101.500 01/15/19: \$100.000	01/15/16: 104.750 01/15/17: 103.167 01/15/18: 101.583 01/15/19: 100.000	12/01/11: \$105.750 12/01/12: \$103.833 12/01/13: \$101.970 12/01/14: \$100.000
Make-Whole	T+50bp	T+50bp	T+50bp	T+50bp	T+50bp
Equity Claw	35% until 10/15/15 @ \$108.875	35% until 10/15/15 @ \$110.00	35% until 01/15/14 @ \$109.00	35% until 01/15/14 @ 109.50	Expired
COC @ 101 (permitted holders)	Y	Y	Y	Y	Y
Debt Incurrence					
Fixed Charge Coverage Ratio (Ratio Debt)	Greater than or equal to 2.0x	Greater than or equal to 2.0x	Greater than or equal to 2.0x	Greater than or equal to 2.0x	Greater than or equal to 2.0x
Credit Agreement	Greater of \$1,500mm and Secured Leverage Ratio up to 3.75x	Greater of \$1,500mm and Secured Leverage Ratio up to 3.75x	Greater of \$1,500mm and Secured Leverage Ratio up to 3.75x	Greater of \$1,500mm and Secured Leverage Ratio up to 3.75x	Greater of \$1,500mm and Secured Leverage Ratio up to 3.50x
Receivables Facilities	Unlimited	Unlimited	Unlimited	Unlimited	Unlimited
Capital Leases, CAPEX or Acquired Indebtedness	Not to exceed greater of \$150mm and 5.0% of Total Assets	Not to exceed greater of \$150mm and 5.0% of Total Assets	Not to exceed greater of \$150mm and 5.0% of Total Assets	Not to exceed greater of \$150mm and 5.0% of Total Assets	Not to exceed greater of \$150mm and 4.5% of Total Assets
Foreign Subsidiary Indebtedness	Not to exceed greater of \$150mm and 5.0% of Total Assets	Not to exceed greater of \$150mm and 5.0% of Total Assets	Not to exceed greater of \$150mm and 5.0% of Total Assets	Not to exceed greater of \$150mm and 5.0% of Total Assets	Not to exceed greater of \$150mm and 4.5% of Total Assets
General Debt Basket	Not to exceed greater of \$150mm and 5.0% of Total Assets	Not to exceed greater of \$150mm and 5.0% of Total Assets	Not to exceed greater of \$150mm and 5.0% of Total Assets	Not to exceed greater of \$150mm and 5.0% of Total Assets	Not to exceed greater of \$75mn and 2.25% of Total Assets
Liens Incurrence					
Credit Agreement	Greater of \$1,500mm and Secured Leverage Ratio up to 3.75x	Greater of \$1,500mm and Secured Leverage Ratio up to 3.75x	Greater of \$1,500mm and Secured Leverage Ratio up to 3.75x	Greater of \$1,500mm and Secured Leverage Ratio up to 3.75x	Greater of \$1,500mm and Secured Leverage Ratio up to 3.50x
Receivables Facilities	Unlimited	Unlimited	Unlimited	Unlimited	Unlimited
Capital Leases, CAPEX or Acquired Indebtedness	Not to exceed greater of \$150mm and 5.0% of Total Assets	Not to exceed greater of \$150mm and 5.0% of Total Assets	Not to exceed greater of \$150mm and 5.0% of Total Assets	Not to exceed greater of \$150mm and 5.0% of Total Assets	Not to exceed greater of \$150mm and 4.5% of Total Assets
Foreign Subsidiary Indebtedness	Not to exceed greater of \$150mm and 5.0% of Total Assets	Not to exceed greater of \$150mm and 5.0% of Total Assets	Not to exceed greater of \$150mm and 5.0% of Total Assets	Not to exceed greater of \$150mm and 5.0% of Total Assets	Not to exceed greater of \$150mm and 4.5% of Total Assets
General Debt Basket	Not to exceed greater of \$150mm and 5.0% of Total Assets	Not to exceed greater of \$150mm and 5.0% of Total Assets	Not to exceed greater of \$150mm and 5.0% of Total Assets	Not to exceed greater of \$150mm and 5.0% of Total Assets	Not to exceed greater of \$75mn and 2.25% of Total Assets
General Liens Basket	\$30mm	\$30mm	\$30mm	\$30mm	\$30mm
Restricted Payments					
50% of Net Income (100% of loss) since:	07/01/12	04/01/12	10/01/10	10/01/10	01/01/07
General RP Basket	Not to exceed greater of \$50mm and 1.0% of Total Assets	Not to exceed greater of \$50mm and 1.0% of Total Assets	Not to exceed greater of \$50mm and 1.0% of Total Assets	Not to exceed greater of \$50mm and 1.0% of Total Assets	Not to exceed greater of \$50mm and 1.0% of Total Assets
Shareholder Dividends	No restriction	No restriction	No restriction	No restriction	Requires PF Leverage < 6.00x
Asset Sales					
Form	At least 75% in cash	At least 75% in cash	At least 75% in cash	At least 75% in cash	At least 75% in cash
Use	Within 365 days proceeds must be applied to repay debt or CAPEX or similar investments	Within 365 days proceeds must be applied to repay debt or CAPEX or similar investments	Within 365 days proceeds must be applied to repay debt or CAPEX or similar investments	Within 365 days proceeds must be applied to repay debt or CAPEX or similar investments	Within 365 days proceeds must be applied to repay debt or CAPEX or similar investments
Fallaway Covenants	Restrictive covenants fall away if bonds rated IG by Moody's & S&P	Restrictive covenants fall away if bonds rated IG by Moody's & S&P	Restrictive covenants fall away if bonds rated IG by Moody's & S&P	Restrictive covenants fall away if bonds rated IG by Moody's & S&P	Restrictive covenants fall away if bonds rated IG by Moody's & S&P

Source: Citi Research, Company Reports

Financial Projections

We forecast EBITDA to rebound from trough levels over the next several years as demand growth for silicones absorbs excess supply and semiconductor demand eventually rebounds. We expect leverage to drop over the next several years, but to remain elevated and for liquidity to continue to remain strained.

Figure 35. Historical and Forecasted Sales and EBITDA



Source: Citi Research, Company Reports

Figure 36. Historical and Forecasted Summary Financials

Operating Statistics	Fiscal Year				LTM			Quarterly				Fiscal Year End		
	2007A	2008A	2009A	2010A	2011A	2012	3/31/2013	1Q13A	2Q13E	3Q13E	4Q13E	2013E	2014E	2015E
Rating (Moody's/S&P)	(B3/B)	(B3/B-)	(B3/CCC+)	(B3/B-)	(B3/B-)	(Caa1/CCC)	(Caa1/CCC)	(Caa1/CCC)	(Caa1/CCC)	(Caa1/CCC)				
Revenue	\$2,538	\$2,639	\$2,083	\$2,588	\$2,637	\$2,357	\$2,334	\$570	\$650	\$608	\$582	\$2,410	\$2,500	\$2,700
Growth			(21.1%)	24.2%	1.9%	(10.6%)		(13.6%)	(10.7%)	(6.9%)	(2.3%)	(8.6%)	3.7%	8.0%
Adjusted EBITDA	447	377	286	492	379	214	234	68	72	57	57	255	320	370
Margin	17.6%	14.3%	13.7%	19.0%	14.4%	9.1%	10.0%	11.9%	11.1%	9.4%	9.9%	10.6%	12.8%	13.7%
Cash	249	341	210	254	203	110	116	116	187	146	63	63	(75)	(183)
Secured Debt	1,116	1,272	1,402	1,239	1,220	2,730	2,725	2,725	2,725	2,725	2,725	2,725	2,725	2,725
Other Debt	2,407	2,464	2,207	2,354	2,403	1,149	1,175	1,175	1,196	1,219	1,239	1,239	1,332	1,436
Total Debt	3,523	3,735	3,609	3,593	3,623	3,880	3,900	3,900	3,922	3,944	3,964	3,964	4,058	4,162
CASH FLOW														
Adjusted EBITDA	447	377	286	492	379	214	234	68	72	57	57	255	320	370
Cash Interest	(277)	(258)	(219)	(208)	(203)	(237)	(237)	(61)	(83)	(61)	(83)	(288)	(294)	(294)
Cash Taxes	(37)	(11)	0	(8)	(22)	(18)	(18)	(5)	(5)	(5)	(5)	(19)	(19)	(19)
Chg in Working Capital	150	113	5	3	12	32	(11)	(22)	11	(7)	(3)	(21)	(16)	(36)
OCF	284	221	73	280	166	(9)	(32)	(20)	(5)	(15)	(33)	(73)	(9)	21
CAPEX	(177)	(139)	(77)	(95)	(111)	(107)	(107)	(20)	(25)	(25)	(25)	(95)	(100)	(100)
M&A + JV, net	(63)	(10)	(3)	(4)	(8)	5	5	(1)	(1)	(1)	(1)	(4)	(4)	(4)
Dividends	0	0	0	(1)	(1)	0	0	0	0	0	0	0	0	0
Other	(55)	(44)	(36)	(94)	(106)	(121)	(86)	(2)	102	0	(24)	76	(25)	(25)
FCF	(12)	28	(44)	86	(60)	(232)	(220)	(43)	71	(41)	(83)	(96)	(138)	(108)
LEVERAGE														
Net 1st Lien	1.9x	2.5x	3.6x	1.7x	2.2x	4.8x	4.4x	4.4x	4.0x	4.0x	4.2x	4.2x	3.8x	3.6x
Net 1.5 Lien	1.9x	2.5x	3.6x	1.7x	2.2x	4.8x	4.4x	4.4x	4.0x	4.0x	4.2x	4.2x	3.8x	3.6x
Net 2nd Lien	1.9x	2.5x	4.2x	2.0x	2.7x	12.2x	11.2x	11.2x	10.5x	10.4x	10.4x	10.4x	8.8x	7.9x
Net Unsecured	5.2x	6.4x	8.6x	4.8x	6.2x	12.2x	11.2x	11.2x	10.5x	10.4x	10.5x	10.5x	8.8x	7.9x
Net Subordinated	6.3x	7.7x	10.0x	5.5x	7.2x	14.0x	12.8x	12.8x	12.1x	12.0x	12.0x	12.0x	10.0x	8.9x
Net HoldCo	7.3x	9.0x	11.9x	6.8x	9.0x	17.6x	16.2x	16.2x	15.5x	15.3x	15.3x	15.3x	12.9x	11.7x

Source: Citi Research, Company Reports

EXHIBITS

Figure 37. HY Chemicals Relative Value

Coupon	Description	Rating	Maturity	Ratings (Moody's/S&P)	Amount Outst.	Bid	Ask	Current Prices			Next Call Data		Sales LTM	EBITDA LTM	EBITDA Margin	Cash Balance	Net Leverage	EV/EBITDA	Mkt Cap
								YTW (%)	Z-SPRD	YTW Date	Date	Price							
ASHLAND INC (ASH)																			
3.000%	Sr Nts	Buy (1)	3/15/2016	Ba1(S)/BB(S)	\$600.0	100.500	101.500	2.80%	209	2/15/2016	2/15/2016	100.00	\$8,040.0	\$1,408.0	17.5%	\$468.0	2.2x	LTM Date: 7.0x	3/31/2013 \$6,746
3.875%	Sr Nts	Buy (1)	4/15/2018	Ba1(S)/BB(S)	\$700.0	98.500	99.500	4.22%	270	4/15/2018	3/15/2018	100.00					2.2x		
4.750%	Sr Nts	Buy (1)	8/15/2022	Ba1(S)/BB(S)	\$650.0	98.500	99.000	4.96%	233	8/15/2022	NC	NC					2.2x		
4.750%	Sr Nts	Buy (1)	8/15/2022	Ba1(S)/BB(S)	\$500.0	98.000	99.000	5.03%	240	8/15/2022	NC	NC					2.2x		
6.600%	Sr Nts		8/1/2027	Ba1(S)/NR(S)	\$2.9	NA	NA										2.2x		
6.875%	Sr Nts	Neutral (2)	5/15/2043	Ba1(S)/BB(S)	\$350.0	103.000	103.750	6.64%	324	2/15/2043	NC	NC					2.2x		
6.500%	Jr Sub Nts		6/30/2029	Ba2(S)/B+(S)	\$129.0	NA	NA										2.2x		
ASH is a manufacturer of specialty chemicals and through its Valvoline brand, a marketer of premium-branded automotive and commercial lubricants.																			
AXIALL CORP (AXLL)																			
L+250	Eagle Spino TLB		1/28/2017	Ba1	\$196.3								\$3,527.1	\$735.0	20.8%	\$69.2	0.4x	LTM Date: 5.9x	3/31/2013 \$2,885
4.875%	Sr Nts	Buy (1)	5/15/2023	Ba3(S)/BB(S)	\$450.0	94.500	95.500	5.61%		5/15/2023	5/15/2018	102.44					2.0x		
4.625%	Sr Nts	Buy (1)	2/15/2021	Ba3(S)/BB	\$688.0	95.500	96.500	5.35%	301	2/15/2021	2/15/2018	102.31					2.0x		
AXLL is created from the combination of Georgia Gulf and the PPG commodity chemicals business in 2012. The company is an integrated chemicals & building products company; US nat gas benefit will make AXLL one of the low cost chlor-alkali producers.																			
CELANESEUS HOLDINGS LLC (CE)																			
L+275	USD Term Loan C-EXT		10/31/2016	Ba1(P)/BBB(S)	\$1,140.0	100.750	100.750	2.78%					\$6,390.0	\$1,299.0	20.3%	\$978.0	0.5x	LTM Date: 7.3x	3/31/2013 \$7,408
L+275	EUR Term Loan C-EXT		10/31/2016	Ba1(P)/BBB(S)	€ 203.9	99.750	100.750	2.97%									1.6x		
6.625%	Sr Nts	Neutral (2)	10/15/2018	Ba2(P)/BB+(S)	\$600.0	105.750	106.750	4.44%	405	10/15/2014	10/15/2014	103.31					1.6x		
5.875%	Sr Nts	Buy (1)	6/15/2021	Ba2(P)/BB+(S)	\$400.0	105.000	106.000	5.10%	272	6/15/2021	NC	NC					1.6x		
4.625%	Sr Nts	Buy (1)	11/15/2022	Ba2(P)/BB+(S)	\$500.0	95.750	96.750	5.20%	254	11/15/2022	NC	NC					1.6x		
CE is a medium sized diversified chemicals company producing acetyles, emulsions (VAM), acetate tow and engineered thermoplastics.																			
CHEMTURA CORP (CHMT)																			
L+400	Term Loan B- EXT		8/27/2016	Ba1(S)/BB+(S)	\$418.0	100.625	101.375	5.28%					\$2,816.0	\$360.0	12.8%	\$251.0	0.5x	LTM Date: 7.6x	3/31/2013 \$2,105
7.875%	Sr Nts	Buy (1)	9/1/2018	B1(S)/BB-(S)	\$455.0	111.250	112.250	1.27%	89	9/1/2014	9/1/2014	103.94					1.7x		
CHMT produces and supplies pool & spa products, niche agricultural products, petroleum additives, and urethane polymers which it sells into automotive, transportation, construction, packaging, agriculture, electronics and pool and spa end markets.																			
INEOS GROUP HOLDINGS SA (INEGRP)																			
L+200	Short-Dated Dollar Term Loan		5/4/2015		\$370.5	100.750	101.750						€ 17,952.4	€ 1,466.6	8.2%	€ 1,250.0	0.1x	LTM Date: NA	3/31/2013 NA
Euribor+325	Euro Term Loan		5/4/2018		€ 847.7	98.750	99.250										0.1x		
L+300	Dollar Term Loan		5/4/2018		\$2,616.6	98.625	99.625										0.1x		
8.375%	1st Lien Nts	Buy (1)	2/15/2019	B1(P)/BB-	\$1,000.0	108.750	109.750	6.15%	509	2/15/2017	2/15/2015	106.28					2.5x		
7.250%	1st Lien Nts		2/15/2019	B1(P)/BB-	€ 500.0	NA	NA	5.35%	NA	2/15/2015	2/15/2015	102.00					2.5x		
7.500%	1st Lien Nts	Buy (1)	5/1/2020	B1(P)/BB-	\$775.0	106.250	107.250	5.98%	448	5/1/2018	5/1/2015	105.63					2.5x		
6.125%	Sr Nts		8/15/2018	Caa1	\$678.0	98.625	99.625	6.44%	482	8/15/2018	5/15/2015	103.06					3.9x		
6.500%	Sr Nts		8/15/2018	Caa1	€ 500.0	96.625	97.375	7.31%	624	8/15/2018	5/15/2015	103.06					3.9x		
INEGRP produces olefins, polymers and intermediate chemicals. The company is one of the largest petrochemical companies in the world with 2011 revenue of € 17.6B and € 1.7B of EBITDA before exceptionals.																			

Note: (ASH; OW); (AXLL; OW); (CE; OW); (CHMT; OW); (INEGRP; MW)
Source: Bloomberg, Citi Research, Company Filings. Pricing as of 7/10/13.

Figure 38. HY Chemicals Relative Value

Coupon	Description	Rating	Maturity	Ratings (Moody's/S&P)	Amount Outst.	Bid	Ask	Current Prices			Next Call Data		Sales LTM	EBITDA LTM	EBITDA Margin	Cash Balance	Net Leverage	EV/EBITDA	Mkt Cap
								YTW (%)	Z-SPRD	YTW Date	Date	Price							
MOMENTIVE PERFORMANCE (MOMENT)																			LTM Date: 3/31/2013
8.875%	1st Lien Nts		10/15/2020	B1(N)/CCC+(N)	\$1,100.0	104.500	105.500	7.81%	618	10/15/2018	10/15/2015	106.66	\$2,334.0	\$234.0	10.0%	\$116.0	4.2x	NA	NA
10.000%	1.5 Lien Nts		10/15/2020	B2(N)/CC(N)	\$250.0	103.750	104.750	9.08%	747	10/15/2018	10/15/2015	107.50					5.3x		
9.500%	2nd Lien Nts		1/15/2021	Caa1(N)/NA(N)	€ 132.8	80.000	82.000	13.87%	1247	1/15/2021	1/15/2016	104.75					11.0x		
9.000%	2nd Lien Nts		1/15/2021	Caa1(N)/CC(N)	\$635.0	84.750	86.750	12.16%	999	1/15/2021	1/15/2016	104.50					11.0x		
9.000%	2nd Lien Nts		1/15/2021	Caa1(N)/NA(N)	\$525.7	85.375	87.375	12.01%	984	1/15/2021	1/15/2016	104.50					11.0x		
11.500%	Sr Sub Nts		12/1/2016	Caa3(N)/CC(N)	\$381.9	76.500	78.500	21.64%	2069	12/1/2016	8/12/2013	103.83					12.8x		
Momentive is one of the world's largest producers of silicones, silicone derivatives, quartz, and specialty ceramics.																			
MOMENTIVE SPECIALTY CHEM (HXN)																			LTM Date: 3/31/2013
6.625%	1st Lien Nts		4/15/2020	B1/B-	\$1,100.0	100.000	101.000	6.62%	513	4/15/2018	4/15/2015	104.97	\$4,712.0	\$449.0	9.5%	\$397.0	2.8x	NA	NA
6.625%	1st Lien Nts		4/15/2020	B1/B-	\$450.0	100.000	101.000	6.62%	513	4/15/2018	4/15/2015	104.97					2.8x		
8.875%	1.5 Lien Nts		2/1/2018	Caa1/CCC+	\$1,000.0	103.500	104.500	7.73%	669	2/1/2017	2/1/2014	104.44					5.5x		
8.875%	1.5 Lien Nts		2/1/2018	Caa1/CCC+	\$200.0	93.000	102.500	10.86%	948	2/1/2018	2/1/2014	104.44					5.5x		
9.000%	2nd Lien Nts		11/15/2020	Caa2/CCC+	\$439.8	97.000	99.000	9.57%	742	11/15/2020	11/15/2015	104.50					6.7x		
9.200%	Sr Nts		3/15/2021	Caa2(P)/CCC+(S)	\$74.0	90.250	90.250	11.12%	892	3/15/2021	NC	NC					7.8x		
7.875%	Sr Nts		2/15/2023	Caa2(P)/CCC+(S)	\$188.4	84.250	86.500	10.52%	798	2/15/2023	NC	NC					7.8x		
8.375%	Sr Nts		4/15/2016	Caa2(P)/CCC+(S)	\$59.7					8/12/2013	8/12/2013	100.00					7.8x		
Momentive Specialty Chemicals (MSC or HXN) is the world's largest producer of thermosetting resins, or thermosets, a critical ingredient in virtually all paints, coatings, glues and other adhesives produced for consumer or industrial uses.																			
NOVA CHEMICALS CORP (NCX)																			LTM Date: 3/31/2013
8.375%	Sr Nts	Neutral (2)	11/12/2016	Ba2(S)/BB+(S)	\$345.0	105.750	106.750	2.86%	258	11/12/2013	11/12/2013	104.19	\$4,965.0	\$1,170.0	23.6%	\$499.0	0.2x	NA	NA
8.625%	Sr Nts	Neutral (2)	11/12/2016	Ba2(S)/BB+(S)	\$345.0	105.250	111.250	3.72%	331	11/12/2014	11/12/2014	104.31					0.2x		
NCX, based in Calgary, Alberta, Canada is a leading producer of ethylene and polyethylene. NCX was purchased by International Petroleum Investment Company (IPIC, Aa3/AA) in July 2009.																			
OLIN CORP (OLN)																			LTM Date: 3/31/2013
6.750%	Sr Nts	Neutral (2)	6/15/2016	Ba1(S)/BB+(S)	\$125.0	102.000	109.875	2.46%	165	6/15/2016	NC	NC	\$2,307.5	\$386.0	16.7%	\$93.0	10x	6.7x	\$1956
8.875%	Sr Nts	Neutral (2)	8/15/2016	Ba1(S)/BB+(S)	\$150.0	109.250	109.250	4.10%	373	8/15/2014	8/15/2014	104.44					10x		
5.500%	Sr Nts	Buy (1)	8/15/2022	Ba1(S)/BB+(S)	\$200.0	102.000	101.250	5.22%	262	8/15/2022	NC	NC					10x		
OLN is primarily a producer of chlor alkali (chlorine and caustic soda) and its derivatives (bleach), as well as a manufacturer of brand name small caliber ammunition ("Winchester").																			
POLYONE CORP (POL)																			LTM Date: 12/31/2012
7.500%	1st Lien Nts		12/15/2015	Baa2(S)/BB+	\$50.0	111.750	111.750	2.46%	182	12/15/2015	NC	NC	Pf \$4,192.2	Pf \$345.0	8.2%	Pf \$213.0	Pf -0.5x	10.4x	\$2,776
7.375%	Sr Nts	Neutral (2)	9/15/2020	Ba3(S)/BB-(S)	\$360.0	108.500	109.500	4.83%	426	9/15/2015	9/15/2015						2.4x		
5.250%	Sr Nts	Neutral (2)	3/15/2023	Ba3(S)/BB-(S)	\$600.0	99.000	99.500	5.38%	269	3/15/2023	NC	NC					2.4x		
POL is a global provider of specialized polymer materials, services, and solutions. It was formed in August 2000 through the merger of Geon Co. with M. A. Hanna Co.																			
POLYMER GROUP INC (POLGA)																			LTM Date: 3/31/2013
7.750%	1st Lien Nts	Neutral (2)	2/1/2019	B1(S)/B(S)	\$560.0	105.000	105.500	6.1%	512	2/1/2017	2/1/2015	103.88	\$1,147.1	\$1219	10.6%	\$74.6	4.1x	NA	NA
POLGA is one of the world's largest producers of nonwoven materials which has end uses in various disposable products (i.e. diapers, feminine hygiene products, wipes, surgical gowns & drapes and various industrial applications).																			
ROCKWOOD SPECIALTIES GRO (ROC)																			LTM Date: 3/31/2013
L+225	Term Loan A		2/22/2017	Baa3(S)/BBB(P)	\$323.8	100.000	100.750	2.52%					\$3,532.0	\$712.2	20.2%	\$491.1	0.7x	9.8x	\$5,217
L+250	Term Loan B		2/10/2018	Baa3(S)/BBB(P)	\$587.3	100.000	101.250	3.50%									0.7x		
4.625%	Sr Nts	Buy (1)	10/15/2020	Ba2(S)/BB(P)	\$1250.0	100.500	101.500	4.52%	282	10/15/2018	10/15/2015	103.47					2.4x		
ROC is a global producer of a variety of specialty chemicals and advanced materials used for a number of industrial and commercial purposes.																			
TROXO FINANCE LLC (TROX)																			LTM Date: 3/31/2013
L+225	Term Loan A		3/19/2020	Ba2/BBB-	\$1500.0	100.625	100.625	4.39%					\$2,074.0	\$545.0	26.3%	\$1375.0	19x	4.2x	\$1257
6.375%	Sr Nts	Buy (1)	8/15/2020	B2(S)/BB-	\$900.0	94.750	95.750	7.34%	516	8/15/2020	8/15/2015	104.78							
TROX is the only fully integrated global producer of TiO2 and mineral sands post its recent acquisition of Exaro Mineral Sands business.																			
TRINSEO OP / TRINSEO FIN (TRINSE)																			LTM Date: 3/31/2013
8.750%	Sr Secured Nts		2/1/2019	B1/B+	\$1,325.0	97.750	98.750	9.28%	756	2/1/2019	8/1/2015	104.38		\$232.0					Private
Trinseo is a leading producer of styrenics and has diversified into the world's largest producer of styrene butadiene (SB) latex, the largest European producer of synthetic rubber (solution styrene butadiene rubber - SBR), the third largest global producer of polystyrene.																			
US COATINGS ACQUISITION INC (USCOAT)																			LTM Date: 3/31/2013
L+350	TLB		2/1/2020	B1/B+	\$2,300.0	100.250	100.875	4.7%			2/1/2014								Private
5.750%	Sr Secured Nts		2/1/2021	B1/B+	\$250.0	99.500	101.000	5.83%	433	2/1/2021	2/1/2016	104.31							
7.375%	Sr Nts		5/1/2021	Caa1/B-	\$750.0	101.250	102.250	7.10%	535	2/4/2019	2/4/2016	105.53							

Pricing Source: Citi, Bloomberg. EV/EBITDA multiple based on current fiscal year estimate.

*AXLL PF reflects GGC & PPG Commodity Chemicals Combination; INEGRP PF reflects refi announced on 4/30/13; PolyOne PF reflects results of the Spartech Acquisition in FY12.

(NCX; MW); (OLN; MW); (POL; OW); (ROC; OW); (TROX; OW); (POLGA; OW)

Source: Bloomberg, Citi Research, Company Filings. Pricing as of 7/10/13.

Key Industry Terms

Fused Quartz

A man-made glass manufactured principally from quartz sand which is used in processes requiring extreme temperature, high purity and other specific characteristics.

Polymer

A polymer is a large molecule made up of smaller molecular units (monomers). It contains between 10,000 and 100,000 monomers.

Semiconductor

Semiconductors are used extensively in electronic circuits. As implied by its name, a semiconductor is a material that conducts current, but only partly. Most semiconductors are crystals made of certain materials, most commonly silicon.

Ingots are circular pieces of single-crystal semiconductor material resulting from a crystal growth process; an ingot is ready to be shaped and sliced into wafers used to manufacture semiconductor devices. **Quartz glass crucibles** are used by the semiconductor and solar industries for growing for growing single crystal from silicon metal.

Silanes

Silanes are used as monomers for the synthesis of siloxanes or sold directly as reagents or raw materials. Typical applications include surface treatment, reagents in pharmaceutical synthesis or coupling agents for coatings.

Silicon

After oxygen, silicon is the most common element on the planet. In nature, it occurs without exception in the form of compounds, chiefly silicon dioxide and silicates. Silicon is obtained through energy-intensive reaction of quartz sand with carbon and is the most important raw material in the electronics industry.

Silicon Wafer

A silicon wafer is an ultra thin disc used by the semiconductor industry for the manufacture of semiconductor devices (i.e. integrated circuits and discrete components).

Silicones

General term used to describe compounds of organic molecules and silicon. According to their areas of application, silicones can be classified as fluids, resins or rubber grades. Silicones are characterized by myriad outstanding properties. Typical areas of application include construction, the electrical and electronics industries, shipping and transportation, textiles and paper coatings.

Siloxanes

Systematic name given to compounds comprising silicon atoms linked together via oxygen atoms and with the remaining valences occupied by hydrogen or organic groups. Siloxanes are the building blocks for the polymers (polysiloxane and polyorganosiloxane) that form silicones.

Source: Semiconductor Industry Association, Wacker-Chemie and Company Reports.

Appendix A-1

Analyst Certification

The research analyst(s) primarily responsible for the preparation and content of this research report are named in bold text in the author block at the front of the product except for those sections where an analyst's name appears in bold alongside content which is attributable to that analyst. Each of these analyst(s) certify, with respect to the section(s) of the report for which they are responsible, that the views expressed therein accurately reflect their personal views about each issuer and security referenced and were prepared in an independent manner, including with respect to Citigroup Global Markets Inc and its affiliates. No part of the research analyst's compensation was, is, or will be, directly or indirectly, related to the specific recommendation(s) or view(s) expressed by that research analyst in this report.

IMPORTANT DISCLOSURES

Citigroup Global Markets Inc. owns a position of 1 million USD or more in the debt securities of PolyOne Corp

Citigroup Global Markets Inc. owns a position of 1 million USD or more in the debt securities of INEOS GROUP HOLDINGS LTD

Citigroup Global Markets Inc. owns a position of 1 million USD or more in the debt securities of Axiall Corp

Citigroup Global Markets Inc. owns a position of 1 million USD or more in the debt securities of Polymer Group Inc

Citigroup Global Markets Inc. owns a position of 1 million USD or more in the debt securities of Ashland Inc

Within the past 12 months, Citigroup Global Markets Inc. or its affiliates has acted as manager or co-manager of an offering of securities of MOMENTIVE PERFORMANCE MATERIALS INC, INEOS GROUP HOLDINGS LTD, Polymer Group Inc, Olin Corp, Ashland Inc.

Citigroup Global Markets Inc. or its affiliates has received compensation for investment banking services provided within the past 12 months from MOMENTIVE PERFORMANCE MATERIALS INC, PolyOne Corp, INEOS GROUP HOLDINGS LTD, ROCKWOOD SPECIALTIES GROUP INC, Polymer Group Inc, Olin Corp, Chemtura Corp, Ashland Inc, Celanese Corp, NOVA Chemicals Corp.

Citigroup Global Markets Inc. or its affiliates expects to receive or intends to seek, within the next three months, compensation for investment banking services from MOMENTIVE PERFORMANCE MATERIALS INC, ROCKWOOD SPECIALTIES GROUP INC, Chemtura Corp, Ashland Inc, NOVA Chemicals Corp.

Citigroup Global Markets Inc. or an affiliate received compensation for products and services other than investment banking services from MOMENTIVE PERFORMANCE MATERIALS INC, PolyOne Corp, INEOS GROUP HOLDINGS LTD, ROCKWOOD SPECIALTIES GROUP INC, Polymer Group Inc, Olin Corp, Chemtura Corp, Ashland Inc, Celanese Corp, Shin-Etsu Chemical, NOVA Chemicals Corp in the past 12 months.

Citigroup Global Markets Inc. currently has, or had within the past 12 months, the following as investment banking client(s): MOMENTIVE PERFORMANCE MATERIALS INC, PolyOne Corp, INEOS GROUP HOLDINGS LTD, ROCKWOOD SPECIALTIES GROUP INC, Polymer Group Inc, Olin Corp, Chemtura Corp, Ashland Inc, Celanese Corp, NOVA Chemicals Corp.

Citigroup Global Markets Inc. currently has, or had within the past 12 months, the following as clients, and the services provided were non-investment-banking, securities-related: MOMENTIVE PERFORMANCE MATERIALS INC, PolyOne Corp, INEOS GROUP HOLDINGS LTD, ROCKWOOD SPECIALTIES GROUP INC, Polymer Group Inc, Olin Corp, Chemtura Corp, Ashland Inc, Celanese Corp, Shin-Etsu Chemical, NOVA Chemicals Corp.

Citigroup Global Markets Inc. currently has, or had within the past 12 months, the following as clients, and the services provided were non-investment-banking, non-securities-related: MOMENTIVE PERFORMANCE MATERIALS INC, PolyOne Corp, INEOS GROUP HOLDINGS LTD, ROCKWOOD SPECIALTIES GROUP INC, Polymer Group Inc, Olin Corp, Chemtura Corp, Ashland Inc, Celanese Corp, Shin-Etsu Chemical, NOVA Chemicals Corp.

Analysts' compensation is determined based upon activities and services intended to benefit the investor clients of Citigroup Global Markets Inc. and its affiliates ("the Firm"). Like all Firm employees, analysts receive compensation that is impacted by overall firm profitability which includes investment banking revenues.

For important disclosures (including copies of historical disclosures) regarding the companies that are the subject of this Citi Research product ("the Product"), please contact Citi Research, 388 Greenwich Street, 28th Floor, New York, NY, 10013, Attention: Legal/Compliance [E6WYB6412478]. In addition, the same important disclosures, with the exception of the Valuation and Risk assessments and historical disclosures, are contained on the Firm's disclosure website at https://www.citivelocity.com/cvr/eppublic/citi_research_disclosures. Valuation and Risk assessments can be found in the text of the most recent research note/report regarding the subject company. Historical disclosures (for up to the past three years) will be provided upon request.

Citi Research Fixed Income Ratings Distribution

Data current as of 30 Jun 2013	Rating		
	Buy	Hold	Sell
Citi Research US High Yield Issuer Coverage	28%	57%	15%
% of companies in each rating category that are investment banking clients	74%	56%	65%
Citi Research US High Yield Issue Coverage	24%	55%	21%
% of companies in each rating category that are investment banking clients	78%	78%	78%

Citi Research Equity Ratings Distribution

Data current as of 30 Jun 2013	12 Month Rating			Relative Rating		
	Buy	Hold	Sell	Buy	Hold	Sell
Citi Research Global Fundamental Coverage	48%	40%	12%	6%	88%	6%
% of companies in each rating category that are investment banking clients	53%	50%	45%	58%	51%	49%

Guide to Citi Research Fundamental Research Investment Ratings:

Citi Research stock recommendations include an investment rating and an optional risk rating to highlight high risk stocks.

Risk rating takes into account both price volatility and fundamental criteria. Stocks will either have no risk rating or a High risk rating assigned.

Investment Ratings: Citi Research investment ratings are Buy, Neutral and Sell. Our ratings are a function of analyst expectations of expected total return ("ETR") and risk. ETR is the sum of the forecast price appreciation (or depreciation) plus the dividend yield for a stock within the next 12 months. The Investment rating definitions are: Buy (1) ETR of 15% or more or 25% or more for High risk stocks; and Sell (3) for negative ETR. Any covered stock not assigned a Buy or a Sell is a Neutral (2). For stocks rated Neutral (2), if an analyst believes that there are insufficient valuation drivers and/or investment catalysts to derive a positive or negative investment view, they may elect with the approval of Citi Research management not to assign a target price and, thus, not derive an ETR. Analysts may place covered stocks "Under Review" in response to exceptional circumstances (e.g. lack of information critical to the analyst's thesis) affecting the company and / or trading in the company's securities (e.g. trading suspension). As soon as practically possible, the analyst will publish a note re-establishing a rating and investment thesis. To satisfy regulatory requirements, we correspond Under Review and Neutral to Hold in our ratings distribution table for our 12-month fundamental rating system. However, we reiterate that we do not consider Under Review to be a recommendation.

Relative three-month ratings: Citi Research may also assign a three-month relative call (or rating) to a stock to highlight expected out-performance (most preferred) or under-performance (least preferred) versus the geographic and industry sector over a 3 month period. The relative call may highlight a specific near-term catalyst or event impacting the company or the market that is anticipated to have a short-term price impact on the equity securities of the company. Absent any specific catalyst the analyst(s) will indicate the most and least preferred stocks in the universe of stocks under consideration, explaining the basis for this short-term view. This three-month view may be different from and does not affect a stock's fundamental equity rating, which reflects a longer-term total absolute return expectation. For purposes of NASD/NYSE ratings-distribution-disclosure rules, most preferred calls correspond to a buy recommendation and least preferred calls correspond to a sell recommendation. Any stock not assigned to a most preferred or least preferred call is considered non-relative-rated (NRR). For purposes of NASD/NYSE ratings-distribution-disclosure rules we correspond NRR to Hold in our ratings distribution table for our 3-month relative rating system. However, we reiterate that we do not consider NRR to be a recommendation.

Prior to October 8, 2011, the firm's stock recommendation system included a risk rating and an investment rating. **Risk ratings**, which took into account both price volatility and fundamental criteria, were: Low (L), Medium (M), High (H), and Speculative (S). **Investment Ratings** of Buy, Hold and Sell were a function of the Citi Research expectation of total return (forecast price appreciation and dividend yield within the next 12 months) and risk rating. Additionally, analysts could have placed covered stocks "Under Review" in response to exceptional circumstances (e.g. lack of information critical to the analyst's thesis) affecting the company and/or trading in the company's securities (e.g. trading suspension). Stocks placed "Under Review" were monitored daily by management and as practically possible, the analyst published a note re-establishing a rating and investment thesis. For securities in developed markets (US, UK, Europe, Japan, and Australia/New Zealand), investment ratings were: Buy (1) (expected total return of 10% or more for Low-Risk stocks, 15% or more for Medium-Risk stocks, 20% or more for High-Risk stocks, and 35% or more for Speculative stocks); Hold (2) (0%-10% for Low-Risk stocks, 0%-15% for Medium-Risk stocks, 0%-20% for High-Risk stocks, and 0%-35% for Speculative stocks); and Sell (3) (negative total return). For securities in emerging markets (Asia Pacific, Emerging Europe/Middle East/Africa, and Latin America), investment ratings were: Buy (1) (expected total return of 15% or more for Low-Risk stocks, 20% or more for Medium-Risk stocks, 30% or more for High-Risk stocks, and 40% or more for Speculative stocks); Hold (2) (5%-15% for Low-Risk stocks, 10%-20% for Medium-Risk stocks, 15%-30% for High-Risk stocks, and 20%-40% for Speculative stocks); and Sell (3) (5% or less for Low-Risk stocks, 10% or less for Medium-Risk stocks, 15% or less for High-Risk stocks, and 20% or less for Speculative stocks).

Investment ratings are determined by the ranges described above at the time of initiation of coverage, a change in investment and/or risk rating, or a change in target price (subject to limited management discretion). At other times, the expected total returns may fall outside of these ranges because of market price movements and/or other short-term volatility or trading patterns. Such interim deviations from specified ranges will be permitted but will become subject to review by Research Management. Your decision to buy or sell a security should be based upon your personal investment objectives and should be made only after evaluating the stock's expected performance and risk.

Guide to Citi Research High Yield Ratings: Coverage in the Citi Research High Yield universe is assigned a relative return based rating. Depending on the issuer under analysis ratings may be applied to either some or all of the issuer's debt securities, bank loans or other instruments. These ratings and their definitions are:

Guide to Citi Research High Yield Issue Ratings:

Buy (1): The analyst expects the six-month total return of the rated debt security or instrument to exceed the market value weighted average total return for the analyst's sector or comparable sub-index of the Citi High Yield Market Index

Neutral (2): The analyst expects the six-month total return of the rated debt security or instrument to be in line with the market value weighted average total return for the analyst's sector or comparable sub-index of the Citi High Yield Market Index

Sell (3): The analyst expects the six-month total return of the rated debt security or instrument to be below the market value weighted average total return for the analyst's sector or comparable sub-index of the Citi High Yield Market Index

Guide to Citi Research High Yield Sector/Issuer Portfolio Weightings:

Overweight (OW): Over the next six months, the recommended sector or issuer is expected to outperform the returns on the relevant index or benchmark based on valuation and methodology provided below;

Marketweight (MW): Over the next six months, the recommended sector or issuer is expected to perform in line with the returns on the relevant index or benchmark based on valuation and methodology provided below;

Underweight (UW): Over the next six months, the recommended sector or issuer is expected to underperform the returns on the relevant index or benchmark based on valuation and methodology provided below;

Under Review: Citi Research has suspended the investment rating for this issuer because there is not a sufficient fundamental basis for determining an investment rating. The previous investment rating is no longer in effect for this issuer and should not be relied upon. To satisfy regulatory requirements, we correspond 'under review' to Hold in our ratings distribution table. However, we reiterate that we do not consider 'under review' to be a recommendation. For purposes of complying with ratings-distribution-disclosure rules, a Citi Research High Yield rating of Overweight is considered to correspond to a Buy recommendation; Marketweight and Neutral to a Hold recommendation; and Underweight to a Sell recommendation.

Valuation and Methodology: In Citi's High Yield Credit Research we assign a rating (Buy, Neutral or Sell) that, depending on the company under analysis, may be assigned to some or all of the company's debt securities. The rating is based on our credit view of the issuer and the relative value of its securities,

taking into account the ratings assigned to the issuer by credit rating agencies and the market prices for the issuer's securities. Our credit view of an issuer is based upon our opinion as to whether the issuer will be able to service its debt obligations when they become due and payable. We may assess this by analyzing, among other things, the issuer's credit position using standard credit ratios such as cash flow to debt and fixed charge coverage (including and excluding capital investment). We also analyze the issuer's ability to generate cash flow by reviewing standard operational measures for comparable companies in the sector, such as revenue and earnings growth rates, margins, and the composition of the issuer's balance sheet relative to the operational leverage in its business.

NON-US RESEARCH ANALYST DISCLOSURES

Non-US research analysts who have prepared this report (i.e., all research analysts listed below other than those identified as employed by Citigroup Global Markets Inc.) are not registered/qualified as research analysts with FINRA. Such research analysts may not be associated persons of the member organization and therefore may not be subject to the NYSE Rule 472 and NASD Rule 2711 restrictions on communications with a subject company, public appearances and trading securities held by a research analyst account. The legal entities employing the authors of this report are listed below:

Citigroup Global Markets Inc	James P Finnerty; Victoria X Li
Citigroup Global Markets Japan Inc.	Takao Kanai

OTHER DISCLOSURES

Citigroup Global Markets Inc. and/or its affiliates has a significant financial interest in relation to Olin Corp, Chemtura Corp, Ashland Inc, Celanese Corp. (For an explanation of the determination of significant financial interest, please refer to the policy for managing conflicts of interest which can be found at www.citiVelocity.com.)

For securities recommended in the Product in which the Firm is not a market maker, the Firm is a liquidity provider in the issuers' financial instruments and may act as principal in connection with such transactions. The Firm is a regular issuer of traded financial instruments linked to securities that may have been recommended in the Product. The Firm regularly trades in the securities of the issuer(s) discussed in the Product. The Firm may engage in securities transactions in a manner inconsistent with the Product and, with respect to securities covered by the Product, will buy or sell from customers on a principal basis.

Securities recommended, offered, or sold by the Firm: (i) are not insured by the Federal Deposit Insurance Corporation; (ii) are not deposits or other obligations of any insured depository institution (including Citibank); and (iii) are subject to investment risks, including the possible loss of the principal amount invested. Although information has been obtained from and is based upon sources that the Firm believes to be reliable, we do not guarantee its accuracy and it may be incomplete and condensed. Note, however, that the Firm has taken all reasonable steps to determine the accuracy and completeness of the disclosures made in the Important Disclosures section of the Product. The Firm's research department has received assistance from the subject company(ies) referred to in this Product including, but not limited to, discussions with management of the subject company(ies). Firm policy prohibits research analysts from sending draft research to subject companies. However, it should be presumed that the author of the Product has had discussions with the subject company to ensure factual accuracy prior to publication. All opinions, projections and estimates constitute the judgment of the author as of the date of the Product and these, plus any other information contained in the Product, are subject to change without notice. Prices and availability of financial instruments also are subject to change without notice. Notwithstanding other departments within the Firm advising the companies discussed in this Product, information obtained in such role is not used in the preparation of the Product. Although Citi Research does not set a predetermined frequency for publication, if the Product is a fundamental research report, it is the intention of Citi Research to provide research coverage of the/those issuer(s) mentioned therein, including in response to news affecting this issuer, subject to applicable quiet periods and capacity constraints. The Product is for informational purposes only and is not intended as an offer or solicitation for the purchase or sale of a security. Any decision to purchase securities mentioned in the Product must take into account existing public information on such security or any registered prospectus.

Investing in non-U.S. securities, including ADRs, may entail certain risks. The securities of non-U.S. issuers may not be registered with, nor be subject to the reporting requirements of the U.S. Securities and Exchange Commission. There may be limited information available on foreign securities. Foreign companies are generally not subject to uniform audit and reporting standards, practices and requirements comparable to those in the U.S. Securities of some foreign companies may be less liquid and their prices more volatile than securities of comparable U.S. companies. In addition, exchange rate movements may have an adverse effect on the value of an investment in a foreign stock and its corresponding dividend payment for U.S. investors. Net dividends to ADR investors are estimated, using withholding tax rates conventions, deemed accurate, but investors are urged to consult their tax advisor for exact dividend computations. Investors who have received the Product from the Firm may be prohibited in certain states or other jurisdictions from purchasing securities mentioned in the Product from the Firm. Please ask your Financial Consultant for additional details. Citigroup Global Markets Inc. takes responsibility for the Product in the United States. Any orders by US investors resulting from the information contained in the Product may be placed only through Citigroup Global Markets Inc.

The Citigroup legal entity that takes responsibility for the production of the Product is the legal entity which the first named author is employed by. The Product is made available in **Australia** through Citi Global Markets Australia Pty Ltd. (ABN 64 003 114 832 and AFSL No. 240992), participant of the ASX Group and regulated by the Australian Securities & Investments Commission. Citigroup Centre, 2 Park Street, Sydney, NSW 2000. The Product is made available in **Australia** to Private Banking wholesale clients through Citigroup Pty Limited (ABN 88 004 325 080 and AFSL 238098). Citigroup Pty Limited provides all financial product advice to Australian Private Banking wholesale clients through bankers and relationship managers. If there is any doubt about the suitability of investments held in Citigroup Private Bank accounts, investors should contact the Citigroup Private Bank in Australia. Citigroup companies may compensate affiliates and their representatives for providing products and services to clients. The Product is made available in **Brazil** by Citigroup Global Markets Brasil - CCTVM SA, which is regulated by CVM - Comissão de Valores Mobiliários, BACEN - Brazilian Central Bank, APIMEC - Associação dos Analistas e Profissionais de Investimento do Mercado de Capitais and ANBID - Associação Nacional dos Bancos de Investimento. Av. Paulista, 1111 - 11º andar - CEP. 01311920 - São Paulo - SP. If the Product is being made available in certain provinces of **Canada** by Citigroup Global Markets (Canada) Inc. ("CGM Canada"), CGM Canada has approved the Product. Citigroup Place, 123 Front Street West, Suite 1100, Toronto, Ontario M5J 2M3. This product is available in **Chile** through Banchile Corredores de Bolsa S.A., an indirect subsidiary of Citigroup Inc., which is regulated by the Superintendencia de Valores y Seguros. Agustinas 975, piso 2, Santiago, Chile. The Product is made available in **France** by Citigroup Global Markets Limited, which is authorised and regulated by Financial Services Authority. 1-5 Rue Paul Cézanne, 8ème, Paris, France. The Product is distributed in

Germany by Citigroup Global Markets Deutschland AG ("CGMD"), which is regulated by Bundesanstalt fuer Finanzdienstleistungsaufsicht (BaFin). CGMD, Reuterweg 16, 60323 Frankfurt am Main. Research which relates to "securities" (as defined in the Securities and Futures Ordinance (Cap. 571 of the Laws of Hong Kong)) is issued in **Hong Kong** by, or on behalf of, Citigroup Global Markets Asia Limited which takes full responsibility for its content. Citigroup Global Markets Asia Ltd. is regulated by Hong Kong Securities and Futures Commission. If the Research is made available through Citibank, N.A., Hong Kong Branch, for its clients in Citi Private Bank, it is made available by Citibank N.A., Citibank Tower, Citibank Plaza, 3 Garden Road, Hong Kong. Citibank N.A. is regulated by the Hong Kong Monetary Authority. Please contact your Private Banker in Citibank N.A., Hong Kong, Branch if you have any queries on or any matters arising from or in connection with this document. The Product is made available in **India** by Citigroup Global Markets India Private Limited, which is regulated by Securities and Exchange Board of India. Bakhtawar, Nariman Point, Mumbai 400-021. The Product is made available in **Indonesia** through PT Citigroup Securities Indonesia. 5/F, Citibank Tower, Bapindo Plaza, Jl. Jend. Sudirman Kav. 54-55, Jakarta 12190. Neither this Product nor any copy hereof may be distributed in Indonesia or to any Indonesian citizens wherever they are domiciled or to Indonesian residents except in compliance with applicable capital market laws and regulations. This Product is not an offer of securities in Indonesia. The securities referred to in this Product have not been registered with the Capital Market and Financial Institutions Supervisory Agency (BAPEPAM-LK) pursuant to relevant capital market laws and regulations, and may not be offered or sold within the territory of the Republic of Indonesia or to Indonesian citizens through a public offering or in circumstances which constitute an offer within the meaning of the Indonesian capital market laws and regulations. The Product is made available in **Israel** through Citibank NA, regulated by the Bank of Israel and the Israeli Securities Authority. Citibank, N.A. Platinum Building, 21 Ha'arba'ah St, Tel Aviv, Israel. The Product is made available in **Italy** by Citigroup Global Markets Limited, which is authorised and regulated by Financial Services Authority. Via dei Mercanti, 12, Milan, 20121, Italy. The Product is made available in **Japan** by Citigroup Global Markets Japan Inc. ("CGMJ"), which is regulated by Financial Services Agency, Securities and Exchange Surveillance Commission, Japan Securities Dealers Association, Tokyo Stock Exchange and Osaka Securities Exchange. Shin-Marunouchi Building, 1-5-1 Marunouchi, Chiyoda-ku, Tokyo 100-6520 Japan. If the Product was distributed by SMBC Nikko Securities Inc. it is being so distributed under license. In the event that an error is found in an CGMJ research report, a revised version will be posted on the Firm's Citi Velocity website. If you have questions regarding Citi Velocity, please call (81 3) 6270-3019 for help. The Product is made available in **Korea** by Citigroup Global Markets Korea Securities Ltd., which is regulated by the Financial Services Commission, the Financial Supervisory Service and the Korea Financial Investment Association (KOFIA). Citibank Building, 39 Da-dong, Jung-gu, Seoul 100-180, Korea. KOFIA makes available registration information of research analysts on its website. Please visit the following website if you wish to find KOFIA registration information on research analysts of Citigroup Global Markets Korea Securities Ltd. <http://dis.kofia.or.kr/fs/dis2/fundMgr/DISFundMgrAnalystPop.jsp?companyCd2=A03030&pageDiv=02>. The Product is made available in Korea by Citibank Korea Inc., which is regulated by the Financial Services Commission and the Financial Supervisory Service. Address is Citibank Building, 39 Da-dong, Jung-gu, Seoul 100-180, Korea. The Product is made available in **Malaysia** by Citigroup Global Markets Malaysia Sdn Bhd (Company No. 460819-D) ("CGMM") to its clients and CGMM takes responsibility for its contents. CGMM is regulated by the Securities Commission of Malaysia. Please contact CGMM at Level 43 Menara Citibank, 165 Jalan Ampang, 50450 Kuala Lumpur, Malaysia in respect of any matters arising from, or in connection with, the Product. The Product is made available in **Mexico** by Acciones y Valores Banamex, S.A. De C. V., Casa de Bolsa, Integrante del Grupo Financiero Banamex ("Accival") which is a wholly owned subsidiary of Citigroup Inc. and is regulated by Comision Nacional Bancaria y de Valores. Reforma 398, Col. Juarez, 06600 Mexico, D.F. In **New Zealand** the Product is made available to 'wholesale clients' only as defined by s5C(1) of the Financial Advisers Act 2008 ('FAA') through Citigroup Global Markets Australia Pty Ltd (ABN 64 003 114 832 and AFSL No. 240992), an overseas financial adviser as defined by the FAA, participant of the ASX Group and regulated by the Australian Securities & Investments Commission. Citigroup Centre, 2 Park Street, Sydney, NSW 2000. The Product is made available in **Pakistan** by Citibank N.A. Pakistan branch, which is regulated by the State Bank of Pakistan and Securities Exchange Commission, Pakistan. AWT Plaza, 1.1. Chundrigar Road, P.O. Box 4889, Karachi-74200. The Product is made available in the **Philippines** through Citicorp Financial Services and Insurance Brokerage Philippines, Inc., which is regulated by the Philippines Securities and Exchange Commission. 20th Floor Citibank Square Bldg. The Product is made available in the Philippines through Citibank NA Philippines branch, Citibank Tower, 8741 Paseo De Roxas, Makati City, Manila. Citibank NA Philippines NA is regulated by The Bangko Sentral ng Pilipinas. The Product is made available in **Poland** by Dom Maklerski Banku Handlowego SA an indirect subsidiary of Citigroup Inc., which is regulated by Komisja Nadzoru Finansowego. Dom Maklerski Banku Handlowego S.A. ul.Senatorska 16, 00-923 Warszawa. The Product is made available in the **Russian Federation** through ZAO Citibank, which is licensed to carry out banking activities in the Russian Federation in accordance with the general banking license issued by the Central Bank of the Russian Federation and brokerage activities in accordance with the license issued by the Federal Service for Financial Markets. Neither the Product nor any information contained in the Product shall be considered as advertising the securities mentioned in this report within the territory of the Russian Federation or outside the Russian Federation. The Product does not constitute an appraisal within the meaning of the Federal Law of the Russian Federation of 29 July 1998 No. 135-FZ (as amended) On Appraisal Activities in the Russian Federation. 8-10 Gasheka Street, 125047 Moscow. The Product is made available in **Singapore** through Citigroup Global Markets Singapore Pte. Ltd. ("CGMSPL"), a capital markets services license holder, and regulated by Monetary Authority of Singapore. Please contact CGMSPL at 8 Marina View, 21st Floor Asia Square Tower 1, Singapore 018960, in respect of any matters arising from, or in connection with, the analysis of this document. This report is intended for recipients who are accredited, expert and institutional investors as defined under the Securities and Futures Act (Cap. 289). The Product is made available by The Citigroup Private Bank in Singapore through Citibank, N.A., Singapore Branch, a licensed bank in Singapore that is regulated by Monetary Authority of Singapore. Please contact your Private Banker in Citibank N.A., Singapore Branch if you have any queries on or any matters arising from or in connection with this document. This report is intended for recipients who are accredited, expert and institutional investors as defined under the Securities and Futures Act (Cap. 289). This report is distributed in Singapore by Citibank Singapore Ltd ("CSL") to selected Citigold/Citigold Private Clients. CSL provides no independent research or analysis of the substance or in preparation of this report. Please contact your Citigold/Citigold Private Client Relationship Manager in CSL if you have any queries on or any matters arising from or in connection with this report. This report is intended for recipients who are accredited investors as defined under the Securities and Futures Act (Cap. 289). Citigroup Global Markets (Pty) Ltd. is incorporated in the **Republic of South Africa** (company registration number 2000/025866/07) and its registered office is at 145 West Street, Sandton, 2196, Saxonwold. Citigroup Global Markets (Pty) Ltd. is regulated by JSE Securities Exchange South Africa, South African Reserve Bank and the Financial Services Board. The investments and services contained herein are not available to private customers in South Africa. The Product is made available in **Spain** by Citigroup Global Markets Limited, which is authorised and regulated by Financial Services Authority. 29 Jose Ortega Y Gasset, 4th Floor, Madrid, 28006, Spain. The Product is made available in the **Republic of China** through Citigroup Global Markets Taiwan Securities Company Ltd. ("CGMTS"), 14 and 15F, No. 1, Songzhi Road, Taipei 110, Taiwan and/or through Citibank Securities (Taiwan) Company Limited ("CSTL"), 14 and 15F, No. 1, Songzhi Road, Taipei 110, Taiwan, subject to the respective license scope of each entity and the applicable laws and regulations in the Republic of China. CGMTS and CSTL are both regulated by the Securities and Futures Bureau of the Financial Supervisory

Commission of Taiwan, the Republic of China. No portion of the Product may be reproduced or quoted in the Republic of China by the press or any third parties [without the written authorization of CGMTS and CSTL]. If the Product covers securities which are not allowed to be offered or traded in the Republic of China, neither the Product nor any information contained in the Product shall be considered as advertising the securities or making recommendation of the securities in the Republic of China. The Product is for informational purposes only and is not intended as an offer or solicitation for the purchase or sale of a security or financial products. Any decision to purchase securities or financial products mentioned in the Product must take into account existing public information on such security or the financial products or any registered prospectus. The Product is made available in **Thailand** through Citicorp Securities (Thailand) Ltd., which is regulated by the Securities and Exchange Commission of Thailand. 18/F, 22/F and 29/F, 82 North Sathorn Road, Silom, Bangkok, Bangkok 10500, Thailand. The Product is made available in **Turkey** through Citibank AS which is regulated by Capital Markets Board. Tekfen Tower, Eski Buyukdere Caddesi # 209 Kat 2B, 23294 Levent, Istanbul, Turkey. In the **U.A.E.**, these materials (the "Materials") are communicated by Citigroup Global Markets Limited, DIFC branch ("CGML"), an entity registered in the Dubai International Financial Center ("DIFC") and licensed and regulated by the Dubai Financial Services Authority ("DFSA") to Professional Clients and Market Counterparties only and should not be relied upon or distributed to Retail Clients. A distribution of the different Citi Research ratings distribution, in percentage terms for Investments in each sector covered is made available on request. Financial products and/or services to which the Materials relate will only be made available to Professional Clients and Market Counterparties. The Product is made available in **United Kingdom** by Citigroup Global Markets Limited, which is authorised and regulated by Financial Services Authority. This material may relate to investments or services of a person outside of the UK or to other matters which are not regulated by the FSA and further details as to where this may be the case are available upon request in respect of this material. Citigroup Centre, Canada Square, Canary Wharf, London, E14 5LB. The Product is made available in **United States** by Citigroup Global Markets Inc, which is a member of FINRA and registered with the US Securities and Exchange Commission. 388 Greenwich Street, New York, NY 10013. Unless specified to the contrary, within EU Member States, the Product is made available by Citigroup Global Markets Limited, which is regulated by Financial Services Authority.

Pursuant to Comissão de Valores Mobiliários Rule 483, Citi is required to disclose whether a Citi related company or business has a commercial relationship with the subject company. Considering that Citi operates multiple businesses in more than 100 countries around the world, it is likely that Citi has a commercial relationship with the subject company.

Many European regulators require that a firm must establish, implement and make available a policy for managing conflicts of interest arising as a result of publication or distribution of investment research. The policy applicable to Citi Research's Products can be found at https://www.citivelocity.com/cvr/epublic/citi_research_disclosures.

Compensation of equity research analysts is determined by equity research management and Citigroup's senior management and is not linked to specific transactions or recommendations.

The Product may have been distributed simultaneously, in multiple formats, to the Firm's worldwide institutional and retail customers. The Product is not to be construed as providing investment services in any jurisdiction where the provision of such services would not be permitted.

Subject to the nature and contents of the Product, the investments described therein are subject to fluctuations in price and/or value and investors may get back less than originally invested. Certain high-volatility investments can be subject to sudden and large falls in value that could equal or exceed the amount invested. Certain investments contained in the Product may have tax implications for private customers whereby levels and basis of taxation may be subject to change. If in doubt, investors should seek advice from a tax adviser. The Product does not purport to identify the nature of the specific market or other risks associated with a particular transaction. Advice in the Product is general and should not be construed as personal advice given it has been prepared without taking account of the objectives, financial situation or needs of any particular investor. Accordingly, investors should, before acting on the advice, consider the appropriateness of the advice, having regard to their objectives, financial situation and needs. Prior to acquiring any financial product, it is the client's responsibility to obtain the relevant offer document for the product and consider it before making a decision as to whether to purchase the product. With the exception of our product that is made available only to Qualified Institutional Buyers (QIBs) and other product that is made available through other distribution channels only to certain categories of clients to satisfy legal or regulatory requirements, Citi Research concurrently disseminates its research via proprietary and non-proprietary electronic distribution platforms. Periodically, individual Citi Research analysts may also opt to circulate research posted on such platforms to one or more clients by email. Such email distribution is discretionary and is done only after the research has been disseminated via the aforementioned distribution channels. Citi Research simultaneously distributes product that is limited to QIBs only through email distribution.

The level and types of services provided by Citi Research analysts to clients may vary depending on various factors such as the client's individual preferences as to the frequency and manner of receiving communications from analysts, the client's risk profile and investment focus and perspective (e.g. market-wide, sector specific, long term, short-term etc.), the size and scope of the overall client relationship with Citi and legal and regulatory constraints. Citi Research product may source data from dataCentral. dataCentral is a Citi Research proprietary database, which includes Citi estimates, data from company reports and feeds from Reuters and Datastream.

© 2013 Citigroup Global Markets Inc. Citi Research is a division of Citigroup Global Markets Inc. Citi and Citi with Arc Design are trademarks and service marks of Citigroup Inc. and its affiliates and are used and registered throughout the world. All rights reserved. Any unauthorized use, duplication, redistribution or disclosure of this report (the "Product"), including, but not limited to, redistribution of the Product by electronic mail, posting of the Product on a website or page, and/or providing to a third party a link to the Product, is prohibited by law and will result in prosecution. The information contained in the Product is intended solely for the recipient and may not be further distributed by the recipient to any third party. Where included in this report, MSCI sourced information is the exclusive property of Morgan Stanley Capital International Inc. (MSCI). Without prior written permission of MSCI, this information and any other MSCI intellectual property may not be reproduced, disseminated or used to create any financial products, including any indices. This information is provided on an "as is" basis. The user assumes the entire risk of any use made of this information. MSCI, its affiliates and any third party involved in, or related to, computing or compiling the information hereby expressly disclaim all warranties of originality, accuracy, completeness, merchantability or fitness for a particular purpose with respect to any of this information. Without limiting any of the foregoing, in no event shall MSCI, any of its affiliates or any third party involved in, or related to, computing or compiling the information have any liability for any damages of any kind. MSCI, Morgan Stanley Capital International and the MSCI indexes are services marks of MSCI and its affiliates. The Firm accepts no liability whatsoever for the actions of third parties. The Product may provide the addresses of, or contain hyperlinks to, websites. Except to the extent to which the Product refers to website material of the Firm, the Firm has not reviewed the linked site. Equally, except to the extent to which the Product refers to website material of the Firm, the Firm takes no responsibility for, and makes no representations or warranties whatsoever as to, the data and information contained therein. Such address or hyperlink (including addresses or hyperlinks to website material of the Firm) is provided solely for your convenience and information and the content of the linked site

does not in anyway form part of this document. Accessing such website or following such link through the Product or the website of the Firm shall be at your own risk and the Firm shall have no liability arising out of, or in connection with, any such referenced website.

ADDITIONAL INFORMATION IS AVAILABLE UPON REQUEST
