

Advanced Materials

Results Comment

April 24, 2019

(Maintain) **Buy**

Target Price (12M, W) **72,500**

Share Price (04/23/19, W) **57,100**

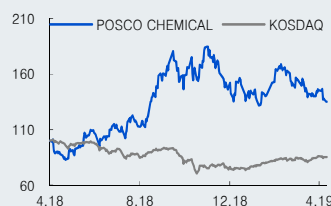
Expected Return **27%**

OP (19F, Wbn) 112
Consensus OP (19F, Wbn) 133

EPS Growth (19F, %) -9.7
Market EPS Growth (19F, %) -16.1
P/E (19F, x) 28.3
Market P/E (19F, x) 12.0
KOSDAQ 761.42

Market Cap (Wbn) 3,482
Shares Outstanding (mn) 61
Free Float (%) 34.6
Foreign Ownership (%) 10.7
Beta (12M) 0.85
52-Week Low 35,100
52-Week High 78,100

(%)	1M	6M	12M
Absolute	-12.3	-15.9	49.7
Relative	-14.3	-20.6	72.8



Mirae Asset Daewoo Co., Ltd.

[Advanced Materials/Metals]

Jaekwang Rhee
+822-3774-6022
jkrhee@miraeasset.com

POSCO CHEMICAL

(003670 KQ)

Earnings to meaningfully grow from 2020

1Q19 review: Lower oil prices and weaker needle coke volume drag down profits QoQ

For 1Q19, POSCO Chemical reported consolidated revenue of W355bn (+5.5% YoY, -2.9% QoQ), operating profit of W22bn (-5% YoY, -25.1% QoQ), and pretax profit of W33bn (-19% YoY, -24.1% QoQ). Pretax profit fell by around W10bn, which we attribute to: 1) a W4bn decline in chemicals profit as a result of lower oil prices; and 2) a W4.5bn fall in equity-method profits, due to weaker needle coke sales.

Anode materials growth continues; new cathode materials facility to come online in 2H19

Anode materials revenue continued to grow in 1Q19, rising to W32bn (+91.7% YoY, +21.9% QoQ). We believe this was largely driven by sales volume growth following capacity expansion. Management said that anode materials sales volume jumped 83% YoY in 1Q19. For anode materials, POSCO Chemical has an annual production capacity of 24,000 tonnes, as of end-2018, and is currently adding 20,000 tonnes of new capacity, which is expected to come online later this year. The company plans to expand its anode materials capacity to 74,000 tonnes by 2022.

Because POSCO Chemical's merger with cathode materials supplier POSCO ESM was finalized on April 3rd, cathode materials earnings were not reflected in the 1Q19 results. We estimate POSCO ESM's 1Q19 revenue was around W27bn. For cathode materials, POSCO Chemical has an annual production capacity of 9,000 tonnes as of end-2018. Currently, the company has two capacity expansions underway, a 6,000-tonne facility that will come online in 3Q19, and a 24,000-tonne facility that will come online in 2Q20. POSCO Chemical plans to expand its cathode materials capacity to 57,000 tonnes by 2022.

Needle coke prices come under pressure

As we had previously feared (see our January 29th report, *Near-term share price to hinge on needle coke prices after Chinese New Year*), China's needle coke prices have tumbled roughly 25% since the Chinese New Year, mainly due to weak electrode prices. PMC Tech is also believed to have lowered its selling prices by 25% in April. We think additional downside to electrode prices is limited and thus do not expect further declines in needle coke prices. On the contrary, prices of needle coke for anode materials have reportedly been moving higher.

Focus on medium/long-term growth; maintain Buy and TP of W72,500

Given the rechargeable battery materials (anode and cathode materials) capacity ramp-up plans presented by management, we believe POSCO Chemical is poised for medium/long-term growth. The vertical integration of lithium and cobalt (key raw materials) within the group should also give the company a competitive advantage over other suppliers. That said, we believe such growth prospects have largely been reflected in the stock's appreciation. We thus advise approaching the stock from a medium/long-term growth perspective, rather than counting on a continuation of the strong rally seen over the past couple of years.

FY (Dec.)	12/16	12/17	12/18	12/19F	12/20F	12/21F
Revenue (Wbn)	1,118	1,197	1,384	1,556	2,266	2,828
OP (Wbn)	85	104	106	112	167	220
OP margin (%)	7.6	8.7	7.7	7.2	7.4	7.8
NP (Wbn)	44	104	132	122	154	193
EPS (W)	740	1,753	2,237	2,019	2,522	3,171
ROE (%)	8.0	17.2	19.0	15.3	16.9	18.2
P/E (x)	16.2	22.7	28.5	28.3	22.6	18.0
P/B (x)	1.3	3.6	5.0	4.1	3.6	3.0
Dividend yield (%)	2.5	0.9	0.6	0.7	0.7	0.7

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

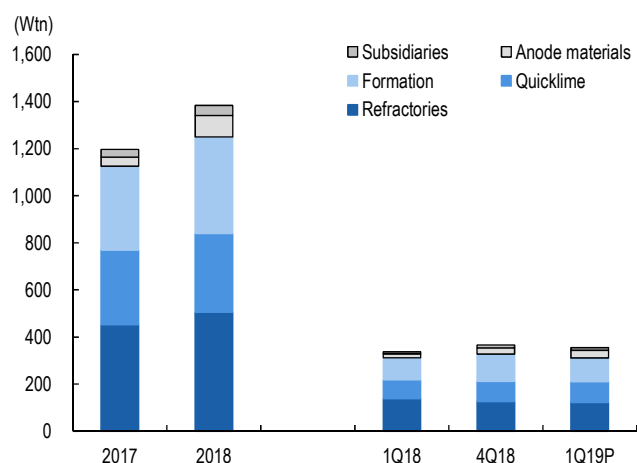
Analysts who prepared this report are registered as research analysts in Korea but not in any other jurisdiction, including the U.S.
PLEASE SEE ANALYST CERTIFICATIONS AND IMPORTANT DISCLOSURES & DISCLAIMERS IN APPENDIX 1 AT THE END OF REPORT.

Table 1. Quarterly and annual earnings

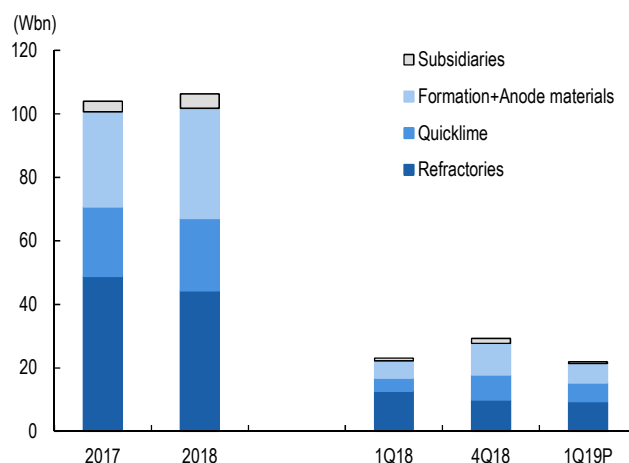
(Wbn, %)

	1Q18	2Q18	3Q18	4Q18	1Q19P	2Q19F	3Q19F	4Q19F	2018	2019F	2020F
Revenue	337	335	346	366	355	382	382	438	1,384	1,556	2,266
POSCO Chemical (parent)	328	324	335	354	343	372	372	428	1,341	1,513	2,226
Subsidiaries	8	10	11	12	12	10	10	10	43	42	40
Operating profit	23	21	33	29	22	29	29	32	106	112	167
POSCO Chemical (parent)	22	20	32	28	21	28	28	31	102	108	163
Subsidiaries	1	1	1	1	1	1	1	1	4	4	4
OP margin	6.8	6.3	9.6	8.0	6.2	7.6	7.6	7.3	7.7	7.2	7.4
POSCO Chemical (parent)	6.8	6.1	9.5	7.8	6.2	7.5	7.5	7.2	7.6	7.2	7.3
Subsidiaries	9.6	9.6	10.2	12.1	4.5	10.0	10.0	10.0	10.5	8.4	10.0
Pretax profit	41	42	50	44	33	38	38	41	177	150	202
Net profit (controlling interests)	31	32	37	32	33	29	29	31	132	122	154

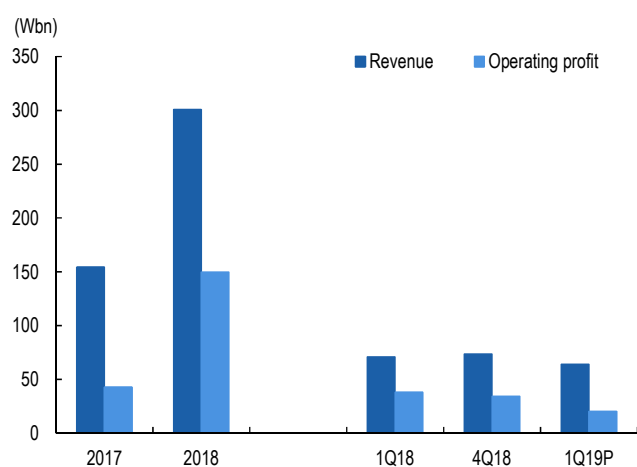
Source: Mirae Asset Daewoo Research estimates

Figure 1. Revenue by division

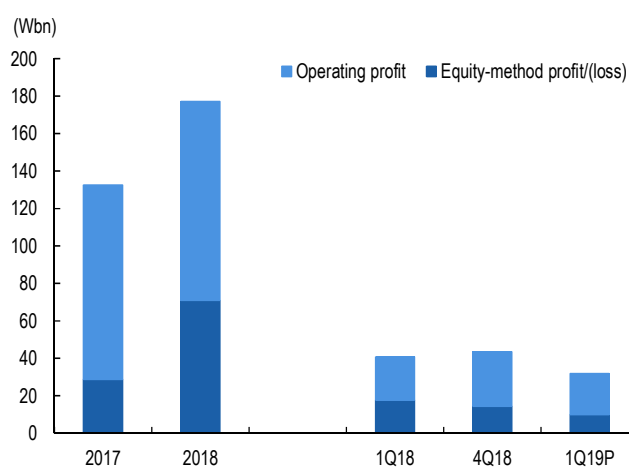
Source: Mirae Asset Daewoo Research

Figure 2. OP by division

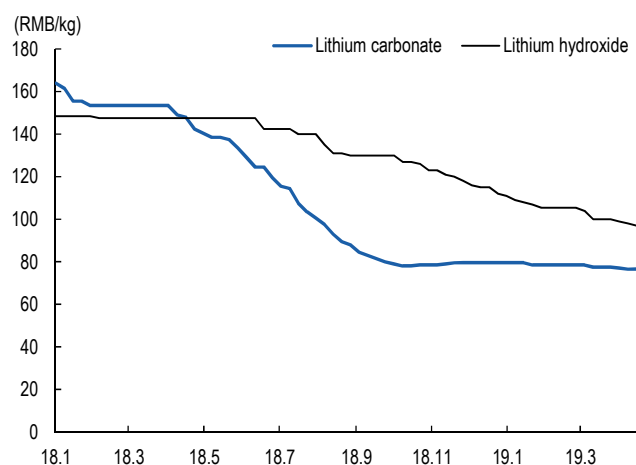
Source: Mirae Asset Daewoo Research

Figure 3. PMCT

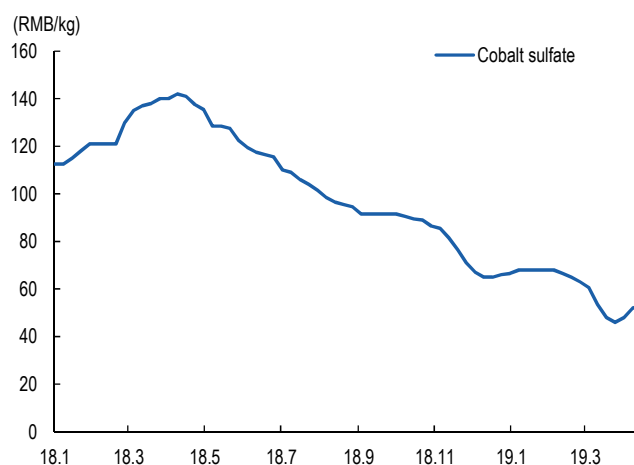
Source: Mirae Asset Daewoo Research

Figure 4. OP and equity-method profit/(loss)

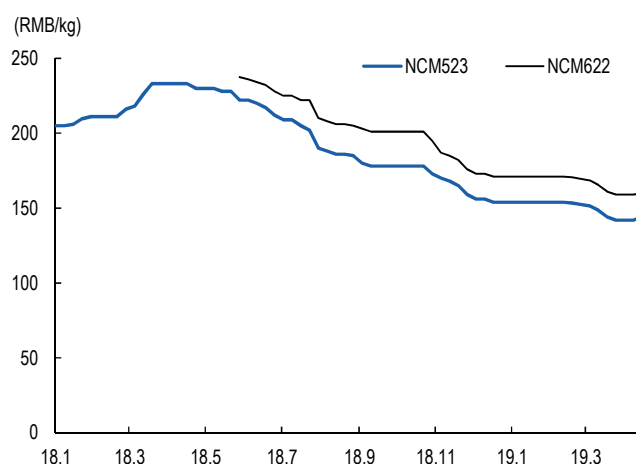
Source: Mirae Asset Daewoo Research

Figure 5. Chinese lithium compound price

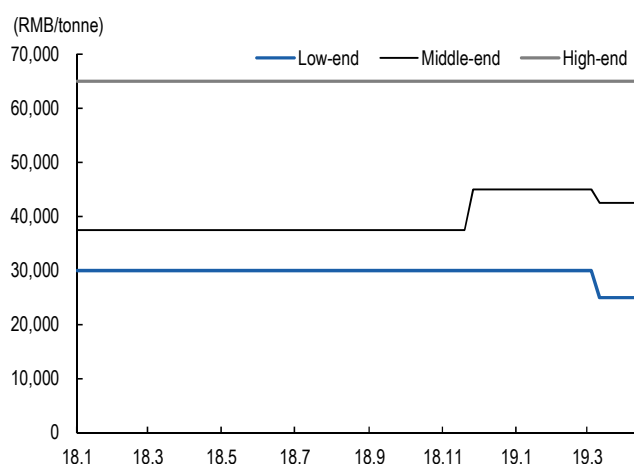
Source: Industry data, Mirae Asset Daewoo Research

Figure 6. Chinese cobalt sulfate price

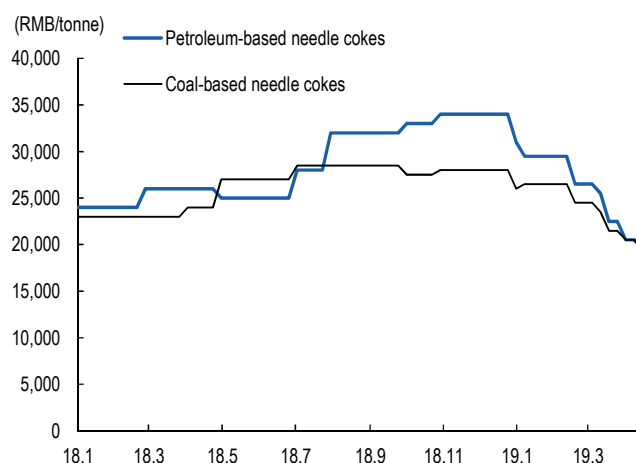
Source: Industry data, Mirae Asset Daewoo Research

Figure 7. Chinese cathode materials price

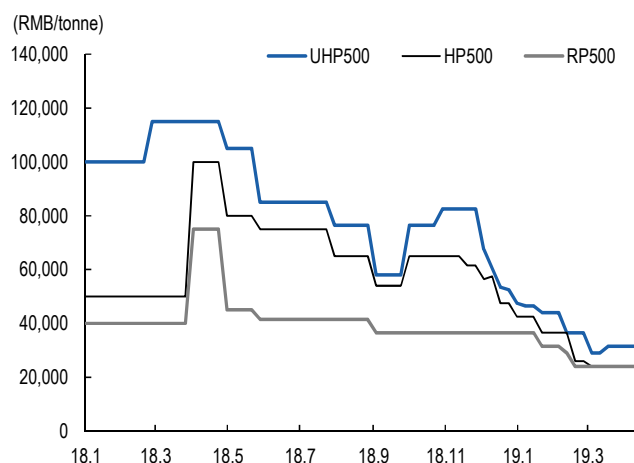
Source: Industry data, Mirae Asset Daewoo Research

Figure 8. Chinese natural graphite anode materials

Source: Industry data, Mirae Asset Daewoo Research

Figure 9. Chinese needle cokes price

Source: Industry data, Mirae Asset Daewoo Research

Figure 10. Chinese graphite electrode price

Source: Industry data, Mirae Asset Daewoo Research

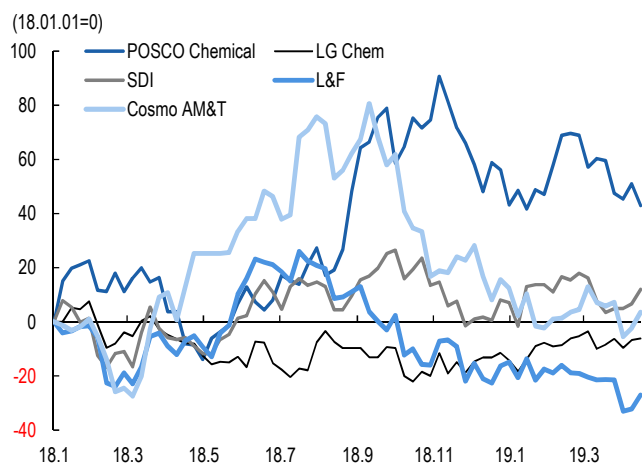
Table 2. Global peer group performance and valuation

(Wbn, x, %)

	Market cap	Revenue		OP		OP margin		P/E		P/B		ROE		EV/EBITDA	
		18	19E	18	19E	18	19E	18	19E	18	19E	18	19E	18	19E
POSCO Chemical	3,556	1,384	1,570	106	131	7.7	8.4	28.5	21.6	5.0	3.8	19.0	19.2	29.8	21.6
Major domestic secondary battery materials peer group															
LG Chem	25,872	28,183	31,490	2,246	2,159	8.0	6.9	18.1	18.7	1.4	1.5	8.0	8.3	7.2	7.2
Samsung SDI	15,781	9,158	10,834	715	842	7.8	7.8	20.9	19.7	1.2	1.3	5.9	6.5	12.5	10.8
Ecopro BM	1,289	589		50		8.5		-	-	-	-	26.7	-	-	-
L&F	775	506	541	27	31	5.3	5.7	39.3	38.1	5.4	4.8	14.8	13.9	23.9	18.3
Cosmo AM&T	312	534		15		2.8		32.0	-	3.9	-	12.9	-	17.8	-
Average						6.5		27.5	25.5	3.0	2.5	13.7	9.6	15.4	12.1
Major domestic refractories peer group															
ChosunRefrctr	368	789		39		5.0		5.1	-	0.5	-	9.2	-	4.1	-
KRC	132	240		11		4.8		16.4	-	0.9	-	5.7	-	9.0	-
Average						4.9		10.8		0.7		7.4		6.6	
Major global secondary battery materials peer group															
Panasonic	25,680	79,997	83,680	3,713	3,998	4.6	4.8	15.0	9.9	2.1	1.3	14.4	13.7	5.9	4.4
BYD	26,082	20,261	26,202	1,274	855	6.3	3.3	47.2	43.7	2.3	2.8	5.0	6.4	10.8	12.7
CATL	30,955	3,333	4,998	591	770	17.7	15.4	-	49.4	-	5.5	19.3	11.6	-	26.1
Umicore	13,681	19,208		641	728	3.3		26.2	28.6	3.2	3.8	14.4	13.9	13.3	14.4
SMM	10,704	9,356	9,364	1,104	870	11.8	9.3	13.5	14.3	1.2	0.9	9.2	6.9	10.0	10.0
Shanshan	3,015	1,375	1,711	129	258	9.3	15.1	24.3	15.8	2.1	1.5	9.6	12.4	27.0	12.3
Easpring	2,036	359	584	34	59	9.6	10.1	38.5	38.5	6.1	3.9	17.1	11.6	39.6	26.7
Average						9.0	9.7	27.4	28.6	2.8	2.8	12.7	10.9	17.8	15.2
Major global graphite electrode peer group															
SDK	6,438	9,888	10,970	1,794	2,079	18.1	19.0	4.3	4.7	1.1	1.1	28.1	27.0	3.2	3.4
Tokai Carbon	3,357	2,305	3,228	750	1,035	32.5	32.0	3.6	4.5	1.4	1.3	47.2	34.0	3.2	2.9
Graftech	4,599	2,087	2,267	1,239	1,424	59.4	62.8	3.7	4.7					4.6	4.9
Fangda Carbon	8,462	1,371	1,915	814	1,157	59.4	60.4	13.7	8.8	5.1	4.1	46.6	49.5	9.2	6.6
Graphite India	1,444	563	1,336	243	833	43.2	62.3	13.7	2.5	5.2	1.9	45.0	84.3	9.1	1.6
HEG	1,275	459	1,095	284	696	61.9	63.6	11.6	2.6	6.7	2.0	76.9	89.1	7.6	1.7
Average						45.8	50.0	8.4	4.6	3.9	2.1	48.7	56.8	6.2	3.5

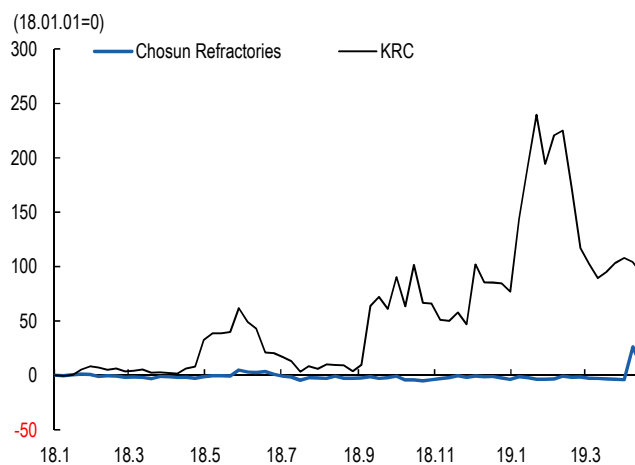
Source: Bloomberg, Mirae Asset Daewoo Research

Figure 11. Major domestic secondary battery materials players' performance



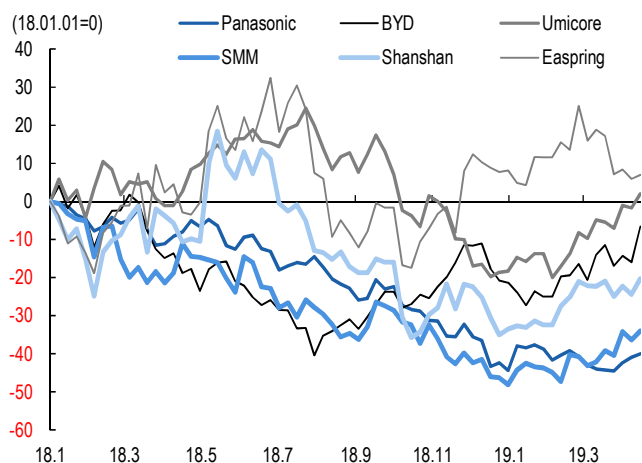
Source: Bloomberg, Mirae Asset Daewoo Research

Figure 12. Major domestic refractories players' performance



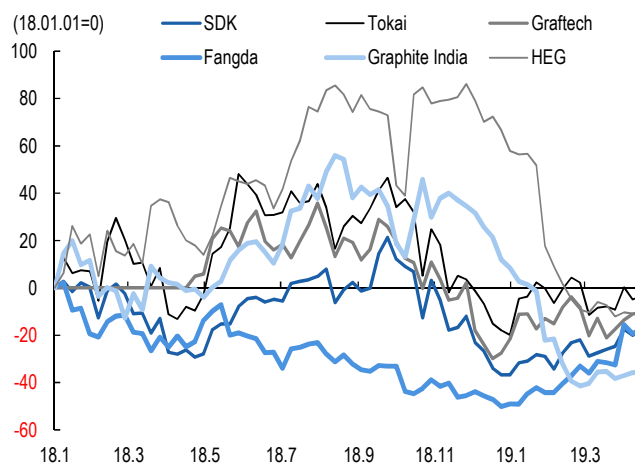
Source: Bloomberg, Mirae Asset Daewoo Research

Figure 13. Major global secondary battery materials players' performance



Source: Bloomberg, Mirae Asset Daewoo Research

Figure 14. Major global graphite electrode players' performance



Source: Bloomberg, Mirae Asset Daewoo Research

Figure 15. P/E



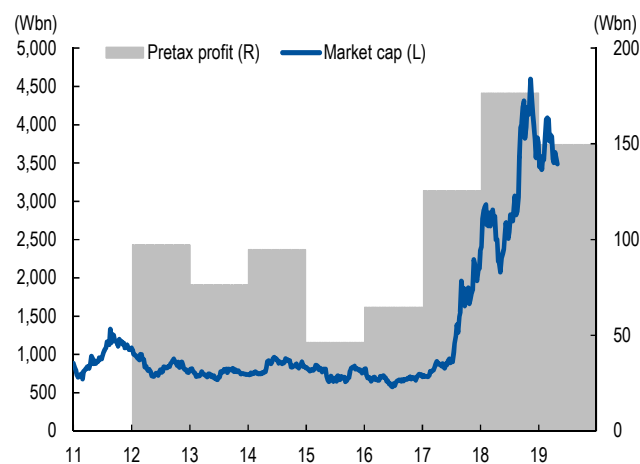
Source: Mirae Asset Daewoo Research

Figure 16. P/B



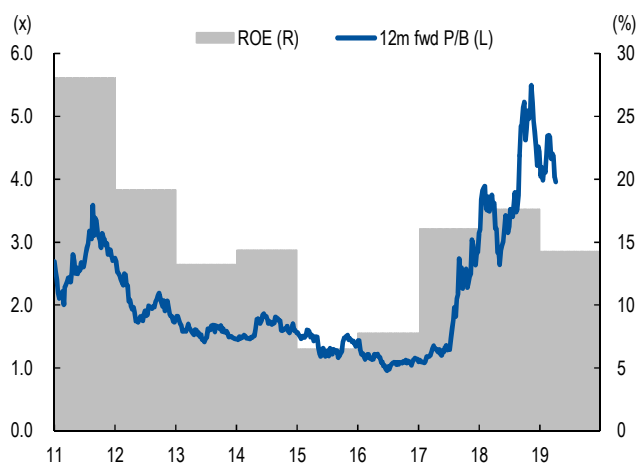
Source: Mirae Asset Daewoo Research

Figure 17. Pretax profit and market cap



Source: Mirae Asset Daewoo Research

Figure 18. P/B and ROE



Source: Mirae Asset Daewoo Research

POSCO CHEMICAL (003670 KQ/Buy/TP: W72,500)

Comprehensive Income Statement (Summarized)

(Wbn)	12/18	12/19F	12/20F	12/21F
Revenue	1,384	1,556	2,266	2,828
Cost of Sales	1,218	1,374	1,997	2,481
Gross Profit	166	182	269	347
SG&A Expenses	60	70	102	127
Operating Profit (Adj)	106	112	167	220
Operating Profit	106	112	167	220
Non-Operating Profit	71	38	35	34
Net Financial Income	1	1	1	1
Net Gain from Inv in Associates	71	37	34	34
Pretax Profit	177	150	202	254
Income Tax	44	28	49	61
Profit from Continuing Operations	133	122	154	193
Profit from Discontinued Operations	0	0	0	0
Net Profit	133	122	154	193
Controlling Interests	132	122	154	193
Non-Controlling Interests	1	0	0	0
Total Comprehensive Profit	125	122	154	193
Controlling Interests	125	120	151	190
Non-Controlling Interests	1	2	2	3
EBITDA	123	134	195	252
FCF (Free Cash Flow)	-16	-7	-36	20
EBITDA Margin (%)	8.9	8.6	8.6	8.9
Operating Profit Margin (%)	7.7	7.2	7.4	7.8
Net Profit Margin (%)	9.5	7.8	6.8	6.8

Cash Flows (Summarized)

(Wbn)	12/18	12/19F	12/20F	12/21F
Cash Flows from Op Activities	85	93	64	120
Net Profit	133	122	154	193
Non-Cash Income and Expense	9	13	41	59
Depreciation	16	21	27	32
Amortization	1	1	1	1
Others	-8	-9	13	26
Chg in Working Capital	-37	-16	-83	-72
Chg in AR & Other Receivables	0	-36	-73	-72
Chg in Inventories	-11	-12	-47	-41
Chg in AP & Other Payables	-14	30	33	38
Income Tax Paid	-22	-28	-49	-61
Cash Flows from Inv Activities	-39	-106	-100	-100
Chg in PP&E	-101	-100	-100	-100
Chg in Intangible Assets	-3	0	0	0
Chg in Financial Assets	71	-6	0	0
Others	-6	0	0	0
Cash Flows from Fin Activities	-29	-24	-24	-24
Chg in Financial Liabilities	-8	0	0	0
Chg in Equity	0	0	0	0
Dividends Paid	-21	-24	-24	-24
Others	0	0	0	0
Increase (Decrease) in Cash	16	4	-26	29
Beginning Balance	104	120	125	98
Ending Balance	120	125	98	128

Source: Company data, Mirae Asset Daewoo Research estimates

Statement of Financial Condition (Summarized)

(Wbn)	12/18	12/19F	12/20F	12/21F
Current Assets	440	492	585	728
Cash and Cash Equivalents	120	125	98	128
AR & Other Receivables	181	217	290	362
Inventories	109	121	167	209
Other Current Assets	30	29	30	29
Non-Current Assets	508	586	659	726
Investments in Associates	187	187	187	187
Property, Plant and Equipment	264	342	415	484
Intangible Assets	7	6	5	5
Total Assets	948	1,078	1,244	1,454
Current Liabilities	153	185	221	262
AP & Other Payables	99	130	167	208
Short-Term Financial Liabilities	4	4	4	4
Other Current Liabilities	50	51	50	50
Non-Current Liabilities	37	37	37	37
Long-Term Financial Liabilities	16	16	16	16
Other Non-Current Liabilities	21	21	21	21
Total Liabilities	189	221	258	299
Controlling Interests	749	848	977	1,146
Capital Stock	30	30	30	30
Capital Surplus	24	24	24	24
Retained Earnings	699	797	927	1,096
Non-Controlling Interests	9	9	9	9
Stockholders' Equity	758	857	986	1,155

Forecasts/Valuations (Summarized)

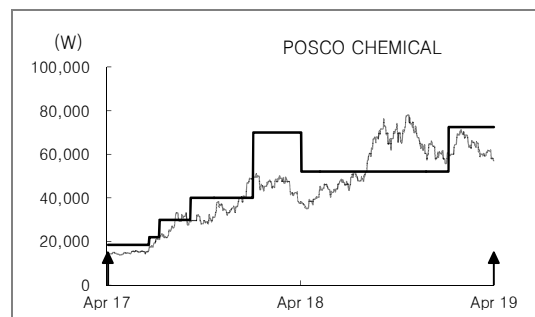
	12/18	12/19F	12/20F	12/21F
P/E (x)	28.5	28.3	22.6	18.0
P/CF (x)	26.5	25.5	17.9	13.8
P/B (x)	5.0	4.1	3.6	3.0
EV/EBITDA (x)	29.8	25.1	17.4	13.3
EPS (W)	2,237	2,019	2,522	3,171
CFPS (W)	2,406	2,238	3,193	4,136
BPS (W)	12,690	13,904	16,026	18,797
DPS (W)	400	400	400	400
Payout ratio (%)	17.8	20.0	15.9	12.6
Dividend Yield (%)	0.6	0.7	0.7	0.7
Revenue Growth (%)	15.6	12.4	45.6	24.8
EBITDA Growth (%)	4.2	8.9	45.5	29.2
Operating Profit Growth (%)	1.9	5.7	49.1	31.7
EPS Growth (%)	27.6	-9.7	24.9	25.7
Accounts Receivable Turnover (x)	7.7	7.8	9.0	8.7
Inventory Turnover (x)	13.3	13.6	15.8	15.1
Accounts Payable Turnover (x)	12.4	13.1	14.7	14.5
ROA (%)	14.9	12.0	13.3	14.3
ROE (%)	19.0	15.3	16.9	18.2
ROIC (%)	19.1	17.7	19.9	21.2
Liability to Equity Ratio (%)	25.0	25.8	26.1	25.9
Current Ratio (%)	288.1	266.4	264.8	277.5
Net Debt to Equity Ratio (%)	-15.5	-14.2	-9.7	-10.8
Interest Coverage Ratio (x)	68.6	50.5	75.5	99.2

APPENDIX 1

Important Disclosures & Disclaimers

2-Year Rating and Target Price History

Company (Code)	Date	Rating	Target Price
POSCO CHEMICAL (003670)	01/28/2019	Buy	72,500
	04/25/2018	Buy	52,000
	01/24/2018	Buy	70,000
	09/28/2017	Buy	40,000
	07/31/2017	Buy	30,000
	07/12/2017	Buy	22,000
	04/25/2017	Buy	18,500



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	83.52%	8.24%	8.24%	0.00%
Investment Banking Services	82.61%	4.35%	13.04%	0.00%

* Based on recommendations in the last 12-months (as of March 31, 2019)

Disclosures

As of the publication date, Mirae Asset Daewoo Co., Ltd. and/or its affiliates do not have any special interest with the subject company and do not own 1% or more of the subject company's shares outstanding.

Analyst Certification

The research analysts who prepared this report (the "Analysts") are registered with the Korea Financial Investment Association and are subject to Korean securities regulations. They are neither registered as research analysts in any other jurisdiction nor subject to the laws or regulations thereof. Each Analyst responsible for the preparation of this report certifies that (i) all views expressed in this report accurately reflect the personal views of the Analyst about any and all of the issuers and securities named in this report and (ii) no part of the compensation of the Analyst was, is, or will be directly or indirectly related to the specific recommendations or views contained in this report. Mirae Asset Daewoo Co., Ltd. ("Mirae Asset Daewoo") policy prohibits its Analysts and members of their households from owning securities of any company in the Analyst's area of coverage, and the Analysts do not serve as an officer, director or advisory board member of the subject companies. Except as otherwise specified herein, the Analysts have not received any compensation or any other benefits from the subject companies in the past 12 months and have not been promised the same in connection with this report. Like all employees of Mirae Asset Daewoo, the Analysts receive compensation that is determined by overall firm profitability, which includes revenues from, among other business units, the institutional equities, investment banking, proprietary trading and private client division. At the time of publication of this report, the Analysts do not know or have reason to know of any actual, material conflict of interest of the Analyst or Mirae Asset Daewoo except as otherwise stated herein.

Disclaimers

This report was prepared by Mirae Asset Daewoo, a broker-dealer registered in the Republic of Korea and a member of the Korea Exchange. Information and opinions contained herein have been compiled in good faith and from sources believed to be reliable, but such information has not been independently verified and Mirae Asset Daewoo makes no guarantee, representation or warranty, express or implied, as to the fairness, accuracy, completeness or correctness of the information and opinions contained herein or of any translation into English from the Korean language. In case of an English translation of a report prepared in the Korean language, the original Korean language report may have been made available to investors in advance of this report.

The intended recipients of this report are sophisticated institutional investors who have substantial knowledge of the local business environment, its common practices, laws and accounting principles and no person whose receipt or use of this report would violate any laws or regulations or subject Mirae Asset Daewoo or any of its affiliates to registration or licensing requirements in any jurisdiction shall receive or make any use hereof.

This report is for general information purposes only and it is not and shall not be construed as an offer or a solicitation of an offer to effect transactions in any securities or other financial instruments. The report does not constitute investment advice to any person and such person shall not be treated as a client of Mirae Asset Daewoo by virtue of receiving this report. This report does not take into account the particular investment objectives, financial

situations, or needs of individual clients. The report is not to be relied upon in substitution for the exercise of independent judgment. Information and opinions contained herein are as of the date hereof and are subject to change without notice. The price and value of the investments referred to in this report and the income from them may depreciate or appreciate, and investors may incur losses on investments. Past performance is not a guide to future performance. Future returns are not guaranteed, and a loss of original capital may occur. Mirae Asset Daewoo, its affiliates and their directors, officers, employees and agents do not accept any liability for any loss arising out of the use hereof.

Mirae Asset Daewoo may have issued other reports that are inconsistent with, and reach different conclusions from, the opinions presented in this report. The reports may reflect different assumptions, views and analytical methods of the analysts who prepared them. Mirae Asset Daewoo may make investment decisions that are inconsistent with the opinions and views expressed in this research report. Mirae Asset Daewoo, its affiliates and their directors, officers, employees and agents may have long or short positions in any of the subject securities at any time and may make a purchase or sale, or offer to make a purchase or sale, of any such securities or other financial instruments from time to time in the open market or otherwise, in each case either as principals or agents. Mirae Asset Daewoo and its affiliates may have had, or may be expecting to enter into, business relationships with the subject companies to provide investment banking, market-making or other financial services as are permitted under applicable laws and regulations.

No part of this document may be copied or reproduced in any manner or form or redistributed or published, in whole or in part, without the prior written consent of Mirae Asset Daewoo.

Distribution

United Kingdom: This report is being distributed by Mirae Asset Securities (UK) Ltd. in the United Kingdom only to (i) investment professionals falling within Article 19(5) of the Financial Services and Markets Act 2000 (Financial Promotion) Order 2005 (the "Order"), and (ii) high net worth companies and other persons to whom it may lawfully be communicated, falling within Article 49(2)(A) to (E) of the Order (all such persons together being referred to as "Relevant Persons"). This report is directed only at Relevant Persons. Any person who is not a Relevant Person should not act or rely on this report or any of its contents.

United States: Mirae Asset Daewoo is not a registered broker-dealer in the United States and, therefore, is not subject to U.S. rules regarding the preparation of research reports and the independence of research analysts. This report is distributed in the U.S. by Mirae Asset Securities (USA) Inc., a member of FINRA/SIPC, to "major U.S. institutional investors" in reliance on the exemption from registration provided by Rule 15a-6(b)(4) under the U.S. Securities Exchange Act of 1934, as amended. All U.S. persons that receive this document by their acceptance hereof represent and warrant that they are a major U.S. institutional investor and have not received this report under any express or implied understanding that they will direct commission income to Mirae Asset Daewoo or its affiliates. Any U.S. recipient of this document wishing to effect a transaction in any securities discussed herein should contact and place orders with Mirae Asset Securities (USA) Inc. Mirae Asset Securities (USA) Inc. accepts responsibility for the contents of this report in the U.S., subject to the terms hereof, to the extent that it is delivered to a U.S. person other than a major U.S. institutional investor. Under no circumstances should any recipient of this research report effect any transaction to buy or sell securities or related financial instruments through Mirae Asset Daewoo. The securities described in this report may not have been registered under the U.S. Securities Act of 1933, as amended, and, in such case, may not be offered or sold in the U.S. or to U.S. persons absent registration or an applicable exemption from the registration requirements.

Hong Kong: This report is distributed in Hong Kong by Mirae Asset Securities (HK) Limited, which is regulated by the Hong Kong Securities and Futures Commission. The contents of this report have not been reviewed by any regulatory authority in Hong Kong. This report is for distribution only to professional investors within the meaning of Part I of Schedule 1 to the Securities and Futures Ordinance of Hong Kong (Cap. 571, Laws of Hong Kong) and any rules made thereunder and may not be redistributed in whole or in part in Hong Kong to any person.

All Other Jurisdictions: Customers in all other countries who wish to effect a transaction in any securities referenced in this report should contact Mirae Asset Daewoo or its affiliates only if distribution to or use by such customer of this report would not violate applicable laws and regulations and not subject Mirae Asset Daewoo and its affiliates to any registration or licensing requirement within such jurisdiction.

Mirae Asset Daewoo International Network

Mirae Asset Daewoo Co., Ltd. (Seoul)

Global Equity Sales Team
Mirae Asset Center 1 Building
26 Eulji-ro 5-gil, Jung-gu, Seoul 04539
Korea

Tel: 82-2-3774-2124

Mirae Asset Securities (USA) Inc.

810 Seventh Avenue, 37th Floor
New York, NY 10019
USA

Tel: 1-212-407-1000

PT. Mirae Asset Sekuritas Indonesia

Equity Tower Building Lt. 50
Sudirman Central Business District
Jl. Jend. Sudirman, Kav. 52-53 Jakarta Selatan
12190
Indonesia
Tel: 62-21-515-3281

Mirae Asset Securities Mongolia UTsK LLC

#406, Blue Sky Tower, Peace Avenue 17
1 Khoroo, Sukhbaatar District
Ulaanbaatar 14240
Mongolia

Tel: 976-7011-0806

Shanghai Representative Office

38T31, 38F, Shanghai World Financial Center
100 Century Avenue, Pudong New Area Shanghai
200120
China

Tel: 86-21-5013-6392

Mirae Asset Securities (HK) Ltd.

Suites 1109-1114, 11th Floor
Two International Finance Centre
8 Finance Street, Central
Hong Kong
China
Tel: 852-2845-6332

Mirae Asset Wealth Management (USA) Inc.

555 S. Flower Street, Suite 4410,
Los Angeles, California 90071
USA

Tel: 1-213-262-3807

Mirae Asset Securities (Singapore) Pte. Ltd.

6 Battery Road, #11-01
Singapore 049909
Republic of Singapore

Tel: 65-6671-9845

Mirae Asset Investment Advisory (Beijing) Co., Ltd

2401B, 24th Floor, East Tower, Twin Towers
B12 Jianguomenwai Avenue, Chaoyang District
Beijing 100022
China

Tel: 86-10-6567-9699

Ho Chi Minh Representative Office

7F, Saigon Royal Building
91 Pasteur St.
District 1, Ben Nghe Ward, Ho Chi Minh City
Vietnam

Tel: 84-8-3910-7715

Mirae Asset Securities (UK) Ltd.

41st Floor, Tower 42
25 Old Broad Street,
London EC2N 1HQ
United Kingdom

Tel: 44-20-7982-8000

Mirae Asset Wealth Management (Brazil) CCTVM

Rua Funchal, 418, 18th Floor, E-Tower Building Vila
Olimpia
Sao Paulo - SP
04551-060
Brasil
Tel: 55-11-2789-2100

Mirae Asset Securities (Vietnam) LLC

7F, Saigon Royal Building
91 Pasteur St.
District 1, Ben Nghe Ward, Ho Chi Minh City
Vietnam

Tel: 84-8-3911-0633 (ext.110)

Beijing Representative Office

2401A, 24th Floor, East Tower, Twin Towers
B12 Jianguomenwai Avenue, Chaoyang District
Beijing 100022
China

Tel: 86-10-6567-9699 (ext. 3300)