Rating
Buy

Asia
China

Energy
Chemicals

Company
Wanhua Chemical

Reuters	Bloomberg	Exchange	Ticker
600309.SS	600309 CH	SHH	600309

Date
11 August 2017

Initiation of Coverage

Price at 11 Aug 2017 (CNY)	31.44
Price target - 12mth (CNY)	42.00
52-week range (CNY)	34.71 - 19.12
Shanghai Composite	3,262

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A crown jewel in fine chemicals; initiating Buy with TP RMB42.0

A crown jewel in fine chemicals; initiating Buy with TP RMB42.0

Wanhua Chemical (WHC) is the biggest global methylene diphenyl diisocyanate (MDI) producer with a 24% market share. Its share price has a 72% correlation with MDI spreads, and as spreads have risen 165% in the last 12 months, the share price has risen +75%. However, we see more potential share price upside as we believe the MDI upcycle will continue until 2020 on slowing new capacity additions globally. We also see new product ramp-up and potential asset injection as key earnings drivers. We expect WHC's EPS to achieve a 37% CAGR in 2016-19E with ROIC improving to 23% in 2017-19E.

Strong supply-demand supports MDI upcycle

In 2016-20E, we expect a 3.5% supply CAGR, below the 4.8% CAGR in 2010-16 when there was a big capacity increase. On the other hand, we expect demand to record a healthy 5.6% CAGR during the same period, driven by construction materials, which account for 52% of usage globally. Consequently, we expect the MDI operating rate to increase from 87% in 2016 to 94% by 2020. This should expand the MDI spread from RMB9,500/tonne in 2016 to RMB15,928/tonne in 2019E, a 19% CAGR. Other PU such as TDI also will likely enter an upcycle post 2018E; we see the TDI operating rate reaching 89% by 2020. Conversely, with the new 300ktpa TDI line expected in 2018, we project WHC's PU volume should increase a 7% CAGR over 2016-19E.

Entering high-end chemicals market

Currently, polyurethane (PU) accounts for 55% of WHC's revenue (71% of GP). WHC has branched out to six new business units since 2015, of which TPU, PC, and water-based paint are promising products, as China is still a net importer of high-end TPU and PC products, and we believe water-based paint will be a key beneficiary of the stricter environmental regulation. We expect the revenue of the functional material and specialty chemicals segments to register a 33% CAGR in 2016-19E and become a second growth driver.

Asset injection & new business ahead with flexible balance sheet

As stated by WHC, it is likely to acquire BorsodChem (BC) by Sep-2018 from its parent company, Wanhua Industrial Group (WIG). BC holds a MDI/TDI/PVC capacity of 240k/250k/400ktpa in Hungary. We believe this asset injection would strengthen WHC's global presence. Besides, the company is conducting feasibility studies for the construction of a 1mntpa ethylene capacity and to utilise its strong balance sheet (net gearing of 22%/2% in 2018E/19E). We have not factored either of these events into our model currently.

Valuation and risks; target price RMB42.0

Our target price of RMB42.0 is based on 8.0x EV/EBITDA, at an 18% discount to its historical average of 9.7x. We use a Gordon Growth Model, applying average 2017-18E FCF growth to its EBITDA. The shares trade at 6.2x 12-month forward EV/EVITDA, at a 12% discount to global MDI peers and a 36% discount to their historical mean. Our target price implies 4.7x 2017-18E P/B; we believe the premium to global peers is justified as its ROE averaged 38% in 2017-18E, which is at a 137% premium over MDI peers. Key risks: fluctuations in oil and chemical product prices, lower-than-expected GDP growth and unexpected corporate actions with demanding valuation. More detail pp. 3-4.

Stock data

Market cap (CNYm)	85,957
Market cap (USDm)	12,908
Shares outstanding (m)	2,734.0
Major shareholders	Wanhua Industrial Group (47.9%)
Free float (%)	52
Avg daily value traded (USDm)	172.4

Source: Deutsche Bank

Forecasts & Ratios

	2017E	2018E	2019E
EBITDA (RMB bn)	15.8	17.7	19.8
NP (RMB bn)	7.6	8.8	10.1
EPS (RMB)	2.79	3.22	3.68
Growth (%)	+97%	+15%	+14%
vs. Consensus	+9%	+14%	+11%
EV/EBITDA (x)	6.6x	5.7x	4.9x
P/E (x)	11.3x	9.8x	8.5x
P/B (x)	3.9x	3.1x	2.6x
ROE (%)	41%	35%	33%

Source: Deutsche Bank estimates

Key products abbreviation

Products	Full name
PU	Polyurethane
MDI	Methylene diphenyl diisocyanate
TDI	Toluene diisocyanate
TPU	Thermoplastic polyurethane
PC	Polycarbonate
SAP	Superabsorbent polymer
PVC	Polyvinyl chloride
VCM	Vinyl Chloride Monomer

Source: Deutsche Bank

Model updated:09 August 2017

Running the numbers

Asia

China

Chemicals

Wanhua Chemical

Reuters: 600309.SS Bloomberg: 600309 CH

Buy

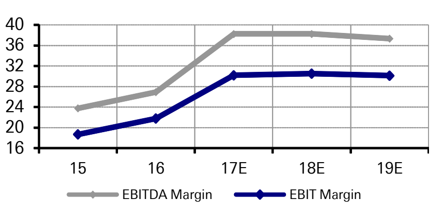
Price (11 Aug 17)	CNY 31.44
Target Price	CNY 42.00
52 Week range	CNY 19.12 - 34.71
Market Cap (m)	CNYm 85,957
	USDm 12,908

Company Profile

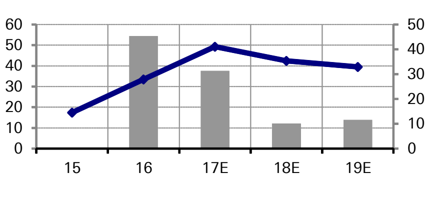
Wanhua Chemical Group Co. Ltd (WHC) was founded in 1998. The company engages in the production, sales, R&D of downstream chemical products such as isocyanate, polyol, and polyurethane. WHC is the largest MDI producer in the world with more than 24% market shares globally as of 2016. Moreover, the company started six new business segments, including intermediate chemicals products, polycarbonate (PC), TPU, water-based paints, etc.

Price Performance

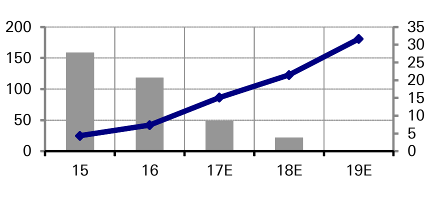
Margin Trends



Growth & Profitability



Solvency



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Fiscal year end 31-Dec	2015	2016	2017E	2018E	2019E
Financial Summary					
DB EPS (CNY)	0.62	1.42	2.79	3.22	3.68
Reported EPS (CNY)	0.62	1.42	2.79	3.22	3.68
DPS (CNY)	0.17	0.44	0.98	1.29	1.47
BVPS (CNY)	4.5	5.7	8.2	10.1	12.3
Weighted average shares (m)	2,595	2,595	2,728	2,734	2,734
Average market cap (CNYm)	54,994	45,932	85,957	85,957	85,957
Enterprise value (CNYm)	81,640	70,766	104,339	100,781	96,112
Valuation Metrics					
P/E (DB) (x)	34.2	12.5	11.3	9.8	8.5
P/E (Reported) (x)	34.2	12.5	11.3	9.8	8.5
P/BV (x)	3.96	3.77	3.85	3.12	2.56
FCF Yield (%)	nm	nm	10.8	11.4	13.5
Dividend Yield (%)	0.8	2.5	3.1	4.1	4.7
EV/Sales (x)	4.2	2.4	2.5	2.2	1.8
EV/EBITDA (x)	17.6	8.7	6.6	5.7	4.9
EV/EBIT (x)	22.4	10.8	8.3	7.1	6.0
Income Statement (CNYm)					
Sales revenue	19,492	30,100	41,398	46,413	52,903
Gross profit	5,872	9,355	16,408	18,549	20,929
EBITDA	4,637	8,108	15,828	17,749	19,758
Depreciation	934	1,473	3,153	3,390	3,616
Amortisation	55	73	174	190	205
EBIT	3,648	6,562	12,501	14,169	15,937
Net interest income(expense)	-841	-890	-826	-660	-504
Associates/affiliates	0	0	0	0	0
Exceptionals/extraordinaries	5	-74	0	0	0
Other pre-tax income/(expense)	143	55	16	18	19
Profit before tax	2,954	5,653	11,692	13,527	15,452
Income tax expense	675	1,105	2,285	2,644	3,020
Minorities	670	869	1,797	2,079	2,374
Other post-tax income/(expense)	0	0	0	0	0
Net profit	1,610	3,679	7,610	8,804	10,057
DB adjustments (including dilution)	0	0	0	0	0
DB Net profit	1,610	3,679	7,610	8,804	10,057
Cash Flow (CNYm)					
Cash flow from operations	4,021	4,602	12,538	13,417	15,171
Net Capex	-9,050	-5,097	-3,300	-3,600	-3,600
Free cash flow	-5,029	-495	9,238	9,817	11,571
Equity raised/(bought back)	0	0	2,500	0	0
Dividends paid	-2,851	-1,866	-3,489	-4,181	-4,527
Net inc/(dec) in borrowings	7,706	3,607	-4,893	-2,652	-2,214
Other investing/financing cash flows	180	-179	0	0	0
Net cash flow	6	1,068	3,356	2,984	4,830
Change in working capital	*-1,079*	*-69*	*-1,020*	*-1,705*	*-1,586*
Balance Sheet (CNYm)					
Cash and other liquid assets	2,066	1,987	5,343	8,327	13,157
Tangible fixed assets	20,046	28,468	28,902	28,879	28,518
Goodwill/intangible assets	2,530	2,889	3,135	3,402	3,654
Associates/investments	186	363	363	363	363
Other assets	22,976	17,058	19,191	22,215	24,650
Total assets	47,804	50,765	56,934	63,187	70,343
Interest bearing debt	25,646	23,672	18,779	16,127	13,913
Other liabilities	7,335	8,759	10,578	12,122	13,083
Total liabilities	32,981	32,431	29,357	28,248	26,996
Shareholders' equity	11,571	14,822	22,268	27,551	33,585
Minorities	3,252	3,512	5,309	7,387	9,762
Total shareholders' equity	14,823	18,334	27,577	34,938	43,347
Net debt	*23,580*	*21,685*	*13,436*	*7,800*	*756*
Key Company Metrics					
Sales growth (%)	nm	54.4	37.5	12.1	14.0
DB EPS growth (%)	na	128.6	96.7	15.4	14.2
EBITDA Margin (%)	23.8	26.9	38.2	38.2	37.3
EBIT Margin (%)	18.7	21.8	30.2	30.5	30.1
Payout ratio (%)	26.9	31.0	35.0	40.0	40.0
ROE (%)	14.5	27.9	41.0	35.3	32.9
Capex/sales (%)	46.4	17.1	8.0	7.8	6.8
Capex/depreciation (x)	9.2	3.3	1.0	1.0	0.9
Net debt/equity (%)	159.1	118.3	48.7	22.3	1.7
Net interest cover (x)	4.3	7.4	15.1	21.5	31.6

Source: Company data, Deutsche Bank estimates

Investment thesis

Outlook

The MDI industry has very high technical and capital barriers and, hence it is a highly concentrated market. In 2016, global MDI capacity amounted to 7.4mntpa, with the top five producers controlling c.77% of total capacity. According to IHS, WHC ranks No. 1 among global MDI producers with a total capacity of 1.8mntpa (24% of global market share).

MDI upcycle to continue until 2020E and new capacity in TDI

WHC benefits most from MDI improvement, in our view. We estimate MDI demand will outpace capacity growth and the utilisation rate should reach 94% by 2020E vs. 87% in 2016. We expect global MDI demand to record a 5.6% CAGR in 2016-2020E, outpacing capacity expansion with a CAGR of 3.5%. We see slowing MDI supply growth due to: 1) shutdowns of outdated production facilities (including Korea, Japan, Spain, etc.); and 2) lack of capacity additions in Asia; the only large new capacity would be Sadara Chemical, with a 400ktpa capacity in the Middle East in 2018E. We expect WHC's MDI spread to expand to RMB15,928/tonne in 2019E, a 19% CAGR over 2016-19E.

New material production becoming new growth engine

With a more diversified product portfolio going forward, we believe this would enable WHC to become less sensitive to the MDI cycle. We expect functional material & specialty chemicals revenue to surge a 33% CAGR over 2016-19E. Among the new products, thermoplastic polyurethane (TPU), polycarbonate (PC), and water-based paint are the three most promising products.

Unlocking value & potential corporate actions

We estimate WHC's net gearing should drop to 49% in 2017E vs. the 5-year average of 126%. With strong cash flow ahead, WHC would become almost net cash (without new investment) by 2019E. Also, we believe WHC's healthy balance sheet should enable it to acquire Wanhua Industrial Group's (WIG) stake in BorsodChem (BC), which has a MDI/TDI/PVC capacity of 240k/250k/400k-tpa in Hungary. This would strengthen WHC's global presence, although valuation is an uncertainty. Besides, WHC plans to build a 1mntpa ethylene cracker capacity in Shandong, which will further its vertical integration.

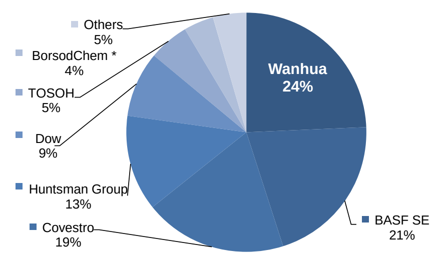
Valuation

We derive WHC's target price of RMB42.0/share by using 8.0x EV/EBITDA based on the Gordon Growth Model, at an 18% discount to its historical average of 9.7x. Our target price implies 4.7x 2017-18E P/B, which is 53% higher than its +1 SD of historical mean P/B.

Risk

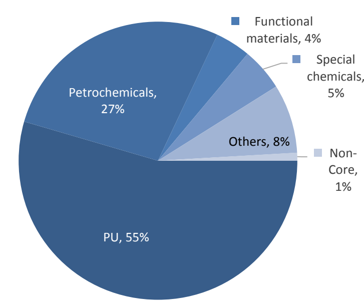
Key risks include: 1) slower-than-expected demand growth in the consumer market, which is the main source of downstream demand for MDI, TPU, and PC; 2) slower-than-expected energy price recovery; 3) slower-than-expected ramp up in TPI capacity; and 4) any unexpected corporate actions with demanding valuation.

Figure 1: 2016 MDI capacity shares by stake



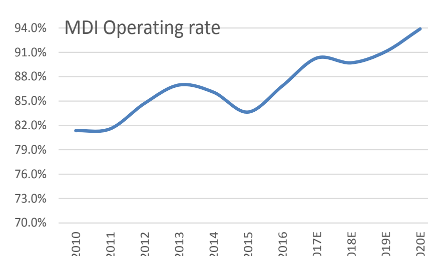
*Source: IHS, Deutsche Bank; Note: * - BorsodChem owned by Wanhua's parent company*

Figure 2: WHC revenue breakdown 2016



Source: Deutsche Bank estimates

Figure 3: Global MDI operating rate



Source: Deutsche Bank estimates; Note: effective utilization rate

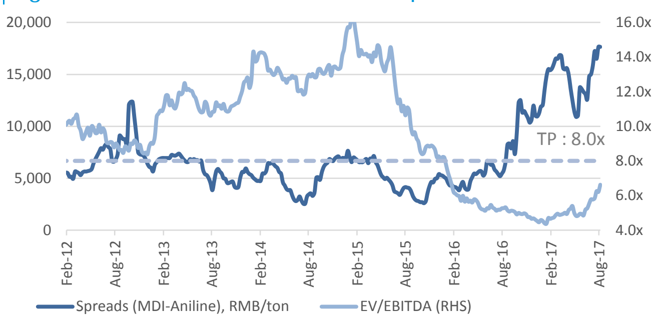
Valuation

What next? More potential upside yet to price in

There is more potential upside due to higher MDI prices and larger volume

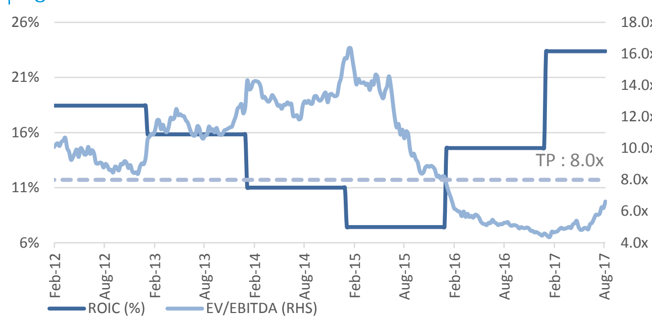
WHC share prices have almost doubled in the past 12 months, but we see more upside considering: 1) MDI upcycle likely to continue until 2020E; 2) new capacity to start in 2018E; and 3) new product ramp-up, plus potential asset injection and new business plan. We believe past share price performance has not fully reflected the strong improvement in free cash flow and return on assets. We expect WHC's EPS to achieve a 37% CAGR in 2016-19E with ROIC improving to an average of 23% in 2017-19E from 15% in 2016.

Figure 4: WHC EV/EBITDA vs MDI spreads



Source: WIND, Bloomberg Finance LP, Deutsche Bank estimates

Figure 5: EV/EBITDA vs ROIC

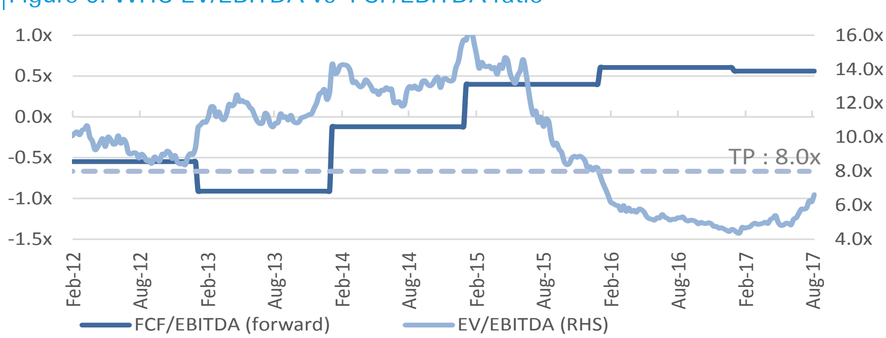


Source: WIND, Bloomberg Finance LP, Deutsche Bank estimates

WHC trades at 10.3x and 6.2x average 2017-18E P/E and EV/EBITDA, at a discount of 19% and 12%, respectively, to global MDI peers, but its 2017-18E P/B of 3.4x is at an 86% premium over global MDI peers. In our view, WHC deserves to trade at a premium to peers given its superior ROE (137% higher than peers) and strong free cash flow yields.

We derive our target price using the Gordon Growth Model. Our target price RMB42.0/share is based on 8.0x EV/EBITDA, using 2017-18E FCF to its EBITDA. This implies an 18% discount to its historical average EV/EBITDA of 9.7x while we expect its FCF to improve at a 12% CAGR in 2016-19E, much better than in the previous MDI upcycle when WHC's FCF stream was in a deficit. Our EV/EBITDA-based TP is at a 7% discount to the DCF model theoretical price.

Figure 6: WHC EV/EBITDA vs FCF/EBITDA ratio



Source: Bloomberg Finance LP, Deutsche Bank estimates

In our opinion, EV/EBITDA is a better methodology than DCF to value WHC because: 1) it addresses free cash flow situation changes as WHC's heavy investment cycle has already passed; 2) it addresses the petrochemical business cyclical; and 3) is in-line with our regional petrochemical company valuation methodology. We cross check our valuation with a DCF below.

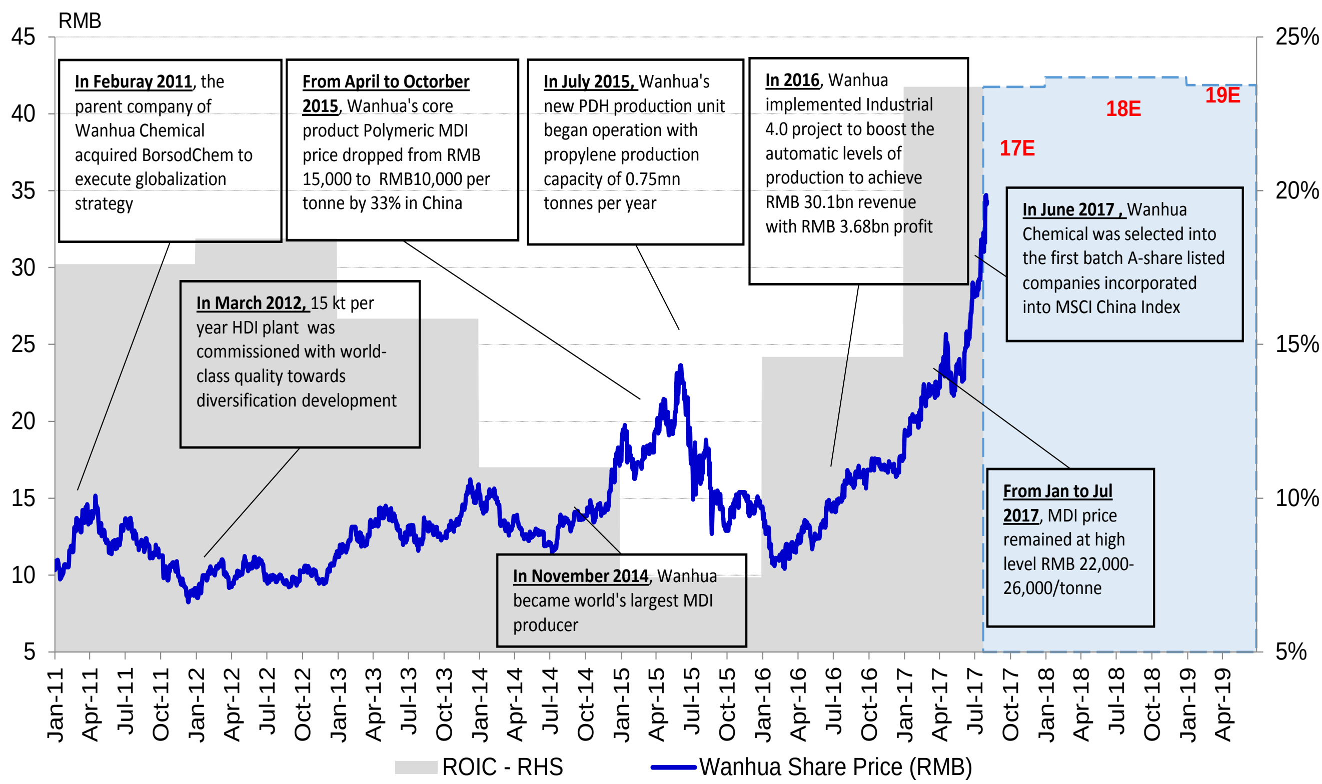
Figure 7: Target price methodology - EV/EBITDA vs DCF model

TP multiples		2017E	2018E	2017-18E Average
EV/EBITDA: [(FCF/EBITDA) x (1+g)]/ [WACC-g]				
Terminal growth		2.0%	2.0%	
WACC		9.4%	9.4%	
FCF (RMB bn)		9.2	9.8	
EBITDA (RMB bn)		15.26	17.50	
EV/EBITDA target		**8.3**	**7.7**	**8.0**
Enterprise value	RMB mn	127,405	135,393	131,738
Net Debt/ (Cash)	RMB mn	13,436	7,800	10,618
MI	RMB mn	5,309	7,387	6,348
Equity value	RMB mn	108,661	120,205	114,773
No. of Existing Shares (mn)		2,734		
Target Price		**39.7**	**44.0**	**42.0**
Discount to DCF				**-7%**

DCF Model						
WACC		9.4%	**Cost of Equity**		**Cost of Debt**	
Debt/Total Capital		20%	Risk-free Rate	3.9%	Pre-tax Cost of Debt (a	6.0%
Terminal growth		2.0%	Equity Risk Premium	5.6%	Tax Rate	25.0%
			Company Beta	1.20	After-tax Cost of Debt	4.5%
			Cost of Equity	10.6%		
NPV for CashFlow	RMBmn	69,738				
Terminal growth	RMBmn	70,138				
Net (debt) / cash	RMBmn	(10,618)				
Minority interest	RMBmn	(6,348)				
Equity value	RMBmn	122,911				
DCF / share	RMB	45.0				

Source: Deutsche Bank estimates

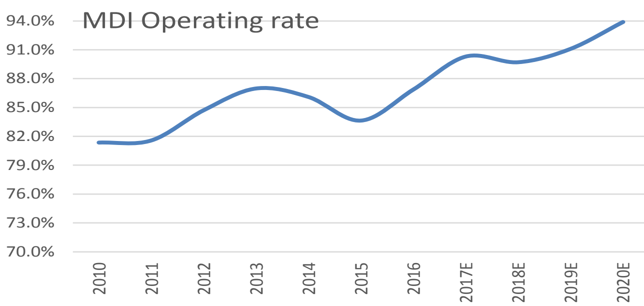
Figure 8: Share price performance, ROIC, and key events



Source: Company data, Deutsche Bank estimates

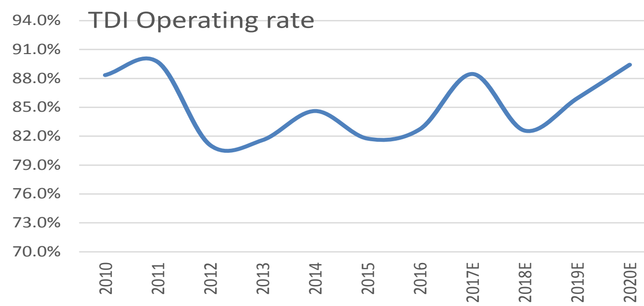
Key charts

Figure 9: MDI global operating rate (%)



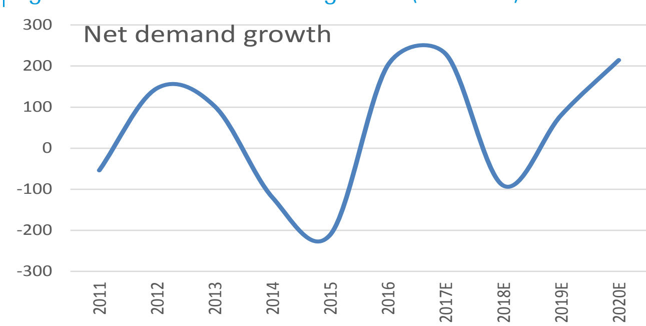
Source: IHS, Deutsche Bank estimates; Note: effective utilization rate

Figure 10: TDI global capacity addition growth (%)



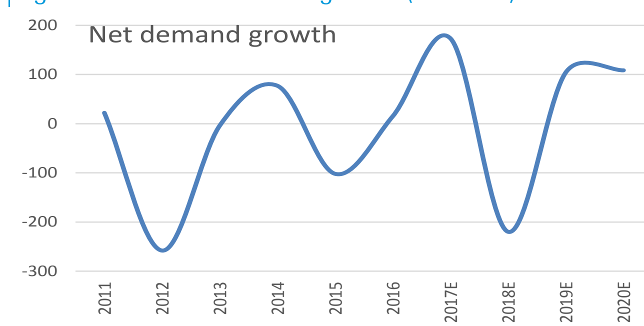
Source: IHS, Deutsche Bank estimates; Note: effective utilization rate

Figure 11: MDI net demand growth (k tonnes)



Source: IHS, Deutsche Bank estimates

Figure 12: TDI net demand growth (k tonnes)



Source: IHS, Deutsche Bank estimates

Figure 13: Comps

		Trading	DB	Target	10-Aug	Mkt Cap	P/E (x)		P/B (x)		ROE (%)		Dvd yield (%)		EV/EBITDA (x)	
Name	Ticker	Curr	Rating	Price	Shr price	(USD mn)	FY17E	FY18E	FY17E	FY18E	FY17E	FY18E	FY17E	FY18E	FY17E	FY18E
Wanhua Chemical	600309.SS	CNY	Buy	42.00	33.47	13,018	12.0	10.4	4.1	3.3	41.0	35.3	2.9	3.8	6.6	5.7
China - A Share Listed																
SPC - A	600688.SS	CNY	Sell	5.30	6.93	9,676	13.0	11.2	2.7	2.4	21.9	22.5	3.5	4.0	6.2	5.2
Oriental Energy	002221.SZ	CNY	NR	NA	11.80	2,815	12.9	9.8	2.3	1.8	18.1	19.1	NA	NA	8.9	7.4
Cangzhou Dahua	600230.SS	CNY	NR	NA	48.35	1,925	11.3	10.8	5.2	3.7	45.8	34.6	NA	NA	NA	NA
Satellite Petrochemic	002648.SZ	CNY	NR	NA	15.87	2,492	17.6	15.0	2.8	2.5	17.1	17.3	2.7	3.2	18.4	16.3
Luxi Chemical	000830.SZ	CNY	NR	NA	9.20	1,915	16.8	13.8	1.4	1.3	8.3	9.1	NA	NA	9.7	8.8
Befar	601678.SS	CNY	NR	NA	8.56	1,492	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Jiangshan Chemical	002061.SZ	CNY	NR	NA	12.03	1,162	18.1	16.6	2.0	1.8	14.5	14.0	1.1	1.3	2.2	2.0
Skshu Paint	603737.SS	CNY	NR	NA	56.88	841	30.6	21.7	4.6	4.0	16.2	19.4	0.6	0.9	23.7	17.7
Haiyue	600387.SS	CNY	NR	NA	12.42	722	96.0	73.4	NA	NA	NA	NA	NA	NA	NA	NA
Hongbaoli	002165.SZ	CNY	NR	NA	6.42	565	22.0	16.3	2.0	1.8	11.1	11.3	NA	NA	11.6	8.3
Honghui New Materia	002802.SZ	CNY	NR	NA	34.78	596	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Weighted average							**14.6**	**12.2**	**3.0**	**2.5**	**26.3**	**24.1**	**2.2**	**2.7**	**7.1**	**6.0**
Wanhua Chemical vs China - A Peers							**-18%**	**-15%**	**35%**	**32%**	**56%**	**47%**	**35%**	**44%**	**-7%**	**-5%**
Overseas Listed																
BASF	BASFn.DE	EUR	Buy	101.00	79.80	86,008	13.8	12.7	2.1	2.0	16.0	16.1	4.1	4.4	7.9	7.4
Covestro	1COV.DE	EUR	Buy	85.00	65.74	15,647	9.2	9.6	2.6	2.2	31.2	24.9	3.8	3.7	5.1	5.1
Solvay	SOLB.BR	EUR	Sell	100.00	121.70	14,741	12.5	18.0	1.2	1.2	10.0	6.7	3.0	3.1	7.4	7.6
Arkema	AKE.PA	EUR	Buy	115.00	93.95	8,348	13.9	12.2	1.6	1.5	11.7	12.4	2.7	2.9	6.8	6.2
Lanxess	LXSG.DE	EUR	Buy	79.00	64.52	6,929	37.3	14.9	2.2	2.0	6.1	14.2	1.2	1.7	8.9	8.4
Synthomer	SYNTS.L	GBP	Buy	550.00	472.90	2,086	23.5	17.3	4.3	3.8	19.6	23.2	2.6	2.8	12.3	10.8
Weighted average							**14.5**	**13.1**	**2.1**	**1.9**	**16.4**	**15.9**	**3.7**	**3.9**	**7.6**	**7.2**
Wanhua Chemical vs Oversea Peers							**-17%**	**-20%**	**97%**	**74%**	**150%**	**123%**	**-21%**	**-2%**	**-12%**	**-20%**
HK Listed																
PetroChina	0857.HK	HKD	Hold	5.51	4.99	209,349	33.4	20.5	0.6	0.6	2.0	3.1	1.3	2.2	6.1	5.7
Sinopec	0386.HK	HKD	Buy	7.27	5.84	105,760	11.3	9.7	0.8	0.8	7.4	8.3	4.9	5.7	3.6	3.2
CNOOC Ltd	0883.HK	HKD	Buy	11.56	8.79	50,207	15.4	13.5	0.9	0.8	5.7	6.3	4.8	5.2	4.3	3.8
SPC - H	0338.HK	HKD	Buy	5.80	4.69	9,676	7.5	6.5	1.6	1.4	21.9	22.5	6.0	7.0	6.2	5.2
Weighted average							**24.1**	**16.2**	**0.8**	**0.7**	**4.5**	**5.5**	**2.9**	**3.7**	**5.2**	**4.7**
Wanhua Chemical vs HK Listed Peers							**-50%**	**-36%**	**447%**	**356%**	**814%**	**541%**	**0%**	**4%**	**28%**	**21%**

Source: Bloomberg Finance LP, Deutsche Bank estimates; Note: Bloomberg consensus estimates for non-rated (NR) companies

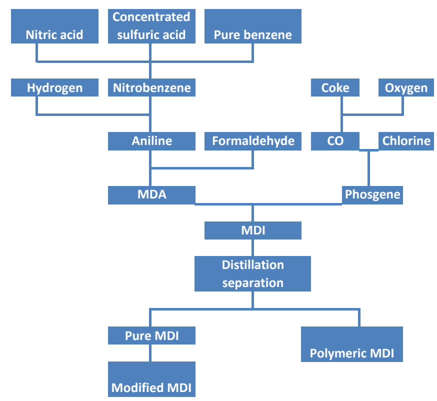
MDI 101

MDI (methylene diphenyl diisocyanate) is an aromatic diisocyanate. MDI reacts with polyols in the manufacturing of polyurethane. MDI is categorised as pure MDI and polymeric MDI.

- Pure MDI is mainly used to produce the slurry of synthetic leather, sole resin, and spandex.
- Polymeric MDI is used to produce rigid PU foam, adhesive, and flexible PU foams.

MDI is an aromatic diisocyanate consisted of isocyanate and polyhydric alcohols. MDI is the most important feedstock for the production of polyurethane (PU), which is the sixth-largest plastic after polyethylene, PVC, polypropylene, polystyrene and ABS. PU possesses not only the elasticity of rubber but also the strength of plastic with wide applications in economic activities of multiple industries including chemicals, aerospace, automobile, medical treatment, etc.

Figure 14: MDI production flow



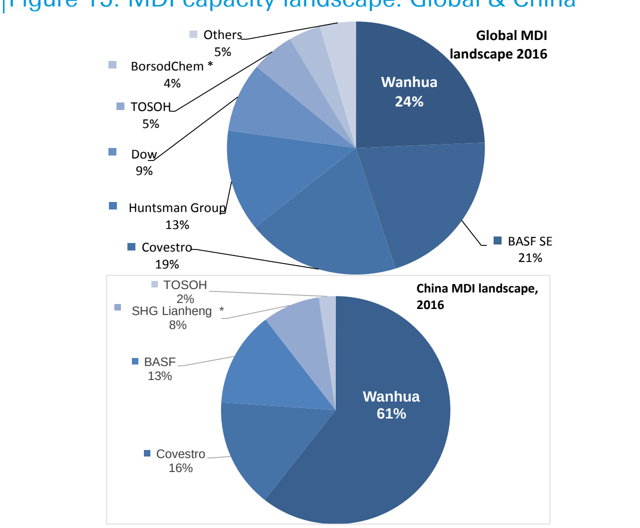
Source: Deutsche Bank

Highly concentrated market – MDI & TDI

PU is a highly concentrated market both domestically and globally

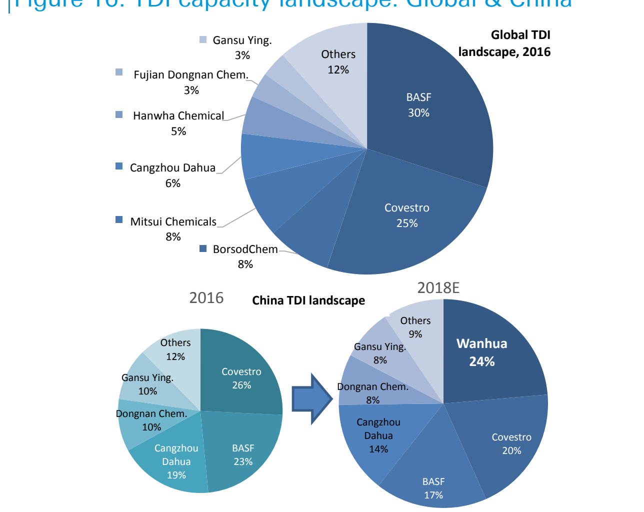
The PU industry has very high technical and capital barriers, which lead to a highly concentrated market. In 2016, global MDI capacity amounted to 7.4mntpa, with the top five producers controlling 77% of total capacity. WHC tops the list of global MDI producers with total capacity at 1.8mntpa, followed by BASF, Convestro, Huntsman, and Dow with a share of 21%, 19%, 13%, 9%, respectively. Likewise, in the TDI market, the top five producers control 77% of total capacity. In China, the MDI market is even more concentrated with only five active producers and WHC's 1.8mntpa capacity accounts for 62% of total capacity. On TDI, the China landscape is changing, with WHC entering the TDI market; its new 300ktpa capacity is scheduled to start in 2018, which will instantly make it a market leader with a 24% share in China.

Figure 15: MDI capacity landscape: Global & China



Source: IHS, Deutsche Bank; Note: * - BorsodChem owned by Wanhua's parent company

Figure 16: TDI capacity landscape: Global & China



Source: IHS, Deutsche Bank; Note: * - Owned by BASF, Huntsman, SGPC, Shanghai Huayi, and Shanghai Chlor-Soda Chemical

PU continues to be key earnings driver while MDI outlook improving

- The PU segment (MDI + TDI) accounted for 55% of WHC's revenue in 2016. We believe the positive outlook of the MDI industry aligns with WHC's future performance.
- With improvements in the global MDI utilisation rate, we expect WHC's MDI margin to expand from RMB9,500/tonne in 2016 to RMB15,9288/tonne in 2019E at a 19% CAGR.
- We expect China MDI demand to register a 7.3% CAGR over 2016-2020, a rise of 1.9mntpa. China MDI demand is mainly driven by refrigerators, construction materials, and slurry and sole resin, which account for 45%, 22.5%, and 18% of total demand, respectively.

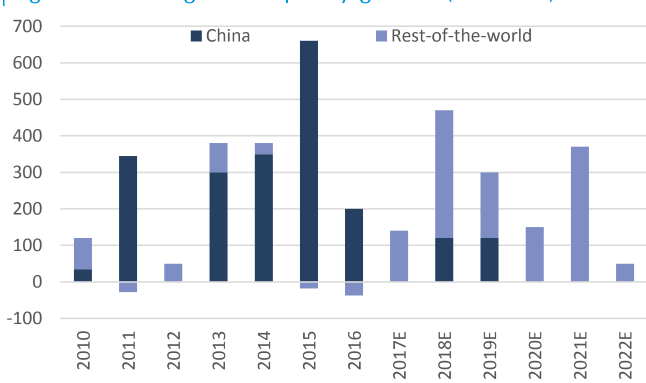
Formula for a bull market: steady demand growth + slowing capacity additions + feedstock cost drop

Global MDI capacity rose at a 4.8% CAGR between 2010 and 2016. More than 50% of total MDI capacity is located in Asia, followed by Europe with c.30% of total capacity. However, we see global capacity additions slowing down to a 3.5% CAGR in 2016-20E to reach 8.2mntpa by the end of 2020E. China MDI capacity expanded rapidly in 2011-16 with a 16% CAGR and reached c.3.0mntpa in 2016, which exceeded the global capacity CAGR of c.5%.

Capacity addition CARG will slow to 3.5% in 2016- 2020E from 4.8% CAGR in 2010-2016.

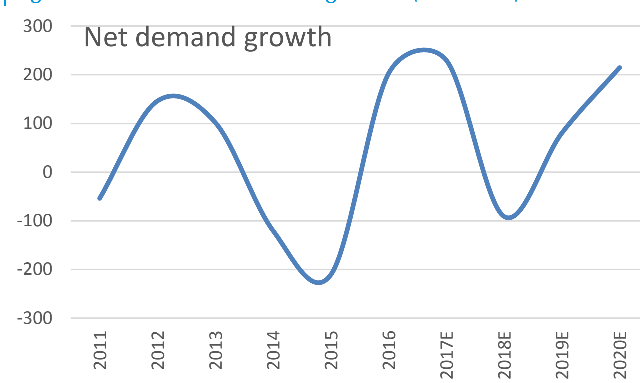
We forecast another 1.06mtpa of new capacity to come on stream between 2017 and 2020E globally. Also, Jilin Connell MDI plans to roll out another 800ktpa of new MDI capacity (c.10% of global capacity) in 2018. However, considering several environmental issues, the new capacity is highly likely to be deferred. Therefore, we have not included this in our expected new capacity. We believe rapid MDI capacity additions should slow down starting in 2017.

Figure 17: MDI global capacity growth (k tonnes)



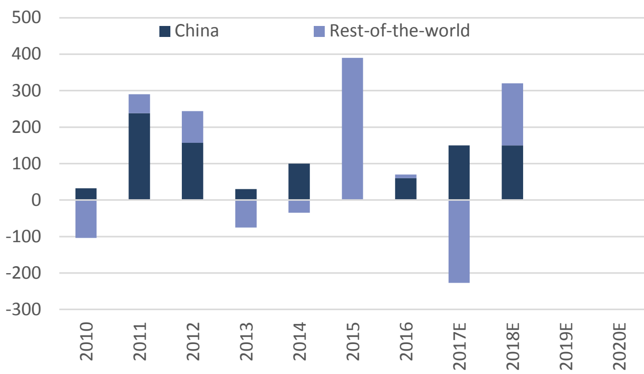
Source: IHS, Deutsche Bank estimates

Figure 18: MDI net demand growth (k tonnes)



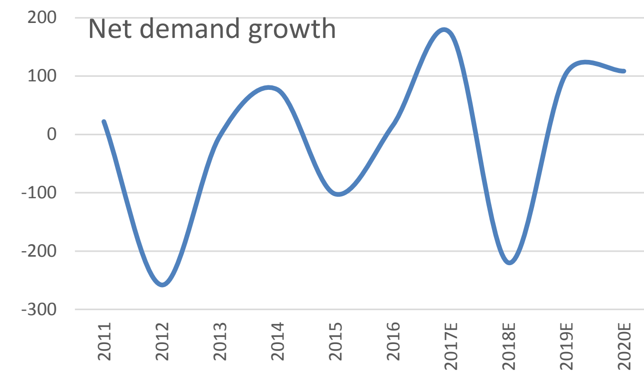
Source: IHS, Deutsche Bank estimates

Figure 19: TDI global capacity growth (k tonnes)



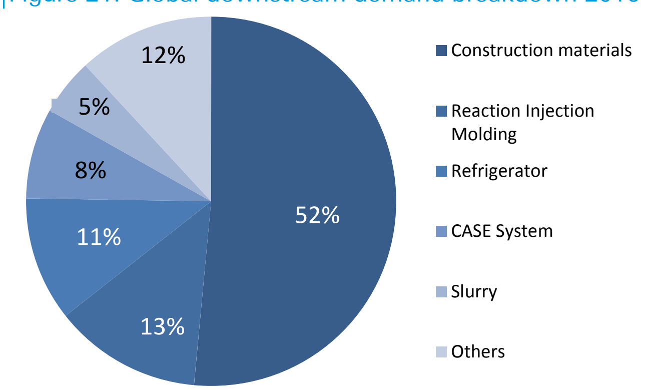
Source: IHS, Deutsche Bank estimates

Figure 20: TDI net demand growth (k tonnes)



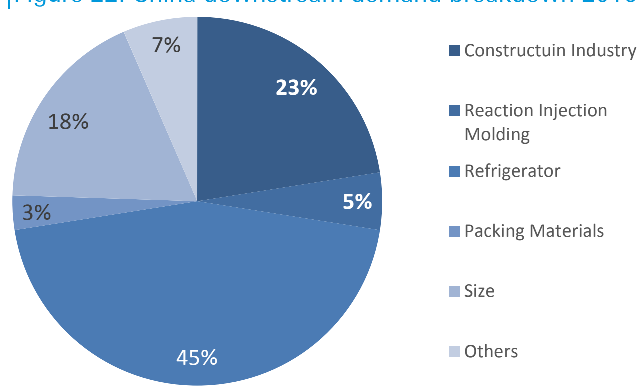
Source: IHS, Deutsche Bank estimates

Figure 21: Global downstream demand breakdown 2016



Source: CKNI, Deutsche Bank

Figure 22: China downstream demand breakdown 2016



Source: CKNI, Deutsche Bank

Utilisation rate picking up

Globally, more than 52% of MDI consumption comes from construction materials, and only 13% is used in refrigerators. In China, MDI is mainly used in refrigerators, construction materials, and slurry and sole resin, accounting for 45%, 22.5%, and 18%, respectively. China apparent MDI demand has remained largely stable at c.1.9mnt since 2013. According to China's 13th Five-Year Plan, the domestic MDI demand CAGR in 2015- 2020E is 7.3%.

Figure 23: China MDI key downstream products demand

	Refrigerator Production (k unit)	YoY	Upholstered furniture (k unit)	YoY	Synthetic leather (k tonnes)	YoY
2010	70,552	26.4%	47,310	28%	2,146	16%
2011	78,818	11.7%	42,862	-9%	2,403	12%
2012	75,136	-4.7%	42,157	-2%	3,143	31%
2013	76,418	1.7%	42,617	1%	3,470	10%
2014	75,465	-1.2%	52,987	24%	3,751	8%
2015	73,174	-3.0%	53,570	1%	3,438	-8%
2016	74,583	1.9%	58,498	9%	3,315	-4%
YTD	39,091	1.0%	N/A	N/A	1,382*	13%

Source: WIND, Deutsche Bank

Suffering from the rapid capacity growth over the past five years, China MDI facilities' utilisation rate dipped to c.60% in 2015, and will likely continue to drop to the low-50% levels due to capacity additions in 2016. Given stable demand and consumption growth, we expect utilisation to gradually recover from the trough level in 2016 with few new capacity additions.

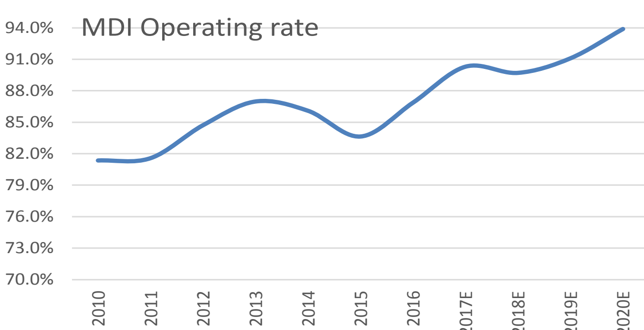
Figure 24: China 13th Five-Year Plan – Petrochemical and chemical development guidance

Products (Unit : k tons)	2015 Demand	2020 Demand Forecast	Demand CAGR %
Traditional Petrochemical Products			
Ethylene (Equivalent consumptions)	40,300	48,000	3.6
Propylene (Equivalent consumptions)	31,800	40,000	4.7
Paraxylene	20,700	28,500	6.6
Methanol	52,380	80,000	8.8
Ethanediol	13,350	18,500	6.7
Potash Fertilizer(as K2O100%)	11,450	13,000	2.5
Typical High-end Products			
Polycarbonate	1,670	2,300	6.7
PMMA (Equivalent consumptions)	710	1,000	7.2
Ethylene-vinyl acetate (EVA)	1,180	1,500	4.9
Silastic (as Polysiloxane, recycling included)	750	1,500	14.9
Butyl rubber	310	480	9.1
Methylene diphenyl diisocyanate (MDI)	**1,900**	**2,700**	**7.3**
Polytetrafluoroethylene (PTFE)	74	100	6.3
Organic Silicon Monomer(as siloxane, recycling included)	900	1,560	11.6

Source: MIIT, Deutsche Bank

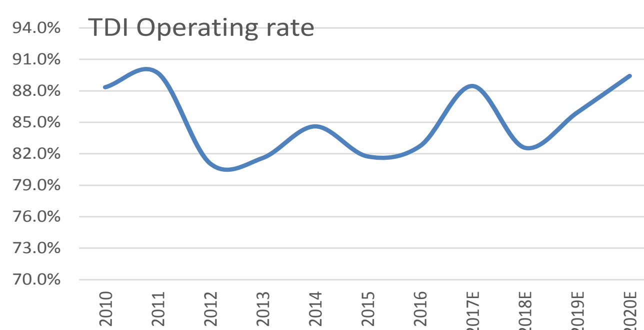
The rapid capacity expansion over the past four years has caused global utilisation to drop continuously, from 87% to 84% in 2015. However, as we expect capacity additions to slow down, we estimate utilisation will rebound to 87% in 2017, 90% in 2018, 90% in 2019 and 91% in 2020. TDI is in a very similar situation. We expect it to witness slowing capacity additions and after 2018, we believe there will be a lack of new supply which should help TDI utilisation gradually recover to 89% by 2020E from 83% in 2016.

Figure 25: MDI global operating rate (%)



Source: IHS, Deutsche Bank estimates; Note: effective utilization rate

Figure 26: TDI global capacity additions growth (%)



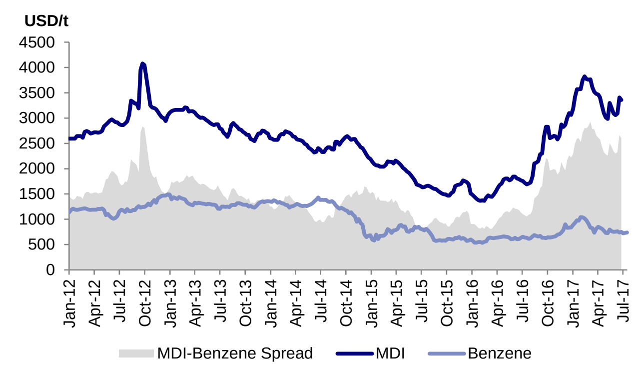
Source: IHS, Deutsche Bank estimates; Note: effective utilization rate

Margin recovering

MDI prices and margin are surging on supply-demand tightening

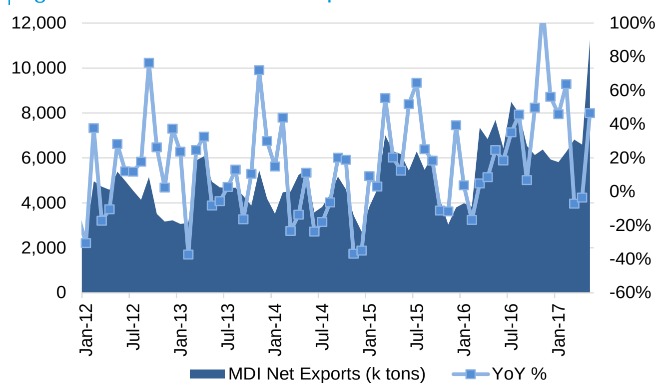
Despite the relatively stable downstream demand, MDI prices, especially in Asia markets, have dropped significantly since the end of 2012 till 1H 2016, which is mainly due to the rapid capacity expansion. Over the past five years, more than 85% of new capacity additions have come from Asian producers, and China MDI capacity increased by c.400ktonne p.a. (on average), while apparent demand increased by only c.100ktonne p.a. The worsened supply-demand dynamic depressed MDI prices as well as the MDI-benzene spread. Also, MDI prices are highly sensitive to crude oil prices, as aniline is one of the main raw materials.

Figure 27: China MDI spread



Source: WIND, Deutsche Bank

Figure 28: China MDI net exports data

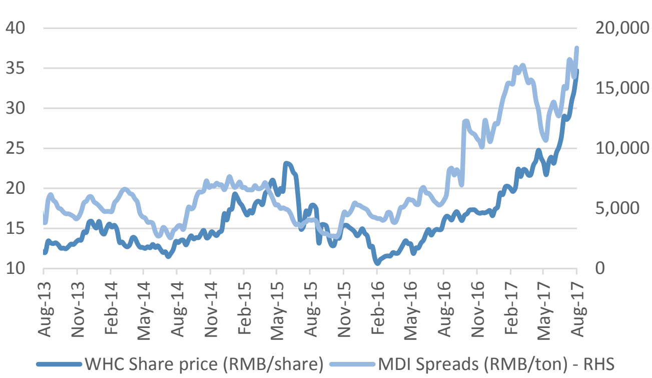


Source: WIND, Deutsche Bank

WHC share price high correlation to MDI margin with 0.72 R-square

Since 2016, China MDI prices have started to recover from the trough, driven by: 1) decreased MDI imports from Japan and Korea, where MDI production was unstable or halted, and China polymeric MDI imports declined by 15% in the past trailing 12 months; and 2) stabilized crude oil price and chemical prices. In the past four years, WHC's share price and MDI are highly correlated with a 0.72 R-square efficiency.

Figure 29: WHC share price vs MDI spread (0.72 R2)



Source: WIND, Deutsche Bank

Figure 30: WHC share price correlations with key products and spreads

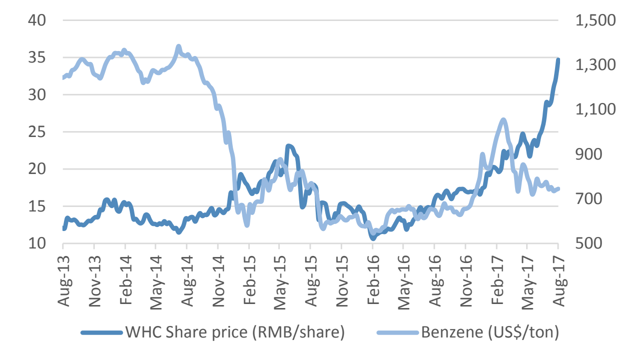
Series		Series	Correlation
WHC Share price (RMB/share)	vs.	**MDI Spreads (RMB/ton)**	**0.72**
	vs.	MDI (RMB/ton)	0.53
	vs.	Benzene (US$/ton) - RHS	-0.29
	vs.	Brent (US$/bbl) - RHS	-0.38
MDI Spreads (RMB/ton)	vs.	**MDI (RMB/ton)**	**0.86**
	vs.	Benzene (US$/ton)	-0.18
	vs.	Brent (US$/bbl)	-0.32
MDI price (US$/ton)	vs.	**Benzene (US$/ton)**	**0.46**
	vs.	Brent (US$/bbl)	0.32
Benzene (US$/ton)	vs.	**Brent (US$/bbl)**	**0.96**

Source: WIND, Deutsche Bank

On the other hand, WHC share price correlation with petrochemical products is lower than with MDI spreads. The highest correlation with a single product is the MDI price with 0.53 R-square efficiency, while the WHC share price has a negative correlation with the prices of benzene / Brent oil, which are its key feedstocks, at -0.29 / -0.38 R-square efficiency, respectively.

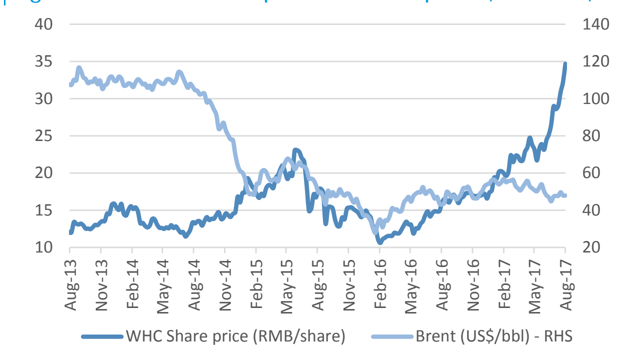
We believe the MDI spread is determined more by its own supply and demand other than cost-push factors because its correlation with benzene and Brent oil prices is only -0.18/-0.32 R-square efficiency while it has 0.86 R-square efficiency correlation with the MDI price. Conversely, the MDI price has 0.46 and 0.32 R-square efficiency correlation with benzene and Brent prices.

Figure 31: WHC share price vs Benzene price (-0.29 R2)



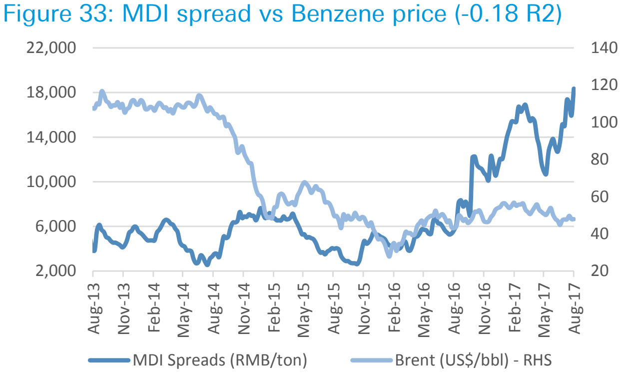
Source: WIND, Deutsche Bank

Figure 32: WHC share price vs Brent price (-0.38 R2)



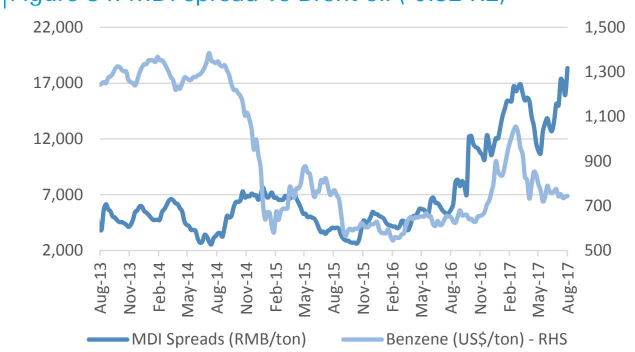
Source: WIND, Deutsche Bank

Figure 33: MDI spread vs Benzene price (-0.18 R2)



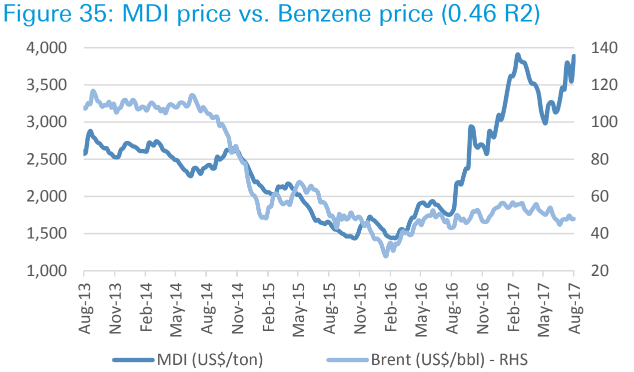
Source: WIND, Deutsche Bank

Figure 34: MDI spread vs Brent oil (-0.32 R2)



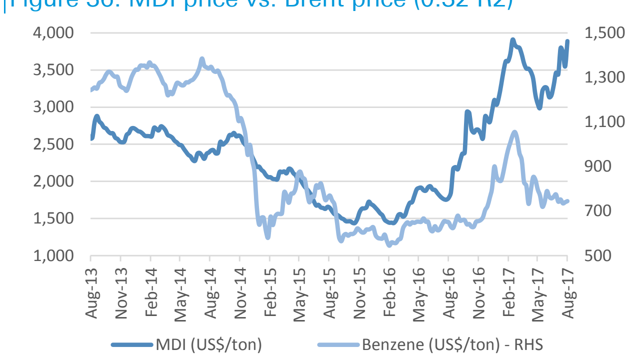
Source: WIND, Deutsche Bank

Figure 35: MDI price vs. Benzene price (0.46 R2)



Source: WIND, Deutsche Bank

Figure 36: MDI price vs. Brent price (0.32 R2)



Source: WIND, Deutsche Bank

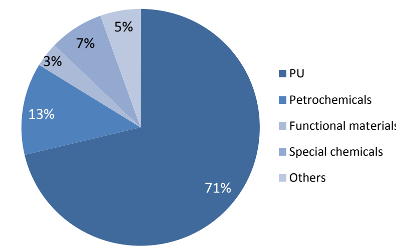
New growth engines

Figure 39: Key products and usages by segment

Category	PU	Petrochem	Functional Materials	Special Chems	Water-based Resin
Products	Pure MDI	Propylene	TPU	- Special Isocyanate	PA
	Poly MDI	Polypropylene	SAP	HDI	PUA
	Modified MDI	MTBE	PC	HDMI	PUD
	Monomeric MDI	PO	- Thickener	IPDI	Vac-Veova Emulsion
	TDI	NPG	ASE	- Special Amine	Watersolubility HPR
	Polyol	TBA	HASE	MDA	UV
			HEUR	HMDA	
				IPDA	
				MDBA	
Usages	Appliances / Cold Chain	Commodity Chemicals	Electronics	Appliances / Cold Chain	Coatings
	Elastomers		Clothing / Footwear	Elastomers	Adhesives
	Electronics		Industrial Mechanical	Sealants	Personal Care
	Furniture / Bedding		Automotive	Automotive	
	Building / Construction		Sports Goods	Coatings	
	Sealants		Toys	PU Wheel	
	Automotive		Adhesives	Toys	
	Coatings		Elastomers	Adhesives	
	Adhesives		Furniture / Bedding		
			Coatings		
			Personal Care		

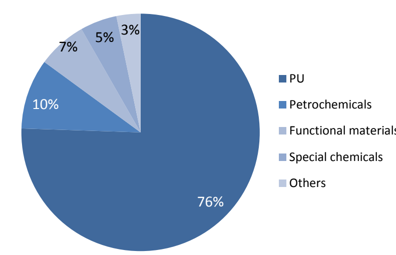
Source: Company data, Deutsche Bank

Figure 37: GP breakdown in 2016



Source: Company data, Deutsche Bank estimates

Figure 38: GP breakdown in 2019E



Source: Company data, Deutsche Bank estimates

A more diversified portfolio ahead

With a more diversified product portfolio going forward, we believe it should enable WHC to become less sensitive to the MDI cycle. WHC has set up six new business units to further strengthen its downstream products mix. Of the new products produced from these six new business units, specialty polyurethane (i.e. thermoplastic polyurethane - TPU), polycarbonate (PC), and water-based paint are the three most promising. TPU is facing booming downstream demand due to intelligent wearable devices. PC should alleviate the pressure of high dependence on imports. Water-based paint should benefit from stricter environment protection laws. We expect functional materials and specialty chemicals revenue to record a 33% CAGR between 2016 and 2019E.

TPU: expecting ascending downstream demand

TPU is any-of-a-class of polyurethane plastics with many properties, including elasticity, transparency, and resistance to oil, grease, and abrasion. TPU has many applications, including automotive instrument panels, sporting goods, medical devices, drive belts, and footwear.

WHC's performance material business unit is the biggest TPU manufacturer in APAC with the widest product range. Out of the c.500kt total capacity of China, WHC's annual TPU production capability is 90ktpa (18%) and offers high-end TPU in the market.

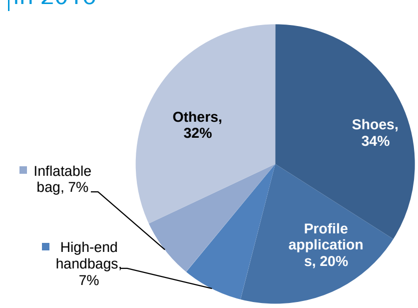
TPU is now a popular material found in outer cases of mobile electronic devices. Since 2014, TPU has become a dominant material serving as a wristband for the booming market of intelligent wearable devices which required high-end TPU. Conversely, China has become a TPU net export country since 2013 while the majority of Chinese TPU is low-end product and fails to meet the increasing high-end TPU demand. We observe that Chinese high-end TPU demand still relies on imports, and TPU import prices are far higher than export prices.

Figure 40: China major TPU makers

Producers	Capacity (ktpa)
Wanhua	90
Zhejiang Huafeng TPU	35
Covestro	30
BASF	30
Dongguan Hongde	20
Lubrizol	20
Baoding Bangtai	15
Nanguang Light Industry	10
Kunsheng Composite Plastic	10
361° (Fujian) Sporting Goods	10

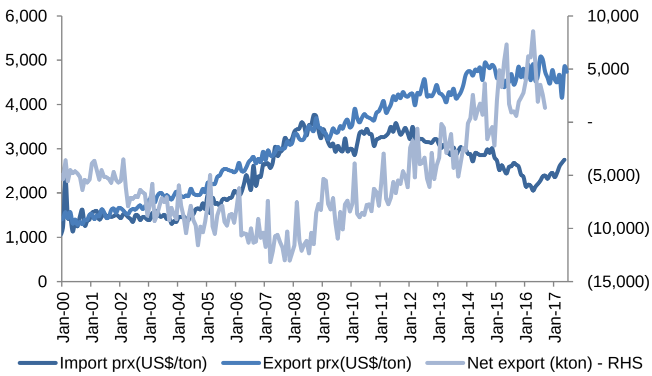
Source: Company data, Ningbo Petrochemical Association Deutsche Bank

Figure 41: TPU demand breakdown in 2016



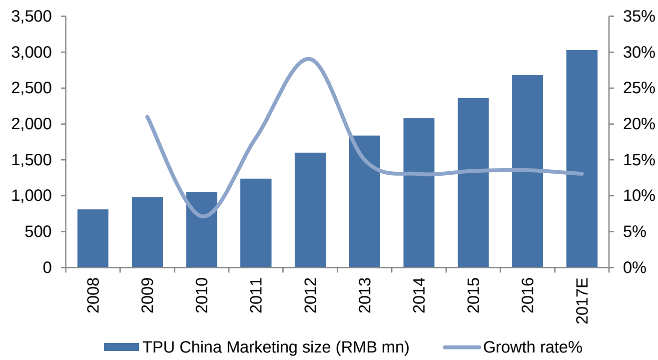
Source: Chyxx.com, Deutsche Bank

Figure 42: China TPU net-export and prices



Source: WIND, Deutsche Bank

Figure 43: China TPU market size



Source: WIND, Chyxx.com, Deutsche Bank

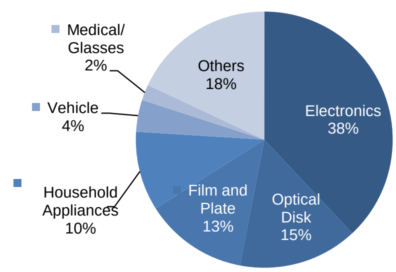
PC: WHC a landscape changer in China

Polycarbonate (PC) is one of the five engineering plastics. PC is widely used in electronic devices, household appliances, construction materials, automobile manufacturing, and medical apparatus. PC has become the most popular engineering plastic with the highest growth rate.

PC manufacturing has very high technological barriers; therefore, the PC market is highly concentrated. Covestro (27% market share) is the global market leader and global capacity is at 4.7mntpa, on our estimates. Currently, China PC demand highly relies on imports.

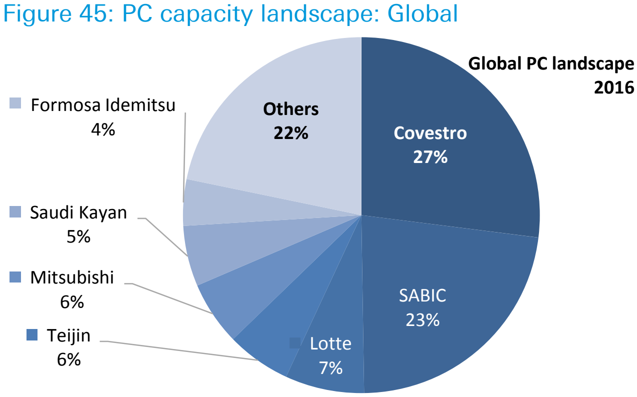
WHC's new PC line is expected to come on stream in 2018E, and it will instantly become the second-largest (17% of China capacity) PC producer in China. The company spent about RMB1.46bn on the 200ktpa capacity after it raised RMB2.5bn from a private placement in January 2017.

Figure 44: PC demand breakdown



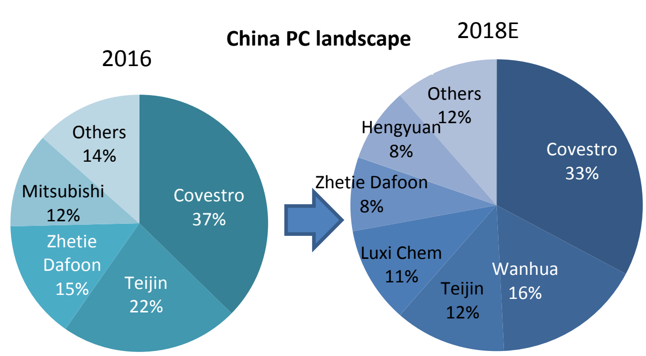
Source: Deutsche Bank

Figure 45: PC capacity landscape: Global



Source: IHS, Deutsche Bank

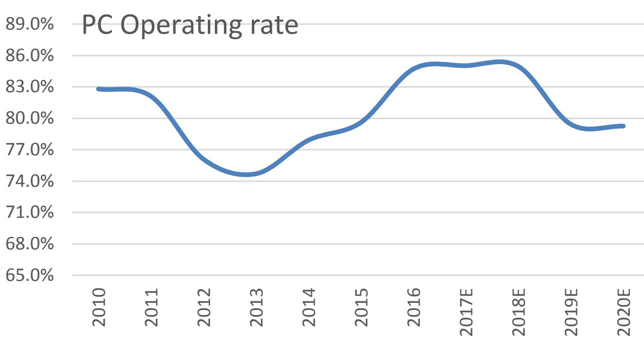
Figure 46: PC capacity landscape: China



Source: IHS, Deutsche Bank estimates

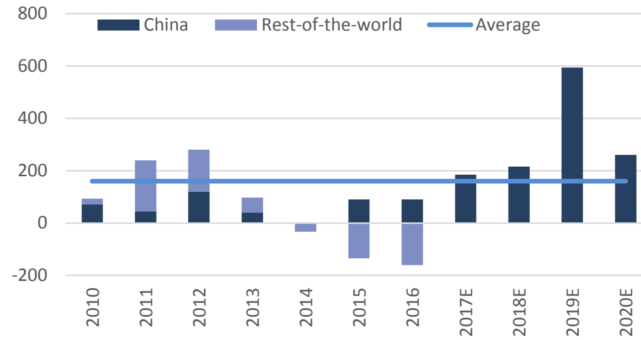
We expect that global capacity will outgrow demand in the coming years, driven by Chinese capacity additions. We expect the overall operating rate to peak at 85% in 2017-18E and decline to 80% by 2020E.

Figure 47: PC global operating rate (%)



Source: IHS, Deutsche Bank estimates

Figure 48: PC global capacity growth (k tonnes)



Source: IHS, Deutsche Bank estimates

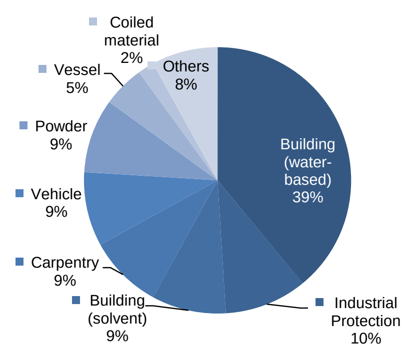
Water-based paint: the beneficiary of the "strictest" new environmental protection law

Compared with traditional paint, water-based paint is more environmentally friendly and cost efficient. In the global market, water-based paint has surpassed traditional paint; it accounted for c.44% of the total paint consumption in 2014. In China, the consumption of water-based paint used in construction materials and automobile paint is growing rapidly, accounting c.48%.

Water-based paint should benefit from stricter environment protection laws. We expect the revenue of main business including MDI and the new chemical products to see a CAGR of 21% in 2016-19E. As MDI only accounts for 41.7% of the growth rate, we estimate the rest will come from new chemical products and other core business segments including functional materials and special chemicals.

Since 2015, there has been a paint tax of 4% under the new environment protection law. However, paint with Volatile Organic Compounds (VOC) of less than 420g/L will be waived from the paint tax. The 13th Five-Year Plan (2016-2020) petrochemical and chemicals development guidance also notes that producers should facilitate the R&D and promotion process of environmentally friendly paints and efficiently control the VOCs. Being the most environmentally friendly paint, water-based paint should be one of the main beneficiaries of the "strictest" environment protection law as well as the development guidance.

Figure 49: China water-based paint demand



Source: Company data Deutsche Bank

Water-based paint will benefit from the stricter environment protection law.

Figure 50: Water-based paint – main advantages

Advantages	Content
Environmental advantages	The traditional solvent based paint has volatile organic compounds (VOC), which will cause pollution to atmosphere environment. Long-term exposure to high VOC environment places people at serious risk of cancer. By contrast, water-based paints have zero emissions of VOC.
Economic advantages	Solvent based paints represent 75% of total 15 million tons industrial paints. If 50% will be replaced by water-based paints, RMB15bn will be saved.
Policy guidance advantages	Since Feb. 1st, 2015, the government has levied 4% of consumption tax on coatings, with the exception of VOC lower than 420g/L in the construction process.
Other advantages	The inflammable and explosive problem during transportation, construction and production can be solved completely as the dominating part is water.

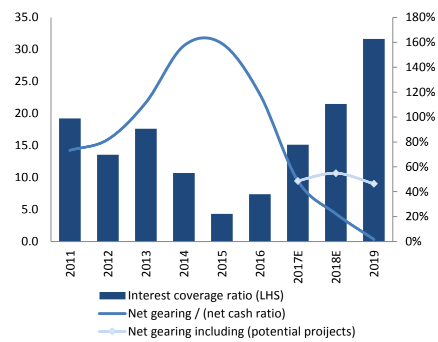
Source: Deutsche Bank

Unlocking value & potential corporate actions

WHC improved its balance sheet via issuance of 158mn new shares to repay debt and set up new business in 2016. WHC's net gearing should cut to 49% in 2017E from 118% in 2016. All of WHC's debt is in bank loans after repaying the corporate bond in 2015. We expect that WHC's net interest expense should decrease to RMB504mn in 2019E from RMB890mn in 2015.

Moreover, as mentioned during public management meetings, the company is likely to acquire WIG's stake in BC by September 2018 which has a MDI/TDI/PVC capacity of 240kpta / 250ktpa / 400ktpa in Hungary. Besides the benefit of having instant capacity expansion, we believe the planned asset injection could strengthen WHC's global presence although valuation is an uncertainty. Nowadays, MDI / TDI / PVC constructions usually cost about RMB1.9bn / RMB2.1bn / RMB0.4bn for a 100ktpa of capacity. The overall replacement cost for such capacity would be near RMB11.4bn.

Figure 51: Interest coverage and net gearing



Source: Company data, Deutsche Bank estimates

Figure 52: China key projects capex per tonne since 2011

Company	Announcement Date	Total CAPEX RMB mn	Capacity ktons	Average CAPEX RMB mn/k tons
MDI CAPEX				
Huntsman Shanghai	Jun-16	5,100	240	21.3
BASF Chongqing	Apr-15	8,000	400	20.0
Covestro Shanghai	Jun-14	5,000	350	14.3
Huntsman Shanghai	May-14	4,660	240	19.4
Total/Average				**18.7**
TDI				
Fujian Petrochemical	Apr-17	3,930	200	19.7
BASF Germany	Nov-15	7,867	300	26.2
Cangzhou Dahua	Jun-12	1,970	100	19.7
Cangzhou Dahua	Dec-11	1,196	70	17.1
Total/Average				**20.7**
PVC CAPEX				
Xinjiang Chengxuan	Apr-17	559	100	5.6
Weinan Government	May-16	1,200	300	4.0
Tangshan Government	Jun-15	300	100	3.0
Yibing Jiangan	Oct-14	100	20	5.0
Total/Average				**4.4**

Source: Deutsche Bank

BC's MDI and TDI capacity is equivalent to 13% / 83% of WHC 2018E capacity. Our sensitivity analysis suggests BC has the potential to bring another 17% of EBIT to WHC, assuming BC achieves a 75% utilisation rate with gross margins of MDI / TDI similar to those of WHC, a PVC margin of USD240/tonne and its operating expenses per unit doubles that of WHC. We have not factored any potential acquisition in our model.

Even with all projects realised, WHC's net gearing level would still be under 50% by 2019E

Besides, the company is conducting feasibility studies for constructing a 1mntpa ethylene capacity in Shandong, to utilise its expected net cash balance sheet. We estimate WHC will reach close to net cash by 2019 and the potential 1 mntpa ethylene project will cost about USD4bn (RMB32bn in 2019E based on our USD/RMB exchange rate forecast). If all these projects are realised by 2019E, assuming acquiring BC at market replacement cost and new ethylene capex spend across 2019E-2022E, we estimate WHC's net gearing would jump to c.46% by the end of 2019. Hence, we see <50% of net gearing level as low risk for further equity raising.

Sensitivity analysis

WHC's earnings and target price are sensitive to MDI prices. Our sensitivity analysis suggests for each 5% change in the MDI price, 2017E EPS would change by 9%, and our target price would change by 10% correspondingly. The earnings and target price sensitivity beta to MDI is c.1.8-2.0x. WHC's earnings and target price are also sensitive to the benzene price which is the biggest cost factor for WHC. For each 5% change in the benzene price, 2017E EPS and target price would change by 3% and 4%, respectively.

Figure 53: TP scenario analysis (RMB/tonne)

MDI price EPS (RMB/share)	2017E	2018E	2019E	Price Target (RMB/share)
-10%	2.27	2.65	3.01	**34.0**
-5%	2.53	2.93	3.34	**38.0**
Base case	2.79	3.22	3.68	**42.0**
5%	3.05	3.51	4.01	**46.0**
10%	3.31	3.80	4.35	**49.9**
Every +/- 5% change	9%	9%	9%	**10%**

Source: Deutsche Bank estimates

Figure 54: TP scenario analysis (RMB/tonne)

Benzene price EPS (RMB/share)	2017E	2018E	2019E	Price Target (RMB/share)
-10%	2.98	3.47	3.99	**45.4**
-5%	2.88	3.34	3.83	**43.7**
Base case	2.79	3.22	3.68	**42.0**
5%	2.70	3.10	3.52	**40.3**
10%	2.60	2.97	3.37	**38.5**
Every +/- 5% change	3%	4%	4%	**4%**

Source: Deutsche Bank estimates

WHC's target price is more sensitive to the MDI price than the Benzene price. According to our scenario analysis, if the MDI price increases by 15% and the benzene price decreases by 15%, this would raise our target price by 41% to RMB59. On the other hand, if the MDI price goes down by 15% and the benzene price increases by 15%, our target price would fall 41% to RMB24.9. These scenarios are more favorable to the upside comparison.

MDI price has more influence than Benzene price on WHC's share price

Figure 55: TP scenario analysis (RMB/tonne)

TP sensitivity		MDI Price						
RMB/sh	42.0	-15%	-10%	-5%	0%	5%	10%	15%
Benzene price	15%	24.9	28.8	32.8	36.8	40.8	44.8	48.7
	10%	26.6	30.6	34.5	38.5	42.5	46.5	50.5
	5%	28.3	32.3	36.3	40.3	44.2	48.2	52.2
	0%	30.0	34.0	38.0	$\boxed{42.0}$	46.0	49.9	53.9
	-5%	31.8	35.7	39.7	43.7	47.7	51.7	55.7
	-10%	33.5	37.5	41.4	45.4	49.4	53.4	57.4
	-15%	35.2	39.2	43.2	47.2	51.1	55.1	59.1

Source: Deutsche Bank estimates

Figure 56: TP scenario analysis (RMB/tonne)

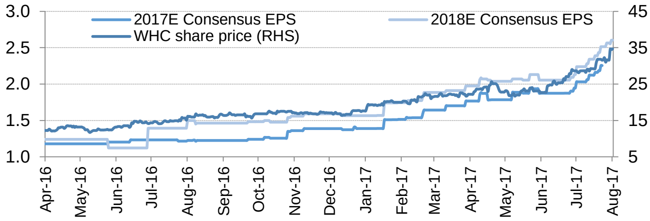
TP sensitivity		MDI Price						
%		-15%	-10%	-5%	0%	5%	10%	15%
Benzene price	15%	-41%	-31%	-22%	-12%	-3%	7%	16%
	10%	-37%	-27%	-18%	-8%	1%	11%	20%
	5%	-33%	-23%	-14%	-4%	5%	15%	24%
	0%	-29%	-19%	-10%	$\boxed{0\%}$	10%	19%	28%
	-5%	-24%	-15%	-5%	4%	14%	23%	33%
	-10%	-20%	-11%	-1%	8%	18%	27%	37%
	-15%	-16%	-7%	3%	12%	22%	31%	41%

Source: Deutsche Bank estimates

Consensus

Our estimates are slightly higher than Bloomberg Finance LP consensus estimates by 9-11%. We believe this is mainly due to our constructive view on the MDI price trend.

Figure 57: Share price vs consensus EPS movement



Source: Bloomberg Finance LP, Deutsche Bank

Figure 58: DB EPS estimates vs. consensus estimates

RMB/share	2017E	2018E	2019E
DB estimates	2.79	3.22	3.68
Bloomberg Consensus	2.55	2.83	3.32
Variance	**9%**	**14%**	**11%**

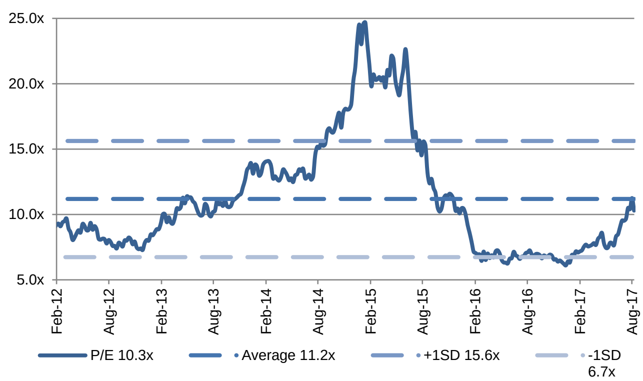
Source: Bloomberg Finance LP, Deutsche Bank

Valuation charts

WHC is trading at 3.4x forward P/B, higher than +1SD of the historical average of 3.1x. We believe it is not fully reflecting a ROE rerating potential, which we expect to reach 41% in 2017E.

On the other hand, the 6.2x forward EV/EBITDA is 36% below its historical average of 9.7x or 3% below -1 SD of the historical average of 6.4x. Moreover, the current trading multiple of 10.3x forward P/E is an 8% discount to its historical average P/E.

Figure 59: 12-month forward P/E

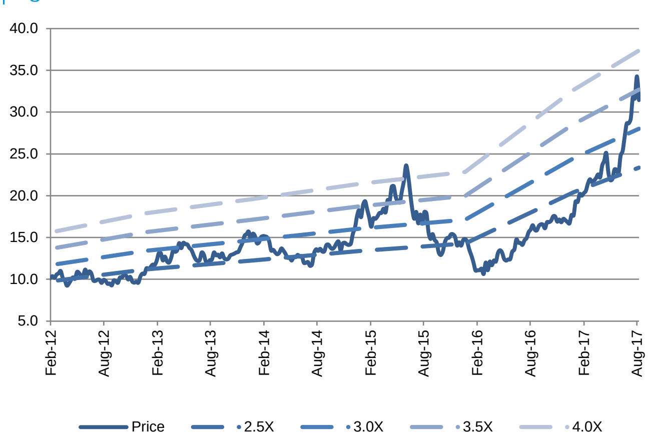


Source: Company data, Bloomberg Finance LP, Deutsche Bank estimates

Figure 60: 12-month forward EV/EBITDA

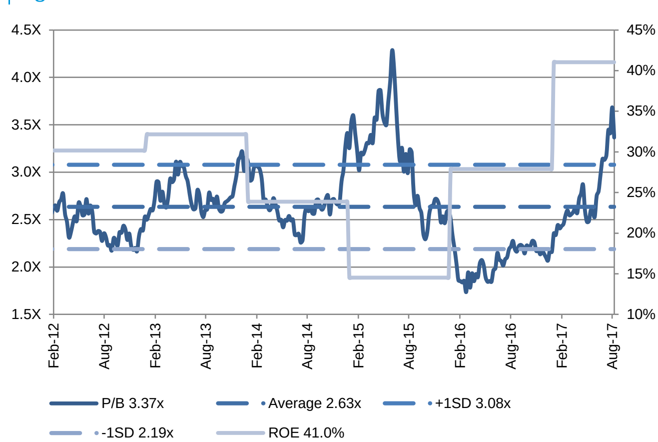
Source: Company data, Bloomberg Finance LP, Deutsche Bank estimates

Figure 61: 12-month forward P/B band



Source: Company data, Bloomberg Finance LP, Deutsche Bank estimates

Figure 62: 12-month forward P/B



Source: Company data, Bloomberg Finance LP, Deutsche Bank estimates

Key assumptions and financials

Income statement

ROIC to increase significantly in 2017E

On the back of higher MDI prices and expansion of new chemical product range, we forecast revenue will increase 38%, 12%, and 14% in 2017E, 2018E, and 2019E, respectively. We estimate GPM should gradually recover from 31% in 2016 to 40% in 2019E. ROIC will also likely rebound sharply to an average of 23% in 2017-19E from 15% in 2016.

WHC's revenue to improve by 21% CAGR in 2016-2019E due to higher MDI prices and new products contribution

Figure 63: Key ratios

Ratio	2015	2016	2017E	2018E	2019E
ROA	3.4%	7.2%	13.4%	13.9%	14.3%
Net income margin	8%	12%	18%	19%	19%
Asset turnover	44%	61%	77%	77%	79%
Equity Multiplier	318%	297%	235%	192%	171%
ROE	14.5%	27.9%	41.0%	35.3%	32.9%
Invested capital	37,881	36,169	43,019	48,128	54,723
ROIC	7.4%	14.6%	23.4%	23.7%	23.4%
Net Debt	23,580	21,685	13,436	7,800	756
Equity	14,823	18,334	27,577	34,938	43,347
Net gearing (%)	159%	118%	49%	22%	2%

Source: Company data, Deutsche Bank estimates

MDI passed the toughest time, and new chemicals come to the stage

We expect MDI prices and spreads to further strengthen, driven by energy prices recovery, slowing global new capacity additions and stable demand growth. We project the PU segment's GPM will be 50-56% in 2017E-19E vs. 41% in 2016. Functional material and special chemicals are the second growth engine. As such, we estimate the two segments' combine revenue will more than double during 2016-2019. We expect petrochemical projects to run at full steam in 2017-19 after two years of capacity ramp-up since 2015.

MDI GPM should continue to increase to 56% in 2017E

Figure 64: WHC GPM & ROIC

WHC GPM & ROIC	2015	2016	2017E	2018E	2019E
GPM	30%	31%	40%	40%	40%
ROIC	7.4%	14.6%	23.4%	23.7%	23.4%
Segments GPM					
PU	14%	41%	56%	52%	50%
Petrochemicals	1%	14%	3%	16%	15%
Functional Materials	23%	25%	25%	27%	31%
Special Chemicals	42%	46%	43%	36%	36%

Source: Company data, Deutsche Bank estimates

Figure 65: Business assumptions

Business assumptions	2015	2016	2017E	2018E	2019E
PU (MDI, TDI, Polyether)					
Domestic MDI Capacity (kton)	1,800	1,800	1,800	1,800	1,800
Utilization rate %	71%	69%	75%	75%	75%
Production (kton)	1,280	1,236	1,350	1,350	1,350
MDI ASP	*10,964*	*13,979*	*20,689*	*21,309*	*22,801*
PU revenue (RMB mn)	16,522	16,417	25,501	28,726	33,124
GPM %	14%	41%	56%	52%	50%
Petrochemicals					
Capacity (kton)	1,400	1,400	1,400	1,400	1,400
Utilization rate %	35%	96%	100%	100%	100%
Production (kton)	*485*	*1,346*	*1,400*	*1,400*	*1,400*
Total Revenue (RMB mn)	539	8,261	9,162	10,137	10,214
GPM %	1%	14%	3%	16%	15%
Functional Materials (TPU, SAP , PC)					
Capacity (ktpa)	100	130	200	230	360
Utilization rate(%)	72%	84%	71%	75%	73%
Production volume (kton)	72	109	142	173	262
Revenue (RMB mn)	1,009	1,235	1,866	2,285	3,651
GPM %	23%	25%	25%	27%	31%
Special Chemicals					
Utilization rate(%)	0%	75%	75%	80%	85%
Production volume (kton)	38	55	55	58	62
Revenue (RMB mn)	973	1,497	2,058	2,327	2,844
GPM %	42%	46%	43%	36%	36%

Source: Company data, Deutsche Bank estimates

Figure 66: Income statement

Income statement (RMB mn)	2015	2016	2017E	2018E	2019E
Revenue	19,492	30,100	41,398	46,331	52,803
Cost of Goods Sold	(13,620)	(20,745)	(24,990)	(27,864)	(31,974)
Gross Profit	5,872	9,355	16,408	18,467	20,829
GPM (%)	30%	31%	40%	40%	39%
Selling & Distribution	(847)	(1,166)	(1,656)	(1,853)	(2,112)
General & Administrative	(1,282)	(1,423)	(2,070)	(2,317)	(2,640)
EBIT	3,648	6,562	12,501	14,094	15,846
EBITDA	4,637	8,108	15,263	17,421	19,426
Interest expense	(841)	(890)	(830)	(684)	(555)
One-off expenses/income	8	(22)	-	-	-
Other non-core income/exp	139	3	16	18	19
Profit before tax	2,954	5,653	11,687	13,429	15,310
Income tax	(675)	(1,105)	(2,284)	(2,625)	(2,993)
Effective tax rate (%)	23%	20%	20%	20%	20%
Profit after tax	2,280	4,548	9,402	10,804	12,317
Minority income	670	869	1,796	2,063	2,352
Net income	1,610	3,679	7,607	8,740	9,965
EPS (RMB/share)	0.620	1.418	2.788	3.197	3.645
Growth (%)	-33%	129%	97%	15%	14%
DPS (RMB/share)	0.167	0.439	0.976	1.279	1.458
Payout (%)	27%	31%	35%	40%	40%
Weight No# of shares (mn)	2,595	2,595	2,728	2,734	2,734

Source: Company data, Deutsche Bank estimates

Balance sheet

Net gearing ratio will drop significantly

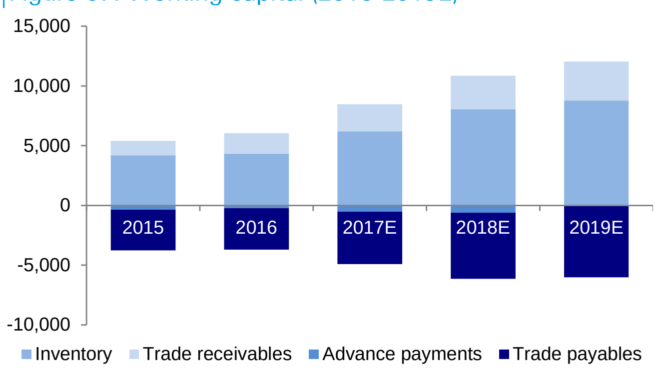
On 16 January 2017, WHC issued 116mn new shares at RMB21.55/share for a total sum of RMB2.5bn to develop its new business. After deleveraging, we estimate the net gearing ratio will drop to 49% in 2017 from 119% in 2016. With strong cash flow ahead, we expect net gearing will drop to 2% if no new project announced.

WHC's net gearing ratio will drop to 49% in 2017E

Working capital

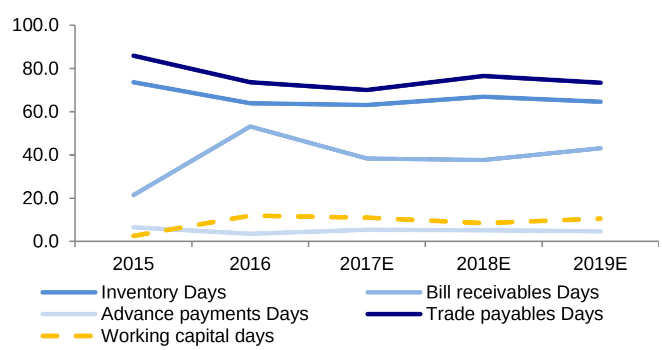
We expect working capital inflow in 2017 due to an increase in the amount of trade payables, which offset an increase in trade receivables. Trade receivable/payable days will likely remain largely stable, but inventory days should drop to 60 days in 2017E from 74 days in 2015.

Figure 67: Working capital (2015-2019E)



Source: Company data, Deutsche Bank estimates

Figure 68: Working capital cycle (2015-2019E)



Source: Company data, Deutsche Bank estimates

Figure 69: Balance Sheet

Balance sheet (RMB mn)	2015	2016	2017E	2018E	2019E
Cash and cash equivalents	2,066	1,987	5,343	8,327	13,157
Inventories	4,194	4,337	6,183	8,043	8,791
Trade and other receivables	2,580	5,449	6,159	7,454	9,236
Other current assets	2,186	1,462	1,747	1,840	1,858
Total Current Assets	11,027	13,236	19,431	25,664	33,041
PP&E	20,046	28,468	28,902	28,879	28,518
Intangible assets	2,252	2,612	2,857	3,124	3,376
Investments	186	363	363	363	363
Other long term assets	14,293	6,086	5,380	5,156	5,044
Total long term assets	36,778	37,529	37,502	37,522	37,301
Total Assets	47,804	50,765	56,934	63,187	70,343
Short-term borrowings	12,151	14,247	10,255	8,102	6,388
Trade/bill payable	5,622	5,328	6,246	7,402	7,877
Other payables	584	1,167	1,762	1,942	2,132
Others	917	1,860	2,166	2,373	2,670
Total Current Liabilities	19,273	22,601	20,429	19,819	19,066
Long-term borrowings	11,440	9,333	8,432	7,933	7,433
Other long-term liabilities	2,268	496	496	496	496
Total long-term liabilities	13,708	9,830	8,929	8,429	7,930
Total Liabilities	32,981	32,431	29,357	28,248	26,996
Shareholder's Equity	11,571	14,822	22,268	27,551	33,585
Minority interests	3,252	3,512	5,309	7,387	9,762
Total equity	14,823	18,334	27,577	34,938	43,347
Total Liabilities and Equity	47,804	50,765	56,934	63,187	70,343

Source: Company data, Deutsche Bank estimates

Cash flow statement

Issuing new shares

WHC raised RMB2.5bn via private placement at a placement price of RMB21.55/share. Of the raised funds, RMB1.46bn will be invested in new PC projects with total capacity of 200ktpa. RMB400mn will be used to build WHC Shanghai Center, and the rest of funds will be used to repay bank loans and replenish working capital.

Dividend and capital expenditure

WHC's capex should remain at c.RMB3.3-3.6bn, which is the maintenance capex, given the company does not have any Greenfield investment committed currently. Moreover, in keeping with trends we have observed, WHC will likely continue to increase dividends, with the payout ratio likely to increase from 31% in 2016 to 35% in 2017E and further to 40% in 2018-19E.

Dividend payout is set to increase with strong FCF ahead.

Figure 70: Cash flow statement

Cashflow statement (RMB mn)	2015	2016	2017E	2018E	2019E
Profit after tax	2,280	4,548	9,406	10,883	12,432
Change in working capital	-69	-1,044	-1,020	-1,705	-1,586
Other non cash items	1,698	2,869	3,327	3,580	3,821
Finance cost	694	975	826	660	504
Net operating cash flow	4,602	7,349	12,538	13,417	15,171
Capex	-5,160	-4,113	-3,300	-3,600	-3,600
Cash payments to acquire investments and JV	-100	-15	0	0	0
Other investments	-38	-67	0	0	0
Cash received from disposal of assets	63	2	0	0	0
Others	11	224	0	0	0
Net investment cash flow	-5,225	-3,970	-3,300	-3,600	-3,600
Share issuance	0	0	2,500	0	0
Net proceeds from borrowings	3,638	-1,543	-4,893	-2,652	-2,214
Dividends	-432	-1,139	-2,663	-3,522	-4,023
Others	-1,449	-822	-826	-660	-504
Net financing cash flow	1,756	-3,504	-5,882	-6,833	-6,740
Net changes	1,134	-125	3,356	2,984	4,830
FX & other adjustment	-66	26	0	0	0
Beginning cash balance	1,025	2,066	1,987	5,343	8,327
Ending cash balance	2,092	1,967	5,343	8,327	13,157
Balance sheet Cash	2,066	1,987	5,343	8,327	13,157

Source: Company data, Deutsche Bank estimates

Company profile

Business overview

Wanhua Chemical Group Co., Ltd. was established on 20 December 1998, and was listed on the Shanghai Stock Exchange on 5 January 2001. As the most competitive MDI producer in the world, WHC has set up R&D centres, manufacturing bases, and business centers in Yantai, Ningbo, Beijing, Zhuhai, Chengdu, and Shanghai in China, and it has set up more than 10 subsidiaries or branches in Europe, the Middle East, America, Japan, Russia, India, etc. Meanwhile, WHC has its own overseas manufacturing bases in Hungary.

WHC is a leading international A-share listed chemical group in China

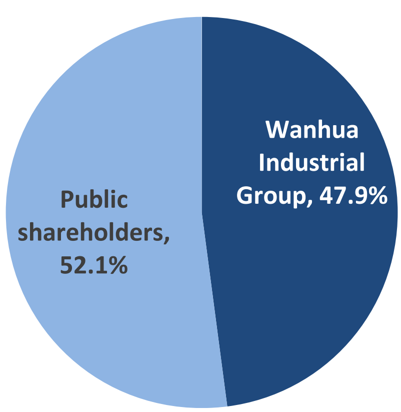
The main business of WHC is R&D, production, and sales of PU series products, such as isocyanate and polyol; petrochemical series products, such as PO/AE; and functioning materials of water-based coatings and specialty chemicals.

PU is the major business product of WHC

Figure 71: Business locations

Source: Deutsche Bank, Company data

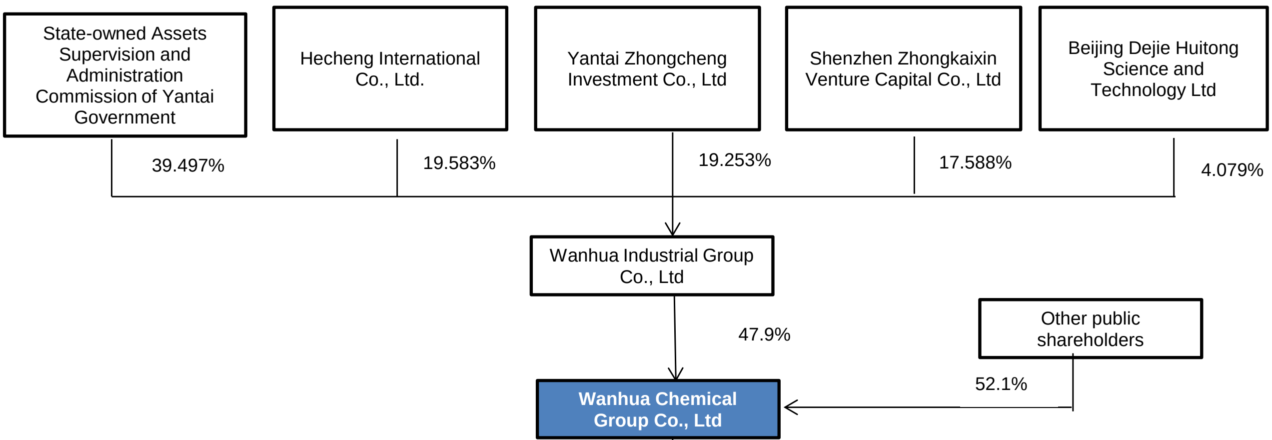
Figure 72: Shareholder structure



Source: Company data, Deutsche Bank

Company structure & management profile

Figure 73: Business structure



Manufacture	% Stake	Service	%Stake
Wanhua Chemical (Ningbo) Co., Ltd	74.5%	Wanhua Chemical (Ningbo) Terminal Co., Ltd	55%
Wanhua Chemical (Beijing) Co., Ltd	100%	Shanghai Wanhua Industrial Development Co., Ltd	100%
Wanhua Chemical (Ningbo) Thermal Power Co., Ltd	51%	Wanhua Chemical (HongKong) Co., Ltd	100%
Wanhua Chemical (Yantai) Chlor-alkali Thermalpower Co.,	60%	Wanhua Chemical (U.S.A.) Co.,Ltd	100%
Ltd Wanhua Chemical (Guangdong) Co., Ltd	100%	Wanhua Chemical International Holding Ltd Wanhua	100%
Wanhua Chemical (Ningbo) Chlor-alkali Co., Ltd	50.4%	Chemical (Japan) Co., Ltd	100%
Wanhua Chemical (Ningbo) Rongwei PU Co., Ltd	80.0%	Wanhua Chemical (Ningbo) Energy Trade Co., Ltd	74.5%
Wanhua Chemical (Foshan) Rongwei PU Co., Ltd	80.0%	Ningbo Xinda Mingzhou Trade Co., Ltd	50.4%
Wanhua Chemical (Yantai) Rongwei PU Co., Ltd	80.0%	Yantai Wanhua Chemical Design Institute Co., Ltd	100%
		Wanhua Chemical (Yantai) sales Co., Ltd	

Source: Company data, Deutsche Bank

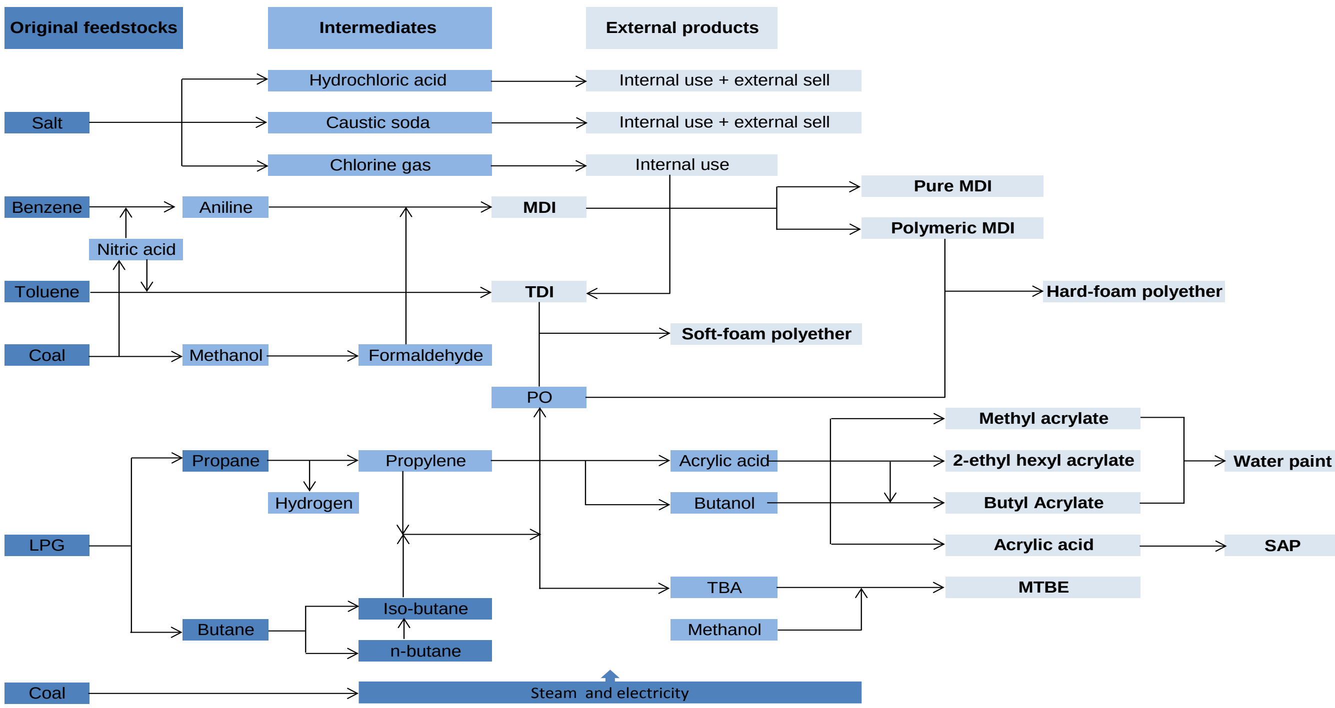
Figure 74: Management profile

Name	Position	Age	Profile
Zengtai Liao	Chairman, President, & Party Secretary	53	Mr Liao Zengtai, master and senior engineer, successively served as Chief Engineer and Vice-general Manager of Yantai Wanhua Polyurethanes CO., Ltd. and General Manager of Ningbo Wanhua Polyurethanes Co., Ltd. From Oct 16 to present, he is Chairman and Party Secretary of Wanhua Industrial Group as well as Wanhua Chemical Group Co., Ltd.
Jiansheng Ding	Director	62	Mr. Ding Jiansheng, with an MBA from National University of Singapore and a Taishan scholar, successively served as Chairman, General Manager and Chief Technologist of Yantai Wanhua Polyurethanes CO., Ltd. He is also Chairman of Wanhua Chemical Group co., Ltd, CEO of Wanhua Industrial Group Co., Ltd, Chairman and CEO of Borsed Chem, Hungary, and Director of the National Engineering Center for polyurethane. Since Oct 2016, he has been Director of Wanhua Chemical Group Co., Ltd.
Guangwu Kou	Executive Vice President	50	Mr Kou Guangwu, master and senior accountant, successively served as Chief Accountant and Vice General Manager of Yantai Wanhua Polyurethanes Co., Ltd. Since Dec 2004, he has been Director, Executive Vice President, Chief Financial Administrator of Wanhua Chemical Group Co., Ltd. He is Chairman of the Finance Committee and Chairman of the secretary committee board of the Shandong Listed Company Association.
Pengtao Huo	Vice President	50	Pengtao Huo, PH.D in high polysicsm, worked in WR.Grace as a researcher, then in Pharmacia & Upjohn as a project manager and later in Galt Lab Inc.as a manager from 1993 to 2002. He has assumed the role of Vice President and Marketing Executive since April 2010.
Weiqi Hua	Vice President	44	Mr Hua Weiqi, PH.D in Chemical Engineering and MBA at Wright State University, joined Wanhua in Jan 2001 and is Vice President and Technology Executive in Wanhua Chemical, as well as Executive Director of the National Engineering Centre for polyurethanes.
Yifeng Chen	Vice President	39	Mr Chen Yifeng, master and professorate senior engineer, joined Wanhua in 1998, and is MDI Device Manager of Ningbo Wanhua Polyurethane, Ltd, Manager at Production Control Department, Production Director and Vice President of Wanhua Chemical Group.

Source: Deutsche Bank

Production flow

Figure 75: Wanhua production flow chart



Source: Company data, Deutsche Bank

Key products abbreviation

Figure 76: Key products

Products	Full name	Products	Full name
PU	Polyurethane	PUD	Polyurethane dispersion
MDI	Methylene diphenyl diisocyanate	PF	Phenol-formaldehyde resin
TDI	Toluene diisocyanate	PUA	Polyurethane Acrylate
TPU	Thermoplastic polyurethane	HEUR	Hydrophobically modified polyurethanes
PC	Polycarbonate	HASE	Hydrophobically modified alkali swellable emulsions
SAP	Superabsorbent polymer	MTBE	Methyl tert-butyl ether
MDBA	Methylenebis (n-sec-butylaniline)	PVC	Polyvinyl chloride
IPDA	Isophoronediamine	VCM	Vinyl Chloride Monomer
MDA	Methylene dioxyamphetamine		

Source: Deutsche Bank

The author of this report would like to acknowledge the contribution made by Luka Li.

Appendix 1

Important Disclosures

*Other information available upon request

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Company	Ticker	Recent price*	Disclosure
Wanhua Chemical	600309.SS	33.47 (CNY) 10 Aug 17	NA

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Historical recommendations and target price: Wanhua Chemical (600309.SS)
(as of 8/10/2017)

Previous Recommendations

Strong Buy
Buy
Market Perform
Underperform
Not Rated
Suspended Rating

Current Recommendations

Buy
Hold
Sell
Not Rated
Suspended Rating

*New Recommendation Structure as of September 9,2002

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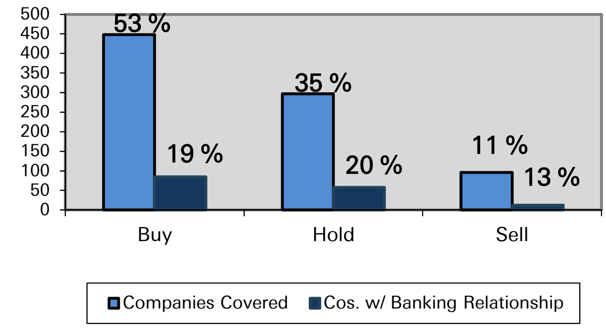

Asia-Pacific Universe

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