

Lanxess (LXSG.DE)

2013 – The Supply Side Responds; Sell

- **2013: A New (less profitable) Normal?** — From 2007-2011, LXS benefitted from the US shale gas revolution, which eliminated 500kt of butadiene (BD) capacity at times of strong synthetic rubber demand. The consequent shortage of BD resulted in strong pricing power and boosted EPS growth (CAGR07-11 20%). In 2013, however, we think earnings momentum could stall. More butadiene and synthetic rubber supply and sluggish demand from the tyre industry should lead to a more competitive environment. Higher D&A and pension charges and plant start-up costs should put additional pressure on EPS. With shares trading near all-time highs, we see downside risk and downgrade our rating to Sell.
- **Changes in estimates** — We cut our 2013 and 2014 estimates by c. 23% to reflect higher D&A, pension and start-up charges and a more challenging trading environment. We lower our TP to €56 from €58 to reflect these changes.
- **More supply, less pricing power** — The upstream BD and synthetic rubber markets should see some significant capacity expansions in 2013, mainly driven by Asia (global BD +6%, S-SBR +24%). LXS is a price-driven growth story, but with BD capacity set to outpace demand growth for the first time in 3 years, we expect lower average BD prices, resulting in lower sales and profitability. Potential capacity additions in the high-performance rubber segment (SSBR) are of particular concern to us.
- **Sluggish tyre demand outlook** — 70-75% of synthetic rubber is consumed by the tyre industry and the near-term demand outlook remains sluggish as stock levels are high (c. 170bps above historic average) and further de-stocking seems likely. Jan-Nov 2012 replacement tyre demand is -10% in EU and -2% in the US. We expect some recovery in 2H13 and see 2013 car tyre demand growth at c. 3-4%.
- **Valuation** — At our TP of €56, shares would trade at a 13E PE of 8.9x, in line with the historical average. Earnings momentum remains key for the shares and with downside risk to consensus estimates, we think shares are likely to underperform.

- Company Update
- Rating Change
- Target Price Change
- Estimate Change

Sell	3
from Neutral	
Price (08 Jan 13)	€63.63
Target price	€56.00
from €58.00	
Expected share price return	-12.0%
Expected dividend yield	1.4%
Expected total return	-10.6%
Market Cap	€5,295M
	US\$6,945M

Price Performance (RIC: LXSG.DE, BB: LXS GR)



Lanxess (EUR)

Year to 31 Dec	2010A	2011A	2012E	2013E	2014E
Sales (€M)	7,119.5	8,775.0	9,060.9	9,306.7	9,893.3
Net Income (€M)	400.6	544.7	555.5	522.5	592.9
Diluted EPS (€)	4.82	6.55	6.68	6.28	7.13
Diluted EPS (Old) (€)	4.82	6.55	6.72	8.07	9.20
PE (x)	13.2	9.7	9.5	10.1	8.9
EV/EBITDA (x)	7.1	6.0	5.9	5.6	5.0
DPS (€)	0.70	0.85	0.90	1.00	1.05
Net Div Yield (%)	1.1	1.3	1.4	1.6	1.7

Dominik Frauendienst

+44-20-7986-4299
dominik.frauendienst@citi.com

Andrew Benson

+44-20-7986-3925
andrew.benson@citi.com

Evgenia Molotova

+44-20-7986-4252
evgenia.molotova@citi.com

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.

LXSG.DE: Fiscal year end 31-Dec						Price: €65.37; TP: €58.00; Market Cap: €5,439m; Recomm: Sell					
Profit & Loss (€m)	2010	2011	2012E	2013E	2014E	Valuation ratios	2010	2011	2012E	2013E	2014E
Sales revenue	7,120	8,775	9,061	9,307	9,893	PE (x)	13.6	10.0	9.8	10.4	9.2
Cost of sales	-5,381	-6,765	-6,985	-7,175	-7,627	PB (x)	3.1	2.6	1.9	1.6	1.4
Gross profit	1,739	2,010	2,075	2,132	2,266	EV/EBITDA (x)	7.2	6.1	6.0	5.7	5.1
Gross Margin (%)	24.4	22.9	22.9	22.9	22.9	FCF yield (%)	-0.4	-0.6	1.4	5.7	6.9
EBITDA (Adj)	918	1,146	1,196	1,203	1,307	Dividend yield (%)	1.1	1.3	1.4	1.5	1.6
EBITDA Margin (Adj) (%)	12.9	13.1	13.2	12.9	13.2	Payout ratio (%)	15	13	13	16	15
Depreciation	-283	-320	-373	-418	-435	ROE (%)	23.9	26.6	21.4	16.6	16.5
Amortisation	0	0	0	0	0	Cashflow (€m)					
EBIT (Adj)	635	826	823	785	872	EBITDA	918	1,146	1,196	1,203	1,307
EBIT Margin (Adj) (%)	8.9	9.4	9.1	8.4	8.8	Working capital	-220	-256	-217	-33	-108
Net interest	-83	-93	-100	-95	-90	Other	-218	-242	-230	-200	-222
Associates	16	7	15	15	15	Operating cashflow					
Non-op/Except	-75	-85	-48	-30	-30	Capex	-501	-679	-675	-660	-600
Pre-tax profit	493	655	690	676	767	Net acq/disposals	126	-244	0	0	0
Tax	-112	-148	-155	-152	-172	Other	0	0	0	0	0
Extraord./Min.Int./Pref.div.	-2	-1	-1	-1	-1	Investing cashflow					
Reported net profit	379	506	534	523	593	Dividends paid	-42	-58	-71	-75	-83
Net Margin (%)	5.3	5.8	5.9	5.6	6.0	Financing cashflow					
Core NPAT	401	545	555	523	593	Net change in cash	-15	287	-321	110	1,155
Per share data						Free cashflow to s/holders					
Reported EPS (€)	4.56	6.09	6.42	6.28	7.13		-21	-31	74	310	377
Core EPS (€)	4.82	6.55	6.68	6.28	7.13						
DPS (€)	0.70	0.85	0.90	1.00	1.05						
CFPS (€)	5.77	7.79	9.01	11.67	11.75						
FCFPS (€)	-0.25	-0.37	0.89	3.73	4.54						
BVPS (€)	21.00	24.75	35.26	40.50	46.19						
Wtd avg ord shares (m)	83.2	83.2	83.2	83.2	83.2						
Wtd avg diluted shares (m)	83.2	83.2	83.2	83.2	83.2						
Growth rates											
Sales revenue (%)	40.8	23.3	3.3	2.7	6.3						
EBIT (Adj) (%)	211.3	30.1	-0.4	-4.6	11.1						
Core NPAT (%)	393.1	36.0	2.0	-5.9	13.5						
Core EPS (%)	393.4	36.0	2.0	-5.9	13.5						
Balance Sheet (€m)											
Cash & cash equiv.	524	528	528	528	528						
Accounts receivables	942	1,146	1,207	1,215	1,266						
Inventory	1,094	1,386	1,460	1,499	1,594						
Net fixed & other tangibles	2,131	2,679	2,981	3,223	3,388						
Goodwill & intangibles	226	373	373	373	373						
Financial & other assets	749	766	799	832	878						
Total assets	5,666	6,878	7,348	7,670	8,027						
Accounts payable	796	921	848	871	926						
Short-term debt	176	633	309	183	0						
Long-term debt	1,302	1,465	1,465	1,465	1,465						
Provisions & other liab	1,631	1,785	1,777	1,766	1,777						
Total liabilities	3,905	4,804	4,399	4,286	4,168						
Shareholders' equity	1,746	2,058	2,932	3,368	3,841						
Minority interests	15	16	17	17	18						
Total equity	1,761	2,074	2,949	3,385	3,859						
Net debt	954	1,570	1,246	1,120	937						
Net debt to equity (%)	54.2	75.7	42.3	33.1	24.3						

For further data queries on Citi's full coverage universe please contact Citi Research Data Services at CitiRsch.DataServices.Global@citi.com
For definitions of the items in this table, please click [here](#).

Contents

Unfavourable Market Dynamics in 2013	4
Citi vs. Consensus	4
Valuation – attractive, but earnings momentum matters more	5
DCF Model	6
Pricing – Butadiene Downside in 2013	7
BD capacity set to increase by 6% in 2013	8
2013 Downside Risk due to more supply and sluggish demand	11
The Supply Side Responds	13
Portfolio mix remains largely unchanged	13
Global Supply of Synthetic Rubber increases	14
1. S- SBR – Prepare for a supply shock in 2013	14
2. PBR – Specialties to remain tighter	16
3. Butyl Rubber – More to come	17
Tyre Market – All hopes on premium	20
Status Quo – Rather Weak	20
High inventory levels point towards further de-stocking	21
Demand – All Focus on Premium	22
What are premium tyres?	22
Premium Tyres – Set to Outperform	22
Case Study: Tyres aren't washing machines or are they?	26
Financials	27
Lanxess	29
Company description	29
Investment strategy	29
Valuation	29
Risks	29
Appendix A-1	32

Unfavourable Market Dynamics in 2013

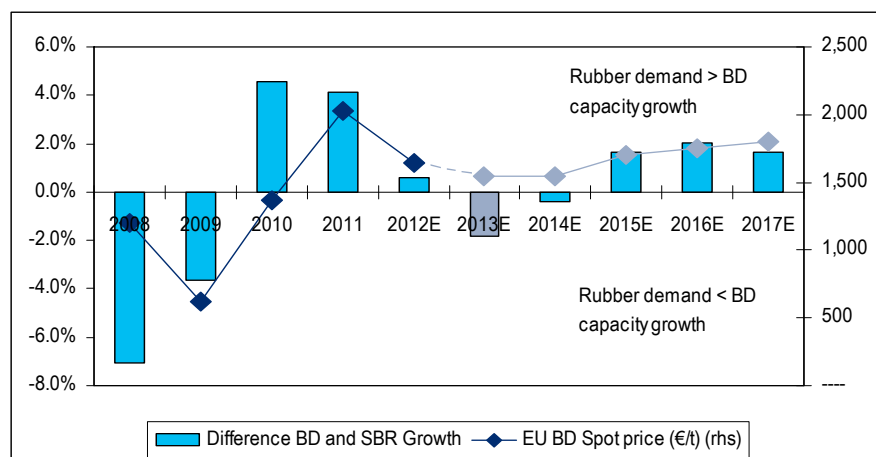
Lanxess benefitted from tight Butadiene and synthetic rubber markets in the past; pricing was the main driver

2013 trading conditions look more challenging with butadiene and synthetic rubber capacity set to increase by 6% and 15% respectively while demand remains sluggish

In the past few years, Lanxess has benefitted from the US shale gas revolution, which eliminated 500kt of capacity of its key raw material BD at times of strong synthetic rubber demand (synthetic rubber accounts for over 50% of BD consumption). This resulted in a shortage of BD, which in turn boosted LXS' pricing power (average prices in Performance Polymers rose 12% p.a. from 2007-2011) and led to strong EPS growth (CAGR07-11 20%).

We expect trading conditions in 2013 to be more challenging than in previous years as LXS will have to cope with rising supply in a low growth environment. Global butadiene and synthetic rubber (PBR, S/E-SBR) capacity are set to increase by 6% and 15% respectively, mainly in Asia. At the same time, demand from the tyre industry looks sluggish, at least in 1H13, due to relatively high stock levels and ongoing macro concerns. We expect BD prices to be down yoy, resulting in weaker pricing. The better availability of the building blocks is likely to lead to lower profitability.

Figure 1. Difference between BD Capacity and SBR demand growth and BD Price



Source: Citi Research; IHS

Higher D&A and pension charges in 2013

In addition, higher D&A charges (+€40m), plant start-up costs (c. €20m) and higher pension charges (c. €9m) are expected to put pressure on EPS.

Cutting estimates

We cut our 2013 and 2014 EPS estimates by 23% to reflect the changing market dynamics and additional cost items.

Valuation looks undemanding, but earnings momentum likely to stall

With shares trading near all-time highs and earnings momentum likely to stall, we see considerable downside risk and downgrade to Sell. At our TP of €56, shares would be trading at 13E PE of 8.9x, in line with historic averages.

Citi vs. Consensus

Figure 2. Citi vs. Consensus

	2013			2014		
	CITI	Consensus	Deviation	CITI	Consensus	Deviation
Sales (€m)	9,263	9,568	-2.7%	9,893	10,096	-2.0%
EBITDA (€m)	1,203	1,257	-4.2%	1,307	1,362	-4.1%
Margin	12.9%	13.1%		13.2%	13.5%	
EPS(€) adj	6.28	7.11	-11.6%	7.13	8.03	-11.1%

Source: Powered by dataCentral

Valuation – attractive, but earnings momentum matters more

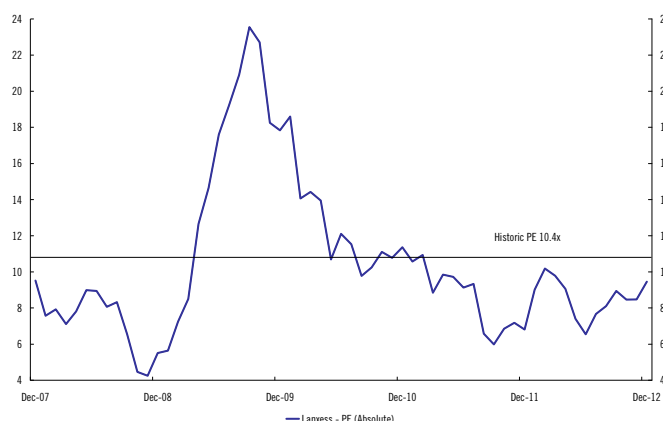
12-month forward consensus PE of 9.5x
vs. historic average of 10.4x

Lanxess shares are currently trading at 12-month forward PE of 9.5x based on consensus estimates. This is below its 5 historic average of 10.4x, but above its 2 year average of 8.7x. While valuation looks attractive, we want to highlight **two things: 1)** valuation has hardly ever looked stretched and **2)** earnings momentum is far more important.

Earnings momentum remains key

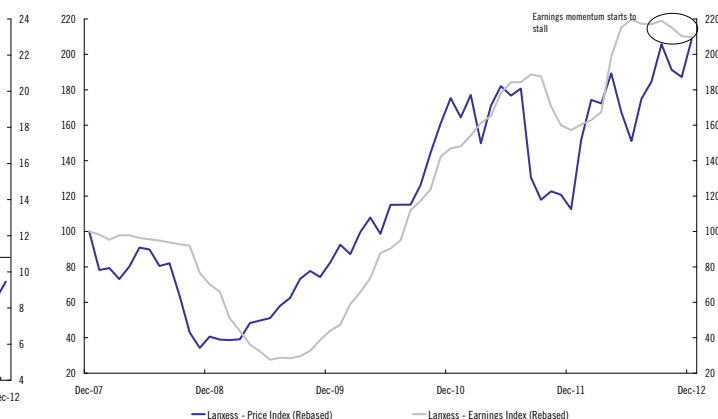
While Lanxess looks attractively valued on an absolute and relative basis (c. 30% discount to the sector), earnings momentum has stalled and going forward we see further downside risk to consensus estimates as the market seems to over-estimate the contribution of the Singapore plant in 2013 and seems too bullish on pricing and volumes. At the same time, we think consensus under-estimates the additional D&A and start-up charges resulting from this. Hence, we expect earnings momentum to decelerate further, resulting in more downside risk for Lanxess's share price.

Figure 3. PE development (5 year history)



Source: Powered by dataCentral

Figure 4. Lanxess – Price and Earnings Development (Absolute)



Source: Powered by dataCentral.

DCF Model

DCF-based fair value of €65

Our DCF model generates a fair value of €65. However, consistent with our general approach, we set our TP at a discount to this fair value at €56 to account for market volatility and likely consensus downgrades as we think the market underestimates the negative impact of higher D&A and pension charges, and start-up costs related to the new butyl plant in Singapore.

Figure 5. DCF Model (in €m)

Discounted Cash Flow	History	Forecast period					
Year	2012	2013	2014	2015	2016	2017	2018
Sales	9,061	9,307	9,893	10,547	11,030	11,536	12,066
EBITA	823	785	872	932	976	1,032	1,047
Depreciation	373	418	435	467	493	494	494
EBITDA	1,196	1,203	1,307	1,400	1,400	1,400	1,541
Tax	(173)	(177)	(196)	(210)	(220)	(233)	(236)
Capex	(675)	(660)	(600)	(550)	(500)	(480)	(480)
Acquisitions/Disposals/Other	0	0	0	0	0	0	0
Investment in working capital	(217)	(31)	(106)	(118)	(78)	(81)	(84)
Restructuring costs	0	(52)	(49)	(53)	(55)	(58)	(60)
Capital employed	5,439	5,714	5,987	6,190	6,277	6,348	6,421
NOPLAT (EBITA-Tax-restructuring costs)	650	557	626	670	701	741	750
ROCE	12%	10%	10%	11%	11%	12%	12%
FCF	132	284	355	469	547	548	680

	Value	Proportion of Firm Value	Key Assumptions	2013
Value of Forecast period (2014-2018)	1,979	28%	Average ROCE for sustainable advantage period	11%
Value of sustainable advantage period (2019-2038)	3,945	56%	No. of years of sustainable advantage	20
Value of capital at end of sustainable advantage period	9,541		Growth rate (mid-term)	2.0%
PV of capital	1,133	16%	WACC	8.9%
Firm value	7,057	100%	Ongoing restructuring costs as % of sales	0.5%
Net debt	1,120	16%		
Debt equivalents	544	8%		
MV of equity	5,393	76%		
No. of shares	83			
Value per share	64.9			

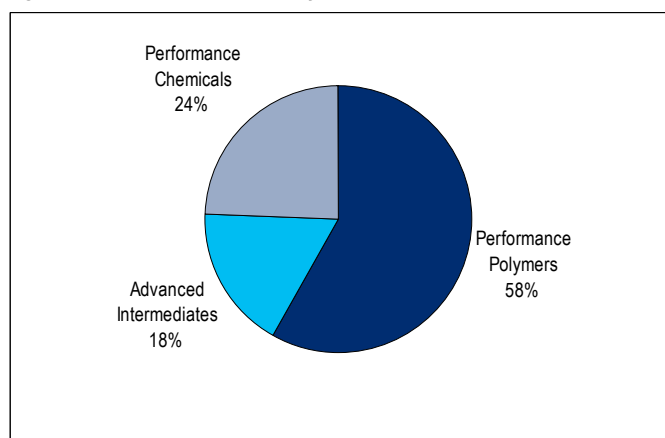
Source: Citi Research

Pricing – Butadiene Downside in 2013

LXS' earnings growth has been price driven. On average, LXS Performance Polymers has increased selling prices by about 12% p.a. since 2007. The main driver was higher butadiene prices: European spot Butadiene prices rose c. 23% p.a. on average during the same period. Volume growth was about 4% p.a. on average. With BD capacity growth expected to outpace synthetic rubber demand, we see downside risk for Butadiene prices and hence LXS pricing.

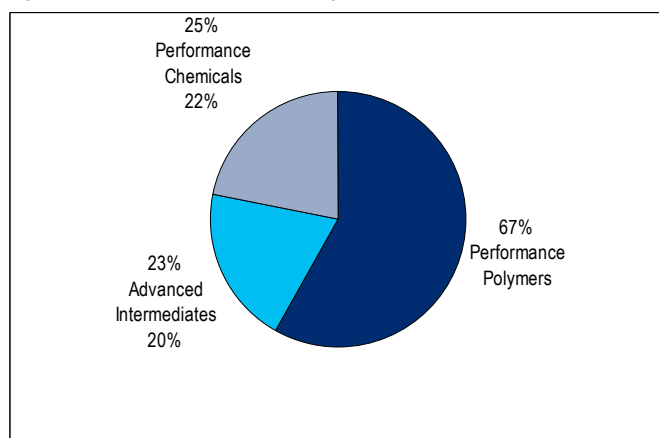
In this note we focus on the Performance Polymers division, which generated 2011 sales of €5.06bn (c. 60% of group sales) and EBITDA of €768m (c. 70% of group EBITDA).

Figure 6. Lanxess – Sales split by division (2011)



Source: Company Reports

Figure 7. Lanxess – EBITDA Split by Division (2011)

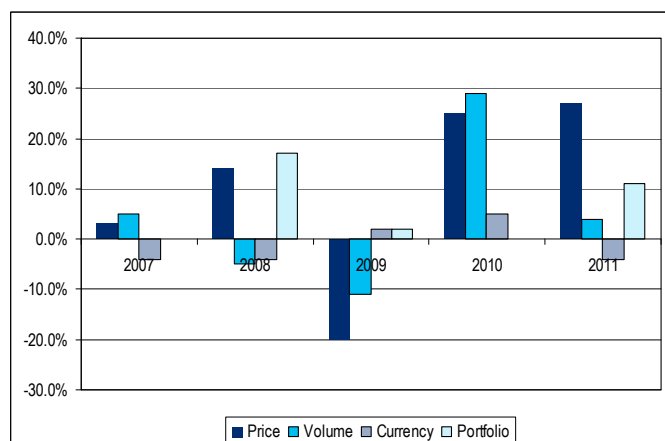


Source: Company Reports

60% of sales growth driven by pricing

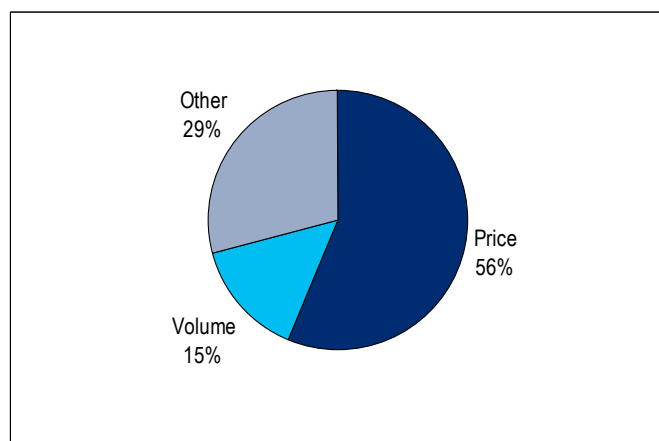
Key to the Lanxess story has been and will be the development of pricing. Almost 60% of incremental sales growth in the Performance Polymers division between 2007 and 2011 was driven by pricing. On average, Lanxess increased selling prices by about 12% p.a. The main driver was the sharp inflation of butadiene prices (CAGR07-11 23%).

Figure 8. Performance Polymers - Price, Volume, Currency, Portfolio (YoY)



Source: Citi Research; company reports

Figure 9. Sales Contribution in Performance Polymers – Price, Volume, Other (2007-2011)



Source: Citi Research; company reports

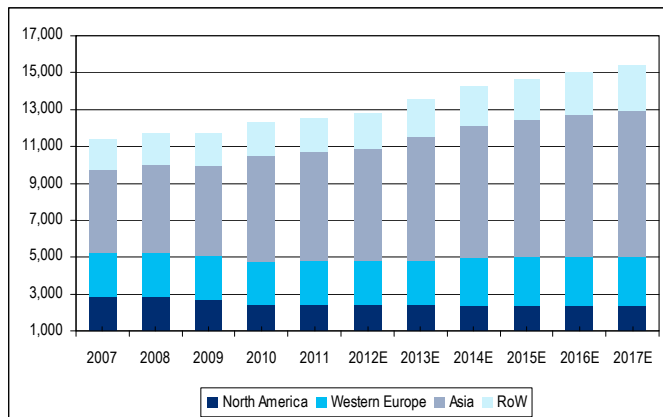
So in order to understand the prospects of Lanxess's Performance Polymers division, investors need to form a view on butadiene prices.

BD capacity set to increase by 6% in 2013

Global BD capacity about 12.8m t

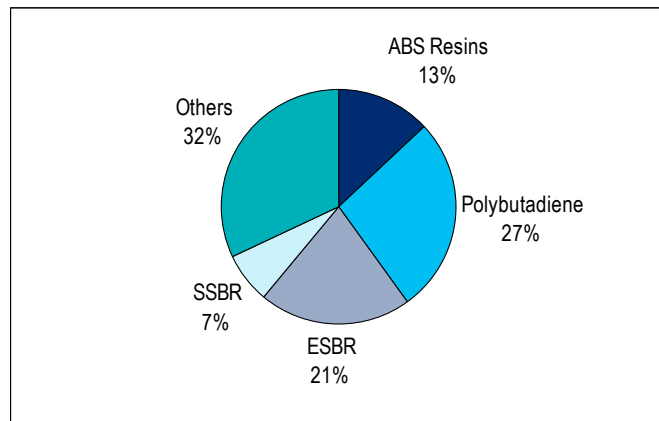
Global BD capacity is currently about 12.8m t p.a. with about 50% located in Asia. Europe and the US account for about 20% each. Main end-markets are the synthetic rubber industry (PBR and SBR alone account for over 50% of global butadiene demand) and Acrylonitrile butadiene Styrene (ABS) Resins, which are used to make basic plastics.

Figure 10. Butadiene Capacity Development (2007-2017E)*



Source: Citi Research; CMAI

Figure 11. Butadiene Demand – by End Market (2011)



Source: IHS Chemical

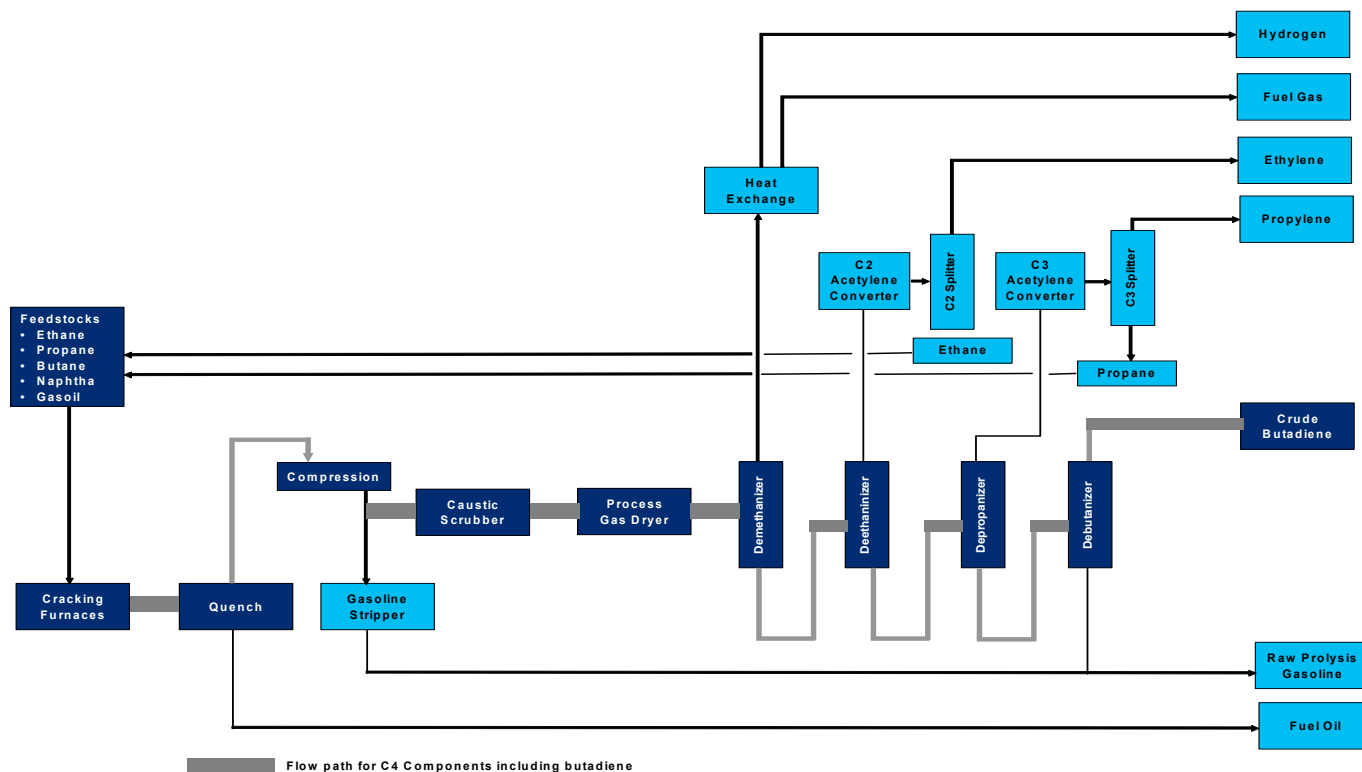
There are 2 main production routes:

- Extractive distillation from crude C4 streams from ethylene co-production (95% of production)
- De-hydrogenation of n-butane and n-butenes (Houdry Process; Oxidative dehydrogenation).

Typical composition of “crude C4”: 40-50% butadiene, 10-25% isobutylene, 15-30% butenes, 5-15% butanes

Over 95% of butadiene is produced as a **by-product of ethylene production** from steam crackers when liquid (naphtha) or gas (ethane, propane) feeds are being cracked. The cracking process produces so-called “**crude C4**”, a gaseous mixture of C4 hydrocarbons. The crude C4 stream **is fed to butadiene extraction units** where butadiene is separated from the other C4s, such as isobutylene, by extractive/fractional distillation.

Figure 12. Setup of a Olefins Plant and Flow Path of C4 Components

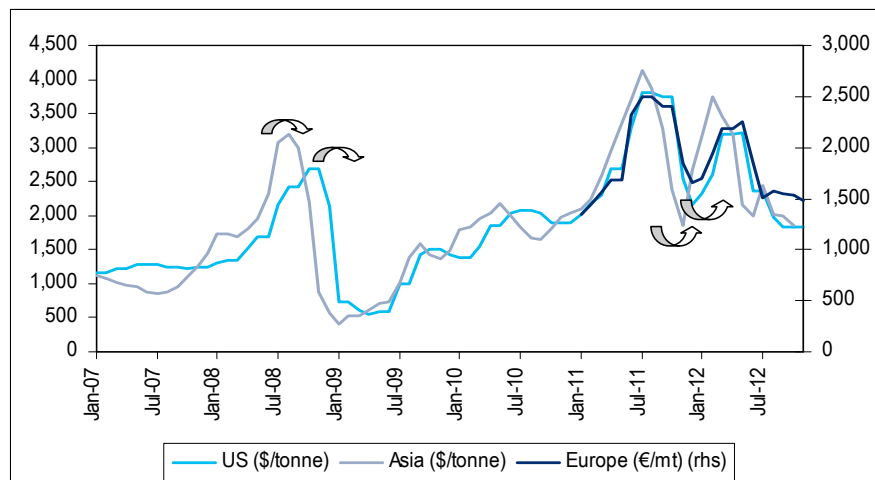


Source: Citi Research

Butadiene – Historically a tight product

Butadiene has been a relatively tight product, leading to extreme price volatility. The tightness has been caused by two factors: 1) feedstock shift in the US from naphtha to gas cracking reducing the availability of butadiene; and 2) at the same time limited capacity expansion and strong downstream demand, mainly from the synthetic rubber industry.

Figure 13. Global Butadiene Prices – US and EU contract; Asia Spot pricing



Source: Citi Research, ICIS

1. Feedstock shift in the US

Steam crackers can crack gas feeds (ethane, propane) and/or liquid feeds (naphtha). The choice of feedstock has significant implications for the availability of Butadiene.

Naphtha-based cracking produces 7x more BD

As can be seen from the table below, a typical steam cracker based on ethane produces about 0.025lb of butadiene for every pound of ethylene vs. 0.176lb for a typical naphtha-based cracker. **In other words, naphtha-based cracking produces about 7x more butadiene for every pound of ethylene.** The main reason for this is the size of the molecule: naphtha is a mixture of “bigger” molecules (C6-12 molecules) vs. ethane or propane (C2 for ethane and C3 for propane).

Figure 14: Butadiene Yields from Ethylene Production depending on Feedstock

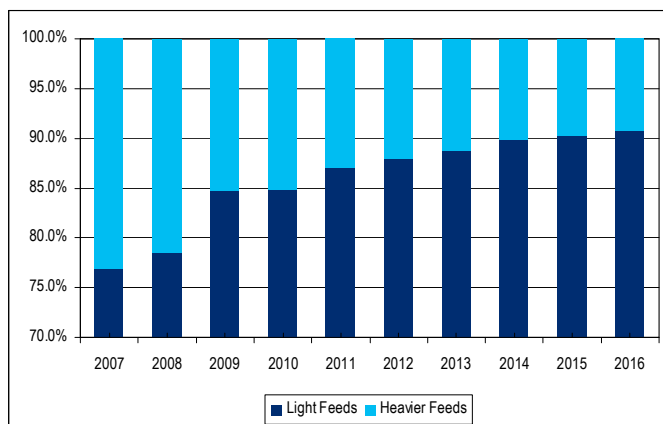
Feedstock	Average Feedstock per lb of Ethylene (in lb)	Butadiene per lb of Ethylene (in lb)	Butadiene/Feedstock (in %)
Ethane	1.24	0.025	2.0%
Propane	2.43	0.07	2.9%
Naphtha	3.19	0.176	5.5%
Gas Oil	4.34	0.262	6.0%

Source: Citi Research; SRI Consulting

US butadiene capacity has fallen by 18% since 2007

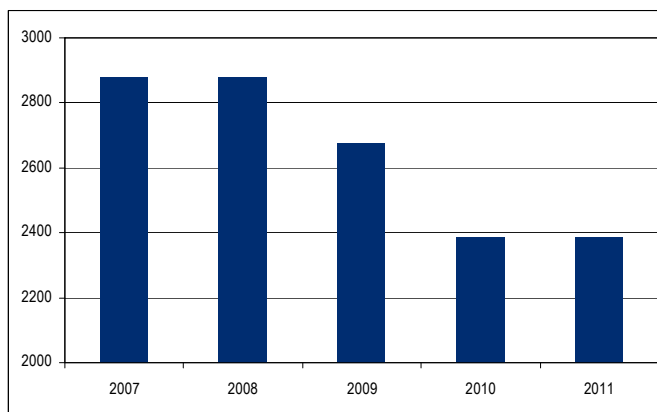
These economics are well understood and the shift to light feedstock cracking in the US from 77% in 2007 to about 88% in 2012 has resulted in a reduction of US butadiene capacity by about 18% since 2007 from 2.9mt to 2.4m t. as most light feedstock crackers do not have butadiene extraction units given the limited C4 output. In this case, the crude C4 stream is recycled, burned, or collected for transfer to a Bd recovery unit. Today, the US is the biggest net importer of Bd, with net imports about 300kt p.a.

Figure 15: US Ethylene – Light Feeds vs Heavier Feedstocks



Source: Citi Research; CMAI

Figure 16: North American Butadiene Capacity (in '000 t)



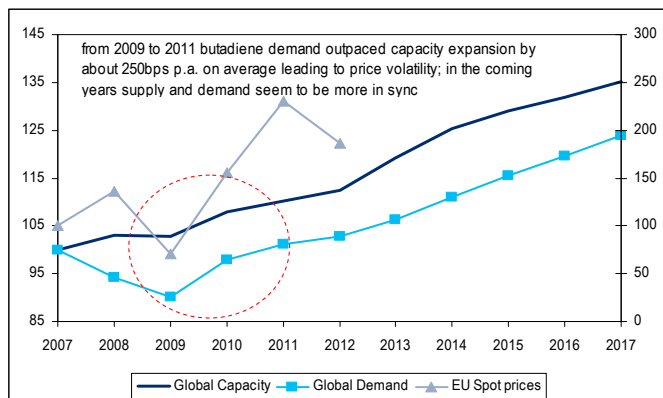
Source: Citi Research; CMAI

2. Global capacity and derivatives demand

In the last 2 years, synthetic rubber demand outpaced BD capacity additions creating tightness in the chain

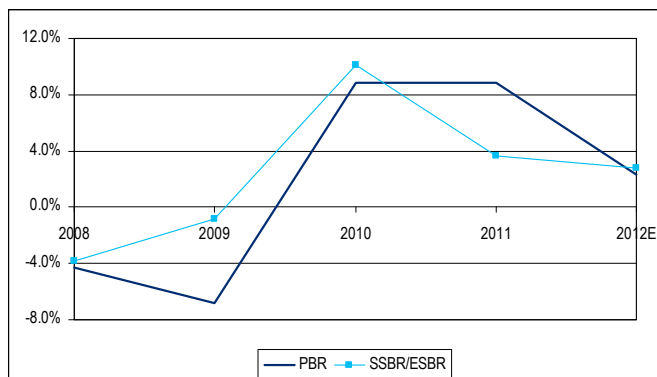
At the time when the US effectively eliminated 500kt of BD capacity by switching from oil to gas cracking, BD capacity in other regions of the world expanded rather moderately, resulting in global Bd capacity growth of 5% and 2% in 2010 and 2011, respectively. However, downstream demand from the synthetic rubber industry grew strongly following the crisis of 2009 as the entire chain restocked: PBR and SBR demand was up 9% and 10%, respectively, in 2010, and 9% and 4%, respectively, in 2011. This led to extreme tightness, escalating butadiene prices (EU contract price at over €2,500/t), and record profitability.

Figure 17. Global Butadiene Capacity and Demand (Indexed; 2007=100)



Source: Citi Research

Figure 18. Global demand for PBR and SSBR/ESBR (YoY)



Source: Citi Research; CMAI

2013 Downside Risk due to more supply and sluggish demand

2013 global BD capacity set to increase by 6% vs. 5% and 2% in 2010 and 2011 respectively

We think Butadiene availability will improve in the coming years, leading to a more stable, less volatile pricing environment. Especially in **2013 supply is set to increase by about 6% globally**, with Asia being the main driver (adding about 10% of Bd capacity in 2013 to about 6.8m t). For the period 2011-2017, the average annual increase is expected to be about 3.5% p.a. outpacing the 2.5% p.a. average growth from 2007-2011, according to IHS. This limits price upside, in our view, especially in a lower-growth environment.

C4 shortage created high levels of profitability as C4 derivatives demanded a scarcity premium due to strong demand

In addition, the butadiene shortage created an environment in which companies like Lanxess enjoyed strong pricing power and high margins: strong demand for butadiene derivatives, like synthetic rubber, allowed Lanxess to extract superior margins as its products demanded a scarcity premium. This can be seen in Figure 20: in 2010 and 2011 global synthetic rubber demand outpaced butadiene capacity growth by c. 400bps creating extreme tightness and high levels of profitability.

Figure 19. Notable Butadiene Capacity Additions in 2013

Company	Location	Capacity (in kt)
Asia		
Fushun PC	China	80
PetroChina Daqing PC	China	60
Qixiang Tengda Chem	China	75
Shandong Wanda Chemical	China	75
Shandong Yuhuang	China	84
Sinopec Wuhan	China	110
South America		
Braskem	Brazil	50
Western Europe		
LyondellBasell	Germany	34
Versalis	Italy	71

Source: CMAI

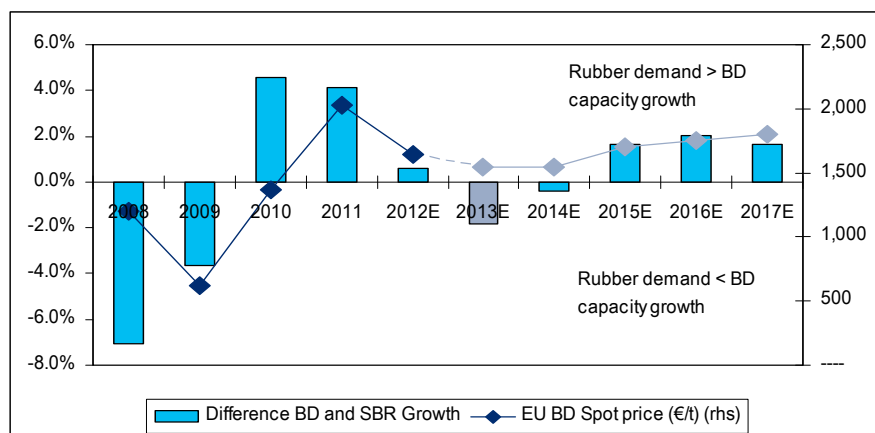
Butadiene capacity growth set to outpace demand for synthetic rubber; butadiene price upside limited

At the same time, the demand environment is rather sluggish, especially due to weak tyre markets. The 6% capacity growth in Butadiene outpaces the forecasted **SSBR/ESBR and PBR demand growth of 4% and 4.5%, respectively**. 70% of PBR and 75% of SBR production is used in tyres and the outlook is rather cautious. Tyre markets have been weak this year (more details below), with European and

US replacement tyre markets down 10% and 2%, respectively. The outlook for 2013 is cautious given relatively high stock levels and expected sluggish economic growth.

Figure 20 shows the link between synthetic rubber demand growth, butadiene capacity growth and EU Butadiene spot prices. Especially in the years 2010 and 2011, demand for synthetic rubber outpaced butadiene capacity additions, resulting in a BD price spike. Looking at IHS forecasts for 2013 and 2014, this is about to change: demand for synthetic rubber is expected to lag butadiene capacity expansions.

Figure 20. The link between Rubber Demand, Butadiene Capacity additions, and BD price*



Source: Citi Research; CMAI; *price development from 2013E onwards just indicative

Expect lower butadiene price in 2013 vs. 2012

Hence, our base case is for a slight decline in butadiene price in the next 12-24 months with less volatility across the regions, but still high relative to historical levels.

For Lanxess we forecast a c. 2% price decline in 2013.

The Supply Side Responds

Portfolio mix remains largely unchanged

Lanxess is investing heavily in its capacity network. However, investments in high-performance rubber are being diluted by an aggressive expansion of lower-margin EPDM in China. As a result, we think that these investments dilute the company's ROCE and do not change the overall portfolio mix.

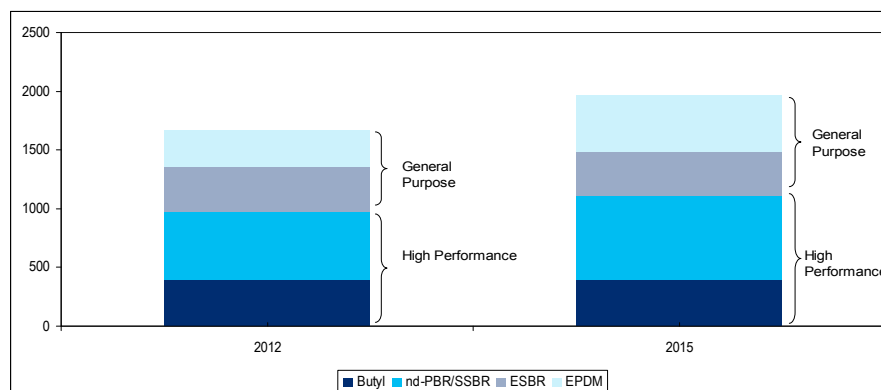
Lanxess total synthetic rubber capacity is c. 1.7m t

60% of total capacity is high-performance rubber

Lanxess's total synthetic rubber capacity (Butyl, nd-PBR, S/E-SBR, EPDM) is about 1.67m t including its new 100kt butyl plant in Singapore (start-up 2013).

About 60% is high-performance rubber (butyl, nd-PBR, S-SBR), i.e. rubber used in high-performance tyres/applications in order to provide certain performance characteristics, such as low rolling resistance and good wet grip. 40% is lower-margin (EBITDA margin c. 5-14%) commodity rubber, such as E-SBR and EPDM used in more basic applications, such as standard tyres, windscreen wipers, and seals.

Figure 21. Lanxess – Synthetic Rubber Portfolio (2012 and 2015)*

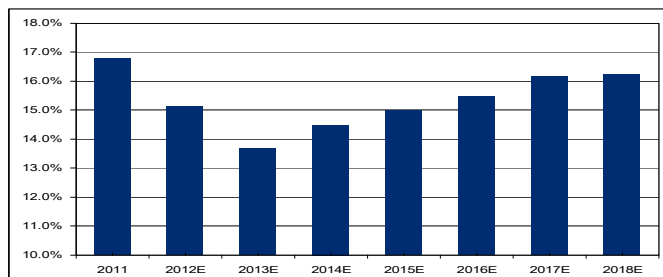


Source: Citi Research; company reports; *2012 incl 100kt butyl capacity from new Singapore plant

3 major capex projects by 2015 totalling over €830m

By 2015 the company plans to have made 3 major investments in its synthetic rubber portfolio, mainly focused on the high-performance segment (butyl, nd-PBR). In total, Lanxess plans to have invested over €830m by 2015, bringing total capacity to 2m t. However, by adding 160kt p.a. of lower-margin EPDM capacity in China in 2015, the company effectively dilutes its previous efforts, resulting in an overall unchanged portfolio mix. We therefore do not expect any significant margin and ROCE uplift in Performance Polymers due to these acquisitions.

Figure 22. Lanxess ROCE (EBIT/Capital Employed)



Source: Citi Research; Company reports

Figure 23. Lanxess - Major Capex Projects

Project	Type of Rubber	Location	Capacity (kt/a)	Capex (in €m)	Start-up
Butyl Rubber	High Performance	Singapore	100	400	3Q13
nd-PBR	High Performance	Singapore	140	200	1H15
EPDM	Standard	China	160	235	2015

Source: Company Reports

Global Supply of Synthetic Rubber increases

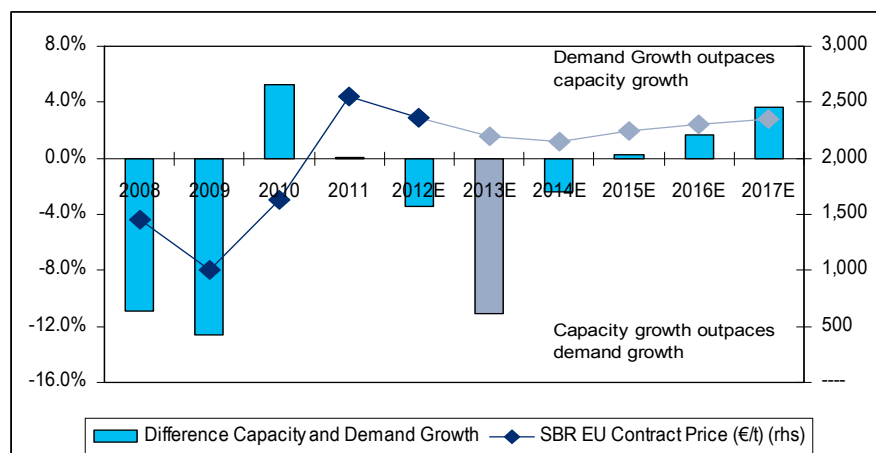
Global synthetic rubber capacity is set to increase significantly in the coming years. We think the competitive environment will become more challenging, putting pressure on Lanxess and limiting margin upside.

In this report, we focus on the competitive outlook for Lanxess's high-end rubber portfolio: S-SBR, PBR and Butyl rubber.

2013 to see significant capacity expansions in S-SBR (+24%), PBR (+13%) and Butyl (+8%)

2013 is expected to see a significant step-up in global capacities (S-SBR +24%, PBR +13%, Butyl +8% (annualised)), which is set to outpace global demand. As a result, we think operating rates are likely to decline somewhat within the industry, which should limit price upside. This is good news for the tyre makers, but leads to a more cautious outlook for synthetic rubber producers, such as Lanxess.

Figure 24. SBR (S/E-SBR) Capacity and Demand Growth Differential and SBR EU Contract prices*



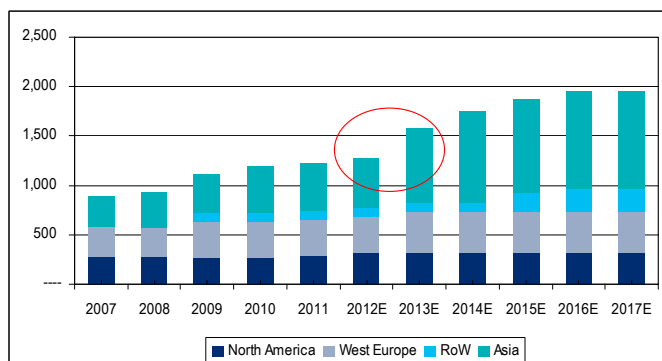
Source: Citi Research; CMAI; *price development from 2013E onwards just indicative

1. S- SBR – Prepare for a supply shock in 2013

S-SBR global capacity is 1.3m t; Lanxess is world's largest independent supplier

Solution Styrene Butadiene Rubber (S-SBR) is mainly used in the tyre tread. S-SBR is a high-performance rubber given its excellent wet grip, reduced rolling resistance and good abrasion. Global S-SBR capacity is about 1.3mt, of which about 40% is located in Asia. The market is rather fragmented as the top 7 producers account for about 50% of global capacity. **Lanxess is currently the largest independent supplier according to our estimates, with about 130kt p.a.** Bridgestone/Firestone (180kt p.a) and Michelin (170kt) have more capacity but use most of this internally.

Figure 25. S-SBR – Capacity Development (2007-2017E)



Source: Citi Research; CMAI

Figure 26. Most notable S-SBR Capacity additions in 2013

Company	Location	Capacity (in kt)
Asia		
Asahi Kasei Chem	Singapore	25
Dynasol Synthetic	China	100
JSR BST Elastomer	Thailand	50
Korea Kumho	South Korea	40
LG Chem	South Korea	15
Nippon Zeon	Singapore	12
Sumitomo Chem	Singapore	10
Western Europe		
Styron	Germany	50

Source: Citi Research; CMAI

Global capacity set to increase by 24% and 11% in 2013 and 2014, respectively

However, **global capacity is set to increase by 24% in 2013 and 11% in 2014 according to latest CMAI estimates**, with Asian companies being the main driver (Asian capacity up 24%). For example, Asahi Kasei, Nippon Zeon and Sumitomo Chemical are set to make Singapore a net exporter by adding 125kt p.a of S-SBR by 2014 vs. zero capacity today. The significant global expansion compares to more moderate growth in the past: 2.5% in 2011 and 5% in 2012. Hence, we expect overall lower capacity utilisation rates in the industry of around 80-85% vs. 90%+ in previous years, with negative implications for profitability.

Demand growth of 5-10% p.a. on average

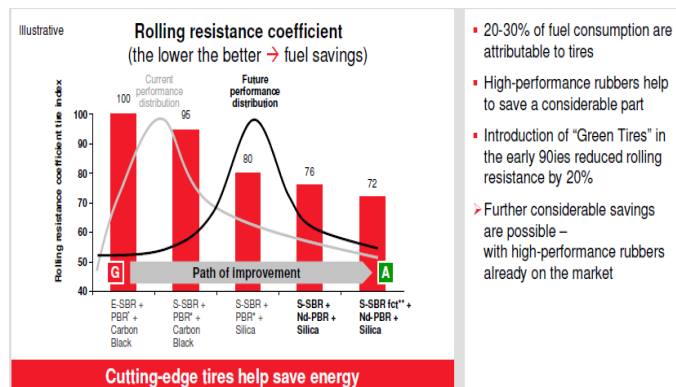
Supply growth should also outpace global demand, which is forecast to grow in the range of 5-10% p.a., according to Lanxess and other industry sources. The key demand driver is the gradual shift towards high-performance tyres. S-SBR is key for reducing rolling resistance and **“green tyres” can achieve up to 30% lower rolling resistance vs. standard tyres**. Hence, given that tyres account for about 25% of a car’s fuel consumption, green tyres can improve fuel efficiency of a car by up to 7.5%.

Tyre labeling is believed to be an important driver for the shift towards more fuel-efficient tyres (more details below) and high-performance rubbers are key for achieving higher rankings when it comes to fuel efficiency, wet grip performance, and noise emissions.

OEMs likely to remain the principal innovation driver

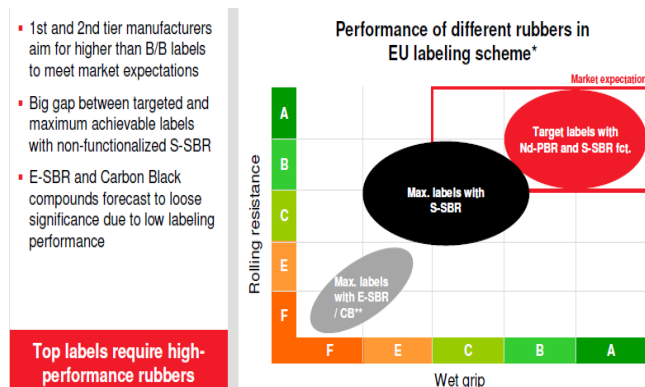
However, in our view, car OEMs, like Daimler, BMW etc, will remain the principal driving force behind development of better tyres given their crucial role (30% less rolling resistance) in complying with stricter CO2 legislation and meeting consumer needs (higher speeds, durability, design).

Figure 27. Rolling Resistance Development



Source: Lanxess; *PBR: General Purpose Rubber; **fct.: functionalized S-SBR for better integration of the filler into the polymer matrix

Figure 28. Rubber types and Tyre Labels



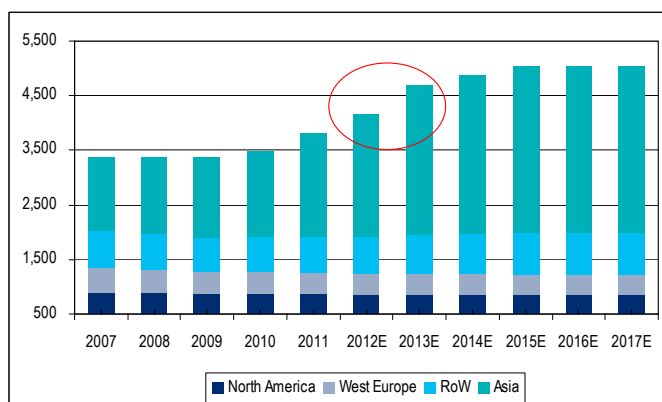
Source: Lanxess; *Statements are applicable to passenger car tyres only; **Carbon Black

2. PBR – Specialties to remain tighter

Global PBR capacity is 4.2m t; Asia accounts for over 50%; tyres account for 70% of consumption

Polybutadiene Rubber (PBR), the 2nd largest volume synthetic rubber behind SBR (S-/E-SBR), with **global PBR capacity of 4.2m t in (up 9% YoY) in 2012**. It is produced via solution-polymerisation of butadiene using different catalysts, such as Neodymium, cobalt, nickel, depending on the desired product characteristics. The main end-market is the tyre industry. PBR is **mainly used in the tyre tread and sidewall**, which together account for over 70% of PBR consumption. Other applications include automotive hoses, rubberised cloth, golf balls etc.

Figure 29. PBR – Capacity Development (2007-2017E)



Source: Citi Research; CMAI

Figure 30. Most notable PBR Capacity additions in 2013

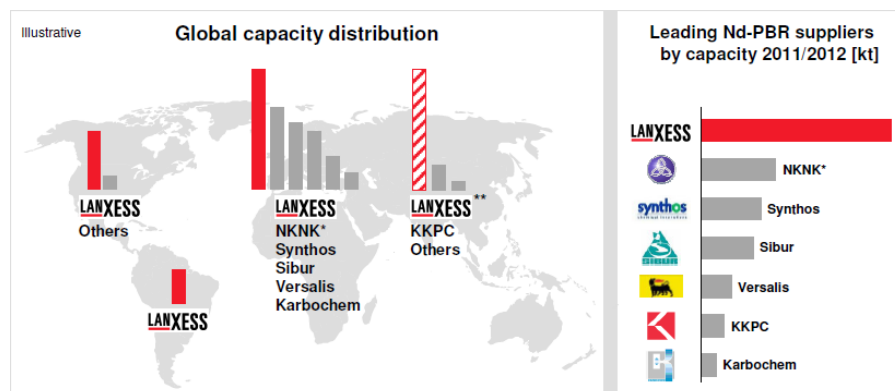
Company	Location	Capacity (in kt)
Maoming PC	China	83
PetroChina Daqing	China	60
Reliance Industries	India	100
Shandong Huamao	China	50
Sichuan PC	China	38
Yangzi PC	China	149
Zhejiang Transfar	China	67

Source: Citi Research; CMAI

IHS estimates that Nd-PBR accounts for about 20-25% of global capacity or about 840-1,050kt. Nd-PBR is a high performance rubber that provides high abrasion resistance, reduced rolling resistance, and rebound resilience, while reducing heat build up. Main producers of nd-PBR are Lanxess, NKNK, Synthos, Sibur, Versalis. KKPC, Karbochem.

Lanxess is the world's largest nd-PBR producer, with capacity of 440-460kt according to our estimates.

Figure 31. Global nd-PBR Producers



Source: Lanxess, Lanxess estimates based on IHS Chemicals 2012; *Nizhnekamskneftekhim, **plant start up expected in 1H15

PBR – Supply/Demand Outlook

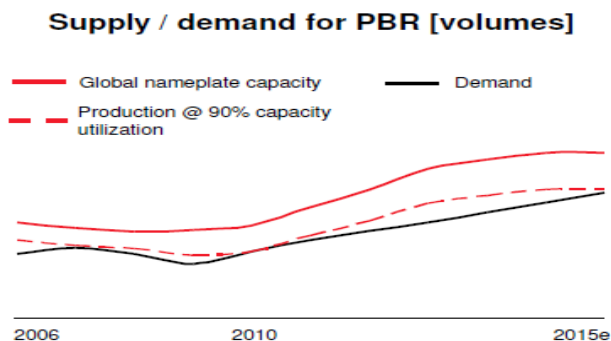
PBR capacity to increase by 13% in 2013 to 4.7m t vs. global demand growth of c. 5%

Nd-PBR unlikely to see any significant capacity additions until 2015; capacity and demand growth seem in line

IHS forecasts global PBR capacity to grow by 13% to 4.7m t in 2013, well ahead of anticipated demand growth of c. 5%. Asian companies are the main driver behind the capacity boost. By the end of 2013, the industry will likely have added about 870kt of capacity since the end of 2011 or about 31% of annual demand (2.8m t p.a.). Demand is forecast to grow by about 4.7% p.a. on average or about 130-160kt p.a. Hence, it could take up to 5 years for this capacity to be absorbed by the market.

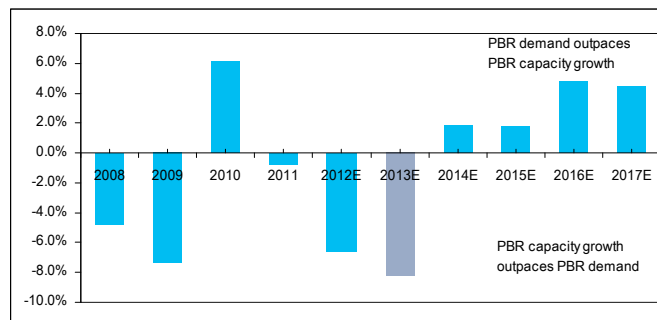
However, the more specialised nd-PBR segment is unlikely to see any significant capacity boost until 2015, when Lanxess is scheduled to start up its new 140kt plant in Singapore. However, Chinese producers, such as PetroChina, have stated their intention to gradually switch from standard PBR to nd-PBR. **We estimate global nd-PBR capacity CAGR of about 5-8% going forward vs. demand growth of 5-10% p.a. Hence, this implies the market requires a world-scale plant (100-150kt p.a.) every 2 years on average.** While supply/demand for nd-PBR should remain rather tight going forward, it seems a bit less constrained than in the past given capacity additions from established players and expansion efforts from new entrants, such as PetroChina.

Figure 32. nd-PBR – Supply/Demand



Source: Lanxess

Figure 33. Difference between PBR Capacity and Demand Growth



Source: Citi Research; CMAI

3. Butyl Rubber – More to come

Complex production process leads to market consolidation

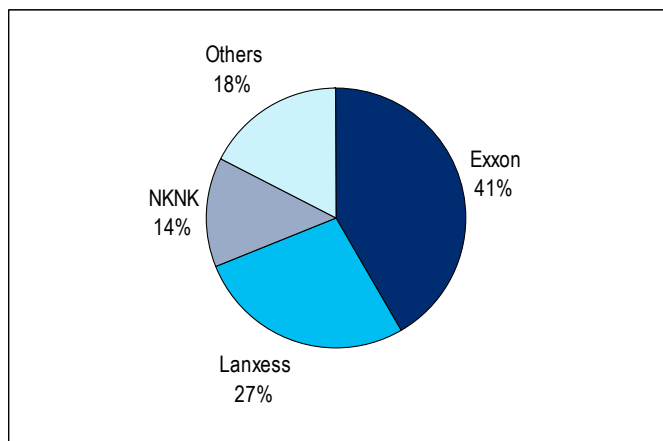
Butyl rubber (IIR) is a synthetic rubber based on the raw materials isobutene and isoprene. The low gas permeability of butyl rubber makes it ideal for constructing the inner tubes and inner liners of tyres where the need to minimise gradual leakage of air is vital. Butyl rubber is more difficult to produce than the simpler butadiene rubber. For instance, the polymerisation process occurs at -100°C in order to control the extremely rapid exothermic reaction and requires very pure monomers. The market consolidation is also a result of the production complexity. Hence, the majority of global capacity still resides in the DM.

There are two types of butyl:

- Regular Butyl
- Halo(genated)-butyl, which occurs in two variants: chlorinated and brominated.

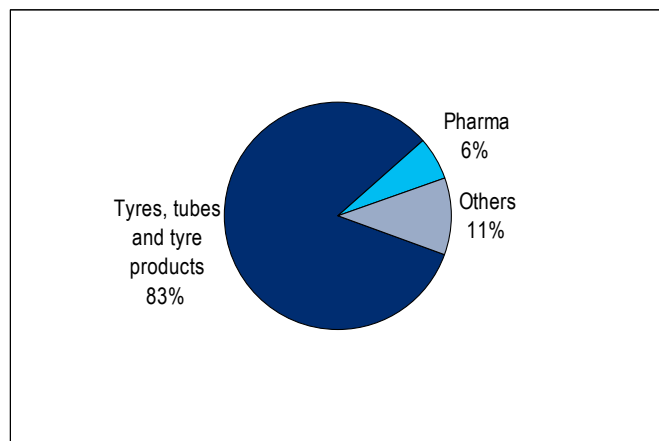
Halo-butyl is used for the inner liner of car, truck, bus and airplane tyres whereas regular butyl is used for inner tubes. The advantage of halo-butyl over regular butyl is its ability to be vulcanised with other rubbers (natural rubber or SBR), which is key in the production of modern, radial tyres. Tyres, tubes and tyre products account for over 80% of butyl rubber consumption.

Figure 34. Main Butyl Producers by capacity (as of Sep 2011)*



Source: IHS; *Lanxess includes 100kt plant in Singapore (start up 2013)

Figure 35. Butyl consumption by end market (2010)

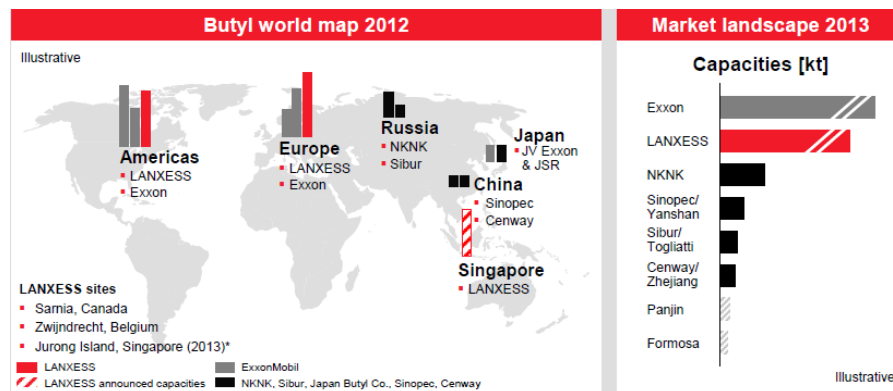


Source: IHS

Global butyl rubber capacity is about 1.2m t

Global butyl rubber capacity is about 1.2m t. The market is highly consolidated with the top 3 producers (Exxon, Lanxess, NKNK) accounting for over 80% of global capacity. Potential new entrants are Formosa and Panjin. **Lanxess is the 2nd largest producer with about 400kt capacity (incl its new 100kt plant in Singapore (start up 2013)).**

Figure 36. Butyl Market – Overview



Source: Lanxess

Better availability going forward

Supply growth (2012-2015E) of 9% p.a. vs. demand growth at c. 5% p.a.

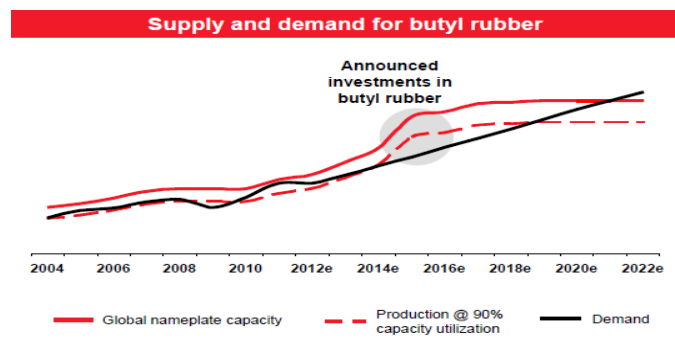
Following the historic shortage of butyl rubber and record producer profitability, we should finally see a more meaningful supply side response in the coming years. The most important projects are Lanxess' 100kt butyl plant in Singapore (on stream 2013) and Exxon/Sabic's 400kt rubber facility in Saudi Arabia (on stream 2015). In addition, the market is likely to see new entrants, such as Reliance/Sibur, Panjin, Formosa.

Up to 372kt of new capacity (=30% of current capacity) to be added by the end of 2015

In total, up to 372kt of new capacity could be added by 2015 (CAGR12-15E 9%) vs. demand growth of about 35-40kt p.a. (CAGR 5%). In other words, it could take till the end of the decade for this capacity to be absorbed by the market.

Hence, it seems the extreme tightness of the past is over for the time being, resulting in better product availability and potentially lower producer profitability.

Figure 37. Butyl – Supply/Demand Outlook



Source: Lanxess

Figure 38. Notable Butyl Rubber capacity expansion projects

Company	Country	Capacity	On Stream Date
Al-Jubail Petrochemical Co - (Kemya)	Saudi Arabia	100kt*	2015
Lanxess	Singapore	100kt	2013
Reliance Industries / Sibur	India	100kt	2014
Zhejiang Xinhui Synthetic New Material Co	China	72kt	2012/2013

Source: Citi Research; ICIS; * assuming 100kt butyl capacity out of 400kt total

Tyre Market – All hopes on premium Status Quo – Rather Weak

Lanxess generates about 25% of group sales with the tyre industry.

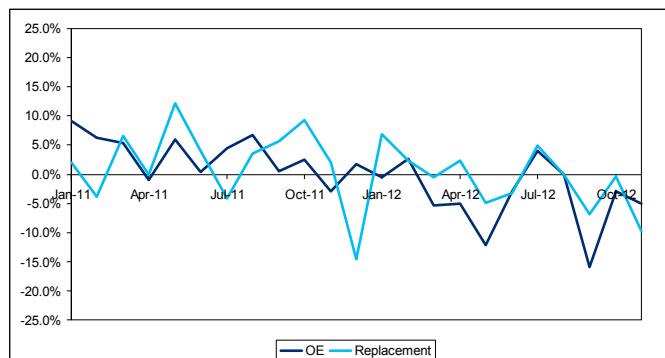
Global passenger car tyre market is about 1.4bn units

The global passenger car tyre market is about 1.35bn units. The market can be divided into two segments: 1) Original equipment; 2) Replacement tyres. Replacement tyre demand accounts for c. 75% of the global tyre market and is generally less volatile than OE demand given that demand is driven by replacement cycles where original tyres are being replaced once they are worn out, usually about 40,000km in Europe. These replacement cycles can be prolonged during times of economic uncertainty, when vehicle miles travelled usually decline, but are generally more predictable than OE demand, which depends on light vehicle production. OE tyres are selected by car producers in close corporation with tyre manufacturers.

Weak tyre markets in 2012

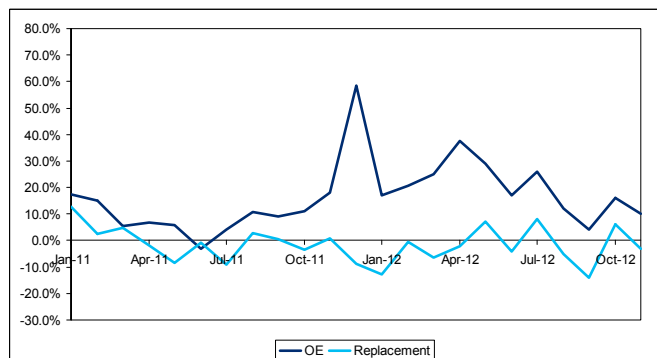
Tyre markets have been weak in 2012. According to Michelin's market data, EU and US replacement tyre markets are down 10% and 2% YTD, respectively. The only pocket of strength has been the US OE, market which is up 18% YTD on the back of strong car sales numbers.

Figure 39. EU - OE and Replacement Tyre Markets (YoY)



Source: Michelin

Figure 40. US – OE and Replacement Tyre Markets (YoY)



Source: Michelin

2013E tyre market growth c. 3-4%

For 2013, our Auto analysts forecast car tyre demand growth of 3-4%, mainly driven by Asia (+5%), with Europe (+2%) and the US (+1-2%) showing some marginal growth

Figure 41. Global Tyre Demand

Passenger car and Light truck tires (in m units)	2011	2012E	2013E	2014E
OE				
Europe	96.9	89.1	88.3	90.0
North America	64.3	76.5	79.6	82.0
Asia excluding India	160.8	176.9	189.3	202.5
South America	21.6	21.6	22.2	23.8
Others	29.2	30.7	32.8	35.1
Total	372.8	394.8	412.2	433.4
YoY				
Europe	7.1%	-8.0%	-1.0%	2.0%
North America	9.9%	19.0%	4.0%	3.0%
Asia excluding India	-1.8%	10.0%	7.0%	7.0%
South America	4.3%	0.0%	3.0%	7.0%
Others	9.8%	5.0%	7.0%	7.0%
Total	3.6%	5.9%	4.4%	5.2%
REP				
Europe	338.2	301.0	310.0	319.3
North America	263.1	255.2	257.8	265.5
Asia excluding India	213.0	213.0	223.7	239.3
South America	61.7	61.7	63.6	66.7
Others	90.7	93.4	97.2	101.0
Total	966.7	924.3	952.1	991.9
YoY				
Europe	5.4%	-11.0%	3.0%	3.0%
North America	-1.2%	-3.0%	1.0%	3.0%
Asia excluding India	9.6%	0.0%	5.0%	7.0%
South America	6.2%	0.0%	3.0%	5.0%
Others	3.0%	3.0%	4.0%	4.0%
Total	4.2%	-4.4%	3.0%	4.2%

Source: Citi Research; Michelin

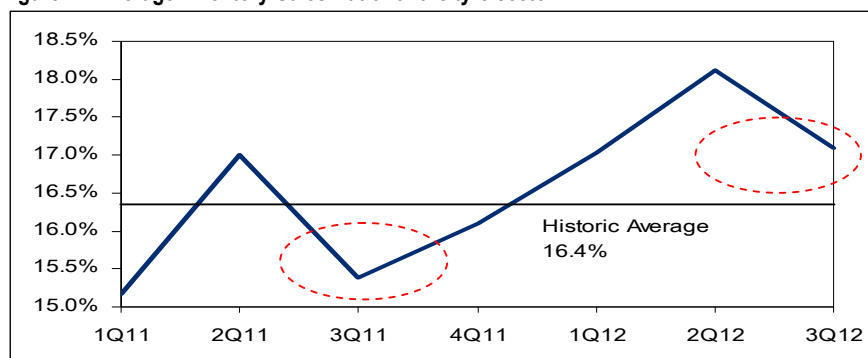
High inventory levels point towards further de-stocking

Tyre inventories still above historic average; further de-stocking likely in 1Q13

However, inventory levels are still high relative to the levels seen 12 months ago. The average inventory/sales ratio of around 17.1% for the tyre industry at the end of 3Q12 was about 170 bps higher than a year ago and above the historic average of about 16.4%. Given ongoing weak end market demand, we think de-stocking, which started in 3Q12, is likely to continue throughout 4Q12 and to potentially last well into 1Q13.

Companies such as Goodyear announced further production cuts in 3Q12 to balance supply/demand. Feedback from Michelin has been that inventory levels especially for summer tyres are at normal levels and the company does not expect any significant re-stocking in 2013.

Figure 42. Average Inventory-Sales Ratio for the tyre sector*



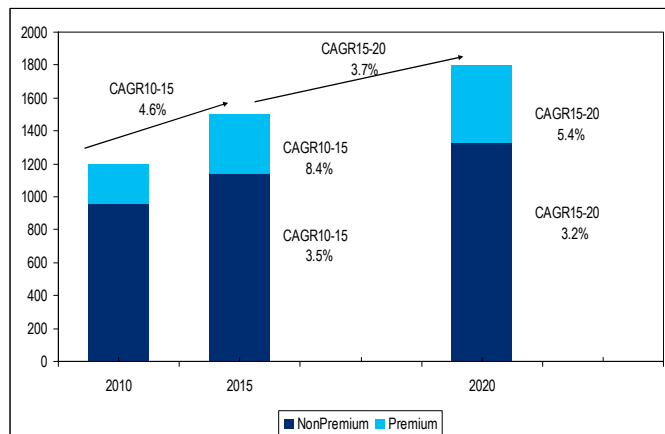
Source: Citi Research; company reports; *incl Bridgestone, Continental, Goodyear, Hankook, Michelin, Pirelli, Sumitomo Rubber, Yokohama Rubber

Demand – All Focus on Premium

Total market growth c. 4-5% p.a.;
premium tyre growth c. 8-10%

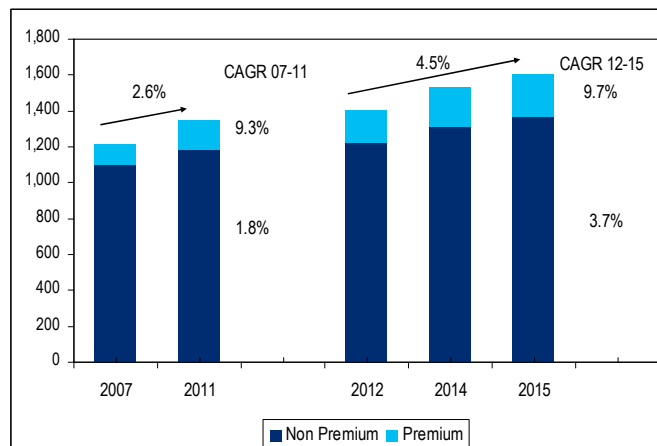
The global passenger car tyre market is c. 1.35bn units and is forecast to grow by about 4-5% p.a. on average, according to Michelin and Pirelli data. By 2015 the market is likely to reach about 1.5-1.6bn units. However **premium tyres are expected to outperform the general market** and take significant share as growth rates are seen in the range of **8-10%p.a.**

Figure 43. Michelin's expectations for global tyre market (in m units)



Source: Citi Research; Michelin. Michelin premium = tyres ≥ 17"

Figure 44. Pirelli expectations for global tyre market (in m units)



Source: Citi Research; Pirelli. Pirelli premium = WYZ speed codes, Run Flat, Motorsport, SUV & Winter > H

In terms of regions, it is hardly surprising that the EM are expected to outperform DM market growth given mega-trends such as urbanisation, higher disposable income levels and mobilisation.

What are premium tyres?

There is **no standard definition of premium tyres**. Conti and Michelin's definitions focus on ≥17" tyres. For Pirelli on the other hand premium tyres include all tyres with any of the following characteristics: WYZ speed codes, Run flat, motorsport, SUV & Winter >H. Lanxess defines premium or high-performance tyres via their performance when it comes to fuel efficiency and wet grip performance. .

We define premium tyres as tyres of a certain size (>17"), with certain performance characteristics (superior fuel efficiency, wet grip performance, durability,) which allow suppliers and manufacturers to generate above-average margins due to the inherent value proposition of their products.

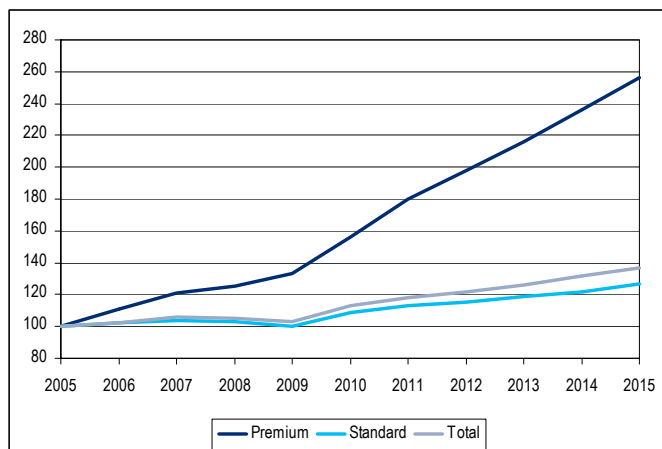
Given that bigger tyres tend to have better performance characteristics (speed, fuel efficiency etc), we focus on Conti's and Michelin's framework going forward.

Premium Tyres – Set to Outperform

Since 2005 premium tyres have outperformed the general tyre market by 7600 bps according to Pirelli data. While the premium tyre market almost doubled (+98%) in the period from 2005-2012, the overall tyre market grew by about 22%. It is current consensus view in the tyre industry that premium tyres are set to continue to outperform the general tyre market. Hence tyre companies and their suppliers focus their efforts on this segment.

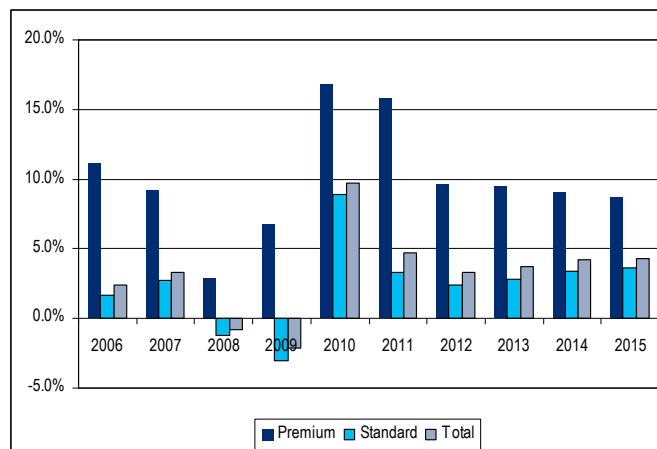
Outperformance of premium tyres

Figure 45. Global Market Trend (Passenger car tyres) – by segment (2005 = 100)



Source: Citi Research; Pirelli

Figure 46. YoY Global Demand Development by Segment



Source: Citi Research; Pirelli

Premium Drivers

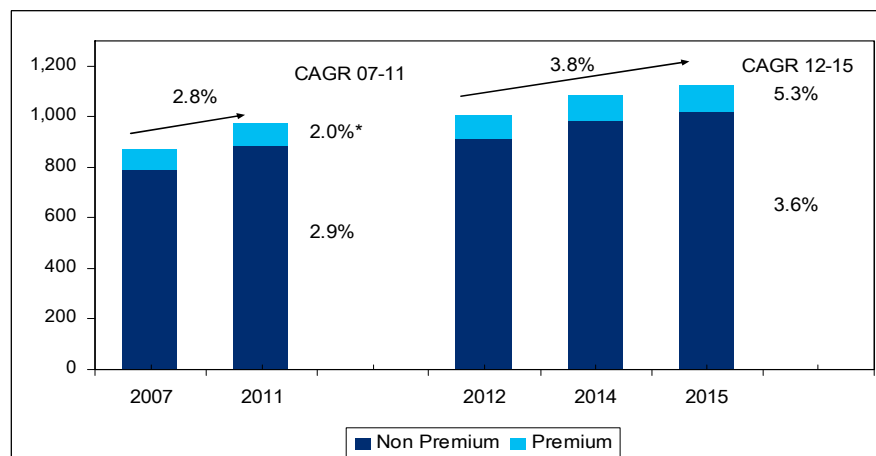
We see 3 key drivers for premium tyres going forward:

1. Car park premiumisation

Premium car market expected to grow c. 5.3% p.a. vs. general market at 3.8% p.a.

OE tyres account for 25% of the global tyre market. OE tyres are tyres originally fitted on new vehicles before sale. The tyres are selected by car producers in close cooperation with tyre manufacturers. Hence, the structure of the global vehicle car park is an important driver for premium OE tyres as premium cars tend to be equipped with better-performing tyres. While the premium car segment underperformed the overall market from 2007-2011 mainly due to car scrappage schemes in 2009, they are expected to outperform the overall market by almost 200bps in the coming years, according to Global Insight: **the overall car park is expected to grow by 3.8% p.a. till 2015 vs. premium at 5.3% p.a.**

Figure 47. Development of global vehicle car park (in m units)



Source: Citi Research; Pirelli; *affected by car scrappage schemes which favoured non-premium segment

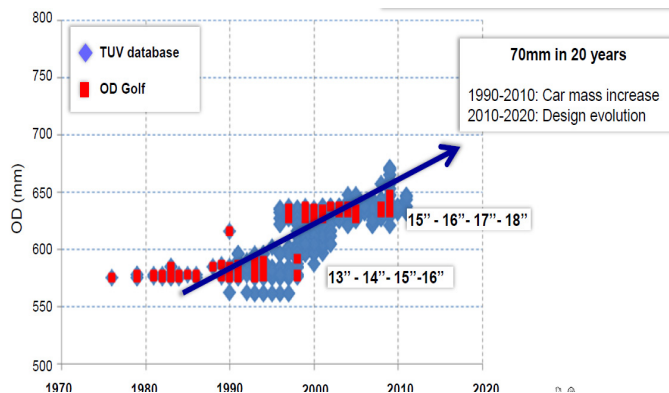
2. Car design – Trend towards sportier looks drives tyre sizes

Trend towards bigger tyres

There has been a strong trend towards bigger tyres over the last decades. Tyres are an integral part of the design/look of a car and with demand shifting towards sportier-looking cars, tyre sizes have increased over time as bigger tyres allow for a more stylish and sportier look.

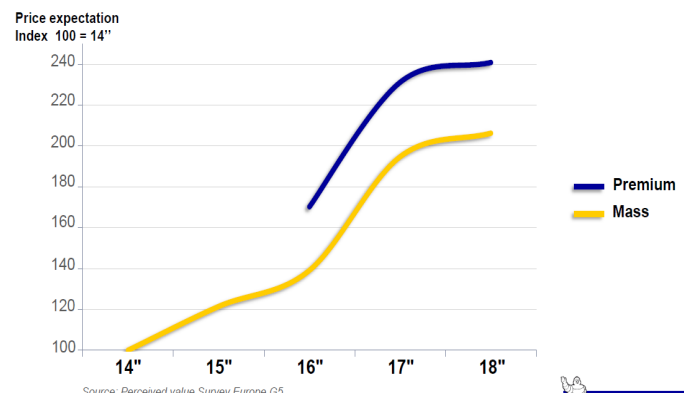
For synthetic rubber suppliers, this means higher sales volumes as bigger tyres require more rubber and tyre manufacturers can extract above-average margins given consumer willingness to premiumise price expectations.

Figure 48. Tyre diameter development – Trend towards bigger sizes



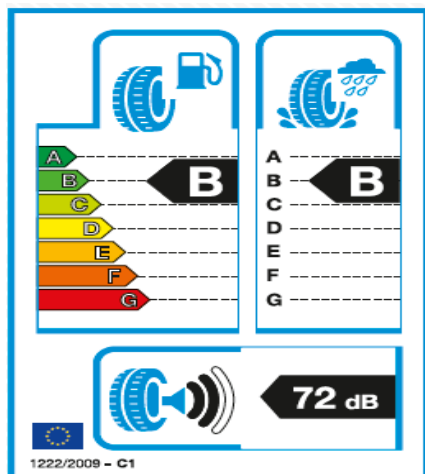
Source: Michelin; TUEV database

Figure 49. Question: "On average, what price would you be prepared to pay for a tyre?"



Source: Michelin; Perceived value Survey Group G5

Figure 50. EU Tyre Label



Source: European Commission

3. Tyre labeling and tighter emission norms

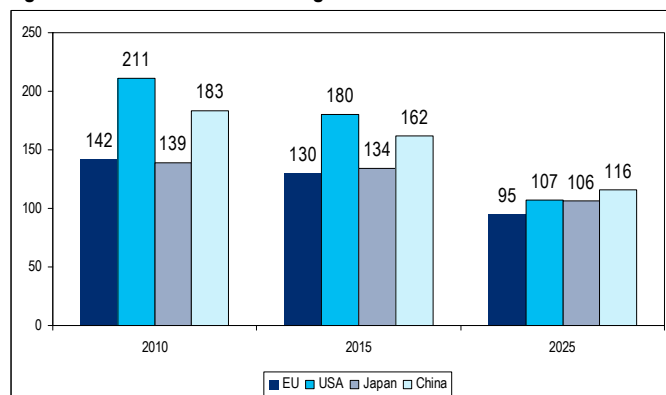
As of 01 November 2012 tyre producers need to label every LDV tyre in Europe produced after 30th June 2012 for **fuel efficiency** (rating A-G, where A is the highest and G the lowest; D is not applicable), **wet grip** (A-F where A is the shortest breaking distance in rain and F the longest; G is not applicable) and **noise performance** (external rolling noise of the tyre in decibel).

Similar to household appliances, the tyre labeling scheme is **based on self-declaration by manufacturers or importers**. The EU regulator only established standardised tests, which are then used by the tyre producers for labeling purposes. While EU Member States must check the conformity of the declared classes and do compliance checks, there is no independent body in Europe that tests and labels tyres. Hence we think there is **risk of abuse**, especially from lower-tier producers in the EM. This could undermine the purpose of the label and increase reliance on brands and dealer recommendations.

In general, **tyre labeling** is believed to be an **important driver for the shift towards more fuel-efficient tyres**. No doubt, the label creates a more transparent market, as it allows customers to compare products and make a more informed purchasing decision. It further gives tyre companies a powerful tool for value-based pricing as an A-rated tyre for examples consumes up to 7.5% less fuel than a G-rated one. Hence consumers can calculate the payback period of their tyres based on fuel prices, kilometers travelled, and the purchase price differentials.

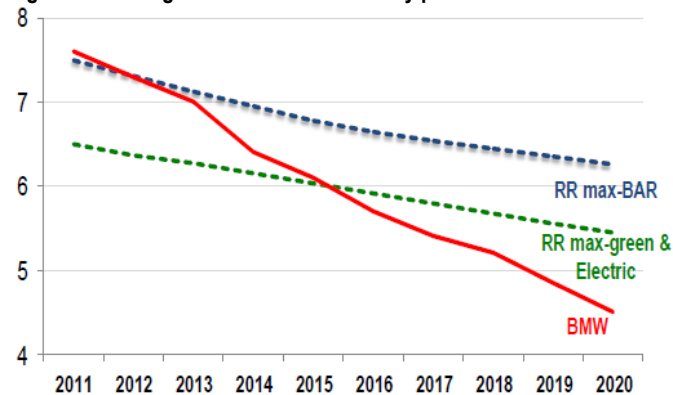
However, while we do think that **tyre labeling** will have a positive impact on the market (more details below), we think it **should not be over-rated**. Even tyre makers seem quite indifferent about it. After speaking with all major players, we found that most do not expect any significant impact on the market as Tier 1 producers seem confident about getting better labels on average than their Tier 2 competitors (c. 10-15% market share).

Figure 51. CO2 fleet emission targets



Source: EU Commission, Parliament and Council; EPA, DOT and NHTSA; JAMA; ICCT; Roland Berger

Figure 52. Rolling Resistance demanded by premium OEMs



Source: Michelin

This more cautious assertion is also based on the experience in other markets, such as Japan, which introduced a voluntary label in 2010. **In Japan there is no data/evidence that suggests a dramatic shift in demand towards premium tyres following the introduction of the tyre label.**

Hence we think in the short- to medium-term, car OEMs, like Daimler, BMW etc, will remain the principal driving force behind development of better-performing tyres given their key role in complying with stricter CO2 legislation and meeting consumer needs (higher speeds, durability, design). However, as the case study below shows, we think in the longer-term the label has the potential to push demand for better tyres leading to increasing market share and technological advancements.

Case Study: Tyres aren't washing machines or are they?

Looking at other markets where efficiency labels were introduced, such as washing machines, refrigerators, and freezers, may give some indication for potential consumer behaviour and market penetration rates of more efficient products.

Market penetration of top rated products takes several years

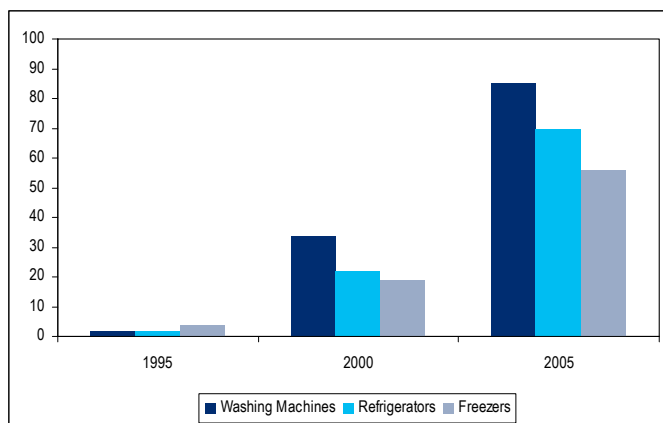
While some appliances, such as washing machines, showed a faster rate of growth of "Band A" sales compared to refrigerators, the common feature is that the uptake of products in higher-efficiency classes takes several years and depends on a number of factors, such as levels of awareness, economic incentives and disincentives, and levels of manufacture and retailer participation.

Top rated tyres could take share faster than expected as many factors work in their favour

In the case of tyres, we think most of these effects are in favour of a rapid penetration of high-performance tyres: level of awareness: high; economic incentives: high (given high fuel prices); level of manufacture and retailer participation: high.

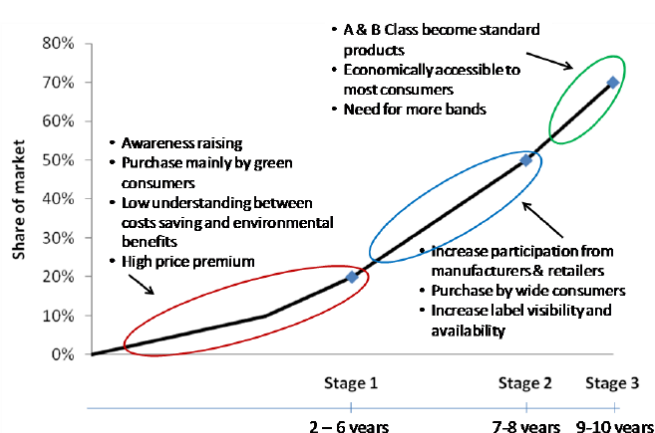
Hence Michelin's or Pirelli's assumptions of market share gains of about 400-600bps for high-performance tyres going forward seem reasonable to us and could even be a nudge too conservative judging by the developments in other markets.

Figure 53. Market Share (in %) Development of Band A or above



Source: Stockle, GfK (2006), Europe Economics (2007), Note: Basis 1995 to 2005 for 8 countries West Europe, measured by GfK since 1995. Countries: Austria, Belgium, Germany, Spain, France, GB, Italy, The Netherlands

Figure 54. Labelling Stages and Share of Market (A & B Class)



Source: GHK Estimates

Financials

Figure 55. Lanxess Profit and Loss A/C (€ Mn)

Profit and Loss	2009	2010	2011	2012e	2013e	2014e	2015e
Performance Polymers	2,388	3,782	5,059	5,221	5,363	5,793	6,284
Advanced Intermediates	1,104	1,321	1,545	1,628	1,710	1,778	1,849
Performance Chemicals	1,530	1,978	2,130	2,170	2,192	2,280	2,371
Reconciliation	35	39	41	41	42	42	43
Net sales	5,057	7,120	8,775	9,061	9,307	9,893	10,547
Growth	-23%	41%	23%	3%	3%	6%	7%
Performance Polymers	250	585	768	825	827	910	980
Advanced Intermediates	154	222	264	285	282	284	287
Performance Chemicals	182	281	289	271	274	296	320
Reconciliation	-121	-170	-175	-185	-180	-184	-187
Analyst adjusted EBITDA	465	918	1,146	1,196	1,203	1,307	1,400
Growth	-36%	97%	25%	4%	1%	9%	7%
Group margin	9.2%	12.9%	13.1%	13.2%	12.9%	13.2%	13.3%
Analyst adjusted EBIT	204	635	826	823	785	872	932
Group margin	4.0%	8.9%	9.4%	9.1%	8.4%	8.8%	8.8%
Associates	8	16	7	15	15	15	15
Net interest income/expense	-73	-83	-93	-100	-95	-90	-80
Pretax profit	32	493	655	690	676	767	836
Taxation	7	-112	-148	-155	-152	-172	-188
Normalized tax rate (proforma)	-22%	23%	23%	23%	23%	23%	0%
Minority interest	1	-2	-1	-1	-1	-1	-1
Reported net income	40	379	506	534	523	593	647
Analyst adjusted earnings	81	401	545	555	523	593	647
Average weighted ordinary shares - adjusted	83.2	83.2	83.2	83.2	83.2	83.2	83.2
EPS - diluted	0.98	4.82	6.55	6.68	6.28	7.13	7.78
EPS growth	-72.4%	393.4%	36.0%	2.0%	-5.9%	13.5%	9.1%

Source: Citi Research, company data

Figure 56. Lanxess Cash flow statement (€ Mn)

Cash flow	2009	2010	2011	2012e	2013e	2014e	2015e
Reported net income	40	379	506	534	523	593	647
Minority interest	-1	2	1	1	1	1	1
Depreciation and amortization	261	283	320	373	418	435	467
Cash tax adjustment	-66	-4	-16	-16	-17	-17	-18
Other operating cash flow	80	39	91	74	78	74	64
Total other operating cash flow	80	40	93	74	78	74	64
Net change in working capital	239	-220	-256	-217	-33	-108	-120
Cash from operations	553	480	648	749	970	977	1,041
Capital expenditure	-316	-501	-679	-675	-660	-600	-550
Net acquisitions/disposals	-466	126	-244	0	0	0	0
Total other investing cash flows	0	0	0	0	0	0	0
Cash from investing activities	-782	-375	-923	-675	-660	-600	-550
Change in borrowings	402	-78	620	-324	-126	861	1,198
Dividends paid	-42	-42	-58	-71	-75	-83	-87
Total other financing cash flows	0	0	0	0	0	0	0
Cash from financing activities	360	-120	562	-395	-200	778	1,111
Change in cash	131	-15	287	-321	110	1,155	1,602

Source: Citi Research, company data

Figure 57. Lanxess Balance Sheet (€ Mn)

Balance Sheet	2009	2010	2011	2012e	2013e	2014e	2015e
Cash and marketable securities	715	524	528	528	528	528	528
Accounts receivable	733	942	1,146	1,207	1,215	1,266	1,322
Inventory	849	1,094	1,386	1,460	1,499	1,594	1,699
Total other current assets	389	368	329	341	352	374	399
Current assets	2,686	2,928	3,389	3,536	3,594	3,762	3,949
Net tangible fixed assets	1,809	2,131	2,679	2,981	3,223	3,388	3,471
Investments	27	21	31	32	33	34	35
Other financial assets	350	360	406	426	448	470	493
Total financial assets	377	381	437	458	481	504	528
Total assets	5,068	5,666	6,878	7,348	7,670	8,027	8,321
Accounts payable	595	796	921	848	871	926	987
Short-term debt	94	176	633	309	183	0	0
Total other current liabilities	430	479	535	551	565	598	635
Current liabilities	1,119	1,451	2,089	1,708	1,619	1,524	1,622
Long-term debt	1,462	1,302	1,465	1,465	1,465	1,465	1,465
Deferred tax liability	38	40	75	77	80	85	90
Other non-current liabilities	358	412	407	410	414	417	421
Total other non-current liabilities	396	452	482	488	493	502	511
Total provisions	646	700	768	738	708	677	645
Total liabilities	3,623	3,905	4,804	4,399	4,286	4,168	4,244
Minority interest - accumulated	13	15	16	17	17	18	19
Shareholders' equity	1,432	1,746	2,058	2,932	3,368	3,841	4,058
Shareholders' funds	1,445	1,761	2,074	2,949	3,385	3,859	4,077
Liabilities and shareholders' funds	5,068	5,666	6,878	7,348	7,670	8,027	8,321
Net tangible fixed assets	1,809	2,131	2,679	2,981	3,223	3,388	3,471
Total other non current assets	196	226	373	373	373	373	373
Net working capital	946	1,129	1,405	1,609	1,630	1,710	1,799
Capital employed	2,951	3,486	4,457	4,962	5,226	5,471	5,642
ROCE (post tax)	8%	14%	14%	13%	12%	12%	17%

Source: Citi Research, company data

Lanxess

Company description

Lanxess generates about €9bn of sales. The company's rubber activities generate half of the sales with the other half coming from specialty chemicals (leather treatment, rubber additives, ion exchange) and basic and fine chemicals. The company has undergone a significant restructuring process divesting about €1.5bn of business (by sales) since its formation, including highly cyclical businesses such as styrenics. With the majority of divestments completed, the focus is now on growth by continuing to extract better performance from existing businesses and expanding capacity in Performance Polymers

Investment strategy

We have a Sell (3) rating. Lanxess has so far delivered on cash generation, EPS performance and restructuring gains. In 2010 and 2011 the company benefitted from tight butadiene markets and strong synthetic rubber demand. Pricing has been key to the success story. In 2013, however, we think earnings momentum could stall. More butadiene and synthetic rubber supply and sluggish demand from the tyre industry should lead to a more competitive environment. Higher D&A and pension charges and plant start-up costs should put additional pressure on EPS. With shares trading near all-time highs, we see downside risk to the share price. Consensus seems to currently underestimate these challenges and we think downgrades are likely.

Valuation

Our target price of €56 is driven mainly by our view of the cash flow potential of the group. Our DCF analysis uses a WACC of 8.9%, beta of 1.5 and long-term growth rate of 2%. We set our target price at a discount to our DCF-derived fair value of €65 to account for macro risk, current market volatility and uncertainty over the development of LXS' s key selling prices

Risks

We would highlight the following key risks to our valuation and investment thesis.

If some of the announced butadiene capacity expansion projects are not realised, butadiene markets look more balanced. This would provide upside risk for prices and result in a better earnings outlook for the company than currently anticipated by us.

In addition, a stronger-than-expected improvement in the macro-environment would provide upside to our current estimates. We expect tyre markets to remain challenging in 1H13. However, should sentiment improve earlier than expected, we expect LXS customers to come back to the market, which could result in a stronger-than-expected volume development.

Notes

Notes

Appendix A-1

Analyst Certification

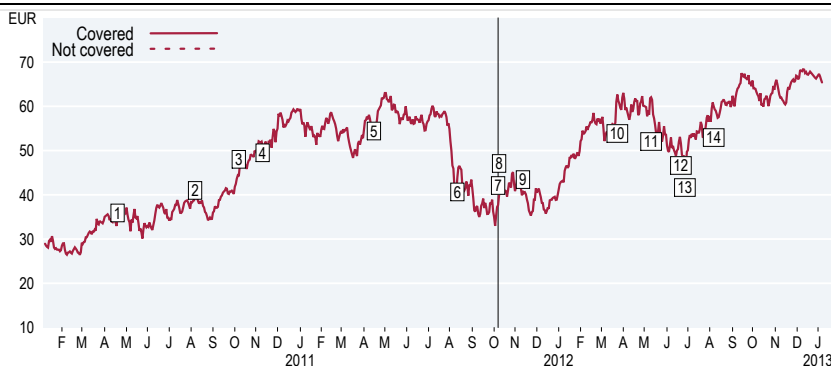
The research analyst(s) primarily responsible for the preparation and content of this research report are named in bold text in the author block at the front of the product except for those sections where an analyst's name appears in bold alongside content which is attributable to that analyst. Each 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

Lanxess (LXSG.DE)

Ratings and Target Price History Fundamental Research

Analyst: Dominik Frauendienst
Covered since October 8 2010



	Date	Rating	Target Price	Closing Price
1	20-Apr-10	*2H	*33.00	34.92
2	6-Aug-10	2H	*39.00	40.14
3	7-Oct-10	*1H	*55.00	44.19
4	10-Nov-10	1H	*60.00	51.15
5	15-Apr-11	1H	*70.00	55.29

* Indicates change

	Date	Rating	Target Price	Closing Price
6	11-Aug-11	1H	*66.00	43.96
7	7-Oct-11	Stock rating system changed		
8	8-Oct-11	*1	66.00	37.67
9	11-Nov-11	1	*63.00	40.87
10	23-Mar-12	1	*73.00	62.67

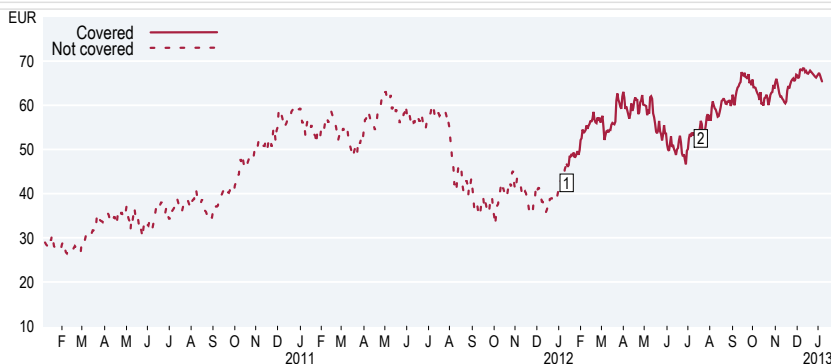
	Date	Rating	Target Price	Closing Price
11	10-May-12	1	*80.00	62.05
12	21-Jun-12	1	*72.00	51.61
13	27-Jun-12	*2	*50.00	47.63
14	7-Aug-12	2	*58.00	60.01

Rating/target price changes above reflect Eastern Standard Time

Lanxess (LXSG.DE)

Ratings and Target Price History Best Ideas Research Relative Call (3 Month)

Analyst: Dominik Frauendienst
Covered since October 8 2010



	Date	Rating	Target Price	Closing Price
1	12-Jan-12	*ADD MP	-	46.62

* Indicates change

	Date	Rating	Target Price	Closing Price
2	19-Jul-12	*REM MP	-	56.48

Rating/target price changes above reflect Eastern Standard Time

Citigroup Global Markets Inc. or its affiliates has received compensation for investment banking services provided within the past 12 months from Lanxess.

Citigroup Global Markets Inc. or an affiliate received compensation for products and services other than investment banking services from Lanxess 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): Lanxess.

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: Lanxess.

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: Lanxess.

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 Equity Ratings Distribution

<i>Data current as of 31 Dec 2012</i>	12 Month Rating			Relative Rating		
	Buy	Hold	Sell	Buy	Hold	Sell
Citi Research Global Fundamental Coverage	49%	38%	12%	7%	86%	7%
% of companies in each rating category that are investment banking clients	53%	49%	45%	60%	49%	55%

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.

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 Ltd

Dominik Frauendienst; Andrew Benson; Evgenia Molotova

OTHER DISCLOSURES

The subject company's share price set out on the front page of this Product is quoted as at 08 January 2013 02:54 PM on the issuer's primary market.

Citigroup Global Markets Inc. and/or its affiliates has a significant financial interest in relation to Lanxess. (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.

Important Disclosures for Morgan Stanley Smith Barney LLC Customers: Morgan Stanley & Co. LLC (Morgan Stanley) research reports may be available about the companies that are the subject of this Citi Research research report. Ask your Financial Advisor or use smithbarney.com to view any available Morgan Stanley research reports in addition to Citi Research research reports.

Important disclosure regarding the relationship between the companies that are the subject of this Citi Research research report and Morgan Stanley Smith Barney LLC and its affiliates are available at the Morgan Stanley Smith Barney disclosure website at www.morganstanleysmithbarney.com/researchdisclosures.

For Morgan Stanley and Citigroup Global Markets, Inc. specific disclosures, you may refer to www.morganstanley.com/researchdisclosures and https://www.citivelocity.com/cvr/eppublic/citi_research_disclosures.

This Citi Research research report has been reviewed and approved on behalf of Morgan Stanley Smith Barney LLC. This review and approval was conducted by the same person who reviewed this research report on behalf of Citi Research. This could create a conflict of interest.

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, Bangrak, 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/eppublic/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