

Chemicals/Oil Refining

An extended upcycle

[Chemicals] An extended upcycle; Lotte Chemical remains our top pick

An extended upcycle: Looking ahead, we expect Korean chemical firms to enjoy an unprecedented upcycle through 2020. While such an extended upcycle is rare, we believe this time will be different, as 1) PE capex has dwindled, following the plunge in oil prices in late 2014, while 2) non-PE spending has also remained constrained, due to severe oversupply conditions.

PE pressures easing: While PE supply was expected to temporarily increase in 2018, it now looks like the actual impact will be limited. China's ban on plastic waste imports is spurring demand, while the operation of some ethane crackers has been delayed (and their eventual operation should have less of an impact, because of pent-up demand during the delays). In all, we expect the PE cycle to remain strong through 2020.

Non-PE chain set for recovery: Looking at the non-PE chain, excess capacities are being absorbed, and product cycles are picking up. In MEG, we see favorable market conditions in 2018, as supply remains tight, due to the low utilization of coal-to-chemical facilities, while China's plastic waste import ban is likely to drive demand. In butadiene, we look for a strong recovery, once temporary inventory pressures are lifted. We expect the SBR and BPA cycles to also improve, as excess capacity tapers off.

Lotte Chemical remains our top pick: As worries over the PE cycle subside, we expect Lotte Chemical's valuation to recover.

[Oil refining] Dividend appeal remains intact; favor S-Oil

Dividend appeal intact: Oil refining stocks have lately pulled back on softer refining margins and a faster-than-expected rise in oil prices. We believe rising oil prices are increasing the relative attractiveness of traditional oil sectors, while raising worries that refining margins (especially for gasoline) could come under pressure. However, we think refining margins will remain supported by supply and demand conditions, which have tightened amid continued low oil prices since 2014. In particular, we expect kerosene/diesel margins to remain robust, supported by improving emerging market demand. While oil price movements are a key variable, we believe the earnings power and dividend appeal of oil refiners remain intact.

Favor S-Oil in light of capex effects: With fuel oil margins declining amid rising oil prices, we believe that S-Oil will stand out from the pack, thanks to its new upgrading facility, which is set to come online in 3Q18. Meanwhile, the fact that PO/PP supply and demand balance remains tight is also positive. In addition, we think the stock offers the most attractive dividend yield in the sector.

Lotte Chemical's EPS and adjusted share price



Source: Quantwise, Mirae Asset Daewoo Research

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I. Chemicals

1. An extended upcycle; Lotte Chemical remains our top pick

Earnings at Korean chemical makers have improved on the pickup in the PE market since end-2014. Going forward, despite concerns over a slowdown in the PE market, stemming from the operation of US ethane crackers, we expect the PE cycle to remain strong, as: 1) China’s ban on plastic waste imports is spurring demand; and 2) the operation of some ethane crackers has been delayed.

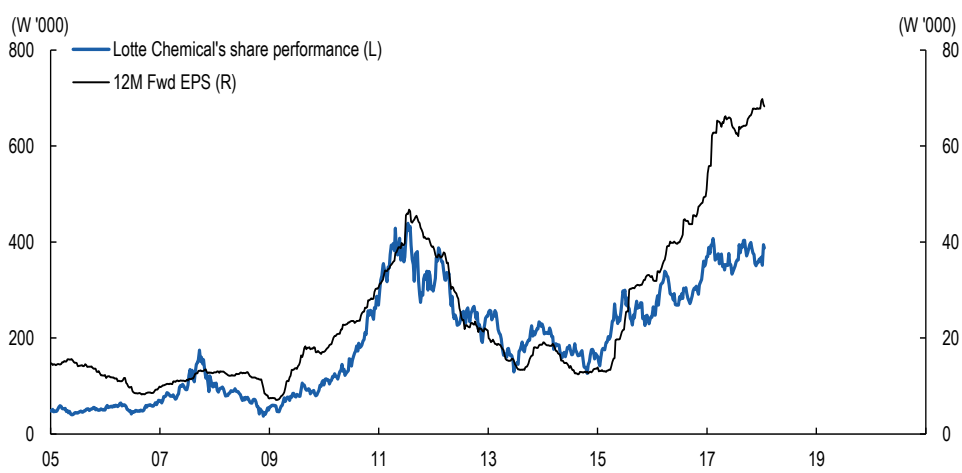
Looking at the non-PE chain, excess capacity is being absorbed, thanks to limited capacity expansion since 2016, leading to a recovery in product cycles. For butadiene, although excess capacity tapered off at end-2016, a full-scale recovery has been delayed, due to inventory burdens in early 2017. However, we expect the recovery to pick up speed toward 2H18, given modest capacity ramp-ups. MEG, ABS, PVC, and caustic soda cycles will likely recover through 2020, backed by limited capacity additions. The SBR and BPA cycles will also improve on the easing of excess capacity, in our view.

In all, we expect Korean chemical firms to enjoy an unprecedented upcycle through 2020. Cyclical industries typically experience a downcycle following massive capex, amid years of an upcycle. However, we believe the current upcycle will persist for an extended period of time, as: 1) PE capex has dwindled, following the plunge in oil prices in late 2014; and 2) non-PE spending has also remained constrained, due to severe oversupply conditions stemming from the Chinese market’s boom in 2009-11. Overall supply will not see a full-fledged increase until 2022, in our view.

Amid rising oil prices, the relative attractiveness of traditional oil sectors will likely increase. In the chemical sector, ethane crackers and coal-to-chemical facilities appear more attractive to investors than naphtha crackers. However, chemical spreads have been determined by supply/demand dynamics, rather than oil prices. Given that supply will likely remain tight over the next two to three years, we expect chemical firms to maintain robust earnings.

We maintain Overweight on the chemical sector, with Lotte Chemical (011170KS/Buy/TP: W600,000) as our top pick. Despite its superior earnings power, Lotte Chemical is currently undervalued, due to excessive concerns over the operation of US ethane crackers. With the increasing likelihood of the PE upcycle persisting, we expect the company’s valuation to recover.

Figure 1. Lotte Chemical’s EPS and adjusted share price



Source: Quantwise, Mirae Asset Daewoo Research

2. PE: An extended upcycle

We expect the PE market to enjoy an unprecedented upcycle through 2020, as capex (at ethane crackers and coal-to-chemical facilities, as well as naphtha crackers) has dwindled, following the plunge in oil prices in late 2014. The absence of capex between 2014 and 2016 indicates that capacity additions will be limited through 2020.

The investment decision for the US ethane cracker that is due to come online in 2H18 was made amid high oil prices in 2012. Since then, the burden of capacity additions has decreased, amid lower oil prices. Of the three crackers that had been expected to be launched in 2H17-1H18, one has begun full operation, but the remaining two have come online only partially. Even with the full-scale operation of the two crackers, excess supply would reach only 2-3mn tonnes annually. We expect a limited supply burden in 2018, given that: 1) pent-up demand should arise from the delayed full-scale operation of the two crackers; and 2) China's ban on plastic waste imports (estimated at 2.6mn tonnes annually) is spurring demand.

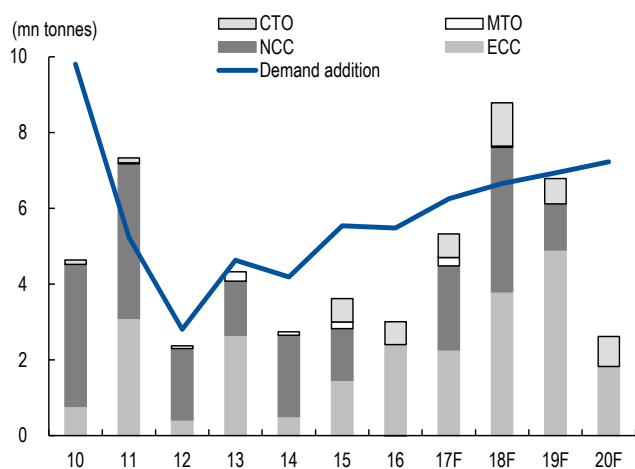
Table 1. Major cracker start-ups

('000 tonnes)

Company	Feedstock	Capacity	Operation schedule
Sadara Chemical	EPB/Naphtha	1,500	Resumption at end-1Q17 after routine maintenance (initial start-up at end-2016)
Reliance Industries	Ethane	1,350	End-August 2017; downstream operation is uncertain
OPAL	EPB/Naphtha	1,100	End- March 2017; full-scale sale started at end-2017
DowDuPont	Ethane	1,500	October 2017
Chevron Phillips	Ethane	1,500	Of two PE lines, one came online in October 2017; cracker to come online in mid-2018
ExxonMobil	Ethane	1,500	Of two PE lines, one came online at end-2017; cracker to come online in mid-2018
Ilam PC (Iran)	EPB/Naphtha	458	2H18 (uncertain)
FPC USA	Ethane	1,200	Start-up was initially scheduled for 3Q18, but delayed to 2019
Indorama	Ethane	420	3Q18
CNOOC	Naphtha	1,000	1H18
Shintech	Ethane	500	2018
Zhong'an Lianhe Coal Chemical	CTO	350	2018
SASOL	Ethane	1,500	Early 2019 for LDPE and 2H19 for the remainder
Axial/Lotte	Ethane	1,000	1Q19
Shanxi Coking, Shanxi	CTO	300	1019

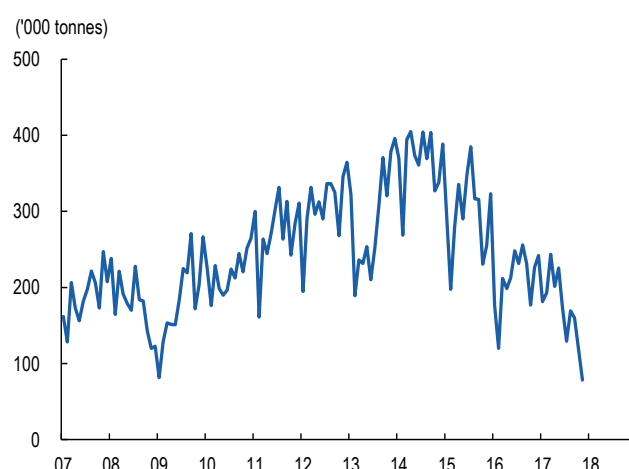
Source: Industry data, Mirae Asset Daewoo Research

Figure 2. Ethylene supply/demand outlook



Source: Industry data, Mirae Asset Daewoo Research

Figure 3. China's plastic waste imports



Source: CEIC, Mirae Asset Daewoo Research

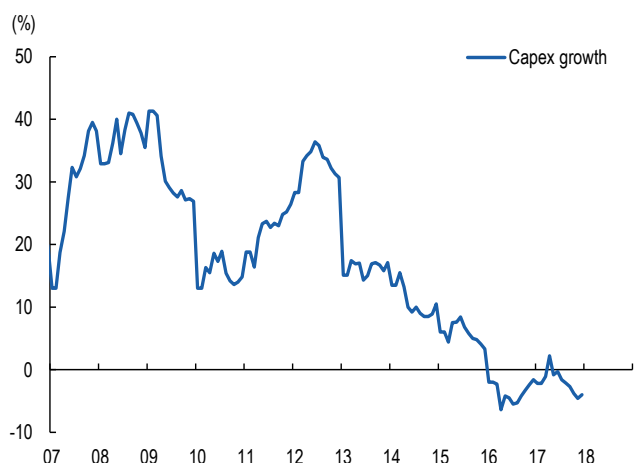
3. MEG, butadiene, ABS, PVC, and caustic soda cycles to improve further

The non-PE chain was plagued by oversupply in 2012-15, as supply increased markedly following the Chinese super-cycle in 2009-11. However, excess capacities are currently being absorbed, and some product cycles are picking up. Given the sluggish market conditions in 2012-15, capacity additions will likely be limited through 2020. For chemical products, supply/demand conditions tend to tighten over time, as demand expands in line with GDP growth.

Currently, non-PE products for which excess capacities are being absorbed and cycles are picking up include MEG, butadiene, ABS, PVC, and caustic soda. These products will likely see tighter supply/demand conditions amid natural demand growth, given limited capacity expansion through 2020.

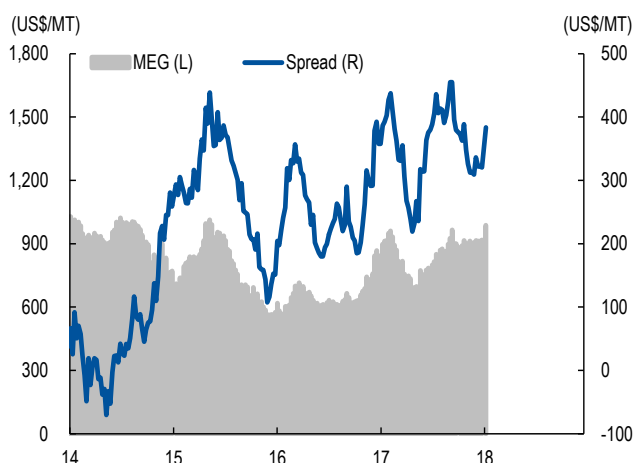
In MEG, the highs and lows of prices have been steadily climbing, despite high volatility over the past several years, as the utilization of coal-to-chemical facilities has been low, amid limited supply additions arising from concerns over coal-to-chemical capacity expansion in 2011-12. We see a robust market recovery in 2018, given that: 1) supply remains tight; 2) capacity additions should be modest this year; and 3) China's plastic waste import ban is likely to boost demand.

Figure 4. Chinese chemical makers' capex growth



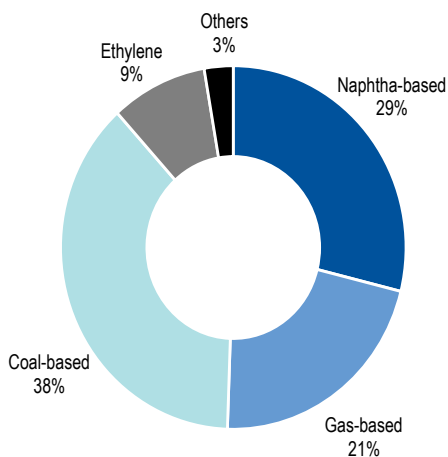
Source: CEIC, Mirae Asset Daewoo Research

Figure 5. MEG spread



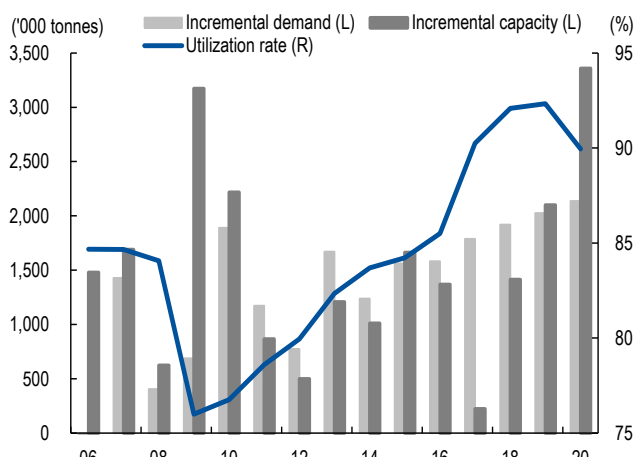
Source: Cischem, Mirae Asset Daewoo Research

Figure 6. MEG capacity additions in 2015-17 (coal-to-chemical facilities accounted for 38%)



Source: Industry data, Mirae Asset Daewoo Research

Figure 7. MEG supply/demand outlook



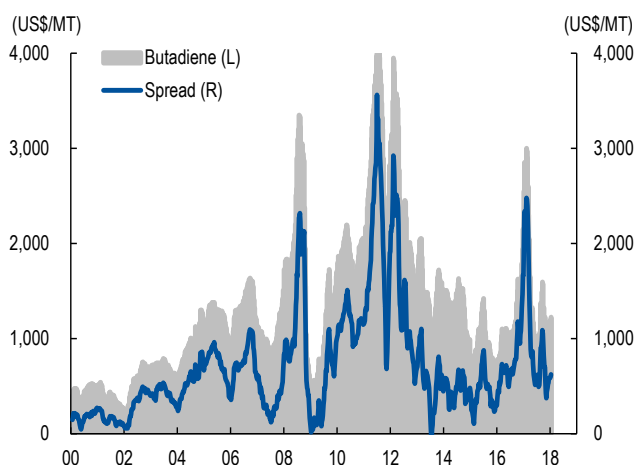
Source: Industry data, Mirae Asset Daewoo Research

For butadiene, the cycle began to pick up on reduced excess capacity at end-2016. In early 2017, however, inventories increased sharply, due to excessive restocking, and modest capacity additions will likely concentrate in 1Q18. As such, the butadiene cycle is unlikely to recover markedly in the near term. In the medium term, however, the cycle will likely improve sharply, as the inventory burden should ease, thanks to limited excess supply through 2020. Although butadiene accounts for only a small portion of naphtha crackers' revenue, its earnings contribution is high during a market recovery, due to: 1) the difficulty of restocking; and 2) high price volatility.

The ABS cycle has recovered since excess capacity tapered off in 2017. We expect additional recovery, as capacity additions should be limited through 2020.

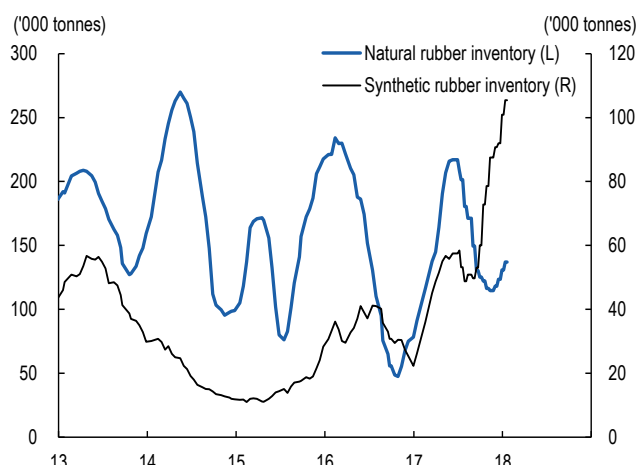
For PVC and caustic soda, supply has been significantly tight, due to: 1) supply reductions, arising from China's environmental regulation; and 2) the shutdown of mercury-based facilities in Europe. Although caustic soda prices have recently fallen, following a surge, they will likely pick up YoY in 2018, given the absence of capacity additions through 2020. The PVC cycle has weakened, due to: 1) sluggish demand, arising from the onset of low-demand season; and 2) high utilization rates, amid a robust caustic soda market. However, given the current tight supply, the PVC market will pick up on favorable seasonality in 2Q-3Q, in our view.

Figure 8. Butadiene spread



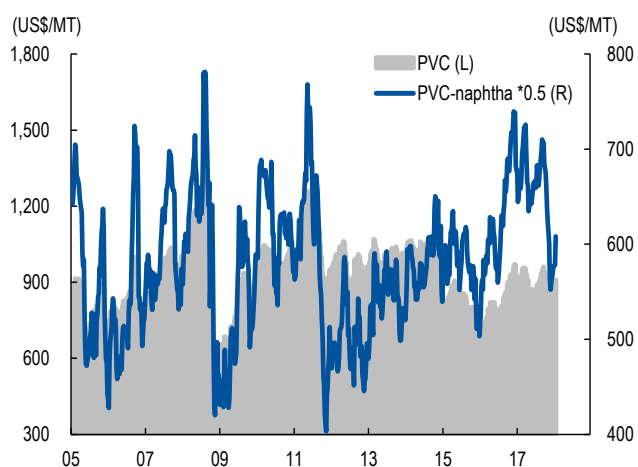
Source: Ciscem, Mirae Asset Daewoo Research

Figure 9. Chinese synthetic rubber/natural rubber inventory



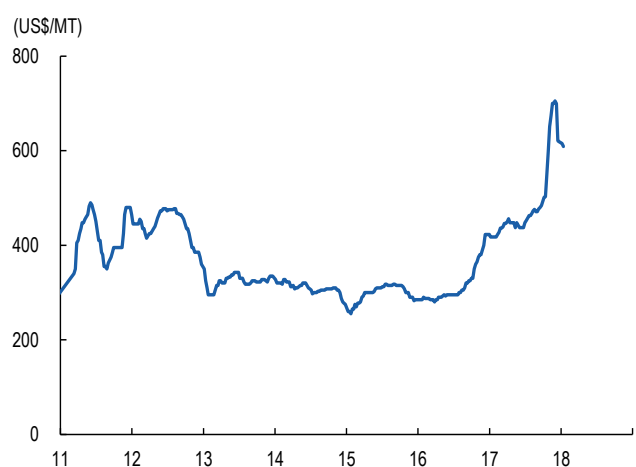
Source: Bloomberg, Mirae Asset Daewoo Research

Figure 10. PVC spread



Source: Ciscem, Mirae Asset Daewoo Research

Figure 11. Caustic soda price



Source: Ciscem, Mirae Asset Daewoo Research

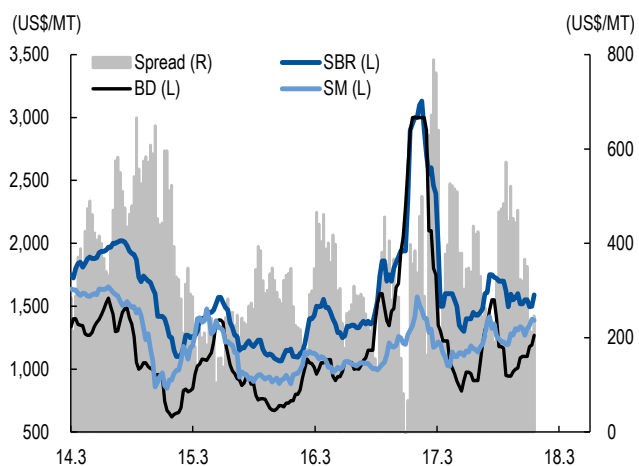
4. SBR spreads likely to improve; BPA spreads already recovering

We expect to see the spreads of currently oversupplied products, namely SBR and BPA, to improve going forward in 2018.

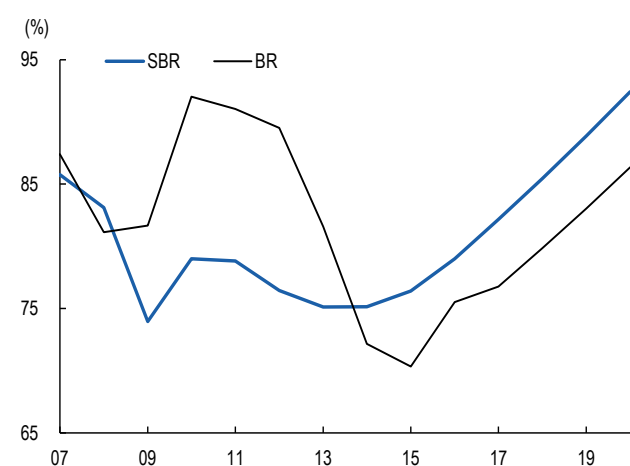
SBR spreads had expanded last year as Sinopec Qilu shut down its 100,000 tonne-facilities (about 1.5% of global capacity) in October, due to stricter environmental regulations. However, the spreads have narrowed subsequently on the news that the facilities will be back online in mid-January, 2018. SBR spreads rebounded last week, in line with butadiene prices, as Sinopec Qilu did not resume the operation of its facilities. The SBR market is now suffering from a higher level of oversupply, compared with butadiene. However, the fact that whether the operation of 100,000 tonne-facilities is resumed or not greatly affects global spreads indicates that SBR oversupply has been significantly eased. Accordingly, we expect the SBR market to improve in 2018.

Meanwhile, BPA spreads are expanding sharply on the back of the absence of capacity expansion plans for 2018 and capacity additions for PC, a major source of demand. The prices of phenol and acetone, major feedstocks for BPA, are also trending upward.

Figure 12. SBR spread trend **Figure 13. SBR/BR supply/demand outlook**

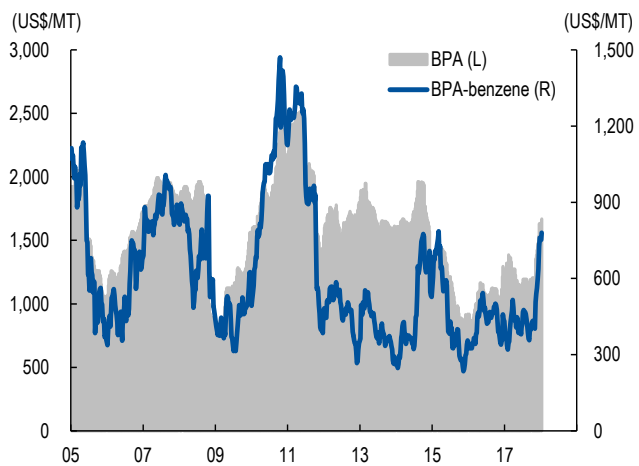


Source: Platts, Mirae Asset Daewoo Research

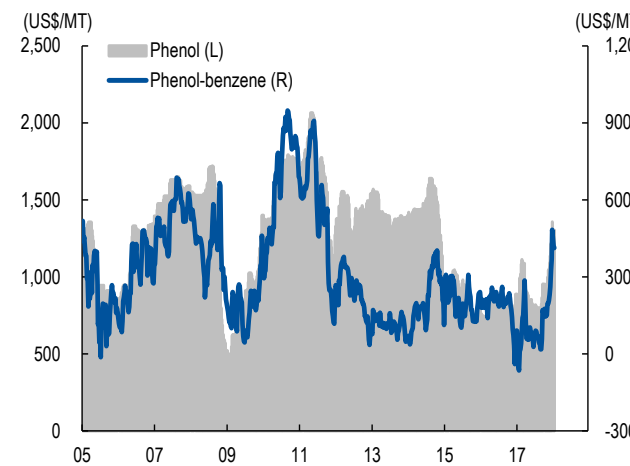


Source: Industry data, Mirae Asset Daewoo Research

Figure 14. BPA spread trend **Figure 15. Phenol spread trend**



Source: Ciscem, Mirae Asset Daewoo Research



Source: Ciscem, Mirae Asset Daewoo Research

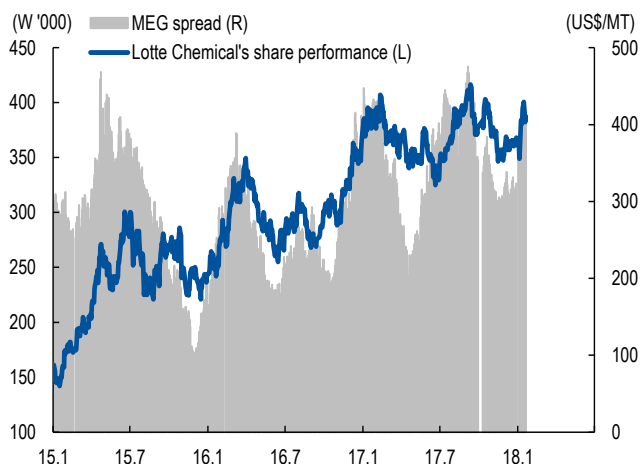
5. Short-term inventory cycle is improving

Chemicals spreads tend to move in several-year cycles in line with a supply cycle. From a short-term perspective, we have also seen inventory cycles of two to three months, arising from various factors, including China's monetary policies. Such short-term inventory cycles have affected the share price momentum of chemicals stocks, due to the significant and direct impact of spreads on earnings.

Short-term inventory cycle slowed in 4Q17, amid inventory drawdowns worldwide. However, the cycle has been recovering since mid-January this year, driven by the price upturn in products with greater price elasticity, including MEG, and the widening of overall spreads, including butadiene and SM.

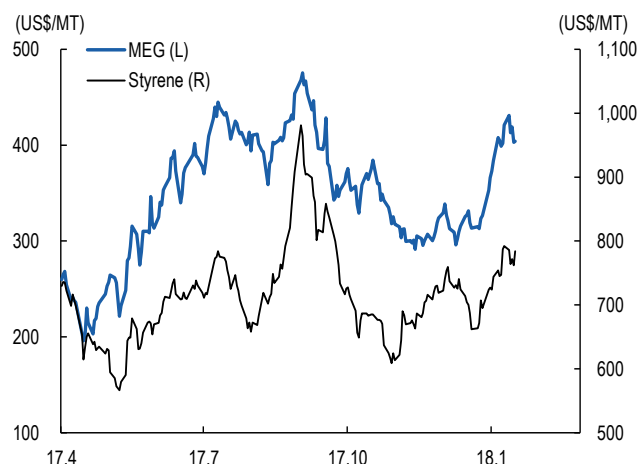
Given that, historically, the inventory upcycle lasted for two to three months, we expect to see a positive momentum in 1Q18. Accordingly, chemical companies are expected to post improved earnings in 1Q18, after suffering earnings slowdowns in 4Q17 resulting from weaker spreads.

Figure 16. MEG spread and Lotte Chemical's share performance



Source: Quantwise, Mirae Asset Daewoo Research

Figure 17. MEG and SM daily spread trends



Source: Platts, Mirae Asset Daewoo Research

6. [Solar PV] China's demand after New Year's holiday is noteworthy

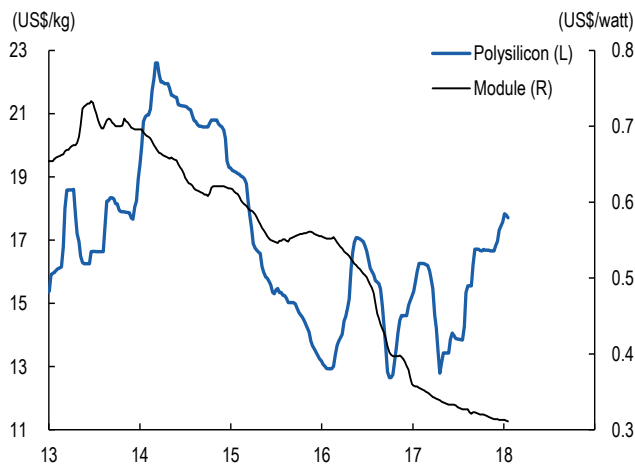
Global solar PV demand likely rose to 106GW in 2017, largely driven by China. Of note, distributed PV demand is believed to have been largely responsible for the Chinese market's growth. China's distributed PV demand had been insignificant, due to lower subsidies, but has seen sharp growth recently, as the downtrend in module prices has pushed up the profitability of distributed PV projects.

We expect solar PV demand to strengthen in 1H, ahead of the scheduled subsidy cut at end-June, 2018. Demand will likely remain robust even after the subsidy adjustment, as the size of the subsidy cut will likely be smaller than feared.

Polysilicon prices have been correcting for two weeks (based on PV Insights). The supply and demand conditions for polysilicon are forecast to remain largely tight over the next two to three years. However, prices are currently experiencing a short-term correction, in our view, amid a dip in demand in China.

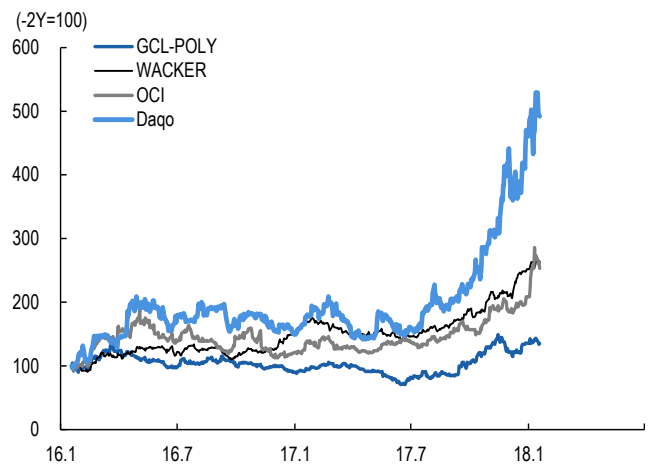
In 2017, polysilicon prices had risen in the run up to the Chinese New Year's holiday, amid a module inventory build-up, but subsequently turned downward, due to inventory adjustments, until returning to the upward trajectory in 2Q. In light of the current tight supply and demand conditions, the price trend after the New Year's holiday is worth tracking, in our view.

Figure 18. Price trends of polysilicon and solar PV modules



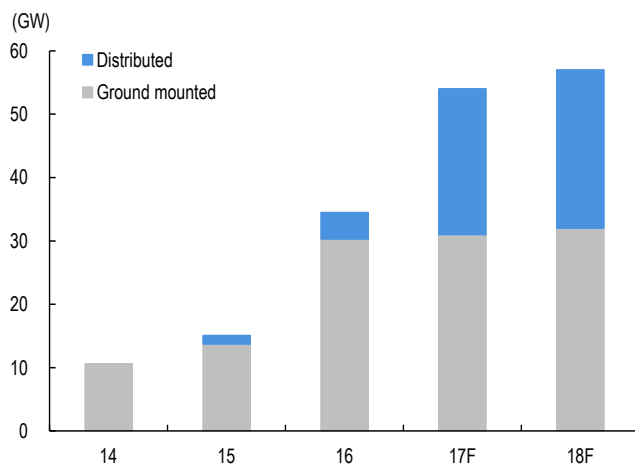
Source: PV Insights, Mirae Asset Daewoo Research

Figure 19. Share performance of global polysilicon makers



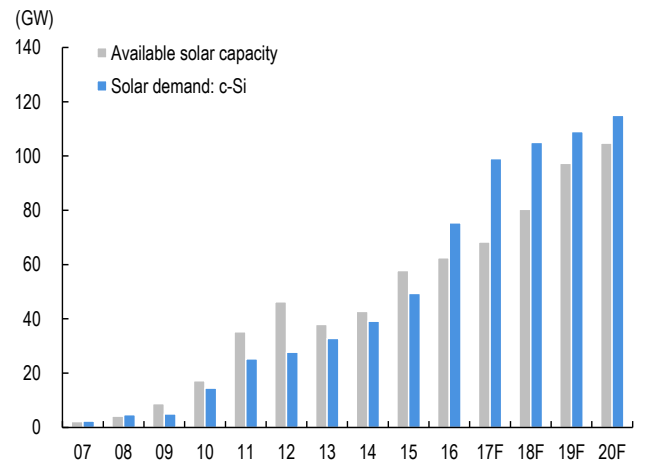
Source: Thomson Reuters, Mirae Asset Daewoo Research

Figure 20. China's solar PV demand trend and outlook



Source: Industry data, Mirae Asset Daewoo Research

Figure 21. Polysilicon supply/demand trend and outlook



Source: Industry data, Mirae Asset Daewoo Research

II. Oil refining

1. Investment strategy: Dividend appeal remains intact; favor S-Oil

Oil refining stocks have lately pulled back on softer refining margins and a faster-than-expected rise in oil prices. We believe rising oil prices are increasing the relative attractiveness of traditional oil sectors (upstream) versus the refining sector (downstream). For refiners, an increase in oil prices should add to valuation gains on inventory, but will likely be accompanied by rises in OSP rises (which should partly offset the positive effects) and a decline in demand for petrochemical products (e.g. gasoline).

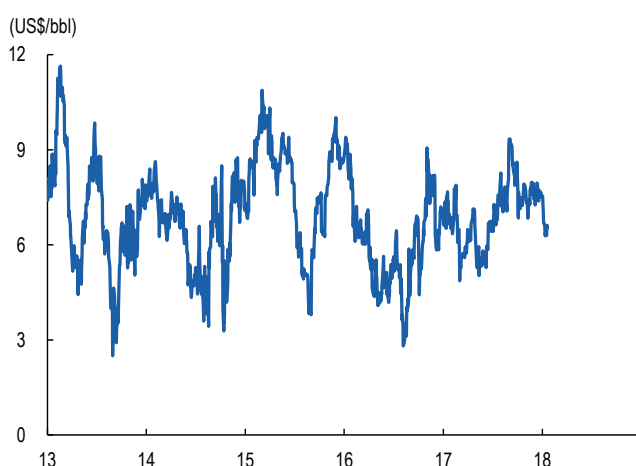
Although it remains to be seen how far oil prices can rise, we expect overall refining margins to remain solid over the next two to three years. While continued low oil prices have boosted demand for oil products since 2014, capacity additions have remained limited.

In contrast to the recent slowdown in margins for gasoline and fuel oil, we expect kerosene/diesel margins to remain supported by improving emerging market demand. Moreover, we believe that a further contraction in fuel oil margins could lead to a decline in the utilization of refineries without upgraded facilities, thus boosting margins for Korean refineries with a higher upgrading ratio. For PX and base oil, spreads are projected to remain in a boxed range, due to the delayed operation of new facilities.

While oil price movements are a key variable, barring a sharp rise in oil prices, we believe the earnings power and dividend appeal of oil refiners should remain intact.

Our top pick for the refining sector is S-Oil. The firm has been upgrading its refining facilities to convert fuel oil into high value-added products, such as propylene oxide (PO) and polypropylene (PP). If fuel oil margins narrow, we think the firm will stand out from the pack, thanks to its new upgrading facility, which is set to come online in 3Q18. It is also positive that PO/PP supply will likely remain tight over the next three years, thanks to likely limited capacity additions. In addition, we believe that the attractive dividend yield should help limit downside to shares going forward.

Figure 22. Korea complex refining margin



Source: Petronet, Mirae Asset Daewoo Research

Figure 23. Oil prices vs. refiners' total market caps



Source: Quantwise, Mirae Asset Daewoo Research

2. Refining margins to remain solid

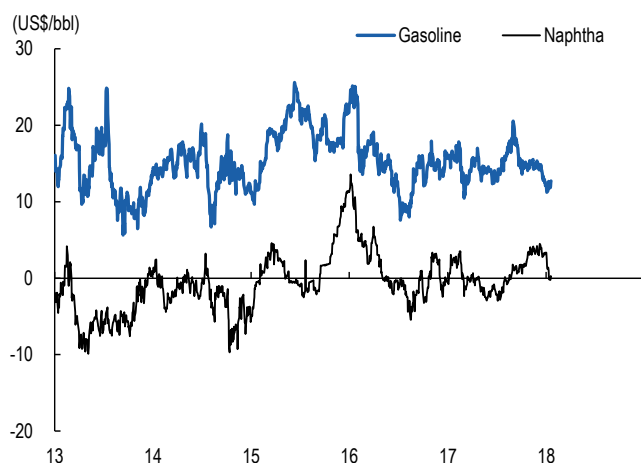
We expect refining margins to remain solid over the next two to three years. While continued low oil prices have boosted demand for oil products since 2014, capacity additions has declined sharply. With capacity ramp-ups likely to remain constrained through 2020, we believe that overall supply will remain tight.

While kerosene/diesel margins have remained robust, margins for gasoline and fuel oil have narrowed. We think the cold wave in the US has been depressing gasoline demand, and slowed demand for power generation spurred by higher oil prices has been weighing on fuel oil margins. Meanwhile, kerosene/diesel margins have remained strong, thanks to improving emerging market demand.

Going forward, gasoline and fuel oil margin trends may hinge on oil price movements. However, we expect kerosene and diesel margins to remain solid, regardless of oil price movements, in light of their low price elasticity of demand and improving demand from emerging markets. Moreover, we believe that if a persistent contraction in fuel oil margins leads to a decline in the utilization of refineries without upgraded facilities, the subsequent reduction in supply of kerosene/diesel and gasoline should benefit Korean refineries with upgraded facilities.

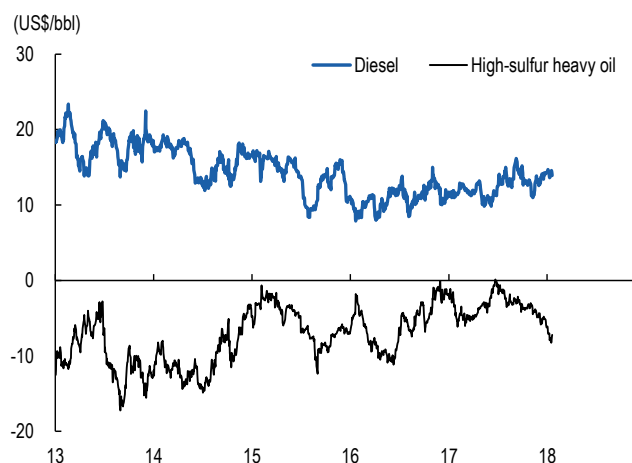
Overall, refining margins are highly likely to remain solid, supported by improving emerging market demand and limited capacity additions.

Figure 24. Gasoline and naphtha margin trends



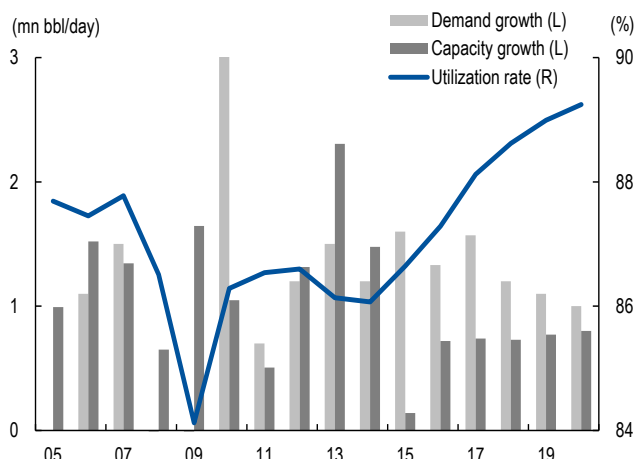
Source: Petronet, Mirae Asset Daewoo Research

Figure 25. Kerosene/diesel, fuel oil (with high sulfur content) margins



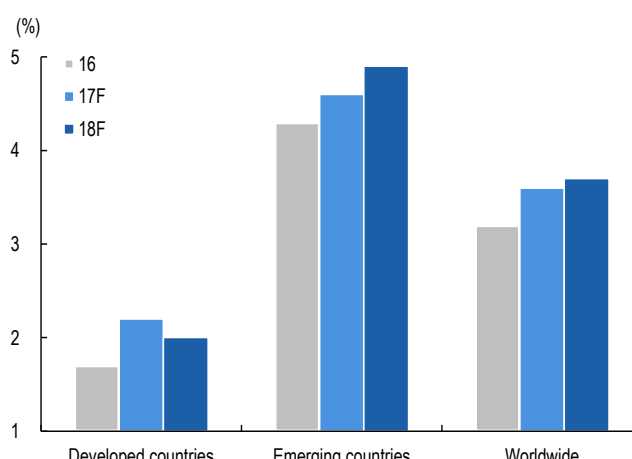
Source: Petronet, Mirae Asset Daewoo Research

Figure 26. Global petroleum product supply/demand outlook



Source: Industry data, Mirae Asset Daewoo Research

Figure 27. Global GDP growth outlook



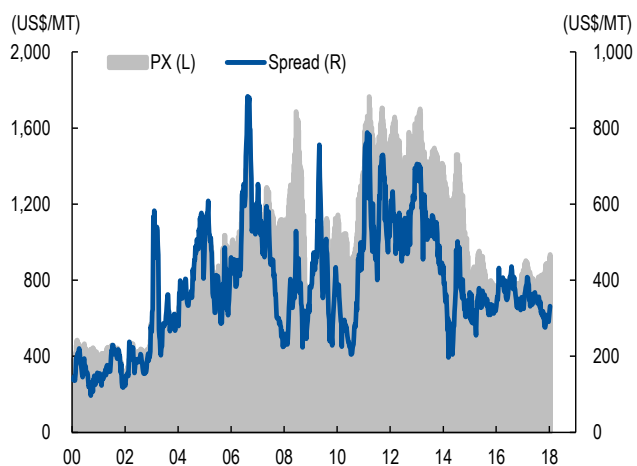
Source: IMF, Mirae Asset Daewoo Research

For PX, spreads have recently been picking up, due to delays in the startup of major facilities (e.g., Petro Rabigh) to 2H18. We believe that delayed operation of new facilities will keep PX spreads within a tight range in 2018.

For base oil, for which capacity ramp-ups are expected for both group 2 and 3 in 2018, the impact of new capacity on spreads deserves attention. However, we believe that base oil spreads are also highly likely to remain in a boxed range in 2018, given that delays in the operation of new facilities are still possible and it will take some time for base oil refiners to gain new customers.

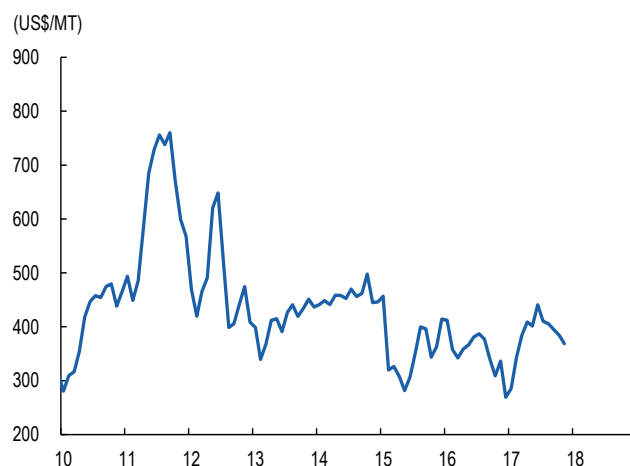
Up until two to three years ago, increases in oil prices immediately drove up shale oil capex, thus heightening expectations for supply expansion. Recently, however, despite oil price rises, US rig count has not risen significantly. We believe shale oil producers have refrained from expanding capex, due to mounting financial difficulties amid persistently low oil prices. Going forward, we think the resumption of capex by oil producers (US rig counts) will be a key factor in determining oil prices.

Figure 28. PX spreads



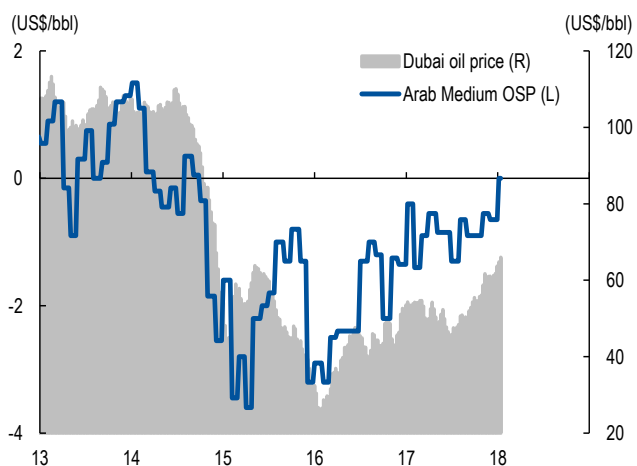
Source: Cischem, Mirae Asset Daewoo Research

Figure 29. Base oil spreads



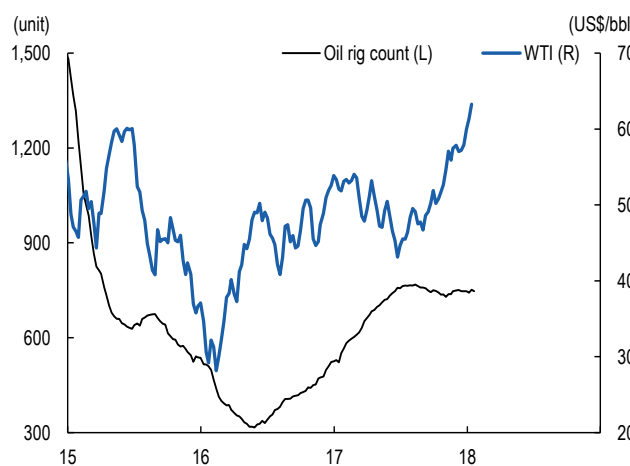
Source: KITA, Mirae Asset Daewoo Research

Figure 30. Dubai crude and OSP trends



Source: Bloomberg, Mirae Asset Daewoo Research

Figure 31. WTI oil price and US rig count



Source: Baker Hughes, Mirae Asset Daewoo Research

Lotte Chemical (011170 KS)

An extended upcycle

Chemicals

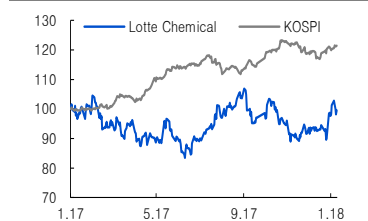
(Maintain)	Buy
Target Price (12M, W)	600,000
Share Price (01/19/18, W)	387,500
Expected Return	55%

OP (17F, Wbn)	2,899
Consensus OP (17F, Wbn)	2,894

EPS Growth (17F, %)	27.2
Market EPS Growth (17F, %)	46.0
P/E (17F, x)	5.4
Market P/E (17F, x)	10.3
KOSPI	2,520.26

Market Cap (Wbn)	13,282
Shares Outstanding (mn)	34
Free Float (%)	46.5
Foreign Ownership (%)	32.6
Beta (12M)	0.45
52-Week Low	325,000
52-Week High	416,500

(%)	1M	6M	12M
Absolute	7.3	8.5	1.0
Relative	5.6	4.7	-16.9



An extended upcycle; our top pick

An extended upcycle: We maintain our Buy call and target price of W600,000 on Lotte Chemical and reiterate the stock as our top pick in chemicals. It looks increasingly likely the PE upcycle will last through 2020, as China's ban on plastic waste imports is spurring demand, while the operation of major ethane crackers is seeing repeated delays. We expect Lotte Chemical to continue to deliver strong earnings through 2020, backed by the sustained PE upcycle and the recovery of the non-PE chain. With PE spreads remaining robust, any signs of a visible recovery in the non-PE chain (butadiene, etc.) will likely lead to a valuation recovery, driving strong upside to shares. Our target price of W600,000 is based on a P/E of 8x our 12-month forward EPS.

PE and non-PE cycles to remain strong through 2020

Ethane cracker impact subsiding: Contrary to some concerns, we believe PE spreads will remain robust through 2020. While the chemicals industry typically enters a slowdown after a two- to three-year upcycle, as a result of increasing demand, there are minimal PE capacity additions through 2020, as spending on new crackers has dwindled following the plunge in oil prices in late 2014. Although supply was set to increase temporarily in 2018, additional demand resulting from China's recent ban on plastic waste imports (which are estimated to be 2.6mn tonnes annually) and delays in the startup of major ethane crackers suggest the impact will be limited.

Improving non-PE cycle: The non-PE chain (MEG, butadiene, etc.) also looks set to improve, given limited capacity ramp-ups in the coming years. Despite years of coal-to-chemical capacity expansions, MEG supply has tightened, thanks to lower utilization at coal-based facilities. In addition, China's recent restriction on polyester waste imports is likely to provide an additional boost to demand. Meanwhile, butadiene spreads should also widen on the back of tight supply, once inventory pressures are lifted.

4Q17 OP to be in line with consensus; earnings to improve in 1Q18

Earnings to improve in 1Q18: For 4Q17, we expect operating profit to come in at W685.6bn, in line with the consensus. While 4Q17 earnings were likely affected by lower oil prices and one-off expenses, overall earnings should improve in 1Q18, in light of the current spread expansion.

FY (12)	12/14	12/15	12/16	12/17F	12/18F	12/19F
Revenue (Wbn)	14,859	11,713	13,224	15,915	16,581	17,957
OP (Wbn)	351	1,611	2,544	2,899	3,072	3,285
OP margin (%)	2.4	13.8	19.2	18.2	18.5	18.3
NP (Wbn)	147	993	1,836	2,335	2,537	2,729
EPS (W)	4,285	28,957	53,561	68,122	74,028	79,607
ROE (%)	2.3	14.2	21.7	22.1	19.5	17.7
P/E (x)	37.3	8.4	6.9	5.4	5.2	4.9
P/B (x)	0.9	1.1	1.4	1.1	0.9	0.8
Dividend yield (%)	0.6	1.0	1.1	1.6	1.5	1.5

Note: All figures are based on consolidated K-IFRS; NP refers to net profit attributable to controlling interests

Source: Company data, Mirae Asset Daewoo Research estimates

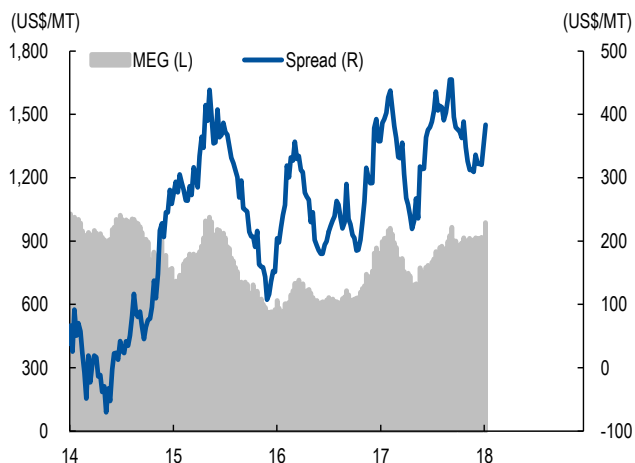
Table 2. Quarterly and annual earnings

(Wbn)

		1Q17	2Q17	3Q17	4Q17F	1Q18F	2Q18F	3Q18F	4Q18F	2016	2017F	2018F
Revenue	Total	3,996.0	3,853.3	3,990.2	4,075.5	4,087.5	4,131.2	4,173.9	4,188.3	13,223.6	15,915.0	16,581.0
	Olefins	1,934.0	1,931.2	1,973.6	1,965.1	1,939.3	1,939.3	1,939.3	1,939.3	6,494.1	7,803.9	7,757.2
	Aromatics	724.2	750.7	735.5	700.2	717.0	717.0	717.0	717.0	1,956.9	2,910.6	2,868.1
	Titan	495.8	457.0	532.9	563.0	576.8	593.3	605.7	593.3	2,285.2	2,048.7	2,369.2
	Advanced Materials	705.0	709.6	767.2	847.3	854.4	881.5	911.9	938.7	1,950.7	3,029.1	3,586.5
Operating profit	Total	815.2	632.2	766.2	685.6	730.9	767.6	802.4	771.0	2,544.0	2,899.2	3,071.8
	Olefins	595.1	398.4	502.8	371.9	420.2	451.0	474.1	451.0	1,711.6	1,868.2	1,796.5
	Aromatics	102.4	113.7	112.4	107.9	115.8	115.8	115.8	115.8	142.0	436.4	463.3
	Titan	69.2	52.7	66.2	112.6	92.3	94.9	103.0	100.9	512.6	300.7	391.1
	Advanced Materials	70.6	78.3	101.0	93.2	102.5	105.8	109.4	103.3	239.7	343.1	421.0
Pretax profit		863.8	686.3	832.8	797.8	861.5	907.5	926.2	884.1	2,487.4	3,143.0	3,427.0
Net profit		640.2	515.3	616.2	592.1	639.3	673.4	687.3	656.1	1,835.8	2,336.0	2,543.0

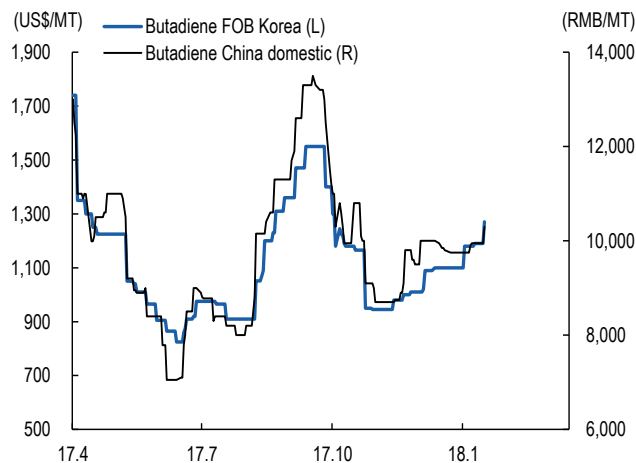
Source: Company data, Mirae Asset Daewoo Research estimates

Figure 32. MEG spread (weekly)



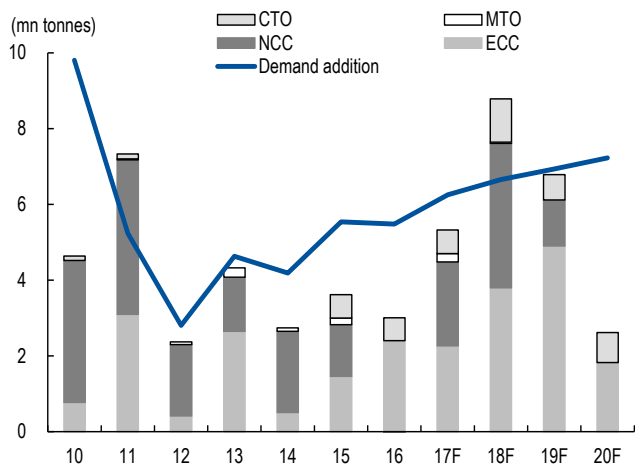
Source: Cischem, Mirae Asset Daewoo Research

Figure 33. Butadiene spread (daily)



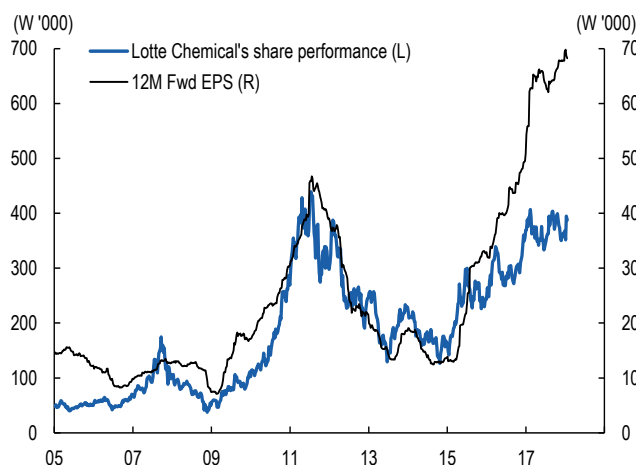
Source: Platts, Mirae Asset Daewoo Research

Figure 34. Ethylene supply/demand outlook



Source: Industry data, Mirae Asset Daewoo Research

Figure 35. 12 month forward EPS and adjusted share price



Source: Quantiwise, Mirae Asset Daewoo Research

Lotte Chemical (011170 KS/Buy/TP: W600,000)

Comprehensive Income Statement (Summarized)

(Wbn)	12/16	12/17F	12/18F	12/19F
Revenue	13,224	15,915	16,581	17,957
Cost of Sales	9,957	12,156	12,649	13,812
Gross Profit	3,267	3,759	3,932	4,145
SG&A Expenses	722	860	860	860
Operating Profit (Adj)	2,544	2,899	3,072	3,285
Operating Profit	2,544	2,899	3,072	3,285
Non-Operating Profit	-57	243	347	392
Net Financial Income	-48	-55	7	52
Net Gain from Inv in Associates	71	316	340	340
Pretax Profit	2,487	3,142	3,419	3,677
Income Tax	650	777	821	882
Profit from Continuing Operations	1,837	2,365	2,599	2,794
Profit from Discontinued Operations	0	0	0	0
Net Profit	1,837	2,365	2,599	2,794
Controlling Interests	1,836	2,335	2,537	2,729
Non-Controlling Interests	1	30	61	66
Total Comprehensive Profit	1,923	2,193	2,599	2,794
Controlling Interests	1,921	2,158	2,522	2,712
Non-Controlling Interests	3	36	77	83
EBITDA	3,173	3,607	3,835	4,204
FCF (Free Cash Flow)	1,112	699	1,863	1,104
EBITDA Margin (%)	24.0	22.7	23.1	23.4
Operating Profit Margin (%)	19.2	18.2	18.5	18.3
Net Profit Margin (%)	13.9	14.7	15.3	15.2

Cash Flows (Summarized)

(Wbn)	12/16	12/17F	12/18F	12/19F
Cash Flows from Op Activities	2,701	2,451	2,863	3,104
Net Profit	1,837	2,365	2,599	2,794
Non-Cash Income and Expense	1,375	1,236	1,113	1,287
Depreciation	561	608	662	829
Amortization	68	100	101	91
Others	746	528	350	367
Chg in Working Capital	-139	-498	-29	-95
Chg in AR & Other Receivables	-128	-890	-21	-70
Chg in Inventories	-126	-48	-42	-139
Chg in AP & Other Payables	154	-21	0	0
Income Tax Paid	-373	-651	-821	-882
Cash Flows from Inv Activities	-3,565	-1,654	-775	-1,759
Chg in PP&E	-1,577	-1,751	-1,000	-2,000
Chg in Intangible Assets	-7	-2	0	0
Chg in Financial Assets	315	0	0	0
Others	-2,296	99	225	241
Cash Flows from Fin Activities	1,101	607	-1,229	-1,272
Chg in Financial Liabilities	1,773	-129	-1,000	-1,000
Chg in Equity	2	401	0	0
Dividends Paid	-84	-135	-135	-206
Others	-590	470	-94	-66
Increase (Decrease) in Cash	261	1,676	1,198	413
Beginning Balance	1,942	2,203	3,879	5,077
Ending Balance	2,203	3,879	5,077	5,490

Source: Company data, Mirae Asset Daewoo Research estimates

Statement of Financial Condition (Summarized)

(Wbn)	12/16	12/17F	12/18F	12/19F
Current Assets	5,852	6,812	8,074	8,699
Cash and Cash Equivalents	2,203	3,879	5,077	5,490
AR & Other Receivables	1,552	800	822	896
Inventories	1,477	1,513	1,555	1,694
Other Current Assets	620	620	620	619
Non-Current Assets	10,015	11,117	11,354	12,435
Investments in Associates	2,136	2,136	2,136	2,136
Property, Plant and Equipment	5,547	6,641	6,979	8,151
Intangible Assets	1,792	1,696	1,595	1,504
Total Assets	15,867	17,929	19,428	21,134
Current Liabilities	3,449	1,906	1,924	1,983
AP & Other Payables	1,128	0	0	0
Short-Term Financial Liabilities	1,747	1,269	1,269	1,269
Other Current Liabilities	574	637	655	714
Non-Current Liabilities	3,017	3,430	2,448	1,506
Long-Term Financial Liabilities	2,441	2,790	1,790	790
Other Non-Current Liabilities	576	640	658	716
Total Liabilities	6,466	5,336	4,371	3,489
Controlling Interests	9,363	11,790	14,193	16,716
Capital Stock	171	171	171	171
Capital Surplus	479	880	880	880
Retained Earnings	8,487	10,678	13,080	15,603
Non-Controlling Interests	38	802	863	929
Stockholders' Equity	9,401	12,592	15,056	17,645

Forecasts/Valuations (Summarized)

	12/16	12/17F	12/18F	12/19F
P/E (x)	6.9	5.4	5.2	4.9
P/CF (x)	3.9	3.5	3.6	3.3
P/B (x)	1.4	1.1	0.9	0.8
EV/EBITDA (x)	4.5	3.6	3.0	2.5
EPS (W)	53,561	68,122	74,028	79,607
CFPS (W)	93,730	105,056	108,294	119,071
BPS (W)	273,173	344,004	414,100	487,707
DPS (W)	4,000	6,000	6,000	6,000
Payout ratio (%)	7.3	8.7	7.9	7.4
Dividend Yield (%)	1.1	1.6	1.5	1.5
Revenue Growth (%)	12.9	20.3	4.2	8.3
EBITDA Growth (%)	51.2	13.7	6.3	9.6
Operating Profit Growth (%)	57.9	14.0	6.0	6.9
EPS Growth (%)	85.0	27.2	8.7	7.5
Accounts Receivable Turnover (x)	10.6	14.1	21.4	21.8
Inventory Turnover (x)	10.0	10.6	10.8	11.1
Accounts Payable Turnover (x)	12.9	26.7	0.0	0.0
ROA (%)	13.4	14.0	13.9	13.8
ROE (%)	21.7	22.1	19.5	17.7
ROIC (%)	26.5	22.8	22.6	22.8
Liability to Equity Ratio (%)	68.8	42.4	29.0	19.8
Current Ratio (%)	169.7	357.3	419.7	438.8
Net Debt to Equity Ratio (%)	16.2	-2.3	-16.5	-22.1
Interest Coverage Ratio (x)	33.3	24.5	32.5	49.6

LG Chem (051910 KS)

Chemical cycle recovery and battery premium

Chemicals

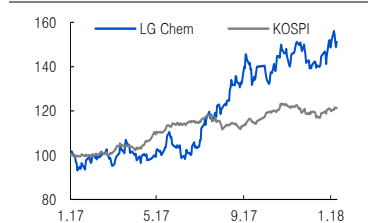
(Maintain)	Buy
Target Price (12M, W)	530,000
Share Price (01/19/18, W)	423,500
Expected Return	25%

OP (17F, Wbn)	2,977
Consensus OP (17F, Wbn)	2,975

EPS Growth (17F, %)	57.4
Market EPS Growth (17F, %)	46.0
P/E (17F, x)	14.8
Market P/E (17F, x)	10.3
KOSPI	2,520.26

Market Cap (Wbn)	29,896
Shares Outstanding (mn)	78
Free Float (%)	64.3
Foreign Ownership (%)	40.9
Beta (12M)	1.07
52-Week Low	261,000
52-Week High	437,000

(%)	1M	6M	12M
Absolute	6.3	33.0	56.6
Relative	4.5	28.2	28.8



Maintain Buy in light of chemical upcycle and battery premium

Maintain Buy and TP: We maintain our Buy call and target price of W530,000 on LG Chem. In deriving the target price based on the sum of the parts valuation methodology, we valued the company's EV battery business at W11.9tr. The EV battery business is expected to maintain a high premium in 2018, in light of the favorable EV market outlook. In addition, the chemicals market has been recovering since January this year. Over the next two to three years, the company is expected to display positive earnings and share performance in line with the chemical upcycle.

Improving chemical cycle: Chemical spreads that had been under downward pressures in the short term have been rebounding since mid-January. In our view, the beginning of inventory buildup cycle has been pushing up spreads. Chemical spreads are expected to remain on the rise over the next two to three months, in light of the historical duration of short-term inventory upcycles.

Positive mid-term cycle: We are bullish about the mid-term chemicals cycle. Despite the scheduled operation of new ethane crackers, global PE supply and demand dynamics will likely remain tight over the next several years. In addition, non-PE spreads are also improving. Following the expansion of PVC, ABS, and caustic soda spreads in 2017, the spreads of synthetic rubber and BPA are expected to recover in 2018. On the back of a diversified product portfolio and the improvement in overall chemical cycles, LG Chem's earnings will likely grow steadily throughout 2018.

EV market to see full-fledged growth: As global automakers' EV development and rollouts are gaining momentum, LG Chem is expected to maintain a valuation premium for its EV battery business. Major events to affect the EV battery business in 2018 include: 1) the listing of Chinese battery giant, CATL; 2) mass production of Tesla's Model 3; and 3) the potential announcements of 3G EV launch plans.

Earnings to miss consensus in 4Q17, but improve in 1Q18

4Q OP estimated at W663.6bn: For 4Q17, LG Chem's operating profit is projected at W663.6bn, slightly below the market consensus, with won appreciation likely depressing overall earnings. The chemicals business is expected to have been weighed down by some one-off expenses, including maintenance costs, and the narrowing of spreads amid inventory adjustments. Such downside factors also likely depressed earnings in the information & electronic materials (I&E) and battery businesses.

OP to improve to W775bn in 1Q: We forecast operating profit to rise to W775bn in 1Q18 on the recovery of chemicals spreads starting in January and removal of negative one-off factors. We believe the widening of spreads should outweigh the negatives from won appreciation.

FY (12)	12/14	12/15	12/16	12/17F	12/18F	12/19F
Revenue (Wbn)	22,578	20,207	20,659	25,852	27,421	30,721
OP (Wbn)	1,311	1,824	1,992	2,977	3,044	3,572
OP margin (%)	5.8	9.0	9.6	11.5	11.1	11.6
NP (Wbn)	868	1,153	1,281	2,136	2,338	2,753
EPS (W)	11,745	15,602	17,336	27,290	29,871	35,172
ROE (%)	7.3	9.2	9.5	14.0	13.4	14.1
P/E (x)	15.4	21.1	15.1	14.8	14.2	12.0
P/B (x)	1.1	1.9	1.4	1.9	1.8	1.6
Dividend yield (%)	2.2	1.4	1.9	1.5	1.4	1.4

Note: All figures are based on consolidated K-IFRS; NP refers to net profit attributable to controlling interests
Source: Company data, Mirae Asset Daewoo Research estimates

Table 3. Quarterly and annual earnings

(Wbn)

		1Q17	2Q17	3Q17	4Q17F	1Q18F	2Q18F	3Q18F	4Q18F	2016	2017F	2018F
Revenue	Total	6,486.7	6,382.1	6,397.1	6,586.6	6,505.2	6,772.8	7,081.7	7,061.5	20,659.3	25,852.5	27,421.3
	Basic Materials & Chemicals	4,495.3	4,318.6	4,316.0	4,478.0	4,529.5	4,575.0	4,641.0	4,606.9	14,447.1	17,607.9	18,352.2
	I&E materials	726.0	747.3	787.3	655.3	652.4	737.5	772.5	722.5	2,655.9	2,915.9	2,885.0
	Energy solutions	999.4	1,119.8	1,188.8	1,237.0	940.9	1,131.7	1,425.5	1,499.2	3,561.7	4,545.0	4,997.4
Operating profit	Total	796.9	726.9	789.7	663.6	775.0	784.5	775.7	708.8	1,991.9	2,977.1	3,044.0
	Basic Materials & Chemicals	733.7	685.5	755.3	649.0	682.1	688.9	705.1	689.8	2,119.2	2,823.5	2,765.8
	I&E materials	29.3	23.4	40.8	31.0	34.9	38.4	40.8	32.8	-54.9	124.5	146.9
	Energy solutions	-10.4	7.5	18.1	0.1	-9.7	11.5	25.3	1.5	-51.4	15.3	28.6
Pretax profit		698.3	729.6	702.4	649.2	762.6	773.2	764.6	697.4	1,659.8	2,779.5	2,997.9
Net profit		531.5	577.1	521.0	506.4	594.8	603.1	596.4	544.0	1,281.1	2,190.0	2,338.4

Source: Company data, Mirae Asset Daewoo Research

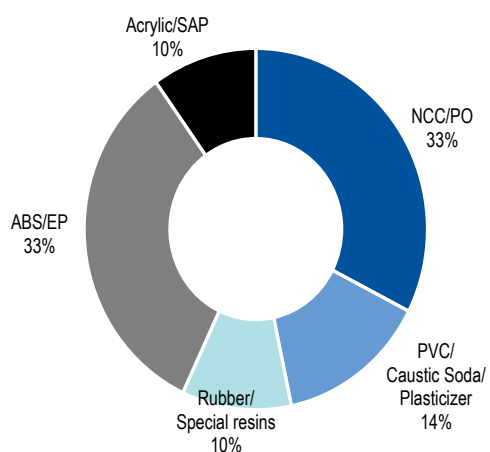
Table 4. Valuation

(Wbn, x, mn shares, W)

	Value	Note
12 month-forward net profit	2,492	
Target P/E	12	High earnings contribution from non-ethylene products and diversified business portfolio
Value of non-EV battery businesses	29,902	
Value of EV battery unit	11,568	Applied an EV/EBITDA of 10x to 2020F EBITDA
Fair market cap	41,470	
No. of shares	78.3	
Fair share price	529,629	

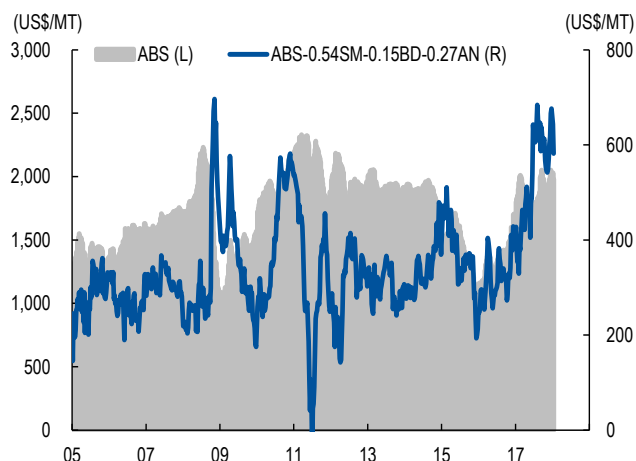
Source: Mirae Asset Daewoo Research

Figure 36. LG Chem's chemical revenue breakdown



Source: Mirae Asset Daewoo Research

Figure 37. ABS spread trend



Source: Cischem, Mirae Asset Daewoo Research

LG Chem (051910 KS/Buy/TP: W530,000)

Comprehensive Income Statement (Summarized)

(Wbn)	12/16	12/17F	12/18F	12/19F
Revenue	20,659	25,852	27,421	30,721
Cost of Sales	16,595	20,387	21,889	24,661
Gross Profit	4,064	5,465	5,532	6,060
SG&A Expenses	2,072	2,488	2,488	2,488
Operating Profit (Adj)	1,992	2,977	3,044	3,572
Operating Profit	1,992	2,977	3,044	3,572
Non-Operating Profit	-332	-197	-46	-42
Net Financial Income	-37	-71	-47	-43
Net Gain from Inv in Associates	-4	4	0	0
Pretax Profit	1,660	2,780	2,998	3,530
Income Tax	379	589	660	777
Profit from Continuing Operations	1,281	2,190	2,338	2,753
Profit from Discontinued Operations	0	0	0	0
Net Profit	1,281	2,190	2,338	2,753
Controlling Interests	1,281	2,136	2,338	2,753
Non-Controlling Interests	0	54	0	0
Total Comprehensive Profit	1,275	2,165	2,338	2,753
Controlling Interests	1,278	2,085	2,223	2,618
Non-Controlling Interests	-3	80	115	136
EBITDA	3,329	4,394	4,628	5,337
FCF (Free Cash Flow)	1,118	1,371	839	1,101
EBITDA Margin (%)	16.1	17.0	16.9	17.4
Operating Profit Margin (%)	9.6	11.5	11.1	11.6
Net Profit Margin (%)	6.2	8.3	8.5	9.0

Cash Flows (Summarized)

(Wbn)	12/16	12/17F	12/18F	12/19F
Cash Flows from Op Activities	2,517	3,398	3,639	3,901
Net Profit	1,281	2,190	2,338	2,753
Non-Cash Income and Expense	1,805	1,870	2,286	2,581
Depreciation	1,282	1,317	1,481	1,675
Amortization	54	100	103	90
Others	469	453	702	816
Chg in Working Capital	-382	-561	-283	-618
Chg in AR & Other Receivables	-13	-335	-289	-631
Chg in Inventories	-352	-291	-245	-534
Chg in AP & Other Payables	349	82	135	294
Income Tax Paid	-554	-491	-660	-777
Cash Flows from Inv Activities	-1,737	-1,299	-2,808	-2,817
Chg in PP&E	-1,381	-2,013	-2,800	-2,800
Chg in Intangible Assets	-74	-57	0	0
Chg in Financial Assets	196	737	-8	-17
Others	-478	34	0	0
Cash Flows from Fin Activities	-1,007	-605	-368	-460
Chg in Financial Liabilities	232	386	0	0
Chg in Equity	0	1,139	0	0
Dividends Paid	-346	-386	-368	-460
Others	-893	-1,744	0	0
Increase (Decrease) in Cash	-231	1,469	441	575
Beginning Balance	1,705	1,474	2,943	3,384
Ending Balance	1,474	2,943	3,384	3,959

Source: Company data, Mirae Asset Daewoo Research estimates

Statement of Financial Condition (Summarized)

(Wbn)	12/16	12/17F	12/18F	12/19F
Current Assets	9,227	10,547	11,537	13,308
Cash and Cash Equivalents	1,474	2,943	3,384	3,959
AR & Other Receivables	3,729	4,209	4,512	5,174
Inventories	2,965	3,395	3,640	4,174
Other Current Assets	1,059	0	1	1
Non-Current Assets	11,260	13,345	14,591	15,691
Investments in Associates	261	312	334	383
Property, Plant and Equipment	9,680	10,677	11,996	13,121
Intangible Assets	832	1,789	1,686	1,596
Total Assets	20,487	23,892	26,127	28,999
Current Liabilities	5,447	5,038	5,303	5,881
AP & Other Payables	1,723	1,871	2,005	2,300
Short-Term Financial Liabilities	2,213	1,361	1,361	1,361
Other Current Liabilities	1,511	1,806	1,937	2,220
Non-Current Liabilities	989	2,226	2,226	2,226
Long-Term Financial Liabilities	678	1,915	1,915	1,915
Other Non-Current Liabilities	311	311	311	311
Total Liabilities	6,436	7,264	7,529	8,107
Controlling Interests	13,937	16,472	18,443	20,736
Capital Stock	370	391	391	391
Capital Surplus	1,158	2,274	2,274	2,274
Retained Earnings	12,463	14,220	16,190	18,484
Non-Controlling Interests	114	156	156	156
Stockholders' Equity	14,051	16,628	18,599	20,892

Forecasts/Valuations (Summarized)

	12/16	12/17F	12/18F	12/19F
P/E (x)	15.1	14.8	14.2	12.0
P/CF (x)	6.2	7.8	7.2	6.2
P/B (x)	1.4	1.9	1.8	1.6
EV/EBITDA (x)	5.8	7.1	6.9	5.9
EPS (W)	17,336	27,290	29,871	35,172
CFPS (W)	41,765	51,871	59,076	68,139
BPS (W)	188,807	214,955	240,125	269,420
DPS (W)	5,000	6,000	6,000	6,000
Payout ratio (%)	25.7	18.9	17.7	15.0
Dividend Yield (%)	1.9	1.5	1.4	1.4
Revenue Growth (%)	2.2	25.1	6.1	12.0
EBITDA Growth (%)	8.1	32.0	5.3	15.3
Operating Profit Growth (%)	9.2	49.4	2.3	17.3
EPS Growth (%)	11.1	57.4	9.5	17.7
Accounts Receivable Turnover (x)	6.1	6.9	6.6	6.7
Inventory Turnover (x)	7.8	8.1	7.8	7.9
Accounts Payable Turnover (x)	11.5	11.3	11.3	11.5
ROA (%)	6.6	9.9	9.3	10.0
ROE (%)	9.5	14.0	13.4	14.1
ROIC (%)	11.2	15.0	13.7	14.7
Liability to Equity Ratio (%)	45.8	43.7	40.5	38.8
Current Ratio (%)	169.4	209.4	217.6	226.3
Net Debt to Equity Ratio (%)	4.7	2.0	-0.6	-3.3
Interest Coverage Ratio (x)	25.9	29.4	32.2	37.8

Hanwha Chemical (009830 KS)

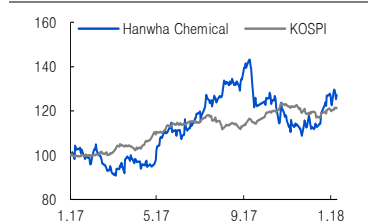
Undervalued relative to earnings power

Chemicals

(Maintain)	Buy
Target Price (12M, W)	43,000
Share Price (01/19/18, W)	33,750
Expected Return	27%

OP (17F, Wbn)	795
Consensus OP (17F, Wbn)	809
EPS Growth (17F, %)	31.7
Market EPS Growth (17F, %)	46.0
P/E (17F, x)	5.3
Market P/E (17F, x)	10.3
KOSPI	2,520.26
Market Cap (Wbn)	5,562
Shares Outstanding (mn)	166
Free Float (%)	62.7
Foreign Ownership (%)	29.2
Beta (12M)	0.99
52-Week Low	24,100
52-Week High	38,000

(%)	1M	6M	12M
Absolute	13.3	2.6	23.9
Relative	11.4	-1.1	1.9



Undervalued relative to earnings power; maintain Buy

Valuation merits: We maintain our Buy rating and target price of W43,000 (8x 12-month forward P/E) for Hanwha Chemical. The shares, which suffered corrections in 4Q, due to concerns about a slowdown in earnings resulting from chemical inventory destocking and the potential imposition of import tariffs on solar panels by the USITC, have recently bounced back, thanks to a turnaround in chemical market conditions. However, at current price levels, we believe shares are still undervalued, relative to earnings power.

Maintain Buy and target price of W43,000: But even after considering uncertainties related to solar PV, we think the shares are undervalued, in light of the current PE market upswing, improvements in PVC/caustic soda cycles, and the strong earnings power of major chemical subsidiaries. From February onwards, however, chemical spreads are projected to expand on improving chemicals market conditions, driving normalization in the firm's valuation.

4Q17 preview: OP to slightly miss consensus, at W164.6bn

4Q operating profit estimated at W164.6bn: For 4Q17, we expect Hanwha Chemical to report operating profit of W164.6bn, slightly below the consensus, dragged down mainly by one-off factors (e.g., bonus payments). For the chemical business, despite higher caustic soda prices, operating profit should slip QoQ, due to narrower PVC and LDPE spreads and the won's appreciation. In solar PV, earnings should meet lowered market expectations, thanks to increased PV panel shipments and a decline in prices of wafers (in 3Q17, the rise in wafer prices weighed on margins at PV module makers).

OP to rise to W202.4bn in 1Q18

We expect Hanwha Chemical to deliver stronger earnings for 1Q18, supported by the expansion in chemical spreads since mid-January. The decline in PVC spreads has recently been reversed, while prices of caustic soda have remained strong. PE spreads have also remained robust, due to delays in the startup of major US ethane crackers. In addition, buoyed by a turnaround in chemical market conditions, major subsidiaries are expected to deliver a QoQ pickup in earnings. The solar PV business also sees limited downside to earnings, amid declining prices of both wafers and modules.

FY (12)	12/14	12/15	12/16	12/17F	12/18F	12/19F
Revenue (Wbn)	8,055	8,037	9,259	9,295	9,050	9,284
OP (Wbn)	141	337	779	795	788	821
OP margin (%)	1.8	4.2	8.4	8.6	8.7	8.8
NP (Wbn)	57	188	755	997	943	1,048
EPS (W)	364	1,154	4,564	6,010	5,684	6,319
ROE (%)	1.3	4.2	15.2	17.3	14.1	13.7
P/E (x)	32.5	23.6	5.4	5.3	5.9	5.3
P/B (x)	0.4	1.0	0.8	0.8	0.8	0.7
Dividend yield (%)	1.3	0.6	1.4	1.1	1.0	1.0

Note: All figures are based on consolidated K-IFRS; NP refers to net profit attributable to controlling interests

Source: Company data, Mirae Asset Daewoo Research estimates

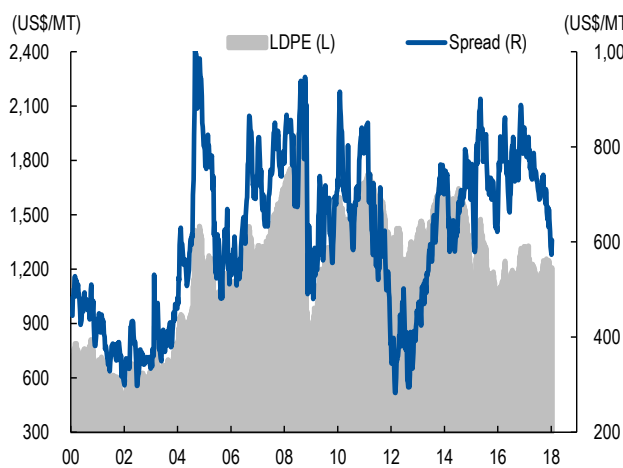
Table 5. Quarterly and annual earnings

(Wbn)

		1Q17	2Q17	3Q17	4Q17F	1Q18F	2Q18F	3Q18F	4Q18F	2016	2017F	2018F
Revenue	Total	2,191.3	2,485.6	2,313.0	2,304.9	2,251.7	2,210.2	2,254.4	2,334.0	9,259.0	9,294.8	9,050.3
	Basic materials	1,052.7	1,064.5	1,102.5	1,011.3	1,023.7	1,022.1	1,029.0	1,029.0	3,871.8	4,231.0	4,103.8
	Process Materials	263.0	232.3	243.4	277.8	276.2	243.9	255.6	291.7	1,024.1	1,016.5	1,067.4
	Retail	167.2	159.8	184.6	226.8	172.2	164.6	190.1	233.6	673.4	738.4	760.6
	Photovoltaics	751.5	872.4	837.5	839.0	829.7	829.7	829.7	829.7	3,912.0	3,300.4	3,318.6
	Others	374.8	521.5	329.1	300.0	300.0	300.0	300.0	300.0	1,890.8	1,525.4	1,200.0
Operating profit	Total	196.6	218.7	215.3	164.6	202.4	196.8	212.2	176.5	779.2	795.2	788.0
	Basic materials	167.3	161.2	182.2	183.4	192.8	197.2	196.8	191.3	471.0	694.1	778.1
	Process Materials	7.5	-1.3	2.8	0.0	2.8	0.0	2.6	5.8	35.9	9.0	11.2
	Retail	-1.3	-11.3	16.7	15.9	6.9	-0.4	7.6	14.0	-1.0	20.0	28.1
	Photovoltaics	10.7	15.3	5.2	5.4	0.0	0.0	5.3	5.3	212.5	36.6	10.6
	Others	17.4	52.1	11.9	-40.0	0.0	0.0	0.0	-40.0	139.9	41.4	-40.0
Pretax profit		392.5	305.2	331.9	245.9	301.3	300.8	338.7	300.2	886.4	1,275.5	1,241.0
Net profit		321.3	236.4	252.7	186.9	229.0	228.6	257.4	228.2	755.3	997.2	943.2

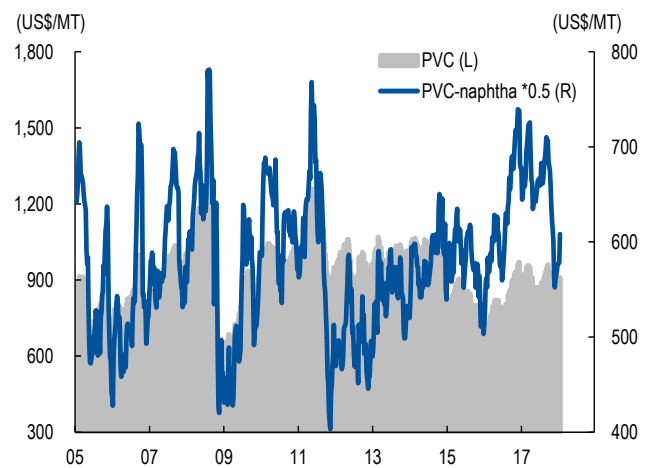
Source: Company data, Mirae Asset Daewoo Research

Figure 38. LDPE spread



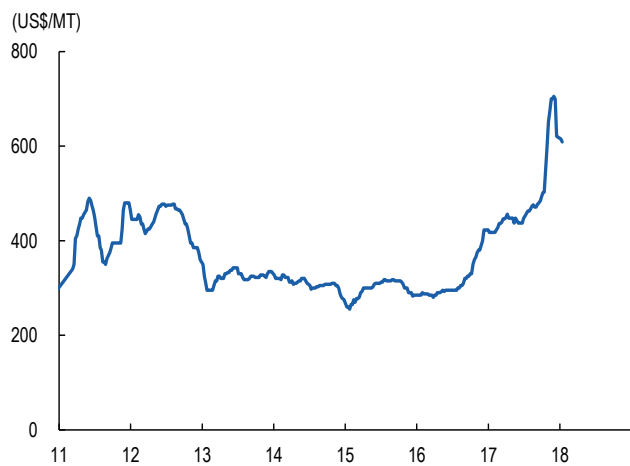
Source: Cischem, Mirae Asset Daewoo Research

Figure 39. PVC spreads



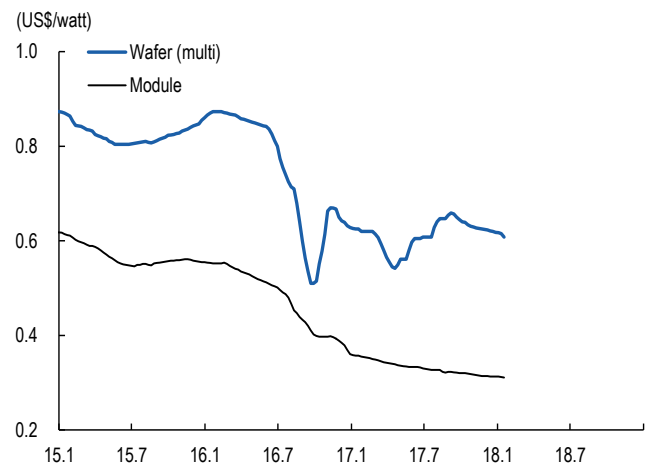
Source: Cischem, Mirae Asset Daewoo Research

Figure 40. Caustic soda price trend



Source: Cischem, Mirae Asset Daewoo Research

Figure 41. PV module and wafer price trends



Source: PV Insights, Mirae Asset Daewoo Research

Hanwha Chemical (009830 KS/Buy/TP: W43,000)

Comprehensive Income Statement (Summarized)

(Wbn)	12/16	12/17F	12/18F	12/19F
Revenue	9,259	9,295	9,050	9,284
Cost of Sales	7,211	7,316	7,078	7,279
Gross Profit	2,048	1,979	1,972	2,005
SG&A Expenses	1,268	1,184	1,184	1,184
Operating Profit (Adj)	779	795	788	821
Operating Profit	779	795	788	821
Non-Operating Profit	107	480	453	559
Net Financial Income	-154	-139	-130	-112
Net Gain from Inv in Associates	423	600	583	670
Pretax Profit	886	1,275	1,241	1,380
Income Tax	115	263	298	331
Profit from Continuing Operations	771	1,013	943	1,048
Profit from Discontinued Operations	0	0	0	0
Net Profit	771	1,013	943	1,048
Controlling Interests	755	997	943	1,048
Non-Controlling Interests	16	15	0	0
Total Comprehensive Profit	668	1,035	943	1,048
Controlling Interests	663	1,020	941	1,046
Non-Controlling Interests	5	16	2	2
EBITDA	1,225	1,236	1,274	1,342
FCF (Free Cash Flow)	536	344	-51	-38
EBITDA Margin (%)	13.2	13.3	14.1	14.5
Operating Profit Margin (%)	8.4	8.6	8.7	8.8
Net Profit Margin (%)	8.2	10.7	10.4	11.3

Cash Flows (Summarized)

(Wbn)	12/16	12/17F	12/18F	12/19F
Cash Flows from Op Activities	1,151	976	749	762
Net Profit	771	1,013	943	1,048
Non-Cash Income and Expense	424	67	126	89
Depreciation	430	424	471	507
Amortization	15	16	14	13
Others	-21	-373	-359	-431
Chg in Working Capital	-122	-96	-22	-44
Chg in AR & Other Receivables	113	76	-18	-36
Chg in Inventories	166	-29	-18	-36
Chg in AP & Other Payables	72	-116	14	28
Income Tax Paid	-38	-211	-298	-331
Cash Flows from Inv Activities	-460	-430	-575	-574
Chg in PP&E	-413	-608	-800	-800
Chg in Intangible Assets	-13	18	0	0
Chg in Financial Assets	59	0	0	0
Others	-93	160	225	226
Cash Flows from Fin Activities	-318	-372	-707	-690
Chg in Financial Liabilities	-199	-174	-500	-500
Chg in Equity	13	0	0	0
Dividends Paid	-25	-58	-58	-58
Others	-107	-140	-149	-132
Increase (Decrease) in Cash	368	578	49	167
Beginning Balance	645	1,012	1,590	1,639
Ending Balance	1,012	1,590	1,639	1,806

Source: Company data, Mirae Asset Daewoo Research estimates

Statement of Financial Condition (Summarized)

(Wbn)	12/16	12/17F	12/18F	12/19F
Current Assets	4,524	5,050	5,135	5,374
Cash and Cash Equivalents	1,012	1,590	1,639	1,806
AR & Other Receivables	1,561	1,493	1,511	1,547
Inventories	1,421	1,437	1,455	1,491
Other Current Assets	530	530	530	530
Non-Current Assets	9,294	9,438	9,752	10,032
Investments in Associates	2,284	2,284	2,284	2,284
Property, Plant and Equipment	5,761	5,939	6,267	6,560
Intangible Assets	426	424	410	397
Total Assets	13,818	14,487	14,887	15,406
Current Liabilities	4,963	5,250	4,765	4,292
AP & Other Payables	1,758	1,637	1,651	1,679
Short-Term Financial Liabilities	2,268	2,676	2,176	1,676
Other Current Liabilities	937	937	938	937
Non-Current Liabilities	3,387	2,803	2,803	2,803
Long-Term Financial Liabilities	2,597	2,014	2,014	2,014
Other Non-Current Liabilities	790	789	789	789
Total Liabilities	8,350	8,054	7,568	7,096
Controlling Interests	5,285	6,247	7,133	8,124
Capital Stock	830	830	830	830
Capital Surplus	828	828	828	828
Retained Earnings	3,586	4,526	5,412	6,403
Non-Controlling Interests	183	186	186	186
Stockholders' Equity	5,468	6,433	7,319	8,310

Forecasts/Valuations (Summarized)

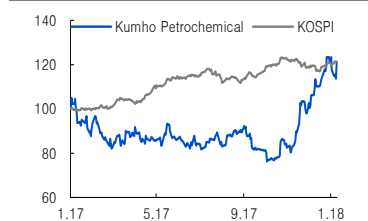
	12/16	12/17F	12/18F	12/19F
P/E (x)	5.4	5.3	5.9	5.3
P/CF (x)	3.4	4.9	5.2	4.9
P/B (x)	0.8	0.8	0.8	0.7
EV/EBITDA (x)	6.4	6.7	6.3	5.5
EPS (W)	4,564	6,010	5,684	6,319
CFPS (W)	7,224	6,506	6,444	6,853
BPS (W)	31,850	37,650	42,987	48,959
DPS (W)	350	350	350	350
Payout ratio (%)	7.4	5.6	6.1	5.4
Dividend Yield (%)	1.4	1.1	1.0	1.0
Revenue Growth (%)	15.2	0.4	-2.6	2.6
EBITDA Growth (%)	55.3	0.9	3.1	5.3
Operating Profit Growth (%)	131.2	2.1	-0.9	4.2
EPS Growth (%)	295.5	31.7	-5.4	11.2
Accounts Receivable Turnover (x)	5.7	6.3	6.3	6.3
Inventory Turnover (x)	5.7	6.5	6.3	6.3
Accounts Payable Turnover (x)	5.9	6.2	6.3	6.4
ROA (%)	5.6	7.2	6.4	6.9
ROE (%)	15.2	17.3	14.1	13.7
ROIC (%)	9.5	9.1	8.2	8.2
Liability to Equity Ratio (%)	152.7	125.2	103.4	85.4
Current Ratio (%)	91.2	96.2	107.8	125.2
Net Debt to Equity Ratio (%)	66.0	44.4	31.5	19.7
Interest Coverage Ratio (x)	4.5	5.1	5.3	6.2

Kumho Petro Chemical (011780 KS)

Enhanced earnings power

Chemicals

(Maintain)	Buy		
Target Price (12M, W)	140,000		
Share Price (01/19/18, W)	106,500		
Expected Return	31%		
OP (17F, Wbn)	232		
Consensus OP (17F, Wbn)	231		
EPS Growth (17F, %)	184.8		
Market EPS Growth (17F, %)	46.0		
P/E (17F, x)	16.0		
Market P/E (17F, x)	10.3		
KOSPI	2,520.26		
Market Cap (Wbn)	3,245		
Shares Outstanding (mn)	33		
Free Float (%)	56.9		
Foreign Ownership (%)	29.0		
Beta (12M)	0.50		
52-Week Low	67,100		
52-Week High	108,500		
(%)	1M	6M	12M
Absolute	10.8	46.3	22.6
Relative	9.0	41.0	0.8



TP raised to reflect faster-than-expected improvements in BPA market

Target price raised to W140,000, reflecting improvements in the BPA market: We remain Buy on Kumho Petrochemical and raise our target price by 27% to W140,000. We revised our earnings estimates for 2018-20 upwards, reflecting faster-than-expected improvements in the BPA market and earnings improvements in the energy business, supported by oil price hikes. Our target price implies a target P/B of 1.8x (average ROE of 18%) based on the 2018-20F BPS.

Enhanced earnings-generating capability: Shares of Kumho Petrochemical have rallied on the widening spreads of SBR and BPA and rising oil prices. The spread of SBR, which widened upon the suspension of Sinopec's 100,000-tonne facility, has been narrowing on the facility's restart. Nevertheless, we expect energy earnings to further improve, in light of: 1) the continued widening of BPA spread; and 2) oil price increases. We expect shares of Kumho Petrochemical to continue performing well on enhanced earnings power and expected improvements in the SBR market.

4Q17 preview: Above-consensus OP of W72.3bn

Across-the-board improvements in synthetic rubbers, phenol derivatives, and energy: We estimate Kumho Petrochemical's operating profit for 4Q17 at W72.3bn, above the consensus. The synthetic rubbers and phenol derivatives units likely displayed earnings improvement on the widening of SBR and BPA spreads, respectively. In addition, we expect the energy unit to deliver earnings improvement, with high oil prices driving up SMP prices.

1Q18 outlook: Enhanced earnings power; SBR market a key variable

1Q18 OP at W76.8bn: We expect synthetic rubber earnings to contract QoQ, with SBR spreads slowing, following the restart of Sinopec's 100,000-tonne facility. In contrast, phenol derivatives earnings will likely remain strong on improvements in the BPA and phenol derivative markets, while energy earnings should further improve, with positive lagged effects from higher oil prices. While the timing of the SBR market's turnaround is a key variable, we expect the SBR market to be more likely to improve over time, supporting Kumho Petrochemical's earnings.

FY (12)	12/14	12/15	12/16	12/17F	12/18F	12/19F
Revenue (Wbn)	4,766	3,935	3,970	5,077	5,996	7,614
OP (Wbn)	185	164	157	232	350	551
OP margin (%)	3.9	4.2	4.0	4.6	5.8	7.2
NP (Wbn)	93	119	73	209	274	431
EPS (W)	2,782	3,550	2,187	6,229	8,167	12,875
ROE (%)	6.1	7.6	4.6	12.1	14.0	18.9
P/E (x)	29.0	14.7	37.5	16.0	13.0	8.3
P/B (x)	1.7	1.1	1.7	1.8	1.7	1.4
Dividend yield (%)	1.9	1.5	1.0	1.5	1.4	1.4

Note: All figures are based on consolidated K-IFRS; NP refers to net profit attributable to controlling interests
Source: Company data, Mirae Asset Daewoo Research estimates

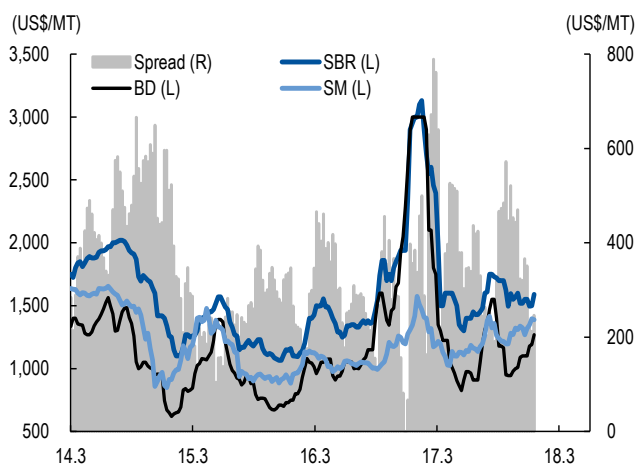
Table 6. Quarterly earnings forecasts

(Wbn)

		1Q17	2Q17	3Q17	4Q17F	1Q18F	2Q18F	3Q18F	4Q18F	2016	2017F	2018F
Revenue	Total	1,408.2	1,239.1	1,205.1	1,245.3	1,284.3	1,397.1	1,633.9	1,543.3	3,973.6	5,097.7	5,858.7
	Synthetic rubber	636.2	499.5	463.5	470.0	493.0	605.8	815.2	724.6	1,559.2	2,069.2	2,638.5
	Synthetic resin	303.5	293.8	308.9	342.5	332.1	332.1	332.1	332.1	1,035.6	1,248.7	1,328.2
	Phenol derivatives	309.2	295.5	287.3	296.7	317.9	317.9	339.1	339.1	859.5	1,188.7	1,314.0
	Energy and others	159.3	150.3	145.4	136.1	141.4	141.4	147.6	147.6	519.3	591.1	577.9
Operating profit	Total	65.7	44.1	57.7	72.3	76.8	79.0	107.4	92.1	156.5	239.8	355.2
	Synthetic rubber	12.7	5.0	9.3	18.8	9.9	12.1	32.6	29.0	26.5	45.8	83.6
	Synthetic resin	9.1	8.8	21.6	20.5	23.2	23.2	23.2	16.6	36.4	60.1	86.3
	Phenol derivatives	9.3	3.0	0.0	14.8	15.9	15.9	20.3	20.3	11.9	27.1	72.5
	Energy and others	34.6	27.3	26.8	18.1	27.8	27.8	31.2	26.2	81.7	106.8	112.9
Pretax profit		88.4	52.9	78.1	67.5	73.9	76.2	104.3	89.3	112.9	286.8	343.7
Net profit		69.1	36.7	56.5	52.5	57.5	59.2	81.1	69.4	73.2	214.7	267.3

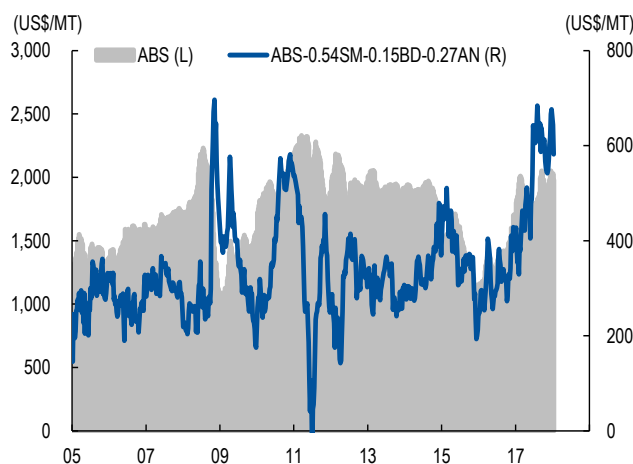
Source: Company data, Mirae Asset Daewoo Research estimates

Figure 42. SBR spread trend



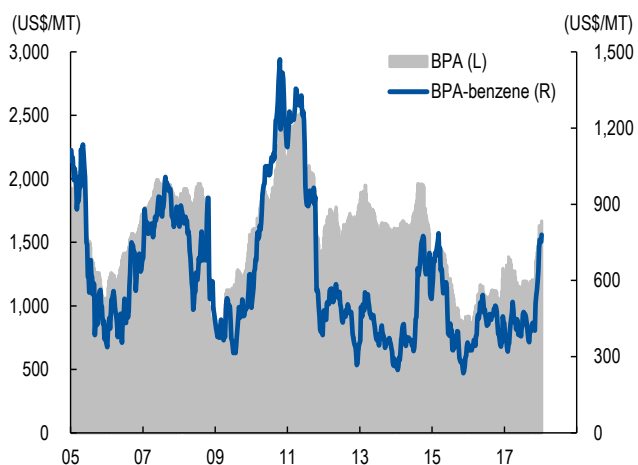
Source: S&P Global Platts, Mirae Asset Daewoo Research

Figure 43. ABS spread trend



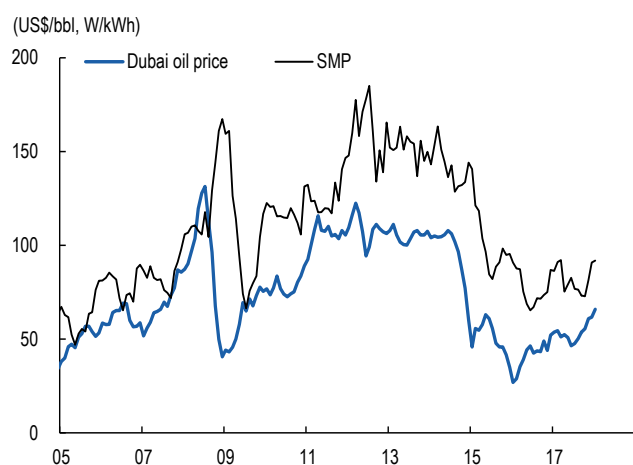
Source: Ciscem, Mirae Asset Daewoo Research

Figure 44. BPA spread trend



Source: Ciscem, Mirae Asset Daewoo Research

Figure 45. Oil and SMP price trends: SMP prices trail oil prices



Source: KPX, Mirae Asset Daewoo Research

Kumho Petro Chemical (011780 KS/Buy/TP: W140,000)

Comprehensive Income Statement (Summarized)

(Wbn)	12/16	12/17F	12/18F	12/19F
Revenue	3,970	5,077	5,996	7,614
Cost of Sales	3,638	4,675	5,476	6,894
Gross Profit	332	402	520	720
SG&A Expenses	176	170	170	170
Operating Profit (Adj)	157	232	350	551
Operating Profit	157	232	350	551
Non-Operating Profit	-44	47	2	3
Net Financial Income	-57	-63	-59	-57
Net Gain from Inv in Associates	28	87	60	60
Pretax Profit	113	279	352	554
Income Tax	32	68	77	122
Profit from Continuing Operations	81	211	274	432
Profit from Discontinued Operations	0	0	0	0
Net Profit	81	211	274	432
Controlling Interests	73	209	274	431
Non-Controlling Interests	8	2	1	1
Total Comprehensive Profit	92	238	274	432
Controlling Interests	87	235	271	428
Non-Controlling Interests	5	3	3	5
EBITDA	363	449	553	742
FCF (Free Cash Flow)	24	233	219	337
EBITDA Margin (%)	9.1	8.8	9.2	9.7
Operating Profit Margin (%)	4.0	4.6	5.8	7.2
Net Profit Margin (%)	1.8	4.1	4.6	5.7

Cash Flows (Summarized)

(Wbn)	12/16	12/17F	12/18F	12/19F
Cash Flows from Op Activities	297	354	319	437
Net Profit	81	211	274	432
Non-Cash Income and Expense	310	283	278	310
Depreciation	203	214	200	189
Amortization	3	3	2	2
Others	104	66	76	119
Chg in Working Capital	-20	-60	-98	-127
Chg in AR & Other Receivables	-94	-2	-121	-157
Chg in Inventories	-51	-34	-108	-140
Chg in AP & Other Payables	118	-40	81	105
Income Tax Paid	-26	-30	-77	-122
Cash Flows from Inv Activities	-251	-110	-104	-105
Chg in PP&E	-271	-120	-100	-100
Chg in Intangible Assets	-2	-1	0	0
Chg in Financial Assets	-1	-2	-4	-5
Others	23	13	0	0
Cash Flows from Fin Activities	104	-104	-22	-40
Chg in Financial Liabilities	165	-76	0	0
Chg in Equity	-1	0	0	0
Dividends Paid	-22	-22	-22	-40
Others	-38	-6	0	0
Increase (Decrease) in Cash	150	221	253	352
Beginning Balance	47	197	418	671
Ending Balance	197	418	671	1,023

Source: Company data, Mirae Asset Daewoo Research estimates

Statement of Financial Condition (Summarized)

(Wbn)	12/16	12/17F	12/18F	12/19F
Current Assets	1,255	1,529	2,010	2,659
Cash and Cash Equivalents	197	418	671	1,023
AR & Other Receivables	566	585	706	863
Inventories	446	480	588	727
Other Current Assets	46	46	45	46
Non-Current Assets	3,291	3,191	3,093	3,006
Investments in Associates	418	418	418	418
Property, Plant and Equipment	2,565	2,471	2,371	2,281
Intangible Assets	17	16	13	12
Total Assets	4,546	4,720	5,103	5,665
Current Liabilities	2,146	2,032	2,163	2,332
AP & Other Payables	543	576	705	872
Short-Term Financial Liabilities	1,521	1,374	1,374	1,374
Other Current Liabilities	82	82	84	86
Non-Current Liabilities	673	745	745	745
Long-Term Financial Liabilities	560	632	632	632
Other Non-Current Liabilities	113	113	113	113
Total Liabilities	2,818	2,776	2,907	3,077
Controlling Interests	1,620	1,833	2,084	2,476
Capital Stock	167	167	167	167
Capital Surplus	267	267	267	267
Retained Earnings	1,208	1,399	1,650	2,041
Non-Controlling Interests	108	111	112	113
Stockholders' Equity	1,728	1,944	2,196	2,589

Forecasts/Valuations (Summarized)

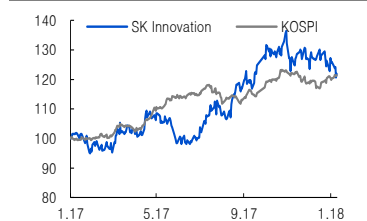
	12/16	12/17F	12/18F	12/19F
P/E (x)	37.5	16.0	13.0	8.3
P/CF (x)	7.0	6.7	6.5	4.8
P/B (x)	1.7	1.8	1.7	1.4
EV/EBITDA (x)	12.5	10.7	8.6	6.0
EPS (W)	2,187	6,229	8,167	12,875
CFPS (W)	11,666	14,757	16,498	22,161
BPS (W)	49,559	55,919	63,426	75,110
DPS (W)	800	1,500	1,500	1,500
Payout ratio (%)	24.2	17.7	13.6	8.6
Dividend Yield (%)	1.0	1.5	1.4	1.4
Revenue Growth (%)	0.9	27.9	18.1	27.0
EBITDA Growth (%)	6.8	23.7	23.2	34.2
Operating Profit Growth (%)	-4.3	47.8	50.9	57.4
EPS Growth (%)	-38.4	184.8	31.1	57.6
Accounts Receivable Turnover (x)	8.3	9.6	10.0	10.3
Inventory Turnover (x)	9.5	11.0	11.2	11.6
Accounts Payable Turnover (x)	12.3	12.7	13.6	13.9
ROA (%)	1.8	4.6	5.6	8.0
ROE (%)	4.6	12.1	14.0	18.9
ROIC (%)	3.8	5.9	9.3	14.6
Liability to Equity Ratio (%)	163.1	142.8	132.4	118.9
Current Ratio (%)	58.5	75.2	93.0	114.0
Net Debt to Equity Ratio (%)	107.0	79.9	59.2	36.6
Interest Coverage Ratio (x)	2.7	3.6	5.6	8.8

SK Innovation (096770 KS)

Dividends to remain attractive

Oil Refining

(Maintain)	Buy		
Target Price (12M, W)	250,000		
Share Price (01/19/18, W)	194,500		
Expected Return	29%		
OP (17F, Wbn)	3,326		
Consensus OP (17F, Wbn)	3,294		
EPS Growth (17F, %)	48.9		
Market EPS Growth (17F, %)	46.0		
P/E (17F, x)	7.7		
Market P/E (17F, x)	10.3		
KOSPI	2,520.26		
Market Cap (Wbn)	17,985		
Shares Outstanding (mn)	94		
Free Float (%)	66.0		
Foreign Ownership (%)	42.0		
Beta (12M)	0.78		
52-Week Low	151,500		
52-Week High	217,500		
(%)	1M	6M	12M
Absolute	-4.0	16.1	19.7
Relative	-5.5	12.0	-1.6



Maintain Buy on solid dividend appeal

Dividend appeal to remain intact: We maintain our Buy call and target price of W250,000 on SK Innovation. Our target price implies a P/E of 10x based on 2018F EPS. Shares of SK Innovation have been retreating on softer refining margin and a lack of attractiveness, relative to upstream players, amid rising oil prices.

Maintain Buy: With the future oil price trend being a key variable, we expect refining margin, especially for kerosene/diesel, to remain solid on tight supply/demand conditions. The chemicals unit likely continued to fare well, supported by the widening of the PE spread. Trading at a P/E of 8x based on 2018F EPS, shares of SK Innovation offers an attractive dividend yield of 4%. Looking ahead, key variables to watch include oil price movements and a recovery of refining margins.

4Q17 preview: In-line earnings on rising oil prices

4Q17F OP of W936.9bn: We expect SK Innovation to post operating profit of W936.9bn, in line with the consensus. We estimate refining margins declined slightly QoQ in 4Q17, but higher oil prices likely added to valuation gains on inventory and created a positive lagging effect. In addition, we believe the partial pass-through of high oil prices from 3Q17 also bolstered the valuation gains on inventory in 4Q17. Chemicals earnings likely remained at the level seen in 3Q17 on strong spreads on key products, such as PE. The oil E&P business likely displayed earnings improvement on rising oil prices.

1Q18 outlook: OP to come in as high as W807bn

1Q18F OP of W807bn: We expect OSP to increase and refining margins to slow in 1Q18, compared with 4Q17. Nevertheless, we expect operating profit to remain high, at W807bn in 1Q18, in light of: 1) valuation gains on inventory, resulting from oil price increases; and 2) a recovery of refining margin over time. Chemical spreads are also improving in 1Q18, which is likely to contribute to earnings improvement.

FY (12)	12/14	12/15	12/16	12/17F	12/18F	12/19F
Revenue (Wbn)	65,861	48,356	39,521	45,746	49,275	52,073
OP (Wbn)	-183	1,980	3,228	3,326	3,255	3,350
OP margin (%)	-0.3	4.1	8.2	7.3	6.6	6.4
NP (Wbn)	-589	815	1,671	2,489	2,366	2,433
EPS (W)	-6,283	8,696	17,834	26,557	25,243	25,957
ROE (%)	-3.8	5.3	10.1	13.9	12.0	11.4
P/E (x)	-	14.9	8.2	7.7	7.7	7.5
P/B (x)	0.5	0.8	0.8	1.0	0.9	0.8
Dividend yield (%)	0.0	3.7	4.4	3.9	4.1	4.1

Note: All figures are based on consolidated K-IFRS; NP refers to net profit attributable to controlling interests

Source: Company data, Mirae Asset Daewoo Research estimates

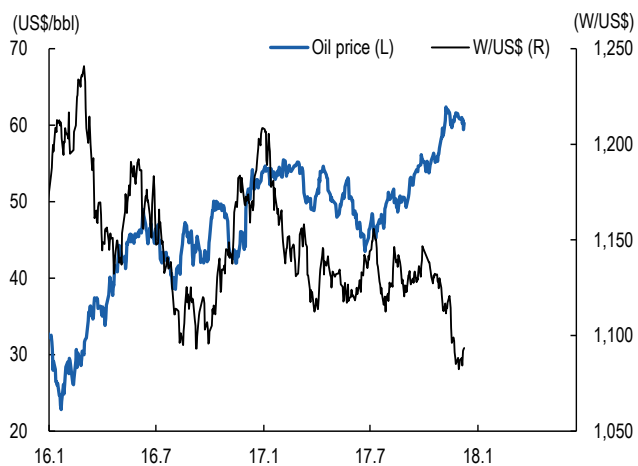
Table 7. Quarterly earnings forecasts

(Wbn)

		1Q17	2Q17	3Q17	4Q17F	1Q18F	2Q18F	3Q18F	4Q18F	2016	2017F	2018F
Revenue	Total	11,387.1	10,561.0	11,758.9	12,039.1	12,287.7	12,341.7	12,348.0	12,297.2	39,520.5	45,746.1	49,274.6
	Refining	8,063.6	7,387.6	8,428.5	8,559.9	8,770.0	8,811.2	8,811.2	8,770.0	28,369.8	32,439.6	35,162.4
	Petrochemicals	2,333.3	2,164.2	2,291.7	2,519.7	2,512.4	2,525.1	2,531.5	2,521.9	7,686.5	9,308.9	10,090.8
	Others	990.2	1,009.2	1,038.7	959.5	1,005.4	1,005.4	1,005.4	1,005.4	3,464.2	3,997.6	4,021.4
Operating profit	Total	1,004.3	421.2	963.6	936.9	807.0	849.5	840.0	758.9	3,228.6	3,326.0	3,255.4
	Refining	453.9	12.5	526.4	504.2	264.9	302.3	302.3	264.9	1,625.6	1,497.0	1,134.5
	Petrochemicals	454.7	333.7	326.0	333.9	378.3	383.4	373.8	370.2	1,232.3	1,448.3	1,505.6
	Others	95.7	75.0	111.2	98.8	163.8	163.8	163.8	123.8	370.7	380.7	615.2
Pretax profit		1,163.0	433.2	977.1	925.9	798.3	841.6	830.2	748.4	2,423.4	3,499.3	3,218.5
Net profit		847.0	278.4	682.8	680.5	586.8	618.6	610.2	550.1	1,671.3	2,488.8	2,365.6

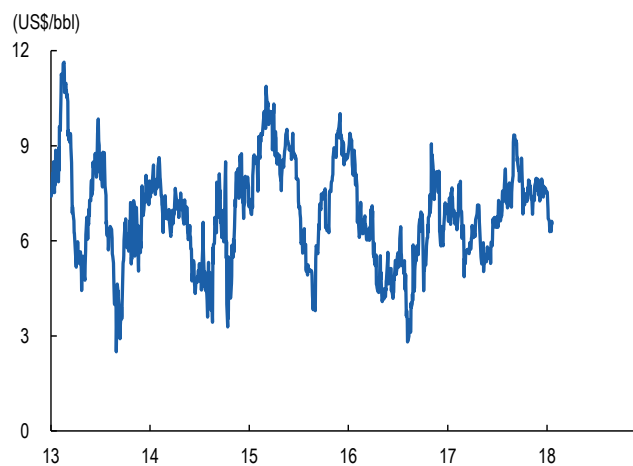
Source: Company data, Mirae Asset Daewoo Research estimates

Figure 46. Oil price and F/X trend



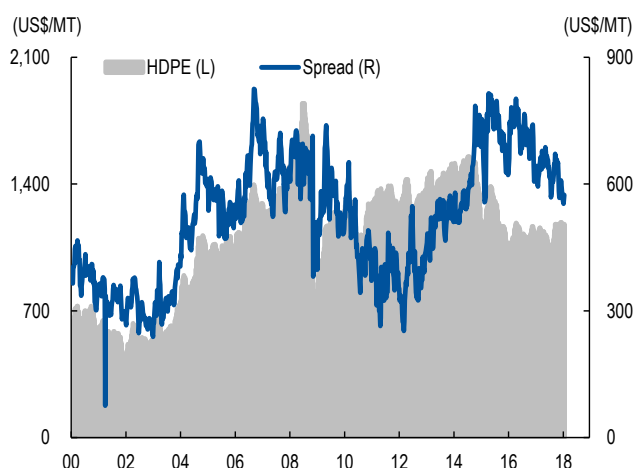
Source: Thomson Reuters, Petronet, Mirae Asset Daewoo Research

Figure 47. Korea complex refining margin



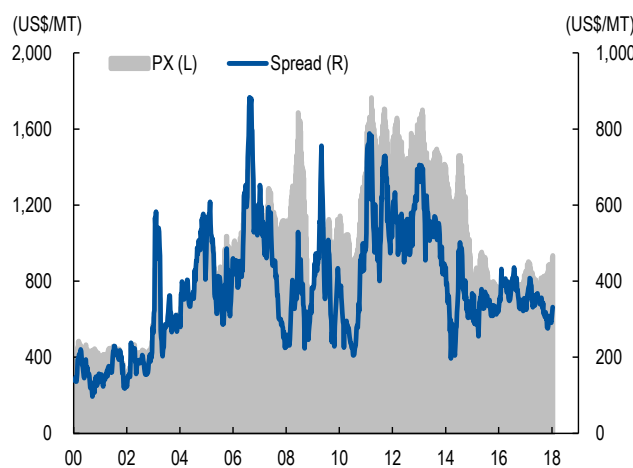
Source: Petronet, Mirae Asset Daewoo Research

Figure 48. HDPE spread



Source: Ciscem, Mirae Asset Daewoo Research

Figure 49. PX spread



Source: Ciscem, Mirae Asset Daewoo Research

SK Innovation (096770 KS/Buy/TP: W250,000)

Comprehensive Income Statement (Summarized)

(Wbn)	12/16	12/17F	12/18F	12/19F
Revenue	39,521	45,746	49,275	52,073
Cost of Sales	34,562	40,552	44,151	46,855
Gross Profit	4,959	5,194	5,124	5,218
SG&A Expenses	1,730	1,868	1,868	1,868
Operating Profit (Adj)	3,228	3,326	3,255	3,350
Operating Profit	3,228	3,326	3,255	3,350
Non-Operating Profit	-805	173	-36	-40
Net Financial Income	-168	-129	-115	-119
Net Gain from Inv in Associates	-124	267	80	80
Pretax Profit	2,423	3,499	3,219	3,310
Income Tax	702	945	805	827
Profit from Continuing Operations	1,721	2,554	2,414	2,482
Profit from Discontinued Operations	0	-12	0	0
Net Profit	1,721	2,543	2,414	2,482
Controlling Interests	1,671	2,489	2,366	2,433
Non-Controlling Interests	50	54	48	50
Total Comprehensive Profit	1,711	2,507	2,414	2,482
Controlling Interests	1,661	2,451	2,359	2,426
Non-Controlling Interests	50	57	55	57
EBITDA	4,143	4,242	4,351	4,619
FCF (Free Cash Flow)	3,071	2,076	413	627
EBITDA Margin (%)	10.5	9.3	8.8	8.9
Operating Profit Margin (%)	8.2	7.3	6.6	6.4
Net Profit Margin (%)	4.2	5.4	4.8	4.7

Cash Flows (Summarized)

(Wbn)	12/16	12/17F	12/18F	12/19F
Cash Flows from Op Activities	3,678	3,256	3,413	3,627
Net Profit	1,721	2,543	2,414	2,482
Non-Cash Income and Expense	2,354	1,806	1,922	2,123
Depreciation	799	812	995	1,177
Amortization	115	104	101	93
Others	1,440	890	826	853
Chg in Working Capital	268	-210	-16	-45
Chg in AR & Other Receivables	-315	-356	-90	-247
Chg in Inventories	-858	-535	-107	-293
Chg in AP & Other Payables	1,467	431	91	251
Income Tax Paid	-519	-772	-805	-827
Cash Flows from Inv Activities	-2,056	-1,634	-3,004	-3,010
Chg in PP&E	-567	-1,121	-3,000	-3,000
Chg in Intangible Assets	-55	-360	0	0
Chg in Financial Assets	-1,328	-28	-4	-10
Others	-106	-125	0	0
Cash Flows from Fin Activities	-2,019	-1,264	-694	-838
Chg in Financial Liabilities	-1,579	-594	-97	-92
Chg in Equity	0	-1	0	0
Dividends Paid	-451	-756	-596	-746
Others	11	87	-1	0
Increase (Decrease) in Cash	-375	644	-204	-142
Beginning Balance	3,020	2,644	3,288	3,083
Ending Balance	2,644	3,288	3,083	2,942

Source: Company data, Mirae Asset Daewoo Research estimates

Statement of Financial Condition (Summarized)

(Wbn)	12/16	12/17F	12/18F	12/19F
Current Assets	14,988	16,431	16,423	16,822
Cash and Cash Equivalents	2,644	3,288	3,083	2,942
AR & Other Receivables	4,272	4,537	4,627	4,874
Inventories	4,445	4,980	5,087	5,380
Other Current Assets	3,627	3,626	3,626	3,626
Non-Current Assets	17,594	18,130	20,039	21,780
Investments in Associates	2,178	2,178	2,178	2,178
Property, Plant and Equipment	13,603	13,915	15,920	17,743
Intangible Assets	1,272	1,526	1,425	1,332
Total Assets	32,581	34,561	36,462	38,602
Current Liabilities	8,737	9,335	9,401	9,758
AP & Other Payables	4,549	4,779	4,881	5,163
Short-Term Financial Liabilities	1,808	1,714	1,617	1,524
Other Current Liabilities	2,380	2,842	2,903	3,071
Non-Current Liabilities	5,540	5,170	5,187	5,234
Long-Term Financial Liabilities	4,871	4,372	4,372	4,372
Other Non-Current Liabilities	669	798	815	862
Total Liabilities	14,276	14,505	14,589	14,992
Controlling Interests	17,103	18,808	20,578	22,264
Capital Stock	469	469	469	469
Capital Surplus	5,884	5,883	5,883	5,883
Retained Earnings	10,671	12,419	14,188	15,875
Non-Controlling Interests	1,202	1,247	1,295	1,345
Stockholders' Equity	18,305	20,055	21,873	23,609

Forecasts/Valuations (Summarized)

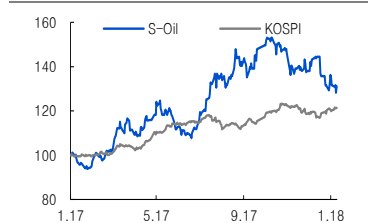
	12/16	12/17F	12/18F	12/19F
P/E (x)	8.2	7.7	7.7	7.5
P/CF (x)	3.4	4.4	4.2	4.0
P/B (x)	0.8	1.0	0.9	0.8
EV/EBITDA (x)	3.8	4.7	4.4	4.2
EPS (W)	17,834	26,557	25,243	25,957
CFPS (W)	43,489	46,407	46,272	49,137
BPS (W)	183,956	202,154	221,032	239,033
DPS (W)	6,400	8,000	8,000	8,000
Payout ratio (%)	34.2	28.9	30.5	29.6
Dividend Yield (%)	4.4	3.9	4.1	4.1
Revenue Growth (%)	-18.3	15.8	7.7	5.7
EBITDA Growth (%)	41.4	2.4	2.6	6.2
Operating Profit Growth (%)	63.0	3.0	-2.1	2.9
EPS Growth (%)	105.1	48.9	-4.9	2.8
Accounts Receivable Turnover (x)	10.7	11.2	11.6	11.8
Inventory Turnover (x)	9.9	9.7	9.8	10.0
Accounts Payable Turnover (x)	9.9	9.6	10.3	10.5
ROA (%)	5.4	7.6	6.8	6.6
ROE (%)	10.1	13.9	12.0	11.4
ROIC (%)	12.9	13.8	13.0	12.3
Liability to Equity Ratio (%)	78.0	72.3	66.7	63.5
Current Ratio (%)	171.6	176.0	174.7	172.4
Net Debt to Equity Ratio (%)	5.0	-1.6	-0.9	-0.7
Interest Coverage Ratio (x)	12.8	16.0	16.2	17.0

S-Oil (010950 KS)

Capex effects

Oil Refining

(Maintain)	Buy		
Target Price (12M, W)	160,000		
Share Price (01/19/18, W)	113,000		
Expected Return	42%		
OP (17F, Wbn)	1,409		
Consensus OP (17F, Wbn)	1,465		
EPS Growth (17F, %)	0.7		
Market EPS Growth (17F, %)	46.0		
P/E (17F, x)	11.2		
Market P/E (17F, x)	10.3		
KOSPI	2,520.26		
Market Cap (Wbn)	12,722		
Shares Outstanding (mn)	117		
Free Float (%)	36.5		
Foreign Ownership (%)	77.1		
Beta (12M)	0.52		
52-Week Low	80,900		
52-Week High	132,000		
(%)	1M	6M	12M
Absolute	-8.9	9.2	33.7
Relative	-10.4	5.3	10.0



Favor S-Oil in light of capex effects

Reasons for recent share declines: Shares of S-Oil have lately pulled back on softer refining margins and a faster-than-expected rise in oil prices. We believe rising oil prices are increasing the relative attractiveness of traditional upstream players, while raising concerns that refining margins could come under pressure. For refiners, an increase in oil prices should add to valuation gains on inventory, but will likely be accompanied by OSP rises, which should partly offset the positive effects, and a decline in demand for petrochemical products (e.g. gasoline).

Refining margin to remain solid: Although it remains to be seen how far oil prices can rise, we think refining margins will remain supported by favorable supply and demand conditions. The petrochemical market sees tight supply and growing demand amid persistent oil price weakness since 2014 and limited supply expansion over the next two to three years. While gasoline and fuel oil may see weakening demand on higher oil prices, kerosene and diesel margins will likely remain solid, regardless of oil price movements, thanks to improving emerging market demand. In addition, the supply of kerosene and diesel may further tighten, if the narrowing of fuel oil margins results in lower utilization rates at refining facilities.

Our sector favorite & momentum from the upgrading project: S-Oil has been upgrading its refining facilities to convert fuel oil into high value-added products, such as propylene oxide (PO) and polypropylene (PP). If fuel oil margins remain weak, as at present, we believe S-Oil will stand out from the pack, thanks to its new upgrading facility, which is set to come online in 3Q18. We lower our earnings estimates for 2018 slightly, reflecting the impact of high oil prices and OSP levels, and lower our target price by 6% to W170,000 (from W160,000). Nevertheless, we maintain Buy on S-Oil and reiterate it as our sector favorite, in light of the positive effects of the upgrading project and high dividend yields. Key share price variables to watch are oil price rises and a recovery of refining margins.

OP to reach W404.7bn in 4Q17 and W1.6tr in 2018

4Q17F OP of W404.7bn: We expect S-Oil to post operating profit of W404.7bn in 4Q17. In oil refining, one-off expenses and the strengthening of the won partly offset the inventory valuation gains and a positive lagging effect from higher oil prices. In petrochemicals and lube base oil, operating profit likely contracted QoQ on weakening spreads.

2018F OP of W1.6tr: We estimate operating profit at W1.6tr in 2018. Despite a slight pickup in OSP levels resulting from rising oil prices, we expect refining earnings to remain strong supported by solid refining margins and PX/lube oil spreads to be range-bound. We expect the upgraded facilities to come on stream beginning in 3Q18, making earnings contribution in earnest from 4Q18.

FY (12)	12/14	12/15	12/16	12/17F	12/18F	12/19F
Revenue (Wbn)	28,558	17,890	16,322	20,303	22,191	25,194
OP (Wbn)	-290	818	1,617	1,409	1,629	2,120
OP margin (%)	-1.0	4.6	9.9	6.9	7.3	8.4
NP (Wbn)	-288	631	1,205	1,214	1,270	1,654
EPS (W)	-2,468	5,414	10,337	10,413	10,896	14,184
ROE (%)	-5.6	12.3	20.5	18.4	18.0	21.2
P/E (x)	-	14.7	8.2	11.2	10.4	8.0
P/B (x)	1.1	1.7	1.5	2.0	1.8	1.6
Dividend yield (%)	0.3	3.0	7.3	5.3	5.9	6.8

Note: All figures are based on consolidated K-IFRS; NP refers to net profit attributable to controlling interests

Source: Company data, Mirae Asset Daewoo Research estimates

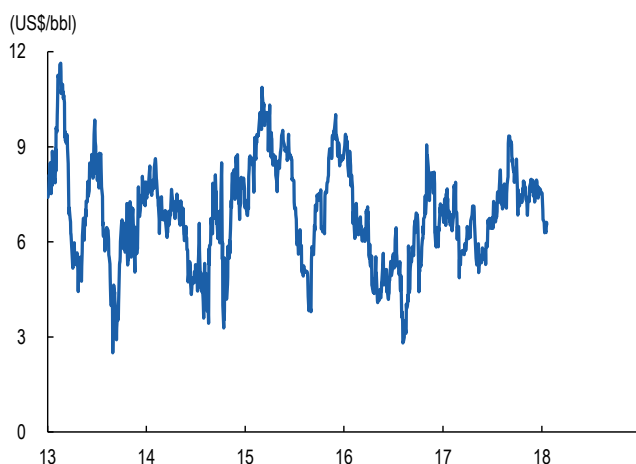
Table 6. Quarterly earnings forecasts

(Wbn)

		1Q17	2Q17	3Q17	4Q17F	1Q18F	2Q18F	3Q18F	4Q18F	2016	2017F	2018F
Revenue	Total	5,200.1	4,665.0	5,211.8	5,226.3	5,289.4	4,983.3	5,851.1	6,067.4	28,557.3	17,890.3	16,321.8
	Refining	4,044.0	3,698.6	4,107.4	4,094.8	4,121.2	3,815.0	4,343.8	4,293.7	23,079.7	14,054.3	12,464.2
	Petrochemical	771.4	560.6	699.5	749.3	767.2	767.2	767.2	767.2	3,505.3	2,496.3	2,544.0
	Lube base oil	384.7	405.8	405.0	382.2	401.0	401.0	401.0	401.0	1,971.7	1,339.7	1,313.6
	Capacity additions							339.0	605.4			944.5
Operating profit	Total	333.5	117.3	553.2	404.7	327.3	381.9	408.7	510.9	-260.2	817.6	1,616.9
	Refining	100.2	-84.9	336.4	234.2	127.7	174.3	174.3	146.2	-699.1	277.9	758.9
	Petrochemical	139.6	72.8	90.5	74.9	107.4	107.4	107.4	107.4	180.8	286.7	517.1
	Lube base oil	84.1	129.4	126.3	95.6	92.2	100.3	100.3	100.3	257.8	316.0	418.4
	Capacity additions							26.8	157.0			183.8
Pretax profit		519.9	71.1	527.0	454.7	327.3	381.9	408.7	510.9	1,575.1	1,572.7	1,628.8
Net profit		393.9	66.9	398.7	354.6	255.3	297.9	318.8	398.5	1,205.4	1,214.2	1,270.5

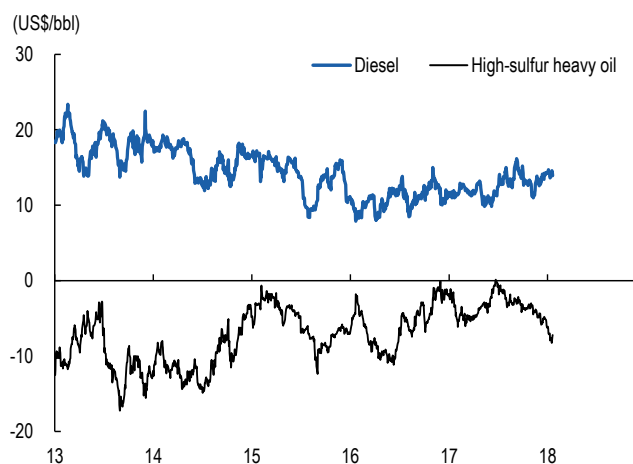
Source: Company data, Mirae Asset Daewoo Research estimates

Figure 50. Korea complex refining margin



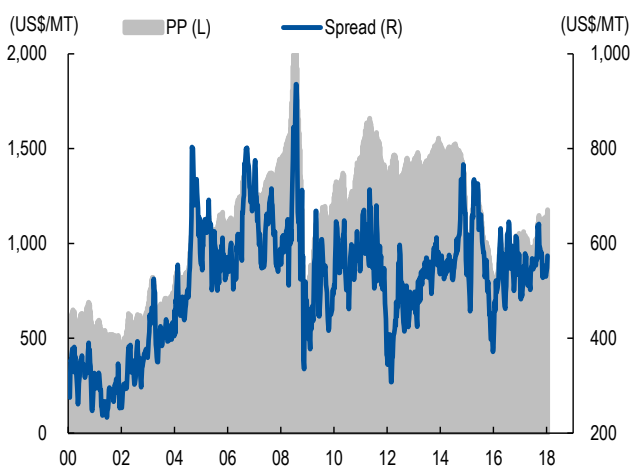
Source: Petronet, Mirae Asset Daewoo Research

Figure 51. Diesel and fuel oil margin trend



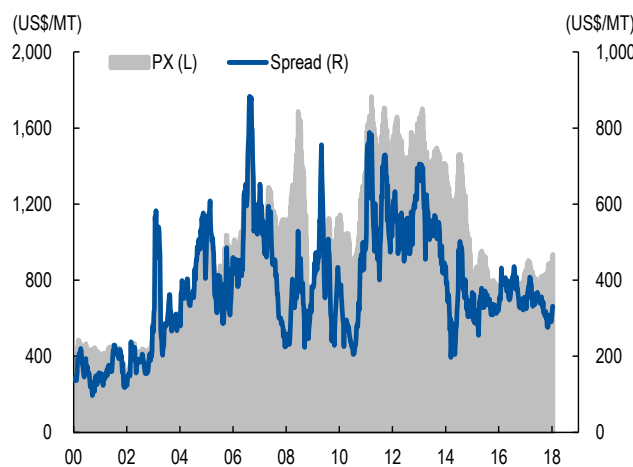
Source: Petronet, Mirae Asset Daewoo Research

Figure 52. PP-naphtha spread



Source: Cischem, Mirae Asset Daewoo Research

Figure 53. PX spread



Source: Cischem, Mirae Asset Daewoo Research

S-Oil (010950 KS/Buy/TP: W160,000)

Comprehensive Income Statement (Summarized)

(Wbn)	12/16	12/17F	12/18F	12/19F
Revenue	16,322	20,303	22,191	25,194
Cost of Sales	14,021	18,185	19,853	22,365
Gross Profit	2,301	2,118	2,338	2,829
SG&A Expenses	684	709	709	709
Operating Profit (Adj)	1,617	1,409	1,629	2,120
Operating Profit	1,617	1,409	1,629	2,120
Non-Operating Profit	-42	164	0	0
Net Financial Income	-2	0	0	0
Net Gain from Inv in Associates	7	4	0	0
Pretax Profit	1,575	1,573	1,629	2,120
Income Tax	370	358	358	466
Profit from Continuing Operations	1,205	1,214	1,270	1,654
Profit from Discontinued Operations	0	0	0	0
Net Profit	1,205	1,214	1,270	1,654
Controlling Interests	1,205	1,214	1,270	1,654
Non-Controlling Interests	0	0	0	0
Total Comprehensive Profit	1,211	1,214	1,270	1,654
Controlling Interests	1,211	1,214	1,270	1,654
Non-Controlling Interests	0	0	0	0
EBITDA	1,904	1,705	1,961	2,485
FCF (Free Cash Flow)	658	-589	-66	592
EBITDA Margin (%)	11.7	8.4	8.8	9.9
Operating Profit Margin (%)	9.9	6.9	7.3	8.4
Net Profit Margin (%)	7.4	6.0	5.7	6.6

Cash Flows (Summarized)

(Wbn)	12/16	12/17F	12/18F	12/19F
Cash Flows from Op Activities	1,722	1,644	1,134	1,792
Net Profit	1,205	1,214	1,270	1,654
Non-Cash Income and Expense	694	687	690	831
Depreciation	278	287	324	358
Amortization	8	9	7	6
Others	408	391	359	467
Chg in Working Capital	-188	260	-468	-226
Chg in AR & Other Receivables	-110	-47	-195	-94
Chg in Inventories	-699	-211	-424	-205
Chg in AP & Other Payables	530	-37	179	87
Income Tax Paid	0	-494	-358	-466
Cash Flows from Inv Activities	-1,967	-2,306	-1,200	-1,200
Chg in PP&E	-1,056	-2,233	-1,200	-1,200
Chg in Intangible Assets	-7	-1	0	0
Chg in Financial Assets	-911	0	0	0
Others	7	-72	0	0
Cash Flows from Fin Activities	811	1,310	278	-780
Chg in Financial Liabilities	1,154	2,093	1,000	0
Chg in Equity	0	0	0	0
Dividends Paid	-210	-803	-722	-780
Others	-133	20	0	0
Increase (Decrease) in Cash	566	645	212	-189
Beginning Balance	201	767	1,413	1,625
Ending Balance	767	1,413	1,625	1,436

Source: Company data, Mirae Asset Daewoo Research estimates

Statement of Financial Condition (Summarized)

(Wbn)	12/16	12/17F	12/18F	12/19F
Current Assets	7,974	8,882	9,742	9,866
Cash and Cash Equivalents	767	1,413	1,625	1,436
AR & Other Receivables	1,309	1,389	1,612	1,720
Inventories	2,423	2,635	3,059	3,264
Other Current Assets	3,475	3,445	3,446	3,446
Non-Current Assets	5,985	8,058	8,926	9,762
Investments in Associates	33	33	33	33
Property, Plant and Equipment	5,711	7,770	8,645	9,487
Intangible Assets	54	47	40	34
Total Assets	13,959	16,940	18,668	19,628
Current Liabilities	4,833	5,214	5,393	5,480
AP & Other Payables	2,152	1,113	1,292	1,379
Short-Term Financial Liabilities	2,197	2,101	2,101	2,101
Other Current Liabilities	484	2,000	2,000	2,000
Non-Current Liabilities	2,735	4,924	5,924	5,924
Long-Term Financial Liabilities	2,564	4,753	5,753	5,753
Other Non-Current Liabilities	171	171	171	171
Total Liabilities	7,567	10,138	11,317	11,404
Controlling Interests	6,392	6,802	7,351	8,225
Capital Stock	292	292	292	292
Capital Surplus	1,332	1,332	1,332	1,332
Retained Earnings	4,745	5,156	5,705	6,578
Non-Controlling Interests	0	0	0	0
Stockholders' Equity	6,392	6,802	7,351	8,225

Forecasts/Valuations (Summarized)

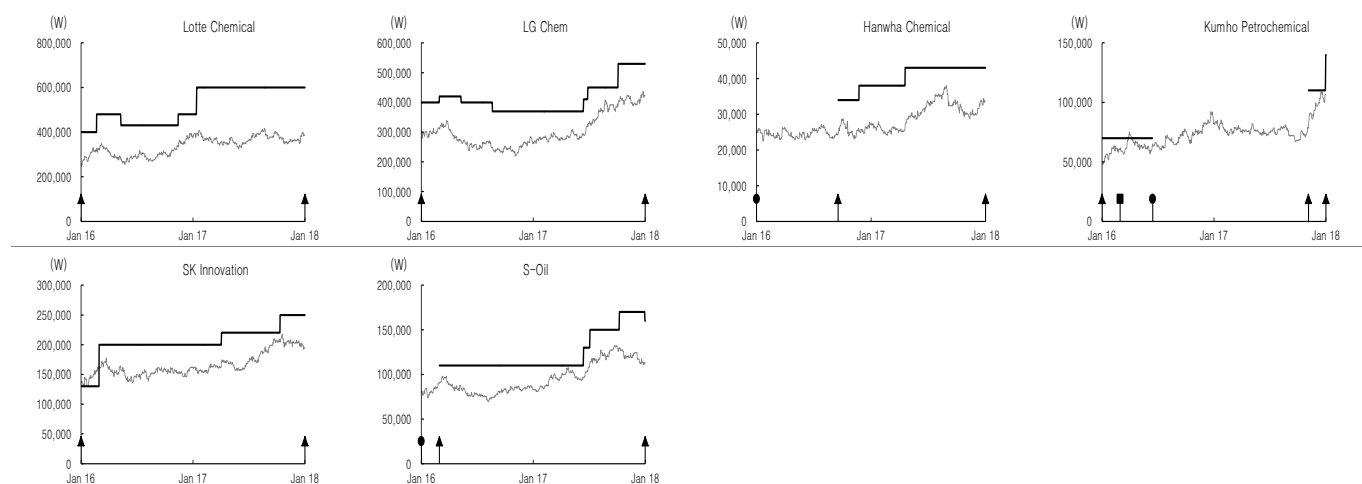
	12/16	12/17F	12/18F	12/19F
P/E (x)	8.2	11.2	10.4	8.0
P/CF (x)	5.2	7.2	6.7	5.3
P/B (x)	1.5	2.0	1.8	1.6
EV/EBITDA (x)	5.4	9.1	8.1	6.5
EPS (W)	10,337	10,413	10,896	14,184
CFPS (W)	16,293	16,303	16,816	21,307
BPS (W)	54,830	58,353	63,058	70,551
DPS (W)	6,200	6,200	6,700	7,700
Payout ratio (%)	57.9	57.5	59.4	52.4
Dividend Yield (%)	7.3	5.3	5.9	6.8
Revenue Growth (%)	-8.8	24.4	9.3	13.5
EBITDA Growth (%)	74.5	-10.5	15.0	26.7
Operating Profit Growth (%)	97.7	-12.9	15.6	30.1
EPS Growth (%)	90.9	0.7	4.6	30.2
Accounts Receivable Turnover (x)	14.9	17.2	16.9	17.3
Inventory Turnover (x)	8.1	8.0	7.8	8.0
Accounts Payable Turnover (x)	16.2	16.1	16.5	16.7
ROA (%)	9.7	7.9	7.1	8.6
ROE (%)	20.5	18.4	18.0	21.2
ROIC (%)	18.6	13.7	13.4	15.4
Liability to Equity Ratio (%)	118.4	149.0	154.0	138.7
Current Ratio (%)	165.0	170.3	180.6	180.0
Net Debt to Equity Ratio (%)	8.6	29.3	37.9	36.1
Interest Coverage Ratio (x)	28.7	0.0	0.0	0.0

APPENDIX 1

Important Disclosures & Disclaimers

2-Year Rating and Target Price History

Company (Code)	Date	Rating	Target Price	Company (Code)	Date	Rating	Target Price
Lotte Chemical (011170)	02/03/2017	Buy	600,000	SK Innovation (096770)	2017.07.06	AFTER 1YR	
	12/05/2016	Buy	480,000		07/06/2016	Hold	
	06/01/2016	Buy	430,000		03/22/2016	Trading Buy	70,000
	03/14/2016	Buy	480,000		09/13/2015	Buy	70,000
	06/15/2015	Buy	400,000		11/02/2017	Buy	250,000
LG Chem (051910)	10/26/2017	Buy	530,000	04/25/2017	Buy	220,000	
	07/19/2017	Buy	450,000	2017.03.22	AFTER 1YR		
	07/05/2017	Buy	410,000	03/22/2016	Buy	200,000	
	09/11/2016	Buy	370,000	07/23/2015	Buy	130,000	
	06/01/2016	Buy	400,000	S-Oil (010950)	01/21/2018	Buy	160,000
Hanwha Chemical (009830)	03/22/2016	Buy	420,000	10/30/2017	Buy	170,000	
	10/18/2015	Buy	400,000	07/26/2017	Buy	150,000	
	05/11/2017	Buy	43,000	07/05/2017	Buy	130,000	
	12/15/2016	Buy	38,000	2017.03.22	AFTER 1YR		
	10/09/2016	Buy	34,000	03/22/2016	Buy	110,000	
Kumho Petrochemical (011780)	2015.11.13	AFTER 1YR		2016.02.01	AFTER 1YR		
	01/21/2018	Buy	140,000	02/01/2015	Hold		
	11/26/2017	Buy	110,000				



Stock Ratings

Buy	: Relative performance of 20% or greater
Trading Buy	: Relative performance of 10% or greater, but with volatility
Hold	: Relative performance of -10% and 10%
Sell	: Relative performance of -10%

Industry Ratings

Overweight	: Fundamentals are favorable or improving
Neutral	: Fundamentals are steady without any material changes
Underweight	: Fundamentals are unfavorable or worsening

Ratings and Target Price History (Share price (—), Target price (—), Not covered (■), Buy (▲), Trading Buy (■), Hold (●), Sell (◆))

* Our investment rating is a guide to the relative return of the stock versus the market over the next 12 months.

* Although it is not part of the official ratings at Mirae Asset Daewoo Co., Ltd., we may call a trading opportunity in case there is a technical or short-term material development.

* The target price was determined by the research analyst through valuation methods discussed in this report, in part based on the analyst's estimate of future earnings.

* The achievement of the target price may be impeded by risks related to the subject securities and companies, as well as general market and economic conditions.

Equity Ratings Distribution & Investment Banking Services

	Buy	Trading Buy	Hold	Sell
Equity Ratings Distribution	75.50%	16.00%	8.50%	0.00%
Investment Banking Services	62.50%	33.33%	4.17%	0.00%

* Based on recommendations in the last 12-months (as of December 31, 2017)

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