

## Korea Technology

### Memory market outlook; positive on supply limitation

- Due to slow migration and limited capacity increases, we now expect DRAM supply to remain tight until 2H18
- For NAND, supply constraints on the back of low yields for 3D-NAND and capacity loss from 3D conversion likely to ease in 2H18
- Reiterating Positive view; raising TPs for SEC and SK Hynix to reflect our 2017-18E EPS revisions on favourable memory market

 Negative Neutral **Positive**

**Positive**  
 (unchanged)

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**What's new:** In the face of the slow technology migration and limited capacity increases, we now expect memory supply to remain tight through 1H18. We remain Positive on the Korea Technology Sector and the memory segment in particular, and introduce new 12-month TPs for Samsung Electronics (SEC) (005930 KS, KRW2,564,000, Buy [1]) and SK Hynix (000660 KS, KRW82,900, Buy [1]) on the back of our earnings revisions to reflect new memory supply/demand assumptions.

**What's the impact: Supply constraints likely to result in stable DRAM prices/margins through to 2018.** Alongside slower technology migration to 1xnm/1ynm DRAM compared with the migration to previous nodes, we foresee only a limited increase in DRAM capacity in 2018 as memory makers allocate capacity/capex to 3D-NAND. We forecast 18% YoY bit growth in DRAM supply for 2018, similar to the growth in 2017. We believe demand should be solid as increased data traffic and cloud services for Internet datacentres drive server DRAM content growth. With DRAM prices likely to increase further in 2H17 (having risen more than 40% YTD), we expect the DRAM makers to maintain high margins in 2018, though we expect a normalised price decline from 2Q18.

**3D-NAND supply bottlenecks likely to ease in 2H18.** We expect low yield rates and capacity loss to 3D-NAND conversion to limit supply growth through 1H18, and foresee demand for mobile storage and enterprise SSD remaining solid in 2018. However, we expect the low yield rate issue for 3D-NAND to ease and expanded capacity for 3D-NAND to drive supply growth in 2H18, resulting in oversupply. Separately, while we expect continued uncertainty over the Toshiba memory deal until the acquisition is wrapped up, the ongoing dispute between Toshiba and Western Digital should be positive for the NAND market and SK Hynix.

**What we recommend:** We reiterate our Buy (1) calls on SEC and SK Hynix, as we expect the favourable memory-price environment to drive strong earnings for both companies in 2H17 and 2018. For SEC, we lift our TP to KRW3.5m (from KRW3.2m), based on an equally-blended target PER/PBR of 9.7x/2.2x (unchanged) applied to the average EPS/BVPS for 2017-18E. SEC remains our sector top pick. For SK Hynix, we raise our TP to KRW100,000 (from KRW87,000), factoring in 5-26% upward revisions to our 2017-18E EPS and a forward PER of 5.9x (unchanged) applied to our 2017-18E average EPS. The key risk: a sharp fall in smartphone demand.

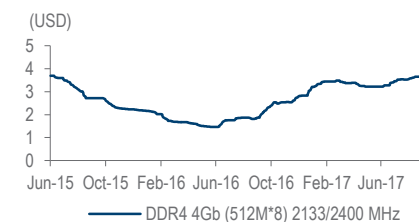
**How we differ:** We are more positive than the market on memory makers' earnings in 2017-18E.

### Key stock calls

	New	Prev.
<b>Samsung Electronics (005930 KS)</b>		
Rating	Buy	Buy
Target	3,500,000	3,200,000
Upside	▲ 36.5%	
<b>SK Hynix (000660 KS)</b>		
Rating	Buy	Buy
Target	100,000	87,000
Upside	▲ 20.6%	

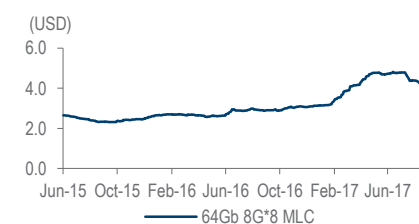
Source: Daiwa forecasts

### DRAM spot price trend



Source: DRAM exchange, Daiwa

### NAND spot price trend



Source: DRAM exchange, Daiwa

## Sector stocks: key indicators

Company Name	Stock code	Share Price	Rating		Target price (local curr.)			EPS (local curr.)					
			New	Prev.	New	Prev.	% chg	FY1			FY2		
								New	Prev.	% chg	New	Prev.	% chg
LG Display	034220 KS	30,550	Buy	Buy	44,000	44,000	0.0%	6,238	6,238	0.0%	5,100	5,100	0.0%
LG Innotek	011070 KS	154,000	Buy	Buy	240,000	240,000	0.0%	10,473	10,473	0.0%	15,645	15,645	0.0%
Samsung Electro-Mechanics	009150 KS	102,000	Buy	Buy	125,000	125,000	0.0%	3,159	3,159	0.0%	4,919	4,919	0.0%
Samsung Electronics	005930 KS	2,564,000	Buy	Buy	3,500,000	3,200,000	9.4%	304,813	296,375	2.8%	382,533	333,184	14.8%
Samsung SDI	006400 KS	198,500	Outperform	Outperform	200,000	200,000	0.0%	9,173	9,173	0.0%	14,354	14,354	0.0%
SK Hynix	000660 KS	82,900	Buy	Buy	100,000	87,000	14.9%	15,425	14,748	4.6%	18,538	14,701	26.1%

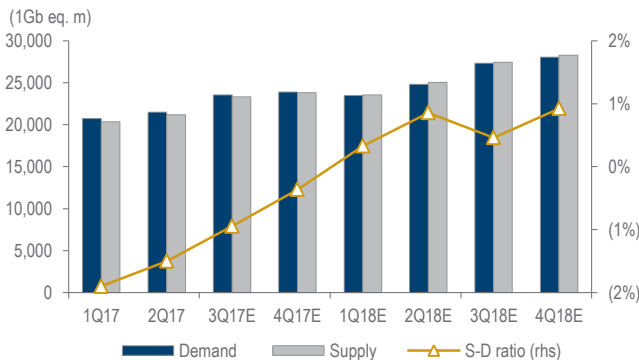
Source: Bloomberg, Daiwa forecasts

### Semiconductors: peer valuations

Company	Ticker (Bloomberg)	Price (Local curr)	Mkt cap (USDm)	PER (x)		PBR (x)		ROE (%)		EV/EBITDA (x)		Div yield (%)	
				FY17E	FY18E	FY17E	FY18E	FY17E	FY18E	FY17E	FY18E	FY17E	FY18E
Samsung Electronics*	005930 KS	2,563,000	280,619	8.4	7.4	1.8	1.4	21%	19%	3.5	3.2	1.3%	1.5%
SK Hynix*	000660 KS	83,200	46,597	5.1	5.1	1.7	1.4	38%	30%	2.8	2.5	1.1%	1.3%
Micron	MU US	38	42,290	8.0	5.1	2.4	1.7	33%	35%	5.0	3.0	0.3%	0.3%
Intel	INTC US	38	177,763	12.6	12.1	2.6	2.3	20%	19%	7.3	6.7	2.9%	3.0%
Mediatek	2454 TT	291	15,146	26.9	18.5	1.9	1.8	7%	10%	19.4	12.4	2.8%	3.4%
TSMC	2330 TT	214	182,608	16.3	14.5	3.6	3.2	23%	23%	8.0	6.9	3.4%	3.8%
Qualcomm	QCOM US	52	76,386	12.6	14.3	2.4	2.8	27%	36%	8.1	8.8	4.2%	4.5%
Nanya	2408 TT	86	7,761	12.2	11.0	2.3	2.0	22%	22%	10.1	6.9	4.0%	5.4%
<b>Average</b>				<b>12.8</b>	<b>11.0</b>	<b>2.3</b>	<b>2.1</b>	<b>23.8%</b>	<b>24.3%</b>	<b>8.0</b>	<b>6.3</b>	<b>2.5%</b>	<b>2.9%</b>

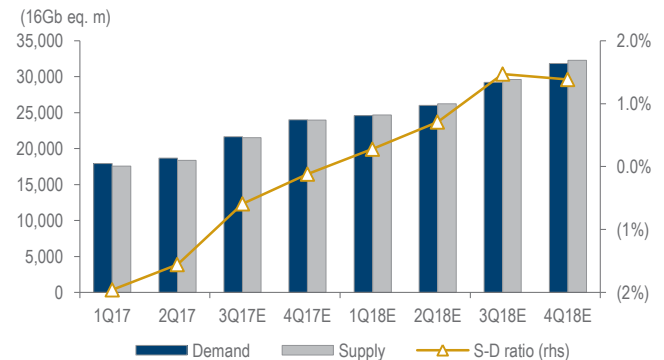
Source: Daiwa forecasts\*, Bloomberg consensus  
 Note: Prices as of close as of 29 September 2017

### DRAM supply-demand forecasts



Source: Companies, Daiwa forecasts

### NAND supply-demand forecasts



Source: Companies, Daiwa forecasts

When a report covers six or more subject companies, please access important disclosures for Daiwa Capital Markets Hong Kong Limited at [http://www.daiwacm.com/hk/research\\_disclaimer.html](http://www.daiwacm.com/hk/research_disclaimer.html) or contact your investment representative or Daiwa Capital Markets Hong Kong Limited at Level 26, One Pacific Place, 88 Queensway, Hong Kong.

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## Memory demand outlook

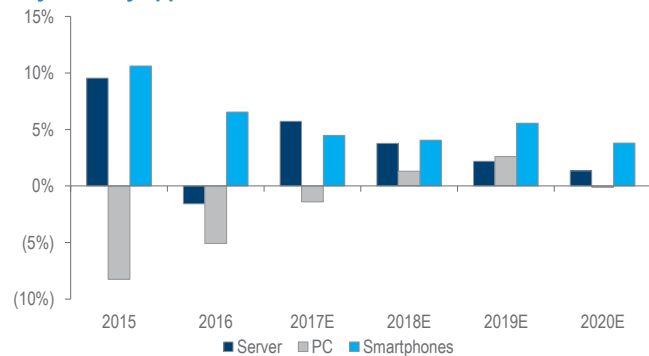
### Content growth for mobile/server applications forecast to underpin solid demand

**We look for solid memory demand in 2018, led by mobile and server applications**

We expect content growth for mobile and server applications to support solid memory demand in 2018. In addition, we forecast demand for enterprise SSD to remain solid in 2018. In sum, our forecasts call for 20% YoY growth in demand (bit growth) for DRAM and 40% YoY for NAND in 2018.

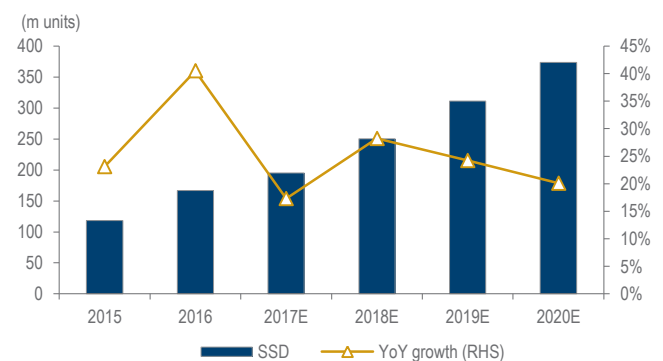
- Content growth for server applications will support DRAM demand going forward, in our view. We forecast server DRAM content to expand by 32% YoY for 2018. Separately, we expect mobile DRAM content for smartphone applications to increase by 22% YoY in 2018, given increased adoption of dual-camera modules, and for DRAM content growth for high-end smartphones to increase by 32% YoY.
- As for NAND, we expect solid demand growth for enterprise SSD in 2018, while demand for mobile storage should expand further on the back of the increased adoption of 128GB/256GB memory capacities in high-end smartphones.
- Although still a small portion of overall memory demand, demand for automotive applications will increase meaningfully from 2019-20, on our forecasts, on the back of further developments in the fields of autonomous vehicles and connected cars.

#### Key memory application demand



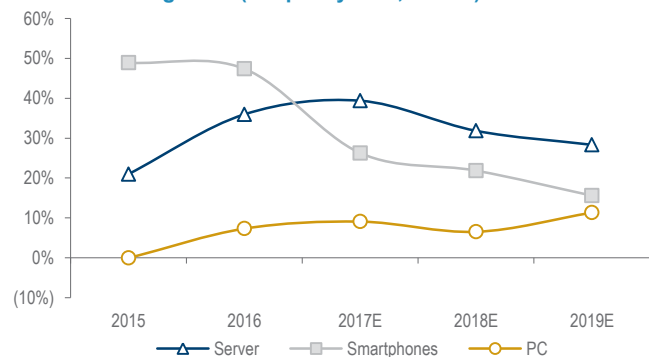
Source: Gartner (Forecast: DRAM Supply and Demand, worldwide, 1Q16-4Q18, 2Q17 Update, by Andrew Norwood)

#### Global SSD demand



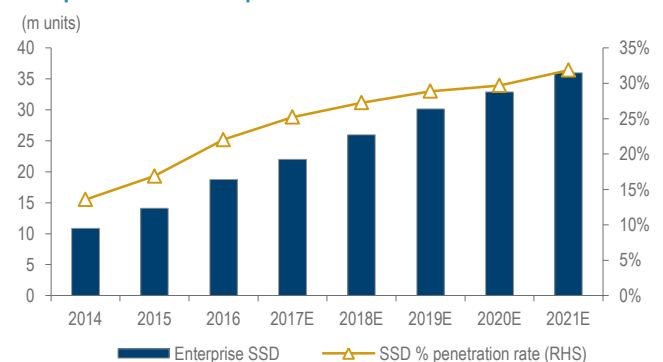
Source: Gartner (Forecast: NAND Flash Supply and Demand, worldwide, 1Q16-4Q18, 2Q17 Update, by Joseph Unsworth)

#### DRAM content growth (MB per system, YoY %)



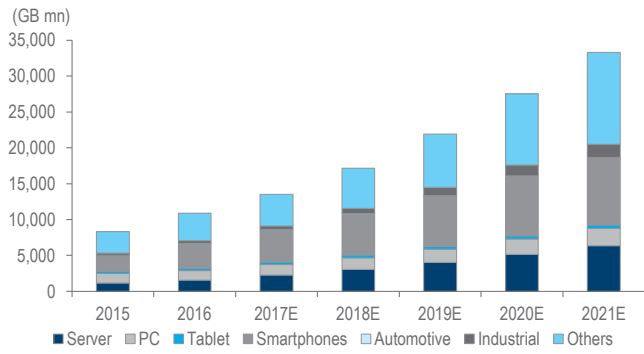
Source: Gartner (Forecast: DRAM Supply and Demand, worldwide, 1Q16-4Q18, 2Q17 Update, by Andrew Norwood)

#### SSD penetration: enterprise market



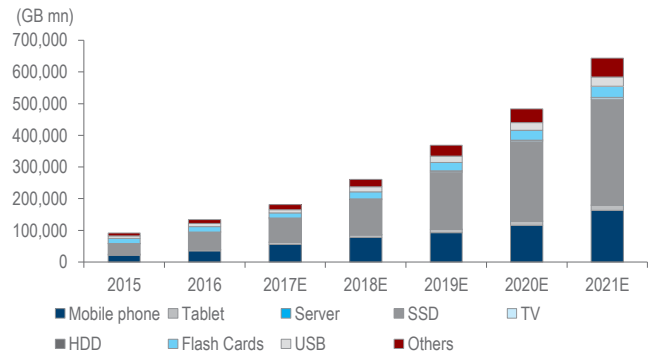
Source: Gartner (Forecast: Hard-Disk Drives, Worldwide, 2014-2021, 1Q17 Update, by John Monroe)

**DRAM consumption by application**



Source: Gartner (Forecast: DRAM Supply and Demand, worldwide, 1Q16-4Q18, 2Q17 Update, by Andrew Norwood)

**NAND consumption by application**



Source: Gartner (Forecast: NAND Flash Supply and Demand, worldwide, 1Q16-4Q18, 2Q17 Update, by Joseph Unsworth)

## Memory supply outlook

### Memory supply should remain limited through 1H18

**Memory supply to remain tight through 1H18, on our forecasts**

We expect memory supply to remain tight through 1H18. In our view, DRAM supply growth could be capped by more capacity/capex allocation issues (such as 3D-NAND), as well as slower technology migration compared with previous nodes. Also, we revise down our forecast of supply growth in NAND due to 3D-NAND conversion and the Toshiba issue. We now forecast supply bit growth of 18% YoY for DRAM and 39% YoY for NAND in 2018 (previously 22% and 42%, respectively).

### DRAM

**Slower technology migration likely to limit DRAM supply growth in 2018**

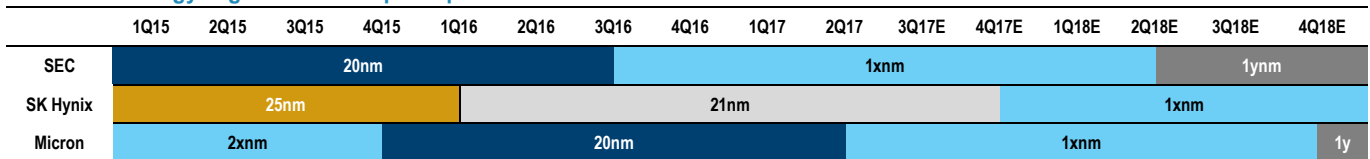
Due to slower technology migration for 1xnm/1ynm DRAM (vs previous technology nodes such as 2xnm/2ynm) and limited capacity increases, we expect growth in DRAM supply in 2018 to be similar to that for 2017.

With memory makers now allocating more capacity/capex to 3D-NAND, most have lowered their bit shipment growth guidance for 2018 to less than 20% YoY (from c.20% previously), lower than the unofficial guidance from some companies of c.20% YoY. However, we expect additional capacity increases to come on stream from end-2018, affecting the supply picture for 2019.

- SEC's planned 1xnm migration has been delayed. Previously, we had expected the 1xnm DRAM ramp-up to begin from 1H16, but SEC started mass production only in 4Q16. In addition, due to the conversion of DRAM capacity to logic on SEC's line 11 and planar NAND to 3D-NAND/DRAM on SEC's line 16, space issues and capacity losses due to conversion are likely to persist through 2018. However, we expect new capacity to come on line around end-2018. As for SK Hynix, it plans to start 1xnm DRAM mass production from the end of 2017, but we expect it will take more than 6 months to secure a stable production yield rate and new capacity in China to become available at end-2018.

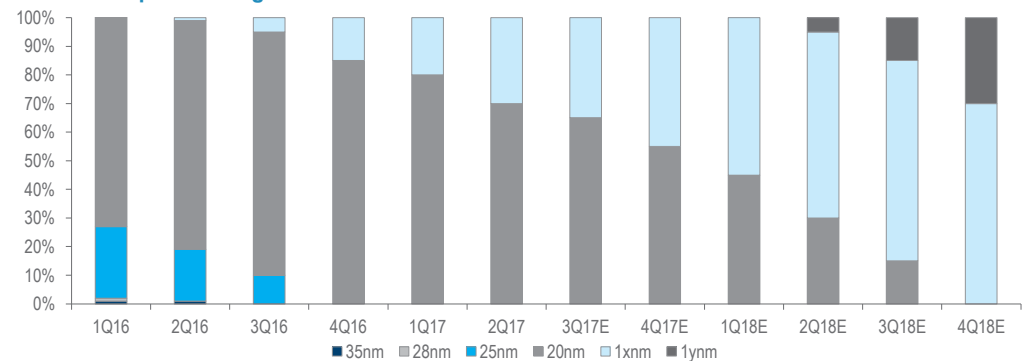
Due to the lower efficiency of 1xnm/1ynm DRAM conversion (vs 2xnm/2ynm/2znm), we expect the life cycle of 1xnm/1ynm DRAM to be longer than for previous nodes, resulting in lower supply growth until the next-generation lithography equipment, EUV, is rolled out in 2019E.

### DRAM: technology migration roadmap comparison



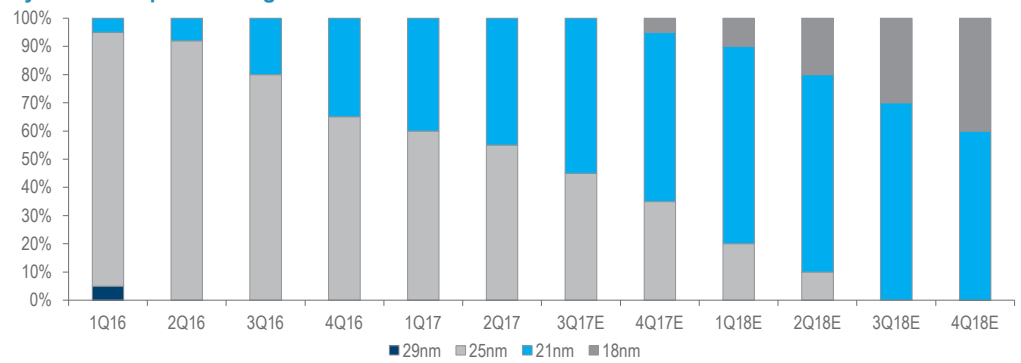
Source: Companies, Daiwa forecasts

### SEC: DRAM process migration



Source: Company, Daiwa forecasts

**Hynix: DRAM process migration**



Source: Company, Daiwa forecasts

**DRAM bit growth outlook**

	2015	2016	2017E	2018E
Samsung Electronics	31%	36%	16%	18%
SK Hynix	23%	25%	20%	19%
Micron	-1%	23%	26%	17%
<b>Total</b>	<b>21%</b>	<b>29%</b>	<b>18%</b>	<b>18%</b>

Source: Companies, Daiwa forecasts

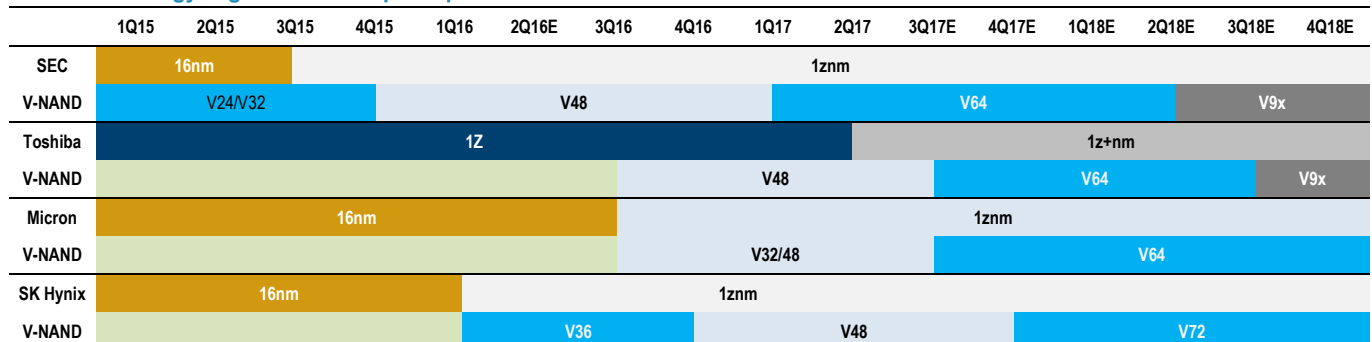
**NAND**

**3D-NAND conversion likely to limit NAND supply growth until the end of 1H18**

We believe that NAND supply growth will be limited until the end of 1H18 given the following factors: 1) continued yield issues in 3D-NAND production, and 2) capacity lost to the conversion from planar NAND to 3D-NAND. However, we believe these issues will ease in 2H18. Moreover, we expect supply from Toshiba to increase if the planned acquisition by the Bain Group-Hynix consortium goes ahead.

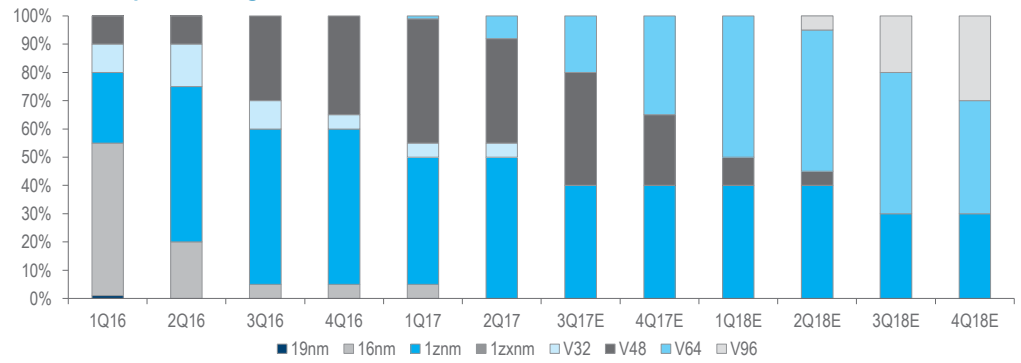
- While SEC has stabilised yields for 64-layer 3D-NAND, we now expect its bit supply growth in 2018 to fall short of our previous forecast as the conversion of line 16 to 3D-NAND will result in capacity losses. Although Toshiba and Hynix have already started mass production of 48-layer 3D-NAND, we believe yields are likely to be low currently and will ramp up only in mid-2018. Toshiba and Hynix are also preparing to start production of 64/72-layer 3D NAND from end-2017.
- Although Toshiba recently agreed to sell its memory business, the deal may only be completed after the scheduled March 2018 as there are numerous participants in the consortium and the dispute with Western Digital is ongoing. At the same time, deciding on large-scale investments could prove to be a complicated process, in our view. Delays on this front could have positive implications for the NAND industry, as they could limit supply growth.

**NAND: technology migration roadmap comparison**



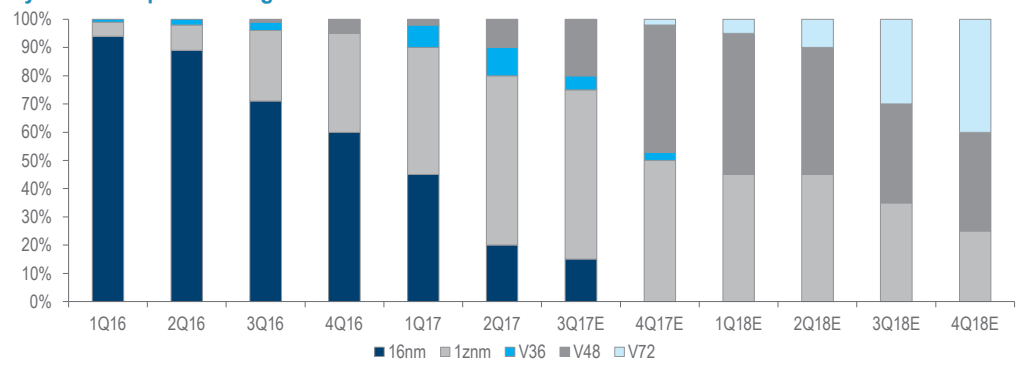
Source: Companies, Daiwa forecasts

**SEC: NAND process migration**



Source: Company, Daiwa forecasts

**Hynix: NAND process migration**



Source: Company, Daiwa forecasts

**NAND bit growth outlook**

	2016	2016	2017E	2018E
Samsung Electronics	58%	68%	31%	40%
Toshiba	32%	34%	30%	40%
Micron	24%	31%	40%	35%
SK Hynix	61%	46%	22%	27%
<b>Total</b>	<b>43%</b>	<b>49%</b>	<b>31%</b>	<b>39%</b>

Source: Companies, Daiwa forecasts



## Memory capex outlook

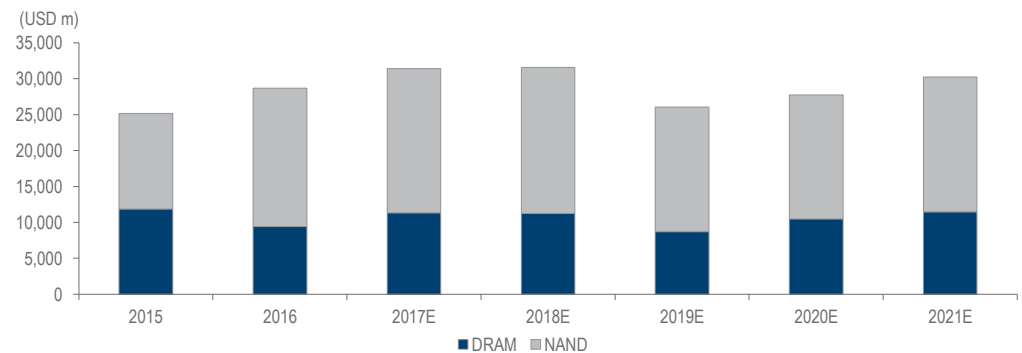
### NAND-driven capital spending likely to rise through 2018

**Gartner forecasts global memory makers' capex to increase by 9% YoY for 2017**

We expect global memory makers' capex to continue to rise in 2018 driven mainly by 3D-NAND investment. According to Gartner, global memory capex increased by 14% YoY for 2016 and is expected to grow by 9% YoY for 2017. We look for memory makers to spend USD31bn per year until end-2018, before scaling back their capex from 2019. Gartner forecasts the portion of NAND capex to increase to 64% in 2017 from 53% in 2015.

- **SEC:** We forecast SEC to spend KRW16tn on memory production lines (DRAM 40%/NAND 60%) in 2017. After capacity increases at its Pyeongtak phase 1 facility (100k wafers/month), we expect it to expand capacity for phase 2 in 2018. The company also plans to invest in phase 2 of its Xi'an, China, factory in 2019.
- **Hynix:** We estimate the company's total spending will be KRW9.6tn in 2017, with equal investments in both DRAM and NAND. It is currently focusing on 3D-NAND capacity expansion on the second floor of its M14 line, and it also plans to increase capacity at its Wuxi (China) fab from end-2018.

#### Global memory capital spending forecasts



Source: Gartner (Forecast: Semiconductor Capital Spending, Worldwide, 2Q17 Update, By Barbara Van, Bob Johnson, Takashi Ogawa, Samuel Wang and Maria Valenzuela)

## DRAM/NAND supply-demand outlook

### Tight supply likely until end-1H18

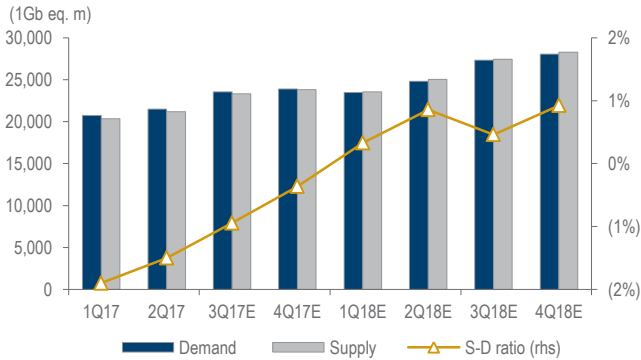
**Memory supply likely to remain tight until the end of 1H18**

While demand for DRAM/NAND remains robust, we expect tight supply-demand to persist for both DRAM/NAND until the end of 1H18 due to limited supply growth.

**DRAM:** Along with strong server demand, we also expect demand for smartphones to rebound from 2H17 with spec upgrades, such as dual-cam and 3D-sensor adoption. On the other hand, as mentioned in the supply section, DRAM supply growth could be limited until end-1H18 due to migration processes and capacity allocation issues.

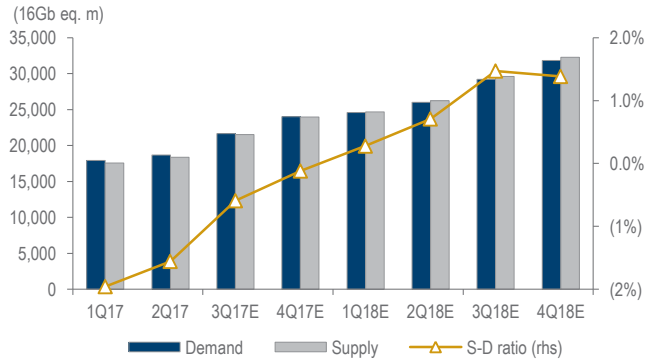
**NAND:** Demand for NAND is also robust with strong mobile/SSD demand whereas NAND supply growth will likely be limited until end-1H18, with the manufacturers' having difficulties with their conversions to 3D-NAND technologies from previous planar NAND, and also with the possible delay of completion of the Toshiba memory unit sale, resulting in limited supply growth from Toshiba. However, we expect the situation to revert to a slight oversupply from 2H18.

#### DRAM supply-demand forecasts



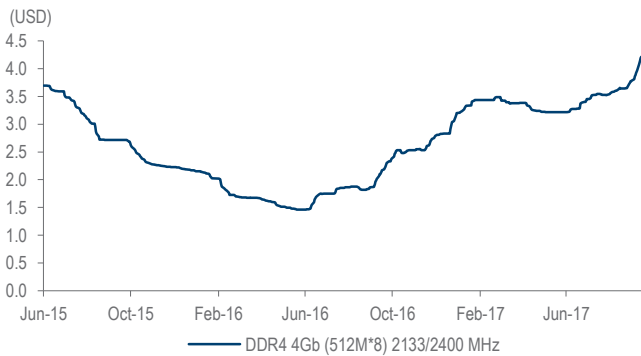
Source: Companies, Daiwa forecasts

#### NAND supply-demand forecasts



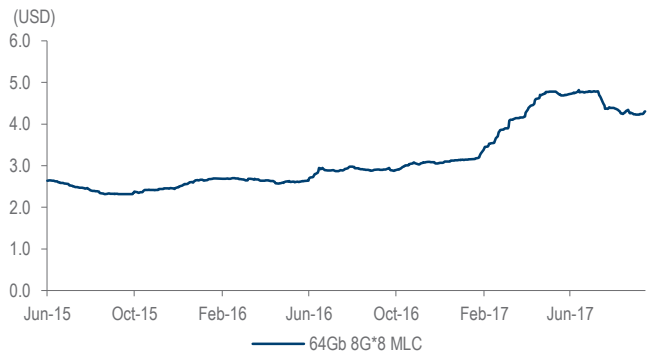
Source: Companies, Daiwa forecasts

#### DRAM spot price trend



Source: DRAM exchange, Daiwa

#### NAND spot price trend



Source: DRAM exchange, Daiwa

## Recommendations

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### Reiterating our Buy (1) calls on SEC and Hynix

**We are upbeat on both SEC and Hynix in the memory segment**

We reiterate our Buy (1) ratings on both SEC and Hynix, while raising our target prices for both stocks to factor in our upward EPS revisions.

We are revising up our 2017-18E EPS for SEC by 3-15%, given our expectation of stronger memory pricing. Our new 12-month target price for SEC of KRW3,500,000 (from KRW3,200,000) is based on an unchanged equally-blended target PER/PBR of 9.7x/2.2x applied to our average EPS/BVPS for 2017-18E.

Also, we are raising our 2017-18E EPS for Hynix by 5-26% for the same reason. Based on a forward PER of 5.9x (unchanged) applied to the average of our 2017-18E EPS, our 12-month TP for Hynix rises to KRW100,000 (from KRW87,000).

### Risks

**A sharp decline in global smartphone demand stands as the main risk**

On our forecasts, mobile applications will account for around 40% of DRAM demand and 30% of NAND demand in 2018. We expect global smartphone demand to grow continuously in 2018. However, there is a risk that, due to market saturation and/or higher ASPs resulting from the increased cost burden of key components, smartphone demand could fall short of the market's expectations. In addition, delays in the production of new high-end smartphone models, such as those with 3D-sensing cameras and OLED displays, could impact broader demand.

# Samsung Electronics (005930 KS)

 Target price: **KRW3,500,000** (from KRW3,200,000)

 Share price (29 Sep): **KRW2,564,000** | Up/downside: **+36.5%**

 5 4 3 2 **1**  
**Buy**  
 (unchanged)

## Strong memory-driven earnings set to continue in 2018

- Robust memory earnings to offset weaker display/mobile in 3Q17
- Solid earnings momentum likely to continue in 2018
- Reiterating our Buy (1) call; raising TP to KRW3,500,000

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**What's new:** Samsung Electronics (SEC) plans to announce its preliminary 3Q17 results on 13 October. We forecast the company to record revenue of KRW64.1tn (up 5% QoQ, 34% YoY) and operating profit of KRW14.5tn (up 3% QoQ, 178% YoY), 3%/1% higher than the consensus. We expect strong memory pricing to support robust earnings improvement. Hence, we revise up our 2017-18E EPS by 2-13% and raise our TP to KRW3,500,000.

**What's the impact: 3Q17 earnings preview.** Despite a likely earnings decline for its display and mobile business QoQ, we expect the strong memory price to drive overall earnings improvement QoQ. In memory, we expect high unit shipment growth (DRAM: 12%, NAND: 20% QoQ) and price increases (DRAM: up 5.5%, NAND: up 2% QoQ) to drive an increase in revenue/profit of 20%/25% QoQ. In mobile, despite increased smartphone unit sales, we expect a price decline from weak sales for the GS8 (10m units vs. 19m in 2Q17) to negatively impact earnings. In display, we estimate that a decline in LCD/rigid OLED prices and the low yield rate at the early stage of new flexible OLED for iPhones will result in a sharp decline in operating profit for 3Q17.

**Memory business to drive strong earnings in 2018.** We forecast SEC to post a further increase in earnings in 4Q17 (revenue: KRW67.7tn, operating profit: KRW15.8tn) driven by its memory division and a recovery in its OLED business. Thanks to continued strong memory prices in 2H17, we forecast SEC to post revenue of KRW258tn (up 6% YoY) and operating profit of KRW62.4tn (up 15% YoY) in 2018. We expect the memory business to contribute 63% of total operating profit in 2018 and the OLED business to record robust growth in revenue/profit of 34%/52% in 2018.

**Waiting for a new shareholder returns policy.** After the announcement of a mid-term shareholder return policy in October 2015, we expect SEC to announce a new shareholder return policy at the end of October. While there are concerns over a negative impact on cash management due to the trial of vice chairman Jay Y. Lee, we assume that SEC will continue to enhance its shareholder return policy, by focusing on dividend increases after sizable share buybacks and cancellations over the past 2 years.

**What we recommend:** We reaffirm our Buy (1) call and raise our 12-month TP to KRW3,500,000 (from KRW3,200,000), based on an unchanged equally-blended target PER/PBR of 9.7x/2.2x to our average EPS/BVPS for 2017-18E. Key risk: a sharp fall in smartphone demand.

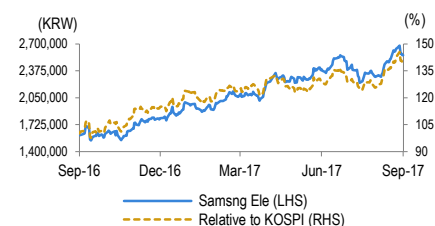
**How we differ:** Our 2017-19E EPS are 5-14% above consensus, which we attribute to our more positive view on SEC's memory earnings.

### Forecast revisions (%)

Year to 31 Dec	17E	18E	19E
Revenue change	0.1	0.7	0.8
Net profit change	1.8	13.3	11.7
Core EPS (FD) change	1.8	13.3	11.7

Source: Daiwa forecasts

### Share price performance



12-month range	1,535,000-2,681,000
Market cap (USDbn)	286.69
3m avg daily turnover (USDm)	485.77
Shares outstanding (m)	128
Major shareholder	National Pension Service (8.0%)

### Financial summary (KRW)

Year to 31 Dec	17E	18E	19E
Revenue (bn)	243,293	257,837	270,585
Operating profit (bn)	54,258	62,396	57,464
Net profit (bn)	40,865	46,030	43,195
Core EPS (fully-diluted)	304,114	377,438	372,878
EPS change (%)	95.4	24.1	(1.2)
Daiwa vs Cons. EPS (%)	4.4	12.4	7.6
PER (x)	8.4	6.8	6.9
Dividend yield (%)	1.3	1.5	1.6
DPS	33,000	38,000	40,000
PBR (x)	1.8	1.4	1.2
EV/EBITDA (x)	3.6	3.0	2.9
ROE (%)	20.8	20.7	17.3

Source: FactSet, Daiwa forecasts

## Financial summary

### Key assumptions

Year to 31 Dec	2012	2013	2014	2015	2016	2017E	2018E	2019E
DRAM bit growth (%)	n.a.	23.1	57.1	30.9	35.6	15.6	17.6	26.8
DRAM ASP (%)	n.a.	(5.7)	(8.1)	(15.3)	(26.8)	40.6	(4.1)	(23.7)
NAND bit growth (%)	n.a.	55.5	45.1	57.7	67.7	30.6	40.0	46.1
NAND ASP (%)	n.a.	(24.8)	(26.9)	(29.3)	(26.0)	21.6	(8.9)	(24.4)
LCD Area (%)	n.a.	(6.2)	17.1	(3.6)	(3.1)	(5.3)	0.8	0.9
LCD Area ASP (%)	n.a.	(22.2)	(18.2)	(7.8)	(29.5)	4.7	(16.8)	(17.6)
OLED Unit (%)	n.a.	40.1	(10.7)	24.4	41.1	32.8	33.5	18.8
OLED ASP (%)	n.a.	(3.1)	(13.1)	(1.0)	(11.6)	6.5	1.1	(0.3)

### Profit and loss (KRWbn)

Year to 31 Dec	2012	2013	2014	2015	2016	2017E	2018E	2019E
Semiconductor	34,890	37,437	39,730	47,587	51,160	75,641	89,028	92,818
IT & Mobile Communication	105,840	138,817	111,764	103,557	100,310	109,534	107,229	112,507
Other Revenue	60,374	52,439	54,712	49,510	50,397	58,118	61,580	65,259
<b>Total Revenue</b>	<b>201,104</b>	<b>228,693</b>	<b>206,206</b>	<b>200,653</b>	<b>201,867</b>	<b>243,293</b>	<b>257,837</b>	<b>270,585</b>
Other income	15,622	16,445	18,053	20,931	20,713	21,165	24,355	25,856
COGS	(126,652)	(137,696)	(128,279)	(123,482)	(120,278)	(129,750)	(133,293)	(149,790)
SG&A	(33,870)	(39,892)	(38,517)	(37,052)	(38,237)	(44,125)	(47,748)	(50,162)
Other op.expenses	(27,155)	(30,765)	(32,439)	(34,637)	(34,824)	(36,324)	(38,755)	(39,025)
<b>Operating profit</b>	<b>29,049</b>	<b>36,785</b>	<b>25,025</b>	<b>26,413</b>	<b>29,241</b>	<b>54,258</b>	<b>62,396</b>	<b>57,464</b>
Net-interest inc./(exp.)	246	842	1,240	985	916	1,057	1,501	2,224
Assoc/forex/extraord./others	619	737	1,610	(1,437)	556	98	(801)	(858)
<b>Pre-tax profit</b>	<b>29,915</b>	<b>38,364</b>	<b>27,875</b>	<b>25,961</b>	<b>30,714</b>	<b>55,414</b>	<b>63,096</b>	<b>58,830</b>
Tax	(6,070)	(7,890)	(4,481)	(6,901)	(7,988)	(13,710)	(16,233)	(14,804)
Min. int./pref. div./others	(660)	(654)	(312)	(366)	(310)	(839)	(833)	(830)
<b>Net profit (reported)</b>	<b>23,185</b>	<b>29,821</b>	<b>23,083</b>	<b>18,695</b>	<b>22,416</b>	<b>40,865</b>	<b>46,030</b>	<b>43,195</b>
<b>Net profit (adjusted)</b>	<b>23,185</b>	<b>29,821</b>	<b>23,083</b>	<b>18,695</b>	<b>22,416</b>	<b>40,865</b>	<b>46,030</b>	<b>43,195</b>
<b>EPS (reported)(KRW)</b>	<b>157,403</b>	<b>202,453</b>	<b>156,705</b>	<b>126,916</b>	<b>155,676</b>	<b>304,114</b>	<b>377,438</b>	<b>372,878</b>
<b>EPS (adjusted)(KRW)</b>	<b>157,403</b>	<b>202,453</b>	<b>156,705</b>	<b>126,916</b>	<b>155,676</b>	<b>304,114</b>	<b>377,438</b>	<b>372,878</b>
<b>EPS (adjusted fully-diluted)(KRW)</b>	<b>157,403</b>	<b>202,453</b>	<b>156,705</b>	<b>126,916</b>	<b>155,676</b>	<b>304,114</b>	<b>377,438</b>	<b>372,878</b>
<b>DPS (KRW)</b>	<b>8,000</b>	<b>14,300</b>	<b>20,000</b>	<b>21,000</b>	<b>27,500</b>	<b>33,000</b>	<b>38,000</b>	<b>40,000</b>
<b>EBIT</b>	<b>29,049</b>	<b>36,785</b>	<b>25,025</b>	<b>26,413</b>	<b>29,241</b>	<b>54,258</b>	<b>62,396</b>	<b>57,464</b>
<b>EBITDA</b>	<b>44,671</b>	<b>53,230</b>	<b>43,078</b>	<b>47,344</b>	<b>49,954</b>	<b>75,424</b>	<b>86,750</b>	<b>83,320</b>

### Cash flow (KRWbn)

Year to 31 Dec	2012	2013	2014	2015	2016	2017E	2018E	2019E
Profit before tax	29,915	38,364	27,875	25,961	30,714	55,414	63,096	58,830
Depreciation and amortisation	15,622	16,445	18,053	20,931	20,713	21,165	24,355	25,856
Tax paid	(6,070)	(7,890)	(4,481)	(6,901)	(7,988)	(13,710)	(16,233)	(14,804)
Change in working capital	(2,341)	(1,483)	2,690	(3,073)	1,673	(7,546)	(3,910)	(2,780)
Other operational CF items	847	1,270	(7,163)	3,144	2,274	(782)	5,389	1,068
<b>Cash flow from operations</b>	<b>37,973</b>	<b>46,707</b>	<b>36,975</b>	<b>40,062</b>	<b>47,386</b>	<b>54,541</b>	<b>72,697</b>	<b>68,169</b>
Capex	(22,965)	(23,158)	(22,043)	(25,880)	(24,143)	(39,627)	(35,000)	(32,000)
Net (acquisitions)/disposals	644	377	386	357	271	216	259	252
Other investing CF items	(9,000)	(21,967)	(11,149)	(1,645)	(5,787)	2,967	(6,774)	(8,796)
<b>Cash flow from investing</b>	<b>(31,322)</b>	<b>(44,747)</b>	<b>(32,806)</b>	<b>(27,168)</b>	<b>(29,659)</b>	<b>(36,444)</b>	<b>(41,515)</b>	<b>(40,544)</b>
Change in debt	249	(3,735)	105	1,608	2,408	455	(93)	150
Net share issues/(repurchases)	0	0	(1,125)	(5,015)	(7,708)	(8,767)	(8,400)	(11,000)
Dividends paid	(1,265)	(1,250)	(2,234)	(3,130)	(3,115)	(4,824)	(4,793)	(5,450)
Other financing CF items	(848)	847	197	(37)	(255)	(9,197)	(1,594)	8,623
<b>Cash flow from financing</b>	<b>(1,865)</b>	<b>(4,137)</b>	<b>(3,057)</b>	<b>(6,574)</b>	<b>(8,670)</b>	<b>(22,333)</b>	<b>(14,880)</b>	<b>(7,676)</b>
Forex effect/others	144	330	250	510	180	175	1,482	1,529
<b>Change in cash</b>	<b>4,931</b>	<b>(1,846)</b>	<b>1,362</b>	<b>6,830</b>	<b>9,237</b>	<b>(4,061)</b>	<b>17,784</b>	<b>21,477</b>
Free cash flow	15,008	23,550	14,932	14,182	23,243	14,914	37,697	36,169

Source: FactSet, Daiwa forecasts

## Financial summary continued ...

### Balance sheet (KRWbn)

As at 31 Dec	2012	2013	2014	2015	2016	2017E	2018E	2019E
Cash & short-term investment	37,448	54,496	61,817	71,493	88,182	74,144	88,111	107,254
Inventory	17,747	19,135	17,318	18,812	18,354	24,716	25,391	28,534
Accounts receivable	23,861	25,256	24,695	25,168	24,279	29,022	30,856	32,381
Other current assets	8,212	11,873	11,317	9,342	10,615	12,049	13,301	12,558
<b>Total current assets</b>	<b>87,269</b>	<b>110,760</b>	<b>115,146</b>	<b>124,815</b>	<b>141,430</b>	<b>139,931</b>	<b>157,659</b>	<b>180,727</b>
Fixed assets	68,485	75,496	80,873	86,477	91,473	111,103	122,968	130,202
Goodwill & intangibles	3,730	3,981	4,785	5,396	5,344	14,610	13,239	12,011
Other non-current assets	21,588	23,838	29,619	25,491	23,928	25,536	26,698	26,958
<b>Total assets</b>	<b>181,072</b>	<b>214,075</b>	<b>230,423</b>	<b>242,180</b>	<b>262,174</b>	<b>291,180</b>	<b>320,565</b>	<b>349,898</b>
Short-term debt	9,443	8,864	9,808	11,377	13,980	13,104	13,500	14,048
Accounts payable	9,489	8,437	7,915	6,187	6,485	9,744	10,010	11,249
Other current liabilities	28,001	34,014	34,291	32,939	34,239	35,974	35,558	35,464
<b>Total current liabilities</b>	<b>46,933</b>	<b>51,315</b>	<b>52,014</b>	<b>50,503</b>	<b>54,704</b>	<b>58,822</b>	<b>59,068</b>	<b>60,761</b>
Long-term debt	5,452	2,296	1,458	1,497	1,303	2,634	2,145	1,747
Other non-current liabilities	7,206	10,447	8,863	11,120	13,204	14,496	14,676	14,692
<b>Total liabilities</b>	<b>59,591</b>	<b>64,059</b>	<b>62,335</b>	<b>63,120</b>	<b>69,211</b>	<b>75,952</b>	<b>75,889</b>	<b>77,200</b>
Share capital	898	898	898	898	898	898	898	898
Reserves/R.E./others	116,197	143,545	161,284	171,979	185,527	206,780	235,618	262,363
<b>Shareholders' equity</b>	<b>117,094</b>	<b>144,443</b>	<b>162,182</b>	<b>172,877</b>	<b>186,424</b>	<b>207,678</b>	<b>236,515</b>	<b>263,260</b>
Minority interests	4,386	5,573	5,906	6,183	6,539	7,550	8,161	9,437
<b>Total equity &amp; liabilities</b>	<b>181,072</b>	<b>214,075</b>	<b>230,423</b>	<b>242,180</b>	<b>262,174</b>	<b>291,180</b>	<b>320,565</b>	<b>349,898</b>
EV	301,410	284,178	278,484	270,650	256,163	271,711	258,253	240,297
<b>Net debt/(cash)</b>	<b>(22,553)</b>	<b>(43,335)</b>	<b>(50,552)</b>	<b>(58,619)</b>	<b>(72,900)</b>	<b>(58,406)</b>	<b>(72,467)</b>	<b>(91,459)</b>
<b>BVPS (KRW)</b>	<b>714,032</b>	<b>881,758</b>	<b>987,982</b>	<b>1,061,204</b>	<b>1,193,688</b>	<b>1,461,599</b>	<b>1,848,413</b>	<b>2,081,083</b>

### Key ratios (%)

Year to 31 Dec	2012	2013	2014	2015	2016	2017E	2018E	2019E
Sales (YoY)	21.9	13.7	(9.8)	(2.7)	0.6	20.5	6.0	4.9
EBITDA (YoY)	52.8	19.2	(19.1)	9.9	5.5	51.0	15.0	(4.0)
Operating profit (YoY)	85.7	26.6	(32.0)	5.5	10.7	85.6	15.0	(7.9)
Net profit (YoY)	73.0	28.6	(22.6)	(19.0)	19.9	82.3	12.6	(6.2)
Core EPS (fully-diluted) (YoY)	73.0	28.6	(22.6)	(19.0)	22.7	95.4	24.1	(1.2)
Gross-profit margin	37.0	39.8	37.8	38.5	40.4	46.7	48.3	44.6
EBITDA margin	22.2	23.3	20.9	23.6	24.7	31.0	33.6	30.8
Operating-profit margin	14.4	16.1	12.1	13.2	14.5	22.3	24.2	21.2
Net profit margin	11.5	13.0	11.2	9.3	11.1	16.8	17.9	16.0
ROAE	21.6	22.8	15.1	11.2	12.5	20.8	20.7	17.3
ROAA	13.8	15.1	10.4	7.9	8.9	14.8	15.0	12.9
ROCE	23.0	24.7	14.7	14.2	14.6	24.7	25.4	20.9
ROIC	24.6	28.4	18.7	16.3	18.0	29.5	28.2	24.3
Net debt to equity	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Effective tax rate	20.3	20.6	16.1	26.6	26.0	24.7	25.7	25.2
Accounts receivable (days)	41.6	39.2	44.2	45.4	44.7	40.0	42.4	42.7
Current ratio (x)	1.9	2.2	2.2	2.5	2.6	2.4	2.7	3.0
Net interest cover (x)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Net dividend payout	5.1	7.1	12.8	16.5	17.7	10.9	10.1	10.7
Free cash flow yield	4.6	7.2	4.5	4.3	7.1	4.5	11.5	11.0

Source: FactSet, Daiwa forecasts

## Company profile

Samsung Electronics Co., Ltd. manufactures a range of consumer and industrial electronic equipment and products, such as semiconductors, display panels, handsets, personal computers, and peripherals. The company had global market shares of 48% in DRAM (2016), 17% in large-size display panels (2016), and 22% in Consumer Electronics (2016).

**SEC: 3Q17 results preview (Daiwa forecasts vs. Bloomberg consensus)**

(KRW tn)	3Q17*	2Q17	QoQ growth	3Q16	YoY growth	BBG consensus**	Diff.
Revenue	64.1	61.0	5.1%	47.8	34.0%	61.9	3.5%
Operating profit	14.5	14.1	2.8%	5.2	178.1%	14.4	0.3%
OP margin	22.6%	23.1%	-0.5%p	10.9%	11.7%p	23.3%	-0.7%p
Net profit	10.9	10.8	0.5%	4.4	146.3%	10.8	0.1%

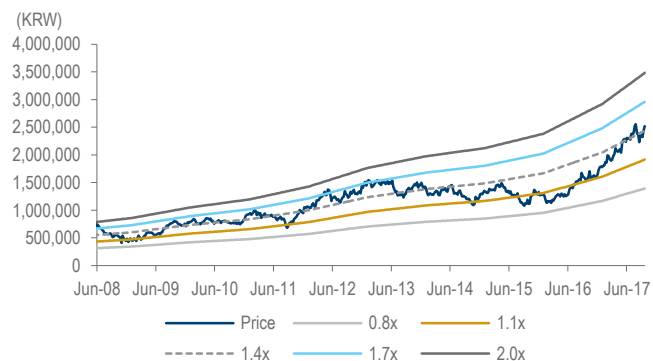
Source: Companies, Bloomberg, Daiwa forecasts  
Note: \*Daiwa estimates, \*\*Bloomberg 28-days consensus as of 28 September

**SEC: earnings outlook by division**

(KRW bn)	1Q17	2Q17	3Q17E	4Q17E	2016	2017E	2018E	2019E
<b>Sales revenue</b>	<b>50,548</b>	<b>61,000</b>	<b>64,087</b>	<b>67,658</b>	<b>201,866</b>	<b>243,293</b>	<b>257,837</b>	<b>270,585</b>
Semiconductor	15,660	17,580	20,352	22,049	51,160	75,641	89,028	92,818
DRAM	7,164	8,396	9,921	10,514	22,049	35,996	40,293	38,670
NAND	4,821	5,399	6,608	7,466	15,299	24,295	30,734	33,913
System LSI	3,603	3,673	3,700	3,938	13,389	14,914	17,498	19,730
Display	7,290	7,710	8,376	9,979	26,940	33,355	39,608	43,538
LCD	2,859	2,923	2,736	2,675	11,357	11,194	9,413	7,825
OLED	4,424	4,791	5,640	7,305	15,607	22,159	29,705	35,189
IT & Mobile Communications	23,500	30,010	28,192	27,832	100,310	109,534	107,229	112,507
Handset	20,848	27,870	26,157	25,303	88,623	100,177	98,997	105,100
Consumer Electronics	10,340	10,920	11,271	12,036	47,050	44,567	40,839	39,607
<b>Operating profit</b>	<b>9,898</b>	<b>14,070</b>	<b>14,462</b>	<b>15,831</b>	<b>29,241</b>	<b>54,262</b>	<b>62,396</b>	<b>57,464</b>
Semiconductor	6,310	8,030	9,941	10,972	13,590	35,252	40,810	35,481
DRAM	3,916	5,099	6,293	6,814	8,524	22,122	25,159	21,262
NAND	2,017	2,550	3,241	3,717	3,695	11,525	14,124	12,287
System LSI	379	372	406	440	972	1,597	1,527	1,932
Display	1,300	1,710	866	1,423	2,230	5,299	7,237	8,194
LCD	329	600	298	228	-657	1,455	1,400	1,183
OLED	979	1,108	568	1,195	2,848	3,851	5,837	7,011
IT & Mobile Communications	2,070	4,060	3,239	2,926	10,810	12,295	12,737	12,137
Handset	1,905	3,844	3,192	2,877	9,816	11,818	12,745	12,302
Consumer Electronics	380	320	416	510	2,740	1,627	1,582	1,502
<b>OP margin</b>	<b>19.6%</b>	<b>23.1%</b>	<b>22.6%</b>	<b>23.4%</b>	<b>14.5%</b>	<b>22.3%</b>	<b>24.2%</b>	<b>21.2%</b>
Semiconductor	40.3%	45.7%	48.8%	49.8%	26.6%	46.6%	45.8%	38.2%
DRAM	54.7%	60.7%	63.4%	64.8%	38.7%	61.5%	62.4%	55.0%
NAND	41.8%	47.2%	49.0%	49.8%	24.2%	47.4%	46.0%	36.2%
System LSI	10.5%	10.1%	11.0%	11.2%	7.3%	10.7%	8.7%	9.8%
Display	17.8%	22.2%	10.3%	14.3%	8.3%	15.9%	18.3%	18.8%
LCD	11.5%	20.5%	10.9%	8.5%	-5.8%	13.0%	14.9%	15.1%
OLED	22.1%	23.1%	10.1%	16.4%	18.2%	17.4%	19.7%	19.9%
IT & Mobile Communications	8.8%	13.5%	11.5%	10.5%	10.8%	11.2%	11.9%	10.8%
Handset	9.1%	13.8%	12.2%	11.4%	11.1%	11.8%	12.9%	11.7%
Consumer Electronics	3.7%	2.9%	3.7%	4.2%	5.8%	3.6%	3.9%	3.8%

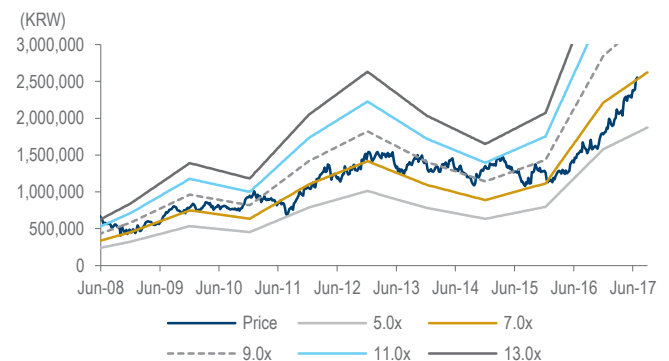
Source: Company, Daiwa forecasts

**SEC: 12-month forward PBR band**



Source: Company, Bloomberg, Daiwa estimates

**SEC: 12-month forward PER band**



Source: Company, Bloomberg, Daiwa estimates

# SK Hynix (000660 KS)

 Target price: **KRW100,000** (from KRW87,000)

 Share price (29 Sep): **KRW82,900** | Up/downside: **+20.6%**

 5 4 3 2 **1**  
**Buy**  
 (unchanged)

## Favourable memory market likely to continue in 2018

- Strong memory price to drive earnings in 3Q17
- Further earnings upside likely in 4Q17 from favourable memory market
- Reiterating our Buy (1) call; raising TP to KRW100,000

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**What's new:** We now forecast SK Hynix to post 3Q17 revenue of KRW8.1tn (up 21% QoQ) and operating profit of KRW4.0tn (up 31% QoQ), which is 1.9%/4.8% higher than the consensus likely due to stronger memory prices. Hence, we raise our 2017-19E EPS by 5-26% and TP to KRW100,000 due to a stronger memory price than we previously expected.

**What's the impact: 3Q17 earnings preview.** Thanks to solid demand for servers and increased mobile demand on the back of new smartphone launches, we expect memory prices to increase further in 3Q17 (DRAM: 6%, NAND: 4% QoQ). Due to higher bit shipment growth (DRAM: 11%, NAND: 23% QoQ), we expect SK Hynix to record strong earnings in 3Q17. In addition, as the memory price increase is likely to continue in 4Q17, we expect the company to see further upside to its earnings in 4Q17. (revenue: KRW8.7tn, operating profit: KRW4.4tn)

**Strong earnings momentum likely to continue in 2018.** Due to slower technology migration for 1xnm/1ynm DRAM and a limited capacity increase, we expect the tight supply situation for DRAM to continue with a marginal price decline in 2018. We also expect the low yield rate and capacity loss from 3D-NAND conversion to limit supply growth until 1H18. We now forecast SK Hynix to post revenue of KRW34.7tn (up 16% YoY) and operating profit of KRW16.8tn (up 21% YoY) in 2018 thanks to a favourable memory market.

**Cash management.** Given strong earnings improvement, we expect SK Hynix to enhance shareholder returns, gradually increasing dividends to achieve a 20% target payout ratio by 2018. Separately, SK Hynix held a board of directors meeting on 27 September and decided to invest JPY395bn as part of the deal for Toshiba Memory Corporation (TMC), of which JPY129bn will be invested as convertible bonds so that it can secure 15% of shares with voting rights. We see some uncertainty due to many participants in the consortium led by Bain Capital until completion of the acquisition. The ongoing dispute between Toshiba (6052 JP; JPY311; Not rated) and Western Digital (WDC US; USD83; Not rated) should also be positive for SK Hynix as we believe it could emerge as a new partner for the current joint venture.

**What we recommend:** We reaffirm our Buy (1) call and raise our 12-month TP to KRW100,000 (from KRW87,000) to factor in our 2017-18E EPS revisions of 5-26%. Our TP is based on an unchanged forward PER of 5.9x applied to 2017-18E average EPS. Key risk: a sharp fall in smartphone demand.

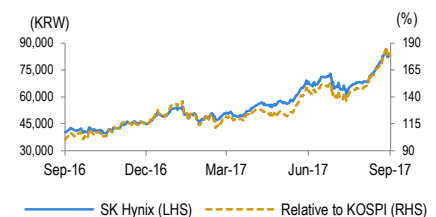
**How we differ:** Our 2017-19E EPS are 6-20% higher than the Bloomberg consensus as we are more positive on the memory market over the period.

### Forecast revisions (%)

Year to 31 Dec	17E	18E	19E
Revenue change	3.3	11.7	7.7
Net profit change	4.6	26.1	19.3
Core EPS (FD) change	4.6	26.1	19.3

Source: Daiwa forecasts

### Share price performance



12-month range	39,650-86,300
Market cap (USDbn)	51.10
3m avg daily turnover (USDm)	253.52
Shares outstanding (m)	706
Major shareholder	SK Telecom (20.8%)

### Financial summary (KRW)

Year to 31 Dec	17E	18E	19E
Revenue (bn)	29,830	34,690	35,031
Operating profit (bn)	13,916	16,802	14,489
Net profit (bn)	10,890	13,088	11,323
Core EPS (fully-diluted)	15,425	18,538	16,038
EPS change (%)	274.4	20.2	(13.5)
Daiwa vs Cons. EPS (%)	6.0	20.2	16.1
PER (x)	5.4	4.5	5.2
Dividend yield (%)	1.0	1.2	1.2
DPS	800	1,000	1,000
PBR (x)	1.8	1.4	1.1
EV/EBITDA (x)	3.0	2.2	2.0
ROE (%)	38.8	35.6	24.3

Source: FactSet, Daiwa forecasts



## Financial summary

### Key assumptions

Year to 31 Dec	2012	2013	2014	2015	2016	2017E	2018E	2019E
DRAM bit growth (%)	n.a.	34.1	33.4	23.0	24.7	20.0	19.2	26.7
DRAM ASP (%)	n.a.	7.5	2.2	(19.5)	(30.4)	48.2	(2.6)	(21.7)
NAND bit growth (%)	n.a.	45.9	58.0	60.9	45.9	21.6	26.7	38.4
NAND ASP (%)	n.a.	(7.9)	(38.0)	(22.9)	(28.5)	37.3	(6.8)	(22.9)

### Profit and loss (KRWbn)

Year to 31 Dec	2012	2013	2014	2015	2016	2017E	2018E	2019E
DRAM	7,229	10,229	13,286	14,058	12,363	22,142	25,747	25,545
NAND	2,536	3,409	3,340	4,144	4,320	7,209	8,515	9,082
Other Revenue	397	526	500	596	515	479	428	404
<b>Total Revenue</b>	<b>10,162</b>	<b>14,165</b>	<b>17,126</b>	<b>18,798</b>	<b>17,198</b>	<b>29,830</b>	<b>34,690</b>	<b>35,031</b>
Other income	0	0	0	0	0	0	0	0
COGS	(8,551)	(8,865)	(9,462)	(10,515)	(10,787)	(11,634)	(12,297)	(14,849)
SG&A	(1,839)	(1,921)	(2,554)	(2,947)	(3,134)	(4,280)	(5,591)	(5,693)
Other op. expenses	0	0	0	0	0	0	0	0
<b>Operating profit</b>	<b>(227)</b>	<b>3,380</b>	<b>5,109</b>	<b>5,336</b>	<b>3,277</b>	<b>13,916</b>	<b>16,802</b>	<b>14,489</b>
Net-interest inc./(exp.)	(238)	(190)	(118)	(78)	(86)	(108)	(101)	(76)
Assoc/forex/extraord./others	266	(115)	56	11	26	(152)	(357)	(385)
<b>Pre-tax profit</b>	<b>(199)</b>	<b>3,075</b>	<b>5,048</b>	<b>5,269</b>	<b>3,216</b>	<b>13,655</b>	<b>16,344</b>	<b>14,029</b>
Tax	41	(202)	(853)	(946)	(256)	(2,763)	(3,253)	(2,703)
Min. int./pref. div./others	(0)	(0)	0	(1)	(7)	(2)	(3)	(3)
<b>Net profit (reported)</b>	<b>(159)</b>	<b>2,872</b>	<b>4,195</b>	<b>4,322</b>	<b>2,954</b>	<b>10,890</b>	<b>13,088</b>	<b>11,323</b>
<b>Net profit (adjusted)</b>	<b>(159)</b>	<b>2,872</b>	<b>4,195</b>	<b>4,322</b>	<b>2,954</b>	<b>10,890</b>	<b>13,088</b>	<b>11,323</b>
<b>EPS (reported)(KRW)</b>	<b>(233)</b>	<b>4,099</b>	<b>5,842</b>	<b>5,937</b>	<b>4,120</b>	<b>15,425</b>	<b>18,538</b>	<b>16,038</b>
<b>EPS (adjusted)(KRW)</b>	<b>(233)</b>	<b>4,099</b>	<b>5,842</b>	<b>5,937</b>	<b>4,120</b>	<b>15,425</b>	<b>18,538</b>	<b>16,038</b>
<b>EPS (adjusted fully-diluted)(KRW)</b>	<b>(233)</b>	<b>4,099</b>	<b>5,842</b>	<b>5,937</b>	<b>4,120</b>	<b>15,425</b>	<b>18,538</b>	<b>16,038</b>
<b>DPS (KRW)</b>	<b>0</b>	<b>0</b>	<b>300</b>	<b>500</b>	<b>600</b>	<b>800</b>	<b>1,000</b>	<b>1,000</b>
<b>EBIT</b>	<b>(227)</b>	<b>3,380</b>	<b>5,109</b>	<b>5,336</b>	<b>3,277</b>	<b>13,916</b>	<b>16,802</b>	<b>14,489</b>
<b>EBITDA</b>	<b>2,976</b>	<b>6,458</b>	<b>8,553</b>	<b>9,289</b>	<b>7,733</b>	<b>18,940</b>	<b>22,374</b>	<b>20,395</b>

### Cash flow (KRWbn)

Year to 31 Dec	2012	2013	2014	2015	2016	2017E	2018E	2019E
Profit before tax	(199)	3,075	5,048	5,269	3,216	13,655	16,344	14,029
Depreciation and amortisation	3,204	3,079	3,444	3,953	4,456	5,024	5,572	5,906
Tax paid	41	(202)	(853)	(946)	(256)	(2,763)	(3,253)	(2,703)
Change in working capital	(733)	148	(640)	1,157	(1,106)	(2,082)	(962)	(407)
Other operational CF items	(100)	273	(1,133)	(114)	(762)	(746)	(528)	(1,493)
<b>Cash flow from operations</b>	<b>2,212</b>	<b>6,372</b>	<b>5,867</b>	<b>9,320</b>	<b>5,549</b>	<b>13,089</b>	<b>17,172</b>	<b>15,332</b>
Capex	(3,773)	(3,206)	(4,801)	(6,775)	(5,956)	(9,634)	(6,959)	(6,929)
Net (acquisitions)/disposals	36	16	199	220	162	27	34	34
Other investing CF items	(961)	(1,702)	(1,486)	(571)	(436)	(3,892)	(6,370)	(6,370)
<b>Cash flow from investing</b>	<b>(4,698)</b>	<b>(4,892)</b>	<b>(6,088)</b>	<b>(7,126)</b>	<b>(6,230)</b>	<b>(13,500)</b>	<b>(13,295)</b>	<b>(13,265)</b>
Change in debt	(304)	(1,895)	(402)	(356)	517	194	(179)	(171)
Net share issues/(repurchases)	2,335	432	827	(859)	0	0	0	0
Dividends paid	0	0	0	(218)	(353)	(424)	(582)	(728)
Other financing CF items	(113)	(37)	(396)	(29)	(48)	503	311	1,383
<b>Cash flow from financing</b>	<b>1,917</b>	<b>(1,500)</b>	<b>28</b>	<b>(1,462)</b>	<b>117</b>	<b>273</b>	<b>(450)</b>	<b>484</b>
Forex effect/others	(264)	(94)	(129)	(58)	(38)	45	(80)	(80)
<b>Change in cash</b>	<b>(833)</b>	<b>(114)</b>	<b>(321)</b>	<b>674</b>	<b>(603)</b>	<b>(92)</b>	<b>3,346</b>	<b>2,471</b>
Free cash flow	(1,561)	3,166	1,066	2,545	(407)	3,455	10,213	8,403

Source: FactSet, Daiwa forecasts

## Financial summary continued ...

### Balance sheet (KRWbn)

As at 31 Dec	2012	2013	2014	2015	2016	2017E	2018E	2019E
Cash & short-term investment	1,785	2,786	4,055	4,791	4,136	4,687	11,042	19,711
Inventory	1,509	1,178	1,498	1,923	2,026	2,430	2,569	3,102
Accounts receivable	1,720	1,942	3,733	2,628	3,252	5,623	6,540	6,604
Other current assets	300	747	1,078	417	425	454	456	456
<b>Total current assets</b>	<b>5,314</b>	<b>6,653</b>	<b>10,364</b>	<b>9,760</b>	<b>9,839</b>	<b>13,195</b>	<b>20,607</b>	<b>29,872</b>
Fixed assets	11,586	12,130	14,090	16,966	18,777	23,829	25,508	26,827
Goodwill & intangibles	984	1,110	1,337	1,705	1,916	2,172	2,215	2,246
Other non-current assets	765	903	1,092	1,246	1,684	2,152	2,152	2,152
<b>Total assets</b>	<b>18,649</b>	<b>20,796</b>	<b>26,883</b>	<b>29,677</b>	<b>32,216</b>	<b>41,347</b>	<b>50,481</b>	<b>61,098</b>
Short-term debt	2,719	870	1,755	1,013	705	810	778	748
Accounts payable	593	649	788	791	696	884	935	1,129
Other current liabilities	1,129	1,559	3,222	3,036	2,760	3,294	3,337	3,333
<b>Total current liabilities</b>	<b>4,441</b>	<b>3,078</b>	<b>5,765</b>	<b>4,841</b>	<b>4,161</b>	<b>4,989</b>	<b>5,050</b>	<b>5,210</b>
Long-term debt	3,753	3,706	2,420	2,805	3,631	3,720	3,573	3,432
Other non-current liabilities	715	946	662	644	401	448	461	464
<b>Total liabilities</b>	<b>8,909</b>	<b>7,730</b>	<b>8,847</b>	<b>8,290</b>	<b>8,192</b>	<b>9,156</b>	<b>9,085</b>	<b>9,106</b>
Share capital	3,488	3,569	3,658	3,658	3,658	3,658	3,658	3,658
Reserves/R.E./others	6,252	9,499	14,379	17,729	20,359	28,523	37,728	48,323
<b>Shareholders' equity</b>	<b>9,740</b>	<b>13,067</b>	<b>18,036</b>	<b>21,387</b>	<b>24,017</b>	<b>32,181</b>	<b>41,386</b>	<b>51,981</b>
Minority interests	(1)	(0)	(0)	1	7	11	11	11
<b>Total equity &amp; liabilities</b>	<b>18,649</b>	<b>20,797</b>	<b>26,883</b>	<b>29,678</b>	<b>32,216</b>	<b>41,348</b>	<b>50,481</b>	<b>61,098</b>
EV	62,449	59,415	57,555	56,309	57,051	56,229	49,695	40,855
<b>Net debt/(cash)</b>	<b>4,687</b>	<b>1,790</b>	<b>120</b>	<b>(973)</b>	<b>200</b>	<b>(157)</b>	<b>(6,691)</b>	<b>(15,531)</b>
<b>BVPS (KRW)</b>	<b>14,031</b>	<b>18,399</b>	<b>24,775</b>	<b>29,379</b>	<b>34,028</b>	<b>45,597</b>	<b>58,635</b>	<b>73,642</b>

### Key ratios (%)

Year to 31 Dec	2012	2013	2014	2015	2016	2017E	2018E	2019E
Sales (YoY)	(2.2)	39.4	20.9	9.8	(8.5)	73.5	16.3	1.0
EBITDA (YoY)	(22.4)	117.0	32.4	8.6	(16.8)	144.9	18.1	(8.8)
Operating profit (YoY)	n.a.	n.a.	51.2	4.4	(38.6)	324.7	20.7	(13.8)
Net profit (YoY)	n.a.	n.a.	46.1	3.0	(31.7)	268.7	20.2	(13.5)
Core EPS (fully-diluted) (YoY)	n.a.	n.a.	42.5	1.6	(30.6)	274.4	20.2	(13.5)
Gross-profit margin	15.9	37.4	44.8	44.1	37.3	61.0	64.6	57.6
EBITDA margin	29.3	45.6	49.9	49.4	45.0	63.5	64.5	58.2
Operating-profit margin	n.a.	23.9	29.8	28.4	19.1	46.6	48.4	41.4
Net profit margin	(1.6)	20.3	24.5	23.0	17.2	36.5	37.7	32.3
ROAE	n.a.	25.2	27.0	21.9	13.0	38.8	35.6	24.3
ROAA	n.a.	14.6	17.6	15.3	9.5	29.6	28.5	20.3
ROCE	n.a.	20.0	25.6	22.5	12.2	42.8	40.7	28.4
ROIC	(1.7)	21.6	25.7	22.7	13.5	39.5	40.3	32.9
Net debt to equity	48.1	13.7	0.7	n.a.	0.8	n.a.	n.a.	n.a.
Effective tax rate	n.a.	6.6	16.9	17.9	8.0	20.2	19.9	19.3
Accounts receivable (days)	58.6	47.2	60.5	61.8	62.4	54.3	64.0	68.5
Current ratio (x)	1.2	2.2	1.8	2.0	2.4	2.6	4.1	5.7
Net interest cover (x)	n.a.	17.8	43.2	68.6	38.1	128.5	166.3	191.3
Net dividend payout	n.a.	0.0	5.1	8.4	14.6	5.2	5.4	6.2
Free cash flow yield	n.a.	5.4	1.8	4.3	n.a.	5.9	17.4	14.4

Source: FactSet, Daiwa forecasts

## Company profile

SK Hynix manufactures semiconductors, such as dynamic random access memory (DRAM) and NAND flash memory. Formerly known as "Hynix", the company was acquired by SK Group in November 2011 and renamed "SK Hynix" in March 2013. Currently, SK Hynix is the world's No.2 player in the DRAM market and has competitive technology in the NAND business as well. SK Telecom is the biggest stakeholder, currently holding 21% of SK Hynix's outstanding shares.

**Hynix: 3Q17 results preview (Daiwa forecasts vs. Bloomberg consensus)**

(KRW bn)	3Q17*	2Q17	QoQ growth	3Q16	YoY growth	BBG consensus**	Diff.
Revenue	8119.6	6692.3	21.3%	4243.6	91.3%	7968.0	1.9%
Operating profit	4001.8	3050.7	31.2%	726.0	451.2%	3803.0	5.2%
OP margin	49.3%	45.6%	3.7%p	17.1%	32.2%p	47.7%	1.6%p
Net profit	3134.2	2468.5	27.0%	597.8	424.3%	2971.0	5.5%

Source: Companies, Bloomberg, Daiwa forecasts

Note: \*Daiwa estimates, \*\*Bloomberg 28-days consensus as of 28 September

**Hynix: earnings forecasts by division**

(KRW bn)	1Q17	2Q17	3Q17E	4Q17E	2016	2017E	2018E	2019E
Sales	6,290	6,692	8,120	8,729	17,199	29,830	34,690	35,031
DRAM	4,655	5,086	6,109	6,292	12,363	22,142	25,747	25,545
NAND	1,510	1,472	1,900	2,326	4,320	7,209	8,515	9,082
Operating profit	2,468	3,051	4,002	4,396	3,277	13,916	16,802	14,489
DRAM	2,277	2,772	3,598	3,824	3,193	12,471	15,030	13,363
NAND	192	245	404	572	-125	1,412	1,772	1,126
OP margin (%)	39.2%	45.6%	49.3%	50.4%	19.1%	46.7%	48.4%	41.4%
DRAM	48.9%	54.5%	58.9%	60.8%	25.8%	56.3%	58.4%	52.3%
NAND	12.7%	16.6%	21.2%	24.6%	-2.9%	19.6%	20.8%	12.4%

Source: Company, Daiwa forecasts

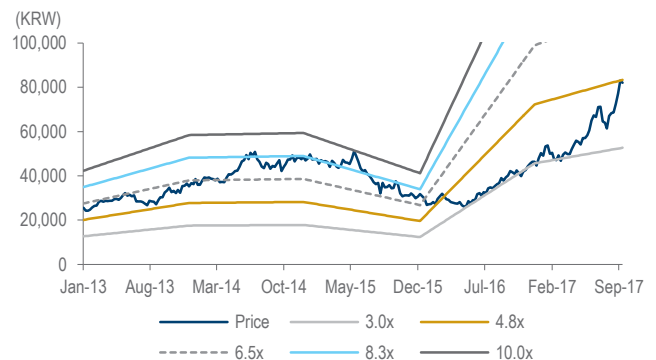
**Hynix: key assumptions forecasts**

	1Q17	2Q17	3Q17E	4Q17E	2016	2017E	2018E	2019E
<b>DRAM</b>								
Bit growth (q-q%)	-4.5%	2.5%	11.0%	0.0%	24.7%	20.0%	19.2%	26.7%
ASP (q-q%)	24.0%	10.7%	6.0%	3.0%	-30.4%	48.2%	-2.6%	-21.7%
<b>NAND</b>								
Bit growth (q-q%)	-3.0%	-6.2%	23.0%	20.0%	45.9%	21.6%	26.7%	38.4%
ASP (q-q%)	15.0%	8.0%	4.0%	2.0%	-28.5%	37.3%	-6.8%	-22.9%

Source: Company, Daiwa forecasts

**Hynix: 12-month forward PBR band**


Source: Company, Bloomberg, Daiwa estimates

**Hynix: 12-month forward PER band**


Source: Company, Bloomberg, Daiwa estimates

**Peer comparison**

Company	Ticker (Bloomberg)	Price (Local curr)	Mkt cap (USDm)	P/E (x)		P/BV (x)		ROE (%)		EV/EBITDA (x)		Div yield (%)	
				FY17	FY18	FY17	FY18	FY17	FY18	FY17	FY18	FY17	FY18
<b>Coverage</b>													
SK Hynix*	000660 KS	83,200	46,597	5.1	5.1	1.7	1.4	38%	30%	2.8	2.5	1.1%	1.3%
Samsung Electronics*	005930 KS	2,563,000	280,619	8.4	7.4	1.8	1.4	21%	19%	3.5	3.2	1.3%	1.5%
Micron	MU US	38	42,290	8.0	5.1	2.4	1.7	33%	35%	5.0	3.0	0.3%	0.3%
Intel	INTC US	38	177,763	12.6	12.1	2.6	2.3	20%	19%	7.3	6.7	2.9%	3.0%
Mediatek	2454 TT	291	15,146	26.9	18.5	1.9	1.8	7%	10%	19.4	12.4	2.8%	3.4%
TSMC	2330 TT	214	182,608	16.3	14.5	3.6	3.2	23%	23%	8.0	6.9	3.4%	3.8%
Qualcomm	QCOM US	52	76,386	12.6	14.3	2.4	2.8	27%	36%	8.1	8.8	4.2%	4.5%
Nanya	2408 TT	86	7,761	12.2	11.0	2.3	2.0	22%	22%	10.1	6.9	4.0%	5.4%
<b>Average**</b>				<b>13.9</b>	<b>11.9</b>	<b>2.4</b>	<b>2.2</b>	<b>21.8%</b>	<b>23.4%</b>	<b>8.8</b>	<b>6.8</b>	<b>2.7%</b>	<b>3.1%</b>

Source: Bloomberg, Daiwa forecasts

Note: Price close as of 28 September 2017, \*Daiwa forecasts for SK Hynix, Samsung Electronics, \*\*Average except for SK Hynix

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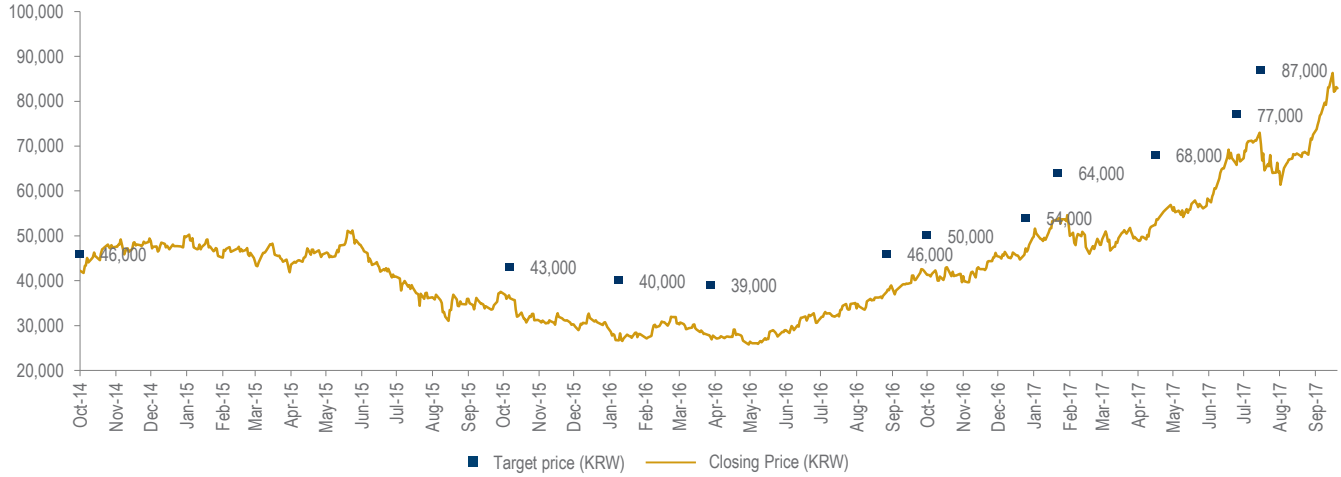
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**SK Hynix: share price and Daiwa recommendation trend**

Date	Target Price	Rating	Date	Target price	Rating	Date	Target price	Rating
16/10/15	43,000	Buy	10/10/16	50,000	Buy	04/07/17	77,000	Buy
18/01/16	40,000	Buy	03/01/17	54,000	Buy	25/07/17	87,000	Buy
06/04/16	39,000	Buy	31/01/17	64,000	Buy			
05/09/16	46,000	Buy	25/04/17	68,000	Buy			

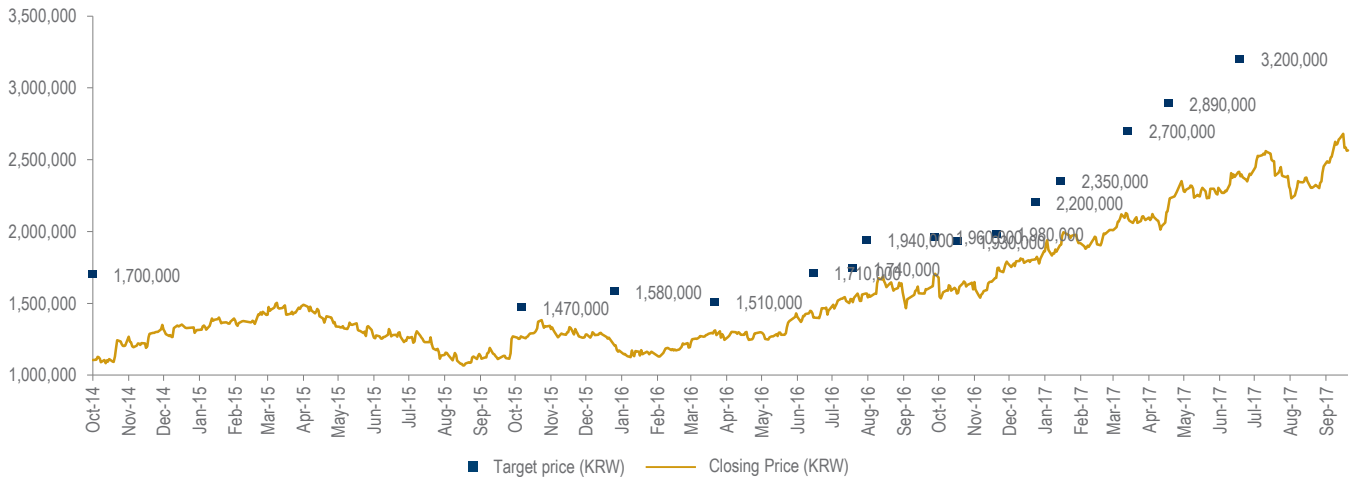


Source: Daiwa

Note: where appropriate, historical target prices have been adjusted to reflect the current share count

**Samsung Electronics: share price and Daiwa recommendation trend**

Date	Target Price	Rating	Date	Target price	Rating	Date	Target price	Rating
16/10/15	1,470,000	Buy	09/08/16	1,940,000	Buy	24/01/17	2,350,000	Buy
31/12/15	1,580,000	Buy	07/10/16	1,960,000	Buy	23/03/17	2,700,000	Buy
31/03/16	1,510,000	Buy	27/10/16	1,930,000	Buy	27/04/17	2,890,000	Buy
24/06/16	1,710,000	Buy	29/11/16	1,980,000	Buy	28/06/17	3,200,000	Buy
28/07/16	1,740,000	Buy	30/12/16	2,200,000	Buy			



Source: Daiwa

Note: where appropriate, historical target prices have been adjusted to reflect the current share count

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- "1": the security could outperform the local index by more than 15% over the next 12 months.
- "2": the security is expected to outperform the local index by 5-15% over the next 12 months.
- "3": the security is expected to perform within 5% of the local index (better or worse) over the next 12 months.
- "4": the security is expected to underperform the local index by 5-15% over the next 12 months.
- "5": the security could underperform the local index by more than 15% over the next 12 months.

#### Disclosure of investment ratings

Rating	Percentage of total
Buy*	65.9%
Hold**	20.1%
Sell***	14.0%

Source: Daiwa

Notes: data is for single-branded Daiwa research in Asia (ex Japan) and correct as of 30 September 2017.

\* comprised of Daiwa's Buy and Outperform ratings.

\*\* comprised of Daiwa's Hold ratings.

\*\*\* comprised of Daiwa's Underperform and Sell ratings.

Additional information may be available upon request.

#### Japan - additional notification items pursuant to Article 37 of the Financial Instruments and Exchange Law

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