MIRAE ASSET Building on principles

MedTech

Results Comment January 31, 2020

(Maintain)			Buy			
Target Price (12M, W)	60),000			
Share Price (01/30/20,	W)	41	,050			
Expected Return			46%			
OP (19P, Wbn)			43			
Consensus OP (19F, W		41				
EPS Growth (19P, %)		-				
Market EPS Growth (1		-34.6				
P/E (19P, x)			-			
Market P/E (19F, x)			15.3			
KOSDAQ			656.39			
Market Cap (Wbn)			586			
Shares Outstanding (r	nn)		14			
Free Float (%)			74.5			
Foreign Ownership (%)		34.7			
Beta (12M)			0.15			
52-Week Low			34,000			
52-Week High			78,200			
(%)	1M	6M	12M			
Absolute	-3.0	-42.3	-25.9			
Relative	-1.0	-45.0	-19.3			



Mirae Asset Daewoo Co., Ltd.

[MedTech/Healthcare Solutions]

Choong-hyun Kim, CFA +822-3774-1740 choonghyun.kim@miraeasset.com

Osstem Implant (048260 KQ)

A ray of hope

4Q19 review: OP surprises to the upside for the second straight quarter

For 4Q19, Osstem Implant reported revenue of W147.4bn (+17.9% YoY), in line with the consensus. By region, Asia (+37.3% YoY) and Europe (+48.9% YoY) were strong, while China also continued solid growth (+17.1% YoY). Operating profit came in above expectations at W11.8bn (+152.3% YoY; OP margin of 8.0%), as allowances for bad debt, inventory, and returns fell significantly to W0.7bn.

Asia's no. 1 dental implant supplier

1) Tighter grip on Asia: Since 2006, Osstem Implant has generated 1.1 to 2.5 times the revenue of global leader Straumann (STMN SW/CP: CHF964.40) in Asia. In 2020, we expect Osstem Implant's Asia revenue to grow 10% YoY (or +16.7% YoY excluding Korea). In the maturing domestic market, the company remains the biggest beneficiary of the dental implant copayment rate cut. Overall, we see robust top-line growth continuing in 2020, led by overseas markets (+14.8% YoY), especially in Asia.

2) Poised to become a total dental solutions provider: Providing total dental solutions has become a dominant trend in the global dental equipment market. Osstem Implant already generates 28-30% of its revenue from products other than dental implants. The company currently sells oral scanners through a partnership with 3Shape, and is also moving into the digital imaging equipment market with its own products.

Reaffirm Buy and TP of W60,000

We reaffirm our Buy call and target price of W60,000 on Osstem Implant. In 2019, the company's stock tumbled 52.8% (vs. -5.29% for the KOSDAQ) from its previous high due to a series of negative events, including the 2Q19 earnings shock, imposition of tax penalties, and the departure of its second largest shareholder. In particular, the possibility of unpredictable allowances leading to quarterly earnings shocks caused many investors to shy away from the stock. Due to the nature of the dental implant business (which relies on long-term contracts and credit transactions), allowances are unavoidable in order to manage risks. The key is to keep allowances to within predictable levels and communicate effectively with the market.

Osstem Implant's 4Q19 results suggest that the risk of massive allowances has declined considerably. Since 2017, the company has improved its OP margin every year. Given its business strategy, the company should find it hard to improve its OP margin by more than 3-4%p. That said, we would view the stock as significantly underpriced at current levels if 1) the level of allowances needed continues to drop, and 2) the divergence in allowances taken per quarter narrows. At a 12-month forward P/E of 15.1x (vs. global peer average of 20.5x), valuation looks cheap in historical, relative, and absolute terms. Lastly, while the recent Wuhan coronavirus outbreak is negative to China earnings, we think demand is likely to be merely pushed back; we therefore caution against getting overly concerned.

FY (Dec.)	12/16	12/17	12/18	12/19P	12/20F	12/21F
Revenue (Wbn)	345	398	460	565	629	732
OP (Wbn)	34	22	31	43	52	66
OP margin (%)	9.9	5.5	6.7	7.6	8.3	9.0
NP (Wbn)	24	10	13	-15	38	50
EPS (W)	1,645	708	888	-1,040	2,646	3,487
ROE (%)	22.1	9.3	11.5	-15.7	37.8	34.6
P/E (x)	36.9	83.5	60.2	-	15.5	11.8
P/B (x)	6.7	6.1	5.5	5.0	3.7	2.8
Dividend yield (%)	0.0	0.0	0.0	0.0	0.0	0.0

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

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.

(Wbn, %, %p)

Table 1. 4Q19 review

				4Q19P		Growth		
	4Q18	3Q19	Preliminary	Mirae Asset Daewoo	Consensus	YoY	QoQ	
Revenue	125.0	147.8	147.4	147.9	148.4	17.9	-0.3	
Operating profit	4.7	10.9	11.8	11.0	9.3	152.3	8.4	
OP margin (%)	3.7	7.3	8.0	7.4	6.2	4.3	0.6	
Pretax profit	3.8	0.9	11.3	8.8	7.4	197.6	1,199.9	
Net profit	3.9	-35.2	4.8	6.8	5.2	23.4	TTB	

Notes: Based on K-IFRS

Source: Company data, Quantiwise, Mirae Asset Daewoo Research estimates

Table 2. Earnings forecast revisions

(Wbn, W, %)

	Previous		Revised		% ch	g.	Notes
	20F	21F	20F	21F	20F	21F	
Revenue	627.2	733.3	629.4	732.0	0.4	-0.2	
Operating profit	50.1	65.5	51.7	66.5	3.3	1.5	
Pretax profit	46.0	61.7	49.1	64.7	6.8	4.8	
Net profit	35.4	47.5	37.8	49.8	6.8	4.8	
EPS (W)	2,476.8	3,326.4	2,646.0	3,487.0	6.8	4.8	

Notes: Based on K-IFRS

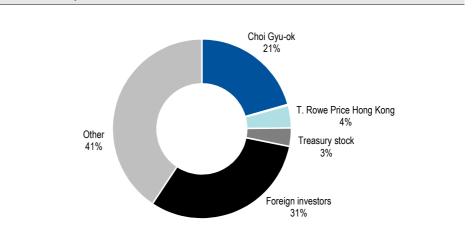
Source: Mirae Asset Daewoo Research estimates

Table 3. Quarterly and annual earnings

Table 3. Quarterly	y and annua	l earnings	;								(Wbn, %)
	1Q19	2Q19	3Q19	4Q19P	1Q20F	2Q20F	3Q20F	4Q20F	2019P	2020F	2021F
Revenue	129.0	140.9	147.8	147.4	147.0	151.9	167.7	162.9	565.0	629.4	732.0
Domestic	55.1	60.3	63.1	62.9	57.0	57.3	70.6	67.0	241.4	251.9	267.1
China	26.7	31.6	33.8	33.9	33.1	38.8	40.0	39.6	126.0	151.5	189.9
North America	23.5	22.5	22.9	22.7	28.0	26.0	25.7	25.7	91.6	105.4	126.0
Other	23.6	26.5	28.0	27.9	28.8	29.8	31.4	30.6	106.1	120.6	149.1
Operating profit	12.6	7.7	10.9	11.8	11.7	12.7	13.9	13.4	42.9	51.7	66.5
Domestic	7.1	8.9	11.5	13.8	9.7	11.1	11.4	13.9	41.3	45.9	54.7
China	2.8	2.3	3.4	1.0	2.9	3.2	3.8	0.3	9.6	10.3	13.8
North America	2.1	-0.3	-0.9	0.3	0.7	0.6	0.7	0.3	1.2	2.3	3.2
Other	0.6	-3.3	-3.2	-3.3	-1.6	-2.1	-2.0	-1.1	-9.1	-6.8	-5.2
Pretax profit	13.4	6.0	0.9	11.2	10.9	12.0	13.3	12.9	31.4	49.1	64.7
Net profit	11.1	4.5	-35.2	4.8	8.4	9.2	10.2	9.9	-14.9	37.8	49.8
OP margin (%)	9.8	5.4	7.3	8.0	8.0	8.4	8.3	8.2	7.6	8.2	9.1
Pretax margin (%)	10.4	4.3	0.6	7.6	7.4	7.9	7.9	7.9	5.6	7.8	8.8
Net margin (%)	7.2	2.2	-25.0	2.8	5.2	5.5	5.5	5.5	-2.6	6.0	6.8

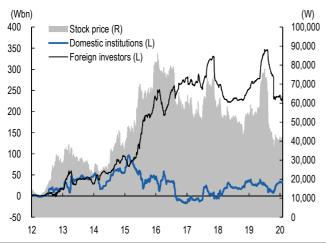
Source: Company data, Mirae Asset Daewoo Research estimates

Figure 1. Ownership breakdown



Source: Bloomberg, Mirae Asset Daewoo Research

Figure 2. Domestic institutional and foreign net buying vs. share price



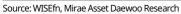
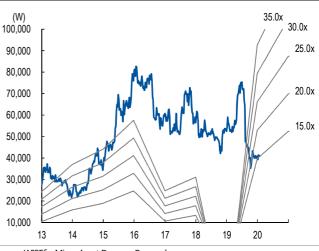


Figure 3. P/E band chart



Source: WISEfn, Mirae Asset Daewoo Research

Table 4. Valuation comparison

Commonies	Market	OP n	nargin (S	%)	l	P/E (x)		l	P/B (x)		i	ROE (%)		EV/I	BITDA	(x)
Companies	сар	18	19F	20F	18	19F	20F	18	19F	20F	18	19F	20F	18	19F	20F
Zimmer Biomet	35,835.1	0.4	27.5	27.7	27.3	18.9	17.9	3.8	3.8	3.7	-0.7	13.7	13.1	33.3	14.6	14.1
Align Technology	24,200.1	23.7	21.9	22.3	53.0	48.4	39.9	9.1	8.6	7.1	33.5	31.4	31.0	22.3	31.8	26.5
Straumann	19,149.9	25.1	25.4	26.2	54.5	46.9	38.5	10.8	9.9	8.6	24.8	25.1	25.3	33.1	33.3	27.9
Dentsply Sirona	15,634.4	-24.0	18.7	19.9	31.3	24.3	21.9	3.4	3.3	3.2	3.2	9.0	9.8	19.4	16.2	15.1
Henry Schein	12,225.0	5.7	7.3	7.3	19.3	20.5	19.2	1.0	1.0	1.0	17.2	16.2	15.9	11.5	13.8	13.5
Envista	5,937.4	10.5	13.5	13.5	-	18.4	18.3	-	1.8	1.8	4.7	6.4	7.3	-	14.9	14.5
SmileDirectClub	5,965.6	-10.8	-48.5	-8.7	-	-	-	-	6.7	4.4	-	-78.8	-17.5	-	-	290.0
DIO Implant	604.6	8.9	28.4	29.9	35.2	21.4	18.9	5.2	4.9	3.9	11.8	21.0	19.8	24.0	15.4	12.2
Osstem Implant	585.7	6.7	7.3	7.8	-	-	16.9	1.0	1.0	0.9	-16.1	-22.0	33.0	12.1	11.4	9.9
Dentium	563.4	22.5	19.7	20.2	12.1	18.5	12.0	1.8	2.2	1.8	17.6	15.6	19.0	14.2	12.3	10.0
Ray	329.7	11.7	17.7	21.7	51.6	28.8	18.0	5.3	4.5	3.3	25.6	22.4	21.6	-	23.9	12.7
Average		6.3	9.9	15.3	34.0	25.5	20.5	4.1	3.9	3.2	11.1	1.7	14.9	19.0	17.6	45.1

Source: Bloomberg

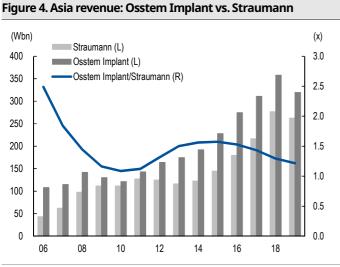
(Wbn)

Brand	Failures	Total implants	Success rate	Failure rate
Nobel Biocare (Branemark)	20	345	94.2%	5.8%
Nobel Biocare (Replace)	2	35	94.3%	5.7%
Straumann	5	352	98.6%	1.4%
Osstem Implant	2	139	98.6%	1.4%
Other	0	31	100.0%	0.0%
Total	29	902	96.8%	3.2%

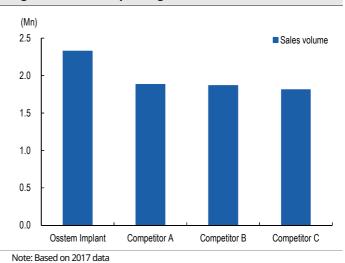
Source: MRG, Mirae Asset Daewoo Research

Table 5. Study on long-term outcomes of implants for patients aged 65 and older

Source: Clinical Oral Implants Research, Mirae Asset Daewoo research







Source: Company data, Mirae Asset Daewoo Research

Figure 6. Return allowances-to-implant revenue ratio

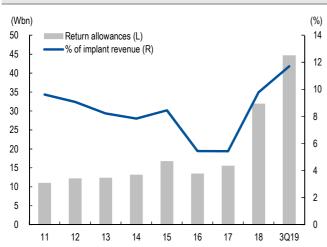
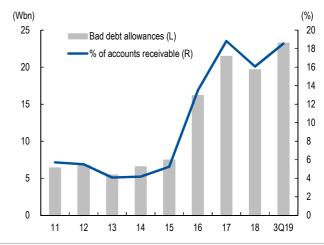


Figure 7. Bad debt allowances-to-accounts receivable ratio

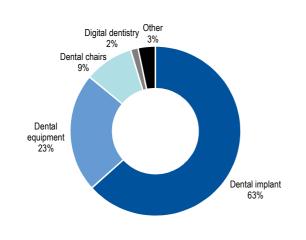


Source: Company data, Mirae Asset Daewoo Research

Source: Company data, Mirae Asset Daewoo Research

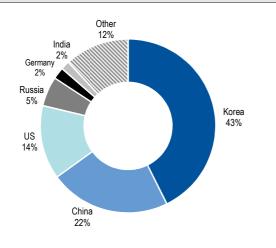
Osstem Implant

Figure 8. Revenue breakdown by category (2018)



Note: Based on non-consolidated data Source: Company data, Mirae Asset Daewoo Research

Figure 10. Revenue breakdown by region (2018)



Source: Company data, Mirae Asset Daewoo Research

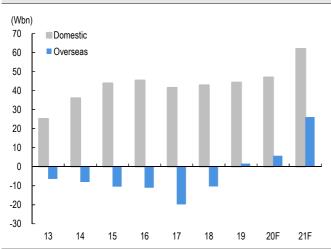
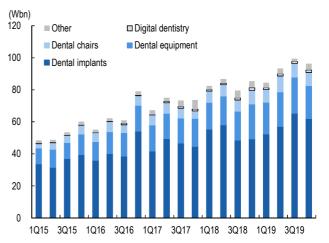


Figure 12. OP: Domestic vs. overseas

Source: Company data, Mirae Asset Daewoo Research

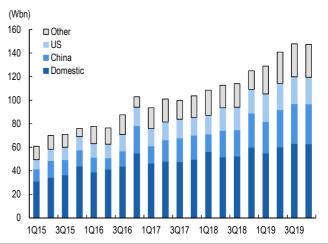
Figure 9. Revenue from key products



Note: Based on non-consolidated data

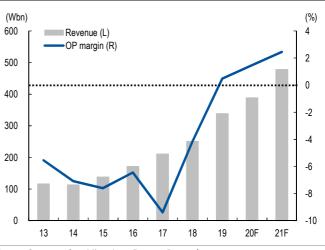
Source: Company data, Mirae Asset Daewoo Research

Figure 11. Revenue in key regions



Source: Company data, Mirae Asset Daewoo Research

Figure 13. Overseas revenue vs. OP margin



Source: Company data, Mirae Asset Daewoo Research



(%)

4

2

0

-2

-4

-6

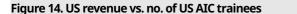
-8

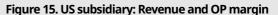
-10

-12

-14

-16





(Wbn)

Revenue (L)

OP margin (R)

140

120

100

80

60

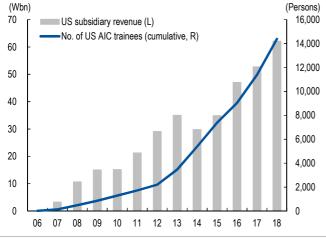
40

20

0

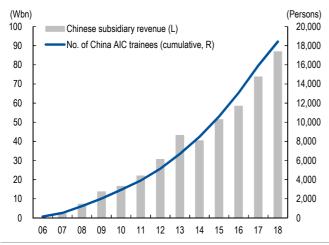
13

14

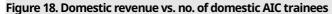


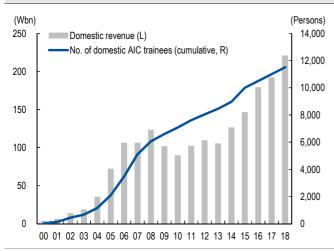
Source: Company data, Mirae Asset Daewoo Research

Figure 16. Chinese revenue vs. no. of Chinese AIC trainees



Source: Company data, Mirae Asset Daewoo Research





Source: Company data, Mirae Asset Daewoo Research

15 Source: Company data, Mirae Asset Daewoo Research

Figure 17. Chinese subsidiary: Revenue and OP margin

16

17

18

19

20F

21F

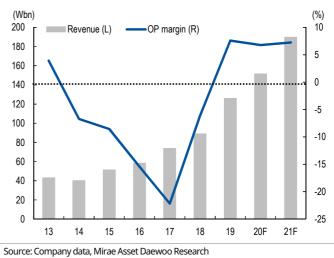
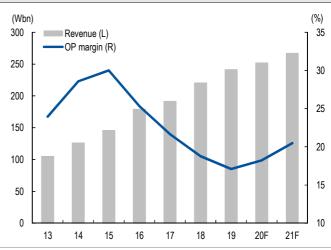


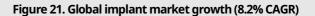
Figure 19. Domestic revenue and OP margin

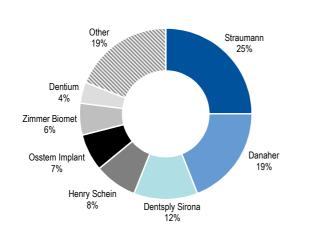


Source: Company data, Mirae Asset Daewoo Research

23F

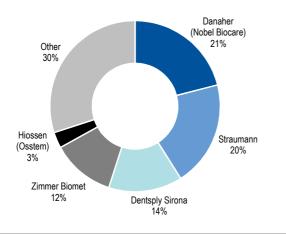
Figure 20. Global implant M/S breakdown





Source: Straumann, company data, Mirae Asset Daewoo Research

Figure 22. US M/S breakdown



15 Source: MRG, Mirae Asset Daewoo Research

Figure 23. US implant market growth (10.2% CAGR)

(US\$bn) 8 г

7 6

5

4

3

2

1

0

Market size

Source: Company data, Mirae Asset Daewoo Research

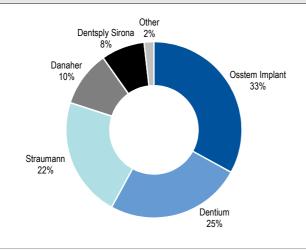


Figure 24. Chinese M/S breakdown

Source: Company data, Mirae Asset Daewoo Research

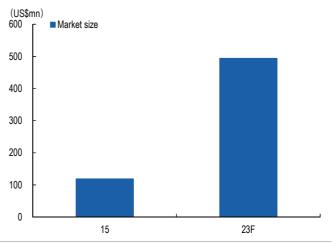
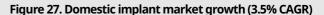
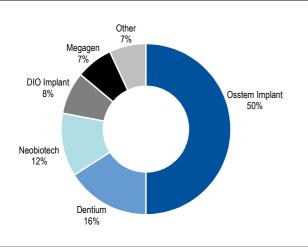


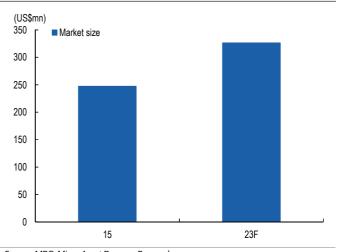
Figure 25. Chinese implant market growth (19.5% CAGR)

Source: MRG, Mirae Asset Daewoo Research

Figure 26. Domestic implant M/S breakdown

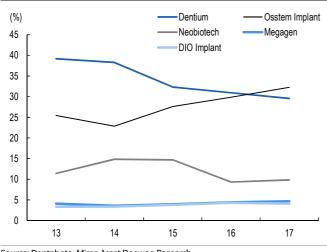






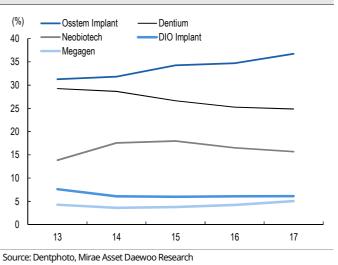
Source: KHIDI, Mirae Asset Daewoo Research

Figure 28. Brands most preferred by dentists

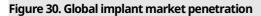


Source: MRG, Mirae Asset Daewoo Research

Figure 29. Brands most widely used by dentists



Source: Dentphoto, Mirae Asset Daewoo Research



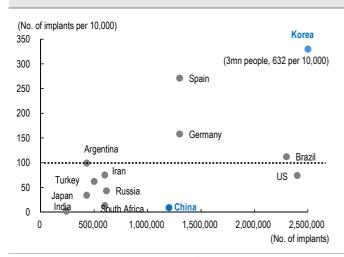
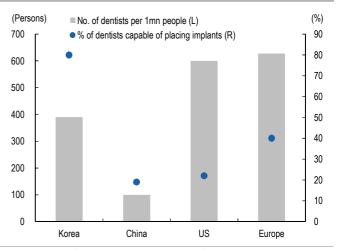


Figure 31. No. of dentists per mn people vs. no. of dentists with implant capabilities (global)



Source: Straumann, Mirae Asset Daewoo Research

Source: Company data, Mirae Asset Daewoo Research

Osstem Implant (048260 KQ/Buy/TP: W60,000)

Comprehensive Income Statement (Summarized)

-				
(Wbn)	12/18	12/19F	12/20F	12/21F
Revenue	460	565	629	732
Cost of Sales	202	249	282	335
Gross Profit	258	316	347	397
SG&A Expenses	228	273	295	331
Operating Profit (Adj)	31	43	52	66
Operating Profit	31	43	52	66
Non-Operating Profit	-13	-12	-3	-1
Net Financial Income	-4	-4	-3	-2
Net Gain from Inv in Associates	0	-1	0	0
Pretax Profit	18	31	49	65
Income Tax	12	52	15	19
Profit from Continuing Operations	6	-21	34	45
Profit from Discontinued Operations	0	0	0	0
Net Profit	6	-21	34	45
Controlling Interests	13	-15	38	50
Non-Controlling Interests	-6	-6	-3	-5
Total Comprehensive Profit	4	-23	34	45
Controlling Interests	11	-17	33	43
Non-Controlling Interests	-7	-5	2	2
EBITDA	41	64	70	81
FCF (Free Cash Flow)	8	-61	69	84
EBITDA Margin (%)	8.9	11.3	11.1	11.1
Operating Profit Margin (%)	6.7	7.6	8.3	9.0
Net Profit Margin (%)	2.8	-2.7	6.0	6.8

Statement of Financial Condition (Summarized)

(Wbn)	12/18	12/19F	12/20F	12/21F
Current Assets	363	357	452	574
Cash and Cash Equivalents	111	71	138	220
AR & Other Receivables	91	107	119	135
Inventories	95	113	124	142
Other Current Assets	66	66	71	77
Non-Current Assets	275	360	341	326
Investments in Associates	2	2	2	2
Property, Plant and Equipment	223	285	268	254
Intangible Assets	12	9	7	5
Total Assets	638	716	793	901
Current Liabilities	480	504	546	606
AP & Other Payables	28	32	36	41
Short-Term Financial Liabilities	148	114	114	114
Other Current Liabilities	304	358	396	451
Non-Current Liabilities	44	129	130	132
Long-Term Financial Liabilities	35	118	118	118
Other Non-Current Liabilities	9	11	12	14
Total Liabilities	524	633	676	738
Controlling Interests	109	81	119	169
Capital Stock	7	7	7	7
Capital Surplus	56	56	56	56
Retained Earnings	84	67	105	155
Non-Controlling Interests	5	2	-1	-6
Stockholders' Equity	114	83	118	163

Cash Flows (Summarized)

(Wbn)	12/18	12/19F	12/20F	12/21F
Cash Flows from Op Activities	41	16	69	84
Net Profit	6	-21	34	45
Non-Cash Income and Expense	43	63	36	36
Depreciation	9	19	17	14
Amortization	2	2	2	1
Others	32	42	17	21
Chg in Working Capital	0	-49	16	23
Chg in AR & Other Receivables	-11	-18	-11	-16
Chg in Inventories	-11	-20	-12	-17
Chg in AP & Other Payables	-3	5	2	3
Income Tax Paid	-14	-18	-15	-19
Cash Flows from Inv Activities	-57	-69	-2	-2
Chg in PP&E	-33	-76	0	0
Chg in Intangible Assets	-2	-1	0	0
Chg in Financial Assets	17	-2	-2	-2
Others	-39	10	0	0
Cash Flows from Fin Activities	17	12	0	0
Chg in Financial Liabilities	15	48	0	0
Chg in Equity	0	0	0	0
Dividends Paid	0	0	0	0
Others	2	-36	0	0
Increase (Decrease) in Cash	0	-40	67	81
Beginning Balance	111	111	71	138
Ending Balance	111	71	138	220

Source: Company data, Mirae Asset Daewoo Research estimates

Forecasts/Valuations (Summarized)

•	,			
	12/18	12/19F	12/20F	12/21F
P/E (x)	60.2	-	15.5	11.8
P/CF (x)	15.6	14.1	8.3	7.2
P/B (x)	5.5	5.0	3.7	2.8
EV/EBITDA (x)	19.4	11.5	9.1	6.8
EPS (W)	888	-1,040	2,646	3,487
CFPS (W)	3,425	2,996	4,921	5,701
BPS (W)	9,727	8,497	11,142	14,629
DPS (W)	0	0	0	0
Payout ratio (%)	0.0	0.0	0.0	0.0
Dividend Yield (%)	0.0	0.0	0.0	0.0
Revenue Growth (%)	15.6	22.8	11.3	16.4
EBITDA Growth (%)	32.3	56.1	9.4	15.7
Operating Profit Growth (%)	40.9	38.7	20.9	26.9
EPS Growth (%)	25.4	-	-	31.8
Accounts Receivable Turnover (x)	5.4	5.8	5.7	5.9
Inventory Turnover (x)	5.0	5.4	5.3	5.5
Accounts Payable Turnover (x)	16.1	16.4	16.4	17.3
ROA (%)	1.0	-3.0	4.6	5.3
ROE (%)	11.5	-15.7	37.8	34.6
ROIC (%)	7.2	-18.1	17.6	26.4
Liability to Equity Ratio (%)	459.6	761.5	575.0	453.3
Current Ratio (%)	75.6	70.7	82.9	94.8
Net Debt to Equity Ratio (%)	29.7	151.7	48.9	-15.9
Interest Coverage Ratio (x)	6.2	9.1	12.1	15.5

APPENDIX 1

Important Disclosures & Disclaimers

2-Year Rating and Target Price History

Company (Code)	Date	Rating	Target Price	(W) Osstern Implant
Osstem Implant (048260)	10/11/2019	Buy	60,000	(W) Osstem Implant
	08/09/2019	Buy	77,000	
	07/02/2019	Buy	94,000	80,000
05/09/2019 Buy 84,000 60,000	60,000 how how have have a first the			
	11/26/2018	Buy	74,000	40,000 -
	08/12/2018	Buy	64,000	40,000
	05/08/2018	Trading Buy	60,000	20,000
	02/07/2018	Trading Buy	62,000	
	01/24/2018	Trading Buy	72,000	Jan 18 Jan 19 Jan 20

Stock Ratings		Industry Ratings		
Buy	: Relative performance of 20% or greater	Overweight	: Fundamentals are favorable or improving	
Trading Buy	: Relative performance of 10% or greater, but with volatility	Neutral	: Fundamentals are steady without any material changes	
Hold	: Relative performance of -10% and 10%	Underweight	: Fundamentals are unfavorable or worsening	
Sell	: Relative performance of -10%			

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	84.05%	9.82%	6.13%	0.00%			
Investment Banking Services	76.67%	13.33%	10.00%	0.00%			
* Pased on recommandations in the last 12 months (as of December 21, 2010)							

* Based on recommendations in the last 12-months (as of December 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

Distribution

consent of Mirae Asset Daewoo.

<u>United Kingdom</u>: 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.

<u>United States</u>: 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 etrms 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 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.

<u>Hong Kong</u>: 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.

<u>All Other Jurisdictions</u>: 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

Tel: 1-213-262-3807

USA

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)