

March 2017

Asia Technology Strategy 2017: A seventh year of outperformance?

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Technology

Technology

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Hardware & Semiconductors

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Foundry/ IC Design/ Backend

ASE	2311 TT
ASM Pacific	522 HK
Hua Hong Semi	1347 HK
MediaTek	2454 TT
PTI	6239 TT
Realtek	2379 TT
SMIC	981 HK
SPIL	2325 TT
TSMC	2330 TT
UMC	2303 TT
Vanguard	5347 TT
WPG	3702 TT

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Handsets/ Components and Substrates

Casetek	5264 TT
Catcher	2474 TT
Chicony	2385 TT
Delta	2308 TT
FTC	2354 TT
HTC	2498 TT
Kinsus	3189 TT
Largan	3008 TT
Lite-on Tech	2301 TT
Merry	2439 TT
NYPCB	8046 TT
Topoint	8021 TT
Tripod	3044 TT
TXC	3042 TT
Unimicron	3037 TT

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Display Semis & Display/ Industrials

AUO	2409 TT
Chipbond	6147 TT
ChipMOS	8150 TT
Chroma	2360 TT
Coretronic	5371 TT
E Ink	8069 TT
Egis Technology	6462 TT
Elan	2458 TT
Epistar	2448 TT
Everlight	2393 TT
FocalTech	3545 TT
Himax	HIMX US
Innolux	3481 TT
Novatek	3034 TT
Parade	4966 TT
Radiant	6176 TT
TPK	3673 TT
VPEC	2455 TT
Win Semi	3105 TT

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PC Hardware/Distributors

Acer	2353 TT
Advantech	2395 TT
Asustek	2357 TT
Compal	2324 TT
Hon Hai	2317 TT
Inventec	2356 TT
Lenovo Group	992 HK
PChome	8044 TT
Pegatron	4938 TT
Quanta	2382 TT
Synnex	2347 TT
Wistron	3231 TT

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Korea Tech/ Semi and Display

DNF	092070.KQ
LG Display	034220 KS
LG Electronics	066570 KS
LG Innotek	011070 KS
SDI	006400 KS
SEC	005930 KS
SEMCO	009150 KS
SK Hynix	000660 KS
SK Materials	036490 KS
SSC	046890 KS
Soulbrain	036830 KQ
Wonik	104830 KQ

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China Technology

AAC	2018 HK
BeijingShiji	002153 CH
BYDE	285 HK
Chinasoft	354 HK
Coolpad	2369 HK
Dahua	002236 CH
DC Holdings	861 HK
FIH	2038 HK
GeorTek	002241 CH
Hikvision	002415 CH
JCET	600584 CH
Kingdee	268 HK
LensTech	300433 CH
Luxshare	002475 CH
Ofilm	002456 CH
Sanan	600703 CH
Sunny Optical	2382 HK
Tongda	698 HK
Tongfu	002156 CH
Truly	732 HK
TSHT	002185 CH
Wangsu	300017 CH
YGSoft	002063 CH
Yonyou	600588 CH
ZTE	000063 CH/763 HK

IT Services and Internet

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Indian IT Services

HCL Tech	HCLT IN
Hexaware	HEXW IN
InfoEdge	INFOE IN
Infosys Ltd	INFO IN
Mindtree	MTCL IN
NIIT Tech	NITEC IN
Tata Consultancy	TCS IN
Tech Mahindra	TECHM IN
Wipro	WPRO IN

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South Korea Internet / New Media

Com2uS	078340.KQ
CJ E&M	130960 KS
CJ CGV	079160 KS
Gamevil	063080 KQ
Kakao	035420 KD
Loen Ent	016170 KQ
Naver	035420 KS
NC Soft	036570 KS

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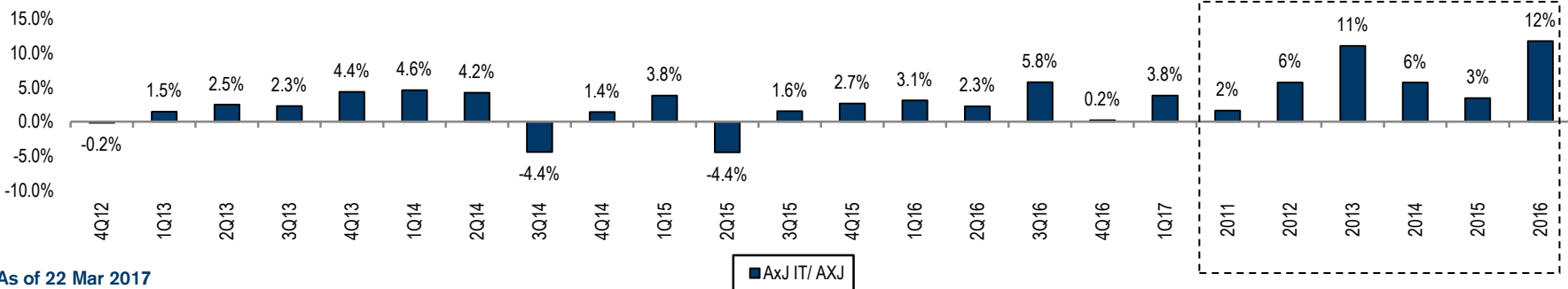
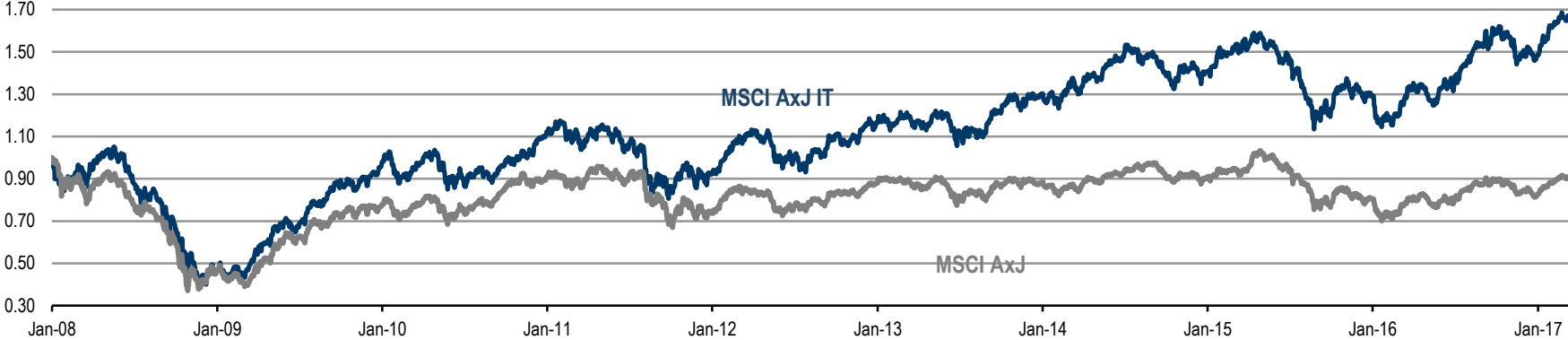
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China Internet/ Education

58.com	WUBA US
Alibaba	BABA US
Autohome	ATHM US
Baidu	BIDU US
Baozun	BZUN US
Bitauto	BITA US
CDEL	DL US
Changyou	CYOU US
Cheetah Mobile	CMCM US
Ctrip	CTRP US
JD	JD US
Kingsoft	3888 HK
Momo	MOMO OQ
New Oriental Education	EDU US
Sina	SINA US
Sohu	SOHU US
SouFun	SFUN US
TAL	XRS US
Tarena	TEDU US
Tencent	700 HK
Tuniu	TOUR US
Vipshop	VIPS US
Weibo	WB US
YY	YY US
Zhaopin	ZPIN US

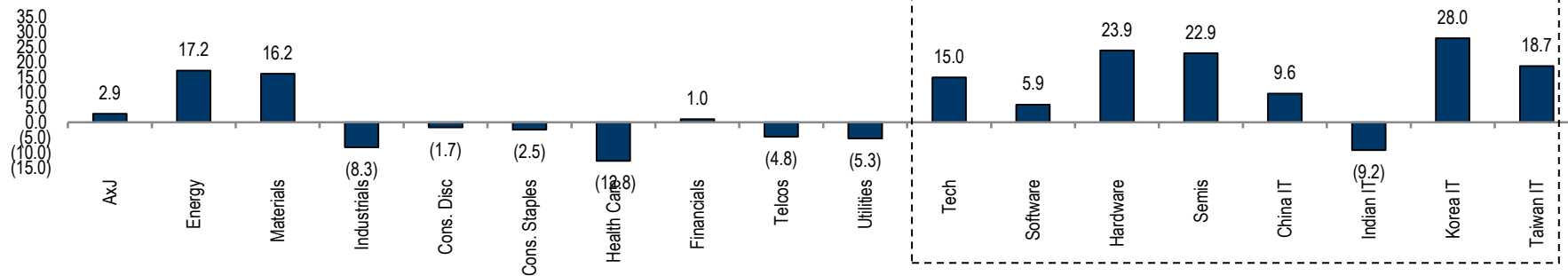
MSCI AxJ tech: A consistent outperformer



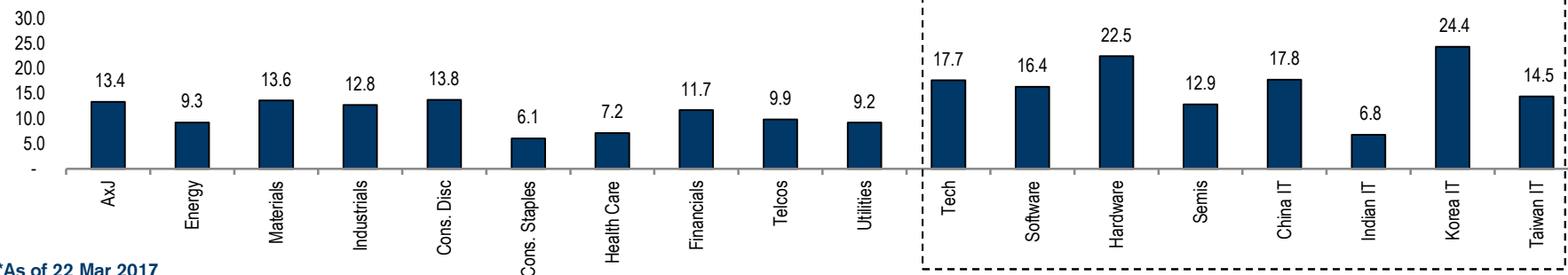
*As of 22 Mar 2017
Source: MSCI, Thomson Reuters, Bloomberg, Credit Suisse

MSCI AxJ tech: A broad-based rally so far in 2017

2016 Performance



QTD

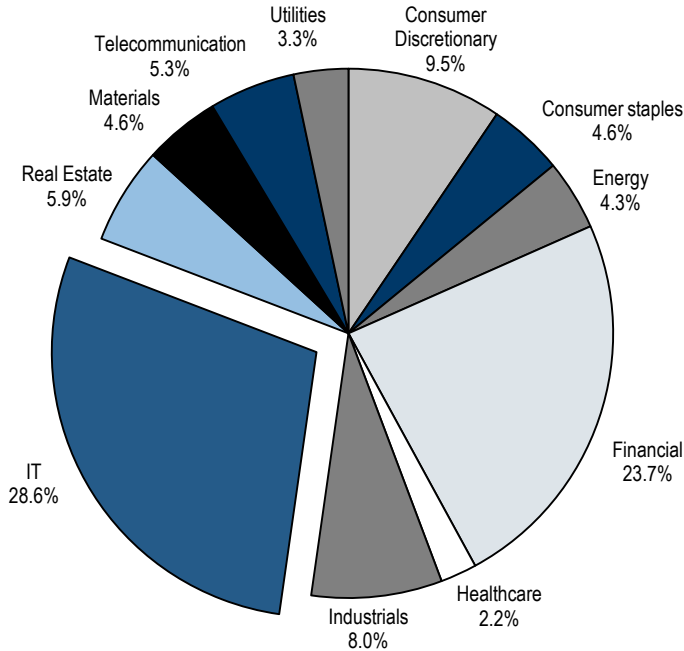


*As of 22 Mar 2017

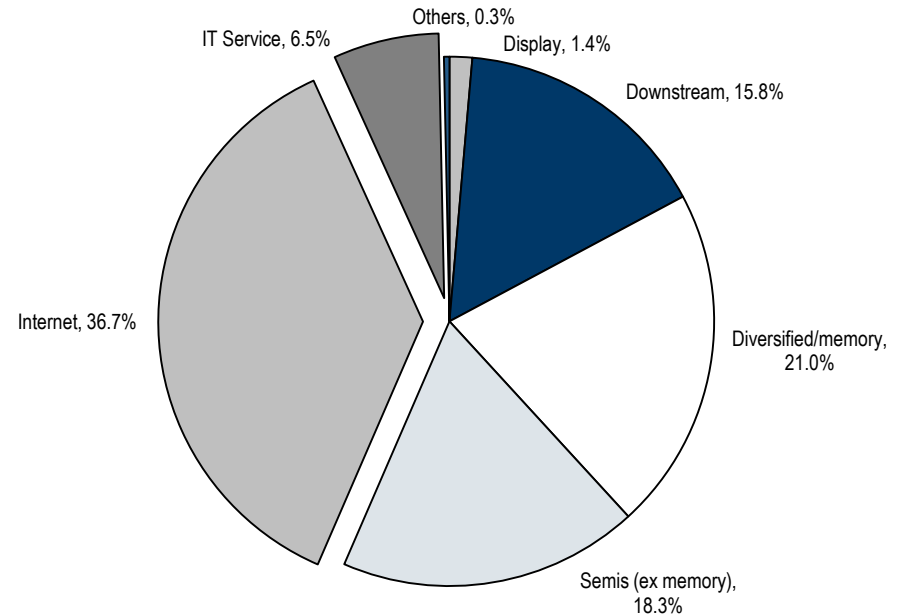
Source: MSCI, Thomson Reuters, Bloomberg, Credit Suisse

Today's "tech" is different

MSCI AxJ – sector weightings



MSCI AxJ tech – sub-sector weightings



Source: MSCI, Thomson Reuters, Credit Suisse

MSCI AxJ: Tech is amongst the fastest forecast EPS growers

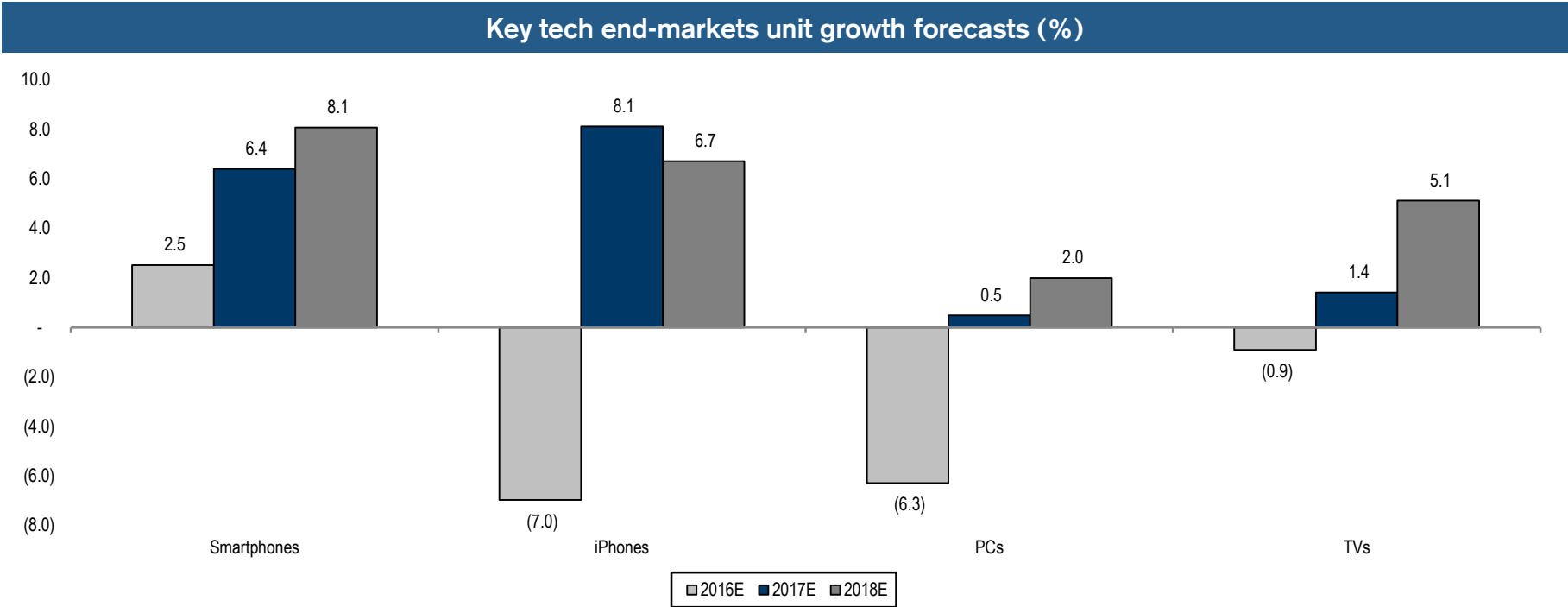
Sector	EPS Growth			P/E		P/B trailing	1M and 3M chg in 12M fwd EPS (%)	
	2017	2018	2019	2017	2018		fwd EPS (%)	fwd EPS (%)
Region (AxJ)	15.7	10.2	10.4	13.3	12.1	1.59	0.5	2.3
Energy	42.9	14.0	15.3	12.4	10.9	1.18	0.3	3.6
Materials	17.4	7.8	7.6	13.4	12.4	1.30	1.9	6.3
Industrials	17.4	9.6	10.4	14.1	12.9	1.26	0.1	-1.1
Cons. Disc.	19.2	14.2	13.5	14.7	12.9	1.84	-0.5	-2.8
Cons. Staple	7.4	10.9	10.8	20.8	18.7	3.19	-0.4	-1.7
Health Care	21.7	20.6	19.6	24.0	19.9	4.12	-0.8	-1.6
Financials	6.9	8.7	8.4	10.3	9.4	1.22	0.2	0.5
Tech	29.2	11.1	12.6	14.8	13.3	2.66	1.5	10.2
Telecom	6.5	8.8	8.7	16.8	15.5	1.98	-0.6	-2.8
Utilities	-0.8	6.0	4.8	11.9	11.2	1.34	-1.0	-5.0

*2017 data as of 22 Mar 2017

Source: MSCI, IBES, Thomson Reuters

**End markets: Still slow,
but better than in 2016**

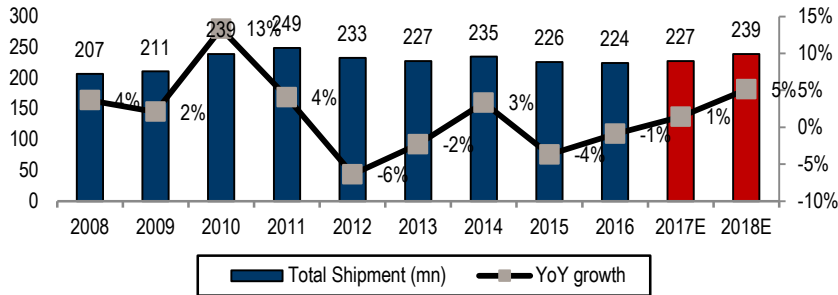
End markets: Still slow, but better



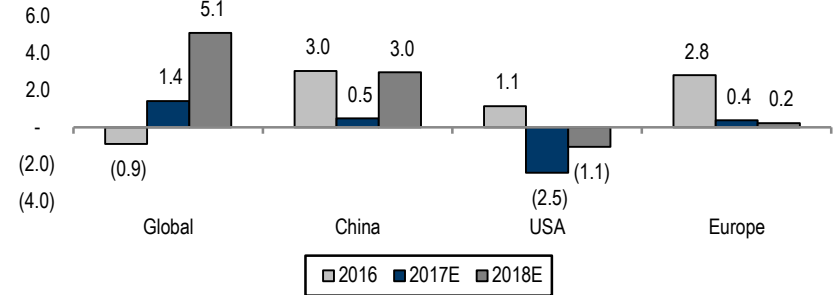
Source: IDC, IHS, Credit Suisse

TVs: Largely a flattish market

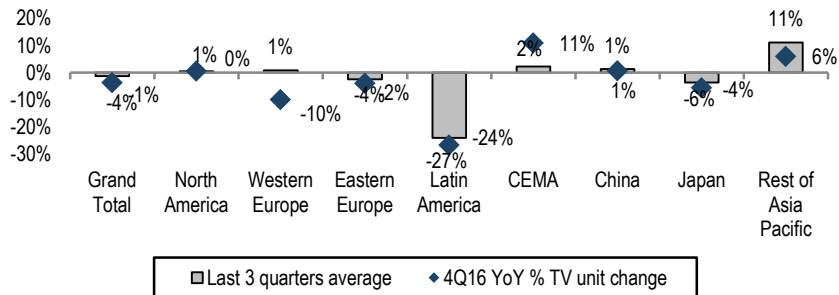
Global TV unit shipment (mn)



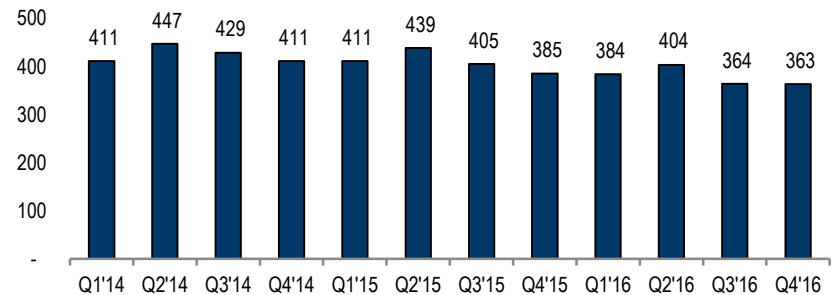
TV total shipment YoY Growth (%)



4Q16 YoY unit change v. last three quarters



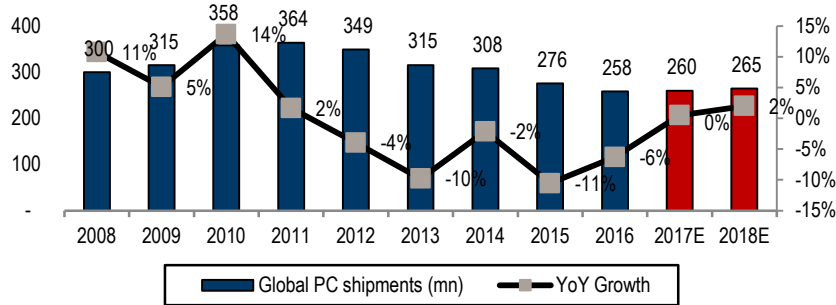
TV Global ASP (USD)



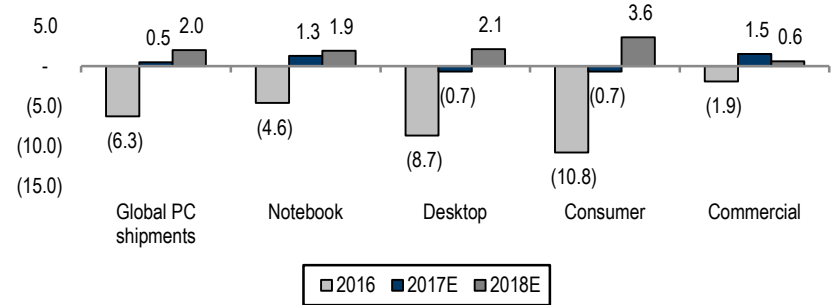
Source: IHS, Credit Suisse

PCs: Stabilising starting 2H16

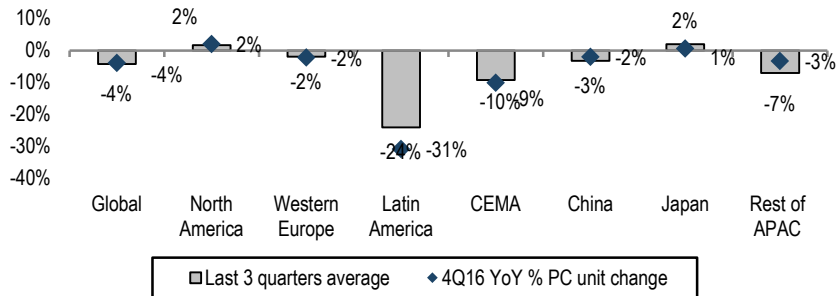
Global PC total unit shipment (mn)



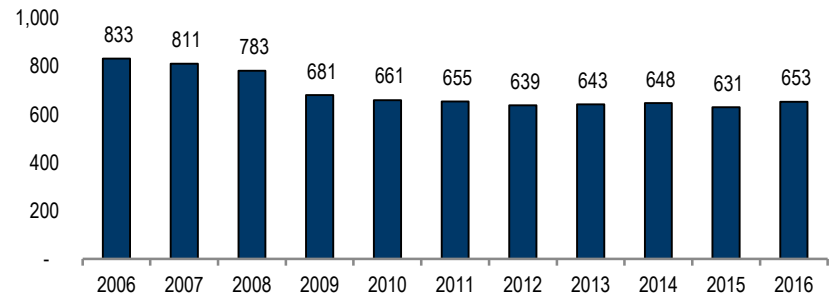
PC Total shipment YoY Growth (%)



4Q16 YoY unit change v. last three quarters



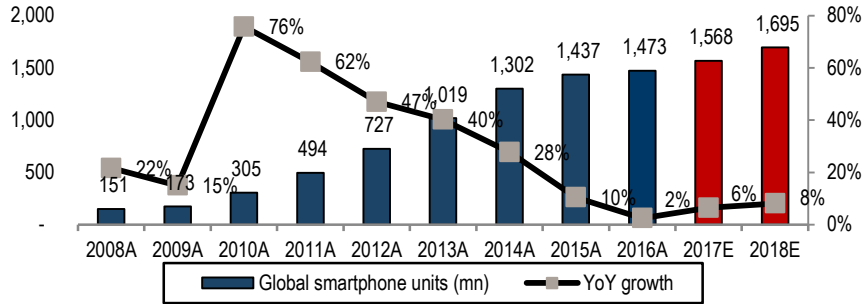
Global PC ASP (USD)



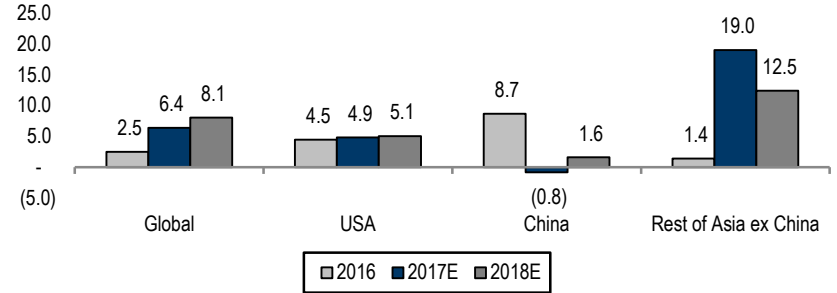
Source: IDC, Credit Suisse

Smartphones: EM and iPhone a plus; China uncertain

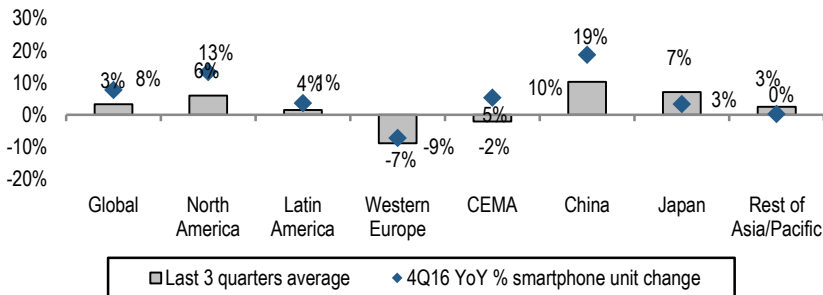
Global Smartphone unit shipment (mn)



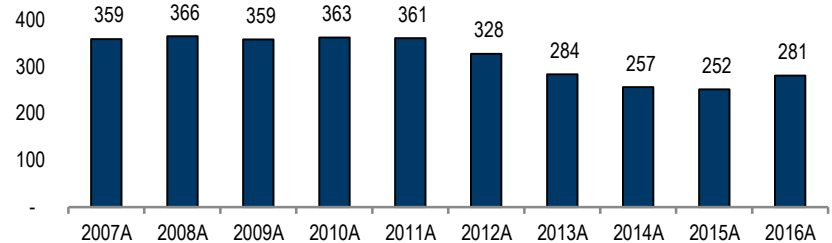
Smartphone total shipment YoY Growth (%)



4Q16 YoY unit change v. last three quarters

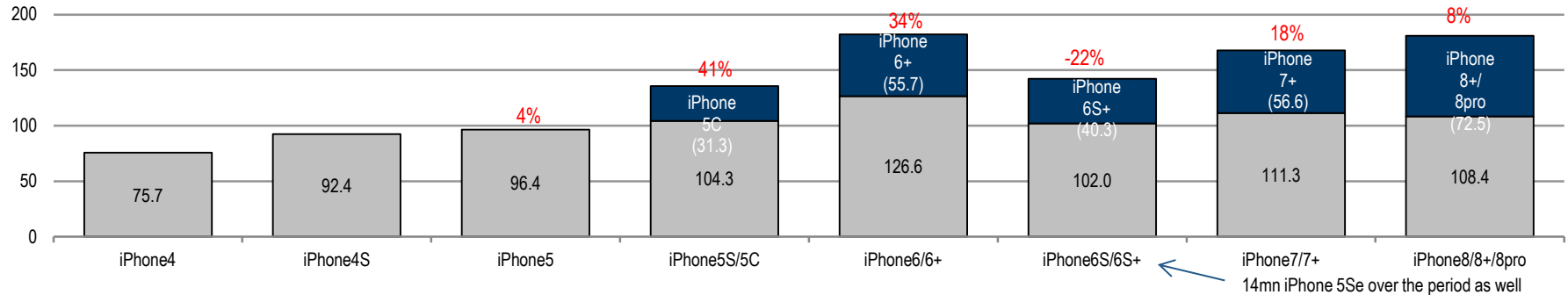


Global PC ASP (USD)

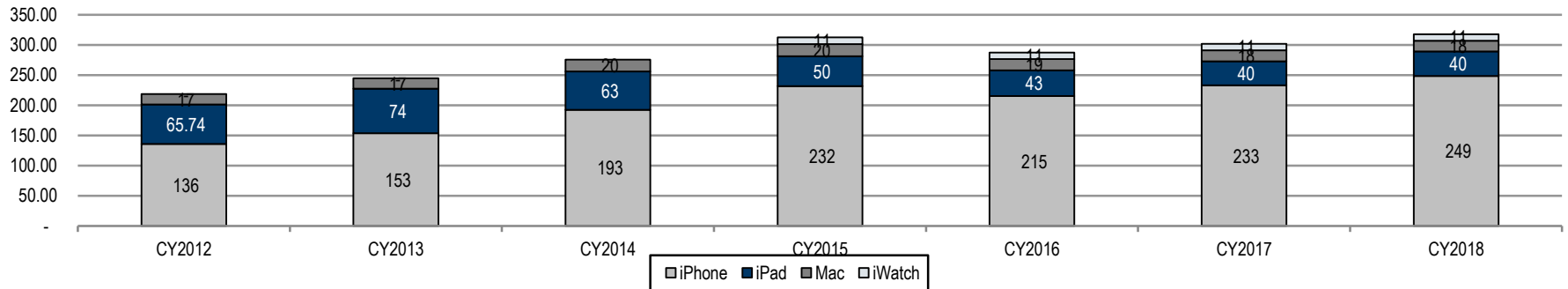


Source: IDC, Credit Suisse

Apple's iPhone: The next product cycle can be big



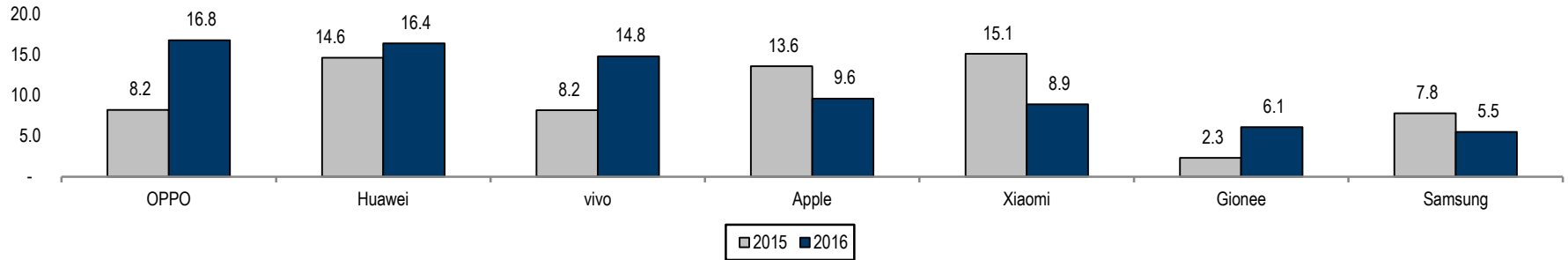
Apple key products shipment (mn)



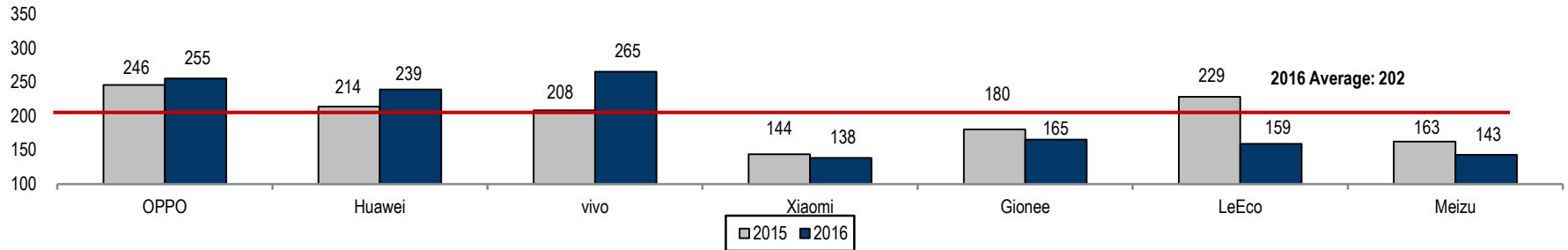
Source: IDC, Company Data, Credit Suisse

China smartphones: Seeing a +ve mix shift

Top7 China smartphone vendors market share (%)



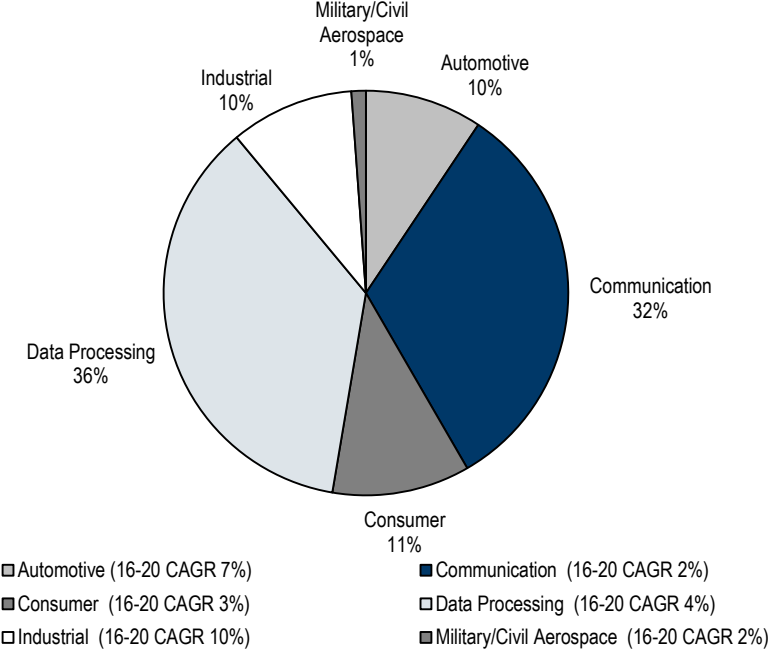
Top 7 China local smartphone vendors ASP (USD)



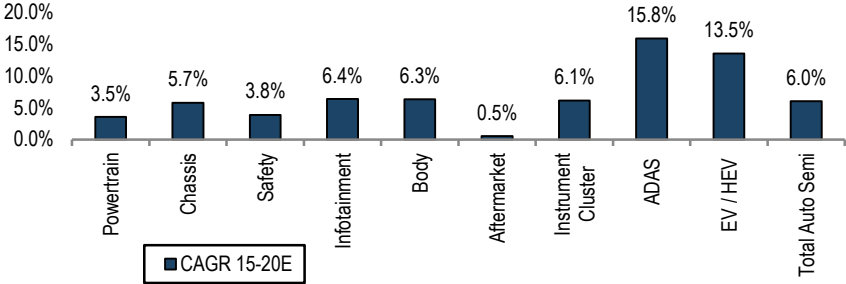
Source: IDC, Company Data, Credit Suisse

Newer themes will take time to be material

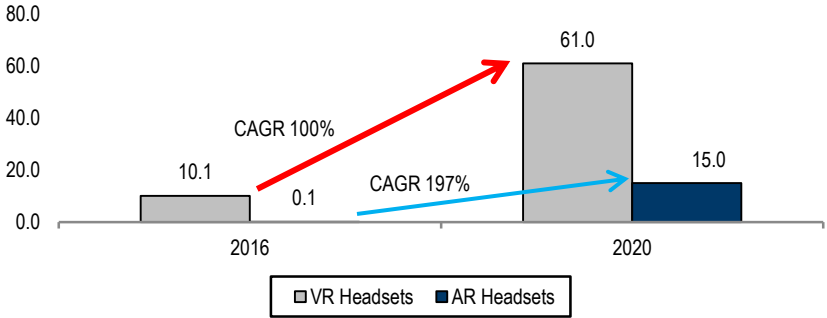
Global semiconductor revenues by end-markets (%)



Automotive semis—CAGRs by various applications (%)



VR and AR global unit shipments (mn)

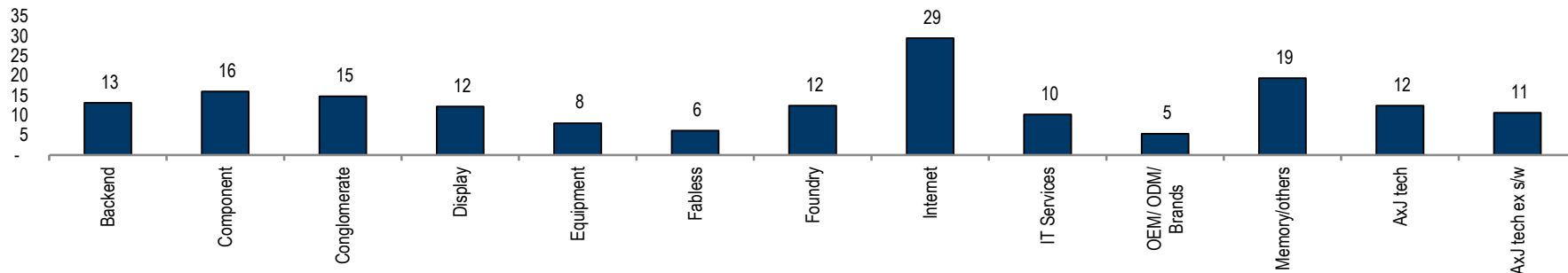


Source: IDC, Credit Suisse

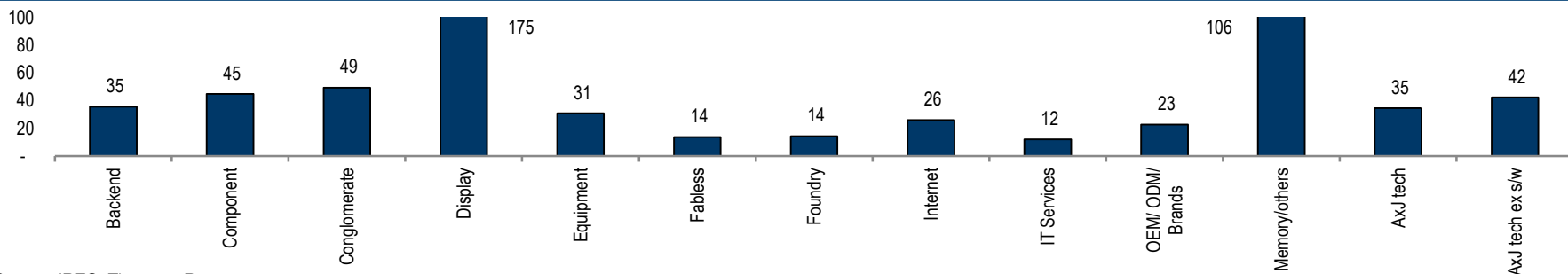
A big forecast earnings growth year: Will it be delivered?

Forecast solid earnings growth in 2017

AxJ Tech – 2017E IBES revenue growth, YoY (%)



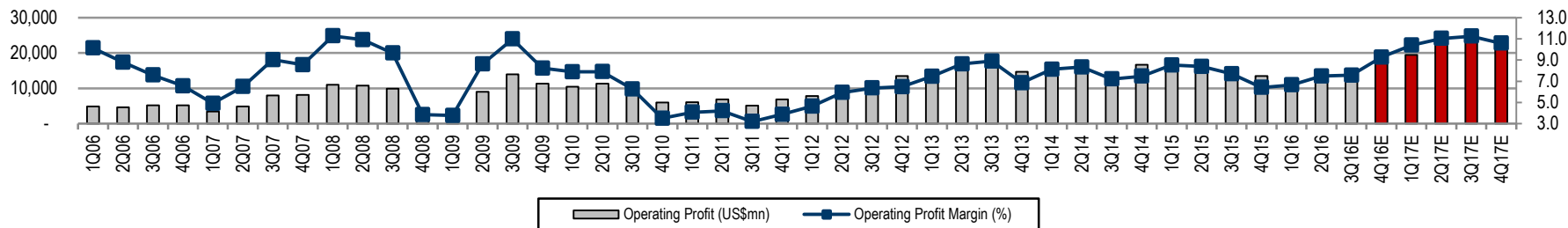
AxJ Tech – 2017E IBES net profit growth, YoY (%)



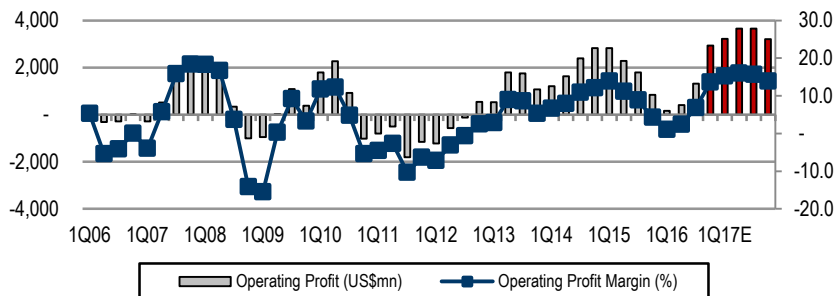
Source: IBES, Thomson Reuters

Hardware: OPM expansion is the key story

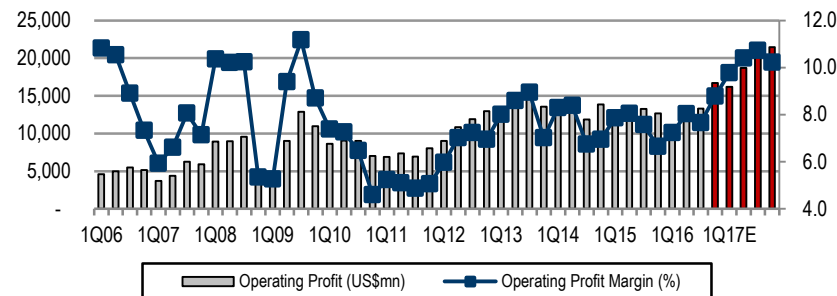
AxJ Tech Hardware OP (mn) and OPM (%)



AxJ Tech—Display and Memory sector OP (mn) and OPM (%)



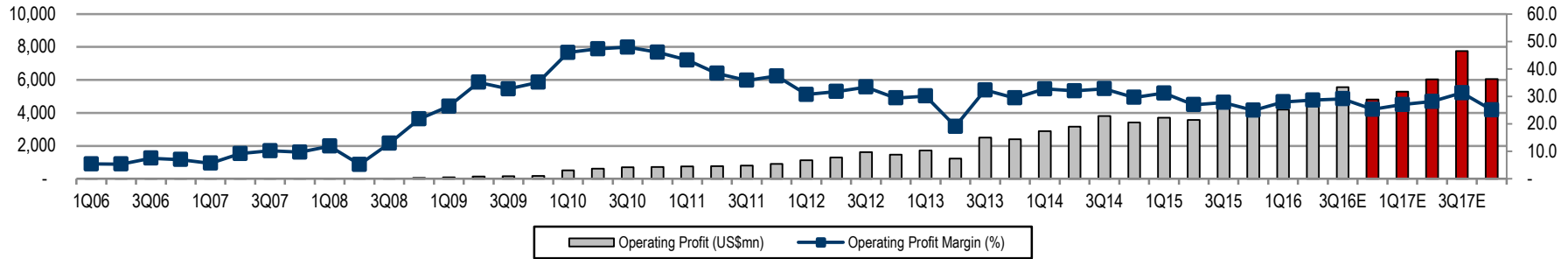
AxJ Tech—Hardware ex Display and Memory OP (mn) and OPM (%)



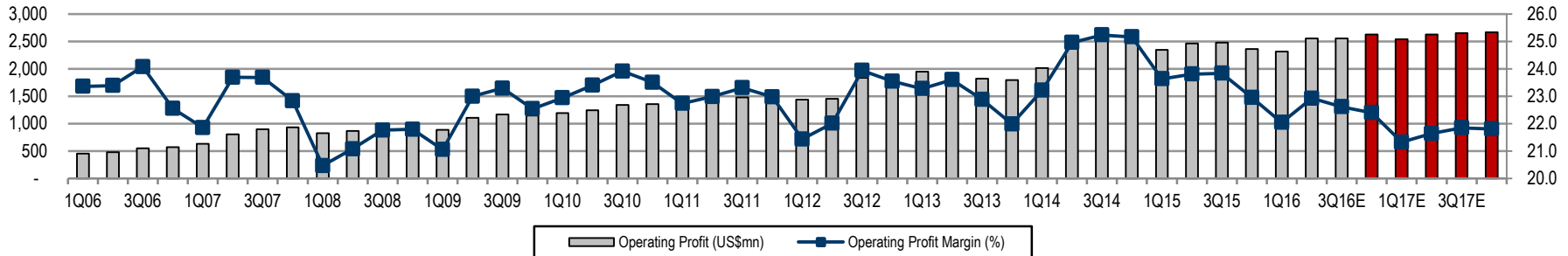
Source: Company Data, Credit Suisse

Software: Largely flattish margin forecasts

AxJ Internet OP (mn) and OPM (%)



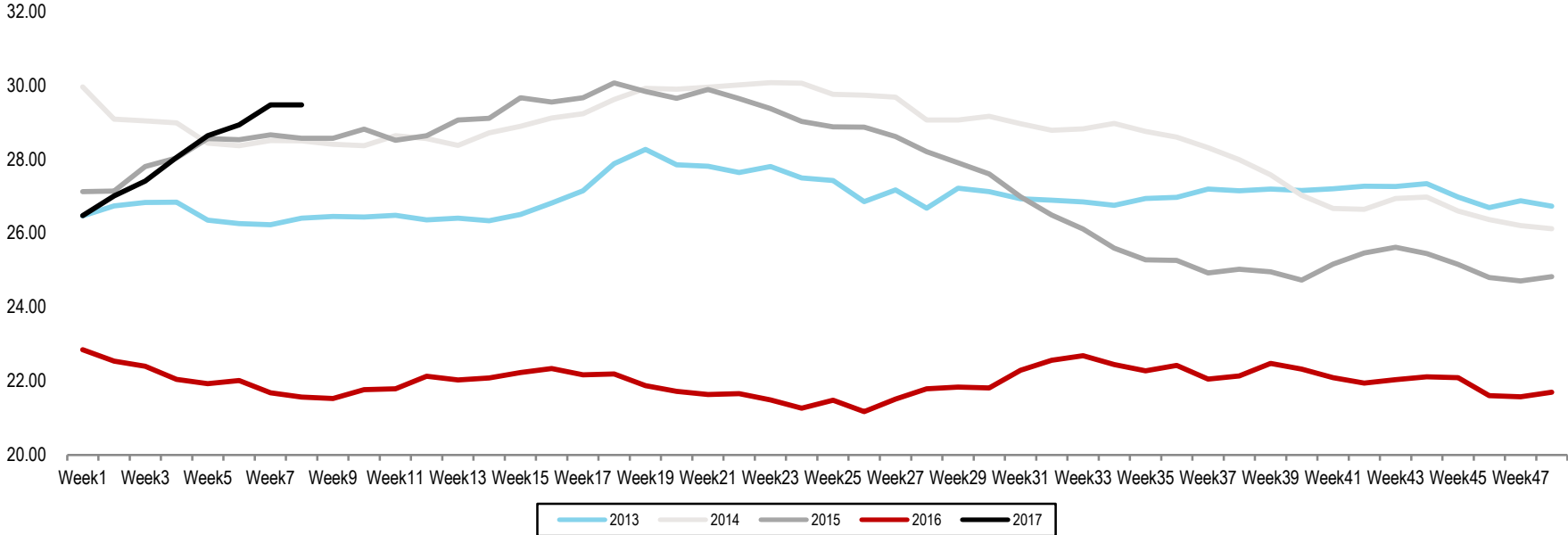
AxJ IT Services OP (mn) and OPM (%)



Source: Company Data, Credit Suisse

Tech EPS: Strong +ve revisions YTD, led by memory/TFT

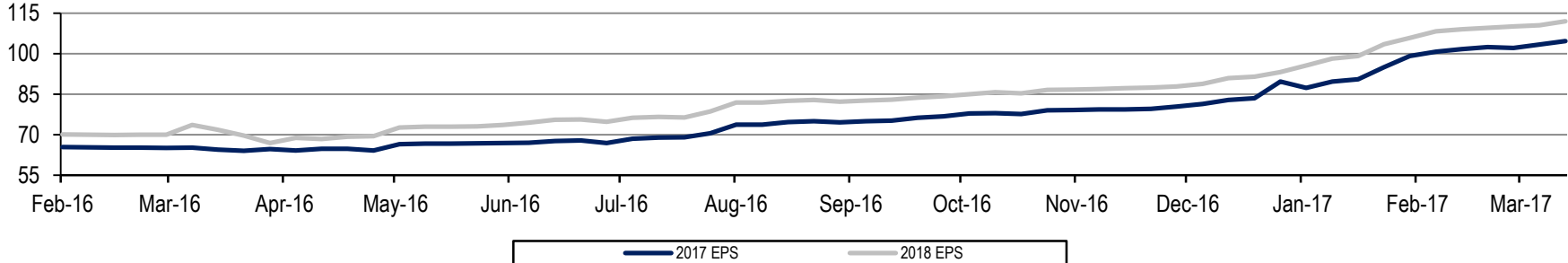
AxJ Tech IBES EPS integer through the year, 2013-2017 (USD)



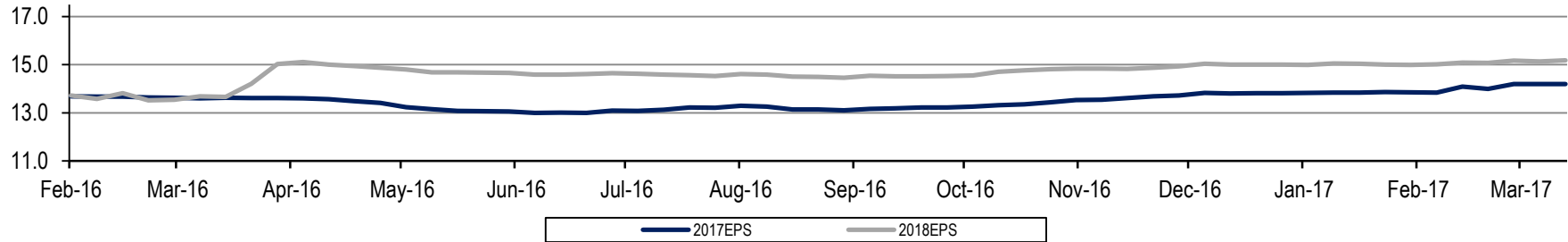
Source: MSCI, IBES, Thomson Reuters

Tech commodities powering Korea revisions

MSCI Korea Tech – IBES EPS estimate (USD)



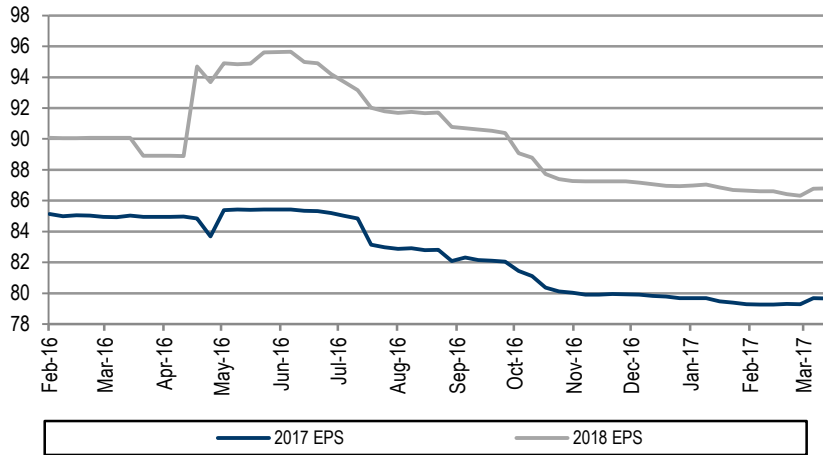
MSCI Taiwan Tech – IBES EPS estimate (USD)



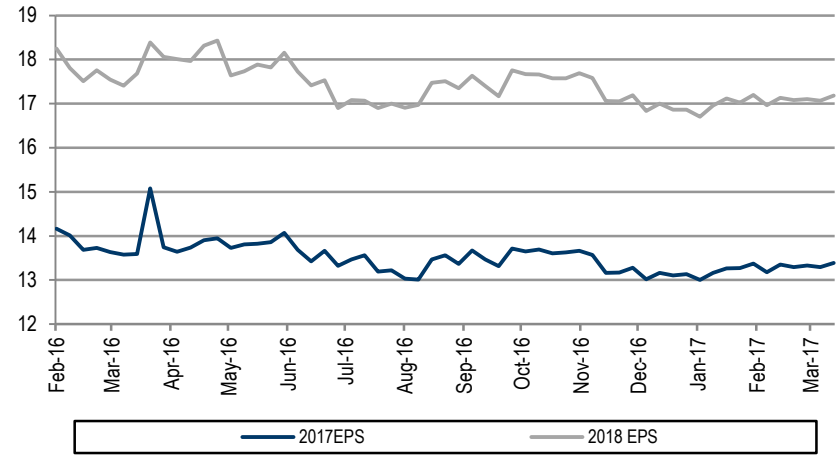
Source: MSCI, IBES, Thomson Reuters

Internet EPS has been quite stable; Indian IT is stabilising

MSCI India Tech – IBES EPS est. (USD)



MSCI China software services – IBES EPS est. (USD)



Source: MSCI, IBES, Thomson Reuters

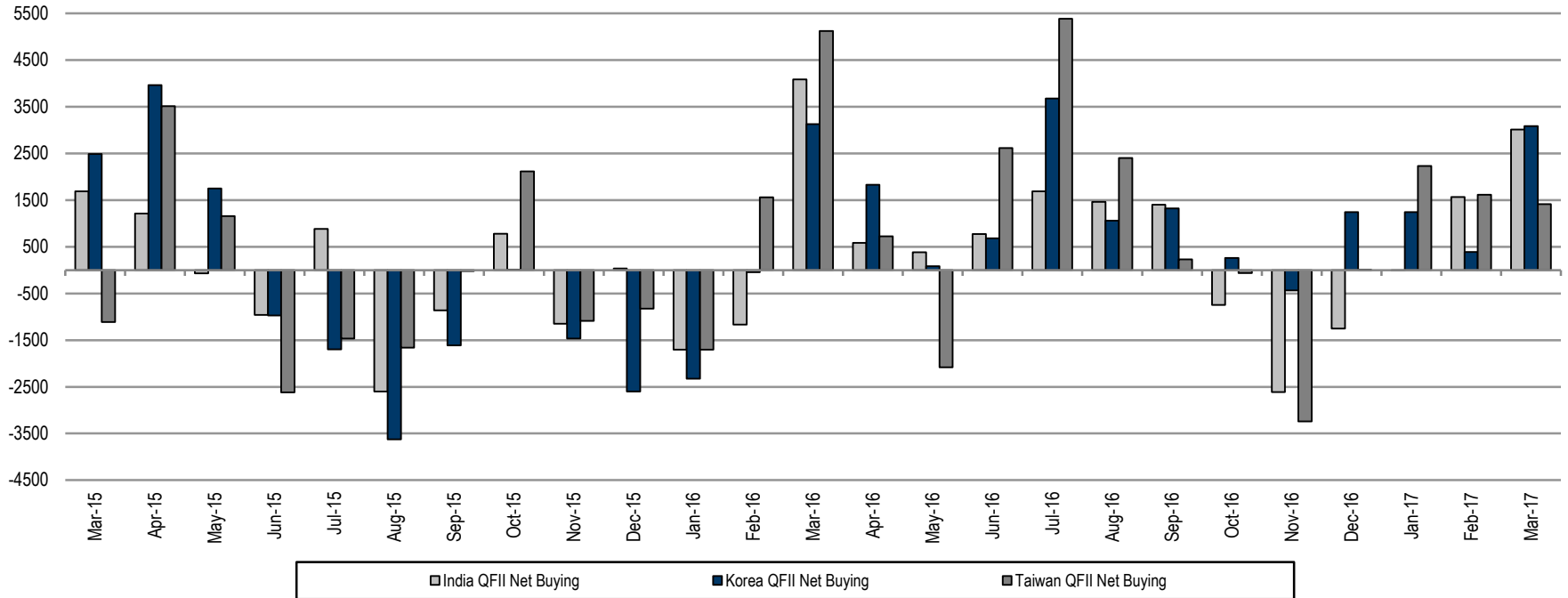
Tech EPS: 1M momentum likely to start rolling over

	Chg in 2017 Cons. EPS (%)		Chg in 2018 Cons. EPS (%)	
	1M	3M	1M	3M
Backend	0.7	2.0	0.0	(0.7)
Component	1.8	4.7	2.5	5.6
Conglomerate	4.8	21.6	4.8	21.2
Display	14.5	70.3	8.1	32.3
Equipment	1.8	2.2	1.7	3.9
Fabless	(0.3)	(10.4)	(0.3)	(5.0)
Foundry	(0.5)	(0.4)	(0.5)	(1.2)
Internet	(0.0)	1.6	0.3	1.5
IT Services	0.0	(0.4)	(0.1)	(0.9)
OEM/ ODM/ Brands	(0.7)	(1.0)	(0.5)	0.4
Memory/others	4.6	64.1	5.3	52.9
PCB/ Substrates	1.8	(0.1)	2.1	2.0
Software	(5.4)	(8.3)	3.0	(1.0)
Total	1.8	9.2	1.7	7.6

Source: IBES, Thomson Reuters

Valuations and portfolio positioning

Foreign flows turning positive again in 1Q17



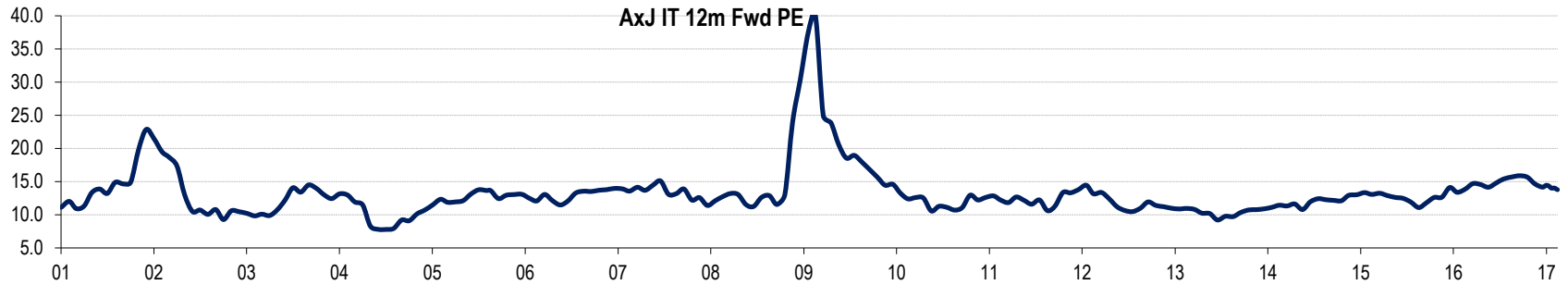
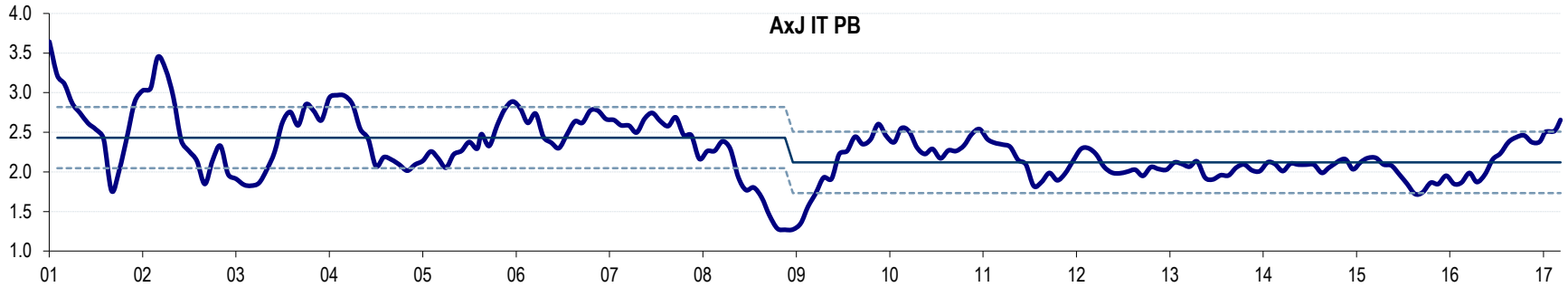
*2017 data as of 22 Mar 2017
Source: Bloomberg, Credit Suisse

Foreign flows turning positive again in 1Q17

(US\$m)	2015	2016	2017	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17
Foundry	538	1,826	911	(209)	(616)	660	831	295	90	(83)	(1,008)	(406)	219	404	287
IC Design	(417)	687	493	36	(208)	130	250	412	(108)	91	(90)	(29)	6	290	197
Backend	(50)	(482)	(49)	(143)	(180)	(106)	84	147	(17)	(22)	(107)	(126)	(55)	113	(107)
Memory	(62)	114	52	(13)	73	7	45	32	0	32	(59)	51	35	0	17
TFT + Touch	(256)	35	133	49	(140)	61	180	139	(74)	(14)	(4)	(9)	121	(108)	120
Tech Components	1,942	2,424	1,281	230	121	354	524	276	738	74	(343)	(45)	706	293	282
Tech Hardware	380	1,577	1,487	(6)	(510)	315	829	(129)	40	545	(468)	386	160	804	523
Total Tech	1,886	6,039	4,462	(127)	(1,504)	1,380	2,807	1,171	660	568	(2,089)	(162)	1,252	1,816	1,393
Financials	(496)	1,315	309	(143)	(637)	250	778	459	239	139	359	516	118	63	127
Materials	(957)	945	130	186	(146)	71	288	144	(6)	(20)	65	118	70	68	(7)
Petrochem	688	1,519	297	424	(99)	16	367	70	(154)	47	47	274	151	133	13
Property	47	(47)	16	(21)	(80)	26	72	42	(10)	(30)	(67)	19	9	11	(4)
Consumer	251	753	(237)	11	171	196	388	243	(47)	30	(333)	(225)	(74)	(145)	(18)
Industrial	547	507	419	181	148	49	147	249	(18)	(141)	(284)	(73)	107	155	158
Healthcare/Biotech	367	(46)	(116)	67	133	65	17	(37)	5	(22)	(121)	(105)	(55)	(61)	0
Telecom	1,110	(681)	(942)	170	82	236	289	(64)	(410)	(486)	(829)	(338)	(173)	(514)	(255)
Transportation	(81)	(153)	143	(116)	(46)	(11)	4	24	14	8	17	(16)	41	63	39
Total Non-Tech	1,506	4,071	19	752	(466)	893	2,359	1,132	(450)	(484)	(1,141)	170	190	(221)	51
Total	3,487	10,080	4,375	625	(1,960)	2,276	5,148	2,287	211	81	(3,228)	1	1,425	1,549	1,401

Source: TEJ, Bloomberg, Credit Suisse

AxJ tech valuations: Multiples have moved up



*2017 data as of 22 Mar 2017

Source: MSCI, Thomson Reuters, Credit Suisse

Country level valuations: A mixed conclusion

Taiwan IT PB



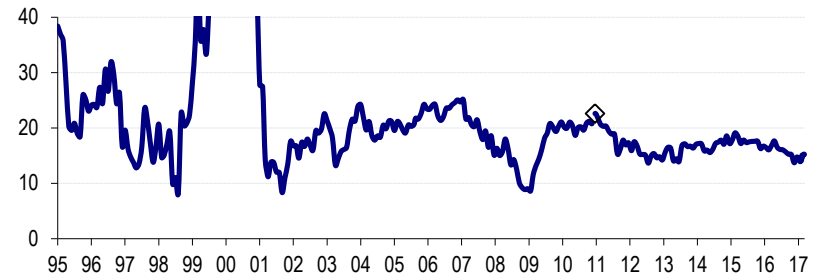
Korea IT PB



China Internet 12mth fwd PE



India IT 12mth fwd PE



*2017 data as of 22 Mar 2017

Source: MSCI, Thomson Reuters, Credit Suisse

CS AxJ Tech model portfolio

Sector	Over/Underweight v. MSCI	Stocks
Downstream/ Display	-400	AUO, Hikvision, Hon Hai, Largan
Diversified + Memory	+350	Samsung Electronics, SK Hynix
Semis (ex-memory)	-225	Pow ertech, TSMC
IT Services	+100	HCL, Tech Mahindra
Internet	+175	Momo, Alibaba, Tencent

Source: MSCI, Credit Suisse

Appendix

Stocks seeing consensus upgrades to 2017 EPS estimates over the past three months

Name	Bloomberg Ticker	Price	TP	Rat	PE (x) 2017	CS EPS growth (%) 2017	Chg in 2017 Cons. EPS (%)		PB (x) 2017
							1M	3M	
AAC Technologies	2018 HK	86.50	99.40	O	17.6	27.2	2.2	3.3	5.4
Alibaba	BABA US	106.09	127.00	O	24.6	23.3	(0.6)	3.7	5.1
ASMP	522 HK	106.20	127.00	O	21.0	31.5	8.1	15.4	4.5
Asustek	2357 TT	290.50	260.00	N	11.7	-	-	2.1	1.2
Catcher	2474 TT	292.00	317.00	O	10.4	1.8	4.0	5.1	1.7
Foxconn	2354 TT	94.90	101.00	O	11.7	8.4	0.2	0.4	1.3
HCL Technologies	HCLT IN	872.35	975.00	O	14.3	7.4	-	0.4	3.5
Hon Hai Precision	2317 TT	91.50	100.00	O	10.2	20.8	(0.6)	1.1	1.4
JD.com	JD US	30.58	32.00	N	116.8	171.6	17.8	25.8	8.5
Largan Precision	3008 TT	4740.00	4800.00	O	19.6	45.1	1.5	7.1	6.9
Lens Tech	300433 CH	31.30	32.10	O	31.6	57.9	1.4	0.8	4.3
LG Display	034220 KS	29500.00	27000.00	N	10.3	24.1	12.8	40.8	0.8
LG Electronics	066570 KS	69200.00	59000.00	N	11.0	339.9	17.5	19.6	0.8
Lite-On Technology	2301 TT	54.00	57.00	O	11.7	19.4	1.9	4.4	1.5
Luxshare Precision	002475 CH	23.46	28.00	O	26.8	53.3	-	0.7	3.9
Momo	MOMO US	32.81	36.00	O	26.0	45.4	22.2	24.0	8.4
NCSOFT	036570 KS	297500.00	420000.00	O	14.4	67.3	1.5	13.3	2.8
New Oriental Education	EDU US	58.69	60.00	O	25.2	31.5	0.3	1.8	4.5
Samsung Electro-Mechanics	009150 KS	67600.00	78600.00	O	18.1	1,757.2	11.3	0.2	1.1
Samsung Electronics	005930 KS	2123000.00	2900000.00	O	8.1	62.4	5.2	22.5	1.2
Samsung SDI	006400 KS	135000.00	99000.00	N	23.3	81.3	1.8	38.4	0.9
Shenzhen O-film Tech	002456 CH	36.95	40.70	N	30.2	55.6	0.6	1.4	3.8
Sina	SINA US	70.59	75.21	O	(398.7)	(90.7)	4.9	6.4	2.1
SK Hynix	000660 KS	48650.00	71000.00	O	4.1	184.7	6.0	83.1	1.1
Sunny Optical	2382 HK	56.65	71.20	O	25.6	61.1	12.6	23.1	8.4
Tata Consultancy Services	TCS IN	2479.10	2300.00	N	17.6	0.8	0.2	0.4	4.8
Tech Mahindra Limited	TECHM IN	475.40	550.00	O	12.0	14.8	0.3	0.4	2.3
Weibo Corporation	WB US	48.92	67.00	O	37.0	60.7	6.5	6.5	10.5
ZTE Corporation	763 HK	14.52	14.70	N	13.1	- to +	(1.2)	0.4	1.8

*Priced as of 22 Mar 2017

Source: Thomson Reuters, Credit Suisse *Stocks with US\$4 bn+ market cap

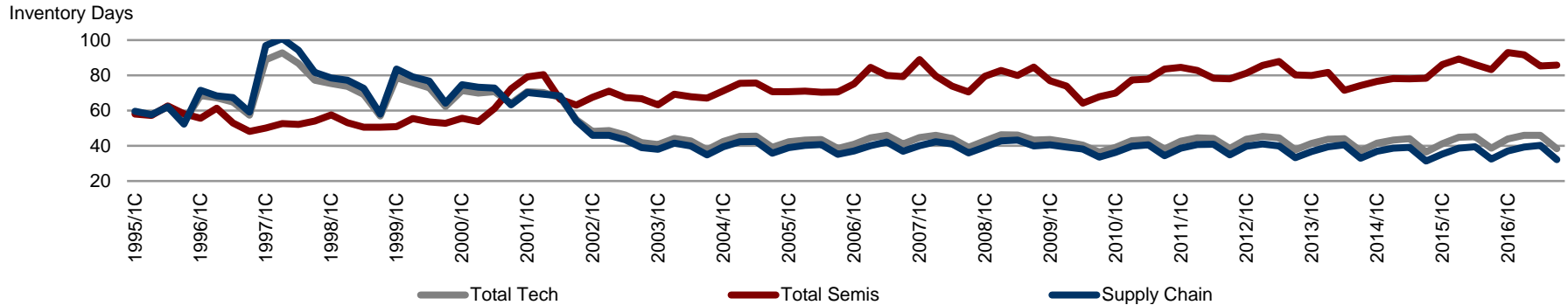
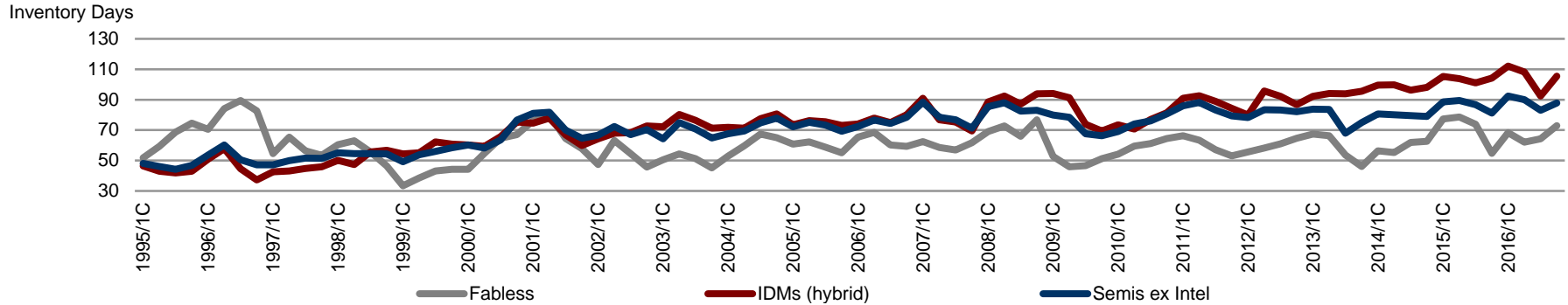
Stocks seeing consensus downgrades to 2017 EPS estimates over the past three months

Name	Bloomberg	Price	TP	Rat	PE (x) CS EPS growth (%)		Chg in 2017 Cons. EPS (%)		PB (x) 2017
	Ticker				2017	2017	1M	3M	
58.com Inc.	WUBA US	37.57	37	N	118.3	- to +	-8.1	-30.2	2.1
Advantech	2395 TT	256.5	300	O	24.9	21.1	-2	-1.9	5.8
Baidu Inc	BIDU US	169.56	181	N	33.5	-13.2	-2.4	-2.7	3.4
Ctrip.com	CTRP US	48.2	60	O	100.3	- to +	-24.9	-27	2.4
Delta Electronics	2308 TT	167	183	O	20.8	16.7	-2.3	-2	3.8
GoerTek Inc.	002241 CH	33.54	42	O	23.6	25.9	0	-1.1	4
Hangzhou Hikvision	002415 CH	31.55	37.4	O	20.3	22.3	0.4	-0.8	7
Infosys Limited	INFO IN	1,027.80	1,050.00	N	15.3	2.7	-0.1	-1.2	3.2
Kakao Corp	035720 KS	86,600.00	63,000.00	U	38.6	83.8	-1.1	-4.3	1.5
Lenovo Group Ltd	992 HK	4.91	5	N	12.7	27.9	-2.1	-12.7	2.1
MediaTek Inc.	2454 TT	227.5	200	N	16.8	-7.1	-2.1	-15.3	1.4
Naver Corp	035420 KS	849,000.00	950,000.00	O	26.5	26.8	-0.7	-8.3	5.8
Pegatron	4938 TT	87.8	73	N	10.7	14.3	-3.1	-4	1.4
Quanta Computer	2382 TT	64.9	63	N	12.5	22	-0.9	-1.1	1.8
Samsung SDS	018260 KS	145,000.00	120,000.00	N	24.5	-0.4	0	-3.5	2.1
Sanan Optoelectronics	600703 CH	16.15	17.6	O	27.4	19.8	0.3	-4	3.6
SMIC	981 HK	10	10.8	N	19.3	-13.7	-2.6	-5.5	1.2
Taiwan Semiconductor Manufacturing	2330 TT	193.5	205	O	14.4	9	-0.6	-0.2	3.2
TAL Education Group	TAL US	102.87	96	O	43.6	56.4	0	-11	10.6
Tencent Holdings	700 HK	225.2	261	O	30	32.9	-0.4	-0.9	8.1
United Microelectronics	2303 TT	12.2	12	N	22.5	-16.1	-0.2	-11	0.7
Vipshop Holdings Limited	VIPS US	13.77	13.8	N	17.9	11.3	-0.3	-1.2	6.7
Wangsu Science & Technology	300017 CH	42.82	51	N	22.6	13.3	-13.4	-14.4	4
Wipro Ltd.	WPRO IN	501.55	475	N	13.4	6.4	-0.2	-2.7	2.2
Zhejiang Dahua Technology	002236 CH	16.84	18.8	O	21.9	17.1	-0.7	-3.5	4.9

*Priced as of 22 Mar 2017

Source: Thomson Reuters, Credit Suisse *Stocks with US\$4 bn+ market cap

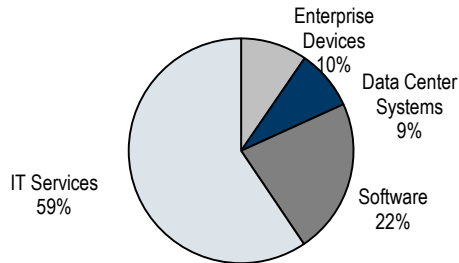
Semi inventory increased since 2H16



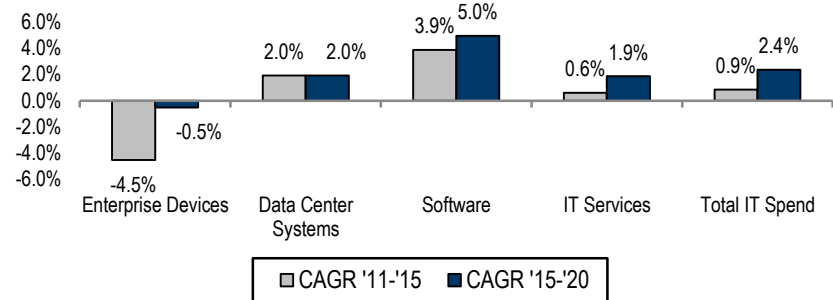
Source: Credit Suisse

IT Spending: Modest growth recovery

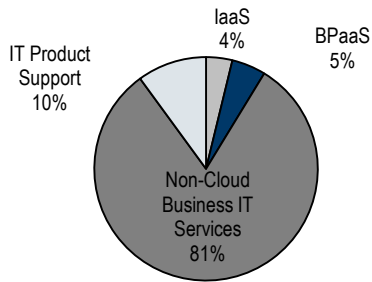
Total IT spending by segments (%)



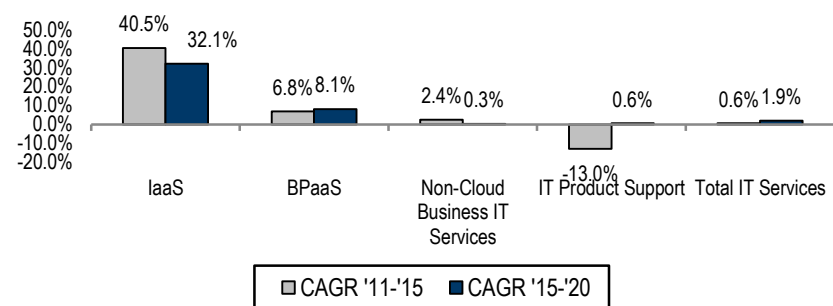
Total IT spending — segment CAGR (%)



IT Services spending by segment (%)



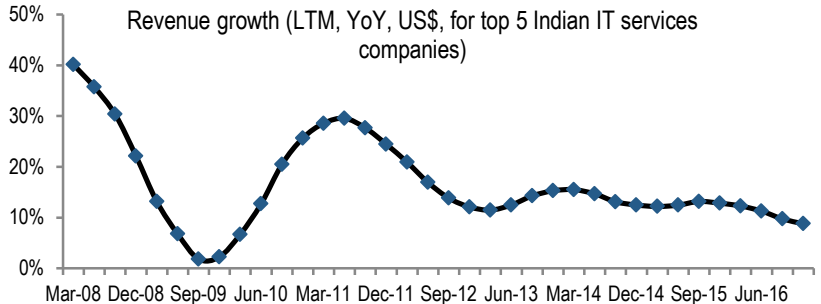
IT Services spending — segment CAGR (%)



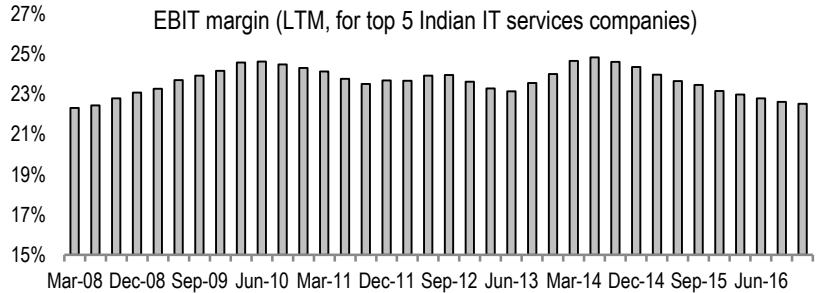
Source: Gartner, Credit Suisse

Indian IT: Revenue growth could pick up

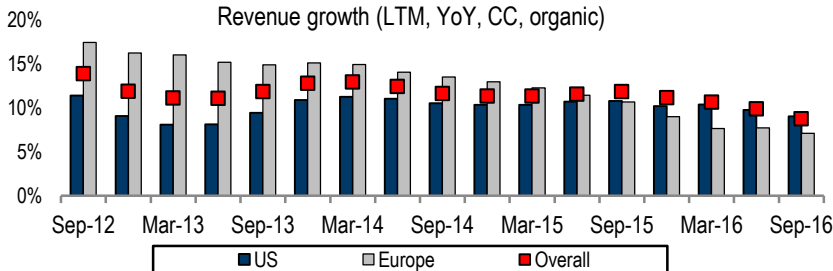
Slight moderation in the growth momentum



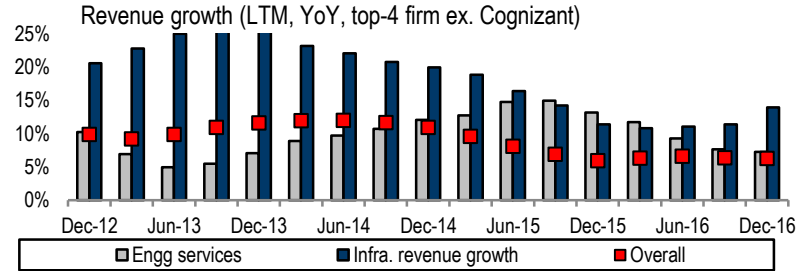
Margins are slightly trending down



Both US and Europe are decelerating; though US is growing slightly above the overall growth



IT Services spending—segment CAGR (%)



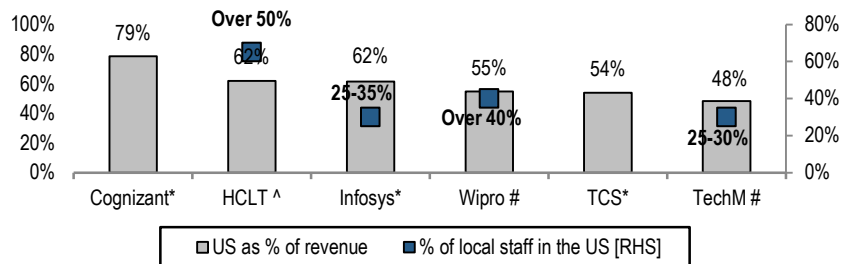
Source: Thomson Reuters, Bloomberg, Credit Suisse. *From December 2013 onwards, used constant currency growth rates. Also adjusted the growth rates for major acquisitions.

Indian IT: Changes to US visa rules a potential risk

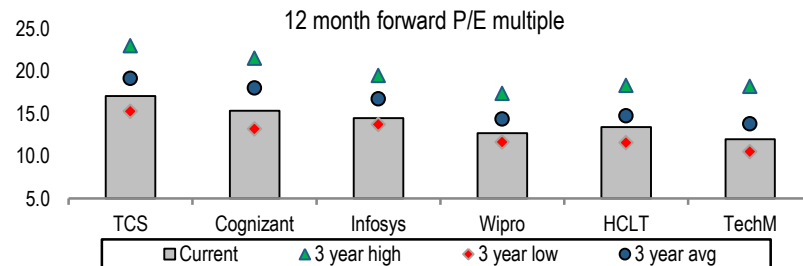
Potential change to H-1B rules is a key overhang; on the other hand, any pick-up in US macro could help

Measure	Ease of practically implementing	Reasons	Impact
H-1B/L1 Visa fee hike by another US\$2,000/2,250	High	One such increase took place in 2015.	20-30 bps margin impact
Minimum wage increased by 15%	Moderate	There have been proposals in the earlier bills to use the prevailing wage as the minimum threshold. In the last couple of bills, the minimum wage limit of US\$100-110k has been proposed. However, the wage levels differ between jobs and locations. One minimum threshold may not work.	~200 bps impact on the gross margins
Lower visa limit	Moderate to low	None of the last 5-6 years' bills that have been tabled has proposed a reduction in the limit of H-1B visa. Indeed, "H-1B and L-1 Visa Reform Act of 2013" and "Border Security, Economic Opportunity, and Immigration Modernization Act of 2013" proposed an increase in the limit. This indicates that there is a genuine skill shortage in the US. However, the recent couple of bills have proposed to make the availability of visa difficult for the Indian IT sector.	Any significant reduction in visa availability could disrupt the business.
Offshoring tax	Low	Trump has been vocal about preserving American jobs by imposing tariffs on products of U.S. companies that relocate overseas. Some companies may be outsourcing to a very smaller extent, while some might be using outsourcing in a major way. Will there be a differential tax? Also, it would be difficult to monitor the level of outsourcing by different companies in case of IT services.	If implemented, this could have a material impact on the IT work that is being outsourced, directly impacting Indian IT firms' revenue growth and in the immediate-term, the margins.

H-1B headwind; HCLT better placed and TechM has the least US exposure

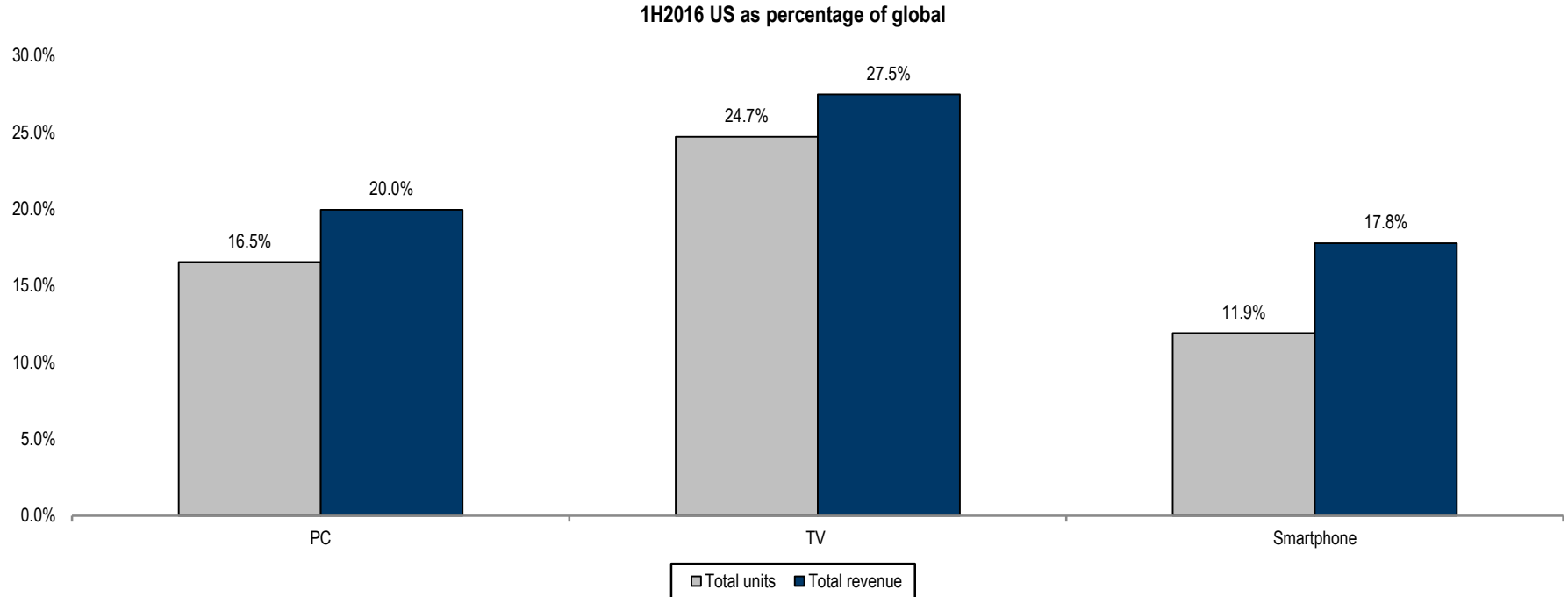


Multiples are well below the three-year average and close to lows



*North America, ^US, # Americas. Source: Credit Suisse estimates, Thomson Reuters, Company data

US accounts for 20-25% of key tech products demand



Source: IDC, IHS

Asian manufacturers in North America

North American manufacturing facilities for relevant Asian technology companies

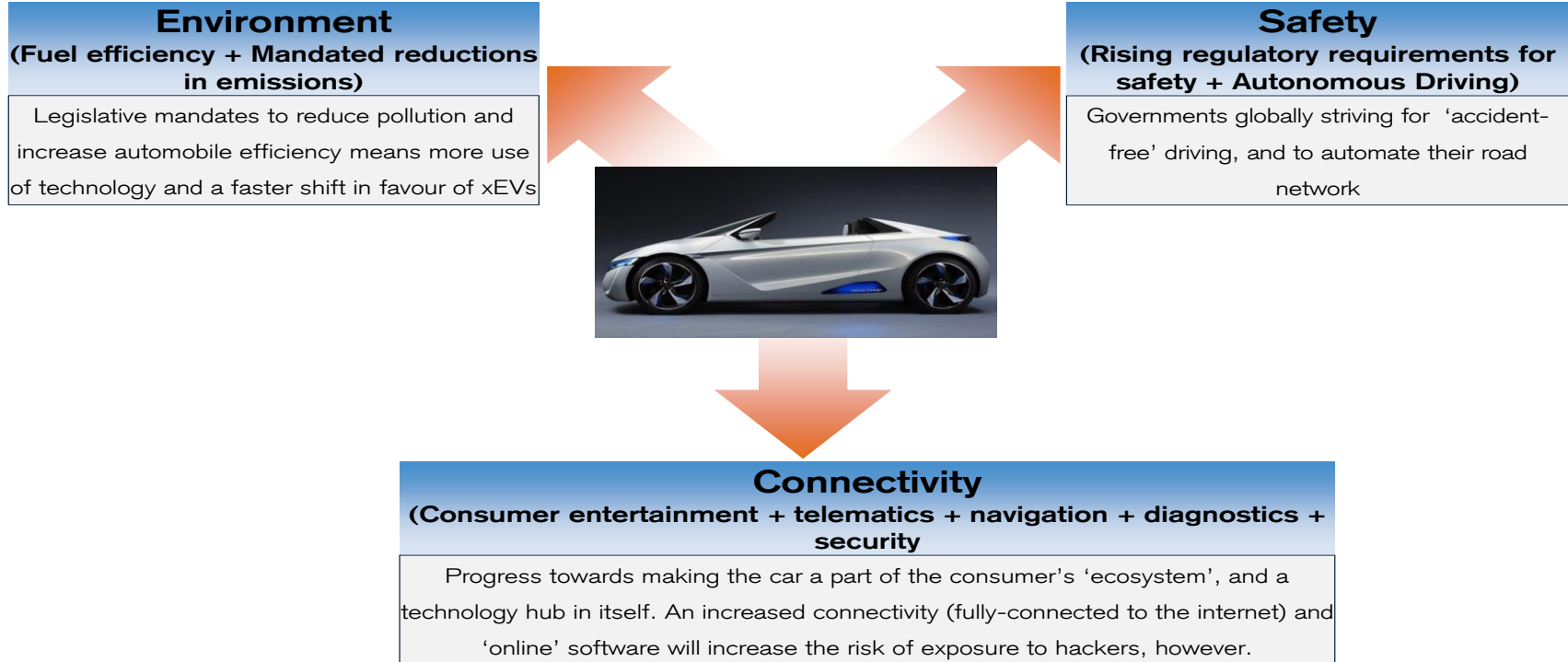
Company	Ticker	Facilities(name/place)	US/Mexico	Function/Product	Absolute capacity	% Capacity
Compal Electronics	2324.TW	Juarez	Mexico	LCD assembly site	n.a	n.a
Dahua	002236.SZ	Dahua Technology USA Inc.	US	Video surveillance	Rmb92.5~278 mn	1-3%
Hon Hai Precision	2317.TW	Chihuahua	Mexico	Handsets	n.a	n.a
Hon Hai Precision	2317.TW	Guadalajara	Mexico	PCs	n.a	n.a
Hon Hai Precision	2317.TW	Baja California	Mexico	LCD TVs	n.a	n.a
Hon Hai Precision	2317.TW	Juarez	Mexico	Set-top box, home gateways, routers, etc	n.a	n.a
Inventec Co Ltd	2356.TW	Juarez	Mexico	Enterprise servers and storages production, testing, troubleshooting, after-sales services, etc.	n.a	n.a
LG Electronics Inc	066570.KS	Manufacturing plant	Mexico	Home appliance	n.a	10%
LG Electronics Inc	066570.KS	Manufacturing plant	Mexico	TV	n.a	5-10%
Pegatron	4938.TW	Juarez	Mexico	Manufacturing	n.a	n.a
Samsung Electronics	005930.KS	Manufacturing plant	Mexico	Home appliance	n.a	10-15%
Samsung Electronics	005930.KS	Manufacturing plant	Mexico	TV	n.a	10%
Samsung Electronics	005930.KS	Manufacturing plant	US	System LSI	40,000 per month; 12"	25%
TSHT	002185.SZ	FlipChip International US	US	Packaging and testing	200-300 mn units/year	<3%
TSMC	2330.TW	8" fab	US	IC manufacturing	38000 WPM	2%
Wangsu	300017.SZ	Quantil Networks	US	CDN nodes	~10 nodes	~2%
Wistron	3231.TW	McKinney, Texas - Wistron GreenTech	US	Recycling services for electronic scrap and e-waste	n.a	n.a
Wistron	3231.TW	Juarez	Mexico	Manufacturing for LCD TV, DT and mobile devices	n.a	n.a

Number of employees

	Hon Hai		Pegatron		Wistron		Inventec	
	Global hires	Mexico	Global hires	Mexico	Global hires	Mexico	Global hires	Mexico
Male	650,000	n.a.	87,070	197	28,771	1,502	n.a.	n.a.
Female	350,000	n.a.	35,970	80	15,575	999	n.a.	n.a.
Total	1,000,000	20,000	123,040	277	44,346	2,501	27,160	1,200

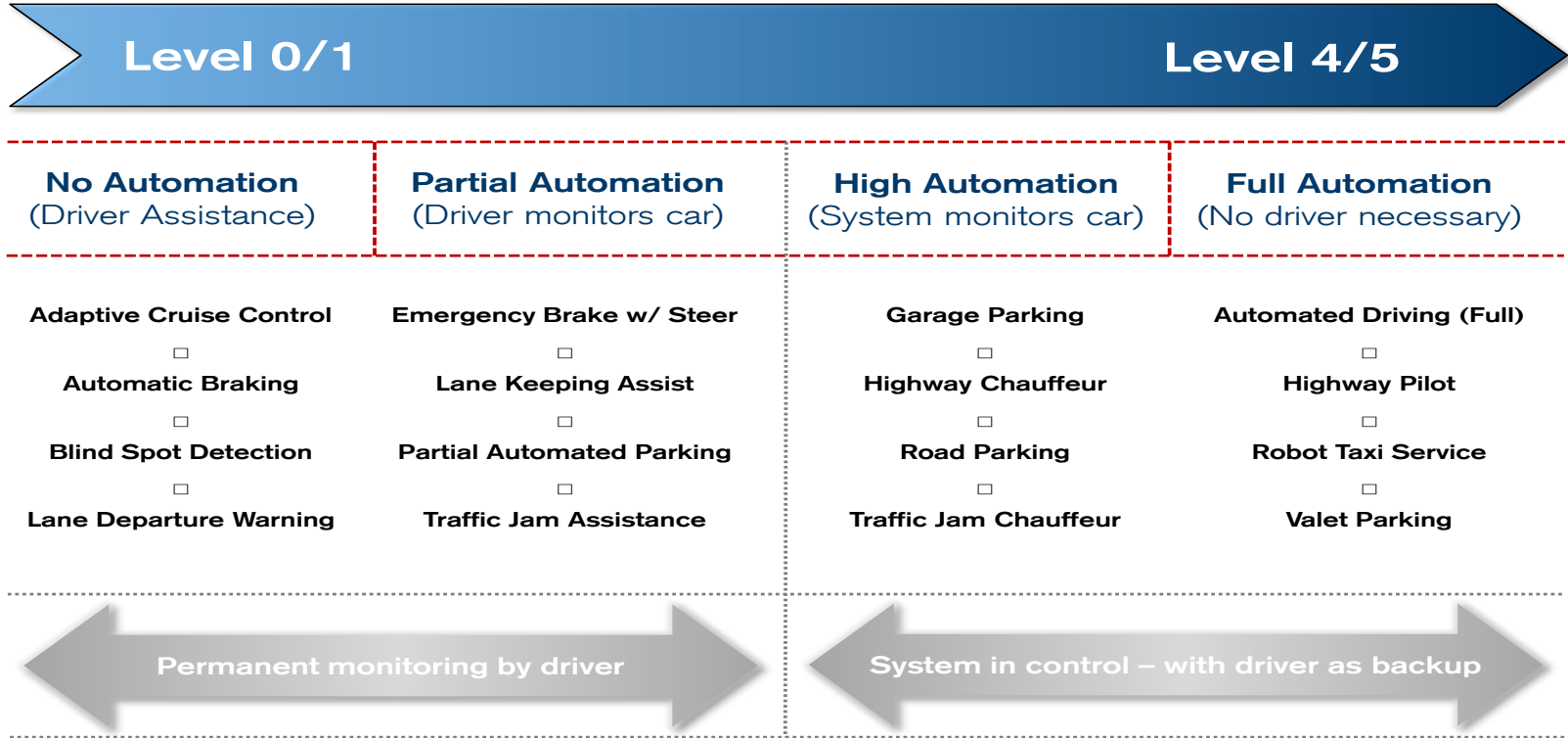
Source: Company data, Credit Suisse

The three prime drivers of tech content in automobiles



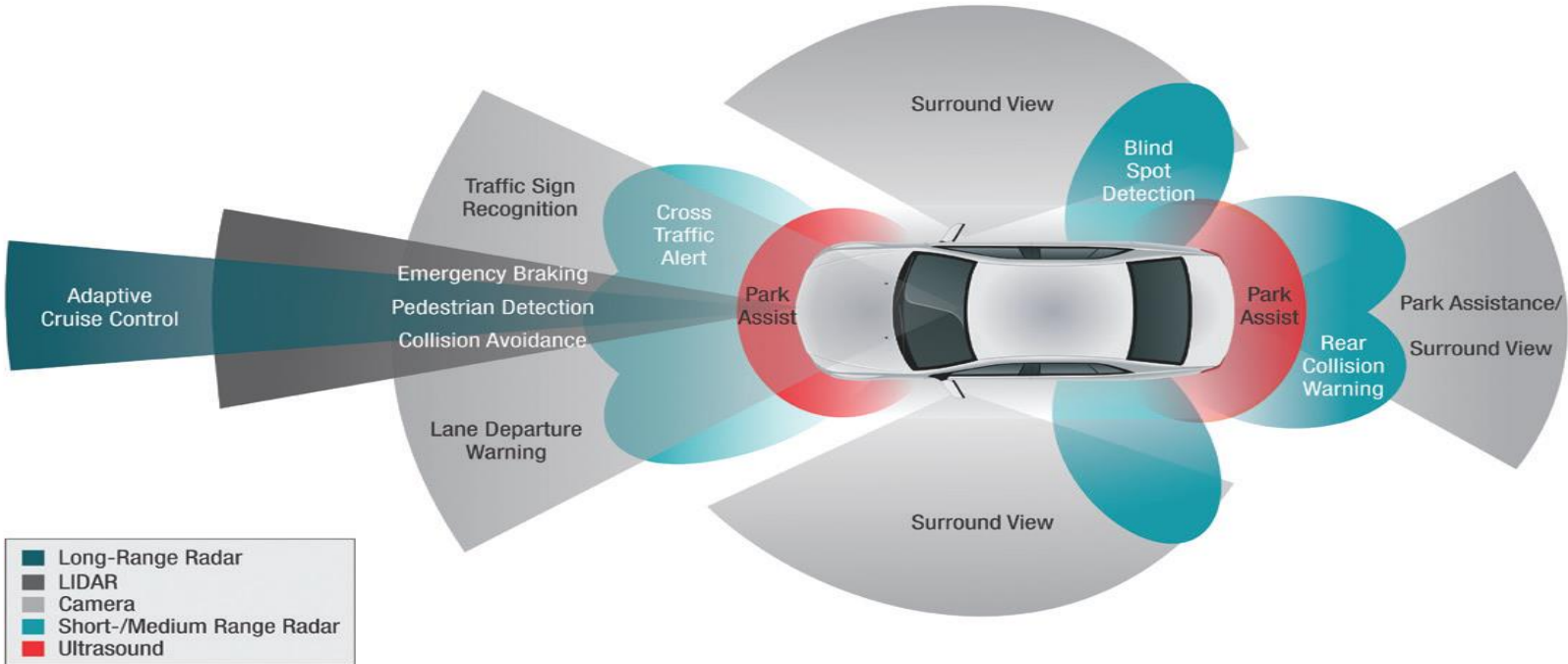
Source: Credit Suisse research

Various automation/safety features



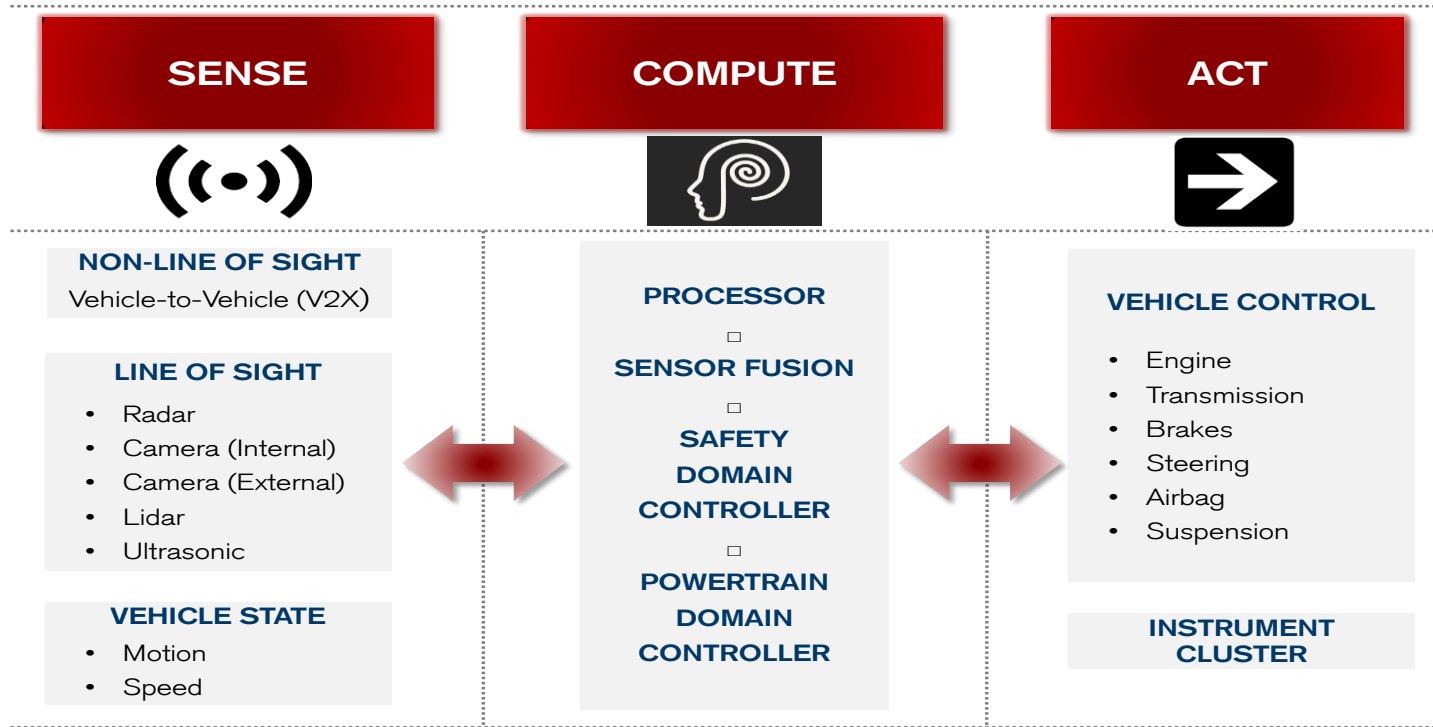
Source: NXP, Infineon, Credit Suisse research

ADAS system overview






Source: Texas Instruments (ADAS Solutions Guide)

ADAS system: Key components



Source: Infineon, NXP, Credit Suisse research

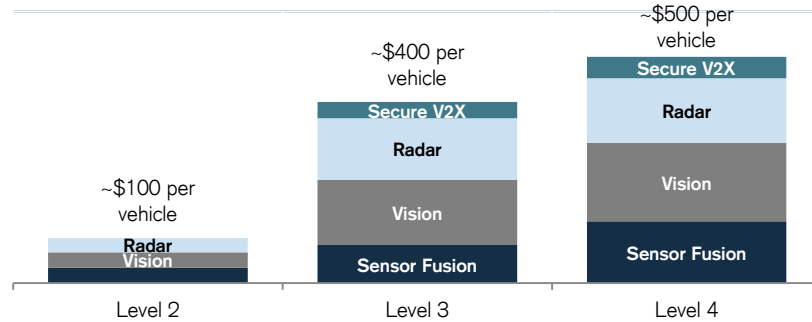
Estimated ADAS components required at different levels of automation

		Level 0-1	Level 2	Level 3	Level 4-5
Camera 		0 - 1	3 - 5	3 - 6	3 - 6
Lidar 		N/A	N/A	N/A	Probably
Radar 		0 - 3	0 - 5	3 - 6	6 - 20
Secure V2X 		No	Some	Yes	Yes
Ultrasonic Sensors 		4 - 8	8 - 12	Radar	Radar

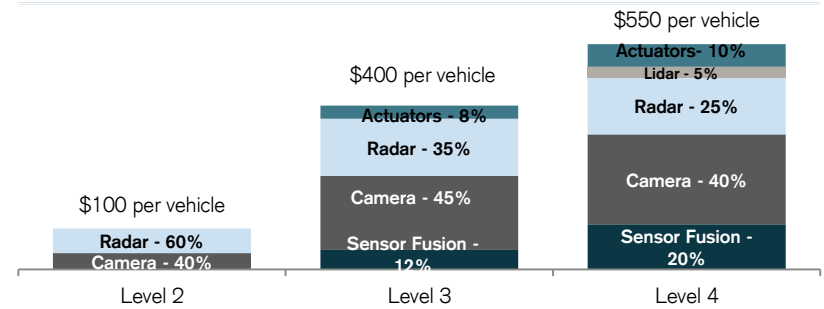
Source: NXP, Credit Suisse research

Automation and xEV lead to increased semis content

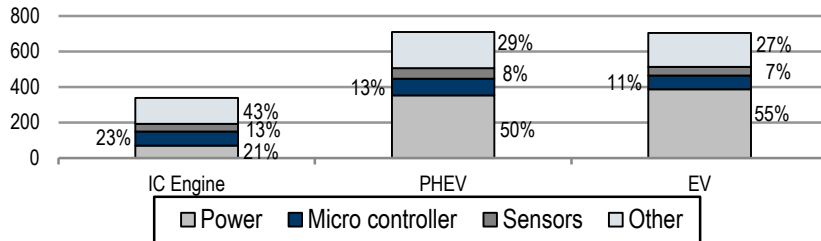
Average ADAS semi content by level of automation (US\$)



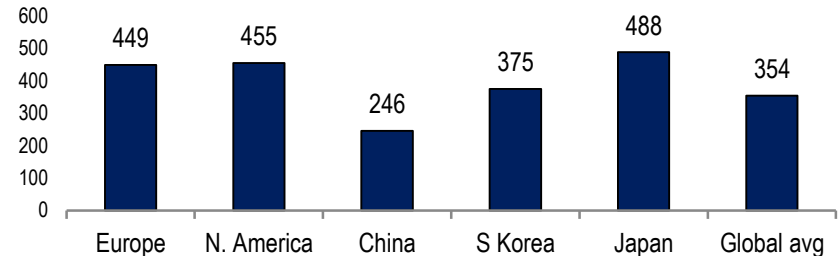
Average ADAS semi content by level of automation (US\$)



Average semiconductor content by type of engine (US\$)



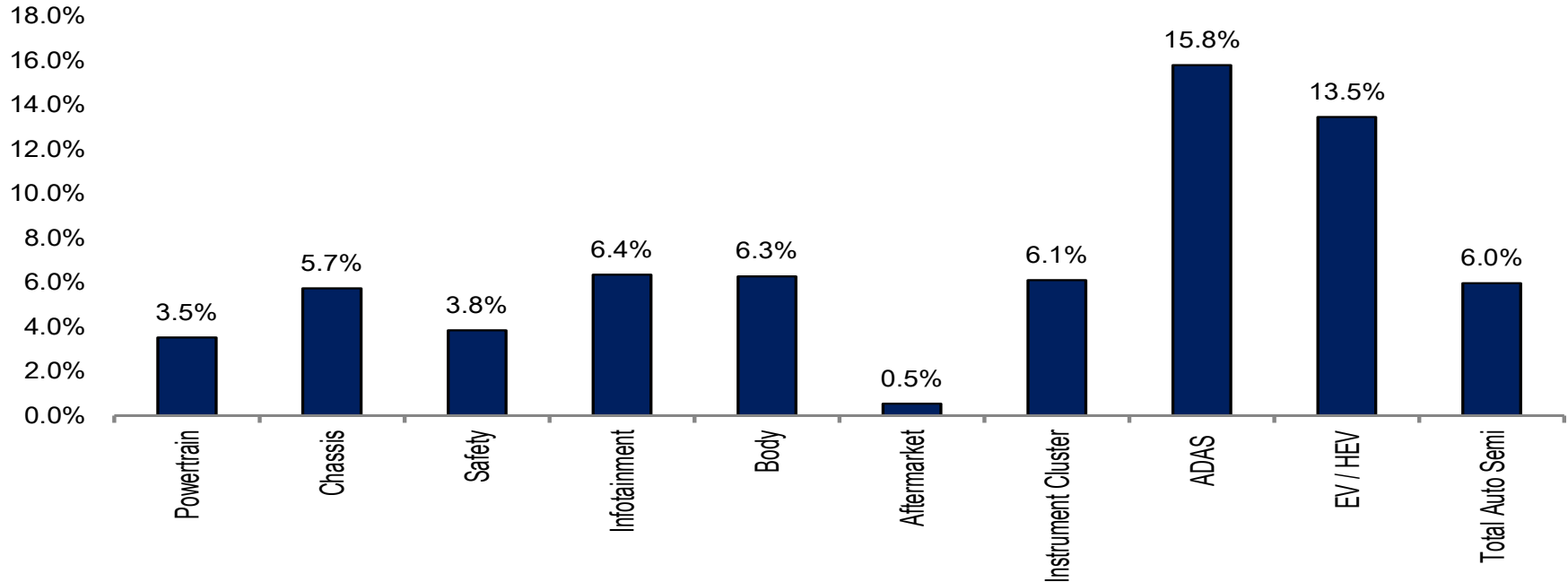
Average semiconductor content per car by geography, 2015E (US\$)



Source: NXP Semiconductors, Infineon (based on IHS data, Sep 2015)

ADAS the key driver for automotive-semis revenues

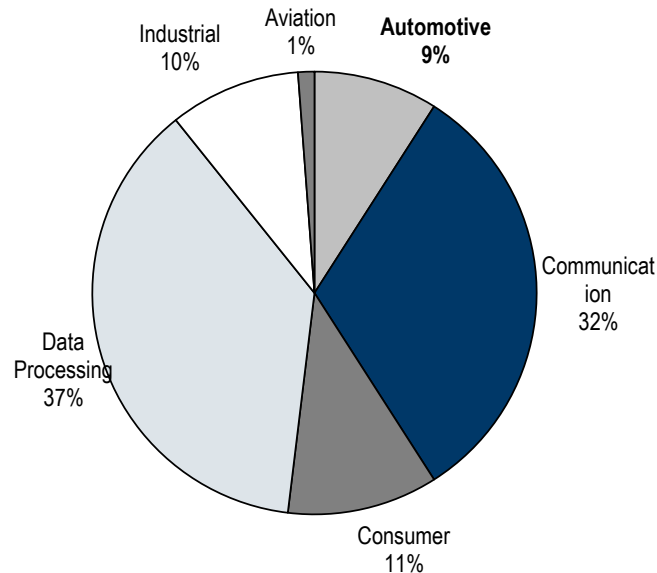
Semiconductor revenues by applications, 2015-20E CAGR 9%)



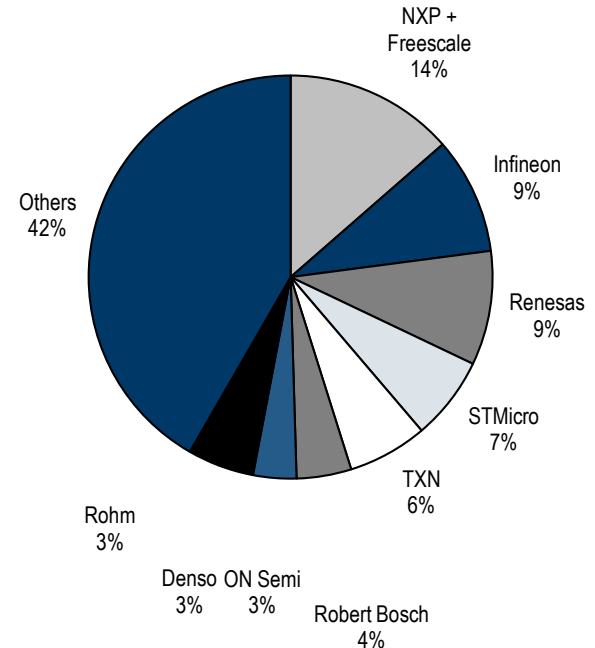
Source: Gartner, Credit Suisse estimates

Automotive-semis: Smaller but a faster growing part

Global semiconductor revenues – by applications, 2015 (%)



Automotive semiconductors – revenue market share, 2015 (%)



Source: Gartner

Asian automotive-tech supply chain

PCB / connectors / passives

- **Chilisin** (2456.TW)
- **Chin Poon** (2355.TW)
- **J. Aviation Elec** (6807.T)
- **Luxshare** (002475.SZ)
- **Murata** (6981.T)
- **Tong Hsing** (6271.TW)
- **TXC** (3042.TW)
- **Yageo** (2327.TW)

Battery + component

- **Aleees** (5227.TWO)
- **BYD** (002594.SZ)
- **Chroma** (2360.TW)
- **LG Chem** (051910.KS)
- **Panasonic** (6752.T)
- **SamsungSDI** (006400.KS)
- **Simple** (6121.TWO)
- **Soulbrain** (036830.KQ)

Engineering services + software

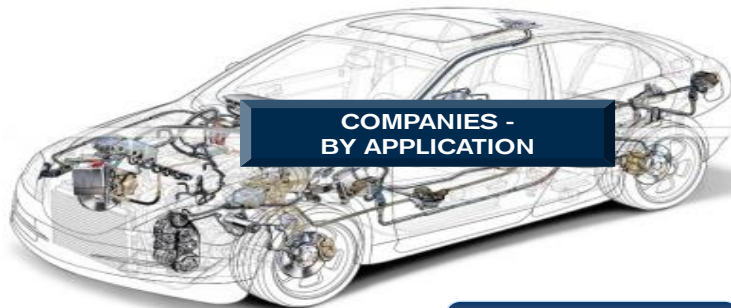
- **HCL Tech** (HCLT.BO)
- **KPIT** (KPIT.BO)
- **MDS Tech** (086960.KQ)
- **Tech Mahindra** (TEML.BO)

Multiple components + systems

- **Alpine** (6816.T)
- **ALPS Electric** (6770.T)
- **Clarion** (6796.T)
- **Delta** (2308.TW)
- **Joyson** (600699.SS)
- **JVC Kenwood** (6632.T)
- **LG Elec** (066570.KS)
- **LG Innotek** (011070.KS)
- **Mitac** (3706.TW)
- **NGK Spark Plug** (5334.T)
- **NIDEC** (6594.T)
- **Pioneer** (6773.T)
- **ROHM** (6963.T)
- **SEMCO** (009150.KS)
- **TDK** (6762.T)
- **WistronNeWeb** (6285.TW)

Semiconductors

- **Amkor** (AMKR.OQ)
- **ASE** (2311.TW)
- **ASMC** (3355.HK)
- **Epistar** (2448.TW)
- **Everlight** (2393.TW)
- **SMIC** (0981.HK)
- **Himax** (HIMX.OQ)
- **Intelleipi** (4971.TWO)
- **King Yuan** (2249.TW)
- **Kingpak** (6238.TWO)
- **NavInfo** (002405.SZ)
- **NFME** (002156.SZ)
- **Novatek** (3034.TW)
- **Renesas Elec.** (6723.T)
- **TSMC** (2330.TW)
- **Vanguard** (5347.TWO)



Optical component

- **Largan** (3008.TW)
- **LOT** (2301.TW)
- **MCNex** (097520.KQ)
- **Sekonix** (053450.KS)
- **Sunny Optical** (2382.HK)

Display components

- **AUO** (2409.TW)
- **Innolux** (3481.TW)
- **LG Display** (034220.KS)
- **Tianma** (000050.SZ)
- **TPK** (3673.TW)
- **Truly** (0732.HK)
- **Varitronix** (0710.HK)

Source: Credit Suisse research

Companies Mentioned (Price as of 22-Mar-2017)

58.com Inc. (WUBA.N, \$37.57)
AAC Technologies Holdings Inc (2018.HK, HK\$86.5)
ASMI Pacific Technology Ltd (0622.HK, HK\$108.2)
Advantech Co., Ltd. (2395.TW, NT\$256.5)
Alibaba Group Holding Limited (BABA.N, \$106.09)
Asustek (2357.TW, NT\$290.5)
Baidu Inc (BIDU.OQ, \$169.56)
Catcher Technology (2474.TW, NT\$292.0)
Ctrip.com International, Ltd. (CTRP.OQ, \$48.2)
Delta Electronics (2308.TW, NT\$167.0)
Foxconn Technology Corp (2364.TW, NT\$94.9)
Goertek Inc. (002241.SZ, Rmb33.54)
HCL Technologies (NSE.OQ, Rs875.35)
Hangzhou Hikvision Digital Technology Co., Ltd. (002415.SZ, Rmb31.55)
Hon Hai Precision (2317.TW, NT\$91.5)
Intosys Limited (HMY.BC, R\$1027.8)
JD.com (JD.OQ, \$30.58)
Kakao Corp (035720.KQ, W\$86.60)
LG Display Co Ltd. (034220.KS, W\$29,500)
LG Electronics Inc (066570.KS, W\$9,200)
Largan Precision (3008.TW, NT\$4740.0)
Lenovo Group Ltd (0992.HK, HK\$4.91)
Lens Technology Co., Ltd (300433.SZ, Rmb31.3)
Lie-On Technology (2301.TW, NT\$54.0)
Luxshare Precision Industry Co., Ltd (002475.SZ, Rmb23.46)
MediaTek Inc. (2454.TW, NT\$227.5)
Momo (MOMO.OQ, \$32.81)
NCSOFT (036570.KS, W\$297,500)
Naver Corp (035420.KS, W\$49,000)
New Oriental Education (EDU.N, \$58.69)
Pegatron (4938.TW, NT\$87.8)
Quanta Computer (2382.TW, NT\$64.9)
SK Hynix Inc. (000660.KS, W\$48,650)
Samsung Electro-Mechanics (008150.KS, W\$7,600)
Samsung Electronics (026930.KS, W\$123,000)
Samsung SDI (006400.KS, W\$135,000)
Samsung SDS (018260.KS, W\$145,000)
Sanan Optoelectronics Co. Ltd (600703.SS, Rmb16.15)
Semiconductor Manufacturing International Corp. (0981.HK, HK\$10.0)
Shenzhen O-film Tech Co., Ltd (002458.SZ, Rmb36.95)
Sina (SINA.OQ, \$70.59)
Sunny Optical Technology Group Co.Limited (2382.HK, HK\$56.65)
TAL Education Group (TAL.N, \$102.87)
Taiwan Semiconductor Manufacturing (2330.TW, NT\$193.5)
Tata Consultancy Services (TCS.BC, R\$2478.1)
Tech Mahindra Limited (TEML.BO, R\$475.4)
Tencent Holdings (0700.HK, HK\$225.2)
United Microelectronics (2303.TW, NT\$12.2)
Vipshop Holdings Limited (VIPS.N, \$13.77)
Wangshu Science & Technology Co. Ltd (300017.SZ, Rmb42.82)
Weibo Corporation (WB.OQ, \$45.92)
Wipro Ltd. (WIPR.BO, R\$501.55)
ZTE Corporation (0753.HK, HK\$14.52)
Zhejiang Dahua Technology Co., Ltd (002236.SZ, Rmb16.84)

Disclosure Appendix

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I, Manish Nigam, certify that (1) the views expressed in this report accurately reflect my personal views about all of the subject companies and securities and (2) no part of my compensation was, is or will be directly or indirectly related to the specific recommendations or views expressed in this report.

3-Year Price and Rating History for Kakao Corp (035720.KQ)

035720.KQ	Closing Price	Target Price	Rating
Date	(W)	(W)	
20-Jun-14	101,300	125,000	O
30-Jul-14	130,800	150,000	
06-Oct-14	154,800	220,000	
10-Nov-14	139,300	200,000	
13-Feb-15	141,200	175,000	
20-Mar-15	121,000	110,000	N
14-May-15	105,900	105,000	
17-Aug-15	137,100	120,000	*
13-Jan-16	119,800		R
21-Mar-16	112,200	120,000	N
12-May-16	106,300		*
07-Jun-16	98,200	69,000	U
21-Jul-16	92,700	73,000	
11-Oct-16	81,500	63,000	



* Asterisk signifies initiation or assumption of coverage.

3-Year Price and Rating History for LG Display Co Ltd. (034220.KS)

034220.KS	Closing Price	Target Price	Rating
Date	(W)	(W)	
23-Apr-14	29,000	26,000	N *
15-Oct-14	32,250	26,000	U
04-Dec-14	34,500	27,000	
28-Jan-15	36,050	29,000	
18-Jun-15	26,450	27,000	N
23-Jul-15	22,950	26,000	
31-Aug-15	23,050	25,800	
22-Oct-15	23,550	25,600	
06-Jan-16	23,100	25,300	
27-Jan-16	22,800	24,000	
17-May-16	24,400	23,700	
27-Jul-16	30,450	25,800	
24-Jan-17	31,750	27,000	



* Asterisk signifies initiation or assumption of coverage.

3-Year Price and Rating History for LG Electronics Inc (066570.KS)

066570.KS	Closing Price	Target Price	Rating
Date	(W)	(W)	
29-Apr-14	71,700	83,000	N *
24-Jul-14	77,000	87,000	
29-Oct-14	67,800	78,000	
29-Jan-15	62,600	75,000	
29-Apr-15	61,200	68,000	
02-Jun-15	55,400	62,000	
09-Jul-15	45,750	53,500	
29-Jul-15	43,800	49,000	
25-Aug-15	40,850	45,500	
30-Oct-15	49,100	46,200	
25-Jan-16	54,800	49,000	
16-Mar-16	61,900	54,000	
28-Apr-16	58,200	57,000	
19-May-16	54,000	50,000	
25-Jan-17	54,200	52,000	
16-Mar-17	68,100	59,000	



* Asterisk signifies initiation or assumption of coverage.

3-Year Price and Rating History for NCSOFT (036570.KS)

036570.KS	Closing Price	Target Price	Rating
Date	(W)	(W)	
19-May-14	186,500	240,000	O
03-Jul-14	186,000	220,000	
14-Aug-14	155,500	190,000	
25-Aug-14	142,000	155,000	N
13-Nov-14	165,500	185,000	
11-Feb-15	209,500	200,000	
31-Jul-15	219,500	210,000	
04-Nov-15	210,000	220,000	*
28-Jan-16	237,000	170,000	U *
12-Feb-16	237,000	182,000	
16-May-16	240,500	186,000	
13-Jul-16	255,500	199,000	
11-Aug-16	252,500	203,000	
30-Nov-16	272,000	184,000	
16-Jan-17	287,000	350,000	O
07-Feb-17	301,000	360,000	
09-Mar-17	281,500	420,000	



* Asterisk signifies initiation or assumption of coverage.

3-Year Price and Rating History for Naver Corp (035420.KS)

035420.KS	Closing Price	Target Price		
Date	(₩)	(₩)	Rating	
08-May-14	705,000	750,000	N	
20-Jun-14	787,000	850,000		
31-Oct-14	754,000	1,000,000	O	
04-May-15	603,000	900,000		
30-Jul-15	518,000	840,000		
29-Oct-15	592,000	800,000	*	
28-Jan-16	631,000	910,000	*	
29-Jan-16	628,000	890,000		
29-Apr-16	677,000	870,000		
10-Jun-16	720,000		R	
23-Aug-16	806,000		NR	
05-Sep-16	850,000	1,060,000	O	
16-Jan-17	794,000	1,020,000		
30-Jan-17	753,000	930,000		
16-Mar-17	819,000	950,000		

* Asterisk signifies initiation or assumption of coverage.



3-Year Price and Rating History for SK Hynix Inc. (000660.KS)

000660.KS	Closing Price	Target Price		
Date	(₩)	(₩)	Rating	
25-Apr-14	40,750	49,000	O	
23-Jun-14	48,900	64,000		
29-May-15	51,100		R	
01-Jun-15	51,100	64,000	O	
06-Jul-15	40,750	59,000		
23-Jul-15	39,000	57,000		
19-Aug-15	33,000	56,000		
22-Oct-15	31,950	49,000		
26-Jan-16	27,850	45,000		
26-Apr-16	29,150	42,000		
20-Sep-16	39,250	46,000		
03-Oct-16	40,200	55,000		
13-Jan-17	50,300	65,000		
26-Jan-17	53,300	71,000		

* Asterisk signifies initiation or assumption of coverage.



3-Year Price and Rating History for Samsung Electro-Mechanics (009150.KS)

009150.KS	Closing Price	Target Price		
Date	(₩)	(₩)	Rating	
28-Apr-14	69,000	72,000	N	
02-Jul-14	58,700	44,000	U	
30-Oct-14	47,000	44,000	N	
02-Dec-14	59,700	53,000		
30-Jan-15	67,000	58,000		
27-Apr-15	67,900	60,000		
10-Jun-15	57,300	58,000		
14-Oct-15	61,500	80,000	O	
25-Jan-16	54,100	70,000		
26-Apr-16	53,400	65,000		
25-Jul-16	55,800	68,000		
27-Oct-16	48,000	60,000		
25-Jan-17	56,600	66,000		
15-Mar-17	62,700	78,600		

* Asterisk signifies initiation or assumption of coverage.



3-Year Price and Rating History for Samsung Electronics (005930.KS)

005930.KS	Closing Price	Target Price		
Date	(₩)	(₩)	Rating	
06-May-14	1,348,000	1,760,000	O	
07-Jul-14	1,292,000	1,740,000		
08-Jul-14	1,295,000	1,720,000		
28-Aug-14	1,242,000	1,700,000		
07-Oct-14	1,162,000	1,680,000		
03-Sep-15	1,122,000	1,630,000		
29-Oct-15	1,325,000	1,785,000		
11-Jan-16	1,152,000	1,690,000		
28-Jan-16	1,145,000	1,550,000		
01-Jun-16	1,333,000	1,702,000		
28-Jul-16	1,507,000	1,790,000		
15-Dec-16	1,759,000	2,400,000		
24-Jan-17	1,908,000	2,650,000		
09-Mar-17	2,010,000	2,900,000		

* Asterisk signifies initiation or assumption of coverage.



3-Year Price and Rating History for Samsung SDI (006400.KS)

006400.KS	Closing Price	Target Price		
Date	(₩)	(₩)	Rating	
27-Apr-14	150,000	142,000	N	
28-Apr-15	126,000	132,000		
30-Jul-15	94,600	105,000		
31-Aug-15	84,500	88,000		
02-Nov-15	111,000	91,000		
26-Jan-17	116,000	99,000		

* Asterisk signifies initiation or assumption of coverage.



3-Year Price and Rating History for Samsung SDS (018260.KS)

018260.KS	Closing Price	Target Price		
Date	(₩)	(₩)	Rating	
25-Nov-14	428,000	470,000	O*	
27-Jan-15	242,000	270,000	N	
01-May-15	256,000	220,000	U	
29-Oct-15	275,000	200,000		
22-Jan-16	259,500	180,000		
28-Apr-16	168,000	130,000		
06-Dec-16	127,500	125,000	N	
23-Jan-17	132,000	120,000		

* Asterisk signifies initiation or assumption of coverage.



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