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Macquarie Capital (USA) Inc.

Initiating Semis Coverage

Not yet out of gas

Crosswinds support further upside to selective stocks

The SOX index has outperformed the S&P 500 by more than 30 points in the last 12 months driven by both secular and cyclical factors. We expect the cyclical momentum to fade as YoY growth slows in the coming months. M&A, which has been a key driver, should also slow as most large-cap companies are still digesting recent acquisitions. At the same time, end-demand appears healthy, inventories are within normal ranges, margins are structurally better, and cash returns are solid. Valuations are rich on an absolute basis but do not appear alarming on a relative basis. As such, we recommend continued exposure to the sector but on a selective basis. In particular, we see opportunities in the Apple supply chain & memory, and also like stocks with secular tailwinds and/or reasonable valuations. We initiate on 13 stocks with positive ratings on AVGO, INTC, MU, MXIM, SWKS, and CAVM.

Momentum to slow but fundamentals healthy

Semiconductor unit growth continues to recover after dipping into negative territory in May 2016. We expect 9.5% growth for the semi industry this year on the back of a strong recovery in memory. Demand in PC, smartphone, industrial and infrastructure markets appears healthy. Inventories and lead times are within normal ranges, and double ordering appears less of an issue. That said, momentum could slow as comps gets tougher in 2H17, which could also limit upside to Street estimates. We expect YoY unit growth to peak in mid-2017 but believe that positive YoY trend will continue through the end of the year.

M&A less of a driver; consolidation to help pricing

M&A accelerated in 2016 with total deal value exceeding $150b. We expect the pace to slow since most large-cap companies are still digesting recent acquisitions (some deals have yet to close). Levered balance sheets, higher cash return commitments, and regulatory issues (as far as foreign capital is concerned) could also dampen M&A activity. On the positive side, consolidation is already driving structural margin expansion in the industry. Anecdotal evidence also points to improving pricing trends, which could further enhance industry profitability in the coming years.

Valuations not stretched on a relative basis

Absolute valuations are above three-year averages for most stocks, with some trading at peaks. However, multiples do not appear alarming on a relative basis. Semis are trading at an 11% premium to the market, compared to an average of 10% premium in the past three years. Semi stock premiums usually shrink as estimates move higher due to cyclical concerns. Lack of multiple compression in the current cycle implies that the stocks are discounting less cyclicality and more structural margin improvements, which we tend to agree with. Looking into the next few quarters, Street estimates appear reasonable and we do not foresee a steep cyclical correction given the healthy demand and lean supply chain. Further multiple expansion also appears less likely as YoY revenue momentum slows. As such, we see limited upside to the broader group but believe that three themes will outperform 1) the Apple supply chain; 2) memory; and 3) stocks with exposure to secular markets such as cloud and auto and/or trading at reasonable valuations.

Not yet out of gas

We still see opportunities in the Semi space despite strong outperformance

We are initiating coverage of 13 stocks with positive ratings on AVGO, INTC, MU, MXIM, SWKS, and CAVM. Our Neutral-rated stocks are QCOM, TXN, AMD, NVDA, QRVO, MRVL and XLNX. The SOX index continues to outperform the broader market YTD on the back of healthy demand trends and upward estimate revisions. Street estimates appear reasonable and we see room for modest upside in the next one to two quarters. While we are not expecting a steep cyclical correction, lack of more meaningful upside and slowing M&A will likely keep the broader group in a range. We prefer a more selective approach this year given the crosswinds. Our Outperform-rated stocks broadly fit into one or more of these themes. 1) The Apple supply chain; 2) memory; 3) exposure to secular markets such as cloud and auto and/or trading at reasonable valuations.

AVGO is our top pick due to its secular growth, margin execution, and improving cash returns

- Our top pick is AVGO. Despite the strong run-up, we see further upside from continued content expansion in the iPhone, data center switching leadership, and dividend growth.
- We believe INTC can work despite free cash flow and competitive concerns given the low bar in PC, and upside potential to DCG & gross margins in 2H17.
- Our global team remains positive on the memory cycle as we expect pricing trends to remain resilient through 2017. We also believe MU's gross margin improvements are partly structural.
- SWKS is another beneficiary from the upcoming iPhone 7S/X cycle. Its stronger free cashflow and margin execution make it more attractive than peer QRVO, in our view.
- MXIM should benefit from lower smartphone exposure and its strong automotive growth. We also like the margin leverage, free cash flow, cash returns, and discounted valuation.
- The stars are aligning for CAVM after a disappointing 2016 on the back of new product ramps and share gains.
- We believe NVDA is the best secular growth story in large cap semis, but prefer to wait for a better entry point. There's not much not to like about TXN except that the story is well understood and the valuation mostly reflects its near-term prospects. QCOM is inexpensive but we see limited upside until Apple litigation is behind. We believe AMD is priced for perfection but the stock likely gets benefit of doubt for another quarter or two. For MRVL, we believe margin expansion and restructuring are now behind, and are skeptical about top-line growth. For XLNX, we do not see many immediate catalysts. For QRVO, we'd like to see cash flow improve more meaningfully before getting constructive.

Fig 1 Semiconductor coverage universe

							EV/FCF		EPS		PE		Revenue Estimate		Rev Growth		EV/Rev	
Company	Opinion	Price	Target	Upside	Mkt Cap	Ent Value	CY17	CY18	CY17	CY18	CY17	CY18	CY17	CY18	CY17	CY18	CY17	CY18
AMD	Neutral	$13.69	$14	2%	$12,978	$13,149	64.5x	31.0x	$0.08	$0.30	NM	45.6x	$4,758	$5,211	11.4%	9.5%	2.8x	2.5x
INTC	O-PF	$35.60	$40	12%	$173,764	$181,948	17.2x	14.0x	$2.85	$3.02	12.5x	11.8x	$59,622	$61,718	0.4%	3.5%	3.1x	2.9x
NVDA	Neutral	$107.69	$110	2%	$67,199	$63,180	29.9x	28.4x	$3.36	$3.87	32.1x	27.8x	$8,019	$8,866	16.0%	10.6%	7.9x	7.1x
MU	O-PF	$28.69	$35	22%	$32,879	$40,817	8.1x	7.7x	$5.31	$4.77	5.4x	6.0x	$21,142	$21,262	62.4%	0.6%	1.9x	1.9x
TXN*	Neutral	$80.61	$82	2%	$82,061	$82,180	19.0x	18.4x	$3.67	$3.92	21.9x	20.6x	$14,031	$14,534	4.9%	3.6%	5.9x	5.7x
MXIM	O-PF	$44.92	$52	16%	$12,937	$11,841	15.6x	14.0x	$2.24	$2.49	20.1x	18.0x	$2,351	$2,461	5.2%	4.7%	5.0x	4.8x
AVGO	O-PF	$220.95	$265	20%	$98,986	$109,012	16.7x	13.8x	$15.27	$16.53	14.5x	13.4x	$17,323	$18,418	10.6%	6.3%	6.3x	5.9x
SWKS	O-PF	$97.93	$110	12%	$18,313	$16,844	15.8x	14.3x	$6.55	$7.16	15.0x	13.7x	$3,709	$3,998	13.2%	7.8%	4.5x	4.2x
QRVO	Neutral	$68.25	$70	3%	$9,009	$9,467	18.9x	12.3x	$5.24	$6.49	13.0x	10.5x	$3,118	$3,480	4.1%	11.6%	3.0x	2.7x
QCOM	Neutral	$57.38	$60	5%	$85,783	$70,532	9.4x	9.2x	$4.63	$4.77	12.4x	12.0x	$24,271	$24,906	2.3%	2.6%	2.9x	2.8x
CAVM	O-PF	$71.90	$85	18%	$5,105	$5,612	31.4x	21.2x	$2.70	$3.48	26.6x	20.7x	$965	$1,088	59.9%	12.7%	5.8x	5.2x
MRVL	Neutral	$15.70	$16	2%	$8,290	$6,619	12.0x	12.0x	$0.99	$1.05	15.9x	15.0x	$2,368	$2,413	(1.0%)	1.9%	2.8x	2.7x
XLNX*	Neutral	$57.97	$60	4%	$15,652	$13,810	18.9x	17.6x	$2.32	$2.54	25.0x	22.8x	$2,449	$2,580	6.0%	5.3%	5.6x	5.4x
Average							**20.8x**	**16.1x**			**17.6x**	**18.0x**			**15%**	**7%**	**4.3x**	**4.0x**

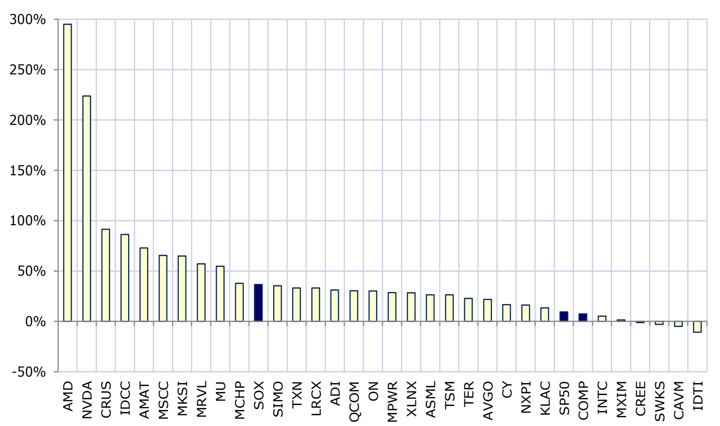
Source: Factset, Macquarie capital (USA), March 2017; priced as market close, March 28, 2017

Momentum to slow but fundamentals healthy

Slowing M&A and revenue momentum could mean more divergence in stock returns

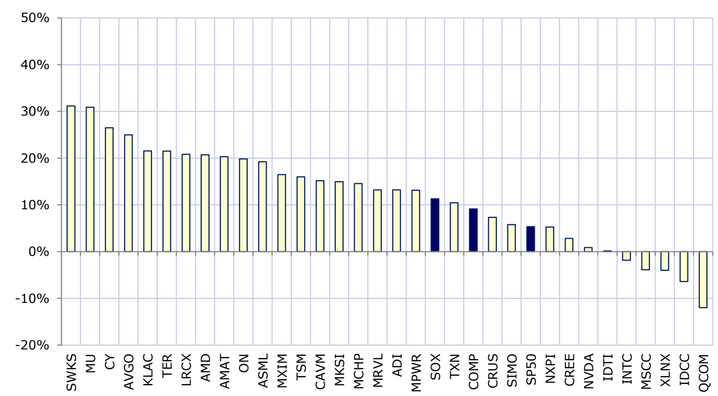
The SOX index has outperformed SP500 by more than 30 points in the last 12 months driven by both secular and cyclical factors. M&A has been a key driver for the stock performance, but improving demand conditions and new product cycles have also helped. The outperformance was fairly broad based in 2016 with 90% of the SOX components beating the market. That trend has more or less continued thus far in 2017. Looking ahead, Street estimates appear reasonable for the next few quarters and the risk of a cyclical inventory correction appears low. However, further upside to estimates also appears limited as industry revenue momentum slows. In such a scenario, we expect the broader sector to trade in a range and individual stock returns to diverge more meaningfully than what we have seen in the past 12 months.

Fig 2 Semi stock performance (2016)



Source: Factset, Macquarie Capital (USA), March 2017

Fig 3 Semi stock performance YTD

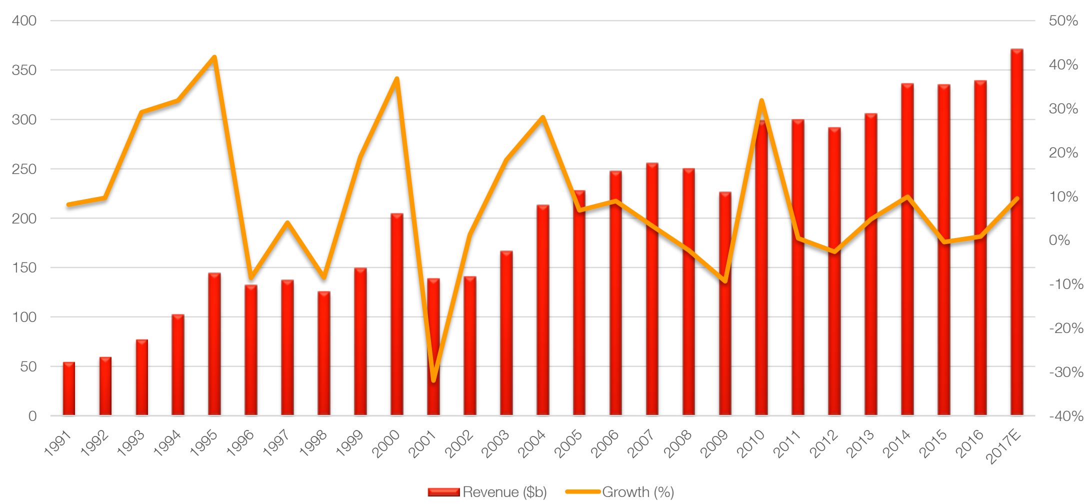


Source: Factset, Macquarie Capital (USA), March 2017

We expect memory strength to drive 9.5% growth for Semi industry this year…ex-Memory, we expect low single digit growth

The semiconductor industry grew 1% in 2016 driven by a broad-based recovery, which started in 3Q16. Year-on-year billings growth turned positive in July and improved every month before reaching a double-digit pace in November. The analog sub-segment was particularly strong with 6% growth in 2016, which we partly attribute to secular trends in industrial and automotive segments. We expect YoY billings growth to peak in the next few months and begin to moderate in 2H17. We are forecasting 9.5% growth for 2017, a significant portion of which is driven by a strong memory market. Excluding memory, we expect low-single-digit growth for the industry in 2017. Longer term, we see enough drivers for the semi industry to grow at a low-single-digit pace. The PC market is now less of a headwind and the smartphone market is still growing, albeit modestly. Emerging applications such as autonomous cars, industrial automation, drones, and IoT will need much higher semiconductor content going forward, which should help maintain at least low-single-digit growth for the industry longer term.

Fig 4 Semi Industry revenue trend & forecast

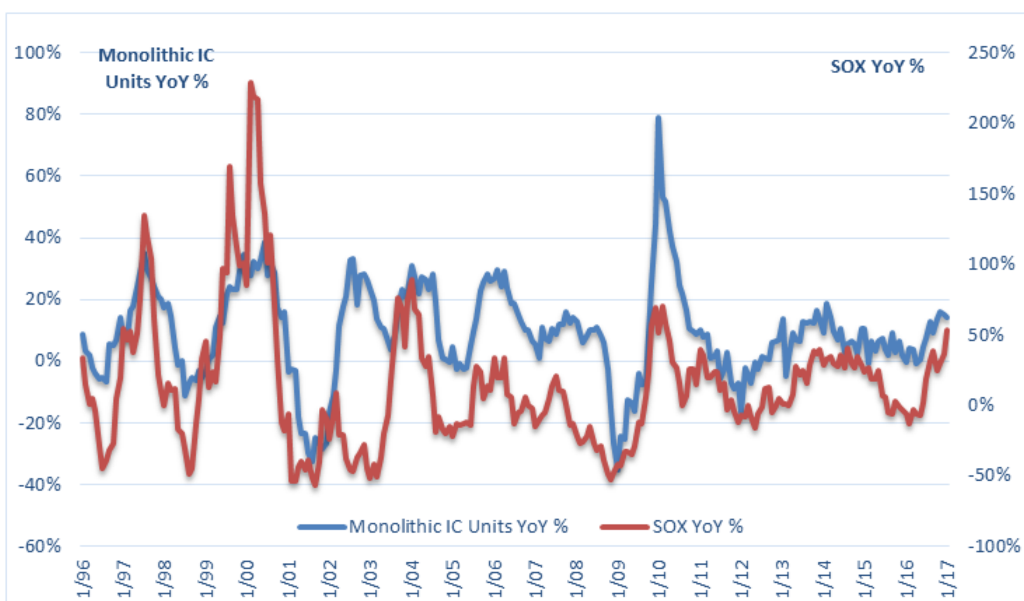


Source: WSTS, Macquarie Capital (USA), March 2017

Cyclicality has moderated as growth slowed, but hasn't completely disappeared

Semi industry cyclicality moderated significantly in recent years as growth slowed. In particular, the recent downturns in the non-memory markets have been much more benign and were primarily driven by weaker end demand as opposed to supply chain excesses. For example, the Semi industry declined only ~4% on a YoY basis in 2H15 after growing at a strong 10% in 2014. Monolithic IC units, which are a better indicator of the overall industry health, have yet to post a negative growth quarter on a YoY basis since 2012. Cyclicality hasn't completely disappeared, however, but slower growth and more efficient supply chain are making it less of an issue outside of the memory market.

Fig 5 Semiconductor units v/s SOX index

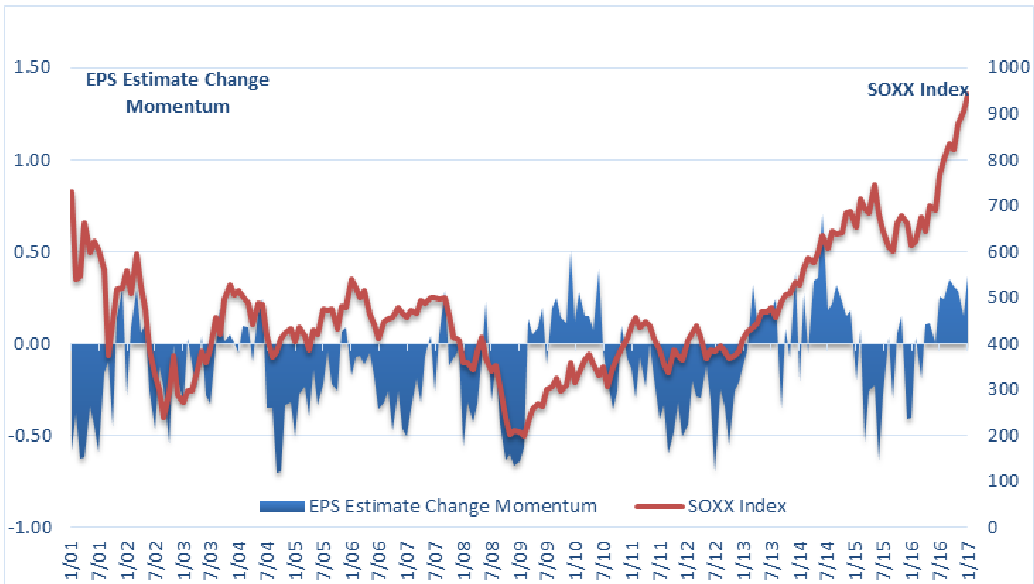


Source: WSTS, Macquarie Capital (USA), March 2017

We expect any cyclical correction to have a less severe impact on stock prices due to structurally better profitability

Industry cyclicality manifests itself in estimate revisions in both directions. During historical semi cycles, stock performance was at times inversely correlated to estimate revisions as investors anxiously waited for cyclical inflections. The correlation has turned positive over the past few years as cyclical volatility declined. We believe Street estimates still have some upside potential in the next one to two quarters, which could remain a tailwind for the SOX index. However, positive estimate revisions could prove to be a challenge for the broader semi space in 2H17 as YoY growth slows. That's not to say that the slowdown will result in a steep or prolonged cyclical correction. The recent strength was primarily driven by improving demand across markets and secular factors such as M&A, restructuring, and improving cash returns. As such, we expect any cyclical correction to have a less severe impact on stock prices than in previous cycles.

Fig 6 Estimate change momentum v/s SOX index



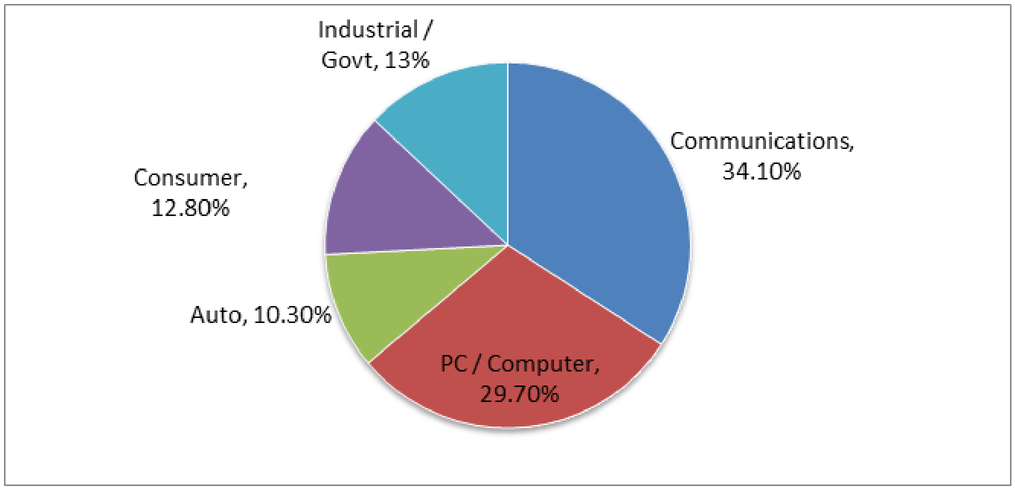
Source: Factset, Macquarie Capital (USA), March 2017

Demand appears healthy across PC, smartphone, and industrial markets

End demand conditions have improved in 2H16 in both PC and smartphone markets, and both markets continue to be healthy. We expect the PC market to be flattish in 2017. Strength in high-end desktops and thin and light notebooks, which tend to offer higher silicon content, should remain a tailwind for semiconductor demand. The gaming PC market saw significant growth in 2016 driven by new catalysts such as eSports, and the trend is likely to continue this year as 4K gaming and virtual reality go mainstream. We estimate that a typical gaming PC has as much as 2-5x the semiconductor content compared to average consumer desktop. Other form factors such as a two-in-ones and thin and light notebooks are also playing a role in stabilizing the market. As such, the worst appears behind for the PC market.

The server market should be stable despite slower enterprise spending. Cloud and HPC markets are growing at a double-digit pace, and we expect Intel's new CPU product to be a catalyst for unit growth in 2H17. Longer term, data center growth should remain robust driven by growing cloud connectivity from IoT and autonomous vehicle applications.

Fig 7 Semiconductor demand by end market (2016)

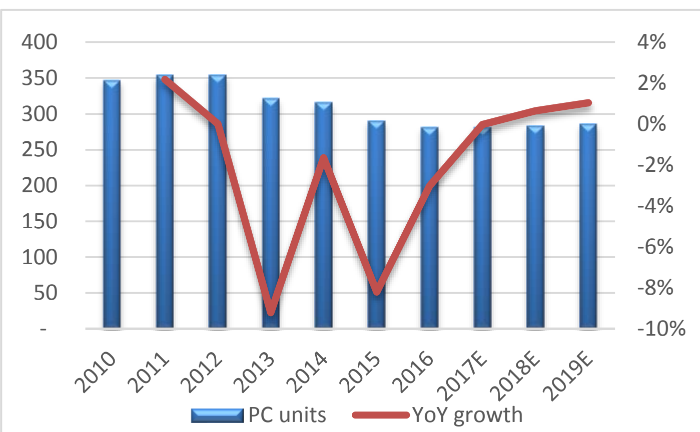


Source: WSTS, Macquarie Capital (USA), March 2017

iPhone 7S/X should drive a strong replacement cycle in the high-end smartphone market

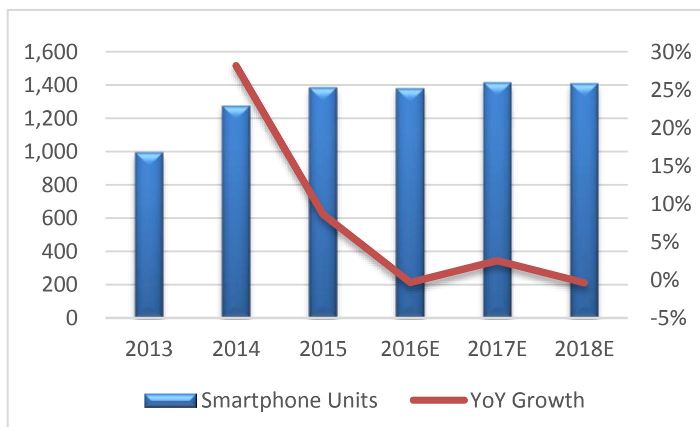
We expect smartphone units to grow 2.5% this year driven by replacement demand in US and China, and proliferation of 4G networks in India and other emerging markets. Apple's expected transition to OLED displays and Samsung's recovery after the Note 7 debacle means that the high-end smartphone market could see added momentum this year. Macquarie's Ben Schachter expects Apple's upcoming iPhone 7S/X to spur a strong replacement cycle due to a complete redesign and several innovative features such as facial recognition and 3D sensing, which we believe will be a tailwind for component suppliers.

Fig 8 Global PC unit forecast



Source: IDC, Macquarie Capital (USA), March 2017

Fig 9 Global Smartphone Unit forecast



Source: IDC, Macquarie Capital (USA), March 2017

5G will be a major driver for semiconductor suppliers

The bigger story in smartphones, however, is the silicon content growth. Components such as radio frequency ICs, DRAM, NAND are all benefiting from growing content per phone as flagship phone specifications continue to increase. Mid-tier phones are implementing faster download speeds through carrier aggregation, which is a tailwind for RF IC vendors. Low-end markets in India and Indonesia are transitioning to LTE, which benefits both RF and DRAM. 5G transition is the next major catalyst for silicon content growth. Besides the faster download speeds, 5G will enable & enhance applications such as virtual reality, augmented reality, artificial intelligence, and home automation, which will require faster processing, memory, more RF ICs and sensors. That said, we expect 5G impact on semiconductor growth to be small until 2019.

Automotive electronics growth should remain a tailwind for the semi industry over the coming years

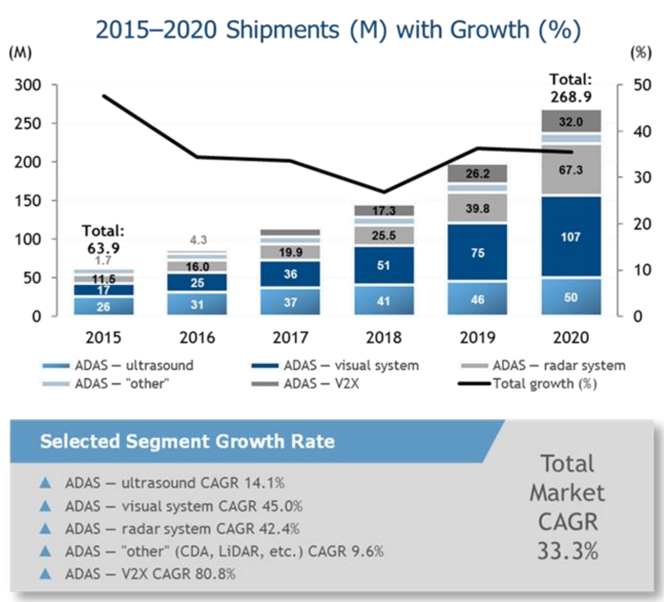
Secular trends in factory automation, IoT, cloud, and automotive markets should continue to help overall semi industry growth. Automotive & industrial markets account for ~23% of semiconductor sales but are growing at a faster pace due to growing electronics content in cars, factory automation, and connectivity growth in industrial markets. We expect content expansion in these markets to continue for the next several years driven by the emergence of self-driving cars, drones, and robotics. Besides the traditional analog and sensing capabilities, these markets are increasingly relying on artificial intelligence and machine learning for automation, which require advanced processing, memory, and high-speed interface technologies. Automotive electronics growth should remain a tailwind for the semi industry over the coming years

Fig 10 Automotive Exposure at major US Semi companies

	Exposure	Components
ADI	14%	Sensors, Interface, and Analog
CY	30%	Microcontrollers, Memory
MCHP	10 - 20%	Microcontrollers
MU	5%	Memory
MXIM	19%	Interface, Power Management
NVDA	6%	Processors
ON	30%	Broad based analog and sensors
QCOM+NXP	11%	Broad based analog, sensors, and processors
TXN	18%	Power, Processors, Interface, Connectivity
XLNX	7%	FPGAs for ADAS and Infotainment

Source: Company data, Macquarie Capital (USA), March 2017

Fig 11 Worldwide Advanced Driver Assistance System Shipment Forecast

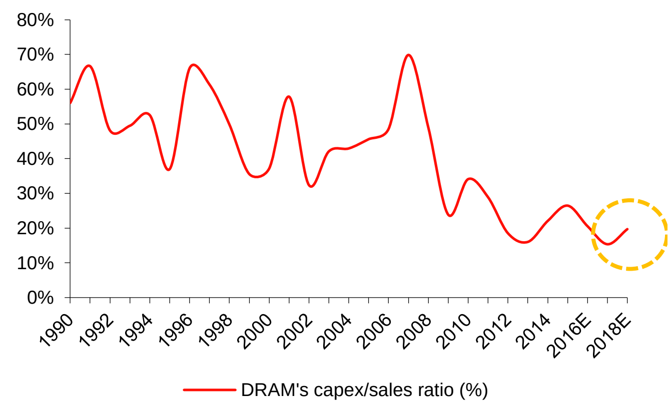


Source: IDC, Macquarie Capital (USA), March 2017

Memory supply & demand to remain in good balance through 2017

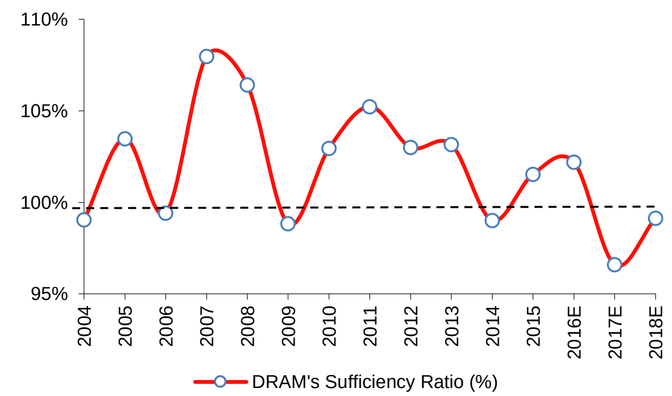
While the overall industry cyclicality has moderated significantly, the memory market remains an exception. High fixed costs, long production planning cycles, and the commodity nature of the product means that cyclical booms and busts are unavoidable in the memory sub-segment. We believe the current upturn, which started in late 2016, has legs and expect demand supply to remain in a good balance throughout 2017. DRAM vendors are not adding much wafer capacity and the technology migrations alone are unlikely to create excess supply situation this year, especially given the healthy demand backdrop in PC and smartphone markets. High DRAM prices are beginning to have an impact on customer profitability in many end markets, which could limit further price appreciation. However, we see little risk of despec'ing in most markets due to competitive reasons, and expect pricing to remain resilient through 2017.

Fig 12 DRAM Capex/sales ratio



Source: InSpectrum, Macquarie Capital (USA), March 2017

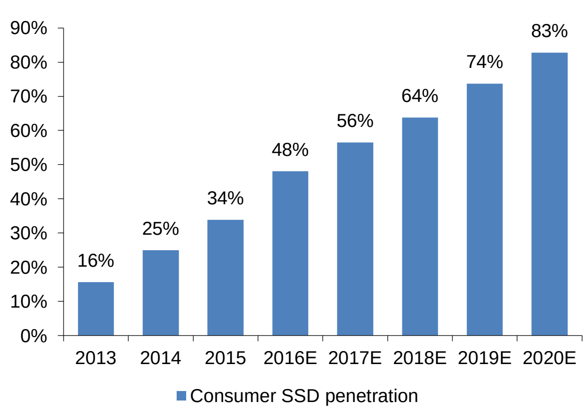
Fig 13 DRAM sufficiency ratio



Source: InSpectrum, Macquarie Capital (USA), March 2017

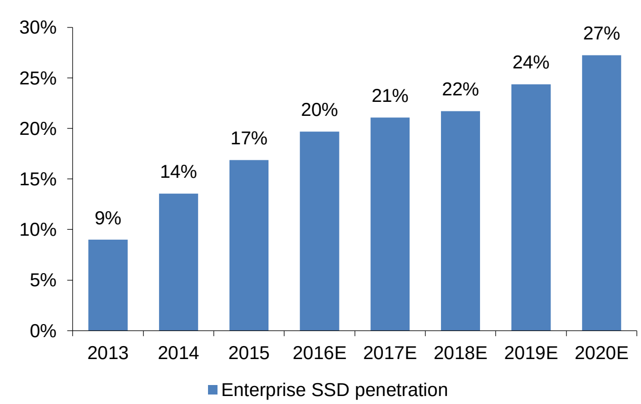
Supply shortages have also impacted NAND prices positively. We expect the supply situation to ease a bit in late 2017 as 3D NAND production picks up pace but do not see excess supply risk given the pent up demand from solid state drive (SSD) market. SSD penetration appears set to accelerate this year in both PC and enterprise markets as price premium over HDDs should continue to shrink. Overall, we expect NAND industry supply to grow 40-45% and expect supply/demand to remain in a healthy balance throughout the year.

Fig 14 Consumer SSD penetration



Source: IDC, Macquarie Capital (USA), March 2017

Fig 15 Enterprise SSD penetration



Source: IDC, Macquarie Capital (USA), March 2017

M&A – expect the pace to slow down

Levered balance sheets and growing cash returns could slow down the pace of M&A

Slowing growth, strong balance sheets, and low cost of borrowing have contributed to M&A in the industry, which helped drive significant outperformance of semiconductor stocks over past 18 months. While the consolidation trend has started in 2014, the pace has picked up in 2016 with more than 10 deals of greater than $1b in size. The semi industry is still fragmented despite the flurry of recent deals and we expect consolidation to continue. However, we believe that the pace of deal making will slow as most large-cap companies, with the exception of Texas Instruments and NVIDIA, are still digesting recent acquisitions. Balance sheets are not as strong and managements are beginning to shift focus to cash returns. We also believe China is no longer in play given the political environment, although we won't be surprised to see other global players (such as Softbank) consider M&A in the US semi space.

Fig 16 Semiconductor M&A details

Announced Date	Acquirer	Target	Premium (US$)	Transaction Value US$ (Bn)
23-Sep-2011	Texas Instrumnets	National Semiconductor	78%	6.50
12-Sep-2011	Broadcom Corporation	NetLogic Microsystems, Inc	57%	3.70
	2 deals		**68%**	**$ 10**
02-May-2012	Microchip Technology	SMSC	41%	0.94
	1 Deal			**0.94**
01-Oct-2013	Maxim Integrated	Volterra Semiconductor	55%	0.58
31-Jul-2013	Micron Technology, Inc	Elpida Memory Inc.	NA	2.50
15-Dec-2013	Avago Technologies Ltd.	LSI Corporation	41%	6.60
	3 Deals		**48%**	**$ 10**
09-Jun-2014	Analog Devices	Hittite Microwave Corporatior	29%	2.00
23-Jun-2014	Avago Technologies Ltd.	PLX Technology, Inc.	9%	0.31
24-Feb-2014	RF Micro Devices, Inc.	TriQuint Semiconductor, Inc.	5%	1.60
21-Oct-2014	Qualcomm	Cambridge Silicon Radio	37%	2.50
20-Aug-2014	Infineon Technologies AG	International Rectifier Corp.	51%	2.90
14-Aug-2014	Hua Capital Management Ltd, Cl	OmniVision Technologies Inc	18%	1.80
01-Dec-2014	Cypress Semiconductor Corp.	Spansion, Inc.	12%	1.60
	7 Deals		**23%**	**$ 13**
28-Dec-2015	Intel Corp.	Altera Corp.	54%	16.40
19-Oct-2015	Microsemi Corp.	PMC-Sierra, Inc.	78%	2.40
02-Mar-2015	NXP Semiconductors N.V.	Freescale Semiconductor, Ltd.	46%	16.70
28-May-2015	Avago Technologies Ltd.	Broadcom Corp.	20%	34.40
25-Feb-2015	Avago Technologies Ltd.	Emulex Corporation	26%	0.61
	5 Deals		**45%**	**$ 71**
26-Jul-2016	Analog Devices	Linear Technology	24%	30.00
19-Jan-2016	Microchip Technology, Inc.	Atmel Corp.	3%	3.56
27-Oct-2016	Qualcomm Incorporated	NXP Semiconductors N.V.	31%	47.00
02-Nov-2016	Avago Technologies Ltd.	Brocade Communications Syst	47%	5.90
06-Dec-2016	Micron Technology, Inc	Inotera Memories, Inc.	1%	4.00
18-Jul-2016	Softbank	ARM Holdings	43%	32.00
15-Jun-2016	Cavium, Inc.	QLogic Corp.	13%	1.36
12-May-2016	Western Digital Corporation	SanDisk Corporation	49%	19.00
12-Sep-2016	Renesas Electronics Corp.	Intersil Corp.	44%	3.20
13-Jan-2016	Joint Venture between Qualcomm Incorporated and TDK		-	3.00
19-Sep-2016	ON Semiconductor Corporation	Fairchild Semiconductor	50%	2.40
02-Nov-2016	Canyon Bridge Capital	Lattice Semiconductor	30%	1.30
	12 Deals		**30%**	**$ 153**
13-Mar-2017	Intel Corp.	Mobileye	34%	14.70

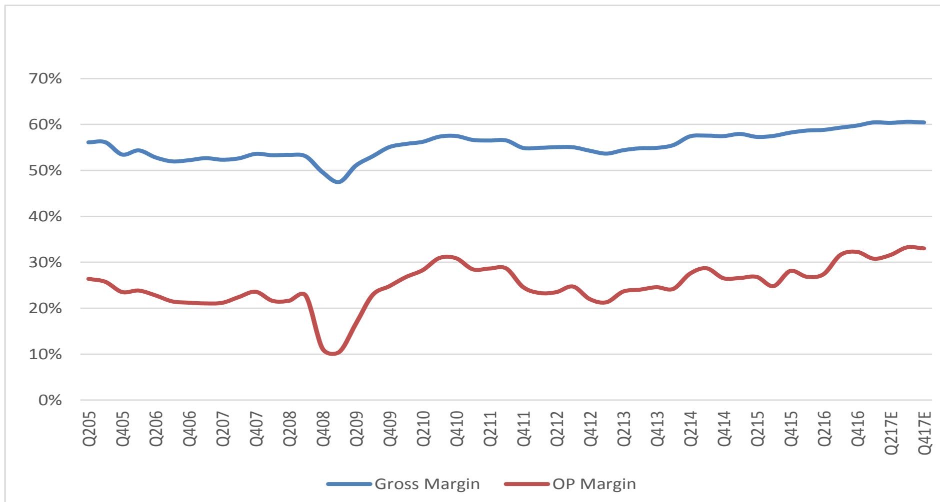
Source: Company data, Macquarie Capital (USA), March 2017

Consolidation to help pricing

We believe gross margins are largely sustainable even in case of a moderate cyclical correction

Gross and operating margins in the industry have improved materially as managements' focus shifted from growth to profitability. M&A driven scale efficiencies and restructuring should continue to improve the industry profitability on a structural basis. We believe the improvements are largely sustainable at the gross margin level even in case of a moderate cyclical correction. On the opex front, M&A driven pruning will continue as companies digest recent acquisitions. Our company models mostly reflect the managements' opex targets.

Fig 17 Non-Memory Semi Gross and OP margin trend

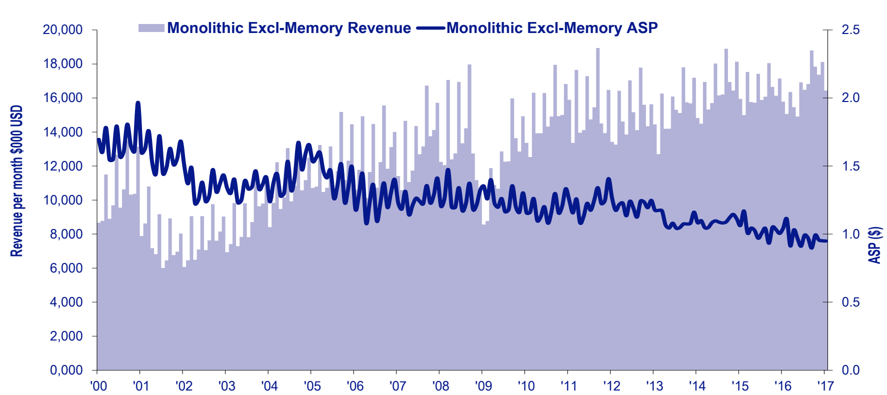


Source: Company data, Macquarie Capital (USA), March 2017

Anecdotal evidence is starting emerge about better pricing trends

The industry consolidation has helped rationalize spending and also appears to be helping pricing in some cases. SIA data shows no material change in industry pricing (ex-memory) trends as yet. However, anecdotal evidence about healthier pricing trends is starting emerge in some sub-segments. Slowing growth, limited competition, and fragmented customer base (with the exception of the smartphone market) appear to be leading to better pricing discipline. We expect broad based pricing trends to improve in the coming years as Semi companies gradually gain more bargaining power, which could further enhance industry profitability.

Fig 18 Semiconductor ASP trends



Source: WSTS/SIA, Macquarie Capital (USA), March 2017

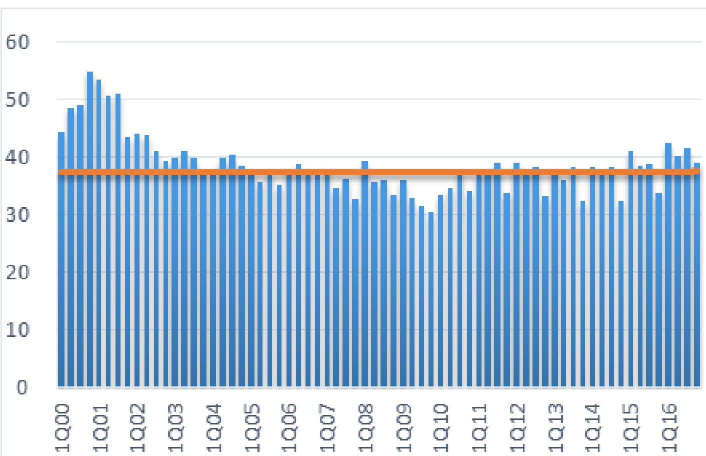
Supply chain Inventories not a concern

Our inventory analysis shows that supply chain inventories are broadly in line with historic ranges despite the recent cyclical tailwinds. Lead times have stayed within normal ranges over the past few quarters and component shortages haven't been an issue outside of memory. While it's possible that pockets of excess inventory could emerge in the coming months, the broader supply chain looks lean and we expect any inventory correction to be moderate.

Macquarie's Asia Tech team believes inventories in PC and smartphone supply chain are lean

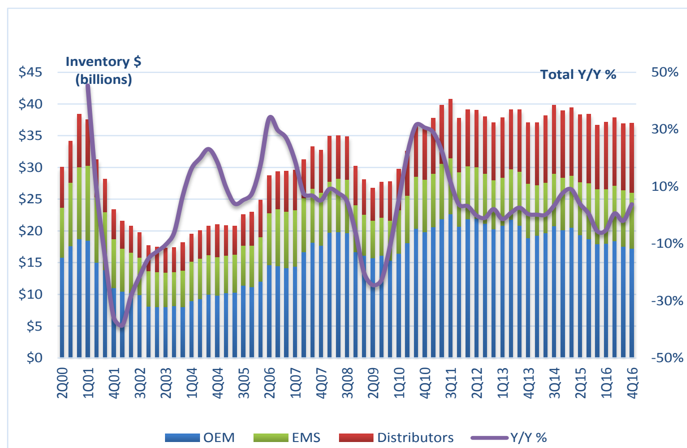
The smartphone supply chain is going through a moderate inventory digestion in China after a strong Chinese New Year holiday. Macquarie's Asia Tech analyst Allen Chang believes that the China handset inventories are currently three to four weeks, which is considered normal. In the PC market, Macquarie's Jeff Ohlweiler believes that ODM & channel inventory in the PC supply chain is currently near the low-end of the range. While we don't have great visibility into industrial and automotive markets, customers had no incentive to build excess inventory as lead times have been relatively short and component availability has not been an issue in this cycle. As such, we expect any potential inventory correction to be driven by weaker end demand as opposed to excess inventory or double ordering.

Fig 19 Distributor Inventory Days



Source: Company Data, Macquarie Capital (USA), March 2017

Fig 20 Aggregate Semi Supply Chain Inventories



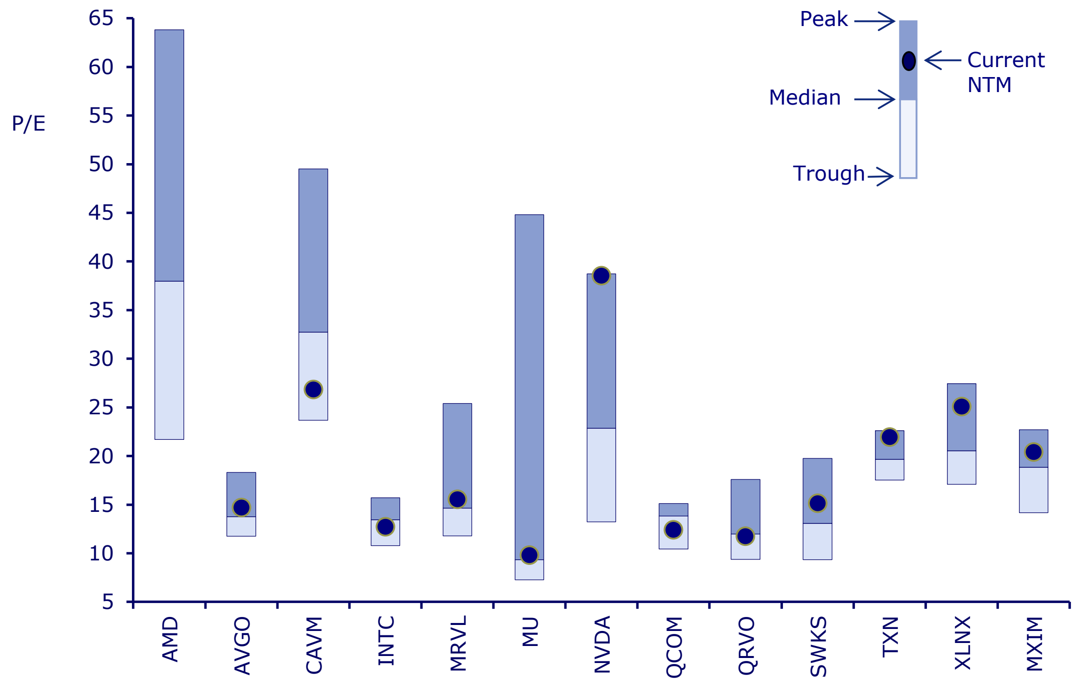
Source: Company Data, Macquarie Capital(USA), March 2017

Valuations not stretched on a relative basis

Absolute PE valuations are at or above historical averages for the most part

Most semi stocks are trading above three-year median PE multiples on an absolute basis. We believe multiple expansion is justified given the structurally higher margins, improving free cashflow metrics, and cash returns. That said, further multiple expansion from current levels will likely be a challenge and we would not be surprised to see some contraction as M&A momentum slows.

Fig 21 Three-year historical and current PE multiples

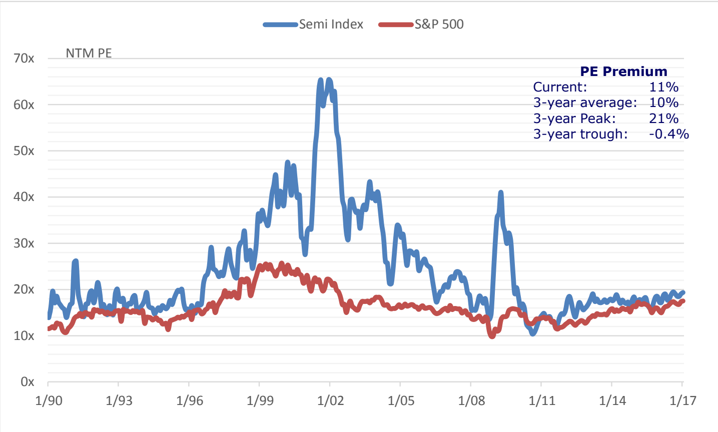


Source: Factset, Macquarie Capital (USA), March 2017

Relative PS valuations are at a peak, which we attribute to structural margin improvements

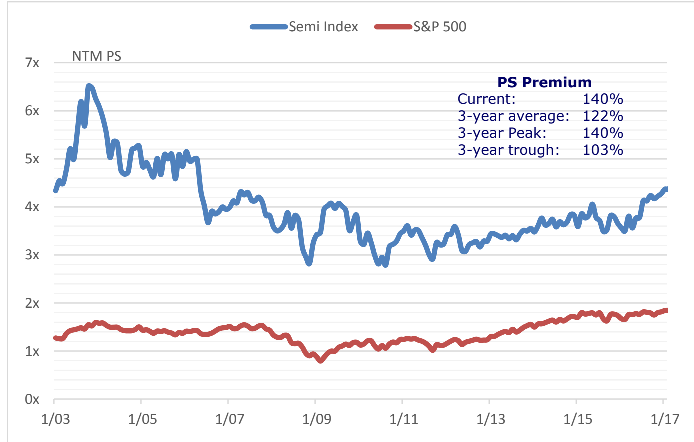
On a relative basis, semi stocks are trading at an 11% premium to market which is at a slight premium to the historical average of 10%. Relative sector PE multiples expanded only slightly despite the strong rally. That said, semi stock premiums usually shrink as estimates move higher due to cyclical concerns. Lack of more multiple compression in the current cycle implies that the stocks are discounting less cyclicality and more structural margin improvements, which we tend to agree with.

Fig 22 Semi v/s S&P500 PE multiples



Source: Factset, Macquarie Capital (USA), March 2017

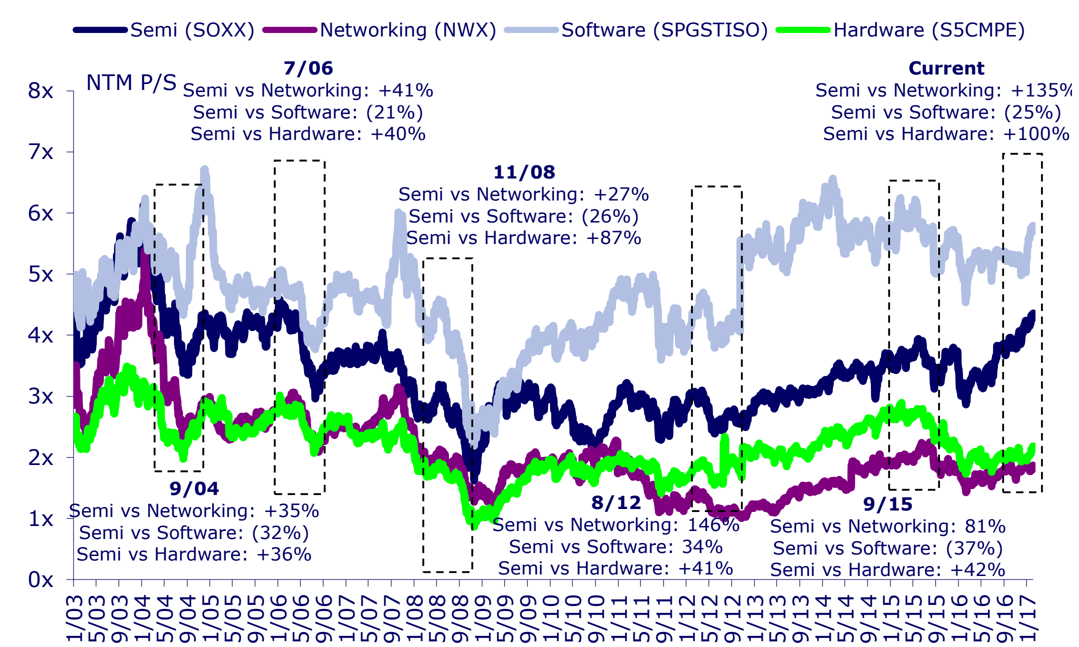
Fig 23 Semi v/s SP500 PS multiples



Source: Factset, Macquarie Capital (USA), March 2017

On a P/S basis however, the multiples have expanded by ~25% in 2016, and are near three-year peaks. One reason for the discrepancy between P/S and P/E multiple expansion is that the industry revenue growth hasn't changed much but the earnings have growth considerably due to restructuring, M&A synergies, and aggressive buybacks. Semi sector PS multiples have also expanded compared to other tech subsectors, in particular vs hardware and networking stocks. That's not a surprise given the M&A and the improving margin profiles within the semi industry.

Fig 24 Semi vs Tech PS multiples



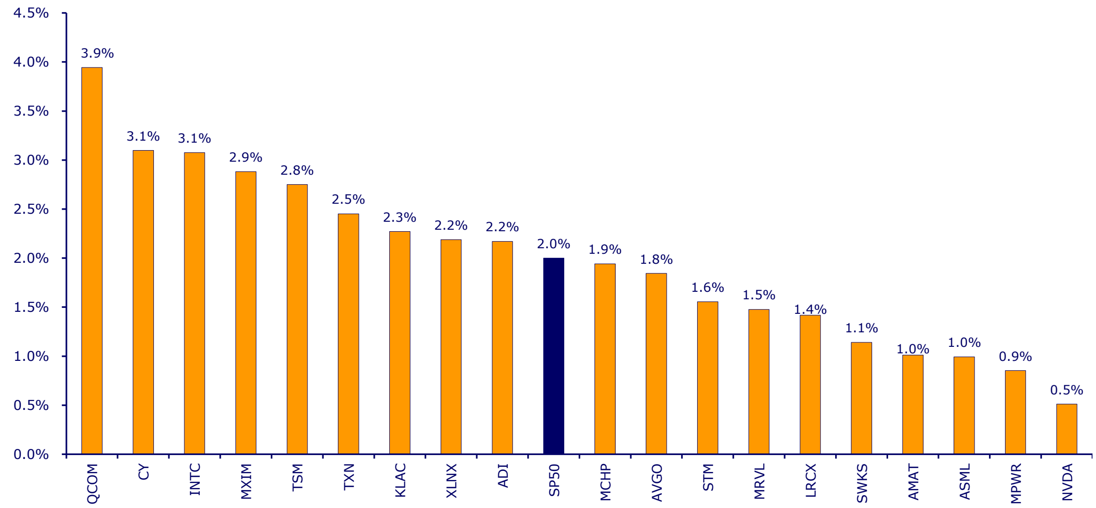
Source: Factset, Macquarie Capital (USA), March 2017

Solid cash returns to continue

Dividends yields are solid as managements shift focus to cash returns

Industry balance sheets are now levered for the most part with the exception of a few names including NVIDIA, XLNX, MRVL, and SWKS. Strong free cashflow generation should enable semi companies to reduce the debt loads in the next one to two years. Companies are also emphasizing cash returns, a trend popularized by Texas Instruments. Dividends at a number of semi companies are yielding more than 2%, which is the average dividend yield for the S&P 500 index. Dividend payout ratio is ~40%, which seems low but we note that many companies are paying out a significant portion of their domestic free cashflow. As such, any tax reform could drive meaningful growth in the payout ratios and dividends in the industry.

Fig 25 Semiconductor company dividend yields (NTM)

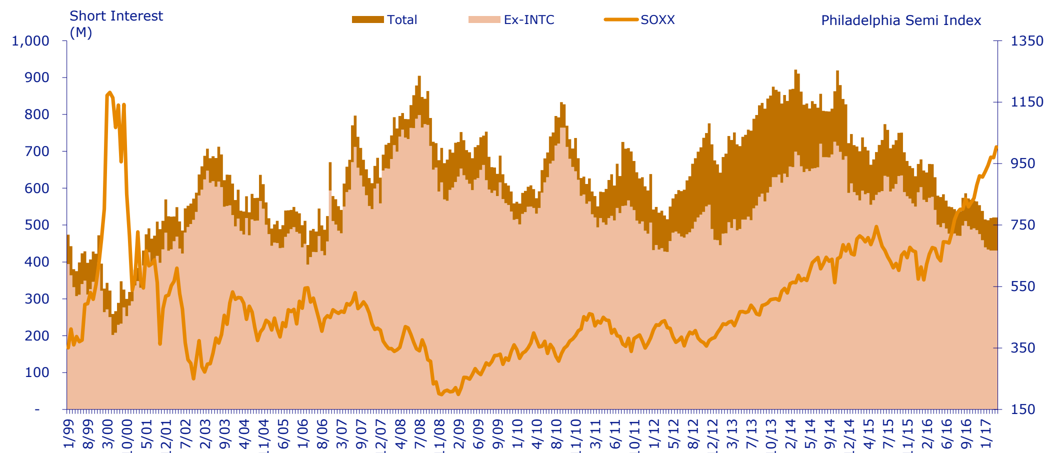


Source: Company Data, Factset, Macquarie Capital (USA), March 2017

Short Interest at a multi-year low

Short interest data is useful in gauging the short-term stock sentiment. Semiconductor short interest peaked in mid-2014 and has been on a decline since. We would not be surprised to see short interest edge up in the coming quarters as the revenue momentum slows. However, we do not expect a steep cyclical correction given the healthy demand backdrop.

Fig 26 Semiconductor short interest



Source: Factset, Macquarie Capital (USA), March 2017

UNITED STATES

AVGO US		**Outperform**
Price (at CLOSE#, 28 Mar 2017)		**US$220.95**
Valuation	**US$**	**260.00-280.00**
- PER		
12-month target	**US$**	**265.00**
12-month TSR	**%**	**+22.1**
GICS sector Semiconductors & Semiconductor Equipment		
Market cap	**US$m**	**88,689**
30-day avg turnover	**US$m**	**651.1**
Number shares on issue	**m**	**401.4**

Investment fundamentals

Year end 31 Oct		2016A	2017E	2018E	2019E
Revenue	m	13,292	17,001	18,047	19,219
Adjusted profit	m	4,672	6,750	7,434	8,118
CFPS	US$	18.92	24.92	25.81	26.84
CFPS growth	%	54.0	31.7	3.6	4.0
PGCFPS	x	11.7	8.9	8.6	8.2
EPS adj	US$	11.30	14.91	16.12	17.31
EPS adj growth	%	25.9	32.0	8.1	7.3
PER adj	x	19.6	14.8	13.7	12.8
Total DPS	US$	1.96	4.08	6.02	7.95
Total div yield	%	0.9	1.8	2.7	3.6
EV/EBITDA	x	11.9	9.2	9.0	8.7

Source: FactSet, Macquarie Capital (USA), March 2017
(all figures in USD unless noted)

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30 March 2017
Macquarie Capital (USA) Inc.

Broadcom

Shifting into a steadier gear

Initiating with OP; Top Pick

We believe AVGO offers the best combination of growth, margin execution, free cash flow generation, and cash returns among large cap semis. AVGO has a dominant position in multiple markets that are benefiting from secular trends, and the company's pricing discipline is adding to incremental growth. While the pace of M&A could slow, management's decision to pay out 50% of trailing FCF should double the dividend in the next 2 years. At a CY17E PE of 15x (adjusted for Brocade & stock comp), valuation is at a discount to large cap Semi peers. Our $265 PT assumes that the stock trades 17x PE over the next 12 months, which is a ~20% discount to industry bellwether TXN. Key risks are customer concentration and potential price pressures in RF filters.

Secular content expansion in Wireless to continue

AVGO stands to benefit from the upcoming iPhone 7S/X unit strength and continued content expansion. We estimate that AVGO has $12 - $14 of content in the iPhone 7 from its premium RF filters (a critical component to enable faster data speeds), WiFi, and GPS chips. We expect AVGO's content to grow at a double-digit pace in iPhone 7S/X due to more complex carrier aggregation (likely more LTE band combinations) and additional opportunities in WiFi (likely dual band MIMO). The company's position at Samsung remains strong, and we see incremental opportunities in flagship phones in China in 2018. AVGO's high-end focus and high barriers to entry in premium (BAW) filters means that the competitive risk is moderate even as content growth slows.

Product cycle tailwinds in Data Center

Broadcom remains the undisputed leader with more than 90% share in Data Center switching silicon market. The 25GE adoption is in early stages, and we expect tailwinds for the company's Tomahawk series switches to sustain for the next 1 – 2 years. Recent wins for the Jericho / Qumron line of aggregation switch ICs expand the company's addressable market. While smaller competitors such as Cavium and Mellanox are making some progress, we are not overly concerned given the expanding TAM. In other segments, Storage has been surprisingly strong which is likely to slow down while Broadband should grow at a mid-single-digit pace.

Stock doesn't need a TXN multiple to work

The Brocade acquisition is on track to close by the end of FQ3, and should add ~8% to EPS in CY18. Gross margins are on track to expand more than 100bps in CY17, and the company should achieve its operating margin target of 45% and FCF target of 35% in 2H17. We are forecasting FCF to double in CY17 and grow more than 20% (ex-BRCD) in CY18, which should lead to doubling of the dividend in the next two years. We are not expecting large M&A in CY17, although tuck-in deals could continue. In case of no major M&A, deleveraging should accelerate with the balance sheet turning net cash positive by late 2019. We see plenty of room for multiple expansion given the strong cash flow growth, cash returns, and deleveraging potential. Our PT of $265 assumes a PE of 17x CY18E (incl stock comp & BRCD) and EV/FCF of 15x, which is a ~20% discount to industry bellwether TXN.

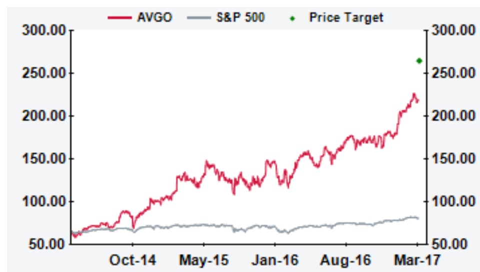
Inside

Broadcom

Company profile

- Broadcom Ltd. designs, develops and supplies a broad range of analog and digital semiconductor connectivity solutions. It serves four primary end markets: wired infrastructure, wireless communications, enterprise storage and industrial & other. The company's products include data center networking, home connectivity, broadband access, telecommunications equipment, smartphones and base stations, data center servers and storage, factory automation, power generation and alternative energy systems, and displays.
- The company was founded in 1961 and is headquartered in Singapore.

Fig 1 AVGO US vs S&P 500, & rec history



Note: Recommendation timeline - if not a continuous line, then there was no Macquarie coverage at the time or there was an embargo period.

Source: FactSet, Macquarie Capital (USA), March 2017

(all figures in USD unless noted)

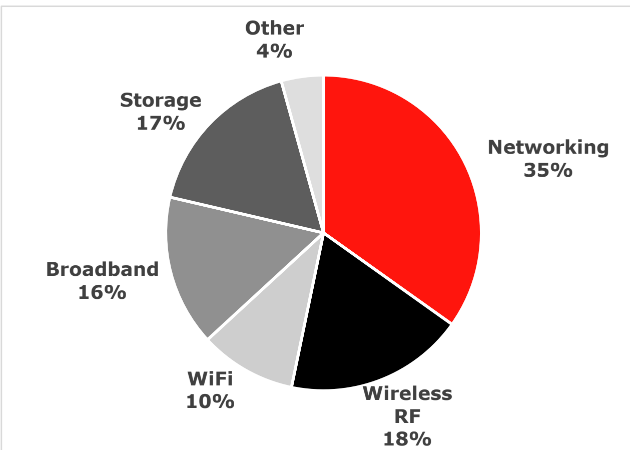
Shifting into a steadier gear

Initiating with an OP and $265 target; Top Pick

AVGO has a dominant position in multiple markets including wireless RF, Data Center switching, Broadband, and Storage

We believe Broadcom offers the best combination of growth, margin execution, free cash flow generation, and cash returns among semi peers. AVGO has a dominant position in multiple markets including wireless RF, data center switching, broadband, and storage. Many of these markets are benefiting from secular trends and the company's pricing discipline is adding incremental growth. While the organic revenue growth is likely moderate given the company's size, we see enough secular drivers to sustain above industry growth for the next 2 – 3 years. Margin execution and free cash flow metrics are among the best in the industry. We expect FCF to nearly double in CY17 and see another 20%+ growth in CY18. Dividends should double to about $8 over the next 2 years given the strong free cash flow and management's target to pay out 50% of trailing FCF. At 15x CY17E PE (incl stock comp, adjusting for BRCD), valuation is at a discount to large cap peers despite the recent run up. We see plenty of room for multiple expansion as cash returns improve and customer concentration concerns fade.

Fig 2 Sales by segment (Jan-17Q)



Source: Company data, Macquarie Capital (USA), March 2017

Fig 3 Estimates Summary

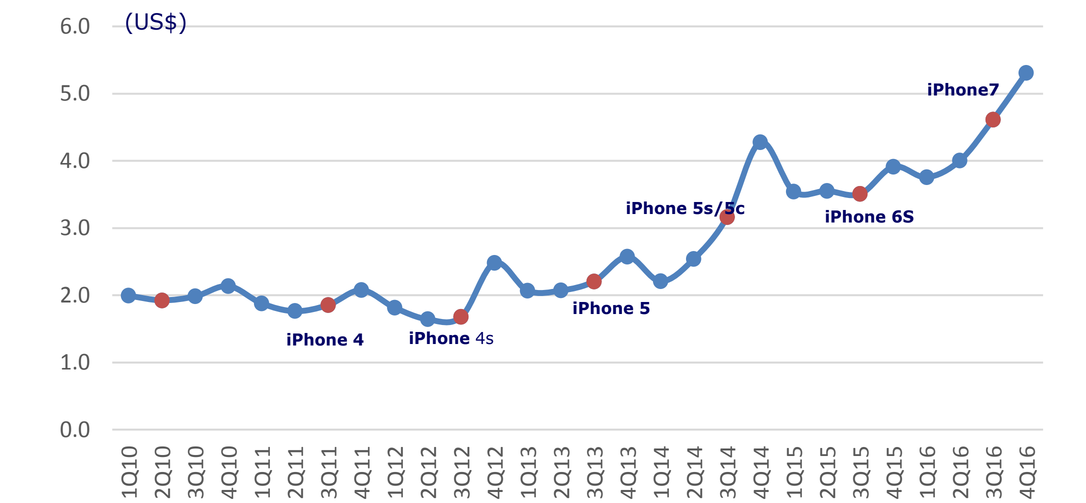
	CY16A	CY17E	CY18E
Revenue (US$m)	15659	17323	18418
YoY change (%)	123%	11%	6%
Gross margin (%)	61%	62%	63%
Operating margin (%)	41%	44%	45%
Non-GAAP EPS (US$)	$12.53	$15.27	$16.53
PE (Non-GAAP) @US$220.95	17.6	14.5	13.4
EV/FCF @US$220.95	27.3	16.7	13.8
EPS Adj for stock comp (US$)	10.8	13.5	14.8
BRCD Accretion (US$)		1.15	1.15
Pro forma EPS (adj for stock comp & BRCD) (US$)		14.7	16.0
Pro forma PE (adj for stock comp & BRCD)		15.1	13.8

Source: Company data, Macquarie Capital (USA), March 2017

RF content still growing at a double-digit pace

Like other Apple suppliers, AVGO stands to benefit from the upcoming iPhone 7S/X cycle. Macquarie's Ben Schachter expects iPhone 7S/X to drive a strong replacement cycle due to innovative features and a new form factor. While AVGO benefits from unit growth, the company's dollar content should also expand. AVGO's premium filters enable more efficient use of wireless spectrum and faster download speeds. We believe AVGO has $12 - $14 of content in the iPhone 7 as the company supplies high-band and mid-band RF modules (PADs), WiFi, and GPS chips (in models with Intel baseband). We estimate that AVGO's content in the iPhone 7 grew ~25% in 2016. We expect ~10% growth in content in the iPhone 7S/X driven by more complex carrier aggregation (likely more band combinations, which will need more BAW filters). We also see additional opportunities in WiFi, as Apple is likely to implement a dual band MIMO solution with HT80 (similar to the iPad line). We are not counting on wireless charging in 2017, which could add an additional $1 - $2 to the company's content.

Fig 4 Overall RF IC content per phone trend

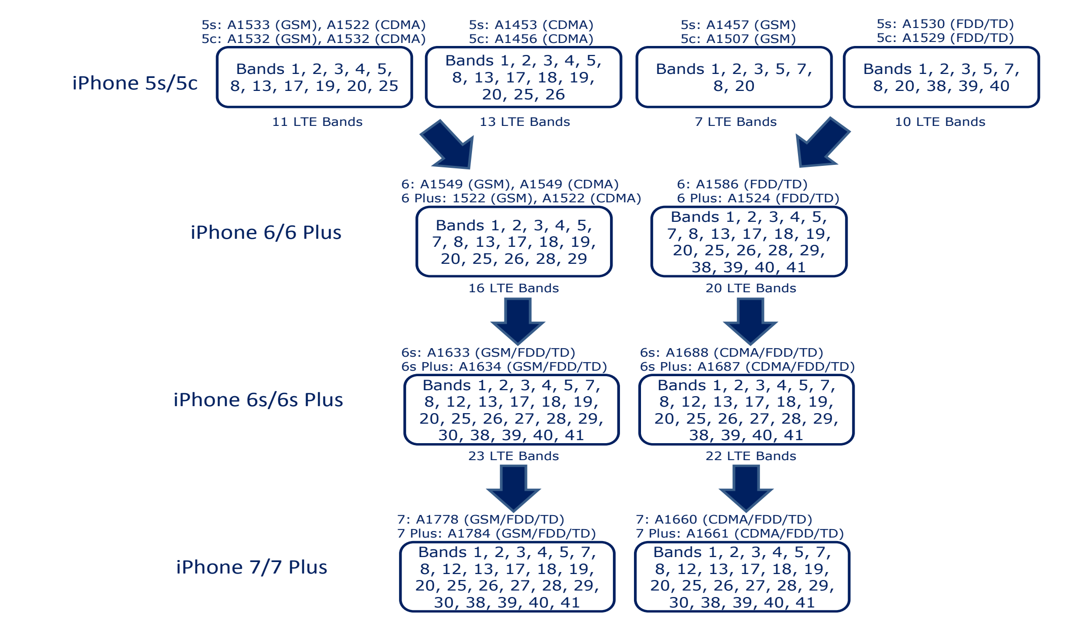


Source: Company data, Macquarie Capital (USA), March 2017

High barriers to entry in BAW filters means that competitive risk is moderate even as content growth moderates

AVGO's position at Samsung remains strong, and we see further content growth opportunities due to carrier aggregation. Management's recent comments suggest that AVGO's content is up strongly in the upcoming Samsung GS8, and we expect further growth as Samsung follows Apple's example of more complex carrier aggregation and fewer SKUs. Broadcom presence in China is currently limited, primarily due to a lack of capacity (despite 50% capacity growth in 2016). As the RF content growth slows at Apple and Samsung in the coming years, we see incremental opportunities in China in the premium segment. RF content expansion could moderate in 2018 as the 4G market matures. We are not overly concerned as AVGO's high-end focus and high barriers to entry in BAW filters means that competitive & pricing risk is moderate even as RF content growth moderates. We expect 5G adoption to gain momentum in 2019, which should reaccelerate the RF industry growth given the much higher frequency support and the need for faster download speeds.

Fig 5 iPhone LTE band growth & SKU consolidation trend



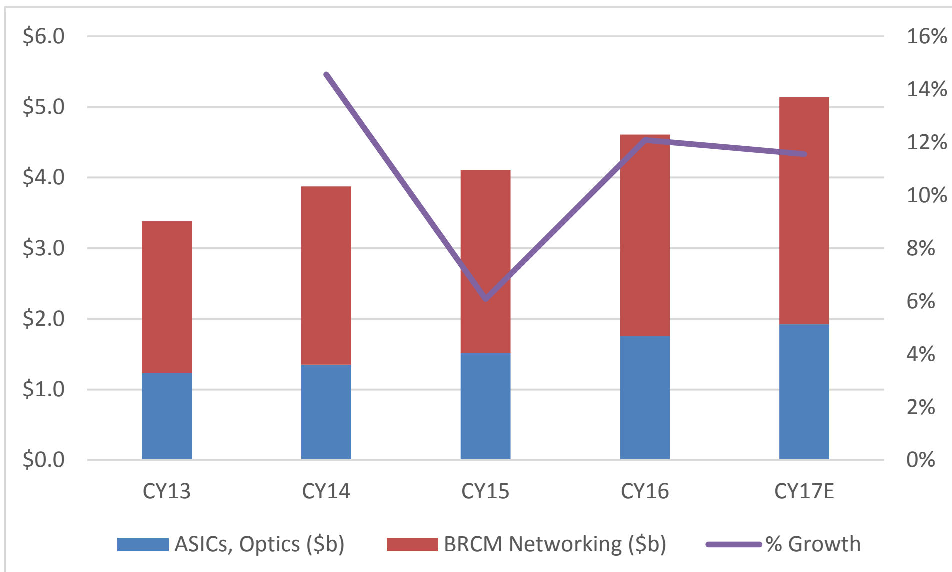
Source: Company data, Macquarie Capital (USA), March 2017

Secular tailwinds in Networking

The 25GE adoption is in early stages and we expect tailwinds to sustain for 1 – 2 years

Broadcom remains the undisputed leader with more than 90% share in the Data Center merchant switching silicon market. The 25GE adoption is in early stages, and we expect tailwinds for the company's Tomahawk series switching ICs to sustain for the next 1 – 2 years. The company also benefits from its custom ASIC engagements with the market leader Cisco. Recent wins for the company's Jericho (network processing) and Qumron (aggregation fabric) line of products at Arista Networks expand AVGO's addressable opportunity into routing and Data Center aggregation markets. While smaller competitors such as Cavium and Mellanox are making some progress, we are not overly concerned given the expanding TAM. Overall, we believe the Networking business, which accounted for 35% of 2016 sales, could grow at a double-digit pace this year.

Fig 6 Networking growth



Source: Company data, Macquarie Capital (USA), March 2017

Other segments stable

The recent strength in the storage segment is surprising to us. While the HDD market has been healthy, we believe the company's SAS, Fiber Channel, and custom SSD products are also faring well due to technology transitions, broader market strength, and disciplined pricing. We expect storage growth to moderate in the coming quarters and view this as a single-digit growth business longer term. While AVGO could face some headwinds as SSD penetration grows in enterprise and the cloud markets, we note that the company has a strong position in custom SSD controllers, which should help offset the declines in the enterprise HDDs to some extent.

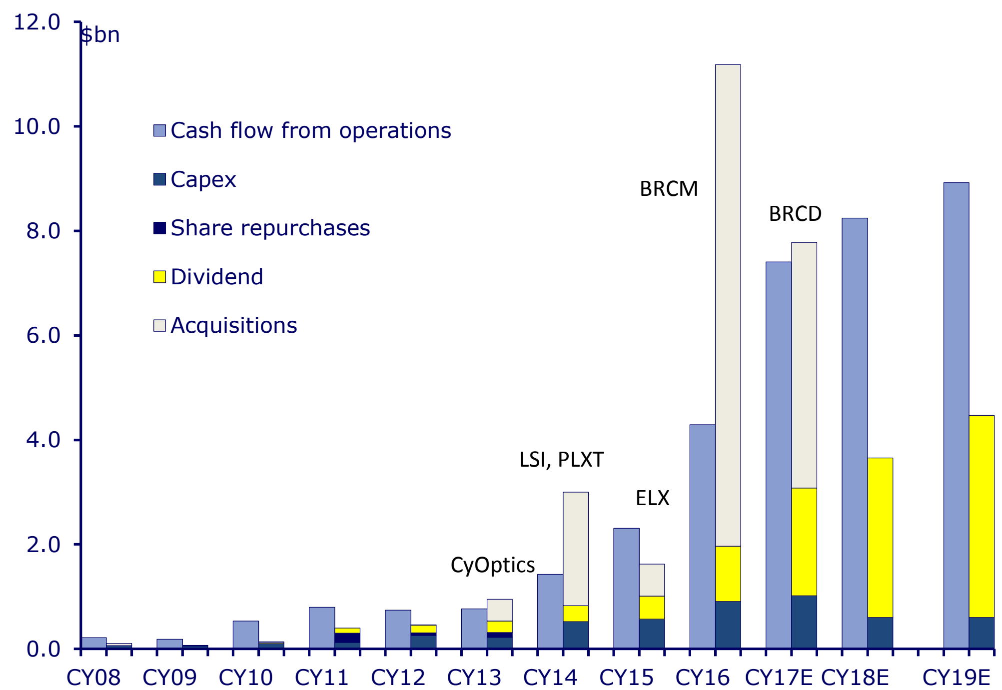
We expect the set top box and modem businesses to grow at a mid-single-digit pace driven by broadband speed upgrades in US and China, 4K/UHD adoption, and continued growth in discrete WiFi. While 4K/UHD adoption has been slower than expected, global broadband upgrades are continuing which should remain a tailwind. We are modeling gradual 4K transition, which we think leaves room for upside potential if the adoption accelerates.

Cash returns + Deleveraging = Multiple expansion

We expect dividend to double in the next two years

The Brocade acquisition is on track to close by the end of FQ3, and should add ~8% to EPS in CY18. Gross margins are on track to expand more than 100bps in CY17, and the company should achieve its operating margin target of 45% and FCF target of 35% (best in the industry) in 2H17. We are forecasting FCF to double in CY17 and grow more than 20% (ex-BRCD) in CY18, which should lead to doubling of the dividend in the next two years. We are not expecting large M&A in CY17, although tuck-in deals could continue. In case of no major M&A, deleveraging should accelerate with the balance sheet turning net cash positive by late 2019.

Fig 7 AVGO cash flow usage



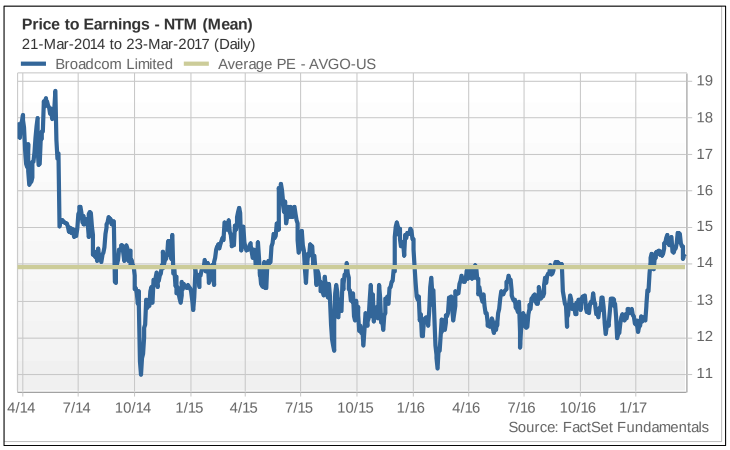
Source: Company data, Macquarie Capital (USA), March 2017

Valuation

We are initiating with an OP and a target price of $265. Our estimates are slightly above consensus. At a 15x CY17E PE, the stock is trading at a slight premium to historic multiples. Our PT of $265 assumes a slight multiple expansion (PE of 17x and EV/FCF of 15x on CY18E (adjusting for BRCD and stock comp)), which we believe is justified given the improving cash returns and more stable free cash flow generation. Our target multiple is about a 20% discount to industry bellwether TXN.

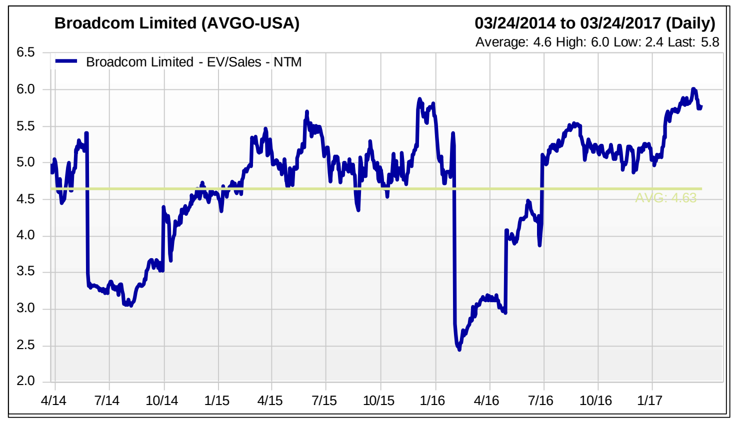
Customer concentration and unexpected price pressures in the RF segment are the key risks.

Fig 8 AVGO Historical PE



Source: Company data, Macquarie Capital (USA), March 2017

Fig 9 AVGO EV/Sales



Source: Company data, Macquarie Capital (USA), March 2017

Fig 10 Macquarie vs Consensus

AVGO	17E	18E	19E
MQ/Consensus (Rev %)	-0.4	0.1	-2.4
MQ/Consensus (EPS %)	0.4	0.9	-0.7

Source: FactSet, Macquarie Capital (USA), March 2017

Broadcom
Income Statement

($million/%)	1Q16	2Q16	3Q16	4Q16	1Q17	2Q17E	3Q17E				
FYE Oct	Jan-16Q	Apr-16Q	Jul-16Q	Oct-16Q	Jan-17Q	Apr-17QE	Jul-17QE	FY16	FY17E	FY18E	FY19E
Revenue	1,782	3,562	3,802	4,146	4,149	4,100	4,191	**13,292**	**17,001**	**18,047**	**19,219**
Cost of products sold	693	1,424	1,505	1,624	1,559	1,558	1,561	**5,246**	**6,383**	**6,718**	**7,150**
Gross profit	1,089	2,138	2,297	2,522	2,590	2,541	2,630	**8,046**	**10,619**	**11,329**	**12,069**
Operating expenses	306	809	808	803	784	789	783	**2,726**	**3,139**	**3,175**	**3,246**
Research and development	238	663	667	666	664	667	665	**2,234**	**2,661**	**2,696**	**2,757**
Selling, general and administrative	68	146	141	137	120	121	119	**492**	**478**	**479**	**490**
Income from operations	783	1,329	1,489	1,719	1,806	1,753	1,847	**5,320**	**7,479**	**8,154**	**8,823**
Other income, net	(38)	(156)	(135)	(97)	(102)	(106)	(103)	**(426)**	**(411)**	**(370)**	**(322)**
Income before income taxes	745	1,173	1,354	1,622	1,704	1,647	1,744	**4,894**	**7,068**	**7,784**	**8,501**
Provision for income taxes	35	53	61	73	77	74	78	**222**	**318**	**350**	**383**
Effective tax rate	5%	5%	5%	5%	5%	5%	5%	**5%**	**5%**	**5%**	**5%**
Net income	710	1,120	1,293	1,549	1,627	1,573	1,665	**4,672**	**6,750**	**7,434**	**8,118**
EPS (Diluted)	**$2.41**	**$2.53**	**$2.89**	**$3.47**	**$3.63**	**$3.48**	**$3.67**	**$11.30**	**$14.91**	**$16.12**	**$17.31**
EPS (Diluted) - inc stock comp	$2.22	$2.13	$2.44	$3.02	$3.20	$3.04	$3.23	**$9.74**	**$13.17**	**$14.40**	**$15.58**
FCF/shr	$1.13	$1.05	$1.64	$2.59	$2.29	$2.95	$3.11	$6.59	$11.79	$15.55	$16.83
Shares Outstanding	295	442	447	447	448	452	454	**408**	**453**	**461**	**469**
% Sales											
Gross profit	61.1%	60.0%	60.4%	60.8%	62.4%	62.0%	62.8%	**60.5%**	**62.5%**	**62.8%**	**62.8%**
Operating expenses	17.2%	22.7%	21.3%	19.4%	18.9%	19.2%	18.7%	**20.5%**	**18.5%**	**17.6%**	**16.9%**
Research and development	13.4%	18.6%	17.5%	16.1%	16.0%	16.3%	15.9%	**16.8%**	**15.7%**	**14.9%**	**14.3%**
Selling, general and administrative	3.8%	4.1%	3.7%	3.3%	2.9%	3.0%	2.8%	**3.7%**	**2.8%**	**2.7%**	**2.5%**
Income from operations	43.9%	37.3%	39.2%	41.5%	43.5%	42.8%	44.1%	**40.0%**	**44.0%**	**45.2%**	**45.9%**
Net income	39.8%	31.4%	34.0%	37.4%	39.2%	38.4%	39.7%	**35.1%**	**39.7%**	**41.2%**	**42.2%**
% YoY											
Revenue	7.5%	116.5%	117.3%	123.7%	132.8%	15.1%	10.2%	**92.5%**	**27.9%**	**6.1%**	**6.5%**
Gross profit	11.8%	114.2%	116.1%	119.5%	137.8%	18.9%	14.5%	**92.3%**	**32.0%**	**6.7%**	**6.5%**
Operating expenses	4.4%	172.4%	144.8%	137.6%	156.2%	-2.5%	-3.0%	**116.7%**	**15.2%**	**1.1%**	**2.3%**
Income from operations	15.0%	89.6%	103.1%	112.0%	130.7%	31.9%	24.0%	**81.8%**	**40.6%**	**9.0%**	**8.2%**
Net income	19.1%	80.6%	95.9%	110.2%	129.2%	40.4%	28.8%	**78.8%**	**44.5%**	**10.1%**	**9.2%**
% QoQ											
Revenue	-3.8%	99.9%	6.7%	9.0%	0.1%	-1.2%	2.2%				
Gross profit	-5.2%	96.3%	7.4%	9.8%	2.7%	-1.9%	3.5%				
Operating expenses	-9.5%	164.4%	-0.1%	-0.6%	-2.4%	0.6%	-0.6%				
Income from operations	-3.5%	69.7%	12.0%	15.4%	5.1%	-2.9%	5.4%				
Net income	-3.7%	57.7%	15.4%	19.8%	5.0%	-3.3%	5.9%				

Source: Company data, FactSet, Macquarie Capital (USA), March 2017

Broadcom
Balance Sheet

($million/%)	1Q16	2Q16	3Q16	4Q16	1Q17		
FYE Oct	**Jan-16Q**	**Apr-16Q**	**Jul-16Q**	**Oct-16Q**	**Jan-17Q**	**FY15**	**FY16**
ASSETS							
Current assets	3,971	6,687	6,048	7,125	7,350	**3,775**	**7,125**
Cash and cash equivalents	2,169	2,041	1,961	3,097	3,536	**1,822**	**3,097**
Trade accounts receivable, net	1,060	1,857	2,181	2,181	1,947	**1,019**	**2,181**
Inventory	490	1,467	1,306	1,400	1,336	**524**	**1,400**
Other current assets	252	1,322	600	447	531	**410**	**447**
Non-current assets							
Property, plant and equipment, net	1,505	2,486	2,573	2,509	2,646	**1,460**	**2,509**
Goodwill	1,685	24,776	24,784	24,732	24,700	**1,674**	**24,732**
Intangible assets, net	3,089	16,944	15,819	15,068	14,067	**3,277**	**15,068**
Other long-term assets	527	514	528	532	854	**406**	**532**
Total assets	**10,777**	**51,407**	**49,752**	**49,966**	**49,617**	**10,592**	**49,966**
LIABILITIES AND SHAREHOLDERS' EQUITY							
Current liabilities	862	2,651	2,728	3,078	2,122	**1,119**	**3,078**
Accounts payable	523	985	1,127	1,261	1,047	**617**	**1,261**
Employee compensation and benefits	101	303	424	517	336	**250**	**517**
Capital lease obligations - current	0	0	0	0	0	**0**	**0**
Other current liabilities	192	1,019	843	846	739	**206**	**846**
Current portion of long-term debt	46	344	334	454	0	**46**	**454**
Non-current liabilities							
Long-term debt	3,892	14,664	13,381	13,188	13,562	**3,903**	**13,188**
Capital lease obligations - non-current	0	0	0	0	0	**0**	**0**
Other long-term liabilities	902	11,330	11,139	11,824	11,923	**856**	**11,824**
Total liabilities	5,656	28,645	27,248	28,090	27,607	**5,878**	**28,090**
Total shareholders' equity	5,121	19,702	19,473	18,892	19,033	**4,714**	**18,892**
Total liabilities and shareholders' equity	**10,777**	**51,407**	**49,752**	**49,966**	**49,617**	**10,592**	**46,982**

Source: Company data, FactSet, Macquarie Capital (USA), March 2017

Ratio Analysis

	1Q16 Jan-16Q	2Q16 Apr-16Q	3Q16 Jul-16Q	4Q16 Oct-16Q	1Q17 Jan-17Q	FY15	FY16
Profitability Analysis							
Return on Assets (Pretax)	17.8%	-12.9%	-2.1%	3.1%	4.1%	**15.5%**	**-1.4%**
Return on Equity (Aftertax)	30.7%	-40.4%	-6.4%	-13.9%	5.3%	**34.3%**	**-15.8%**
ROIC (Pretax)	24.4%	-8.5%	-2.3%	3.4%	4.6%	**21.2%**	**-0.9%**
Cash Conversion Cycle (Days)	47	103	55	60	57	**42**	**82**
DSOs	54	47	52	47	42	**54**	**59**
Days of Inventory	64	93	78	78	77	**69**	**96**
Days Payables Outstanding	71	37	75	65	62	**81**	**74**
Liquidity Analysis							
Current Ratio	4.6x	2.5x	2.2x	2.3x	3.5x	**3.4x**	**2.3x**
Quick Ratio	3.7x	1.5x	1.5x	1.7x	2.6x	**2.5x**	**1.7x**
Debt/Solvency Analysis							
Debt/Total Capital	43%	43%	41%	42%	42%	**46%**	**42%**
Debt/Equity	77%	76%	70%	72%	71%	**84%**	**72%**
Asset Values							
Book Value/Share	$17.72	$47.47	$46.47	$44.87	$43.36	**$16.78**	**$48.94**
Tangible Book Value/Share	$1.20	($53.06)	($50.43)	($49.66)	($44.95)	**($0.84)**	**($54.17)**
Total Cash & Equiv/Share	$7.51	$4.92	$4.68	$7.36	$8.05	**$6.48**	**$8.02**
Net Cash/Share	($6.00)	($29.34)	($26.30)	($23.59)	($22.38)	**($7.31)**	**($25.86)**

Source: Company data, FactSet, Macquarie Capital (USA), March 2017

Companies Mentioned:

Texas Instruments (TXN US, US$80.61, Neutral, TP: US$82)

Apple (AAPL US, US$140.88, Outperform, TP: US$156.00, Ben Schachter)

Cisco (CSCO US, Not Rated)

Arista Networks (ANET US, Not Rated)

Brocade (BRCD US, Not Rated)

Macquarie Quant View

The quant model currently holds a strong positive view on Broadcom. The strongest style exposure is Growth, indicating this stock has good historic and/or forecast growth. Growth metrics focus on both top and bottom line items. The weakest style exposure is Quality, indicating this stock is likely to have a weaker and less stable underlying earnings stream.

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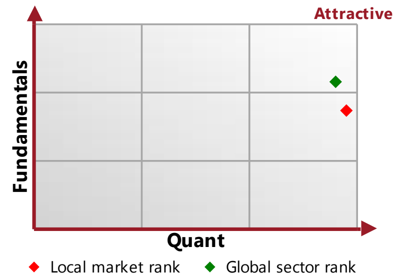
Global rank in Semiconductors & Semiconductor Equip.

% of BUY recommendations	94% (32/34)
Number of Price Target downgrades	0
Number of Price Target upgrades	31

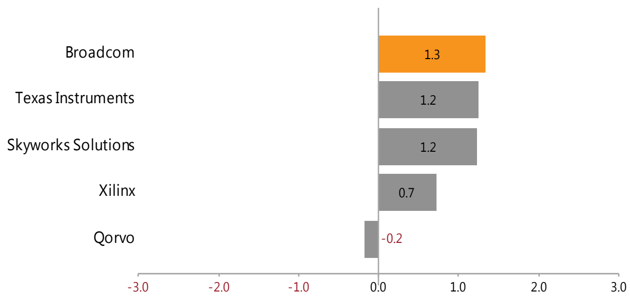


Displays where the company's ranked based on the fundamental consensus Price Target and Macquarie's Quantitative Alpha model.

Two rankings: Local market (United States) and Global sector (Semiconductors & Semiconductor Equip.)

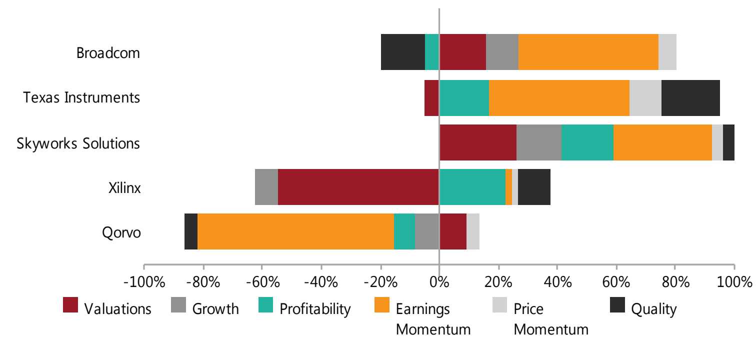
Macquarie Alpha Model ranking

A list of comparable companies and their Macquarie Alpha model score (higher is better).



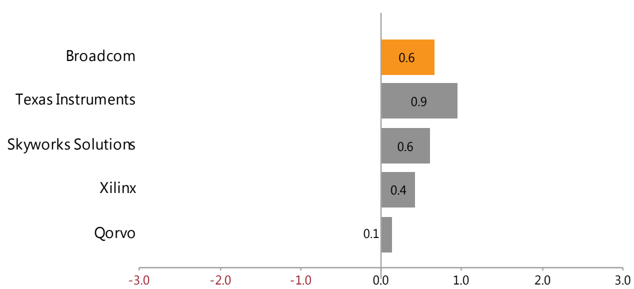
Factors driving the Alpha Model

For the comparable firms this chart shows the key underlying styles and their contribution to the current overall Alpha score.



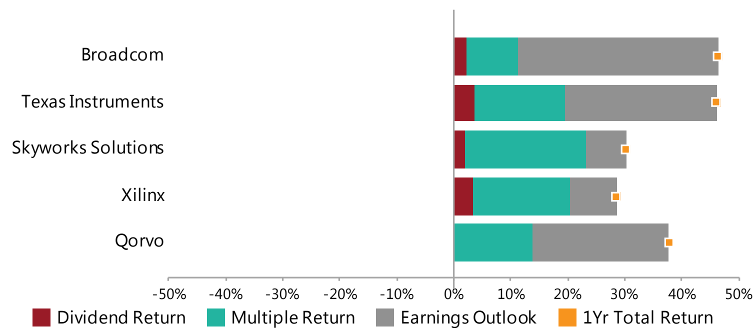
Macquarie Earnings Sentiment Indicator

The Macquarie Sentiment Indicator is an enhanced earnings revisions signal that favours analysts who have more timely and higher conviction revisions. Current score shown below.



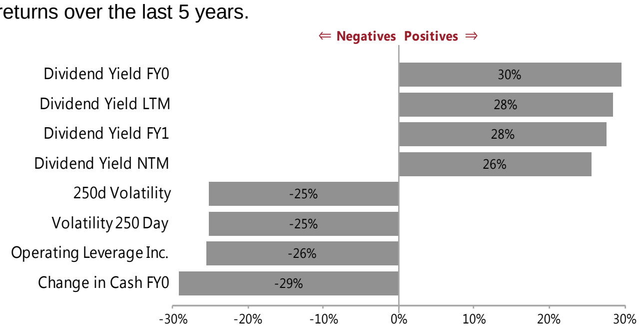
Drivers of Stock Return

Breakdown of 1 year total return (local currency) into returns from dividends, changes in forward earnings estimates and the resulting change in earnings multiple.



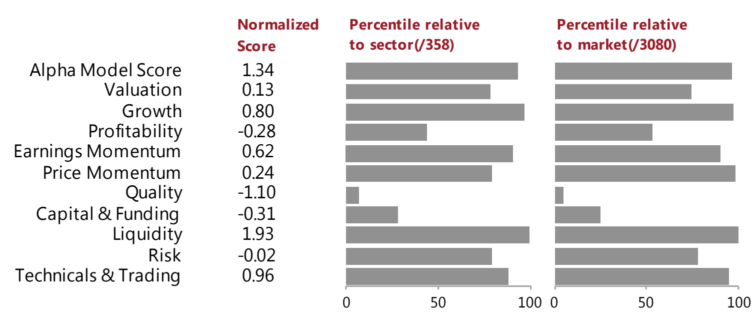
What drove this Company in the last 5 years

Which factor score has had the greatest correlation with the company's returns over the last 5 years.



How it looks on the Alpha model

A more granular view of the underlying style scores that drive the alpha (higher is better) and the percentile rank relative to the sector and market.



Source (all charts): FactSet, Thomson Reuters, and Macquarie Research. For more details on the Macquarie Alpha model or for more customised analysis and screens, please contact the Macquarie Global Quantitative/Custom Products Group (cpg@macquarie.com)

UNITED STATES

INTC US		Outperform
Price (at CLOSE#, 28 Mar 2017)		US$35.60
Valuation - PER	**US$**	**40.00**
12-month target	**US$**	**40.00**
12-month TSR	**%**	**+15.5**
GICS sector Semiconductors & Semiconductor Equipment		
Market cap	**US$m**	**168,317**
30-day avg turnover	**US$m**	**826.2**
Number shares on issue	**m**	**4,728**

Investment fundamentals

Year end 31 Dec		2016A	2017E	2018E	2019E
Revenue	m	59,387	59,622	61,718	63,801
EBITDA	m	7,114	10,075	10,559	11,252
EBITDA growth	%	9.5	41.6	4.8	6.6
Adjusted profit	m	13,239	13,928	14,727	15,513
CFPS	US$	4.31	4.55	4.80	5.00
PGCFPS	x	8.3	7.8	7.4	7.1
EPS adj	US$	2.72	2.85	3.02	3.18
EPS adj growth	%	16.3	5.1	5.7	5.3
PER adj	x	13.1	12.5	11.8	11.2
Total DPS	US$	1.04	1.09	1.14	1.19
Total div yield	%	2.9	3.1	3.2	3.3
ROA	%	15.2	15.9	15.7	15.5
ROE	%	20.8	20.0	19.2	18.4
EV/EBITDA	x	27.2	19.2	18.3	17.2
P/BV	x	2.6	2.4	2.2	2.0

Source: FactSet, Macquarie Capital (USA), March 2017
(all figures in USD unless noted)

Analyst(s)
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30 March 2017
Macquarie Capital (USA) Inc.

Intel

All is not lost

Initiating with Outperform rating and $40TP

We are not particularly enthused by Intel’s capex spending and are also surprised by the timing of the Mobileye deal. However, we believe the stock can work in the next 12 months as we see upside to 1) server segment (DCG) from new “Purley” product and 2) gross margins from a prolonged 14nm cycle. Better DCG and margins, along with the prospect of improving FCF in 2018 should also help the multiple. We are not overly concerned about AMD’s new products and see a limited impact from any share losses. We believe mid-single-digit EPS growth is achievable longer term, and view 12.5x PE & 3.1% yield (CY17E) as attractive. Our estimates are slightly above consensus, and our target price assumes that the stock trades at its three-year average PE of 13.5x over the next 12 months.

“Purley” could drive some upside to DCG

Management expects high-single-digit growth in the data center group (DCG) this year. A recovery in enterprise appears less likely but the upcoming product refresh (Purley) in 2H17 could drive a few points of upside in 2H17. DCG saw 5-6% ASP increase during the last two major product refreshes (Grantley & Romley). We expect a similar trend with Purley given the significant performance improvement and new features such as the integration of Omni-Path fabric. New Xeon Phi and Nervana products could also add incremental revenue in 2H17. While AMD and ARM-based products will make some progress, we believe the revenue impact for DCG will be modest in the next two years, and that DCG can grow at an 8-10% rate longer term.

PC bar low even if AMD gains some share

We expect the overall PC market to be flattish in 2017. Intel’s computing segment (CCG) slightly outperformed PC unit growth over the past few years driven by healthy ASP trends and more recently, progress in LTE modems. Management’s guidance for a mid-single-digit decline implies a $1.5b impact to CCG ($2b adjusting for a full year of modem gains at Apple). We expect AMD to make some progress in the enthusiast/gaming segment ($4b TAM) given its near-zero market share. However, AMD’s gains in mainstream consumer and corporate segments are likely to be minimal. Even if AMD gains 20% share in the enthusiast segment (which we think is unlikely), Intel’s PC segment could still show some upside given the low bar.

Longer 14nm cycle a tailwind to gross margins in 2H17

Excluding a one-time impact, we estimate Intel’s non-GAAP GM was ~65% in 4Q16. Management’s guidance for 63% in 2016 assumes higher 10nm spending and likely some competitive pressures. On the positive side, we see meaningful unit cost improvements in 2H17 as the company ramps a fourth-gen product on the same (14nm) node, which could drive 100-200 bps of upside to gross margins (gross margins were up 300bps YoY in 2H14, when 22nm was extended due to 14nm delays). Needless to say, free cash flow remains an issue given the $12b capex in 2017. FCF should improve meaningfully in 1H18 as 10nm spending comes down. We also believe memory spending will decline next year although it won’t go to zero. We are modelling $10.3b in capex next year, and believe that the combination of better DCG, gross margins, and improving FCF will all help the multiple.

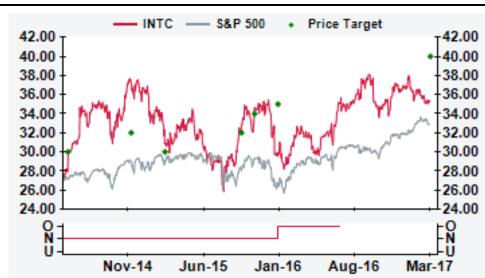
Inside

Intel

Company profile

- Intel Corp. designs, manufactures and sells computer components and related products. The company also engages in the designing and manufacturing of computing and communication components, such as microprocessors, chipsets, motherboards, and wireless and wired connectivity products. It develops advanced integrated digital technology products, primarily integrated circuits, for industries such as computing and communications.
- The company operates its business through the following segments: Client computing Group, Data Center Group, Internet of Things Group, Software & Services and All Other.
- The Client Computing Group segment includes platforms designed for the notebook, desktop, tablets, phones, wireless and wired connectivity products, and mobile communication components.
- The Data Center Group segment includes platforms designed for the enterprise, cloud, communications infrastructure, and technical computing segments.
- The Internet of Things Group segment offers platforms designed for Internet of Things market segments, including retail, transportation, industrial, and buildings and home use, along with other market segments.
- The Software & Services Operating segment includes software products designed to deliver innovative solutions that secure computers, mobile devices, networks, and software products and services that promote Intel architecture as the platform of choice for software development.
- Intel was founded by Robert Norton Noyce and Gordon Earle Moore on July 18, 1968 and is headquartered in Santa Clara, CA.

Fig 1 INTC US vs S&P 500, & rec history



Note: Recommendation timeline - if not a continuous line, then there was no Macquarie coverage at the time or there was an embargo period.

Source: FactSet, Macquarie Capital (USA), March 2017

(all figures in USD unless noted)

All is not lost

Initiating with an Outperform rating and $40 target

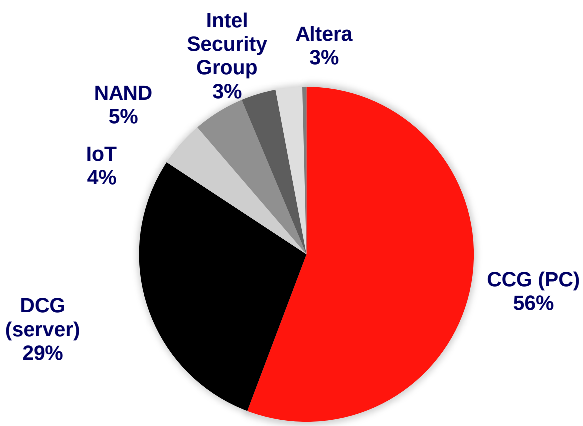
Intel has underperformed the SOX index due to slowing DCG as well as aggressive spending

We are initiating Intel with an Outperform rating and a $40 TP. Our estimates are slightly above consensus. The stock significantly underperformed the SOX index despite a decent PC market and progress on the LTE modem front, largely due to slowing growth in its data center segment. While the PC market is stabilizing, higher margin data center growth slowed from a double-digit pace to high-single-digit rates. Limited operating leverage and elevated capex have also impacted stock performance, in our view.

The recent Mobileye acquisition, which we think makes strategic sense, appears to be raising more concerns about the company's perceived lack of spending discipline. Despite these issues, we believe the stock can outperform over the next 12 months. We see potential upside in 2H17 to 1) DCG revenue from the new "Purley" product, and 2) gross margins due to prolonged 14nm cycle. Both of these should help the multiple along with the prospect of improving free cashflow as we head into 2018. We are not overly concerned about competition from AMD's new product and see a limited impact from any share losses.

We believe low-single-digit top-line growth and mid-single-digit earnings growth is achievable in the next two to three years, and view 12x PE and 3.1% yield on our 2017 estimates as attractive.

Fig 2 Sales by segment (Dec-16Q)



Source: Company data, Macquarie Capital (USA), March 2017

Fig 3 Estimates Summary

	CY16A	CY17E	CY18E
Revenue (US$m)	59387	59622	61718
YoY change (%)	7.3%	0.4%	3.5%
Gross margin (%)	63%	64%	63%
Operating margin (%)	28%	29%	30%
Non-GAAP EPS (US$)	2.72	2.85	3.02
PE (X) @US$35.60	13.1	12.5	11.8
EV/FCF @US$35.60	14.4	17.2	14.0

Source: Company data, Macquarie Capital (USA), March 2017

PC bar is low, even if AMD gains some share

Management's outlook for a mid-single-digit decline in PC segment this year is reasonable and could even prove conservative. We expect the overall PC market to remain flattish in 2017. Intel's CCG segment slightly outperformed the PC market over the past three years driven by healthy ASP trends, share gains, and more recently, progress in LTE modems at Apple. We believe Intel's conservative guidance for the PC segment was partly driven by AMD's competitive offering (Zen). While we expect AMD to make some progress, we are not overly concerned given Intel's conservative outlook. We see risk that Intel loses some market share to AMD especially in the enthusiast segment, where AMD currently has near-zero market share. We estimate that enthusiast/gaming market CPU accounts for a ~$4b opportunity. Assuming even a 20% share loss in this sub-segment shouldn't have much of an impact on Intel's 2017 outlook as the company's mid-single-digit decline in PC segment already implies a $2b decline in 2017.

In other sub-segments, we do not see much opportunity in corporate PCs for AMD as the company lacks security and manageability features required in this segment. In the mainstream consumer PC market, we estimate AMD currently has about 15% share. Retail consumers tend to be less tech-savvy than enthusiasts, and we believe brand name matters more than the price/performance metrics that AMD is claiming. As such, we are not convinced that AMD will gain much share here given Intel's breadth of offerings, marketing subsidies, and a strong brand name.

Potential upside to DCG from "Purley" could help the multiple

We are modelling 10% growth for DCG this year

In DCG, management expects high-single-digit growth as enterprise weakness slightly offsets double-digit growth in cloud and networking. While a recovery in enterprise appears less likely in the near term, we see upside potential from new platform (Purley) ramps in 2H17. During the last two major product refreshes (Grantley & Romley), DCG ASPs increased 5-6% in the next 12 months after the launch. We expect a similar trend with Purley given the significant performance improvement and new features such as the integration of Omni-Path fabric, which should help bring down the TCO meaningfully for data centers. Other new products including 14nm Xeon Phi (Knights Mill), Nervana ASIC, and silicon photonics could also surprise on the upside in 2H17 and in 2018. As such, we are modelling 10% growth for DCG this year as we see upside to management's high-single=digit growth guidance starting in 2H17.

Fig 4 Intel DCG growth trends following new platform launches

Platform	Westmere	Romley	Ivy Bridge	Grantley	Broadwell	Purley
Launch Date	Mar-10	Mar-12	Sep-13	Sep-14	Mar-16	2H17
Next 12-month revenue growth	32%	8%	14%	16%	8%	?
Next 12-month unit growth	23%	3%	5%	10%	4%	?
Next 12-month ASP growth	11%	5%	9%	6%	4%	?
Process Node	32nm	32nm	22nm	22nm	14nm	14nm

Source: Company data, Macquarie Capital (USA), March 2017

AMD could pick up a few points of share in servers, but it will likely take time

AMD's Zen-based server product is likely to make some progress starting in late 2017, especially at enterprise customers such as HP and Dell. AMD has near-zero market share in servers, has a product for the first time in many years, and customers are eagerly waiting for a second source. We think it's reasonable to expect AMD to pick up some share assuming product performance is sufficient. AMD previously had as much as 25% share in this segment back in 2006 before losing it all due to mis-execution and Intel's aggressive roadmaps. One key difference is that nearly-100% of the server market in 2006 was enterprise. Today, less than half of Intel's revenue comes from the enterprise segment. We expect AMD's gains to be limited to lower-end enterprise. The company is highlighting its Memory scalability, which we believe could be attractive to applications that require higher Memory support and not very high CPU performance (such as Microsoft Exchange).

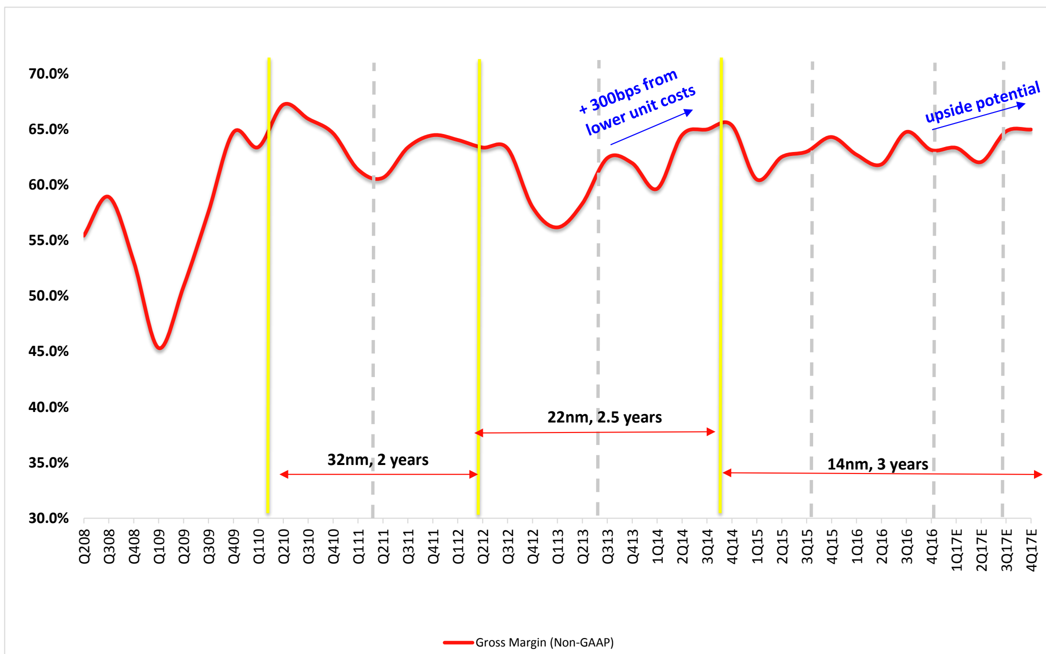
We won't be surprised to see AMD make some progress at hyperscale/cloud customers. However, unless AMD's price/performance is compelling against Intel, we believe volumes will be limited in the public cloud arena as cloud users (startups and enterprises) might just stick to Intel. And finally, server vendors don't make strategic choices based on one-off products and rely more on longer term roadmaps. Intel's decision to move its DCG products to leading edge first starting 7nm means that the performance gap will only widen in the coming years. As such, we believe any share gains by AMD in this segment will be short lived.

Gross margins have upside potential; FCF to improve in 2018

We estimate Intel's Non-GAAP GM was ~65% in 4Q16 excluding a one-time impact from product warranty related costs in DCG, which we believe had a 200bps of impact. Management's guidance for 63% in 2017 assumes higher 10nm spending, stronger growth in lower margin modems and memory, and likely some competitive pressures. While these factors will create some headwinds, management's outlook could still prove conservative. We see meaningful unit cost improvements in 2H17 as the company ramps a fourth-gen product on the same (14nm) node for the first time in its history. We see some die-size reduction opportunity and expect manufacturing yields to also improve further as 14nm cycle gets prolonged in 2H17. Gross margins saw a 300bps YoY improvement in 2H14 when 22nm cycle was extended due to delays in 14nm ramp (management highlighted 100 bps of positive impact from lower platform unit costs in 2Q14 and another 200bps of impact in 3Q14). We are modelling 63.8% gross margin for 2017 v/s management's 63% forecast but see further room for upside in 2H17.

The company saw 300bps of positive impact on gross margins due to prolonged 22nm cycle in 2H14…we expect a similar trend in 2H17

Fig 5 Intel Gross Margin trend with extending Moore's Law



Source: Company data, Macquarie Capital (USA), March 2017

Needless to say, free cash flow remains an issue given the $12b capex in 2017. FCF should improve meaningfully in 1H18 as 10nm spending drops off. We also believe memory spending will decline next year although it won't go to zero. We expect ~15% decline in capex in 2018, and believe that three-year FCF growth will more or less track EPS growth.

Mobileye makes strategic sense, although timing is a surprise

Mobileye's strong customer relationships establish Intel as an indispensable player in self-driving technology

Intel's decision to acquire Mobileye for $14.7b did not go well with some investors. The company was already facing criticism about its capex spending and the limited free cash flow generation, and only recently acquired Altera for $16.7b. While the concerns are understandable, we believe automotive is a market that Intel cannot afford to be just a fringe player for too long. The argument that Intel should have waited at least until self-driving architectures are somewhat mature have validity, but Intel's decision may have been driven by its intent to get in early and influence the future architectures. Mobileye's strong customer relationships with automotive OEMs and Tier 1s establish Intel as an indispensable player in the future of self-driving cars, which offers multi-billion dollar silicon opportunity. While it's early to say how big the data services opportunity will be, silicon opportunity alone ($400-$500/car for Level 4) could add a few billion dollars in annual revenues for Intel. We estimate the deal to be slightly accretive even without the $175m synergies the company is targeting. We also note that the decision to use offshore cash makes the price premium less onerous.

Fig 6 MBLY accretion analysis (2018)

	INTC	MBLY	Adjustments	Combined
Revenue	61,718	730		62,448
Cost of goods sold	22,979	181	0	23,160
Gross profit	38,739	549		39,288
Gross margin	62.8%	75.2%		62.9%
Operating expenses	20,102	138	0	20,240
Operating income	18,637	411		19,048
Operating margin	30.2%	56.3%		30.5%
Other income	190	0	(147)	43
Pre-tax income	18,827	411		19,091
Tax	4,100	32		4,132
Tax rate	21.8%	7.8%		21.6%
Net income	14,727	379		14,959
Stock comp	0	0		0
Net income (adjusted for stock comp)	14,727	379		14,959
Non-GAAP EPS	**$3.02**			**$3.06**
Accretion				**$0.05**
Accretion %				**2%**

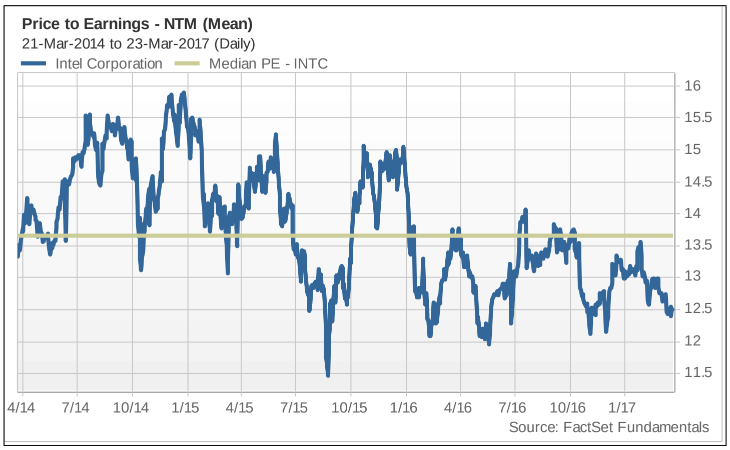
Source: Company data, FactSet, Macquarie Capital (USA), March 2017

Valuation, recommendation, risks

At $35.60, the stock is trading at a 12.5x 17E PE, on our estimates. Our target price assumes that the stock trades near its three-year average PE of 13.5x over the next 12 months, which we believe is reasonable given our view that DCG & gross margins have upside.

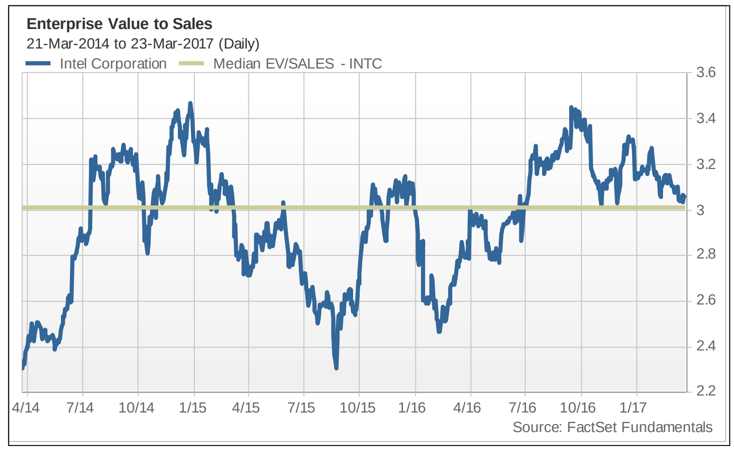
Risks to our rating 1) further slowdown in the data center group; 2) more-than-anticipated share losses to AMD; and 3) price pressures in the PC segment.

Fig 7 PE Historical



Source: Company data, Macquarie Capital (USA), March 2017

Fig 8 EV/Sales Historical



Source: Company data, Macquarie Capital (USA), March 2017

Macquarie vs consensus

Fig 9 We are 2.0% above EPS in 2017E

INTC	17E	18E	19E
MQ/Consensus (Rev %)	-0.6	0.3	0.2
MQ/Consensus (EPS %)	2.0	2.8	5.4

Source: FactSet, Macquarie Capital (USA), March 2017

Intel

Income Statement

(FYE Dec/$mil/%)	1Q16	2Q16	3Q16	4Q16	1Q17E	2Q17E	2016	2017E	2018E	2019E
Revenues	13,702	13,533	15,778	16,374	14,804	14,022	**59,387**	**59,622**	**61,718**	**63,801**
Cost of Sales	5,572	5,560	5,795	6,269	5,661	5,553	**23,196**	**22,488**	**23,907**	**24,641**
Gross Profit	8,130	7,973	9,983	10,105	9,143	8,469	**36,191**	**37,134**	**37,811**	**39,160**
Operating Expenses	5,562	6,655	5,521	5,579	5,648	5,261	**23,317**	**21,059**	**20,302**	**20,708**
R&D	3,246	3,145	3,069	3,280	3,214	3,150	**12,740**	**12,476**	**12,345**	**12,592**
SG&A	2,226	2,007	2,006	2,158	2,093	2,030	**8,397**	**8,063**	**7,957**	**8,116**
Other Oper Exp	90	1,503	446	141	340	80	**2,180**	**520**	**0**	**0**
Oper Income	2,568	1,318	4,462	4,526	3,496	3,209	**12,874**	**16,075**	**17,509**	**18,452**
Non-oper Inc (Exp)	-60	352	-144	-86	-50	520	**62**	**660**	**190**	**240**
Pretax Income	2,508	1,670	4,318	4,440	3,446	3,729	**12,936**	**16,735**	**17,699**	**18,692**
Provision for Taxes	462	340	940	878	758	1,007	**2,620**	**4,251**	**4,425**	**4,673**
Effective Tax Rate	18%	20%	22%	20%	22%	27%	**20%**	**25%**	**25%**	**25%**
Net Income (GAAP)	2,046	1,330	3,378	3,562	2,688	2,722	**10,316**	**12,485**	**13,274**	**14,019**
Diluted EPS (GAAP)	0.42	0.27	0.69	0.73	0.55	0.56	**2.12**	**2.56**	**2.72**	**2.87**
Diluted EPS (Non-GAAP)	0.54	0.59	0.80	0.79	0.64	0.59	2.72	2.85	3.02	3.18
Free cash flow per share	0.56	0.32	0.68	0.95	0.47	0.46	**2.50**	**2.10**	**2.60**	**2.77**
Diluted Shares	4,875	4,866	4,877	4,881	4,881	4,881	**4,875**	**4,881**	**4,881**	**4,881**
% of Revenues										
Gross Profit	59.3%	58.9%	63.3%	61.7%	61.8%	60.4%	**60.9%**	**62.3%**	**61.3%**	**61.4%**
Gross Profit (Non-GAAP)	62.7%	61.8%	64.8%	63.1%	63.3%	62.1%	63.2%	63.8%	62.8%	62.8%
Operating Expenses	40.6%	49.2%	35.0%	34.1%	38.1%	37.5%	**39.3%**	**35.3%**	**32.9%**	**32.5%**
R&D	23.7%	23.2%	19.5%	20.0%	21.7%	22.5%	**21.5%**	**20.9%**	**20.0%**	**19.7%**
SG&A	16.2%	14.8%	12.7%	13.2%	14.1%	14.5%	**14.1%**	**13.5%**	**12.9%**	**12.7%**
Oper Income	18.7%	9.7%	28.3%	27.6%	23.6%	22.9%	**21.7%**	**27.0%**	**28.4%**	**28.9%**
Oper Income (Non-GAAP)	23.8%	23.8%	32.6%	29.9%	27.5%	25.1%	27.8%	29.4%	30.2%	30.7%
Net Income (GAAP)	14.9%	9.8%	21.4%	21.8%	18.2%	19.4%	**17.4%**	**20.9%**	**21.5%**	**22.0%**
% Change YoY										
Revenues	7%	3%	9%	10%	8%	4%	**7%**	**0%**	**4%**	**3%**
Gross Profit	5%	-3%	10%	5%	12%	6%	**4%**	**3%**	**2%**	**4%**
Operating Income	-2%	-54%	6%	5%	36%	143%	**-8%**	**25%**	**9%**	**5%**
Pretax Income	-6%	-44%	2%	3%	37%	123%	**-9%**	**29%**	**6%**	**6%**
Net Income (GAAP)	3%	-51%	9%	-1%	31%	105%	**-10%**	**21%**	**6%**	**6%**
% Change QoQ										
Revenues	-8%	-1%	17%	4%	-10%	-5%				
Gross Profit	-15%	-2%	25%	1%	-10%	-7%				
Operating Income	-40%	-49%	239%	1%	-23%	-8%				
Pretax Income	-42%	-33%	159%	3%	-22%	8%				
Net Income (GAAP)	-43%	-35%	154%	5%	-25%	1%				

Source: Company data, FactSet, Macquarie Capital (USA), March 2017

Intel
Balance Sheet

(FYE Dec/$mil)	4Q15	1Q16	2Q16	3Q16	4Q16	2015	2016	2017E
Assets								
Current Assets	38,320	27,397	31,188	36,216	35,508	38,320	35,508	38,585
Cash and Equivalents	15,308	3,061	3,885	4,752	5,560	15,308	5,560	8,847
Short-term Investments	10,005	12,030	13,804	13,017	11,539	10,005	11,539	11,539
A/R, Net	4,787	4,216	4,426	4,952	4,690	4,787	4,690	4,593
Inventories, Net	5,167	5,751	5,800	5,783	5,553	5,167	5,553	5,439
Other Assets	3,053	2,339	3,273	7,712	8,166	3,053	8,166	8,166
Non-current Assets	63,139	78,070	78,643	76,001	77,819	63,139	77,819	81,519
Plant and Equipment	31,858	32,644	33,804	34,707	36,171	31,858	36,171	41,171
Long-Term Investments	7,851	9,474	8,961	10,211	10,896	7,851	10,896	10,896
Goodwill	11,332	16,942	16,992	23,392	23,593	11,332	23,593	22,293
Other Assets	12,098	19,010	18,886	7,691	7,159	12,098	7,159	7,159
Total Assets	101,459	105,467	109,831	112,217	113,327	101,459	113,327	120,104
Liabilities/Equity								
Current Liabilities	15,646	17,526	18,711	20,093	20,302	15,646	20,302	20,251
Short-term Debt	2,634	3,594	4,560	3,573	4,634	2,634	4,634	4,634
Accounts Payable	2,063	3,163	3,420	3,181	2,475	2,063	2,475	2,424
Accrued Liabilities	8,761	8,137	7,924	11,615	11,475	8,761	11,475	11,475
Deferred Income on Shipments	2,188	2,632	2,807	1,724	1,718	2,188	1,718	1,718
Income Tax Payable	0	0	0	0	0	0	0	0
Long-Term Liabilities	24,728	26,767	29,753	29,009	26,799	24,728	26,799	26,799
Long Term Debt	20,036	21,775	24,053	24,043	20,649	20,036	20,649	20,649
Deferred Tax Liabilities	4,692	4,992	5,700	4,966	6,150	4,692	6,150	6,150
Total Liabilities	40,374	44,293	48,464	49,102	47,101	40,374	47,101	47,050
Stockholders' Equity	61,085	61,174	61,367	63,115	66,226	61,085	66,226	73,054
Total Liabilities and Stockholders' Equity	101,459	105,467	109,831	112,217	113,327	101,459	113,327	120,104

Source: Company data, FactSet, Macquarie Capital (USA), March 2017

Intel

Ratio Analysis

	4Q15	1Q16	2Q16	3Q16	4Q16	2015	2016
Profitability Analysis							
Return on Assets (Pretax)	17.2%	9.9%	4.9%	16.1%	16.1%	**14.5%**	**12.0%**
Return on Equity (Aftertax)	24.5%	13.4%	8.7%	21.7%	22.0%	**19.5%**	**16.2%**
Return on Invested Capital (Pretax)	30.8%	16.8%	7.8%	26.1%	26.4%	**25.5%**	**20.6%**
Cash Conversion Cycle (Days)	83	74	68	69	69	**87**	**77**
DSOs	29	28	29	28	26	**31**	**28**
Days of Inventory	87	93	94	90	80	**90**	**86**
Days Payables Outstanding	34	46	55	50	37	**34**	**38**
Liquidity Analysis							
Current Ratio	2.4x	1.6x	1.7x	1.8x	1.7x	**2.4x**	**1.7x**
Quick Ratio	1.9x	1.1x	1.2x	1.1x	1.1x	**1.9x**	**1.1x**
Debt/Solvency Analysis							
Debt/Total Capital	27.1%	29.3%	31.8%	30.4%	27.6%	**27.1%**	**27.6%**
Debt/Equity	37.1%	41.5%	46.6%	43.8%	38.2%	**37.1%**	**38.2%**
Asset Values							
Book Value/Share	$ 12.53	$ 12.55	$ 12.61	$ 12.94	$ 13.57	**$ 12.48**	**$ 13.59**
Tangible Book Value/Share	$ 10.20	$ 9.07	$ 9.12	$ 8.14	$ 8.73	**$ 10.17**	**$ 8.75**
Total Cash & Equiv/Share	$ 5.19	$ 3.10	$ 3.64	$ 3.64	$ 3.50	**$ 5.17**	**$ 3.51**
Net Cash/Share	$ 0.54	$ (2.11)	$ (2.24)	$ (2.02)	$ (1.68)	**$ 0.54**	**$ (1.68)**
Other							
Revenue per Employee ($ mil)	0.715	0.657	0.649	0.757	0.785	**2.655**	**2.848**
Capital Spending ($mil)	2,328	1,346	2,286	2,463	3,530	**7,326**	**9,625**
Depreciation and Amortization ($mil)	1,936	1,619	1,522	1,543	1,582	**7,821**	**6,266**

Source: Company data, FactSet, Macquarie Capital (USA), March 2017

Companies Mentioned:

Advanced Micro Devices (AMD US, US$13.69, Neutral, TP: US$14.00)

Mobileye (MBLY, Not covered)

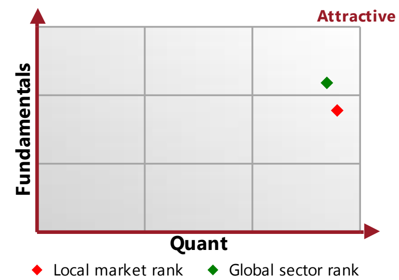
Macquarie Quant View

The quant model currently holds a strong positive view on Intel. The strongest style exposure is Valuations, indicating this stock is under-priced in the market relative to its peers. The weakest style exposure is Growth, indicating this stock has weak historic and/or forecast growth. Growth metrics focus on both top and bottom line items.

37/357

Global rank in Semiconductors & Semiconductor Equip.

% of BUY recommendations	56% (22/39)
Number of Price Target downgrades	4
Number of Price Target upgrades	0

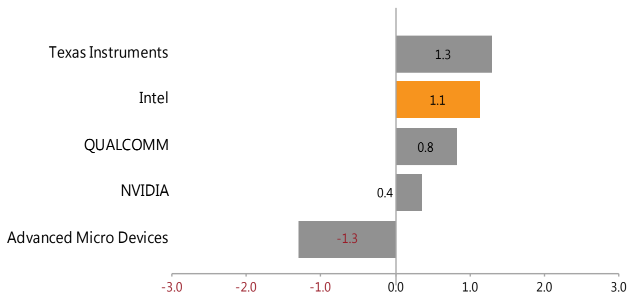


Displays where the company's ranked based on the fundamental consensus Price Target and Macquarie's Quantitative Alpha model.

Two rankings: Local market (United States) and Global sector (Semiconductors & Semiconductor Equip.)

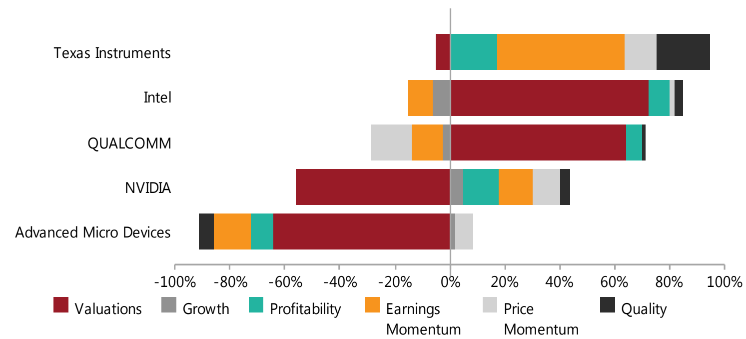
Macquarie Alpha Model ranking

A list of comparable companies and their Macquarie Alpha model score (higher is better).



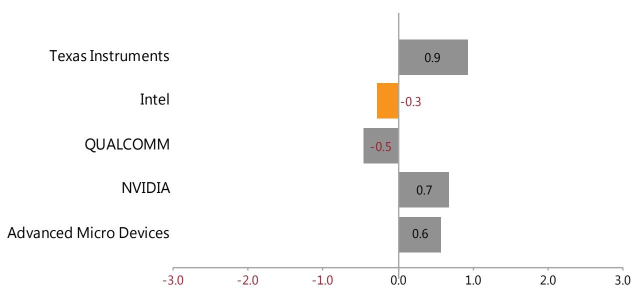
Factors driving the Alpha Model

For the comparable firms this chart shows the key underlying styles and their contribution to the current overall Alpha score.



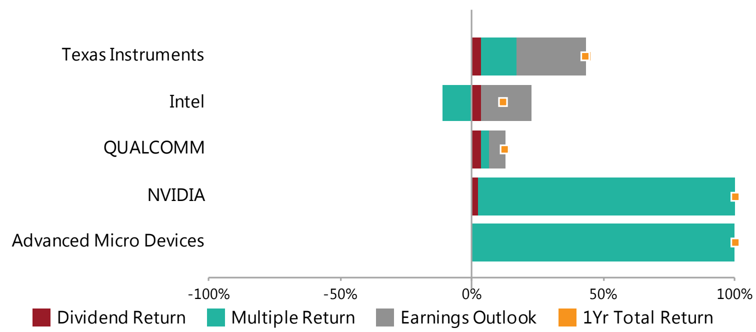
Macquarie Earnings Sentiment Indicator

The Macquarie Sentiment Indicator is an enhanced earnings revisions signal that favours analysts who have more timely and higher conviction revisions. Current score shown below.



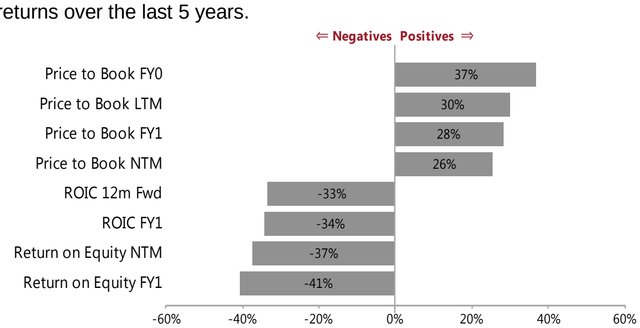
Drivers of Stock Return

Breakdown of 1 year total return (local currency) into returns from dividends, changes in forward earnings estimates and the resulting change in earnings multiple.



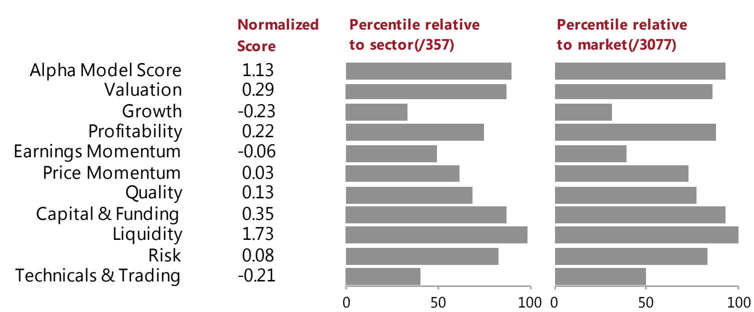
What drove this Company in the last 5 years

Which factor score has had the greatest correlation with the company's returns over the last 5 years.



How it looks on the Alpha model

A more granular view of the underlying style scores that drive the alpha (higher is better) and the percentile rank relative to the sector and market.



Source (all charts): FactSet, Thomson Reuters, and Macquarie Research. For more details on the Macquarie Alpha model or for more customised analysis and screens, please contact the Macquarie Global Quantitative/Custom Products Group (cpg@macquarie.com)

UNITED STATES

MU US		Outperform
Price (at CLOSE#, 28 Mar 2017)		US$28.69
Valuation	**US$**	**35.00-40.00**
- Price to Book		
12-month target	**US$**	**35.00**
12-month TSR	**%**	**+22.0**
GICS sector		
Semiconductors & Semiconductor Equipment		
Market cap	**US$m**	**31,645**
30-day avg turnover	**US$m**	**788.0**
Number shares on issue	**m**	**1,103**

Investment fundamentals

Year end 31 Aug		2016A	2017E	2018E	2019E
Revenue	m	12,399	19,507	21,446	21,965
Adjusted profit	m	113	4,902	6,195	5,503
CFPS	US$	2.99	7.70	8.95	8.50
CFPS growth	%	-41.1	158.0	16.2	-5.1
PGCFPS	x	9.6	3.7	3.2	3.4
EPS adj	US$	0.11	4.27	5.34	4.74
EPS adj growth	%	-95.9	3,806.1	25.1	-11.2
PER adj	x	262.5	6.7	5.4	6.0
EV/EBITDA	x	10.9	4.5	3.8	4.0
P/BV	x	2.5	1.9	1.4	1.1

Source: FactSet, Macquarie Capital (USA), March 2017
(all figures in USD unless noted)

Analyst(s)
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30 March 2017
Macquarie Capital (USA) Inc.

Micron Technology

DRAM cycle has legs

Initiating with Outperform and $35 PT

We expect supply tightness in Memory to persist and believe that pricing will remain resilient throughout 2017, especially in the DRAM market. Micron is clearly benefiting from the industry upturn but the company also appears to be narrowing the technology / cost gap with the leaders, which we believe is driving structural margin improvement. We are forecasting peak gross margin in the current cycle to be more than 10 points above that of 2014 cycle, and expect a similar trend during the next trough. The stock is trading at nearly a 40% discount to the last cycle peak on a P/B basis despite what we believe are structurally better margins. We are not counting on the multiples returning to previous peaks given the higher debt load, opex, and the lingering effects on the sentiment from 2015 losses. However, as the resiliency of the current DRAM cycle becomes apparent in the coming quarters, we see plenty of room for multiple expansion. The key risk, in our view, is demand related, as capacity additions appear less likely this year.

DRAM supply tight; Demand healthy across markets

We expect the supply/demand balance in the DRAM (60% of sales) industry to persist through 2017 and into 2018. Industry consolidation is leading to more rational capacity additions and a lack of clean room space means that wafer capacity growth will be limited until new Samsung / Hynix fabs come online in 2H19. While price increases have moderated recently, it's not due to easing supply constraints. As discussed in Macquarie's recent global Memory Tracker report (Link), DRAM vendors are enjoying strong profitability, and seem less aggressive in pushing up the prices in order not to choke the end demand. From a demand perspective, PC appears stable, and content growth remains strong in smartphone and server markets despite higher prices.

NAND demand drivers intact

NAND supply continues to remain tight due to the hiccups in 3D NAND transitions and Toshiba's (covered by Damian Thong) well-publicized financial constraints. Despite aggressive 3D NAND capex, industry leader Samsung (covered by Daniel Kim) expects bit growth of only 30%, due to smaller than expected contribution from Line 18 (Pyungtaek). We expect any incremental supply in 2H17 to be readily absorbed by the SSD market, which is nearing an inflection. The impact from Intel's capex and any potential China investments should be moderate even in 2018. Micron appears to have a die-size advantage at 64-layer 3D NAND, which should help narrow the gap with the leaders to some extent.

Gross margins structurally better in this cycle

MU's gross margins peaked at around 36% in the previous cycle. We are modeling cost per bit to improve > 20% in DRAM and ~25-30% in NAND. Strong pricing, better manufacturing execution, and the consolidation of Inotera should help keep gross margins above 40%+ levels through the rest of CY2017. While higher fixed cost (Inotera) could be a headwind to margins in the next downturn, we believe technology improvements will more than offset, and see a good possibility that the next trough margins will be significantly higher than in the previous cycle. The stock is currently trading at a 1.7x PB on our CY17 estimates, which is at a ~40% discount to previous cycle peak. Our PT assumes that the stock trades at a PE of 7x our CY18 estimate over the next 12 months, which is still a ~20% discount to last cycle peak of over 9x, and implies 1.6x PB, which is a slight discount to the historic average.

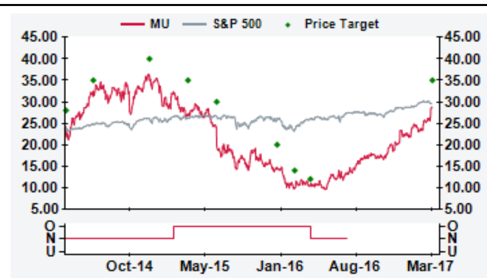
Inside

Micron Technology

Company profile

- Micron Technology, Inc., incorporated on April 6, 1984, is engaged in semiconductor systems. The Company's portfolio of memory technologies includes dynamic random-access memory (DRAM), Flash (NAND and NOR) modules, multi-chip packages and other system solutions.
- The Company's memory solutions enable computing, consumer, enterprise storage, networking, mobile, embedded and automotive applications. The Company markets its products through an internal sales force, independent sales representatives and distributors primarily to original equipment manufacturers (OEMs) and retailers located around the world.
- Its business segments include Compute and Networking Business Unit (CNBU), which includes memory products sold into computer, networking, graphics and cloud server markets; Mobile Business Unit (MBU), which includes memory products sold into smartphone, tablet and other mobile-device markets; Storage Business Unit (SBU), which includes memory products sold into enterprise, client, cloud and removable storage markets, and SBU also includes products sold to Intel through its Intel/Micron Flash Technology (IMFT) joint venture, and Embedded Business Unit (EBU), which includes memory products sold into automotive, industrial, connected home and consumer electronics markets.

Fig 1 MU US vs S&P 500, & rec history



Note: Recommendation timeline - if not a continuous line, then there was no Macquarie coverage at the time or there was an embargo period.

Source: FactSet, Macquarie Capital (USA), March 2017

(all figures in USD unless noted)

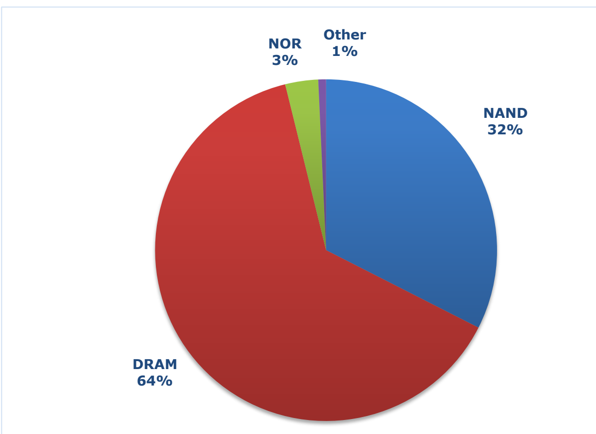
DRAM cycle has legs

Initiating with OP and $35 PT

We see further tailwinds to Memory pricing in the coming quarters

We are initiating coverage on MU with an Outperform rating and a $35 PT. We expect supply tightness in both DRAM and NAND markets to persist through 2017, and see further tailwinds for pricing. Micron clearly benefits from the industry upturn, but the company also appears to be narrowing the technology gap with the leaders, which we believe is driving structural margin expansion. The stock is trading at about 40% discount to the last cycle peak on a P/B basis. We are not counting on the multiples returning to previous peaks given the higher debt load, opex, and the lingering effects on the sentiment from 2015 operating losses. However, a combination of earnings upside and a modest multiple expansion should get the stock to our PT of $35. The key risk, in our view, is demand related, as additional capacity additions in DRAM appear less likely this year.

Fig 2 Micron Revenue segments (Feb-17Q)



Source: Company data, Macquarie Capital (USA), March 2017

Fig 3 Micron estimates summary

	CY16	CY17E	CY18E
Revenue ($m)	13,019	21,142	21,262
Gross Margin (GAAP)	20.5%	43.7%	41.8%
Operating Margin (GAAP)	2.3%	31.5%	29.0%
EPS (GAAP)	($0.29)	$5.07	$4.60
EPS (Non-GAAP)	$0.11	$5.31	$4.77
PE (Non-GAAP) @ $28.69	272	5.4	6.0
PB @ $28.69	2.7	1.7	1.3

Source: Company Data, Macquarie Capital (USA), March 2017

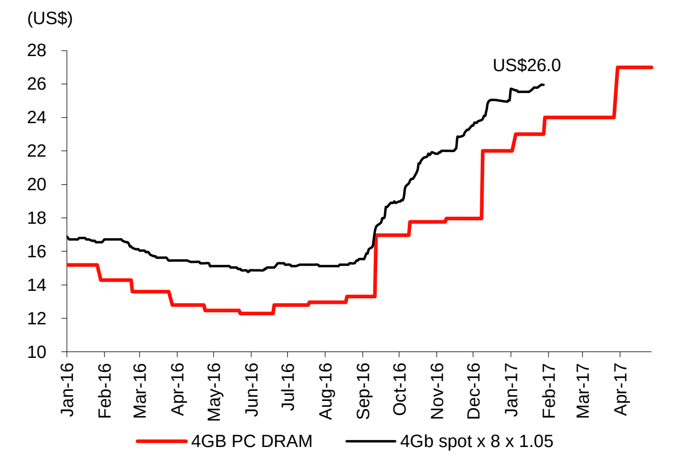
DRAM supply tight; Demand healthy across markets

We see little risk of de-spec'ing in smartphone and PC markets despite high DRAM prices

We expect the supply/demand balance in the DRAM (64% of sales) industry to persist through 2017. While price increases have moderated recently, it's not due to easing supply constraints. As discussed in Macquarie's recent global Memory Tracker report (Link), DRAM vendors are enjoying strong profitability, and seem less aggressive in pushing up the prices in order not to choke the end demand. We expect DRAM prices to remain resilient through 2H17. Industry consolidation is leading to more rational capacity additions and a lack of clean room space means that wafer capacity growth will be limited until new fabs (Samsung/Hynix) come online in 2H19. From a demand perspective, PC appears stable and we expect PC units to be flattish this year. We expect low-single-digit unit growth in smartphones this year. Content growth remains strong in smartphones due to intense competition, and we see little risk of de-spec'ing despite high prices. Content growth in other markets such as Server and Gaming should continue at a steady pace. Overall, we still see a moderate increase in Micron's DRAM ASPs in the next 1 – 2 quarters, and expect any price declines in 2H17 to be moderate.

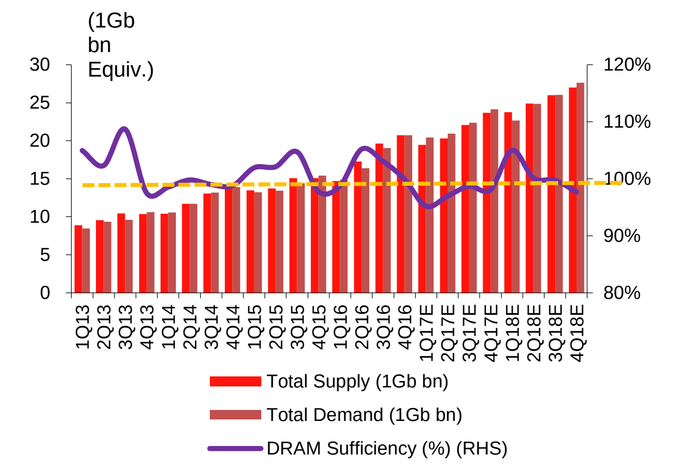
The company's 20nm transition is largely complete and the ramp of 1X should pick up in the coming quarters. MU expects meaningful output on 1X node by the end of FY17. We are modeling 50% bit growth for Micron this fiscal year (v/s 20% for the industry) primarily due to the timing of node transitions, and expect 18% growth next fiscal year. Overall, we are modelling bit growth to be in line with management's forecast for a 30 – 40% 2-year CAGR.

Fig 4 DRAM spot price v/s contract price



Source: inSpectrum, Macquarie Research, March 2017

Fig 5 DRAM demand supply forecast

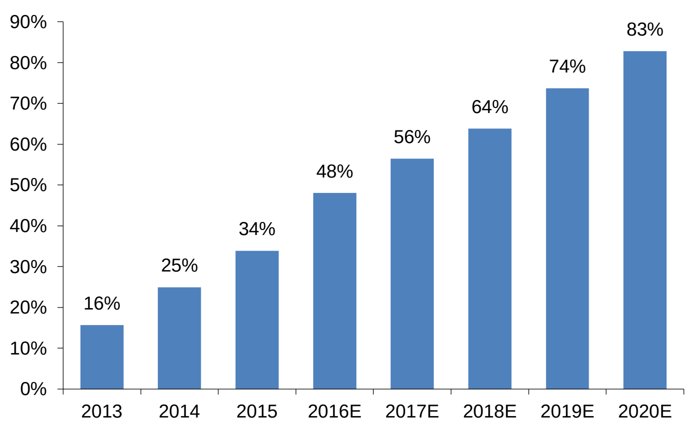


Source: inSpectrum, Macquarie Research, March 2017

NAND demand drivers intact

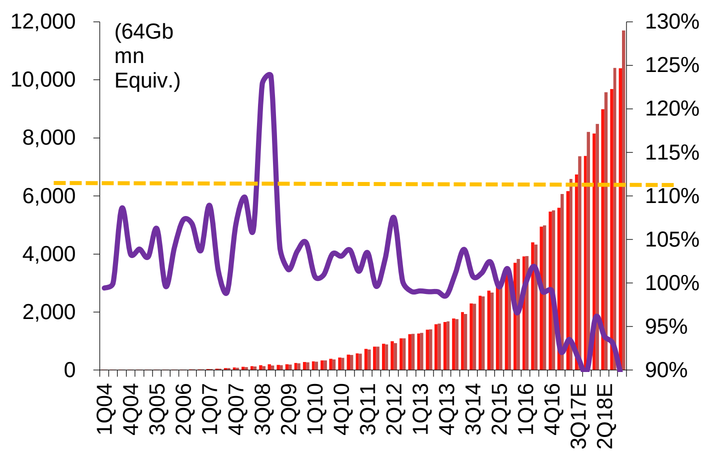
NAND supply continues to remain tight due to the hiccups in 3D NAND transitions and Toshiba's (covered by Damian Thong) well-publicized financial constraints. Despite aggressive 3D NAND capex, industry leader Samsung (covered by Daniel Kim) expects bit growth of only 30%, due to a smaller than expected contribution from Line 18 (Pyungtaek). We expect any incremental supply in 2H17 to be readily absorbed by the SSD market. The impact from Intel's capex and any potential China investments should be moderate even in 2018. While there are concerns about excess supply in 2H17 as 3D NAND production ramps, we see enough demand drivers from smartphone seasonality and SSD transition to more than absorb the bit growth. In particular, we believe SSD transition is nearing an inflection and see rapid adoption in both client and enterprise markets as more NAND supply becomes available. As such, we are not overly concerned about the excess supply risk for the next 12 months.

Fig 6 Notebook SSD Penetration



Source: IDC, Macquarie Capital (USA), March 2017

Fig 7 NAND demand supply forecast



Source: inSpectrum, Macquarie Capital (USA), March 2017

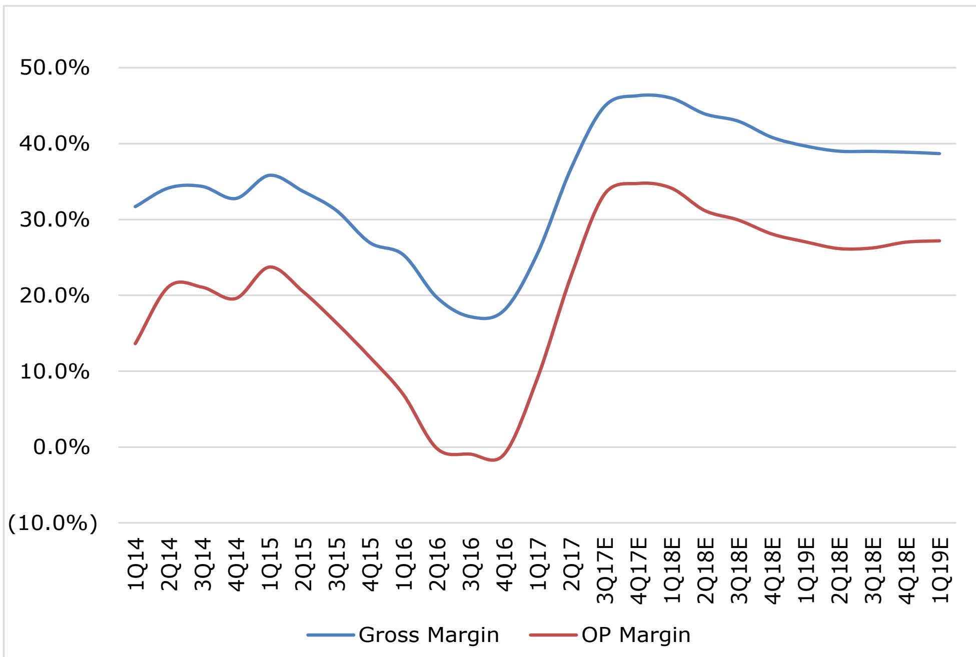
Micron is transitioning to 64-layer 3D NAND and expects 64-layer to account for a meaningful portion of its NAND output by the end of its FY17. The company appears to have a die-size advantage at 64-layer 3D NAND, which should help narrow the gap with the leaders. We are modeling ~60% bit growth at MU this year driven by 64-layer 3D ramps. Micron also appears to be making progress in the enterprise SSD segment with the recently launched 5100 series drive though the company still lags leaders Samsung and Intel in this segment.

Gross margins structurally better in this cycle

We expect gross margins to remain above 40% levels for the next 4 quarters

MU's gross margins peaked at around 36% in the previous cycle. We are modeling cost per bit to improve > 20% in DRAM and ~25-30% in NAND. Strong pricing, faster & smoother process node transition, and the consolidation of Inotera are already driving gross margins above previous cycle peaks. We expect resilient pricing and cost improvements to help sustain gross margins above 40% levels for the rest of CY 2017. While higher fixed cost (Inotera) could be a headwind to margins in the next downturn, we believe technology improvements will more than offset, and as such, we see a good possibility that the next trough margins will also be significantly higher than the previous cycle.

Fig 8 Micron Gross and OP margins (GAAP)



Source: Company data, Macquarie Capital (USA), March 2017

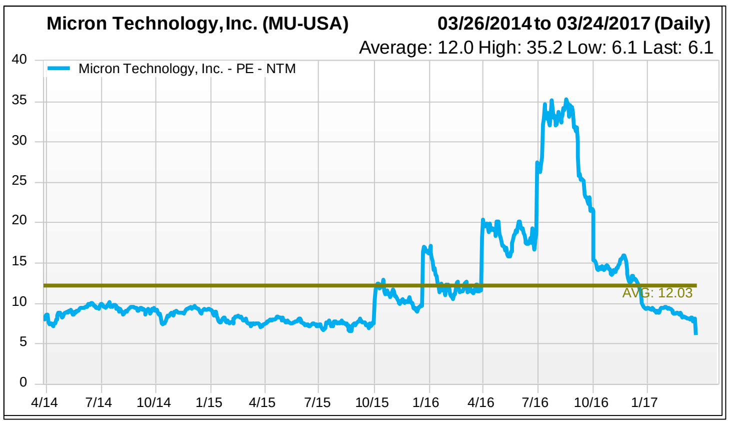
Valuation, recommendation, risks

Given our view that the current upcycle will sustain through 2017, the stock doesn't need multiple expansion on a PB basis to reach our PT

We initiate with an Outperform and a price target of $35. MU is currently trading at a PE of 5.4x and PB 1.7x our CY17 estimates. The PB ratio is in line with its 3-year average but at ~40% discount to last cycle peak of 2.7x. We believe MU's margins have structurally improved in this cycle due to better manufacturing execution and improvements on the technology front. Our PT assumes that the stock trades at a PE of 7x our CY18 estimate over the next 12 months, which is still a ~20% discount to last cycle peak of over 9x, and implies a 1.6x PB, which is a slight discount to the historic average.

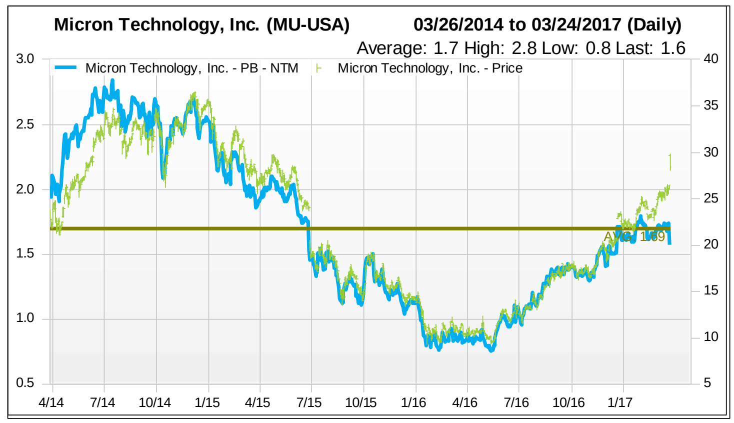
The key risks in our view are 1) weaker than expected demand in PC and smartphone markets, 2) unexpected capacity additions by Samsung or Hynix and 3) Mis-execution during 1x transition by Micron.

Fig 9 MU Historic PE Multiple



Source: Factset, Macquarie Capital (USA), March 2017

Fig 10 MU Historic PB multiple & stock price



Source: Factset, Macquarie Capital (USA), March 2017

Micron											
P&L	**Feb-16Q**	**May-16Q**	**Aug-16Q**	**Nov-16Q**	**Feb-17Q**	**May-17Q**	**Aug-17Q**	**Nov-17Q**			
FYE Aug (US$m/%)	**2Q16**	**3Q16**	**4Q16**	**1Q17**	**2Q17**	**3Q17E**	**4Q17E**	**1Q18E**	**FY16**	**FY17E**	**FY18E**
Revenue	2,934	2,898	3,217	3,970	4,648	5,401	5,487	5,605	**12,399**	**19,507**	**21,446**
Cost of goods sold	2,355	2,400	2,638	2,959	2,944	2,977	2,946	3,027	**9,894**	**11,826**	**12,128**
Gross Profit	579	498	579	1,011	1,704	2,424	2,542	2,578	**2,505**	**7,680**	**9,318**
Operating Expenses	584	525	611	652	660	625	635	665	**2,337**	**2,572**	**2,698**
SG&A	175	148	157	159	187	175	180	180	**659**	**701**	**758**
R&D	403	382	411	470	473	440	445	475	**1,617**	**1,828**	**1,900**
Restructuring	-	-	51	29	4	-	-	-	**51**	**33**	-
Goodwill impairment	-	-	-	-	-	-	-	-	-	-	-
Other, net	6	(5)	(8)	(6)	(4)	10	10	10	**10**	**10**	**40**
Operating income	(5)	(27)	(32)	359	1,044	1,799	1,907	1,913	**168**	**5,108**	**6,619**
Other, net	(91)	(133)	(136)	(146)	(119)	(125)	(125)	(125)	**(449)**	**(515)**	**(500)**
Pretax income (loss)	(96)	(160)	(168)	213	925	1,674	1,782	1,788	**(281)**	**4,593**	**6,119**
Income tax	(5)	(15)	(3)	(31)	(38)	(60)	(71)	(72)	**(19)**	**(200)**	**(288)**
Equity income	5	(40)	1	(2)	7	-	-	-	**25**	**5**	-
Net income (loss)	(96)	(215)	(170)	180	894	1,614	1,710	1,716	**(275)**	**4,398**	**5,831**
Noncontrolling interests	(1)	-	-	-	-	-	-	-	**(1)**	-	-
Net income (loss)	(97)	(215)	(170)	180	894	1,614	1,710	1,716	**(276)**	**4,398**	**5,831**
GAAP EPS	**(0.09)**	**(0.21)**	**(0.16)**	**0.16**	**0.77**	**1.38**	**1.46**	**1.46**	**(0.26)**	**3.77**	**4.96**
Non-GAAP Adj.	0.05	0.13	0.16	0.15	0.13	0.12	0.10	0.10	**0.37**	**0.50**	**0.38**
Non-GAAP EPS	**(0.05)**	**(0.08)**	**(0.01)**	**0.32**	**0.90**	**1.50**	**1.55**	**1.56**	**0.11**	**4.27**	**5.34**
% of revenue											
Gross profit	19.7%	17.2%	18.0%	25.5%	36.7%	44.9%	46.3%	46.0%	**20.2%**	**39.4%**	**43.4%**
Operating expenses	19.9%	18.1%	19.0%	16.4%	14.2%	11.6%	11.6%	11.9%	**18.8%**	**13.2%**	**12.6%**
SG&A	6.0%	5.1%	4.9%	4.0%	4.0%	3.2%	3.3%	3.2%	**5.3%**	**3.6%**	**3.5%**
R&D	13.7%	13.2%	12.8%	11.8%	10.2%	8.1%	8.1%	8.5%	**13.0%**	**9.4%**	**8.9%**
Operating income	-0.2%	-0.9%	-1.0%	9.0%	22.5%	33.3%	34.7%	34.1%	**1.4%**	**26.2%**	**30.9%**
Pretax income	-3.3%	-5.5%	-5.2%	5.4%	19.9%	31.0%	32.5%	31.9%	**-2.3%**	**23.5%**	**28.5%**
Tax rate	5.2%	9.4%	1.8%	-14.6%	-4.1%	-3.6%	-4.0%	-4.0%	**6.8%**	**-4.4%**	**-4.7%**
Net income	-3.3%	-7.4%	-5.3%	4.5%	19.2%	29.9%	31.2%	30.6%	**-2.2%**	**22.5%**	**27.2%**
YoY (%)											
Revenue	-29.6%	-24.8%	-10.6%	18.5%	58.4%	86.4%	70.6%	41.2%	**-23.4%**	**57.3%**	**9.9%**
Gross profit	-58.8%	-58.6%	-40.3%	19.1%	194.3%	386.7%	338.9%	155.0%	**-52.0%**	**206.6%**	**21.3%**
Operating expenses	6.2%	-8.1%	12.5%	5.7%	13.0%	19.0%	3.9%	2.0%	**5.4%**	**10.1%**	**4.9%**
SG&A	-6.4%	-12.4%	-7.6%	-11.2%	6.9%	18.2%	14.6%	13.2%	**-8.3%**	**6.4%**	**8.2%**
R&D	6.3%	-5.9%	8.4%	11.6%	17.4%	15.2%	8.3%	1.1%	**5.0%**	**13.0%**	**3.9%**
Operating income	NM	NM	NM	54.7%	NM	NM	NM	432.8%	**-94.4%**	**2940.7%**	**29.6%**
Pretax income	NM	NM	NM	49.0%	NM	NM	NM	739.4%	**NM**	**NM**	**33.2%**
Net income	NM	NM	NM	-12.6%	NM	NM	NM	853.5%	**NM**	**NM**	**32.6%**
QoQ (%)											
Revenue	-12.4%	-1.2%	11.0%	23.4%	17.1%	16.2%	1.6%	2.1%			
Gross profit	-31.8%	-14.0%	16.3%	74.6%	68.5%	42.2%	4.9%	1.4%			
Operating expenses	-5.3%	-10.1%	16.4%	6.7%	1.2%	-5.3%	1.6%	4.7%			
SG&A	-2.2%	-15.4%	6.1%	1.3%	17.6%	-6.4%	2.9%	0.0%			
R&D	-4.3%	-5.2%	7.6%	14.4%	0.6%	-7.0%	1.1%	6.7%			
Operating income	NM	NM	NM	NM	190.8%	72.3%	6.0%	0.3%			
Pretax income	NM	NM	NM	NM	334.3%	81.0%	6.4%	0.4%			
Net income	NM	NM	NM	NM	396.7%	80.5%	6.0%	0.4%			

Source: Company data, Macquarie Capital (USA), March 2017

Micron								
Balance Sheet	**Feb-16Q**	**May-16Q**	**Aug-16Q**	**Nov-16Q**	**Feb-17Q**			
FYE Aug (US$m/%)	**2Q16**	**3Q16**	**4Q16**	**1Q17**	**2Q17**	**FY14**	**FY15**	**FY16**
Assets								
Cash and equivalents	3,078	4,627	4,140	4,139	3,621	4,150	2,287	4,140
Short-term investments	957	354	258	30	277	384	1,234	258
Receivables	1,984	2,073	2,068	2,453	2,891	2,906	2,507	2,068
Inventories	2,608	2,920	2,889	2,750	3,000	2,455	2,340	2,889
Other current assets	178	136	140	132	156	350	228	140
Total current assets	**8,805**	**10,110**	**9,495**	**9,504**	**9,945**	**10,245**	**8,596**	**9,495**
Intangible assets, net	512	491	464	445	445	468	431	464
Property, plant and equipment, net	11,819	13,209	14,686	15,321	19,098	8,682	10,554	14,686
Equity method investments	1,360	1,361	1,364	1,401	1,401	971	1,324	1,364
LT marketable securities	1,108	671	414	155	589	819	2,113	414
Other noncurrent assets	1,215	1,159	1,117	1,010	877	1,313	1,125	1,117
Total assets	**24,819**	**27,001**	**27,540**	**27,836**	**32,355**	**22,498**	**24,143**	**27,540**
Liabilities and equity								
Accounts payable and accrued expenses	3,087	3,599	3,879	4,155	3,801	2,698	2,611	3,879
Deferred income	199	189	200	236	289	309	205	200
Equipment purchase contracts	0	0	0	0	0	166	0	0
Other current liabilities	0	0	0	0	0	0	0	0
Current portion of long-term debt	1,125	712	756	1,155	1,117	1,638	1,089	756
Total current liabilities	**4,411**	**4,500**	**4,835**	**5,546**	**5,207**	**4,811**	**3,905**	**4,835**
Long-term debt	6,494	8,919	9,154	8,490	11,308	5,012	6,252	9,154
Other noncurrent liabilities	675	548	623	632	705	1,102	747	623
Total liabilities	**11,580**	**13,967**	**14,612**	**14,668**	**17,220**	**10,925**	**10,904**	**14,612**
Micron shareholders' equity	12,264	12,187	12,080	12,320	14,287	10,771	12,302	12,080
Noncontrolling interests in subsidiaries	975	847	848	848	848	802	937	848
Total equity	**13,239**	**13,034**	**12,928**	**13,168**	**15,135**	**11,573**	**13,239**	**12,928**
Total liabilities and equity	**24,819**	**27,001**	**27,540**	**27,836**	**32,355**	**22,498**	**24,143**	**27,540**

Source: Company data, Macquarie Capital (USA), March 2017

Micron Ratio Analysis FYE Aug (US$m/%)	Feb-16Q 2Q16	May-16Q 3Q16	Aug-16Q 4Q16	Nov-16Q 1Q17	Feb-17Q 2Q17	FY14	FY15	FY16
Profitability Analysis								
Return on Assets (Pretax)	-0.1%	-0.4%	-0.5%	5.2%	13.9%	14.8%	12.9%	0.7%
Return on Equity (Aftertax)	-2.9%	-6.5%	-5.2%	5.5%	25.3%	28.2%	23.4%	-2.1%
Return on Invested Capital (Pretax)	-0.1%	-0.6%	-0.7%	7.5%	19.1%	21.8%	18.4%	0.9%
Cash Conversion Cycle (Days)	51	54	23	7	41	54	46	31
DSOs	61	64	58	56	56	64	56	60
Days of Inventory	100	110	99	84	92	81	77	105
Days Payables Outstanding	110	119	134	133	107	91	87	134
Liquidity Analysis								
Current Ratio	2.0x	2.2x	2.0x	1.7x	1.9x	2.1x	2.2x	2.0x
Quick Ratio	1.4x	1.6x	1.3x	1.2x	1.3x	1.5x	1.5x	1.3x
Debt/Solvency Analysis								
Debt/Total Capital	36.5%	42.5%	43.4%	42.3%	45.1%	36.5%	35.7%	43.4%
Debt/Equity	57.5%	73.9%	76.7%	73.2%	82.1%	57.5%	55.4%	76.7%
Asset Values								
Book Value/Share	$ 12.78	$ 12.58	$ 12.47	$ 12.07	$ 13.05	$ 9.66	$11.32	$12.33
Tangible Book Value/Share	$ 12.28	$ 12.11	$ 12.02	$ 11.66	$ 12.66	$ 9.27	$10.95	$11.89
Total Cash & Equiv/Share	$ 3.89	$ 4.81	$ 4.24	$ 3.82	$ 3.36	$ 3.78	$ 3.01	$ 4.19
Net Cash/Share	$ (3.46)	$ (4.49)	$ (5.32)	$ (5.02)	$ (7.35)	$ (1.77)	$ (3.27)	$ (5.26)

Source: Company data, Macquarie Capital (USA), March 2017

Companies Mentioned:

Samsung Electronics (005930 KS, Won2,089,000, Outperform, TP: Won2,900,000, Daniel Kim)

Toshiba (6502 JP, ¥219, Outperform, TP: ¥315, Damian Thong)

SK Hynix Inc. (000660 KS, Won51,300, Outperform, TP: Won69,000, Daniel Kim)

Intel (INTC US, US$35.60, Outperform, TP: US$40, Srini Pajjuri)

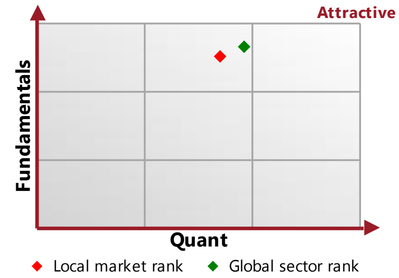
Macquarie Quant View

The quant model currently holds a marginally positive view on Micron Technology. The strongest style exposure is Earnings Momentum, indicating this stock has received earnings upgrades and is well liked by sell side analysts. The weakest style exposure is Quality, indicating this stock is likely to have a weaker and less stable underlying earnings stream.

129/358

Global rank in
Semiconductors & Semiconductor Equip.

% of BUY recommendations	87% (26/30)
Number of Price Target downgrades	0
Number of Price Target upgrades	33

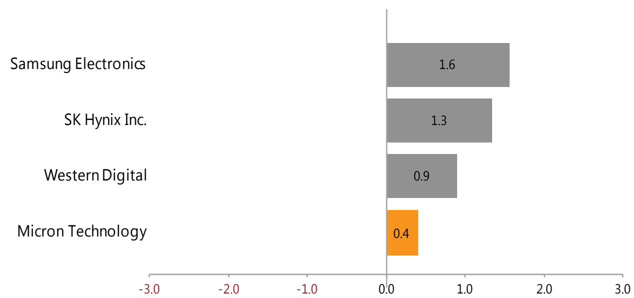


Displays where the company's ranked based on the fundamental consensus Price Target and Macquarie's Quantitative Alpha model.

Two rankings: Local market (United States) and Global sector (Semiconductors & Semiconductor Equip.)

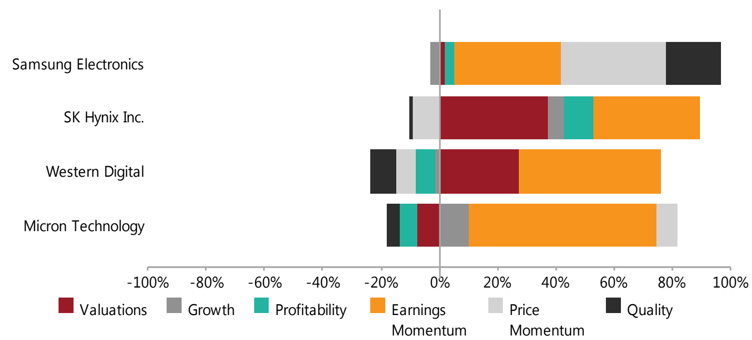
Macquarie Alpha Model ranking

A list of comparable companies and their Macquarie Alpha model score (higher is better).



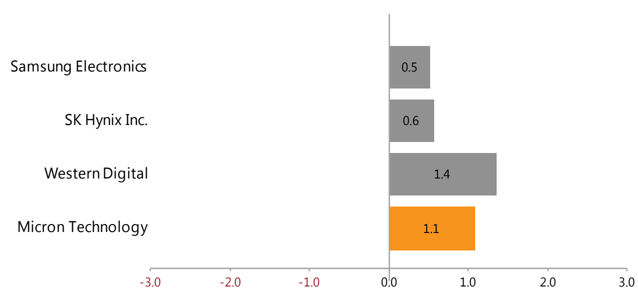
Factors driving the Alpha Model

For the comparable firms this chart shows the key underlying styles and their contribution to the current overall Alpha score.



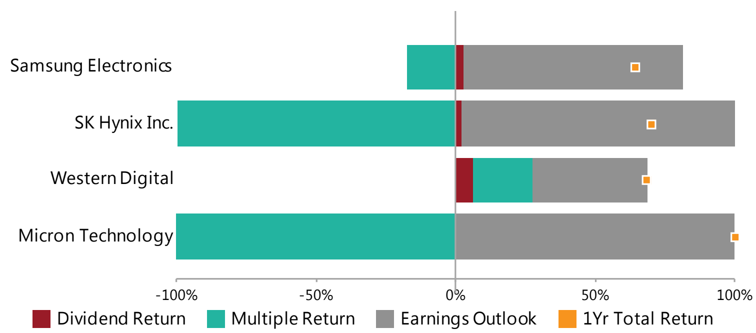
Macquarie Earnings Sentiment Indicator

The Macquarie Sentiment Indicator is an enhanced earnings revisions signal that favours analysts who have more timely and higher conviction revisions. Current score shown below.



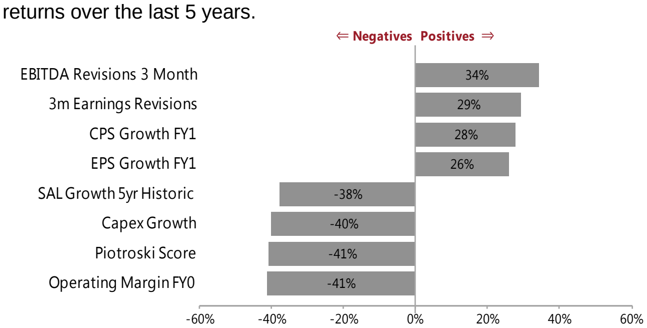
Drivers of Stock Return

Breakdown of 1 year total return (local currency) into returns from dividends, changes in forward earnings estimates and the resulting change in earnings multiple.



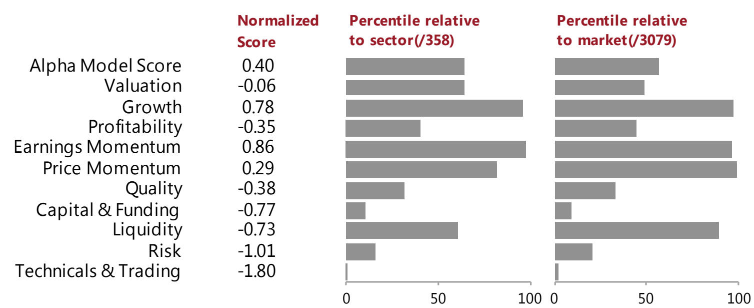
What drove this Company in the last 5 years

Which factor score has had the greatest correlation with the company's returns over the last 5 years.



How it looks on the Alpha model

A more granular view of the underlying style scores that drive the alpha (higher is better) and the percentile rank relative to the sector and market.



Source (all charts): FactSet, Thomson Reuters, and Macquarie Research. For more details on the Macquarie Alpha model or for more customised analysis and screens, please contact the Macquarie Global Quantitative/Custom Products Group (cpg@macquarie.com

UNITED STATES

SWKS US	Outperform
Price (at CLOSE#, 28 Mar 2017)	US$97.93

Valuation - PER	**US$**	**110.00**
12-month target	**US$**	**110.00**
12-month TSR	**%**	**+13.4**
GICS sector Semiconductors & Semiconductor Equipment		
Market cap	**US$m**	**18,107**
30-day avg turnover	**US$m**	**179.6**
Number shares on issue	**m**	**184.9**

Investment fundamentals

Year end 30 Sep		2016A	2017E	2018E	2019E
Revenue	m	3,289.0	3,585.8	3,973.5	4,183.8
EBIT	m	1,192.7	1,463.6	1,689.8	1,791.8
CFPS	US$	6.85	7.51	8.37	8.78
CFPS growth	%	9.2	9.6	11.4	4.9
PGCFPS	x	14.3	13.0	11.7	11.2
EPS adj	US$	5.56	6.26	7.13	7.55
EPS adj growth	%	5.5	12.5	13.9	6.0
PER adj	x	17.6	15.7	13.7	13.0
Total DPS	US$	1.04	1.04	1.04	1.04
Total div yield	%	1.1	1.1	1.1	1.1
EV/EBITDA	x	11.8	9.9	8.7	8.3

Source: FactSet, Macquarie Capital (USA), March 2017
(all figures in USD unless noted)

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30 March 2017
Macquarie Capital (USA) Inc.

Skyworks Solutions

Solid year ahead for RF

Initiating with Outperform rating

We are initiating coverage on SWKS with an Outperform rating and $110 PT. We expect the radio frequency (RFIC) segment to continue to outgrow the broader Semi industry for the next couple of years. In particular, SWKS should benefit from secular content expansion in mid-tier phones in China and at Samsung this year. We expect Apple revenue to rebound driven by a modest increase in content and potentially stronger iPhone 7S/X builds. Non-smartphone business should sustain double-digit growth driven by connected cars, drones, and home automation. Margin execution & cash flow metrics are solid, and the strong balance sheet gives the company optionality with accretive M&A and/or more aggressive buybacks. While lack of in-house BAW filter manufacturing is a risk, the recent wins at Huawei suggest that the company has options.

Mid-tier to drive solid content expansion this year

RF content expansion should continue this year and next, primarily driven by mid-tier phones in China and at Samsung, where Skyworks has a strong presence. Key drivers include carrier aggregation in China, SKU consolidation at Samsung, and rapid 4G adoption in India and Indonesia. The company’s progress at Huawei is already helping drive incremental growth. Skyworks appears well positioned to benefit from content expansion at fast growing Chinese customers such as Oppo and Vivo. Management’s recent commentary suggests that the company’s content will increase at Samsung across the board in GS8 as well as in mid-tier models.

iPhone X a key catalyst; MIMO to drive content growth

Sales to Apple declined more than 10% in CY16. While SWKS appeared to have gained a diversity receive module in the iPhone 7, the loss of low-band PAD and more allocation to Intel modem based SKUs (lower SWKS content) appeared to have more than offset. Looking ahead, we see enough drivers for a modest content increase in the upcoming iPhone 7S/X due to more complex carrier aggregation and WiFi (2x2 likely). We also see the possibility that Apple will implement 4x4 MIMO at least in some SKUs (larger size, glass casing more amenable to MIMO), which should open up additional diversity receive module opportunity. We are modeling Apple revenue to grow at a high-single digit rate this year but see room for upside.

Broad market growth and pricing discipline helps margins

Broad markets segment (25% sales) has grown at a 17% CAGR over the past 3 years and we expect the double digit pace to sustain for the next 2 -3 years. The broad based nature of these markets also means that the gross margins are above corporate average. We are modeling gross margins to increase 100 points over the next 4 quarters driven by higher utilization and efficiency gains. Margin execution has been solid and we are particularly encouraged by the company’s pricing discipline. While price competition could increase from Murata and Qualcomm/TDK, we are not overly concerned given SWKS’s strong integration expertise (modules now 90% of sales) and its focus on mid to high-end markets. At 15x PE (16x EV/FCF) on our CY17 estimates, we believe valuation is attractive given the above industry growth, margin expansion potential, and solid free cash flow metrics.

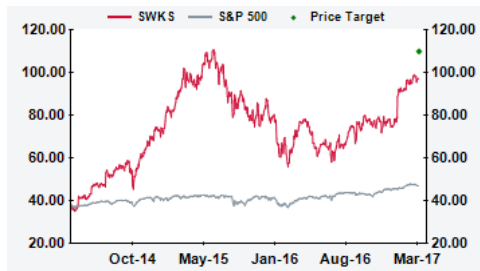
Inside

Skyworks

Company profile

- Skyworks Solutions, Inc. engages in the design, development, and manufacture of proprietary semiconductor products. Its product portfolio includes amplifiers, attenuators, circulators, demodulators, detectors, diodes, directional couplers, front-end modules, hybrids, isolators, lighting and display solutions, mixers, modulators, optocouplers, optoisolators, phase shifters, synthesizers, power dividers and combiners, power management devices, receivers, switches, and technical ceramics.
- The company was founded in 1962 and is headquartered in Woburn, MA.

Fig 1 SWKS US vs S&P 500, & rec history



Note: Recommendation timeline - if not a continuous line, then there was no Macquarie coverage at the time or there was an embargo period.

Source: FactSet, Macquarie Capital (USA), March 2017

(all figures in USD unless noted)

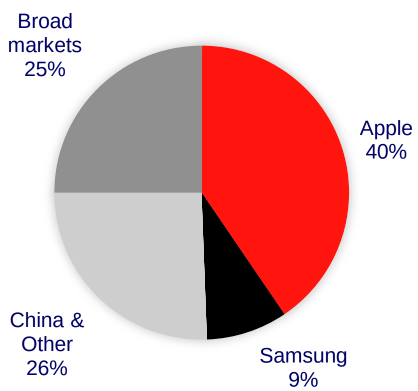
Solid year ahead for RF

Initiating coverage with Outperform and $110 PT

Skyworks grew at a 20% CAGR over the past 3 years driven by expanding RF content in smartphones

Skyworks is a leading supplier of radio frequency (RF) components to smartphone, IoT, consumer, and industrial markets. Skyworks grew at a 20% CAGR over the past 3 years driven by expanding RF content in smartphones. While the company's revenue declined in 2016, we expect Skyworks to outgrow the broader semiconductor industry for the next couple of years driven by the same tailwinds that have helped the RF industry such as global LTE adoption, SKU consolidation, and carrier aggregation (faster download speeds). At 15x CY17 Non-GAAP PE, valuation is at a premium to closest peer QRVO, but at a significant discount on an EV/FCF basis due to better balance sheet and much stronger free cash flow.

Fig 2 Sales by segment (Dec-16Q)



Source: Company data, Macquarie Capital (USA), March 2017

Fig 3 Estimates Summary

	CY16A	CY17E	CY18E
Revenue (US$m)	3277	3709	3998
YoY change (%)	-3.1%	13.2%	7.8%
Gross margin (%)	51%	51%	52%
Operating margin (%)	38%	39%	39%
Non-GAAP EPS (US$)	5.57	6.55	7.16
PE (X) @US$97.93	17.6	15.0	13.7
EV/FCF @US$97.93	15.7	15.9	14.3

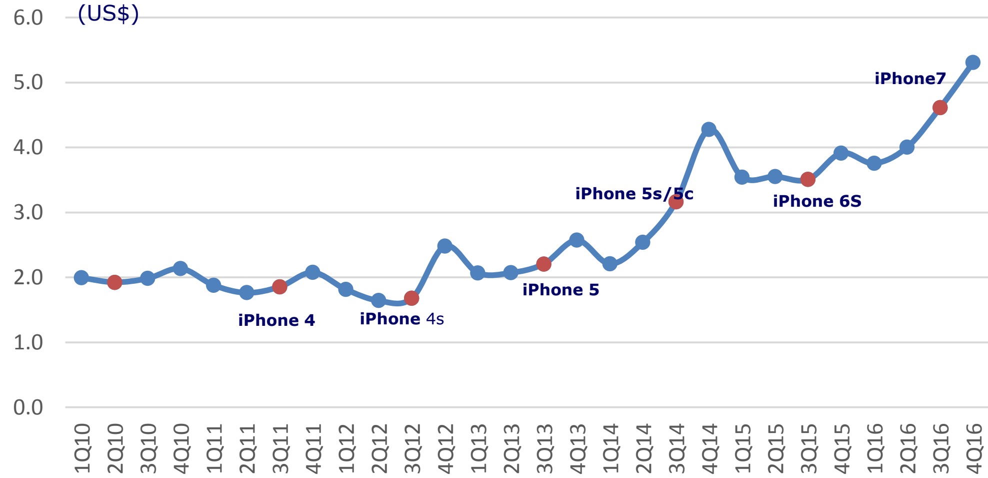
Source: Company data, Macquarie Capital (USA), March 2017

Content expansion to continue, despite slowing pace

RF content expansion is continuing as mid-tier phones adopt carrier aggregation

While RF content growth in high-end smartphones is moderating, mid-tier phones should see continued expansion this year. We believe SWKS is well positioned in the mid-tier segment in China and at Samsung. Chinese carriers and smartphone vendors are aggressively adopting carrier aggregation, which should remain a tailwind to RF content. Emerging markets such as India and Indonesia are rapidly transitioning to 4G smartphones, which typically have 2 – 5x the RF content of 3G phones. SKWS' progress at Huawei is already helping drive incremental growth. In particular, we believe the company is supplying high-band PADs to Huawei, which should allay long term concerns related to lack of in-house BAW filters. Skyworks appears well positioned to benefit from content expansion at fast growing Chinese customers such as Oppo and Vivo. Samsung appears to be consolidating its mid-end SKUs and we expect Skyworks to be a key beneficiary. Management's recent commentary suggests that the company's content will increase at Samsung across the board in GS8 as well as in mid-tier models.

Fig 4 Overall RF content per phone trend



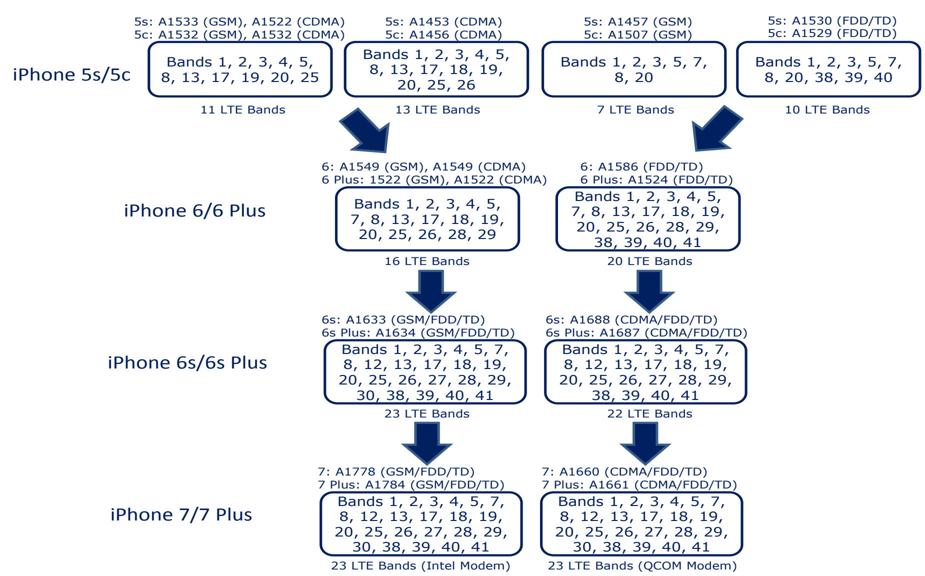
Source: Company data, Macquarie Capital (USA), March 2017

iPhone X a key catalyst

4x4 MIMO feature will need 2 additional diversity receive modules

We estimate that Apple related revenue declined more than 10% in CY16. While Skyworks gained an additional diversity receive module in the iPhone 7, the loss of low-band PAD, and more allocation to Intel modem based SKUs (lower SWKS content) appeared to have more than offset. Higher component shipments in Dec-15Q and the subsequent inventory correction in 1H16 also appears to have contributed to the decline. Looking ahead, it's early to say how the market shares will shift around in the iPhone 7S/X cycle, we see enough drivers for a moderate increase including additional content in diversity receive modules (more complex carrier aggregation and/or 4x4 MIMO) and WiFi (2x2 likely). iPhone 7, which uses a 2x2 MIMO for LTE, relies on 2 diversity receive modules from Skyworks. A 4X4 implementation, which could double the download speeds, will need 2 additional diversity receive modules. We won't be surprised to see Skyworks supply these modules given its strong technical expertise in this area. We are modeling Apple revenue to grow about 8% this fiscal year driven by a combination of moderate dollar content expansion and strong iPhone x build cycle but see room for upside.

Fig 5 iPhone LTE band growth and SKU consolidation trend



Source: Company data, Macquarie Capital (USA), March 2017

Adjacent markets offer solid prospects at higher margins

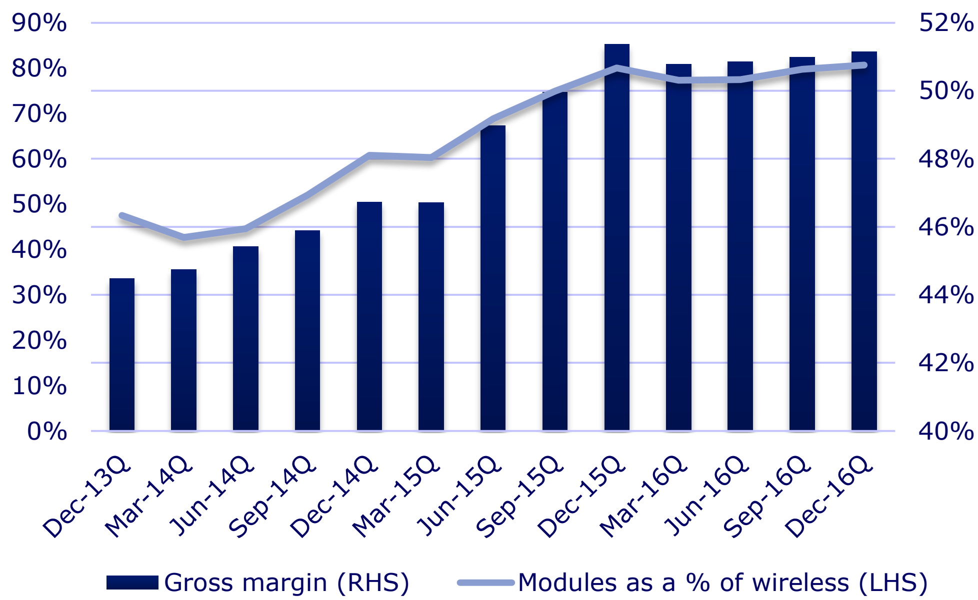
Broad markets segment grew at a 17% CAGR over the past 3 years, and we expect the double-digit pace to sustain for the next 2 -3 years. Growth of IoT, connected cars, and drones as well as growing need for higher data speeds in traditional WiFi markets should keep the strong momentum. The company has a strong presence in discrete WiFi markets where the dollar content is significantly higher than in smartphones. The broad based nature of these markets also means that the gross margins are above corporate average. As such, growth in this segment should remain a tailwind to gross margins in the next 2 – 3 years.

Margin execution solid, competitive risk moderate

We expect FCF to remain around 30%, which is among the best in the industry

We are modeling gross margins to increase about 100bps over the next 4 quarters driven by higher utilization in the TC-SAW factory and efficiency gains. Margin execution has been solid and we are particularly encouraged the company's pricing discipline. While price competition could increase from Murata and Qualcomm/TDK in the coming quarters, we are not overly concerned given SWKS's strong integration expertise (integrated modules now 90% of sales), which limits competitive pressures from discrete components. Management's target of 40% non-GAAP appears achievable by end of FY18, and we expect FCF to remain around 30% of sales. The company has $1.5b net cash, which gives the management optionality for accretive M&A and/or more aggressive buybacks.

Fig 6 Integrated Modules v/s gross margins

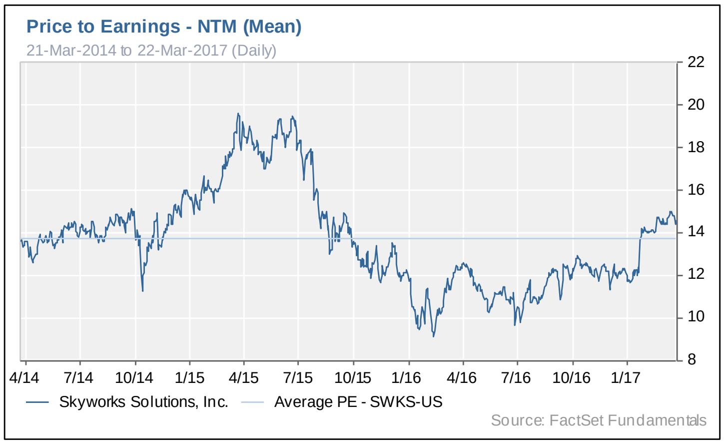


Source: Company data, Macquarie Capital (USA), March 2017

Valuation, recommendation, risks

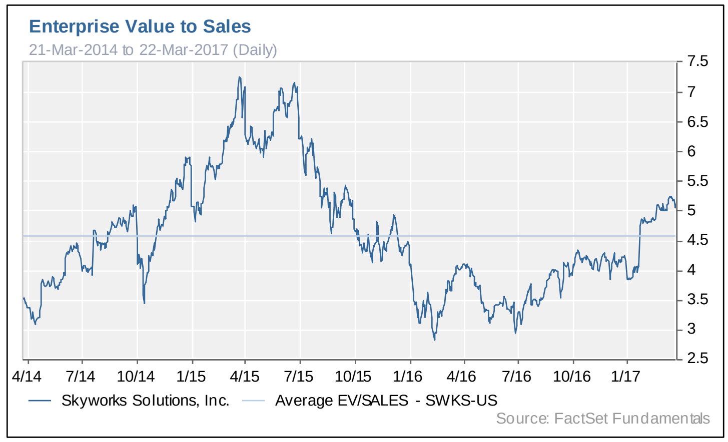
We are initiating coverage with Outperform rating and a $110 price target. On a Non-GAAP basis, the stock is at 15x PE on our CY17 estimates, broadly in line with the historical PE average for the stock. However, it is at a 20% discount to large cap Semis. Our $110 PT assumes that the stock maintains its current forward PE multiple over the next 12-months. Key risks are 1) customer concentration, 2) price competition in China, 3) lack of in-house BAW filters, which could limit SWKS's long term opportunity

Fig 7 SWKS Historical PE



Source: Factset, Macquarie Capital (USA), March 2017

Fig 8 SWKS EV/Sales



Source: Factset, Macquarie Capital (USA), March 2017

Macquarie vs consensus

Fig 9 We are broadly in line with near term consensus

SWKS	17E	18E	19E
MQ/Consensus (Rev %)	0.3	0.7	-2.3
MQ/Consensus (EPS %)	0.0	0.0	0.0

Source: FactSet, Macquarie Capital (USA), March 2017

Skyworks Solutions
Income Statement

($million/%)	F2Q16	F3Q16	FQ416	F1Q17	F2Q17	F3Q17					
FYE Sep	Mar-16Q	Jun-16Q	Sep-16Q	Dec-16Q	Mar-17QE	Jun-17QE	FY15	FY16	FY17E	FY18E	FY19E
Net revenue	775.1	751.7	835.4	914.3	839.9	861.1	3,258.4	3,289.0	3,585.8	3,973.5	4,183.8
Cost of goods sold	381.5	369.4	409.5	446.6	414.5	419.4	1,689.2	1,611.1	1,748.2	1,912.3	2,010.7
Gross profit	393.6	382.3	425.9	467.7	425.5	441.7	1,569.2	1,677.9	1,837.5	2,061.1	2,173.1
Total operating expenses	108.6	107.6	107.5	113.4	115.3	116.9	397.7	433.2	464.2	493.4	513.4
Research and development	73.1	70.2	64.9	73.7	74.8	74.8	257.7	280.1	298.1	309.8	322.4
Selling, general and administrativ	35.5	37.4	42.6	39.7	40.5	42.1	140.0	153.1	166.1	183.6	191.1
Operating income	285.0	274.7	318.4	354.3	310.2	324.8	1,171.5	1,244.7	1,373.3	1,567.7	1,659.7
Other expense, net	(2.2)	(2.1)	(0.7)	(0.8)	(0.5)	(0.8)	1.8	(5.5)	(2.9)	(7.5)	(6.5)
Income before income taxes	282.8	272.6	317.7	353.5	309.7	324.0	1,173.3	1,239.2	1,370.4	1,560.2	1,653.2
Provision for income taxes	40.5	34.5	40.1	51.9	46.5	48.6	145.3	170.0	204.4	234.0	248.0
Net income	242.3	238.1	277.6	301.6	263.2	275.4	1,028.0	1,069.2	1,166.0	1,326.2	1,405.2
EPS (Diluted)	$1.25	$1.24	$1.47	$1.61	$1.42	$1.48	$5.27	$5.57	$6.26	$7.13	$7.55
Stock comp	17.1	17.9	19.7	21.6	21.6	21.6	99.9	78.0	86.4	86.4	24.8
EPS (Diluted) stock comp adj	$1.19	$1.17	$1.39	$1.52	$1.33	$1.39	$4.89	$5.26	$5.91	$6.78	$7.45
FCF/shr	$0.61	$0.44	$2.33	$2.32	$1.86	$1.20	$2.89	$4.72	$6.59	$6.15	$6.60
Diluted shares outstanding	193.3	191.7	188.8	187.3	186.0	186.0	194.9	192.1	186.3	186.0	186.0
% Sales											
Gross profit	50.8%	50.9%	51.0%	51.2%	50.7%	51.3%	48.2%	51.0%	51.2%	51.9%	51.9%
Operating expenses	14.0%	14.3%	12.9%	12.4%	13.7%	13.6%	12.2%	13.2%	12.9%	12.4%	12.3%
Research and development	9.4%	9.3%	7.8%	8.1%	8.9%	8.7%	7.9%	8.5%	8.3%	7.8%	7.7%
Selling, general and administrativ	4.6%	5.0%	5.1%	4.3%	4.8%	4.9%	4.3%	4.7%	4.6%	4.6%	4.6%
Operating income	36.8%	36.5%	38.1%	38.8%	36.9%	37.7%	36.0%	37.8%	38.3%	39.5%	39.7%
Net income	31.3%	31.7%	33.2%	33.0%	31.3%	32.0%	31.5%	32.5%	32.5%	33.4%	33.6%
% YoY											
Revenue	2%	(7%)	(5%)	(1%)	8%	15%	42%	1%	9%	11%	5%
Gross profit	11%	(4%)	(3%)	(2%)	8%	16%	51%	7%	10%	12%	5%
Operating expenses	12%	6%	2%	4%	6%	9%	14%	9%	7%	6%	4%
Operating income	10%	(7%)	(5%)	(3%)	9%	18%	71%	6%	10%	14%	6%
Net income	8%	(9%)	(6%)	(3%)	9%	16%	65%	4%	9%	14%	6%
% QoQ											
Revenue	(16%)	(3%)	11%	9%	(8%)	3%					
Gross profit	(17%)	(3%)	11%	10%	(9%)	4%					
Operating expenses	(1%)	(1%)	(0%)	5%	2%	1%					
Operating income	(22%)	(4%)	16%	11%	(12%)	5%					
Net income	(22%)	(2%)	17%	9%	(13%)	5%					

Source: Company data, FactSet, Macquarie Capital (USA), March 2017

Skyworks Solutions
Balance Sheet

($million/%)	F1Q16	F2Q16	F3Q16	F4Q16	F1Q17		
FYE Sep	**Dec-15Q**	**Mar-16Q**	**Jun-16Q**	**Sep-16Q**	**Dec-16Q**	**FY14**	**FY15**
ASSETS							
Current Assets							
Cash and cash equivalents	1,233.2	1,177.5	973.7	1,083.8	1,469.1	**805.8**	**1,043.6**
Short-term investments	0.0	0.0	0.0	0.0	0.0	**0.0**	**0.0**
Restricted cash	0.0	0.0	0.0	0.0	0.0	**0.0**	**0.0**
Receivables	527.6	538.5	570.0	416.6	495.4	**317.6**	**538.0**
Inventory	276.4	333.7	437.6	424.0	279.9	**270.8**	**267.9**
Other current assets	77.5	77.3	96.8	77.7	77.7	**35.0**	**65.2**
Property, plant and equipment	847.9	837.7	844.5	806.3	766.7	**555.9**	**826.4**
Goodwill	856.7	856.7	865.8	873.3	873.3	**851.0**	**856.7**
Intangible assets	36.6	37.0	68.2	67.0	63.0	**75.0**	**45.0**
Deferred tax assets	56.3	56.6	54.7	54.1	54.1	**50.8**	**56.3**
Other assets	18.3	43.2	44.4	52.6	52.6	**11.9**	**20.3**
Total assets	**3,930.5**	**3,958.2**	**3,955.7**	**3,855.4**	**4,131.8**	**2,973.8**	**3,719.4**
LIABILITIES AND STOCKHOLDERS' EQUITY							
Current Liabilities	367.9	324.7	347.0	210.2	255.9	**297.6**	**463.9**
Short-term debt	0.0	0.0	0.0	0.0	0.0	**0.0**	**0.0**
Accounts payable	191.8	180.7	181.7	110.4	156.1	**200.6**	**291.1**
Accrued compensation and benefits	81.5	54.6	59.6	42.3	42.3	**70.7**	**81.5**
Other current liabilities	94.6	89.4	105.7	57.5	57.5	**26.3**	**91.3**
Long-term debt	0.0	0.0	0.0	0.0	0.0	**0.0**	**0.0**
Long-term tax liabilities	71.0	59.8	64.4	71.8	71.8	**41.6**	**71.0**
Other long-term liabilities	9.0	30.4	30.0	32.0	32.0	**102.2**	**25.3**
Total liabilities	447.9	414.9	441.4	314.0	359.7	**441.4**	**560.2**
Retained earnings	1,797.6	1,933.5	2,068.9	2,263.6	2,494.3	**794.9**	**1,469.2**
Other	1,685.0	1,609.8	1,445.4	1,277.8	1,277.8	**1,737.5**	**1,690.0**
Stockholders' equity	3,482.6	3,543.3	3,514.3	3,541.4	3,772.1	**2,532.4**	**3,159.2**
Total liabilities and stockholders' equity	**3,930.5**	**3,958.2**	**3,955.7**	**3,855.4**	**4,131.8**	**2,973.8**	**3,719.4**

Source: Company data, FactSet, Macquarie Capital (USA), March 2017

Skyworks Solutions
Ratio analysis

FYE Sep	F3Q16 Jun-16Q	F4Q16 Sep-16Q	F1Q17 Dec-16Q	F2Q17 Mar-17QE	F3Q17 Jun-17QE	F4Q17 Sep-17QE	FY15	FY16
Profitability Analysis								
Return on Assets (Pretax)*	24.4%	29.2%	30.3%	25.0%	24.9%	28.3%	**27.0%**	**25.7%**
Return on Equity (Aftertax)*	21.0%	27.0%	26.7%	20.6%	20.6%	23.4%	**23.8%**	**25.2%**
ROIC (Pretax)*	36.2%	45.6%	53.5%	48.8%	50.9%	59.6%	**46.3%**	**43.7%**
Cash Conversion Cycle (Days)								
DSOs	48	50	49	48	49	49	**59**	**46**
Days of Inventory	57	56	56	57	56	56	**57**	**95**
Days Payables Outstanding	49	49	46	49	48	48	**62**	**22**
Liquidity Analysis								
Current Ratio	6.0x	9.5x	9.1x	8.1x	8.4x	8.2x	**4.1x**	**9.5x**
Quick Ratio	4.4x	7.1x	7.7x	7.1x	7.4x	7.2x	**3.4x**	**7.1x**
Debt/Solvency Analysis								
Debt/Total Capital	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**0.0%**
Debt/Equity	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**0.0%**
Asset Values								
Book Value/Share	$18.33	$18.76	$20.14	$21.26	$22.30	$23.58	**$16.21**	**$18.43**
Tangible Book Value/Share	$13.46	$13.78	$15.14	$16.25	$17.30	$18.60	**$11.58**	**$13.54**
Total Cash & Equiv/Share	$5.08	$5.74	$7.84	$9.50	$10.44	$11.38	**$5.35**	**$5.64**
Net Cash/Share	$5.08	$5.74	$7.84	$9.50	$10.44	$11.38	**$5.35**	**$5.64**

*GAAP
Source: Company data, FactSet, Macquarie Capital (USA), March 2017

Companies mentioned:

Qorvo (QRVO US, US$68.25, Neutral, TP: US$70.00)

Apple (AAPL US, US$140.88, Outperform, TP: US$156.00, Ben Schachter)

QUALCOMM (QCOM US, US$57.81, Neutral, TP: US$60.00)

Macquarie Quant View

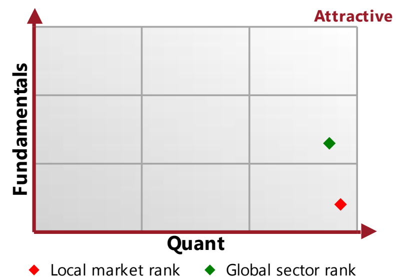
The quant model currently holds a strong positive view on Skyworks Solutions. The strongest style exposure is Growth, indicating this stock has good historic and/or forecast growth. Growth metrics focus on both top and bottom line items. The weakest style exposure is Price Momentum, indicating this stock has had weak medium to long term returns which often persist into the future.

31/358

Global rank in

Semiconductors & Semiconductor Equip.

% of BUY recommendations	62% (15/24)
Number of Price Target downgrades	0
Number of Price Target upgrades	4

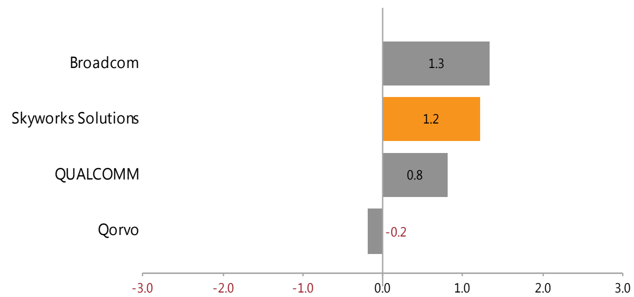


Displays where the company's ranked based on the fundamental consensus Price Target and Macquarie's Quantitative Alpha model.

Two rankings: Local market (United States) and Global sector (Semiconductors & Semiconductor Equip.)

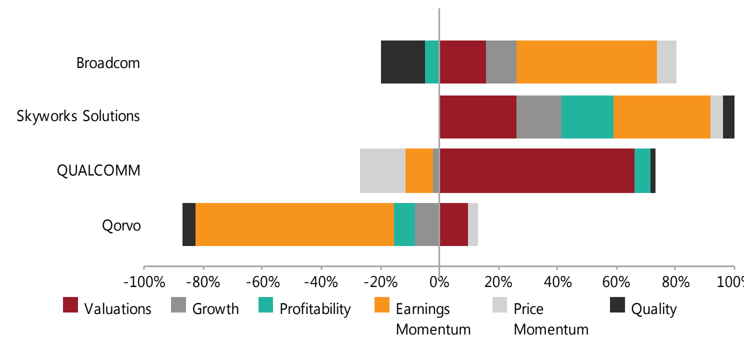
Macquarie Alpha Model ranking

A list of comparable companies and their Macquarie Alpha model score (higher is better).



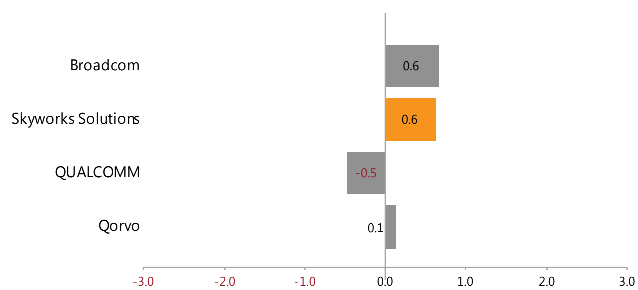
Factors driving the Alpha Model

For the comparable firms this chart shows the key underlying styles and their contribution to the current overall Alpha score.



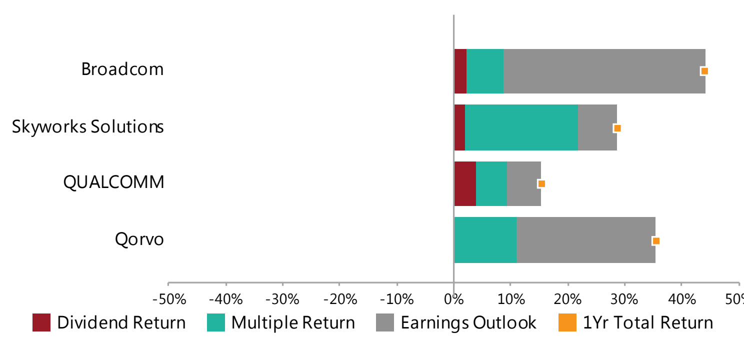
Macquarie Earnings Sentiment Indicator

The Macquarie Sentiment Indicator is an enhanced earnings revisions signal that favours analysts who have more timely and higher conviction revisions. Current score shown below.



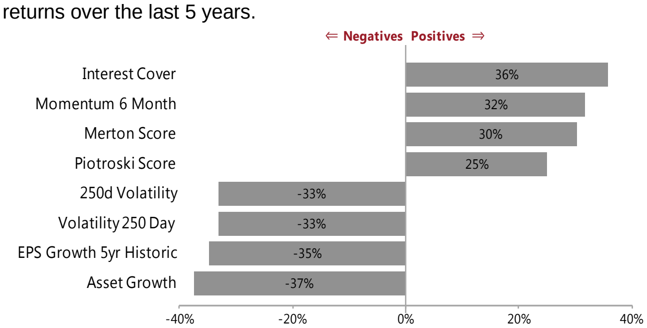
Drivers of Stock Return

Breakdown of 1 year total return (local currency) into returns from dividends, changes in forward earnings estimates and the resulting change in earnings multiple.



What drove this Company in the last 5 years

Which factor score has had the greatest correlation with the company's returns over the last 5 years.



How it looks on the Alpha model

A more granular view of the underlying style scores that drive the alpha (higher is better) and the percentile rank relative to the sector and market.

Source (all charts): FactSet, Thomson Reuters, and Macquarie Research. For more details on the Macquarie Alpha model or for more customised analysis and screens, please contact the Macquarie Global Quantitative/Custom Products Group (cpg@macquarie.com)

UNITED STATES

MXIM US	Outperform
Price (at CLOSE#, 28 Mar 2017)	US$44.92

Valuation - PER	**US$**	**40.00**
12-month target	**US$**	**52.00**
12-month TSR	**%**	**+18.9**
GICS sector Semiconductors & Semiconductor Equipment		
Market cap	**US$m**	**13,004**
30-day avg turnover	**US$m**	**78.8**
Number shares on issue	**m**	**289.5**

Investment fundamentals

Year end 30 Jun		2016A	2017E	2018E	2019E
Revenue	m	2,194.7	2,285.1	2,410.1	2,508.6
EBIT	m	313.8	704.5	822.0	885.4
Adjusted profit	m	227.5	588.5	688.3	743.8
CFPS	US$	1.64	2.63	2.93	3.06
CFPS growth	%	-6.9	60.5	11.3	4.7
PGCFPS	x	27.4	17.1	15.4	14.7
EPS adj	US$	0.78	2.04	2.39	2.58
EPS adj growth	%	10.2	161.4	17.0	8.1
PER adj	x	57.5	22.0	18.8	17.4
Total DPS	US$	1.20	1.32	1.44	1.56
Total div yield	%	2.7	2.9	3.2	3.5
ROA	%	6.7	16.5	19.1	19.5
ROE	%	10.3	27.0	29.1	28.5
EV/EBITDA	x	22.0	14.0	12.5	12.0

Source: FactSet, Macquarie Capital (USA), March 2017
(all figures in USD unless noted)

Analyst(s)
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30 March 2017
Macquarie Capital (USA) Inc.

Maxim Integrated Products

Little bit of everything

Growth, Leverage, and Cash Returns

We are initiating coverage on MXIM with an Outperform rating and a $52 PT. Our estimates are slightly above consensus. We believe risk/reward is attractive given the prospect of above-industry growth, margin leverage, and solid cash returns. The company is repositioning itself away from the volatile smartphone market and stands to benefit from strong growth in the automotive and industrial markets. In particular, we expect sustained double-digit growth in Auto for the next several years driven by secular content expansion. Improving product mix and declining depreciation should drive 200–300bps of gross margin expansion. At 16x CY17E EV/FCF, valuation is at a discount to peers and we believe is attractive given the strong free cash flow and dividend.

Auto strength sustainable; Consumer no longer a drag

Automotive segment accounts for roughly 20% of sales and is growing at a 15-20% rate. MXIM supplies power management and interface chips, which are benefiting from a growing need for faster processing and data transfer speeds inside autos. We are comfortable with 15-20% growth for the next 2-3 years as MXIM is primarily benefiting from content expansion and not as dependent on unit growth. Industrial segment (25%) should grow a mid-single digit rate driven by factory automation. Consumer exposure is likely to drop to mid 20% in 2017 (from~35% in 2014), as we expect Samsung to fall below 10% of sales. We do not expect Consumer to be a drag going forward as the company now has a much more diversified customer base. Overall, we believe MXIM’s topline can slightly outgrow the broader Analog IC market in the next few years.

Margin expansion has further room

Gross / Operating margins have improved more than 600bps/1000bps in the last 2 years driven by improving mix, exit from the lower margin business, and the move to an asset-light manufacturing model. We see additional tailwinds in the coming years as depreciation (5% of sales) should continue to decline to current capex levels (2% of sales). Margins should also benefit from mix shift away from Consumer. Overall, we are modelling 200bps of gross margin improvement in the next four quarters, but believe that there is upside potential.

Solid cash returns to continue

Maxim’s free cash flow margin of >30% is among the best in the industry. The company has returned 80% of its free cash flow through buybacks and dividends (currently yielding 2.9% on 2017E). We expect dividend growth to continue at an 8–10% rate given the strong cash flow generation. At 20x PE and 16x EV/FCF on our CY17 estimates, the stock is trading at a slight discount to TXN and ADI. Given the improving gross margins, declining revenue volatility, and smaller market cap, we would argue that MXIM deserves to trade at a slight premium to its larger peers. Our PT assumes that the stock maintains its forward EV/FCF multiple over the next 12 months. Key risks to our rating are: 1) cyclical correction in Industrial; 2) slower ramps of new automotive wins; 3) further share loss at Samsung.

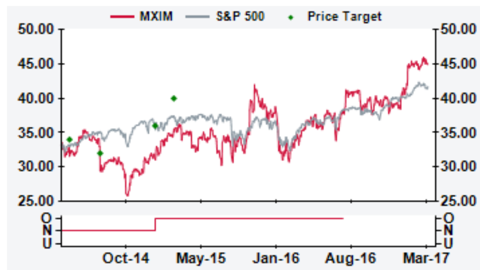
Inside

Maxim Integrated Products

Company Description

- Maxim Integrated Products, Inc. designs, develops, manufactures and markets a broad range of linear and mixed-signal integrated circuits. Its products include integrated power circuits, amplifiers, data converters, analog filters, transceivers, expanders, level translators, broadband switches, powerline communications, microcontrollers, data loggers, ibutton, solar energy, and automotive.
- The company was founded by Jack F. Gifford in 1983 and is headquartered in San Jose, CA. Tunç Doluca is President and CEO. Maxim employs c7,100 people.

Fig 1 MXIM US vs S&P 500, & rec history



Note: Recommendation timeline - if not a continuous line, then there was no Macquarie coverage at the time or there was an embargo period.

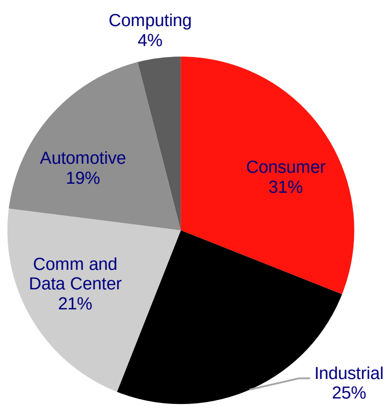
Source: FactSet, Macquarie Capital (USA), March 2017

Little bit of everything

MXIM is repositioning itself away from the volatile smartphone market and into higher margin industrial and auto markets

We are initiating coverage on MXIM with an Outperform rating and $52 PT. We believe risk/reward is attractive given the combination of reasonable growth, margin leverage, and solid cash returns. The company has been going through a transformation, and is repositioning itself away from the volatile smartphone market and into higher margin industrial and auto markets. In particular, Maxim stands to benefit from strong secular growth in Automotive in the next 2-3 years. Improving mix and declining depreciation should drive 200–300 bps of margin expansion in the next 12-18 months. Balance sheet and free cash flow metrics are solid, and we expect 8-10% dividend growth to continue. While there has been some M&A speculation over the past few quarters, we do not believe valuation is reflecting much M&A premium, if any. That said, we won't completely rule out M&A given the company's attractive product portfolio and solid gross margins.

Fig 2 Sales by segment (Dec-16Q)



Source: Company data, Macquarie Capital (USA), March 2017

Fig 3 Estimates Summary

	CY16	CY17E	CY18E
Revenue (US$m)	2,234	2,351	2,461
YoY change (%)	0%	5.2%	4.7%
Gross margin (%)	61.7%	65.2%	65.9%
Operating margin (%)	28.8%	31.4%	33.3%
Non-GAAP EPS (US$)	1.74	2.24	2.49
PE (X) @US$44.92	25.8	20.1	18.0
FCF	668	734	827
EV/FCF @US$44.92	17.2	15.6	14.0

Source: Company data, Macquarie Capital (USA), March 2017

Automotive strength sustainable; Consumer no longer a drag

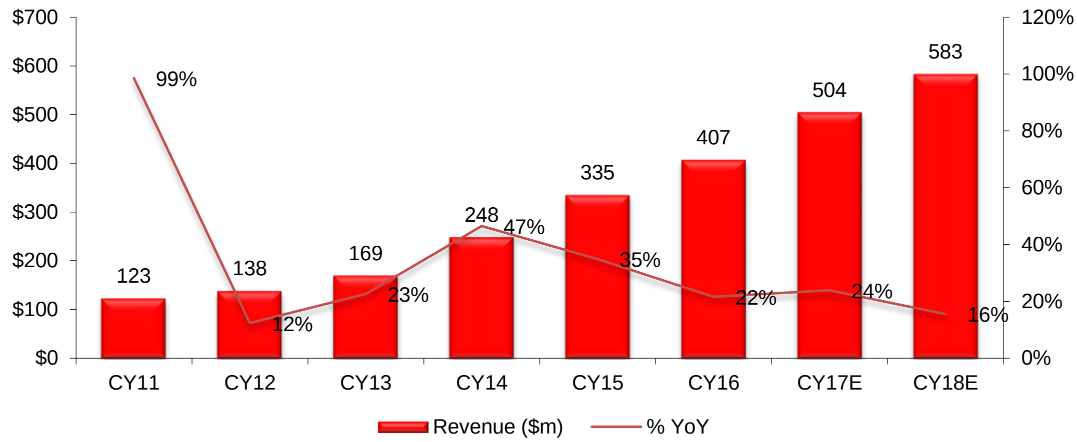
Automotive accounts for roughly 20% of sales and is growing at more than a 20% rate

Automotive accounts for roughly 20% of sales and is growing at more than a 20% rate. The company primarily supplies into infotainment, LED lighting, and battery management for electric cars. Maxim's power management and interface chips (serial link, USB) are benefiting from a growing need for faster processing and data transfer speeds inside cars. We see opportunities in ADAS and autonomous cars, as these features will need faster data speeds and much more processing power. We are comfortable with double-digit growth for the next 2-3 years as MXIM is primarily benefiting from content expansion and not as dependent on unit growth.

The company now has a much more diversified customer base in Consumer

Industrial segment should grow at a mid-single digit rate driven by factory automation. Maxim's interface (IO-Link) and signal chain products enable direct network access to sensors and control systems, which are increasingly distributed on the factory floors. In Consumer, we expect Samsung to fall below 10% of sales in 2017 due to second sourcing of power management IC in the upcoming GS8. As a result, we expect Consumer exposure to drop to mid 20% in 2017 (from ~35% in 2014). The company now has a much more diversified customer base in Consumer and we expect this segment to be relatively stable after 1H17. Data Center power management is another area where we see incremental growth opportunities as we believe the company has secured multiple design wins with cloud service providers. Overall, we believe MXIM's topline can slightly outgrow the broader Analog IC market in the next few years.

Fig 4 MXIM Automotive segment growth



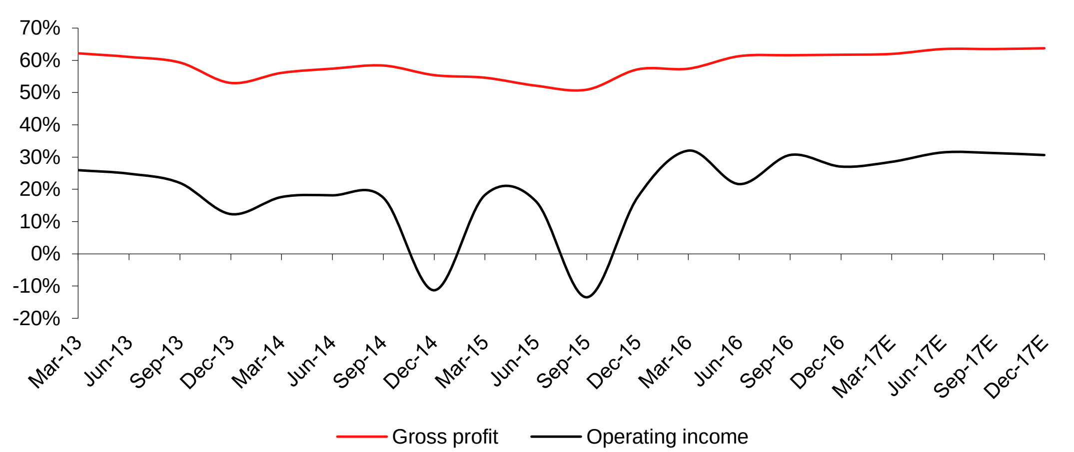
Source: Company data, Macquarie Capital (USA), March 2017

Margin expansion has further room

We see additional margin tailwinds as depreciation (5% of sales) should continue to decline to current capex levels (2% of sales).

Gross margins have improved more than 600bps and OP margins by more than 1000bps in the last 2 years driven by improving mix, exit from the lower margin businesses, and the move to an asset-light manufacturing model. We see additional tailwinds in the coming years as depreciation (5% of sales) should continue to decline to current capex levels (2% of sales). Margins should also benefit from mix shift away from Consumer. Overall, we are modeling 200bps of gross margin improvement in the next 4 quarters, but believe that there is upside potential. Maxim's free cash flow margin of >30% is among the best in the industry. The company has returned 80% of its free cash flow through buybacks and dividends (2.9% yield on 2017E). We expect dividend growth to continue at an 8–10% rate given the strong cash flow generation.

Fig 5 MXIM Margins (Non-GAAP)



Source: Company data, Macquarie Capital (USA), March 2017

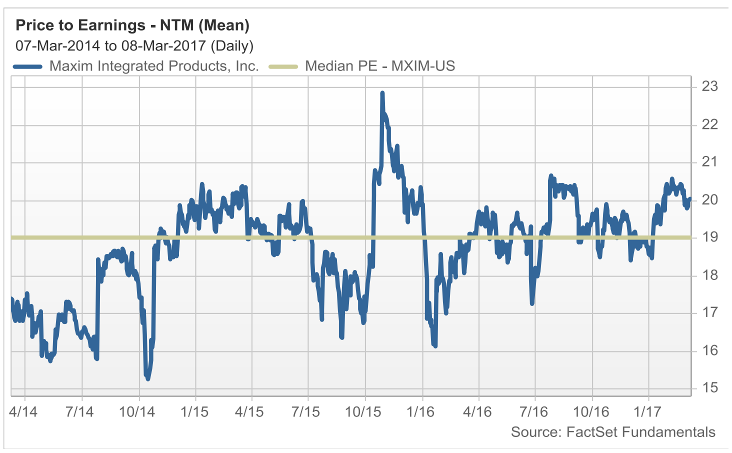
Valuation, recommendation, risks

Outperform and $52 price target

We are initiating coverage with an Outperform rating and a $52 price target. At 20x PE and 16x EV/FCF on our CY17 estimates, the stock is trading at a slight discount to peers TXN and ADI. Given the improving gross margins, declining revenue volatility, and smaller market cap, we would argue that MXIM deservers to trade at a slight premium to its larger peers. Our PT assumes that the stock maintains its forward EV/FCF multiple over the next 12 months. The key risks are 1) cyclical correction in Industrial 2) slower automotive growth 3) Further share losses at Samsung.

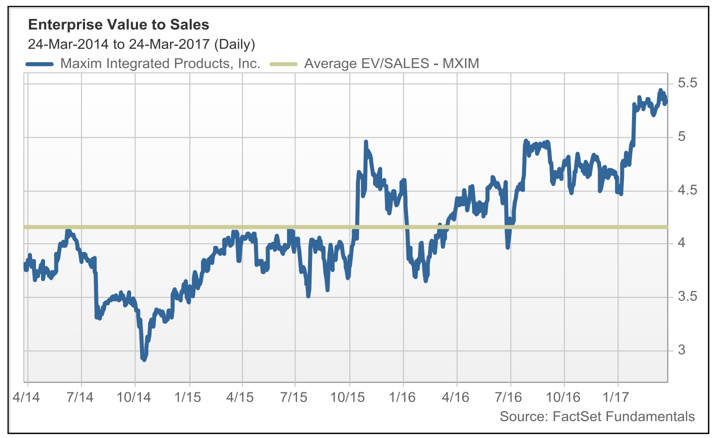
Our PT assumes that the stock maintains its forward EV/FCF multiple over the next 12 months

Fig 6 MXIM Historic PE multiple



Source: FactSet, Macquarie Capital (USA), March 2017

Fig 7 MXIM Historic EV/S multiple



Source: FactSet, Macquarie Capital (USA), March 2017

Macquarie vs consensus EPS

Fig 8 We are 2.7% higher than consensus in 2018E

	17E	18E	19E
MQ/Consensus (EPS %)	0.2	2.7	3.6

Source: FactSet, Macquarie Capital (USA), March 2017

MXIM
Income Statement

(FYE Jun/$mil/%)	Mar-16 3Q16	Jun-16 4Q16	Sep-16 1Q17	Dec-16 2Q17	Mar-17E 3Q17E	Jun-17E 4Q17E	FY15	FY16	FY17E	FY18E	FY19E
Revenues	555.3	566.1	561.4	551.0	575.2	597.5	**2,306.9**	**2,194.7**	**2,285.1**	**2,410.1**	**2,508.6**
Cost of Sales	236.4	219.1	215.7	210.8	218.6	218.1	**1,035.0**	**950.3**	**863.2**	**873.3**	**898.0**
Gross Profit	318.8	347.0	345.7	340.2	356.6	379.4	**1,271.9**	**1,244.4**	**1,422.0**	**1,536.8**	**1,610.6**
Operating Expenses	141.1	224.7	173.7	191.1	192.5	191.5	**1,034.6**	**930.5**	**748.8**	**769.8**	**780.2**
R&D	119.2	113.5	112.7	114.1	114.6	114.6	**521.8**	**467.2**	**456.1**	**460.8**	**467.2**
SG&A	71.8	71.5	70.9	71.5	71.9	71.9	**308.1**	**288.9**	**286.2**	**289.0**	**293.0**
One time charges	(49.8)	39.7	(9.9)	5.5	6.0	5.0	**204.8**	**174.5**	**6.6**	**20.0**	**20.0**
Operating Income	177.7	122.4	172.1	149.1	164.1	187.9	**237.3**	**313.8**	**673.1**	**767.0**	**830.4**
Non Op. Income	(6.4)	(6.4)	(6.9)	(0.6)	(6.0)	(6.0)	**8.9**	**(28.8)**	**(19.4)**	**(22.0)**	**(20.0)**
Pretax Income	171.3	115.9	165.2	148.4	158.2	181.9	**246.2**	**285.1**	**653.7**	**745.0**	**810.4**
Provision for taxes	31.5	23.6	27.6	18.0	23.7	27.3	**40.1**	**57.6**	**96.6**	**111.8**	**121.6**
Effective tax rate	18%	20%	17%	12%	15%	15%	**16%**	**20%**	**15%**	**15%**	**15%**
Net income (GAAP)	139.8	92.3	137.6	130.5	134.4	154.6	**206.0**	**227.5**	**557.2**	**633.3**	**688.8**
One time charges	17.9	16.4	17.1	18.1	18.1	18.1	**81.1**	**69.7**	**71.3**	**72.3**	**18.1**
Net income (pro-forma)	157.7	108.8	154.7	148.6	152.5	172.7	**287.2**	**297.2**	**628.5**	**705.6**	**706.9**
GAAP EPS	$ 0.48	$ 0.32	$ 0.48	$ 0.45	$ 0.47	$ 0.54	$ 0.72	$ 0.79	$ 1.93	$ 2.20	$ 2.39
Non-GAAP EPS	**$ 0.54**	**$ 0.38**	**$ 0.48**	**$ 0.46**	**$ 0.52**	**$ 0.58**	**$ 1.00**	**$ 1.03**	**$ 2.04**	**$ 2.39**	**$ 2.58**
FCF per share	$ 0.52	$ 0.80	$ 0.38	$ 0.61	$ 0.45	$ 0.75	**$ 2.15**	**$ 2.26**	**$ 2.19**	**$ 2.75**	**$ 2.89**
Diluted Shares	290	289	289	288	288	288	**287**	**288**	**288**	**288**	**288**
% Sales											
Gross Profit	57.4%	61.3%	61.6%	61.7%	62.0%	63.5%	**55.1%**	**56.7%**	**62.2%**	**63.8%**	**64.2%**
Operating Expenses	25.4%	39.7%	30.9%	34.7%	33.5%	32.1%	**44.8%**	**42.4%**	**32.8%**	**31.9%**	**31.1%**
R&D	21.5%	20.0%	20.1%	20.7%	19.9%	19.2%	**22.6%**	**21.3%**	**20.0%**	**19.1%**	**18.6%**
SG&A	12.9%	12.6%	12.6%	13.0%	12.5%	12.0%	**13.4%**	**13.2%**	**12.5%**	**12.0%**	**11.7%**
Operating Income	32.0%	21.6%	30.7%	27.1%	28.5%	31.4%	**10.3%**	**14.3%**	**29.5%**	**31.8%**	**33.1%**
Net Income (GAAP)	25.2%	16.3%	24.5%	23.7%	23.4%	25.9%	**8.9%**	**10.4%**	**24.4%**	**26.3%**	**27.5%**
% YoY											
Revenues	-4%	-3%	0%	8%	4%	6%	**-6%**	**-5%**	**4%**	**5%**	**4%**
Gross Profit	1%	14%	21%	16%	12%	9%	**-8%**	**-2%**	**14%**	**8%**	**5%**
Operating Expenses	-33%	8%	-52%	-6%	36%	-15%	**8%**	**-10%**	**-20%**	**3%**	**1%**
Operating Income	69%	29%	-327%	67%	-8%	54%	**-45%**	**32%**	**114%**	**14%**	**8%**
Net Income (GAAP)	76%	-6%	-291%	93%	-4%	67%	**-43%**	**10%**	**145%**	**14%**	**9%**
% QoQ											
Revenues	9%	2%	-1%	-2%	4%	4%					
Gross Profit	9%	9%	0%	-2%	5%	6%					
Operating Expenses	-30%	59%	-23%	10%	1%	-1%					
Operating Income	98%	-31%	41%	-13%	10%	14%					
Net Income (GAAP)	107%	-34%	49%	-5%	3%	15%					

Source: Company data, Macquarie Capital (USA), March 2017

MXIM
Balance Sheet

(FY Jun/$mil)	Jun-15 4Q15	Sep-15 1Q16	Dec-15 2Q16	Mar-16 3Q16	Jun-16 4Q16	Sep-16 1Q17	Dec-16 2Q17	2015A	2016A
Assets									
Current Assets	2,319.4	2,279.0	2,326.6	2,461.9	2,807.0	2,833.9	2,622.6	**2,319.4**	**2,807.0**
Cash	1,551.0	1,508.3	1,648.5	1,710.3	2,105.2	2,092.1	1,687.4	**1,551.0**	**2,105.2**
Short-term investments	75.2	100.3	125.0	150.1	125.4	175.4	399.5	**75.2**	**125.4**
Accounts receivable, net	278.8	282.5	231.2	278.5	256.5	253.5	224.3	**278.8**	**256.5**
Inventories	288.5	290.7	274.7	234.6	227.9	223.5	236.0	**288.5**	**227.9**
Other Current Assets	126.0	97.2	47.2	88.4	91.9	89.4	75.3	**126.0**	**91.9**
Non-current Assets	1,896.7	1,665.8	1,610.9	1,519.6	1,427.6	1,358.7	1,325.4	**1,896.7**	**1,427.6**
PP&E	1,090.7	805.6	770.5	748.8	692.6	678.4	660.7	**1,090.7**	**692.6**
Long term Investments	-	-	-	-	-	-	-	-	-
Investment in UMC	-	-	-	-	-	-	-	-	-
Goodwill and other investments	773.3	753.1	693.5	679.2	637.2	622.5	608.4	**773.3**	**637.2**
Other	32.6	107.2	146.8	91.6	97.8	57.7	56.3	**32.6**	**97.8**
Total Assets	**4,216.1**	**3,944.9**	**3,937.5**	**3,981.5**	**4,234.6**	**4,192.6**	**3,948.0**	**4,216.1**	**4,234.6**
Liabilities and Stockholders' Equity									
Current Liabilities	383.2	346.0	315.3	342.0	609.4	532.0	260.7	**383.2**	**609.4**
Accounts Payables	318.1	251.4	250.7	276.7	549.5	243.3	221.4	**318.1**	**549.5**
Accrued Liabilities	-	-	-	-	-	-	-	-	-
Deferred Income	30.3	35.1	32.1	34.5	38.8	35.8	36.1	**30.3**	**38.8**
Deferred tax liabilities	34.8	59.5	32.5	30.9	21.2	3.1	3.1	**34.8**	**21.2**
Current obligations under capital lease	-	-	-	-	-	249.8	-	-	-
Long Term Liabilities	1,542.9	1,484.1	1,473.4	1,500.7	1,517.4	1,525.4	1,543.1	**1,542.9**	**1,517.4**
LT Debt	987.7	1,000.0	1,000.0	1,000.0	990.1	990.7	991.3	**987.7**	**990.1**
Deferred tax liabilities	501.0	430.4	420.5	451.7	481.4	497.4	514.5	**501.0**	**481.4**
Other liabilities	54.2	53.7	52.9	48.9	45.9	37.4	37.3	**54.2**	**45.9**
Total Liabilities	1,926.1	1,830.1	1,788.7	1,842.7	2,126.8	2,057.4	1,803.8	**1,926.1**	**2,126.8**
Total stockholders' equity	2,290.0	2,114.8	2,148.8	2,138.8	2,107.8	2,135.2	2,144.2	**2,290.0**	**2,107.8**
Total Liabilities & Stockholders' Equity	**4,216.1**	**3,944.9**	**3,937.5**	**3,981.5**	**4,234.6**	**4,192.6**	**3,948.0**	**4,216.1**	**4,234.6**

Source: Company data, Macquarie Capital (USA), March 2017

MXIM
Ratio Analysis

(FYE Jun)	Jun-15 4Q15	Sep-15 1Q16	Dec-15 2Q16	Mar-16 3Q16	Jun-16 4Q16	Sep-16 1Q17	Dec-16 2Q17	FY15	FY16
Profitability Analysis									
Return on Assets (Pretax)	9.1%	-7.4%	9.1%	18.0%	11.9%	16.3%	14.6%	**5.5%**	**7.4%**
Return on Equity (Aftertax)	17.4%	-13.1%	12.7%	26.1%	17.4%	25.9%	24.4%	**8.7%**	**10.3%**
Return on Invested Capital (Pretax)	16.5%	-14.1%	18.2%	38.5%	30.4%	45.0%	36.7%	**14.4%**	**25.6%**
Cash Conversion Cycle (Days)	86	101	108	78	23	85	95	**34**	**(95)**
DSOs	43	45	41	45	41	41	37	**44**	**43**
Days of Inventory	94	96	114	90	95	94	102	**102**	**88**
Days Payables Outstanding	51	40	47	58	112	50	43	**112**	**225**
Liquidity Analysis									
Current Ratio	6.1	6.6	7.4	7.2	4.6	5.3	10.1	**6.1**	**4.6**
Quick Ratio	5.3	5.7	6.5	6.5	4.2	4.9	9.2	**5.3**	**4.2**
Debt/Solvency Analysis									
Debt/Total Capital	30.1%	32.1%	31.8%	31.9%	32.0%	36.7%	31.6%	**30.1%**	**32.0%**
Debt/Equity	43.1%	47.3%	46.5%	46.8%	47.0%	58.1%	46.2%	**43.1%**	**47.0%**
Asset Values									
Book Value/Share	$7.91	$7.43	$7.40	$7.38	$7.31	$7.40	$7.44	**$7.97**	**$7.31**
Tangible Book Value/Share	$5.24	$4.78	$5.01	$5.04	$5.10	$5.24	$5.33	**$5.28**	**$5.10**
Total Cash & Equiv/Share	$5.62	$5.65	$6.10	$6.42	$7.73	$7.86	$7.24	**$5.66**	**$7.74**
Net Cash/Share	$0.13	$0.03	$0.60	$0.90	$2.22	$2.35	$1.72	**$0.13**	**$2.22**
Other									
Capital Spending ($mil)	15.4	15.8	13.5	17.5	22.5	14.3	15.8	**75.8**	**69.4**
Depreciation and Amortization ($mil)	92.6	102.1	49.1	47.1	46.4	43.5	42.1	**299.4**	**244.6**

Source: Company data, Macquarie Capital (USA), March 2017

Companies mentioned:

Texas Instruments (TXN US, US$80.56, Neutral), TP: US$82.00)

Analog Devices (ADI US, Not covered)

Samsung Electronics (005930 KS, Won2,074,000, Outperform, TP: Won2,900,000, Daniel Kim)

Macquarie Quant View

The quant model currently holds a strong positive view on Maxim Integrated Products. The strongest style exposure is Earnings Momentum, indicating this stock has received earnings upgrades and is well liked by sell side analysts. The weakest style exposure is Valuations, indicating this stock is over-priced in the market relative to its peers.

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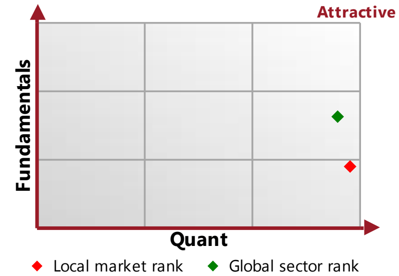
Global rank in Semiconductors & Semiconductor Equip.

% of BUY recommendations	48% (12/25)
Number of Price Target downgrades	0
Number of Price Target upgrades	0

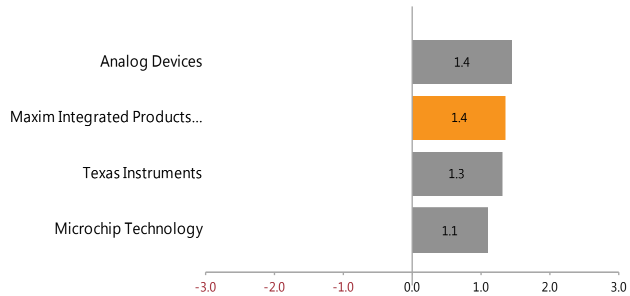


Displays where the company's ranked based on the fundamental consensus Price Target and Macquarie's Quantitative Alpha model.

Two rankings: Local market (United States) and Global sector (Semiconductors & Semiconductor Equip.)

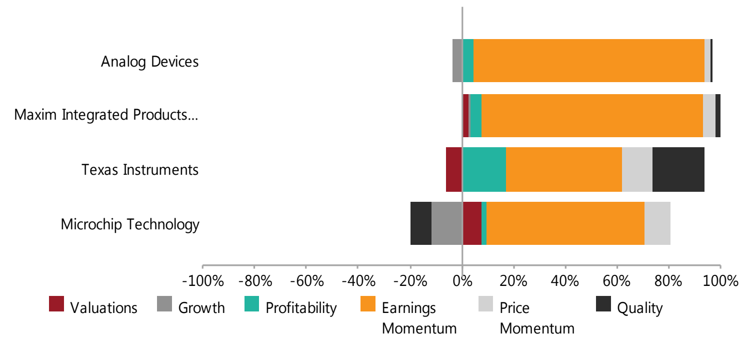
Macquarie Alpha Model ranking

A list of comparable companies and their Macquarie Alpha model score (higher is better).



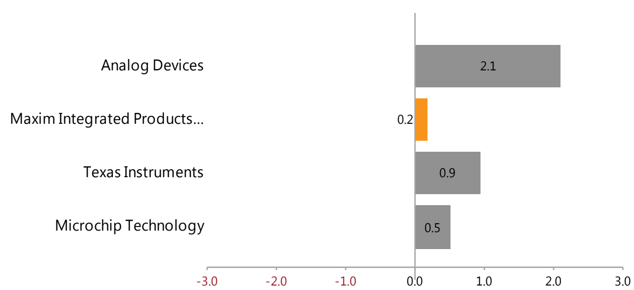
Factors driving the Alpha Model

For the comparable firms this chart shows the key underlying styles and their contribution to the current overall Alpha score.



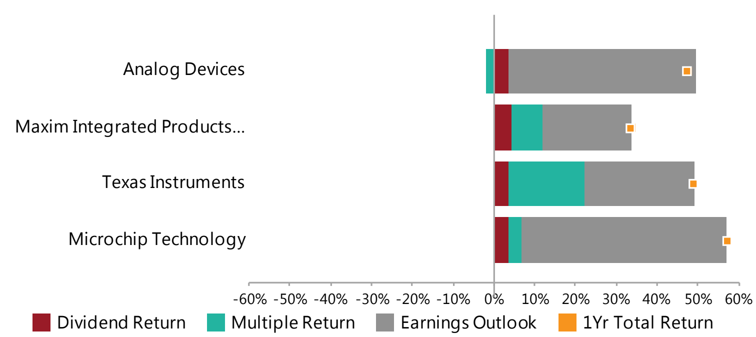
Macquarie Earnings Sentiment Indicator

The Macquarie Sentiment Indicator is an enhanced earnings revisions signal that favours analysts who have more timely and higher conviction revisions. Current score shown below.



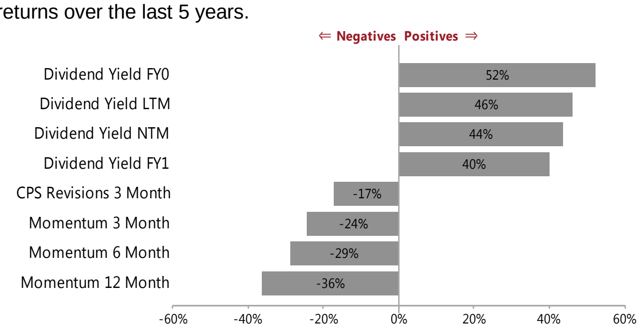
Drivers of Stock Return

Breakdown of 1 year total return (local currency) into returns from dividends, changes in forward earnings estimates and the resulting change in earnings multiple.



What drove this Company in the last 5 years

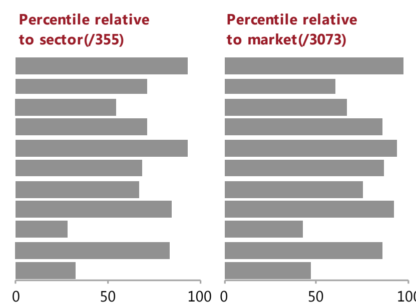
Which factor score has had the greatest correlation with the company's returns over the last 5 years.



How it looks on the Alpha model

A more granular view of the underlying style scores that drive the alpha (higher is better) and the percentile rank relative to the sector and market.

	Normalized Score
Alpha Model Score	1.36
Valuation	0.02
Growth	0.02
Profitability	0.16
Earnings Momentum	0.72
Price Momentum	0.12
Quality	0.09
Capital & Funding	0.32
Liquidity	-1.57
Risk	0.13
Technicals & Trading	-0.33



Source (all charts): FactSet, Thomson Reuters, and Macquarie Research. For more details on the Macquarie Alpha model or for more customised analysis and screens, please contact the Macquarie Global Quantitative/Custom Products Group (cpg@macquarie.com

UNITED STATES

CAVM US		Outperform
Price (at CLOSE#, 28 Mar 2017)		US$71.90
Valuation - PER	**US$**	**80.00-85.00**
12-month target	**US$**	**85.00**
12-month TSR	**%**	**+18.2**
GICS sector Semiconductors & Semiconductor Equipment		
Market cap	**US$m**	**4,877**
30-day avg turnover	**US$m**	**57.1**
Number shares on issue	**m**	**67.83**

Investment fundamentals

Year end 31 Dec		2016A	2017E	2018E	2019E
Revenue	m	603.3	965.2	1,087.8	1,216.7
EBIT	m	113.4	238.6	305.1	378.3
CFPS	US$	3.10	3.47	4.23	5.04
CFPS growth	%	42.6	11.9	21.7	19.2
PGCFPS	x	23.2	20.7	17.0	14.3
EPS adj	US$	1.52	2.70	3.48	4.31
EPS adj growth	%	4.0	77.5	28.8	24.0
PER adj	x	47.3	26.7	20.7	16.7
EV/EBITDA	x	26.5	19.7	16.5	14.1

Source: FactSet, Macquarie Capital (USA), March 2017
(all figures in USD unless noted)

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30 March 2017
Macquarie Capital (USA) Inc.

Cavium

Coming together

Initiating with an Outperform rating and $85 target

Cavium is a pureplay on many emerging trends in Cloud, Data Center, Security, and Wireless Infrastructure markets. The stock has underperformed in 2016 due to slower ARM server product ramps and the unexpected acquisition of slower-growth QLogic. However, CAVM's organic growth has reaccelerated in recent quarters, and we expect double digit topline growth to sustain even with a modest contribution from ARM servers. The company's new products in other large markets including 4G base station (Fusion-M) and Ethernet switching (Xpliant) are now ramping. CAVM also stands to benefit from the recent Nokia/Alcatel merger. Margin expansion should continue on the back of QLogic synergies and new products. We believe the stock can work on earnings growth alone but see room for multiple expansion as organic growth concerns fade. Key risks include 1) slower ramps of new products, 2) 4G spending slowdown in India, 3) Delays in Gen2 ARM server product.

Double-digit growth sustainable for the next 2 – 3 years

CAVM's new products are finally beginning to ramp after the slow start in 2016. Fusion-M ramps are in early stages and India 4G rollouts should remain a tailwind for the next several quarters. Xpliant Ethernet switching IC win at Arista alone could contribute $15 - $20m this year and we see additional revenue potential from HP and others. More importantly, Arista win validates Cavium as a viable second source in the $1b+ Data Center switching market. LiquidIO 2 (networking offload / SDN) and Liquid Security (for FIPS compliance) products are beginning to contribute meaningfully. Cavium also stands to benefit from the recent Nokia/Alcatel merger given its strong presence in Nokia's base stations and limited presence in Alcatel's (which we believe are being de-emphasized). We are comfortable with management's target of 8 – 10% growth for QLogic on the back of 25GE transition.

ARM server adoption slow but the opportunity is significant

ARM server adoption has been a disappointment thus far due to performance issues, software compatibility, and Intel's aggressive product roadmap. That said, we continue to see opportunities for ARM SoCs particularly in Cloud, Storage, and Networking markets. Microsoft recently announced that it has plans to use ARM SoCs in its own Data Centers, which could accelerate broader adoption. We also view ARM as a strategic alternative in China given the customization that it offers compared to x86 CPUs. While we don't expect ARM to gain significant share from x86, it doesn't take much to move the needle for CAVM given the multi-billion dollar TAM. Cavium is already the leader in this market and the recent IP acquisition (we believe from Broadcom) should further strengthen its roadmap.

Stock can work without multiple expansion

Needless to say, the QLogic acquisition was a surprise and has clearly impacted the stock multiple. At 27x CY17E Non-GAAP PE, the stock is at ~15% discount to historic average. We are not counting on multiples returning to historic average given the slower aggregate growth profile. Our PT assumes that the stock trades at 24x forward multiple over the next 12-months, which we believe is reasonable given the double-digit growth prospects and the margin expansion potential.

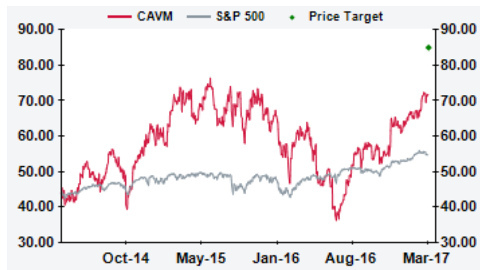
Inside

Cavium

Company profile

- Cavium, Inc. engages in providing integrated semiconductor processors that enable processing for networking, communications, storage, wireless, and security applications. It also offers software compatible processors ranging in performance from 1Gbps to 100Gbps. The company supports the Enterprise network, data center and access and service provider; and Broadband and consumer markets.
- Cavium, Inc. was founded by Syed Basharat Ali and Muhammad Raghib Hussain in November 2000 and is headquartered in San Jose, CA.

Fig 1 CAVM US vs S&P 500, & rec history



Note: Recommendation timeline - if not a continuous line, then there was no Macquarie coverage at the time or there was an embargo period.

Source: FactSet, Macquarie Capital (USA), March 2017

(all figures in USD unless noted)

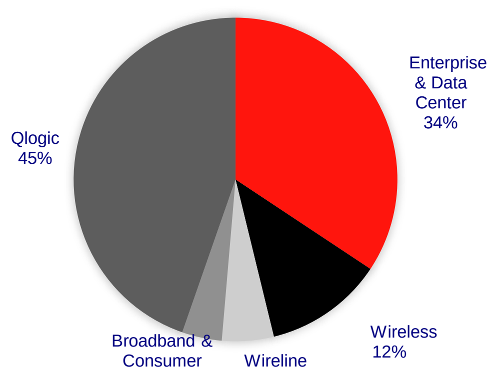
Coming together

Initiating with an Outperform rating

We are initiating coverage of Cavium with an Outperform rating and $85 target

We are initiating coverage of Cavium with an Outperform rating and $85 target. Our estimates are slightly above consensus. The company is a pureplay on many emerging trends in Cloud, Data Center, Security, and Wireless Infrastructure markets. CAVM has underperformed the SOX index in 2016 due to slower ramps of its ARM server product and the unexpected acquisition of slower-growth QLogic. However, the organic growth has recovered in recent quarters driven by new product ramps in other markets, and we see upside potential to 2017 estimates even with modest contribution from ARM servers. We are particularly encouraged by Fusion-M (4G base stations) ramps and Xpliant (Ethernet switching) design wins given the large TAM in these markets. We also see share gain opportunities for the company from Nokia/Alcatel merger, and believe that QLogic can grow at a 8 – 10% rate. Gross margin expansion should continue on the back of QLogic synergies and new product ramps. Valuation is at a discount to historic average and we believe the stock can work without any multiple expansion.

Fig 1 Sales by segment (Dec-16Q)



Source: Company data, Macquarie Capital (USA), March 2017

Fig 2 Estimates Summary

	CY16A	CY17E	CY18E
Revenue (US$m)	603	965	1088
YoY change (%)	46.2%	60.0%	12.7%
Gross margin (%)	65%	67%	68%
Operating margin (%)	19%	25%	28%
Non-GAAP EPS (US$)	1.55	2.70	3.48
PE (X) @US$71.90	46.2	26.6	20.7
EV/FCF @US$71.90	197.2	30.9	20.8

Source: Company data, Macquarie Capital (USA), March 2017

Double-digit revenue growth sustainable for the next 2 – 3 years

India 4G rollouts should remain a tailwind

CAVM's new products are finally beginning to ramp in volume after the slow start in 2016. While we are not counting on ARM server market to be a big driver this year, Fusion-M ramps are in early stages and India 4G rollouts should remain a tailwind for the next several quarters. Cavium also stands to benefit from the recent Nokia/Alcatel merger given its strong presence in Nokia's base stations and limited presence in Alcatel's (which we believe are being de-emphasized).

Arista win validates Cavium as a viable second source to Broadcom

Ethernet switching market offers significant addressable market for the company's Xpliant line of products. We estimate that overall Ethernet switching silicon market accounted for nearly $4b in 2016, of which data center switching was roughly $1b. Broadcom remains the market share leaders with more than 90% share in Data Center merchant silicon market, but we see opportunities for CAVM in the fast growing 25GE market. CAVM's recent win at Arista Networks (7160 series switches) alone could contribute $15 - $20m this year and we see additional revenue potential from HP, Brocade, and whitebox makers. More importantly, Arista win validates Cavium as a viable second source to Broadcom.

We are comfortable with management's target of 8 – 10% growth for QLogic

LiquidIO 2 (networking offload / SDN) and Liquid Security (for FIPS compliance) products are beginning to contribute meaningfully. The QLogic acquisition adds Fiber Channel adaptors, switches, and controller ICs, as well as Ethernet interface cards. Cavium has historically participated in the Ethernet NIC market through its LiquidIO product line for the very high-end. QLogic acquisition accelerates the company's expansion into this market. We are comfortable with management's target of 8 – 10% growth for QLogic on the back of 25GE transition and some incremental opportunities for Fiber Channel controllers in all Flash arrays.

Fig 4 Cavium product summary

Product	Description	% of Sales	Target	Key Customers	Competition
Octeon	Multicore processors	25-30%	Switches & routers, storage equipment	Cisco, Juniper, Nokia	Qualcomm (NXP), Intel
Nitrox	Security processor	10%	Security appliances and routers	F5, Juniper, Palo Alto Networks, Dell	Intel
LiquidIO	PCIe Server Adapter	10%	Servers	Amazon, Google	Intel
XPliant	Ethernet switch	<5%	Switches, Routers, EPC applications	Arista, Brocade, HP	Broadcom, Marvell, Mellanox
Octeon Fusion	Multicore processor	<5	Small cell base station	Samsung, ZTE	Broadcom, TXN, Qualcomm
Octeon Fusion-M	Multicore processor	<5%	Base stations and smart radio heads (CRAN)	Samsung	Intel, Qualcomm (NXP)
ThunderX	ARM processor	<5%	Web Servers	Lenovo, Gigabyte, Wistron	Intel, AMD, Qualcomm
Liquid Security	FIPS security appliance	<5%	Servers		
Fibre Channel Adaptor	Server to storage connectivity	25%	Servers	HP, Dell, Lenovo	Broadcom
Converged Network Interface cards (NIC)	Server to storage / network connectivity	15%	Servers	HP, Dell, Lenovo, Amazon	Intel, Mellanox, Broadcom

Source: Company data, Macquarie Capital (USA), March 2017

Microsoft endorsement could accelerate ARM server adoption

Microsoft recently announced that it had ported Windows Server OS to ARM

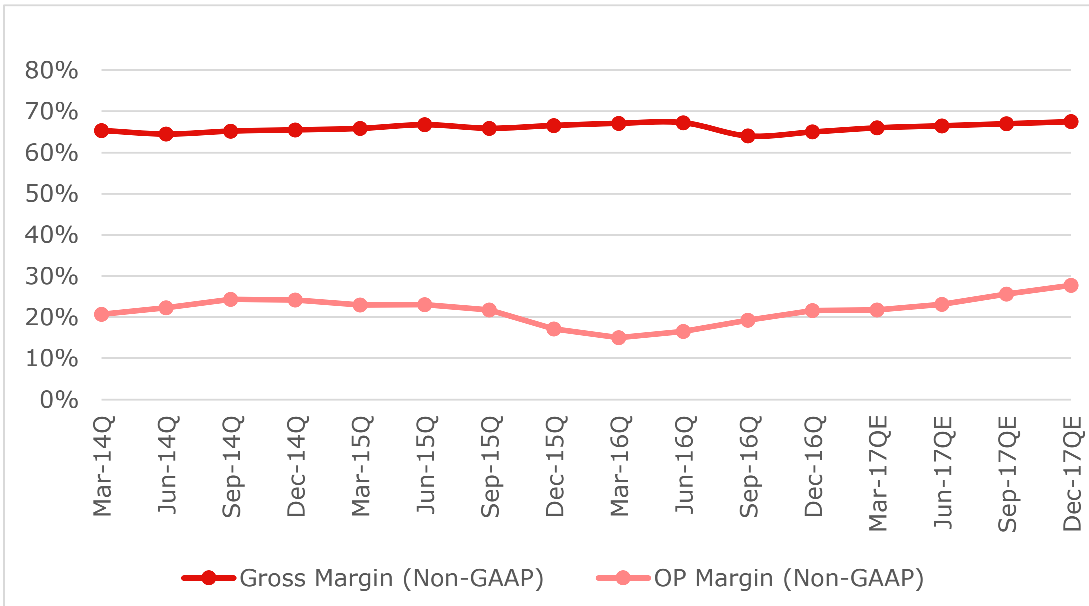
Cavium is a leading supplier in the nascent ARM server market along with Qualcomm. The company's ThunderX ARM server SoC generated a significant interest but the adoption has been a disappointment thus far due to performance, software compatibility issues, as well as Intel's aggressive product roadmap. That said, we continue to see opportunities for ARM SoC vendors particularly in Cloud, Storage, and Networking markets. Microsoft recently announced that it had ported Windows Server OS to ARM and also indicated that ARM based solutions offer compelling value for workloads that benefit from high-throughput computing such as Storage, Big Data, Machine Learning, Search, and Indexing. More importantly, the company announced that it has future deployment plans for ARM servers within its data centers. We also see ARM as a strategic alternative in China given the customization that it offers compared to traditional x86 CPUs. Given Cavium's small size, and the large addressable market (x86 server CPU market is about $17b), it doesn't take much market share to move the needle for the company. That said, we are not counting on an inflection point and believe that the adoption will be gradual over the next 2 – 3 years.

Margin expansion from QLogic synergies and new products

We are modelling operating margins to improve more than 500bps in 2017

We are forecasting 200bps of gross margin expansion this year driven by QLogic related synergies as well as new product ramps. A key driver is the company's decision to directly source wafers for QLogic's HBA chips from foundries as opposed to third party ASIC suppliers. Opex growth should moderate as the company expects to deliver the remaining 1/3rd of opex synergies from QLogic (facilities consolidation etc.) in the next few quarters. Overall, we are modelling operating margins to improve more than 500bps in 2017.

Fig 5 Gross & operating margins



Source: Company Reports, Macquarie Capital (USA), March 2017

Valuation, recommendation, risks

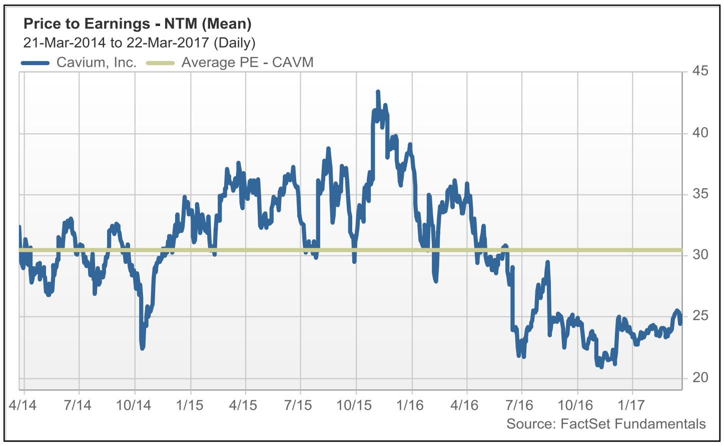
We do not count on multiple returning to historic level

At 27x PE (31x EV/FCF) on our CY17 estimates, the stock is at a discount to historic average of about 30x. We are not counting on multiples returning to historic average given the slower aggregate growth profile. Our PT assumes that the stock trades at about 24x forward multiple over the next 12-months, which we believe is reasonable given the double digit growth prospects and some margin expansion potential.

CAVM is exposed to slowdown in 4G spending in India

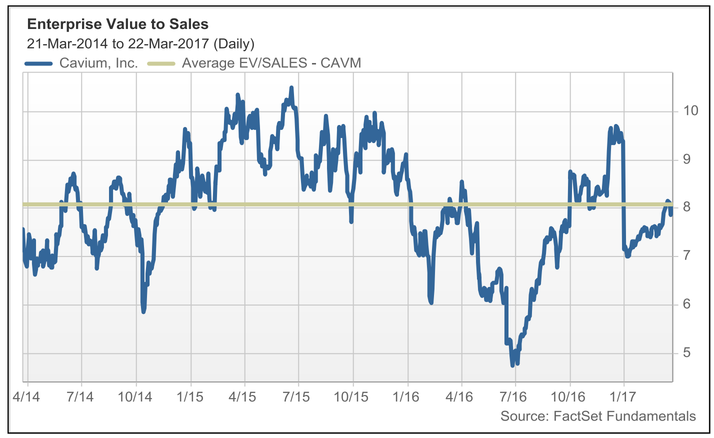
Key risks include 1) slower ramps of new products, 2) 4G spending slowdown in India, 3) Delays in Gen2 ARM server product.

Fig 6 CAVM historic PE



Source: FactSet, Macquarie Capital (USA), March 2017

Fig 7 CAVM historic EV/S



Source: FactSet, Macquarie Capital (USA), March 2017

Macquarie vs consensus

Fig 3 Our 2017 & 2018 estimates are slightly above consensus

CAVM	17E	18E	19E
MQ/Consensus (Rev %)	0.5	1.1	0.9
MQ/Consensus (EPS %)	0.9	1.2	-1.4

Source: FactSet, Macquarie Capital (USA), March 2017

Cavium

Income Statement (Non-GAAP)

($million/%)	Mar-16Q	Jun-16Q	Sep-16Q	Dec-16Q	Mar-17QE	Jun-17QE	2015	2016	2017E	2018E	2019E
Revenue	101,882	107,158	168,123	226,151	227,006	235,248	**412,744**	**603,314**	**965,205**	**1,087,821**	**1,216,710**
Cost of revenue	33,518	35,081	60,474	79,151	77,182	78,808	**139,205**	**208,224**	**320,681**	**352,112**	**381,638**
Gross profit	68,364	72,077	107,649	147,000	149,824	156,440	**273,539**	**395,090**	**644,524**	**735,708**	**835,072**
Operating expenses	53,091	54,318	75,287	98,061	100,513	102,020	**185,835**	**280,757**	**406,573**	**431,242**	**457,408**
Research and development	38,150	40,038	53,146	69,859	71,605	72,680	**131,068**	**201,193**	**289,644**	**307,218**	**325,859**
Sales, general and administrative	14,941	14,280	22,141	28,202	28,907	29,341	**54,767**	**79,564**	**116,929**	**124,024**	**131,549**
Operating income	15,273	17,759	32,362	48,939	49,311	54,419	**87,704**	**114,333**	**237,951**	**304,467**	**377,665**
Other expense	(194)	(336)	(3,692)	(7,751)	(7,500)	(7,500)	**971**	**(11,973)**	**(28,500)**	**(24,500)**	**(20,000)**
Income before income taxes	15,079	17,423	28,670	41,188	41,811	46,919	**88,675**	**102,360**	**209,451**	**279,967**	**357,665**
Provision for income taxes	275	273	702	1,365	1,500	3,284	**1,682**	**2,615**	**13,235**	**19,598**	**25,037**
Net income (loss)	14,804	17,150	27,968	39,823	40,311	43,635	**86,993**	**99,745**	**196,216**	**260,369**	**332,628**
Non-GAAP EPS (diluted)	**$0.25**	**$0.29**	**$0.43**	**$0.56**	**$0.56**	**$0.60**	**$1.46**	**$1.55**	**$2.70**	**$3.48**	**$4.31**
EPS (diluted) - adj for stock comp	**($0.00)**	**$0.04**	**($0.12)**	**$0.24**	**$0.25**	**$0.29**	**$0.60**	**$0.19**	**$1.46**	**$2.27**	**$3.14**
FCF/Shr	**($0.00)**	**$0.25**	**($0.80)**	**$0.74**	**$0.44**	**$0.43**	**$0.37**	**$0.25**	**$2.07**	**$3.19**	**$3.99**
Diluted shares outstanding	60,165	59,998	65,117	71,314	71,849	72,388	**59,524**	**64,149**	**72,661**	**74,866**	**77,137**
% Sales											
Gross profit	67.1%	67.3%	64.0%	65.0%	66.0%	66.5%	**66.3%**	**65.5%**	**66.8%**	**67.6%**	**68.6%**
Operating expenses	52.1%	50.7%	44.8%	43.4%	44.3%	43.4%	**45.0%**	**46.5%**	**42.1%**	**39.6%**	**37.6%**
Research and development	37.4%	37.4%	31.6%	30.9%	31.5%	30.9%	**31.8%**	**33.3%**	**30.0%**	**28.2%**	**26.8%**
Sales, general and administrative	14.7%	13.3%	13.2%	12.5%	12.7%	12.5%	**13.3%**	**13.2%**	**12.1%**	**11.4%**	**10.8%**
Operating income	15.0%	16.6%	19.2%	21.6%	21.7%	23.1%	**21.2%**	**19.0%**	**24.7%**	**28.0%**	**31.0%**
Net income	14.5%	16.0%	16.6%	17.6%	17.8%	18.5%	**21.1%**	**16.5%**	**20.3%**	**23.9%**	**27.3%**
% YoY											
Revenue	0%	2%	60%	124%	123%	120%	**11%**	**46%**	**60%**	**13%**	**12%**
Gross profit	2%	3%	55%	119%	119%	117%	**13%**	**44%**	**63%**	**14%**	**14%**
Operating expenses	22%	18%	62%	96%	89%	88%	**18%**	**51%**	**45%**	**6%**	**6%**
Operating income	-35%	-27%	41%	183%	223%	206%	**2%**	**30%**	**108%**	**28%**	**24%**
Net income	-38%	-29%	24%	140%	172%	154%	**3%**	**15%**	**97%**	**33%**	**28%**
% QoQ											
Revenue	1%	5%	57%	35%	0%	4%					
Gross profit	2%	5%	49%	37%	2%	4%					
Operating expenses	6%	2%	39%	30%	2%	1%					
Operating income	-12%	16%	82%	51%	1%	10%					
Net income	-11%	16%	63%	42%	1%	8%					

Source: Company data, FactSet, Macquarie Capital (USA), March 2017

Cavium

Balance Sheet

($million/%)	Jun-15Q	Sep-15Q	Dec-15Q	Mar-16Q	Jun-16Q	Sep-16Q	Dec-16Q	2015	2016
Assets									
Current Assets	248,864	249,838	260,628	265,548	285,367	515,283	489,118	**260,628**	**489,118**
Cash and cash equivalents	121,984	130,985	134,646	129,629	140,419	192,378	221,439	**134,646**	**221,439**
Accounts receivable, net	67,165	61,696	68,742	79,594	82,137	144,902	125,728	**68,742**	**125,728**
Inventories	50,403	47,645	47,009	48,092	52,702	118,936	119,692	**47,009**	**119,692**
Prepaid expenses and other current assets	9,312	9,512	10,231	8,233	10,109	59,067	22,259	**10,231**	**22,259**
Property and equipment, net	60,235	64,414	64,677	63,303	64,917	122,114	150,862	**64,677**	**150,862**
Intangible assets, net	37,023	36,954	35,492	37,907	36,698	790,368	764,885	**35,492**	**764,885**
Goodwill	71,478	71,478	71,478	71,478	71,478	319,021	241,067	**71,478**	**241,067**
Other assets	1,952	2,019	1,718	1,738	1,822	3,922	4,599	**1,718**	**4,599**
Total assets	**419,552**	**424,703**	**433,993**	**439,974**	**460,282**	**1,750,708**	**1,650,531**	**433,993**	**1,650,531**
Liabilities and Equity									
Current liabilities	73,308	60,956	63,856	57,705	71,707	189,092	168,235	**63,856**	**168,235**
Accounts payable	32,702	25,338	27,489	25,668	30,024	55,009	65,456	**27,489**	**65,456**
Other current liabilities	14,950	12,095	9,443	8,326	16,447	43,163	64,967	**9,443**	**64,967**
Deferred revenue	7,273	6,519	6,316	6,425	7,856	9,399	8,412	**6,316**	**8,412**
Notes payable and other	0	0	0	0	0	0	0	**0**	**0**
Capital lease and license obligations	18,383	17,004	20,608	17,286	17,380	27,747	25,535	**20,608**	**25,535**
Other liabilities	0	0	0	0	0	53,774	3,865	**0**	**3,865**
Notes payable	0	0	0	0	0	676,372	675,414	**0**	**675,414**
Capital lease and license obligations	15,981	16,092	9,858	6,932	4,182	11,780	27,878	**9,858**	**27,878**
Deferred tax liability	3,159	3,320	3,417	3,785	3,923	17,270	18,774	**3,417**	**18,774**
Other non-current liabilities	2,970	2,849	2,962	2,907	4,140	18,266	18,386	**2,962**	**18,386**
Total liabilities	95,418	83,217	80,093	71,329	83,952	912,780	908,687	**80,093**	**908,687**
Retained earnings (deficit)	(192,598)	(188,382)	(189,412)	(193,245)	(200,655)	(214,978)	(337,199)	**(189,412)**	**(337,199)**
Other	516,732	529,868	543,312	561,890	576,985	1,052,906	1,079,043	**543,312**	**1,079,043**
Stockholders' equity	324,134	341,486	353,900	368,645	376,330	837,928	741,844	**353,900**	**741,844**
Total liabilities and stockholders' equity	**419,552**	**424,703**	**433,993**	**439,974**	**460,282**	**1,750,708**	**1,650,531**	**433,993**	**1,650,531**

Source: Company data, FactSet, Macquarie Capital (USA), March 2017

Cavium
Ratio Analysis

	Sep-15Q	Dec-15Q	Mar-16Q	Jun-16Q	Sep-16Q	Dec-16Q	2015	2016
Profitability Analysis								
Return on Assets (Pretax)*	5%	0%	-3%	-6%	-34%	-7%	**-1%**	**-11%**
Return on Equity (Aftertax)*	5%	-1%	-4%	-8%	-9%	-62%	**-3%**	**-23%**
ROIC (Pretax)*	12%	-1%	-7%	-15%	-56%	-10%	**-2%**	**-20%**
Cash Conversion Cycle (Days)	103	111	132	135	140	88	**108**	**149**
DSOs	53	61	70	69	78	50	**60**	**75**
Days of Inventory	118	124	128	134	89	84	**118**	**136**
Days Payables Outstanding	68	74	66	67	26	46	**69**	**61**
Liquidity Analysis								
Current Ratio	4.1x	4.1x	4.6x	4.0x	2.7x	2.9x	**4.1x**	**2.9x**
Quick Ratio	3.2x	3.2x	3.6x	3.1x	1.8x	2.1x	**3.2x**	**2.1x**
Debt/Solvency Analysis								
Debt/Total Capital	9%	8%	6%	5%	46%	50%	**8%**	**50%**
Debt/Equity	10%	9%	7%	6%	85%	98%	**9%**	**98%**
Asset Values								
Book Value/Share	$5.94	$6.30	$6.48	$6.54	$13.50	$11.08	**$6.32**	**$12.19**
Tangible Book Value/Share	$4.06	$4.40	$4.55	$4.66	($4.37)	($3.94)	**$4.41**	**($4.34)**
Total Cash & Equiv/Share	$2.28	$2.40	$2.28	$2.44	$3.10	$3.31	**$2.40**	**$3.64**
Net Cash/Share	$1.70	$1.86	$1.85	$2.07	($8.44)	($7.58)	**$1.86**	**($8.34)**

*based on GAAP

Source: Company data, FactSet, Macquarie Capital (USA), March 2017

Companies mentioned:

Broadcom (AVGO US, US$220.95, Outperform, TP: US$265.00)

Arista Networks (ANET US, Not covered)

Hewlett Packard Enterprise (HPE US, Not covered)

Cisco (CSCO US, Not covered)

Microsoft (MSFT US, US$65.10, Neutral, TP: US$63.00, Sarah Hindlian)

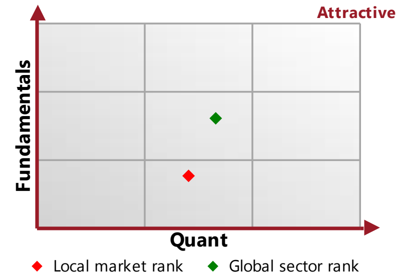
Macquarie Quant View

The quant model currently holds a marginally positive view on Cavium. The strongest style exposure is Profitability, indicating this stock is efficiently converting investments to earnings; proxied by ratios like ROE or ROA. The weakest style exposure is Price Momentum, indicating this stock has had weak medium to long term returns which often persist into the future.

160/357

Global rank in
Semiconductors & Semiconductor Equip.

% of BUY recommendations	62% (13/21)
Number of Price Target downgrades	0
Number of Price Target upgrades	2

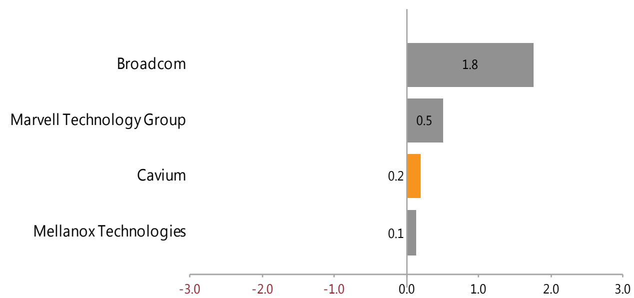


Displays where the company's ranked based on the fundamental consensus Price Target and Macquarie's Quantitative Alpha model.

Two rankings: Local market (United States) and Global sector (Semiconductors & Semiconductor Equip.)

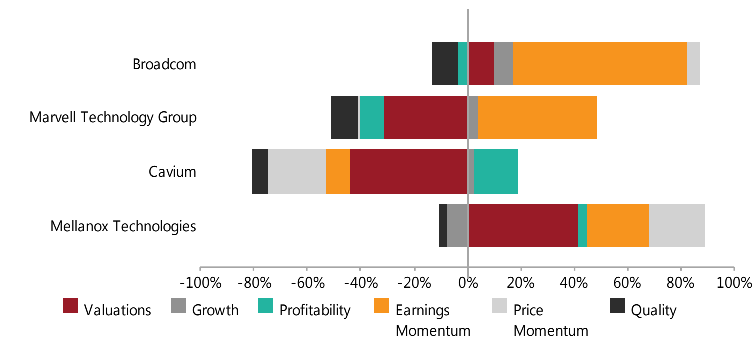
Macquarie Alpha Model ranking

A list of comparable companies and their Macquarie Alpha model score (higher is better).



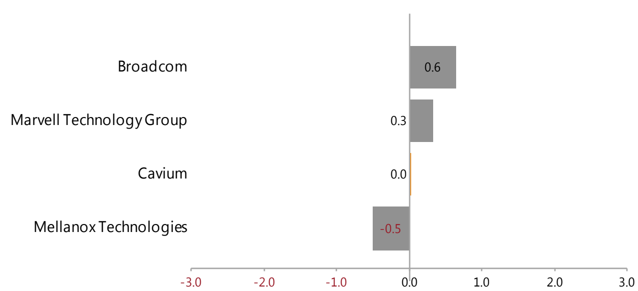
Factors driving the Alpha Model

For the comparable firms this chart shows the key underlying styles and their contribution to the current overall Alpha score.



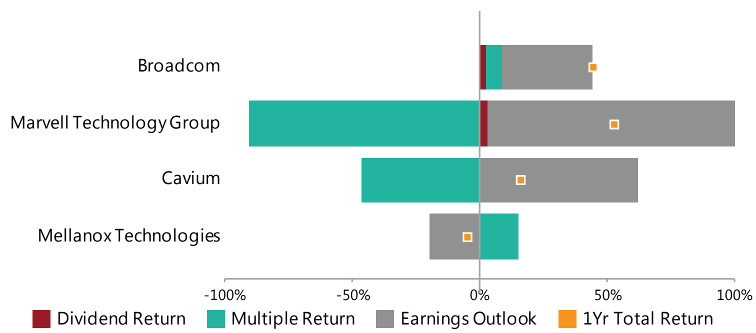
Macquarie Earnings Sentiment Indicator

The Macquarie Sentiment Indicator is an enhanced earnings revisions signal that favours analysts who have more timely and higher conviction revisions. Current score shown below.



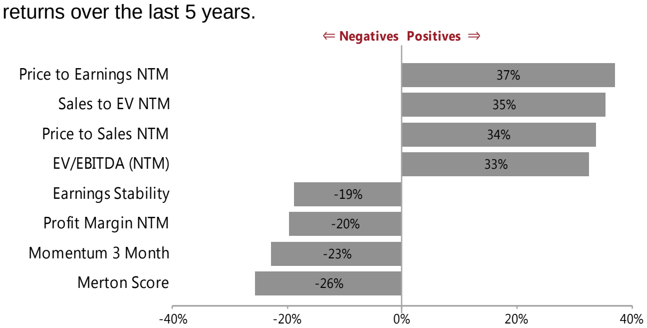
Drivers of Stock Return

Breakdown of 1 year total return (local currency) into returns from dividends, changes in forward earnings estimates and the resulting change in earnings multiple.



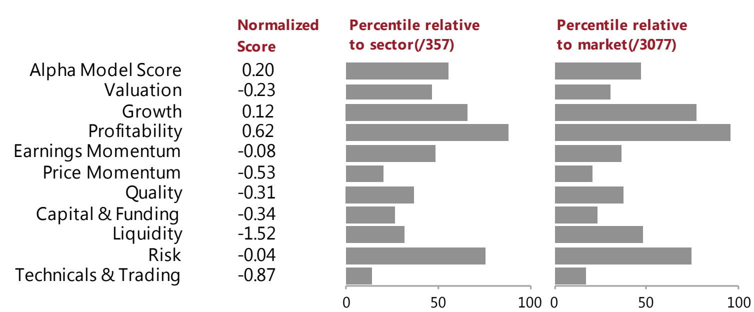
What drove this Company in the last 5 years

Which factor score has had the greatest correlation with the company's returns over the last 5 years.



How it looks on the Alpha model

A more granular view of the underlying style scores that drive the alpha (higher is better) and the percentile rank relative to the sector and market.



Source (all charts): FactSet, Thomson Reuters, and Macquarie Research. For more details on the Macquarie Alpha model or for more customised analysis and screens, please contact the Macquarie Global Quantitative/Custom Products Group (cpg@macquarie.com)

UNITED STATES

AMD US		Neutral
Price (at CLOSE#, 28 Mar 2017))		US$13.69
Valuation - PER	**US$**	**14.00**
12-month target	**US$**	**14.00**
12-month TSR	**%**	**+2.3**
GICS sector Semiconductors & Semiconductor Equipment		
Market cap	**US$m**	**12,745**
30-day avg turnover	**US$m**	**1,110.4**
Number shares on issue	**m**	**931.0**

Investment fundamentals

Year end 31 Dec		2016A	2017E	2018E	2019E
Revenue	m	4,272.0	4,758.1	5,211.1	5,489.1
EBIT	m	8.0	205.8	419.2	509.6
CFPS	US$	0.03	0.22	0.44	0.53
CFPS growth	%	nmf	619.6	99.3	20.4
PGCFPS	x	444.0	61.7	31.0	25.7
EPS adj	US$	-0.15	0.08	0.30	0.40
EPS adj growth	%	72.8	nmf	274.8	30.0
PER adj	x	nmf	168.9	45.1	34.6
EV/EBITDA	x	91.6	40.0	24.5	21.2

Source: FactSet, Macquarie Capital (USA), March 2017
(all figures in USD unless noted)

Analyst(s)
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30 March 2017
Macquarie Capital (USA) Inc.

Advanced Micro Devices

Ryzen from dead, challenges ahead

Initiating with Neutral and $14 target

We believe AMD's management has done an excellent job refocusing its limited resources, improving the balance sheet, and leveraging its IP to generate new revenue streams. The company's new "Ryzen" PC product and "Naples" server product appear competitive. However, we find the recent run-up in the stock is reflecting significant share gains in high-end desktop (we estimate ~20%) and server (~10%) markets, which we believe will be a challenge. Intel has set the bar low for 2017, has plenty of margin buffer, and will have its own new products both in PC and server markets in 2H17. In the event that AMD gains meaningful share, we expect aggressive pricing reaction from Intel, which could limit AMD's profitability. That said, near-term Street estimates appear reasonable to us and the stock could continue to get the benefit of the doubt for another 1 – 2 quarters, which we think limits downside to the stock.

Share gain expectations in PC/Server too optimistic

Assuming the company makes meaningful progress in the server market, we believe AMD can trade at about 20 - 25x normalized EPS at best (NVDA is at 27x our CY18 Non-GAAP EPS). At $13.69, the stock is implying EPS power of $0.55 - $0.70, which will need $1.5 - $2b in incremental revenue and 35-40% incremental operating margin. Initial Ryzen product reviews have been somewhat mixed, but we won't be surprised to see some gains in the $4b Enthusiast/Gaming PC segment given the company's minimal share currently. Even assuming a 20% unit share (~15% revenue share), which we believe is a stretch, would mean only about $600m in incremental revenue. We see limited share gain potential in corporate and even in the mainstream PC segment. That leaves about $1.0b gain from servers or more than 10% unit share (AMD's ASPs will be much lower than Intel's). We think it's highly unlikely AMD can make this much progress without a serious price war from Intel, which could limit margin expansion and profitability.

Console business stable; GPUs to benefit from growing TAM

AMD had a strong year in 2016 in the console business driven by Sony PS4 refresh, and we expect tailwinds in 2017 driven by the upcoming Xbox refresh. We believe our and Street models largely capture the console business prospects this year. On the PC graphics front, AMD regained share in both desktop and notebook segments in 2016, exiting the year with 28% share in desktop and 34% share in notebook GPUs. The company's upcoming Vega products could help boost ASPs and drive additional share gains. That said, NVDA's Pascal gaming portfolio looks compelling and gaining share in the high-end gaming segment might prove difficult. Nevertheless, we are a bit more optimistic about AMD's prospects in gaming as the pie is expanding compared to PC CPUs where it's a zero sum game.

Stock likely to get benefit of the doubt in the near term

AMD is trading at 45x our CY18 EPS, and, needless to say, is implying significant upside potential to estimates. Near-term estimates appear reasonable, and we expect some upside driven by share gains as well as channel fill. AMD's new products are in the early stages and we believe the stock could continue to get the benefit of the doubt for another 1 – 2 quarters as long as the company meets or beats current Street estimates. As such, while we believe longer term expectations are too optimistic, we expect the stock to trade in a tight range in the near term and are initiating with a Neutral and $14 PT.

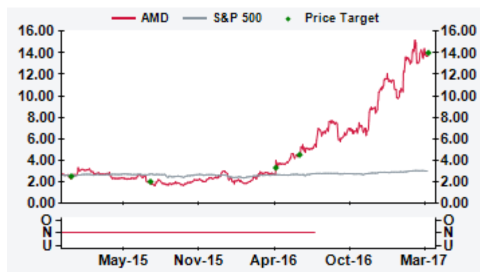
Inside

Advanced Micro Devices

Company profile

- Advanced Micro Devices, Inc. is a global semiconductor company that develops computer processors and related technologies for business and consumer markets. It designs and integrates technology for intelligent devices, including personal computers, game consoles and cloud servers.
- It operates through the following segments: Computing and Graphics, and Enterprise, Embedded and Semi-Custom.
- The Computing and Graphics segment includes desktop, notebook processors, chipsets, discrete GPUs and professional graphics.
- The Enterprise, Embedded and Semi-Custom segment includes server and embedded processors, dense servers, semi-custom SoC products, engineering services and royalties.
- The company was founded by W. J. Sanders III and David John Carey on May 1, 1969 and is headquartered in Sunnyvale, CA.

Fig 1 AMD US vs S&P 500, & rec history



Note: Recommendation timeline - if not a continuous line, then there was no Macquarie coverage at the time or there was an embargo period.

Source: FactSet, Macquarie Capital (USA), March 2017

(all figures in USD unless noted)

Ryzen from dead, challenges ahead

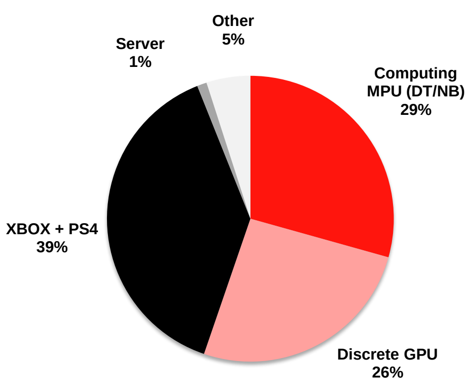
Initiating with a Neutral and $14PT

We believe investors are underestimating potential competitive and pricing reactions by Intel

We are initiating coverage on AMD with a Neutral rating. AMD's management has done an excellent job refocusing its limited resources, improving the balance sheet, and leveraging its IP to generate a new revenue stream. However, we find the recent run-up in the stock is discounting significant share gains in the high-end desktop and server markets, which we believe will be a challenge. AMD has a decent product, but we believe investors are underestimating potential competitive and pricing reactions by Intel. Intel has 1) set the bar low for 2017, 2) has plenty of margin buffer, and 3) launching its own new products in PC/Server markets in 2H17. In the event that AMD gains meaningful share, aggressive pricing reaction from Intel could limit margin expansion and profitability.

At $13.69, the stock is trading at 45x our CY18 EPS estimate. We believe valuation is reflecting $0.55 - $0.70 earnings power, which is likely to prove optimistic. That said, the near-term estimates appear reasonable to us, and we won't be surprised to see the company beat and raise for the next 1 – 2 quarters. The stock will likely get the benefit of the doubt until proven otherwise, which could take a couple of quarters. As such, we see limited downside in the near term despite our skepticism about the company's share gain potential.

Fig 2 Sales by segment (Dec-16Q)



Source: Company data, Macquarie Capital (USA), March 2017

Fig 3 Estimates Summary

	CY16A	CY17E	CY18E
Revenue (US$m)	4272	4758	5211
YoY change (%)	7.0%	11.4%	9.5%
Gross margin (%)	23%	33%	35%
Operating margin (%)	-9%	2%	6%
Non-GAAP EPS (US$)	-0.15	0.08	0.30
PE (X) @US$13.69	-93.9	166.4	45.0
FCF	13	92	312
EV/FCF @US$13.69	993.6	140.5	41.4

Source: Company data, Macquarie Capital (USA), March 2017

Share gain expectations in PC/Server too optimistic

We expect AMD to pick up some share in the Enthusiast segment given its near zero share currently

Assuming the company makes meaningful progress (especially in the server market), we believe the stock can trade at about 20 - 25x normalized EPS at best (a discount to NVDA given the lower GM). At $13.69, the stock is implying EPS power of $0.55 - $0.70, which will need an incremental $1.5 - $2b dollars to the topline from CY16 levels at an incremental margin of 35 – 40%. At a high level, it doesn't appear to be a stretch given the $30b PC CPU market and the $17b server CPU market. The problem, however, is that in the PC market, we believe any share gains will be limited to the Enthusiast/Gaming market, where AMD has little to no share today. We estimate this market accounted for a CPU TAM of $4B in 2016. Consumers in this sub-segment tend to be tech-savvy, and assuming AMD's products have a price/performance advantage, we see a good chance that the company picks up some share. While initial Ryzen product reviews have been mixed, we assume 20% unit share gains in this sub-segment for the sake of the argument. That might not translate into 20% TAM as AMD's ASPs are much lower and pricing could degrade further as Intel is likely to compete aggressively.

We see limited share gains for the company in Corporate PC and even in the mainstream Consumer segment

In other sub-segments, we see little chance of share gains in the corporate PC segment. Security and the management features (Intel's vPro) are critical in this segment, and we do not believe AMD's new architecture will have much of an impact here despite its improved performance. In the mainstream consumer PC market, we estimate that AMD currently has about 15% unit share. It's possible that AMD could pick up some share here, although the typical consumers in this segment are not as tech savvy, and tend to make purchasing decisions based more on perception (that Intel is premium). Improved performance alone may not help AMD much here as the company will have to fight Intel's marketing machine. Given the decent amount of share AMD already has in this segment, we think incremental share gains, if any, will be modest. ASPs in this segment also tend to be much lower than in the enthusiast segment.

AMD will need $1b from the server market or more than 10% unit share to justify the stock's current valuation

That leaves about $1.0b that the company will need from the server segment. At first look, AMD has near zero market share in servers, has a product for the first time in many years, and customers are eagerly waiting for a second source. We think it's reasonable to expect AMD to pick up some share assuming product performance is reasonable. The company's market share in servers peaked at around 25% in 2Q06. The difference, however, is that the last time, nearly 100% of the server market was Enterprise. Today, less than half of Intel's revenues come from the Enterprise segment. We expect AMD's gains to be limited to lower end enterprise. We wouldn't be surprised to see hyperscale / Cloud customers leverage AMD as a bargaining chip against Intel, but real share gains will likely be a challenge. We also caution against using Intel's ASPs (>$1500 / server) as a reference point since AMD's focus will mostly be in the mid to low end. Assuming AMD's blended ASPs will be about 50-60% of Intel's at best, AMD will need more than 10 points of gains in the enterprise segment to get to $1.0b in revenue. We believe it's highly unlikely given Intel's roadmap, product performance, product diversity, and customization. Even if AMD gains share here, the volume ramps will take much longer than in the consumer PC market. And finally, server OEMs and hyperscale customers don't make strategic choices based on one-off products and rely more on longer term roadmaps. Intel's decision to move its DCG products to leading edge first starting at 7nm means that the performance gap will only widen in the coming years. As such, we believe any share gains by AMD in this segment will be modest and/or short lived.

Fig 4 AMD implied share gain analysis

	2016	2018E Best Case	Assumptions
CPU Revenue	1,174	1,774	20% unit share gain in Enthusiast PC
GPU Revenue	793	1,092	Some share gains and ASP growth
Console/Other Revenue	2,254	2,349	Steady
Server Revenue	51	1,000	>10% unit share gain , 6% revenue share gain
Total Revenue	**$4,272**	**$6,215**	
Non-GAAP GM	31%	38%	700bps expansion
GM $	1,338	2,332	
Non-GAAP Opex	1,294	1,553	Opex grows less than half the rate of rev growth
OPM $	44	779	40% incremental margin
Non-Op Income	(76)	(112)	
Pretax Income	(32)	667	
Tax	(85)	(40)	Assume 5% Tax rate
Non-GAAP Net Income	(117)	627	
Non-GAAP EPS	**$ (0.15)**	**$ 0.65**	
Stock price		$13.69	
implied multiple		**21x**	

Source: Company Data, Macquarie Capital (USA), March 2017

Console business stable; GPUs to benefit from growing TAM

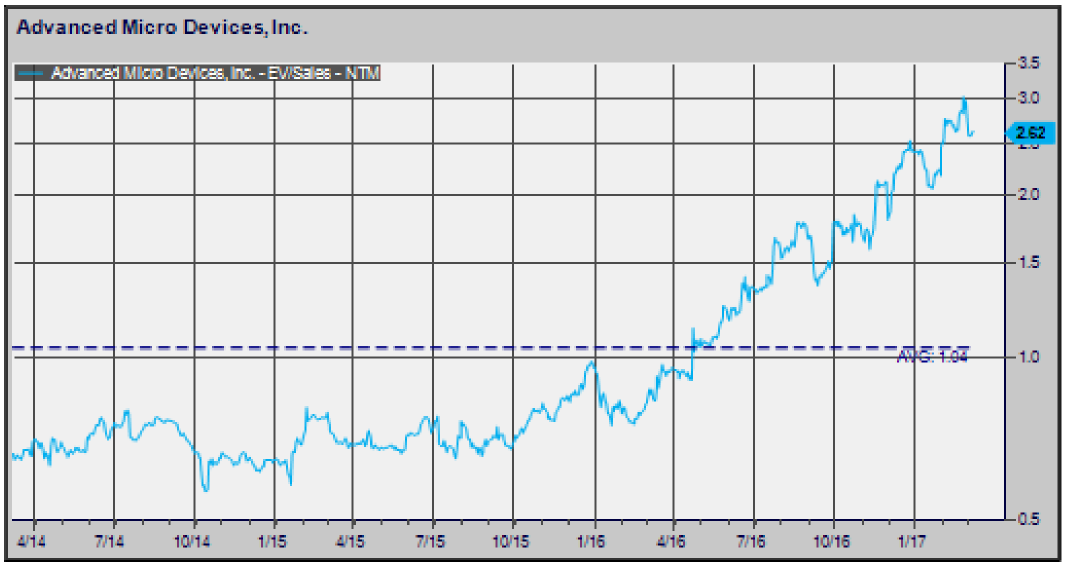
We believe our and Street models largely capture the console business prospects this year.

AMD had a strong year in the 2016 console business driven by Sony's PS4 refresh, and we expect tailwinds in 2017 driven by an Xbox refresh. We believe our and Street models largely capture the console business prospects this year. On the PC graphics front, AMD regained share in both desktop and notebook segments in 2016, exiting the year with 28% unit share in desktop and 34% unit share in notebook. The company's upcoming Vega products could help boost ASPs, and we won't be surprised to see some share gains. That said, NVDA's Pascal gaming portfolio looks compelling and gaining share in the high-end gaming might prove difficult. We are a bit more optimistic about AMD's prospects in gaming given that the pie is expanding as opposed to PC CPUs where it's a zero sum game. AMD's GPU products are well suited for machine learning and automotive applications. However, the company's lack of investments in software will likely limit its opportunities in this fast growing market in the near term. Management also highlighted a third semi-custom design win, which is expected to ramp sometime in 2017. We are modeling some revenue contribution and do not believe this win will drive meaningful upside to our estimates.

Valuation, recommendation, risks

AMD is trading at 2.7x EV/S on CY17E, which is more than a 100% premium to its historic average. We believe a premium to the historic average is justified given the stronger balance sheet and improving growth prospects. On a PE basis, the stock is at 45x our CY18 EPS. Needless to say, valuation is implying significant upside potential to estimates. Near-term estimates appear reasonable to us, and we expect some upside driven by share gains as well as channel fill. AMD's new products are in the early stages and we believe the stock could continue to get the benefit of the doubt for another 1 – 2 quarters as long as the company is meeting or beating estimates. As such, while we believe longer term expectations are too optimistic, we see limited downside in the near term and are initiating with a Neutral and $14 PT.

Fig 5 Historical EV/Sales



Source: FactSet, Macquarie Capital (USA), March 2017

Macquarie vs consensus

Fig 6 Our revenue estimates are mostly in line with consensus

AMD	17E	18E	19E
MQ/Consensus (Rev %)	0.7	0.2	1.0
MQ/Consensus (EPS %)	6.1	9.0	4.8

Source: FactSet, Macquarie Capital (USA), March 2017

AMD
Income Statement

(FYE Dec / $mil)	Q116	Q216	Q316	Q416	Q117E	Q217E	2016	2017E	2018E	2019E
Revenues	832	1,027	1,307	1,106	987	1,148	**4,272**	**4,758**	**5,211**	**5,489**
Cost of Sales	563	708	1,248	755	664	772	**3,274**	**3,193**	**3,407**	**3,552**
Gross Profit	269	319	59	351	323	376	**998**	**1,565**	**1,805**	**1,937**
Operating Expenses	337	327	352	354	361	371	**1,370**	**1,483**	**1,509**	**1,552**
R&D	242	243	259	264	267	264	**1,008**	**1,055**	**1,057**	**1,073**
SG&A	105	117	117	121	120	122	**460**	**489**	**497**	**519**
Other charges incl. options	(10)	(33)	(24)	(31)	(25)	(15)	**(98)**	**(60)**	**(45)**	**(40)**
Op Income	(68)	(8)	(293)	(3)	(39)	5	**(372)**	**82**	**295**	**386**
Non-op Inc (Exp)	(40)	109	(104)	(41)	(28)	(28)	**(76)**	**(112)**	**(112)**	**(112)**
Pretax Income	(108)	101	(397)	(44)	(67)	(23)	**(448)**	**(30)**	**183**	**274**
Provision for Taxes	1	29	4	5	2	2	**39**	**8**	**8**	**8**
Effective Tax Rate	-1%	29%	-1%	-11%	-3%	-9%	**-9%**	**-27%**	**4%**	**3%**
Equity in net income (loss) of investee	-	-	-	-	-	-	-	-	-	-
Discontinued operations (net)	-	-	-	-	-	-	-	-	-	-
Net Income (GAAP)	(109)	69	(406)	(51)	(71)	(27)	**(497)**	**(46)**	**167**	**258**
One-time charges	13	(109)	433	43	31	31	**380**	**124**	**124**	**124**
Net Income (Proforma)	(96)	(40)	27	(8)	(40)	4	**(117)**	**78**	**291**	**382**
EPS (GAAP)	(0.14)	0.08	(0.50)	(0.05)	(0.08)	(0.03)	**(0.60)**	**(0.05)**	**0.18**	**0.27**
EPS (Non-GAAP)	(0.12)	(0.05)	0.03	(0.01)	(0.04)	0.00	**(0.15)**	**0.08**	**0.30**	**0.40**
Free cash flow per share	(0.09)	(0.13)	0.02	0.18	(0.01)	(0.01)	**0.02**	**0.10**	**0.33**	**0.43**
Diluted Shares (Proforma)	793	821	828	931	933	948	**833**	**946**	**957**	**965**
% of Revenues										
Gross Profit	32.3%	31.1%	4.5%	31.7%	32.7%	32.8%	**23.4%**	**32.9%**	**34.6%**	**35.3%**
Operating Expenses	40.5%	31.8%	26.9%	32.0%	36.6%	32.3%	**32.1%**	**31.2%**	**29.0%**	**28.3%**
R&D	29.1%	23.7%	19.8%	23.9%	27.0%	23.0%	**23.6%**	**22.2%**	**20.3%**	**19.5%**
SG&A	12.6%	11.4%	9.0%	10.9%	12.1%	10.6%	**10.8%**	**10.3%**	**9.5%**	**9.4%**
Operating Income	-8.2%	-0.8%	-22.4%	-0.3%	-3.9%	0.4%	**-8.7%**	**1.7%**	**5.7%**	**7.0%**
Pretax Income	-13.0%	9.8%	-30.4%	-4.0%	-6.8%	-2.0%	**-10.5%**	**-0.6%**	**3.5%**	**5.0%**
Net Income (GAAP)	-13.1%	6.7%	-31.1%	-4.6%	-7.2%	-2.4%	**-11.6%**	**-1.0%**	**3.2%**	**4.7%**
Net Income (Proforma)	-11.5%	-3.9%	2.1%	-0.7%	-4.0%	0.3%	**-2.7%**	**1.6%**	**5.6%**	**7.0%**
YoY Change										
Revenue	-19%	9%	23%	15%	19%	12%	**7%**	**11%**	**10%**	**5%**
Gross Profit	-17%	38%	-75%	24%	20%	18%	**-8%**	**57%**	**15%**	**7%**
Operating Income	NM	NM	NM	NM	NM	NM	**NM**	**NM**	**261%**	**31%**
Pretax Income	NM	NM	NM	NM	NM	NM	**NM**	**NM**	**NM**	**49%**
Net Income (GAAP)	NM	NM	NM	NM	NM	-139%	**NM**	**NM**	**NM**	**54%**
Net Income (Proforma)	NM	NM	NM	NM	NM	NM	**NM**	**NM**	**274%**	**31%**
QoQ Change										
Revenue	-13%	23%	27%	-15%	-11%	16%				
Gross Profit	-5%	19%	-82%	495%	-8%	17%				
Operating Income	NM	NM	NM	NM	NM	NM				
Pretax Income	NM	NM	NM	NM	NM	NM				
Net Income (GAAP)	NM	NM	NM	NM	NM	NM				
Net Income (Proforma)	NM	NM	NM	NM	NM	NM				

Source: Company data, FactSet, Macquarie Capital (USA), March 2017

AMD Balance Sheet (FYE Dec / $mil)	Q415	Q116	Q216	Q316	Q416	15A	16A
Assets							
Current Assets	2,320	2,226	2,506	2,824	2,530	**2,320**	**2,530**
Cash and Equivalents	785	716	957	1,258	1,264	**785**	**1,264**
Short term investments	-	-	-	-	-	**-**	**-**
A/R, Net	533	508	671	640	311	**533**	**311**
Inventories/Net	678	675	743	772	751	**678**	**751**
Deferred Income Taxes	-	-	-	-	-	**-**	**-**
Other Current Assets	324	327	135	154	204	**324**	**204**
Non-Current Assets	764	755	810	792	791	**764**	**791**
Plant/Equipment, Net	188	176	169	161	164	**188**	**164**
Long-term marketable securities	-	-	-	-	-		
Investment in GLOBALFOUNDRIES	-	-	-	-	-		
Intangible Assets	278	278	289	289	289	**278**	**289**
Other Assets	298	301	290	282	279	**298**	**279**
Total Assets	3,084	2,981	3,316	3,616	3,321	**3,084**	**3,321**
Liabilities/Equity							
Current Liabilities	1,403	1,328	1,581	1,473	1,346	**1,403**	**1,346**
Short-term Debt	230	230	226	-	-	**230**	**-**
Accounts Payables	279	324	616	582	440	**279**	**440**
Accounts Payable to GLOBALFOUNDRIES	245	233	94	284	255		
Accrued Compensation & Benefits	-	-	-	-	-	**-**	**-**
Accrued Liabilities & Restructuring Accruals	596	498	453	409	460	**596**	**460**
Deferred Inc on Shipments to Distribution	53	43	42	54	63	**53**	**63**
Current portion of LT Liabilities	-	-	-	-	-	**-**	**-**
Income Tax Payable & Other	-	-	-	-	-	**-**	**-**
Long-Term Liabilities	2,093	2,156	2,148	1,758	1,559	**2,093**	**1,559**
Long Term Debt	2,007	2,006	2,012	1,632	1,435	**2,007**	**1,435**
Deferred Tax Liabilities	86	150	136	126	124	**86**	**124**
Total Liabilities	3,496	3,484	3,729	3,231	2,905	**3,496**	**2,905**
Stockholders' Equity	(412)	(503)	(413)	385	416	**(412)**	**416**
Total Liabilities & Stockholders' Equity	3,084	2,981	3,316	3,616	3,321	**3,084**	**3,321**

Source: Company data, FactSet, Macquarie Capital (USA), March 2017

AMD

Ratio Analysis	Q415	Q116	Q216	Q316	Q416	15A	16A
Profitability Analysis							
Return on Assets (Pretax)	-6.2%	-9.0%	-1.0%	-33.8%	-0.3%	**-7.9%**	**-9.0%**
Return on Equity (Aftertax)*	84.5%	83.9%	34.9%	-771.4%	-8.0%	**372.4%**	**-5850.0%**
Return on Invested Capital (Pretax)*	-28.6%	-37.3%	-15.7%	11.2%	-4.0%	**-34.9%**	**-13.3%**
Cash Conversion Cycle (Days)	71	74	63	37	32	**67**	**32**
DSOs	50	55	59	44	25	**48**	**26**
Days of Inventory	90	108	94	56	90	**84**	**83**
Days Payables Outstanding	70	89	90	62	83	**65**	**76**
Liquidity Analysis							
Current Ratio	1.7x	1.7x	1.6x	1.9x	1.9x	**1.7x**	**1.9x**
Quick Ratio	0.9x	0.9x	1.0x	1.3x	1.2x	**0.9x**	**1.2x**
Debt/Solvency Analysis							
Debt/Total Capital	122.6%	129.0%	122.6%	80.9%	77.5%	**122.6%**	**77.5%**
Debt/Equity	-543.0%	-444.5%	-541.9%	423.9%	345.0%	**-543.0%**	**345.0%**
Asset Values							
Book Value/Share	$ (0.52)	$ (0.63)	$ (0.50)	$ 0.47	$ 0.45	**$ (0.53)**	**$ 0.50**
Tangible Book Value/Share	$ (0.87)	$ (0.98)	$ (0.86)	$ 0.12	$ 0.14	**$ (0.88)**	**$ 0.15**
Total Cash & Equiv/Share	$ 0.99	$ 0.90	$ 1.17	$ 1.54	$ 1.36	**$ 1.00**	**$ 1.52**
Net Cash/Share	$ (1.84)	$ (1.92)	$ (1.56)	$ (0.46)	$ (0.18)	**$ (1.85)**	**$ (0.21)**
Other ($mil)							
Capital Spending	32	26	21	9	21	**96**	**77**
Depreciation and Amortization	34	33	33	33	34	**167**	**133**

*Based on proforma net income

Source: Company data, FactSet, Macquarie Capital (USA), March 2017

Companies Mentioned:

Intel (INTC US, US$35.60, Outperform, TP: US$40.00)

NVIDIA (NVDA US, US$107.69, Neutral, TP: US$110.00)

Sony (6758 JP, ¥3,605, Outperform, TP: ¥4,250, Damian Thong)

Microsoft (MSFT US, US$65.10, Neutral, TP: US$63.00, Sarah Hindlian)

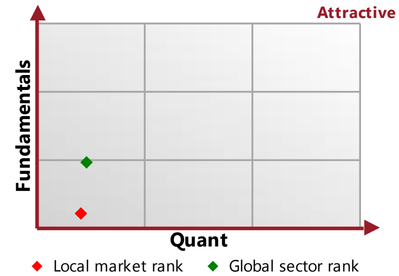
Macquarie Quant View

The quant model currently holds a strong negative view on Advanced Micro Devices. The strongest style exposure is Price Momentum, indicating this stock has had strong medium to long term returns which often persist into the future. The weakest style exposure is Valuations, indicating this stock is over-priced in the market relative to its peers.

303/357

Global rank in Semiconductors & Semiconductor Equip.

% of BUY recommendations	38% (11/29)
Number of Price Target downgrades	0
Number of Price Target upgrades	3

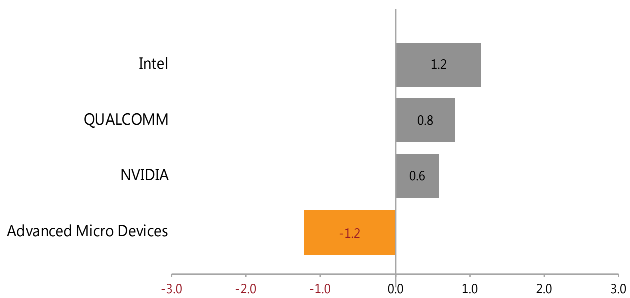


Displays where the company's ranked based on the fundamental consensus Price Target and Macquarie's Quantitative Alpha model.

Two rankings: Local market (United States) and Global sector (Semiconductors & Semiconductor Equip.)

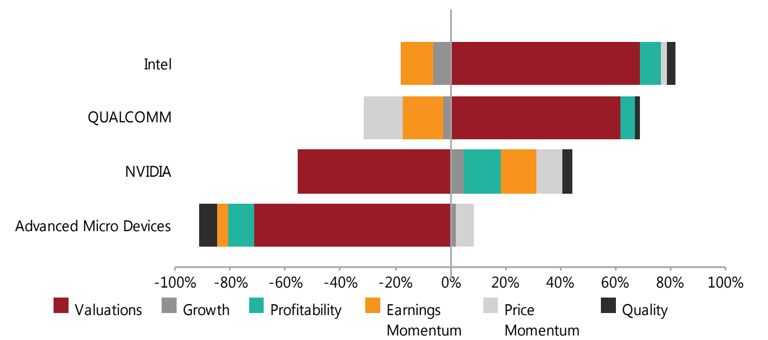
Macquarie Alpha Model ranking

A list of comparable companies and their Macquarie Alpha model score (higher is better).



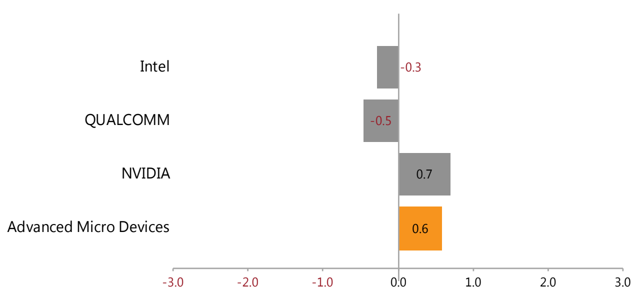
Factors driving the Alpha Model

For the comparable firms this chart shows the key underlying styles and their contribution to the current overall Alpha score.



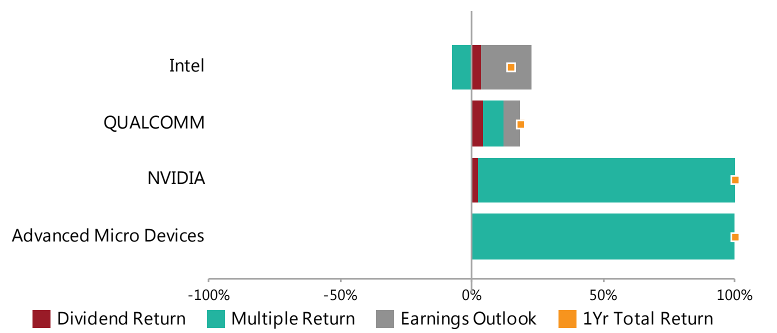
Macquarie Earnings Sentiment Indicator

The Macquarie Sentiment Indicator is an enhanced earnings revisions signal that favours analysts who have more timely and higher conviction revisions. Current score shown below.



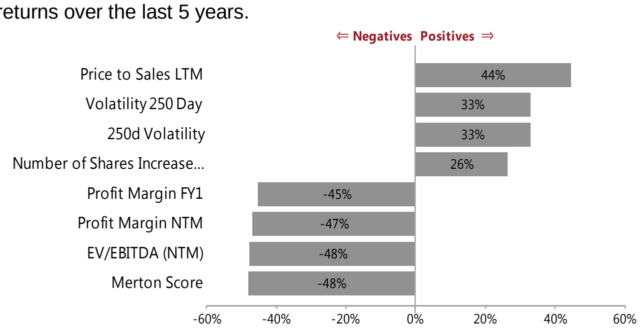
Drivers of Stock Return

Breakdown of 1 year total return (local currency) into returns from dividends, changes in forward earnings estimates and the resulting change in earnings multiple.



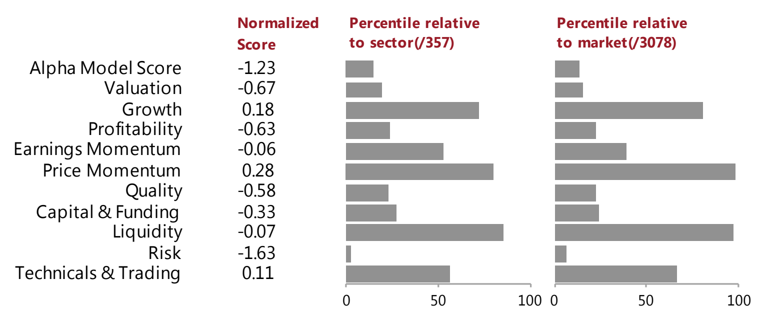
What drove this Company in the last 5 years

Which factor score has had the greatest correlation with the company's returns over the last 5 years.



How it looks on the Alpha model

A more granular view of the underlying style scores that drive the alpha (higher is better) and the percentile rank relative to the sector and market.



Source (all charts): FactSet, Thomson Reuters, and Macquarie Research. For more details on the Macquarie Alpha model or for more customised analysis and screens, please contact the Macquarie Global Quantitative/Custom Products Group (cpg@macquarie.com)

UNITED STATES

NVDA US Neutral

Price (at CLOSE#, 28 Mar 2017) US$107.69

Valuation - PER	**US$**	**110.00**
12-month target	**US$**	**110.00**
12-month TSR	**%**	**+2.6**
GICS sector Semiconductors & Semiconductor Equipment		
Market cap	**US$m**	**63,429**
30-day avg turnover	**US$m**	**1,622.8**
Number shares on issue	**m**	**589.0**

Investment fundamentals

Year end 31 Jan		2017A	2018E	2019E	2020E
Revenue	m	6,910	8,019	8,866	10,002
EBIT	m	2,138	2,528	2,882	3,533
CFPS	US$	3.41	3.66	4.16	5.04
CFPS growth	%	69.4	7.1	13.9	21.0
PGCFPS	x	31.6	29.5	25.9	21.4
EPS adj	US$	3.06	3.36	3.87	4.74
EPS adj growth	%	84.4	9.6	15.2	22.6
PER adj	x	35.2	32.1	27.9	22.7
Total DPS	US$	0.46	0.46	0.46	0.46
Total div yield	%	0.4	0.4	0.4	0.4
EV/EBITDA	x	29.4	25.3	22.4	18.5

Source: FactSet, Macquarie Capital (USA), March 2017
(all figures in USD unless noted)

Analyst(s)
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30 March 2017
Macquarie Capital (USA) Inc.

NVIDIA

Wait for a better entry

Initiating with Neutral and $110 PT

We believe NVIDIA is the best secular growth story in large-cap semis given its leadership position in high-growth markets including gaming, artificial intelligence/ machine learning, and autonomous cars. Margin execution and cash returns have also been solid. While the company's longer-term prospects are promising, near-term upside to estimates appears limited, particularly in gaming and automotive markets. New product (Pascal) ramps, which boosted the ASPs significantly in 2H17, are behind us and we see limited ASP growth this year. While the Intel/ Mobileye deal highlights the value of NVDA's auto business, meaningful revenues from autonomous driving are a couple of years away. At 32x CY17 Non-GAAP PE (30x EV/FCF), valuation is at ~85% premium to large cap semis. We believe this is justified given the secular growth potential and margin execution.

Gaming drivers intact but limited upside until "Volta" ramps

Gaming accounts for 60% of sales and grew 44% in CY16. The growing popularity of e-sports, emergence of 4K/virtual reality, and most importantly, a significant upgrade cycle driven by the company's new Pascal product have all contributed. We estimate that ASPs improved ~50% in CY16 due to Pascal. While we expect the gaming segment to grow at a double-digit pace this year, we see limited upside to estimates until the company's Volta-based products ramp in volume in 2018. AMD's upcoming new product (Vega) could also limit NVDA's pricing power this year.

AI & Machine Learning in early innings

Artificial intelligence (AI) has been a boon for NVDA's Tesla product line. This segment grew 144% in 2016, driven by rapid adoption of GPU-based neural networks training at hyperscale (Google, FB, Alibaba) as well as public cloud (AWS, Microsoft) customers. While competition from Intel, Xilinx, and start-ups is likely to intensify, NVDA has significant performance and software compatibility advantages on the training side of deep learning. According to Intel, less than 3% of servers in 2016 ran deep learning workloads, with GPUs accounting for a mere 7% share, suggesting that NVDA has plenty of growth opportunities ahead.

Auto to take a breather this year before reaccelerating in 2H18

The auto segment accounts for 6% sales and grew 52% in CY16, driven primarily by infotainment & digital cockpit applications. We expect infotainment to flatten out, as the company appears to have mostly ramped its design wins. NVDA has limited exposure to ADAS but is an early leader in autonomous cars. The company's Drive PX self-driving platform is currently shipping to Tesla Motors. While Tesla Model 3 should help, wider adoption of self-driving technology could take a couple of years.

Solid margin execution and cash returns

The company's gross margins expanded more than 300bps and operating margin expanded by nearly 1200bps in the last two years. We expect margins to remain relatively flat this year due to the conclusion of Intel payments and higher opex spending. Dividends and buybacks accounted for an average of ~90% of free cash flow in the past three years, which should sustain given the strong free cash flow generation. At 30x CY17E EV/FCF, valuation is at a premium but we believe is justified given the strong secular growth and margin execution.

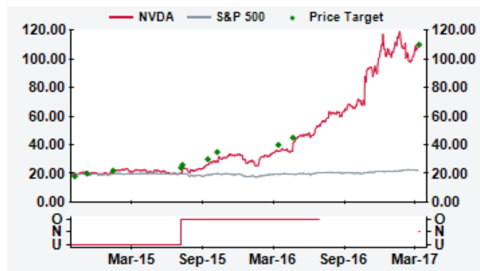
Inside

NVIDIA

Company profile

- NVIDIA Corp. designs and manufactures computer graphics processors, chipsets, and related multimedia software. The company operates through two segments: Graphics Processing Unit and Tegra Processor.
- The Graphics Processing Unit segment includes sales of the company's GeForce discrete and chipset products that supports desktop and notebook PCs plus license fees from Intel and sales of memory products.
- The Tegra Processors segment provides processors that deliver superior visual and multimedia experience on tablets, smart phones and gaming devices while consuming minimal power.
- NVIDIA was founded by Jen-Hsun Huang, Chris A. Malachowsky and Curtis R. Priem in January 1993 and is headquartered in Santa Clara, CA.

Fig 1 NVDA US vs S&P 500, & rec history



Note: Recommendation timeline - if not a continuous line, then there was no Macquarie coverage at the time or there was an embargo period.

Source: FactSet, Macquarie Capital (USA), March 2017

(all figures in USD unless noted)

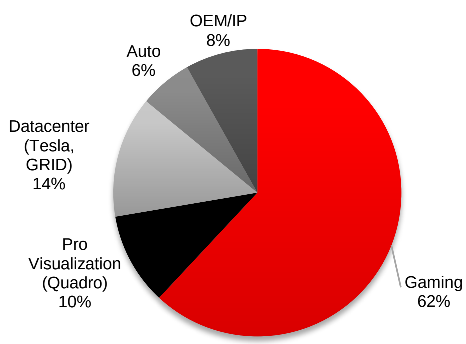
Wait for a better entry

Initiating with Neutral

Near term upside to estimates appears limited in gaming and automotive markets

We believe NVIDIA is the best secular growth story in large cap Semis given its leadership position in multiple high-growth markets including gaming, virtual reality, data center acceleration, and autonomous cars. Margin execution and cash returns have also been among the best in the industry. The stock is trading at a ~50% premium to three-year PE average and ~85% premium to large cap peers. We believe the premium is justified, given the secular growth and margin execution. However, near-term upside to estimates appears limited in gaming and automotive markets, which we believe will keep the stock in a range. As such, we remain on the sidelines and wait for a better entry point. Our 2017 estimates are largely in line with consensus.

Fig 2 Sales by segment (Dec-16Q)



Source: Company data, Macquarie Capital (USA), March 2017

Fig 3 Estimates Summary*

	CY16A	CY17E	CY18E
Revenue (US$m)	6910	8019	8866
YoY change (%)	37.9%	16.0%	10.6%
Gross margin (%)	59%	59%	59%
Operating margin (%)	32%	32%	33%
Non-GAAP EPS (US$)	3.10	3.36	3.87
PE (X) @US$107.69	34.8	32.1	27.9
EV/FCF @US$107.69	41.4	29.9	28.4

**Since NVDA's FY ends in Jan, we assume FY17 as CY16, FY18 as CY17, and FY19 as CY18*

Source: Company data, Macquarie Capital (USA), March 2017

Gaming drivers intact but limited upside until "Volta" ramps

We estimate that gaming ASPs improved ~50% in 2016

Gaming accounts for ~60% of sales and grew 44% in CY16 ,driven by growing popularity of e-sports, emergence of 4K/virtual reality, and most importantly, a significant upgrade cycle driven by the company's Pascal architecture. We estimate that ASPs improved more than 50% in 2016, due primarily to Pascal and consumer enthusiasm for higher performance. The company announced additional new products this year based on the Pascal architecture, and we expect ASP tailwinds to continue. We also expect Nintendo's newly launched Switch console to help to some extent. On the other hand, competition is expected to heat up with AMD's upcoming Vega product, which could limit NVDA's pricing power. Products based on NVDA's next new architecture, Volta, are expected to ship this year but mainly for HPC applications. We believe Volta-based gaming product will be available in 2018. As such, we expect ASP tailwinds to moderate this year before reaccelerating next year.

Fig 4 Pascal based GPU products

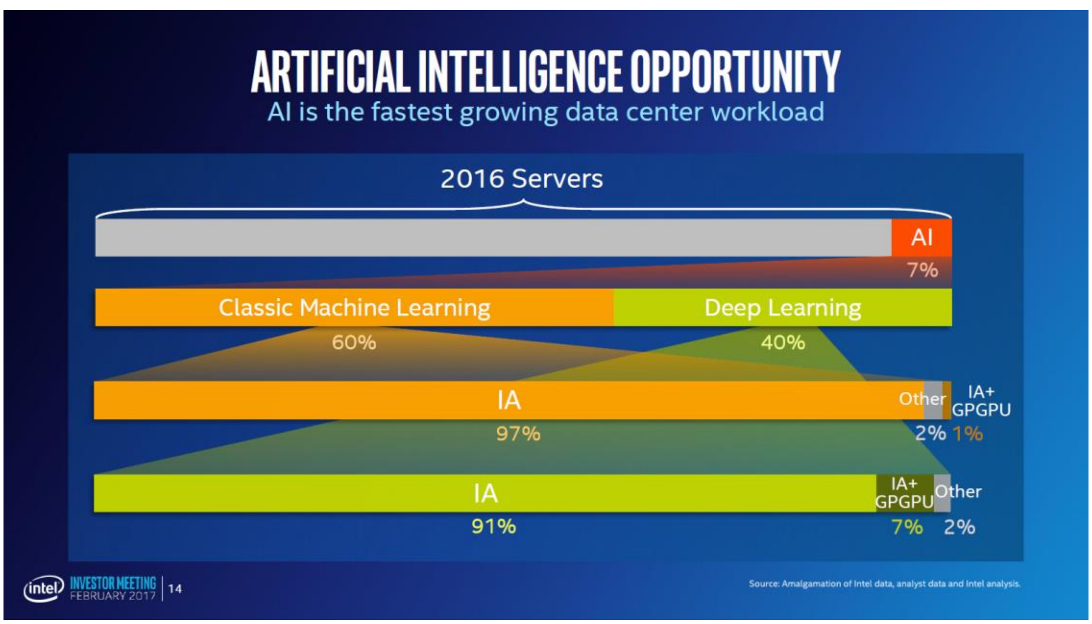
Graphics Card Name	GeForce GTX 1050	GeForce GTX 1050 Ti	GeForce GTX 1060 3 GB	GeForce GTX 1060 3 GB	GeForce GTX 1060 6 GB	GeForce GTX 1070	GeForce GTX 1080	GeForce GTX 1080 Ti	Titan X
Graphics Core	GP107	GP107	GP106	GP104	GP106	GP104	GP104	GP102	GP102
Process Node	14nm	14nm	16nm	16nm	16nm	16nm	16nm	16nm	16nm
Die Size	132mm2	132mm2	200mm2	314mm2	200mm2	314mm2	314mm2	471mm2	471mm2
Transistors	3.3 Billion	3.3 Billion	4.4 Billion	7.2 Billion	4.4 Billion	7.2 Billion	7.2 Billion	12 Billion	12 Billion
CUDA Cores	640	768	1152	1152	1280	1920	2560	3584	3584
FP32 Compute	1.8 TFLOPs	2.1 TFLOPs	4.0 TFLOPs	4.0 TFLOPs	4.4 TFLOPs	6.5 TFLOPs	9.0 TFLOPs	11.5 TFLOPs	11 TFLOPs
VRAM	2 GB GDDR5	4 GB GDDR5	3 GB GDDR5	3 GB GDDR5	6 GB GDDR5	8 GB GDDR5	8 GB GDDR5X	11 GB GDDR5X	12 GB GDDR5X
Bus Interface	128-bit bus	128-bit bus	192-bit bus	192-bit bus	192-bit bus	256-bit bus	256-bit bus	352-bit bus	384-bit bus
TDP	75W	75W	120W	120W	120W	150W	180W	250W	250W
Launch Date	Oct-16	Oct-16	Sep-16	N/A	13th July 2016	10th June 2016	27th May 2016	10th March 2017	2nd August 2016
Launch Price	$109 US	$139 US	$199 US	$199 US	$249 US	$349 US	$499 US	$699 US	$1200 US

Source: Company data, Macquarie Capital (USA), March 2017

AI & Machine Learning in very early innings

Artificial Intelligence and machine learning have been a boon for NVDA's higher margin Tesla product line. This segment grew 144% in 2016, driven primarily by rapid adoption of GPU based neural network training at hyperscale (Google, FB, Alibaba) and public cloud (AWS, Microsoft) customers. While competition from Intel, Xilinx, and start-ups is likely to intensify, NVDA has significant performance and software compatibility advantages on the training side of deep learning, which should help sustain the momentum. According to Intel, less than 3% of servers in 2016 ran deep learning workloads, with GPUs accounting for a mere 7% share of that, suggesting that NVDA has plenty of growth opportunities in this market.

Fig 5 AI workloads and processor usage



Source: Intel, Macquarie Capital (USA), March 2017

Auto to take a breather this year before reaccelerating in 2H18

We estimate the Drive PX opportunity at around $30m to $75m from Tesla Model 3 in 2018.

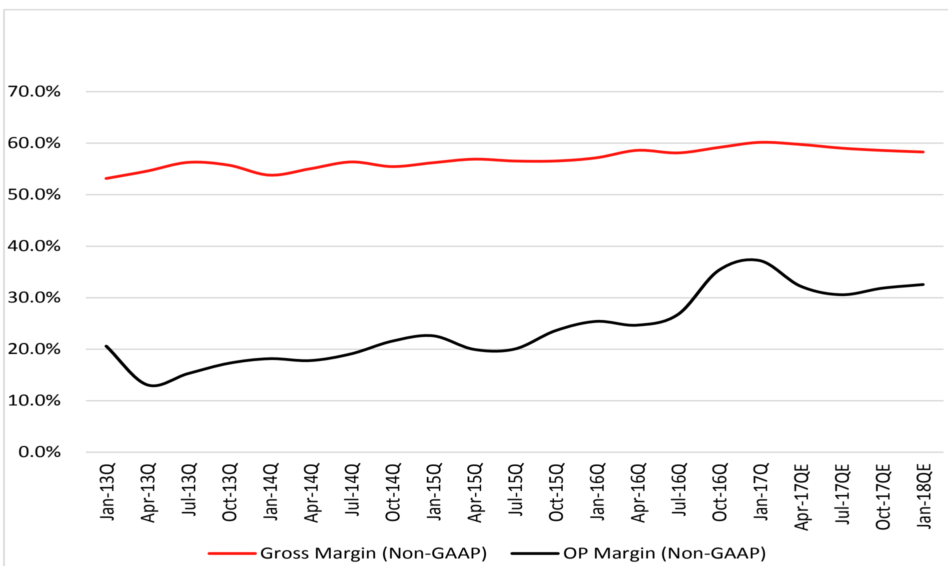
The automotive segment accounts for 6% sales and grew 52% in CY16, driven primarily by infotainment applications and digital cockpits. The company is also the early leader in autonomous cars and its Drive PX2 platform is currently shipping to Tesla Motors. Tesla Model 3 should help later this year and in 2018 as we estimate NVDA has about $100-$150 in every Tesla vehicle. Tesla built about 25k vehicles in the Dec-16Q, suggesting that the contribution to NVDA is running at about $3m/qtr currently. Tesla expects Model 3 production to begin in July and expects production to exceed 5k vehicles/week in late 2017, and to 10k vehicles/week in 2018. Adding it all up, we estimate the Drive PX opportunity at Tesla at around $30m to $75m from Model 3 in 2018. The company also announced design wins at Audi, Volvo, Bosch, and ZF. That said, wider adoption of self-driving technology could take a couple of years. As such, we expect automotive segment growth to flatten out before accelerating again in 2H18. Longer term, we see significant opportunity for dollar content increase as new functions are being implemented.

Solid margin execution and cash returns

NVDA's non-GAAP gross margins expanded by 300bps and operating margin by 1200bps, primarily due to growth in higher-margin data center products as well as manufacturing execution. We expect gross and operating margins to remain relatively flat due to the conclusion of Intel payments and higher opex spending in new markets.

The company has returned an average of 93% free cash flow over the last three years, which on an absolute level should comfortably sustain given the strong free cash flow generation. At 30x CY17E EV/FCF, valuation is at a premium but we believe is justified given the strong growth and margin execution.

Fig 5 Gross and Operating Margins



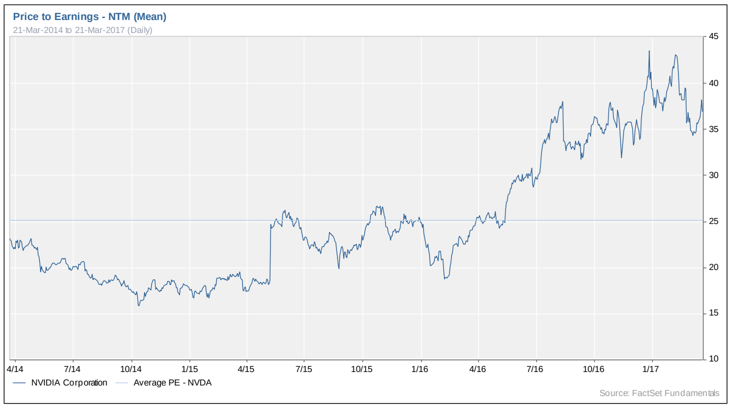
Source: Company reports, Macquarie Capital (USA), March 2017

Valuation, recommendation, risks

Neutral and $110 price target

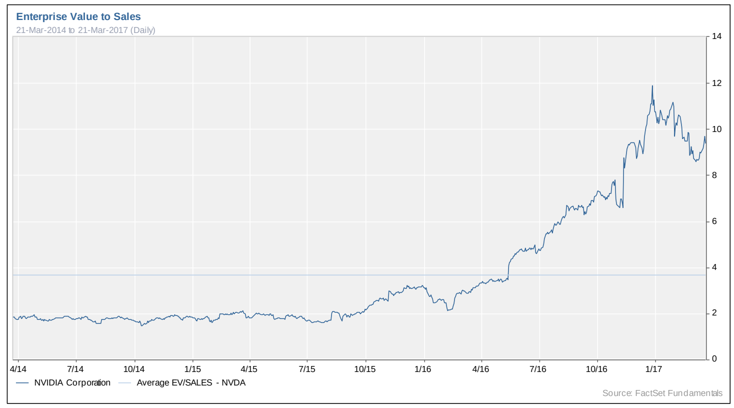
We are initiating coverage with Neutral rating and a $110 price target. On a GAAP basis, the stock is trading at 37x our CY17 estimates, which is about a 50% premium to three-year average. On a non-GAAP basis, the stock is at 32x PE, which is an 85% premium to large cap semis. We believe premium valuation is justified given the strong secular growth prospects and margin execution. However, we expect the stock to be range bound in the near term, given our view that upside to estimates is limited in the next few quarters.

Fig 6 NVDA Historical PE (GAAP)



Source: Company data, Macquarie Capital (USA), March 2017

Fig 7 NVDA EV/Sales



Source: Company data, Macquarie Capital (USA), March 2017

Macquarie vs consensus

Fig 8 We are broadly in line with near-term consensus

NVDA	CY17E	CY18E	CY19E
MQ/Consensus (Rev %)	-0.3	-1.8	-2.8
MQ/Consensus (EPS non-GAAP %)	-0.1	-1.4	-2.5

Source: FactSet, Macquarie Capital (USA), March 2017

Nvidia
Income Statement

($million/%)	1FQ17 Apr-16Q	2FQ17 Jul-16Q	3FQ17 Oct-16Q	4FQ17 Jan-17Q	1FQ18 Apr-17QE	2FQ18 Jul-17QE	CY15 FY16	CY16 FY17	CY17E FY18E	CY18E FY19E	CY19E FY20E
Revenues	1,305.0	1,428.0	2,004.0	2,173.0	1,909.1	1,893.0	**5,010.0**	**6,910.0**	**8,018.9**	**8,866.3**	**10,002.4**
Cost of Sales	540.0	598.0	818.0	865.6	768.1	775.2	**2,164.0**	**2,821.6**	**3,295.4**	**3,674.1**	**4,071.6**
Gross Profit	765.0	830.0	1,186.0	1,307.5	1,141.0	1,117.8	**2,846.0**	**4,088.5**	**4,723.5**	**5,192.1**	**5,930.8**
Operating Expenses	443.0	448.0	478.0	498.6	525.2	538.8	**1,721.0**	**1,867.6**	**2,170.4**	**2,274.7**	**2,361.4**
R&D	317.0	320.0	338.0	353.6	371.3	382.4	**1,217.0**	**1,328.6**	**1,537.7**	**1,606.8**	**1,654.9**
SG&A	139.0	133.0	144.0	149.0	155.0	160.4	**526.0**	**565.0**	**645.7**	**680.8**	**722.5**
Other	(13.0)	(5.0)	(4.0)	(4.0)	(1.0)	(4.0)	**(22.0)**	**(26.0)**	**(13.0)**	**(13.0)**	**(16.0)**
Operating Income	322.0	382.0	708.0	808.9	615.7	579.0	**1,125.0**	**2,220.9**	**2,553.1**	**2,917.5**	**3,569.5**
Non Operating	0.0	7.0	3.0	2.0	(4.0)	(4.0)	**17.0**	**12.0**	**(16.0)**	**7.0**	**16.0**
Pretax Income	322.0	389.0	711.0	810.9	611.7	575.0	**1,142.0**	**2,232.9**	**2,537.1**	**2,924.5**	**3,585.5**
Provision for Taxes	59.0	76.0	141.0	107.0	104.0	97.8	**213.0**	**383.0**	**431.3**	**497.2**	**609.5**
Effective Tax Rate	18.3%	19.5%	19.8%	13.2%	17.0%	17.0%	**18.7%**	**17.2%**	**17.0%**	**17.0%**	**17.0%**
Net Income (non-GAAP)	263.0	313.0	570.0	703.9	507.7	477.3	**929.0**	**1,849.9**	**2,105.8**	**2,427.3**	**2,975.9**
Non-GAAP EPS	**$0.46**	**$0.53**	**$0.94**	**$1.13**	**$0.81**	**$0.76**	**$1.67**	**$3.10**	**$3.36**	**$3.87**	**$4.74**
GAAP EPS	**$0.33**	**$0.40**	**$0.83**	**$0.99**	**$0.65**	**$0.61**	**$1.08**	**$2.62**	**$2.71**	**$3.19**	**$4.01**
FCF/Share	$0.43	$0.24	$0.64	$1.02	$0.95	$0.73	**$1.91**	**$2.35**	**$3.11**	**$3.32**	**$4.11**
Shares Outstanding	568.0	588.0	608.0	624.0	626.0	628.0	**556.0**	**597.0**	**627.5**	**628.0**	**628.0**
%Sales											
Gross Profit	58.6%	58.1%	59.2%	60.2%	59.8%	59.1%	**56.8%**	**59.2%**	**59%**	**59%**	**59%**
Operating Expenses	33.9%	31.4%	23.9%	22.9%	27.5%	28.5%	**34.4%**	**27.0%**	**27%**	**26%**	**24%**
R&D	24.3%	22.4%	16.9%	16.3%	19.4%	20.2%	**24.3%**	**19.2%**	**19%**	**18%**	**17%**
SG&A	10.7%	9.3%	7.2%	6.9%	8.1%	8.5%	**10.5%**	**8.2%**	**8%**	**8%**	**7%**
Operating Income	24.7%	26.8%	35.3%	37.2%	32.3%	30.6%	**22.5%**	**32.1%**	**32%**	**33%**	**36%**
Net Income	20.2%	21.9%	28.4%	32.4%	26.6%	25.2%	**18.5%**	**26.8%**	**26%**	**27%**	**30%**
%YoY											
Revenues	13%	24%	54%	55%	46%	33%	**7%**	**38%**	**16%**	**11%**	**13%**
Gross Profit	17%	27%	61%	63%	49%	35%	**9%**	**44%**	**16%**	**10%**	**14%**
Operating Expenses	4%	6%	11%	12%	19%	20%	**4%**	**9%**	**16%**	**5%**	**4%**
Operating Income	40%	65%	130%	127%	91%	52%	**18%**	**97%**	**15%**	**14%**	**22%**
Net Income	41%	65%	124%	137%	93%	52%	**16%**	**99%**	**14%**	**15%**	**23%**
%QoQ											
Revenues	-7%	9%	40%	8%	-12%	-1%					
Gross Profit	-4%	8%	43%	10%	-13%	-2%					
Operating Expenses	0%	1%	7%	4%	5%	3%					
Operating Income	-10%	19%	85%	14%	-24%	-6%					
Net Income	-11%	19%	82%	23%	-28%	-6%					

Source: Company data, FactSet, Macquarie Capital (USA), March 2017

Since NVDA's FY ends in Jan, we assume FY17 as CY16, FY18 as CY17, and FY19 as CY18

Nvidia

Balance Sheet

($millions)	1FQ17 **Apr-16Q**	2FQ17 **Jul-16Q**	3FQ17 **Oct-16Q**	4FQ17 **Jan-17Q**	**CY15** **FY16**	**CY16E** **FY17**
Assets						
Current assets	5,790.0	6,156.0	8,307.0	8,536.0	**6,053.0**	**8,536.0**
Cash and cash equivalents	547.0	426.0	1,940.0	1,766.0	**596.0**	**1,766.0**
Marketable securities	4,207.0	4,453.0	4,731.0	5,032.0	**4,441.0**	**5,032.0**
Accounts receivable, net	523.0	644.0	833.0	826.0	**505.0**	**826.0**
Inventories	394.0	521.0	679.0	794.0	**418.0**	**794.0**
Prepaid expenses and other	119.0	112.0	124.0	118.0	**41.0**	**118.0**
Deferred income taxes	0.0	0.0	0.0	0.0	**52.0**	**0.0**
Non-current assets						
Property and equipment, net	479.0	485.0	503.0	521.0	**466.0**	**521.0**
Goodwill	618.0	618.0	618.0	618.0	**618.0**	**618.0**
Intangible assets, net	155.0	138.0	120.0	104.0	**166.0**	**104.0**
Deposits and other assets	66.0	64.0	64.0	62.0	**67.0**	**62.0**
Total assets	**7,108.0**	**7,461.0**	**9,612.0**	**9,841.0**	**7,370.0**	**9,841.0**
Liabilities and Stockholders' Equity						
Current liabilities	2,377.0	2,407.0	2,041.0	1,788.0	**2,351.0**	**1,788.0**
Short-term debt	1,421.0	1,428.0	1,011.0	796.0		
Accounts payable	320.0	423.0	523.0	485.0	**296.0**	**485.0**
Accrued liabilities and other	636.0	556.0	507.0	507.0	**642.0**	**507.0**
Non-current liabilities						
Long-term debt	0.0	0.0	1,982.0	1,983.0	**0.0**	**1,983.0**
Other long-term liabilities	447.0	494.0	213.0	271.0	**540.0**	**271.0**
Capital lease obligations, long-term	9.0	8.0	7.0	6.0	**10.0**	**6.0**
Total liabilities	2,833.0	2,909.0	4,243.0	4,048.0	**2,901.0**	**4,048.0**
Total stockholders' equity	4,196.0	4,480.0	5,324.0	5,762.0	**4,469.0**	**5,762.0**
Total liabilities and stockholders' (	**7,108.0**	**7,461.0**	**9,612.0**	**9,841.0**	**7,370.0**	**9,841.0**

Source: Company data, FactSet, Macquarie Capital (USA), March 2017

Nvidia

Ratio Analysis

	3FQ16	4FQ16	1FQ17	2FQ17	3FQ17	4FQ17	CY15	CY16
	Oct-15Q	**Jan-16Q**	**Apr-16Q**	**Jul-16Q**	**Oct-16Q**	**Jan-17Q**	**FY16**	**FY17**
Profitability Analysis								
Return on Assets (Pretax)	13.8%	13.9%	13.5%	17.4%	29.9%	30.1%	**10.3%**	**22.5%**
Return on Equity (Aftertax)	22.8%	18.5%	18.1%	23.3%	44.2%	47.3%	**13.8%**	**32.6%**
ROIC (Pretax)	62.6%	67.5%	70.2%	84.5%	145.5%	148.0%	**48.7%**	**112.2%**
Cash Conversion Cycle (Days)	57	50	46	67	64	73	**56**	**91**
DSOs	37	33	36	41	38	35	**37**	**44**
Days of Inventory	68	62	65	79	75	83	**69**	**102**
Days Payables Outstanding	48	45	55	53	49	45	**51**	**55**
Liquidity Analysis								
Current Ratio	6.8x	2.6x	2.4x	2.6x	4.1x	4.8x	**2.6x**	**4.8x**
Quick Ratio	6.2x	2.4x	2.2x	2.3x	3.7x	4.3x	**2.4x**	**4.3x**
Debt/Solvency Analysis								
Debt/Total Capital	25.3%	39.5%	41.1%	39.6%	32.1%	28.5%	**39.5%**	**28.5%**
Debt/Equity	33.8%	65.4%	69.8%	65.5%	47.3%	40.0%	**65.4%**	**40.0%**
Asset Values								
Book Value/Share	$7.90	$7.54	$7.03	$7.10	$8.15	$8.73	**$7.85**	**$9.07**
Tangible Book Value/Share	$6.50	$6.21	$5.73	$5.90	$7.02	$7.64	**$6.48**	**$7.93**
Total Cash & Equiv/Share	$8.37	$8.49	$7.96	$7.73	$10.22	$10.30	**$8.85**	**$10.70**
Net Cash/Share	$5.69	$3.56	$3.06	$3.08	$6.36	$6.81	**$6.20**	**$8.33**

Source: Company data, FactSet, Macquarie Capital (USA), March 2017

Companies mentioned:

Advanced Micro Devices (AMD, $13.69, Neutral, TP: $14.00)

Intel (INTC, $35.60, Outperform, TP: $40.00)

Mobileye (MBLY, Not Rated)

Xilinx (XLNX, $57.97, Neutral, TP: $60.00)

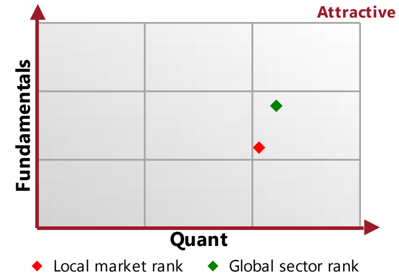
Macquarie Quant View

The quant model currently holds a reasonably positive view on NVIDIA. The strongest style exposure is Profitability, indicating this stock is efficiently converting investments to earnings; proxied by ratios like ROE or ROA. The weakest style exposure is Valuations, indicating this stock is over-priced in the market relative to its peers.

93/357

Global rank in
Semiconductors & Semiconductor Equip.

% of BUY recommendations	52% (17/33)
Number of Price Target downgrades	0
Number of Price Target upgrades	0

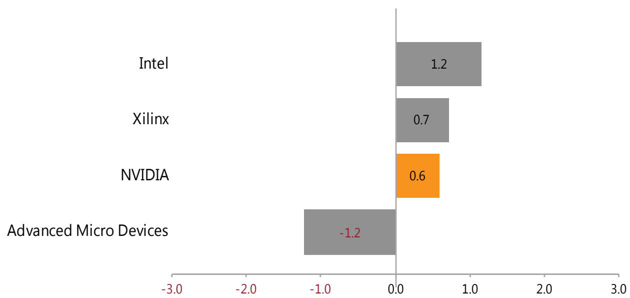


Displays where the company's ranked based on the fundamental consensus Price Target and Macquarie's Quantitative Alpha model.

Two rankings: Local market (United States) and Global sector (Semiconductors & Semiconductor Equip.)

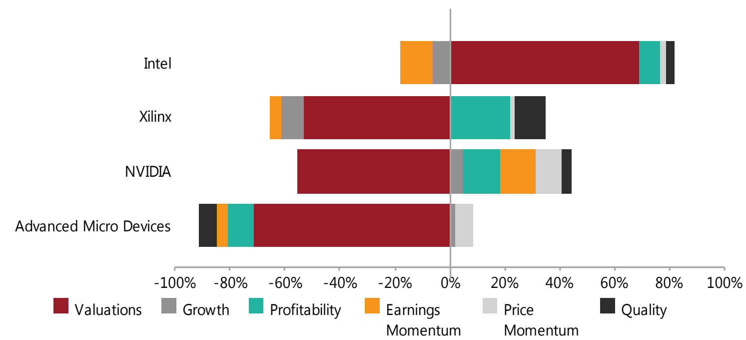
Macquarie Alpha Model ranking

A list of comparable companies and their Macquarie Alpha model score (higher is better).



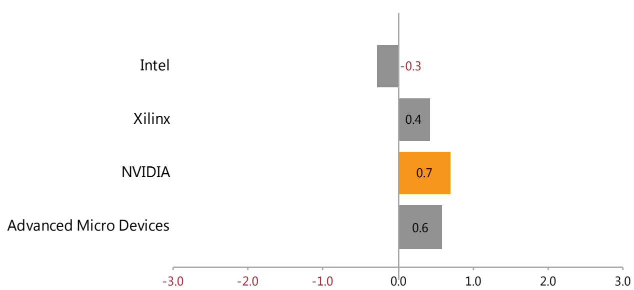
Factors driving the Alpha Model

For the comparable firms this chart shows the key underlying styles and their contribution to the current overall Alpha score.



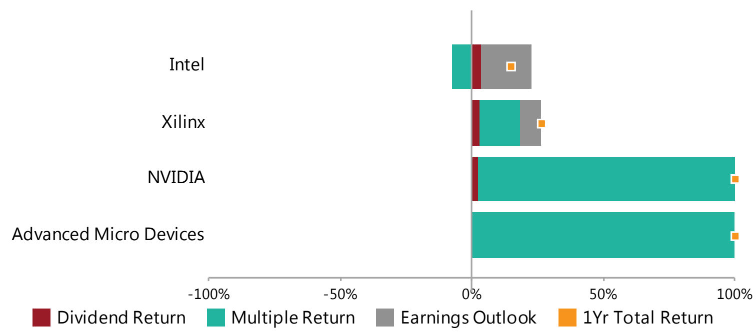
Macquarie Earnings Sentiment Indicator

The Macquarie Sentiment Indicator is an enhanced earnings revisions signal that favours analysts who have more timely and higher conviction revisions. Current score shown below.



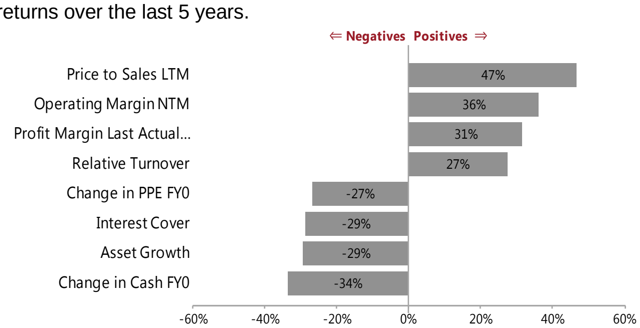
Drivers of Stock Return

Breakdown of 1 year total return (local currency) into returns from dividends, changes in forward earnings estimates and the resulting change in earnings multiple.



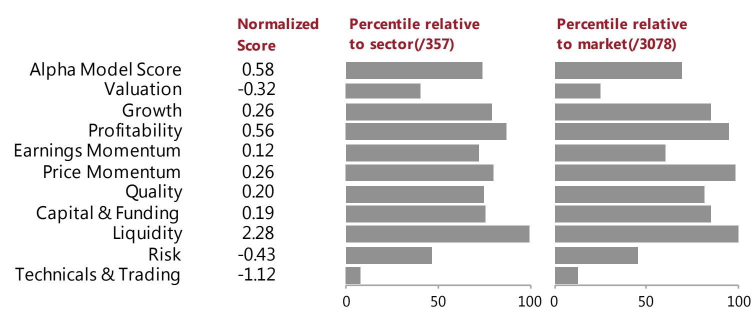
What drove this Company in the last 5 years

Which factor score has had the greatest correlation with the company's returns over the last 5 years.



How it looks on the Alpha model

A more granular view of the underlying style scores that drive the alpha (higher is better) and the percentile rank relative to the sector and market.



Source (all charts): FactSet, Thomson Reuters, and Macquarie Research. For more details on the Macquarie Alpha model or for more customised analysis and screens, please contact the Macquarie Global Quantitative/Custom Products Group (cpg@macquarie.com

UNITED STATES

QCOM US Neutral

Price (at CLOSE#, 28 Mar 2017) US$57.38

Valuation - PER	**US$**	**60.00**
12-month target	**US$**	**60.00**
12-month TSR	**%**	**+8.6**

GICS sector
Semiconductors & Semiconductor Equipment

Market cap	**US$m**	**84,750**
30-day avg turnover	**US$m**	**485.8**
Number shares on issue	**m**	**1,477**

Investment fundamentals

Year end 30 Sep		2016A	2017E	2018E	2019E
Revenue	m	23,507	23,923	24,701	25,281
Adjusted profit	m	6,655	6,957	7,053	7,302
Gross cashflow	m	8,080	8,272	8,369	8,618
CFPS	US$	5.39	5.52	5.56	5.63
CFPS growth	%	-0.1	2.3	0.7	1.4
PGCFPS	x	10.6	10.4	10.3	10.2
EPS adj	US$	4.45	4.64	4.68	4.77
EPS adj growth	%	-4.2	4.4	0.9	1.9
PER adj	x	12.9	12.4	12.3	12.0
Total DPS	US$	2.02	2.24	2.40	2.56
Total div yield	%	3.5	3.9	4.2	4.5
EV/EBITDA	x	10.2	9.8	9.7	9.6

Source: FactSet, Macquarie Capital (USA), March 2017
(all figures in USD unless noted)

Analyst(s)
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30 March 2017
Macquarie Capital (USA) Inc.

QUALCOMM

Range bound for now

Initiating with a Neutral

We initiate coverage with a Neutral rating and $60 PT. Qualcomm should continue to benefit from a healthy smartphone market and disciplined spending in the chipset segment. The recent acquisitions of TDK and NXPI expand its addressable market and help diversify its revenue stream. Valuation is attractive at 12x CY17E PE and the dividend yield is among the best in the industry. However, we have limited visibility into the timing of a potential settlement with Apple, and do not see many other catalysts in the near term. While the stock appears to be largely discounting the royalty rate risk, the Apple lawsuit also attacks the core of Qualcomm's business model of licensing at the device level vs chip level. We believe Qualcomm will prevail (and likely settle for a lower royalty rate), but see limited upside to the stock until the issue is settled. We also see some risk that Foxconn (Apple) stops payments temporarily, which could create additional headwinds.

Near worst case priced in for royalty rates

Among its many allegations against Qualcomm, the key contention of Apple appears to be the royalty rate. We believe QCOM gets about $12 per iPhone in royalties, and accounted for about 45% of Licensing revenue and 25-30% of the company's EPS in CY16. Excluding this amount, and adjusting for NXPI synergies, QCOM is currently trading at 13x PE, suggesting that risk to royalty rates is mostly priced in. The risk from US FTC and Korea FTC lawsuits appears more moderate as these are more likely to end up in one-time fines as opposed to business model changes even if Qualcomm were to lose.

Device vs chip issue keeps coming back

While financial impact from potentially lower royalty rates appears priced in, the bigger risk is if QCOM were forced to change its business model of charging at the device level to charging at the chip level (highly unlikely, in our view). This argument has been made many times before and in all of these cases, a settlement was reached without changing Qualcomm's basic business model. In fact, Apple made a similar argument in 2015 against Ericsson and eventually settled (and we believe, continues to pay Ericsson at the device level). We expect QCOM to prevail but Apple's clout means that the risk cannot be completely ignored.

Chipset competition not abating; NXPI closure will help

We expect QCOM to continue to supply modems to Apple despite the lawsuit (based on Apple vs Samsung litigation example). QCOM's chip business tends to perform particularly well during technology transitions and we expect 5G to be no different. That said, we believe meaningful 5G ramps are 2 years away and, in the interim, expect intense price competition with MediaTek to continue. Overall, we expect the chipset business growth to remain tepid this year and see additional margin pressures. The NXP acquisition is scheduled to close by the end of CY17. NXP helps from a diversification standpoint and management is forecasting $500m synergies. Given the current skepticism regarding the timely closure (spread at 7%), we think QCOM stock could benefit if the deal were to close on time.

Inside

Qualcomm

Company profile

QUALCOMM, Inc. engages in the development, design, manufacture, and marketing of digital telecommunications products and services. It operates through three segments: Qualcomm CDMA Technologies, Qualcomm Technology Licensing, and Qualcomm Strategic Initiatives.

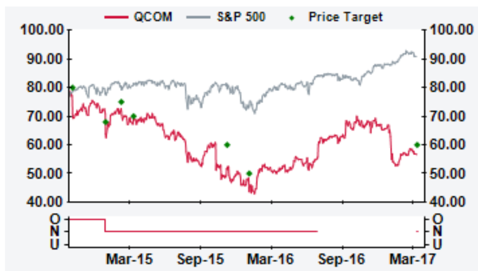
The Qualcomm CDMA Technologies segment develops and supplies integrated circuits and system software based on technologies for the use in voice and data communications, networking, application processing, multimedia, and global positioning system products.

The Qualcomm Technology Licensing segment provides rights to use portions of the firm's intellectual property portfolio.

The Qualcomm Strategic Initiatives segment invests in the technology, design, and introduction of products and services for voice and data communications.

The company was founded by Franklin Antonio, Adelia Coffman, Andrew Cohen, Klein Gilhousen, Irwin Mark Jacobs, Andrew Viterbi, and Harvey White in July 1985 and is headquartered in San Diego, CA.

Fig 1 QCOM US vs S&P 500, & rec history



Note: Recommendation timeline - if not a continuous line, then there was no Macquarie coverage at the time or there was an embargo period.

Source: FactSet, Macquarie Capital (USA), March 2017

(all figures in USD unless noted)

Range bound for now

Initiating with a Neutral

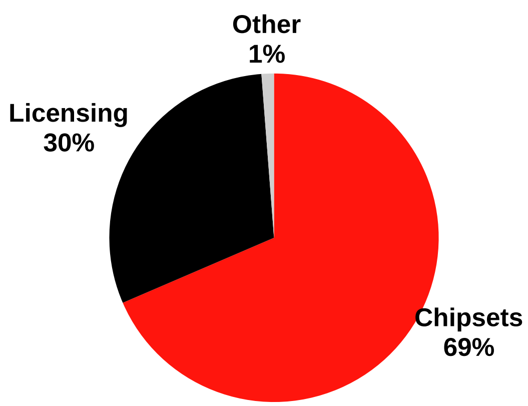
Valuation is attractive and the dividend yield is best in the industry

We are initiating coverage on QCOM with a Neutral rating and $60 PT. We expect Qualcomm to continue to benefit from a healthy smartphone market and disciplined spending in the chipset segment. The company's recent acquisitions of TDK and NXPI expand its addressable market significantly and help diversify its revenue stream. Valuation is attractive at 12.5x CY17 PE and the dividend yield is the best in the industry.

But Apple lawsuit will likely limit upside to the stock in the near term

However, the elephant in the room – the Apple lawsuit – will likely keep the stock in a range. The stock appears to be discounting significantly lower royalty rates. However, the lawsuit also attacks the core of Qualcomm's business model of licensing at the device level vs chip level. We believe Qualcomm will prevail but we have no visibility into the timing of a potential resolution, and expect the stock to be range bound until the issue is settled. We also see some risk that Foxconn (Apple) stops payments temporarily, which could create additional headwinds.

Fig 2 Sales by segment (Dec-16Q)



Source: Company data, Macquarie Capital (USA), March 2017

Fig 3 Estimates summary

	CY16E	CY17E	CY18E
Revenue (US$m)	23,726	24,271	24,906
YoY change (%)	-1%	2%	3%
Gross margin (%)	61%	63%	63%
Operating margin (%)	34%	35%	34%
Non-GAAP EPS (US$)	$ 4.67	$ 4.63	$ 4.77
PE (X) @US$57.38	12.3	12.4	12.0
EV/FCF @US$57.38	13.8	9.3	9.2

Source: Company data, Macquarie Capital (USA), March 2017

Near worst case priced in for royalty rates

We estimate that iPhone royalties accounted for about 46% of Licensing revenue and $1.30 of QCOM's CY16 EPS

Apple filed a complaint against Qualcomm in the Southern District of California alleging that the company breached certain agreements and violated federal antitrust and state competition laws. Apple also filed a complaint against Qualcomm in China. Apple's key contention appears to be that QCOM's royalty rates are excessive, and that Qualcomm's royalties should be tied to the value of the baseband chip as opposed to the entire phone. In addition, Apple is also suing Qualcomm for $1b alleging a contract dispute. We believe QCOM gets about $12 per iPhone in royalties, which we believe are paid by Foxconn. We estimate that iPhone royalties accounted for about 46% of Licensing revenue and $1.30 of QCOM's CY16 EPS. Excluding this amount, and adjusting for NXPI accretion, QCOM stock is currently trading at 13x (CY18), suggesting that the risk is mostly priced in. Qualcomm is also facing other regulatory investigations including from US FTC and Korea FTC. However, the impact from these appear more moderate as these lawsuits are more likely to end up in one-time fines as opposed to business model changes even if Qualcomm were to lose.

Fig 4 Apple Licensing impact on QCOM EPS

	CY16	CY17E	CY18E
Apple % of sales	26%	21%	20%
Apple Total Revs	$ 6,050	$ 5,097	$ 4,981
Licensing Revs	$ 2,776	$ 2,969	$ 3,054
Chipset Revs	$ 3,274	$ 2,128	$ 1,928
Chipset Units	225	245	257
Licensing / Device	$ 12	$ 12	$ 12
EPS from Apple Licensing	$ 1.30	$ 1.39	$ 1.42
Non-GAAP EPS	$ 4.67	$ 4.63	$ 4.77
EPS Ex-Apple Licensing	$ 3.37	$ 3.25	$ 3.35
NXP Accretion			$1.12
EPS ex-Apple Licensing & Incl NXP Accretion			$ 4.47
PE @ $57.38 (ex-Apple Licensing, Incl NXP)			**13x**

Source: Company data, Macquarie Capital (USA), March 2017

Device vs chip issue keeps coming back

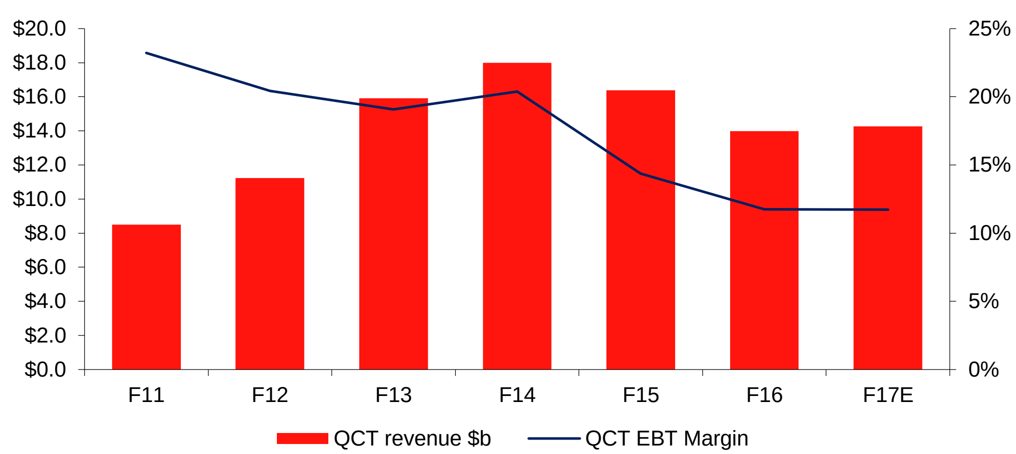
While the financial impact from potentially lower royalty rates appears priced in, the bigger risk is if QCOM were forced to change its business model of charging at the device level to charging at the chipset levels (highly unlikely, in our view). This argument has been made many times before (China NDRC, Samsung) and in all of these cases, a settlement was reached without changing Qualcomm's basic business model. In fact, Apple made a similar argument in 2015 against Ericsson and eventually settled (and, we believe, continues to pay at the device level). We expect QCOM to prevail like it did before but Apple's clout and added pressure by Korea FTC and US FTC means that the risk cannot be completely ruled out.

5G a couple of years away; chipset price pressures not abating

We believe 5G ramps are 1-2 years away, and expect intense price competition with MediaTek to continue

Despite the lawsuit, we expect QCOM to continue to supply modems to Apple (based on Apple vs Samsung litigation). QCOM's chip business tends to perform particularly well during technology transitions and we expect 5G to be no different. That said, we believe meaningful 5G ramps are 1-2 years away, and expect intense price competition with MediaTek to continue in the interim. Overall, we expect the chipset business growth to remain tepid this year and see additional margin pressures.

Fig 5 QCT revenue and margins



Source: Company data, Macquarie Capital (USA), March 2017

TDK JV closed recently (our estimates do not yet reflect it) and management previously indicated that the deal will be immediately accretive to Non-GAAP EPS. We believe TDK's RF business does about $1b/yr in revenues, and should help expand QCOM's addressable opportunity into fast growing RF IC market. We expect QCOM to bundle RF components with its reference platforms in China. However, the company is well behind in GaAs power amplifier capability and module integration expertise, and as such, meaningful share gains appear less likely in the near term.

NXP acquisition is scheduled to close by the end of CY17, and should be more than 20% accretive to CY18 Non-GAAP EPS

NXP acquisition is scheduled to close by the end of CY17. Management expects the deal to close on time but we won't rule out potential delays given the regulatory approvals needed in China and by the US FTC, which recently sued Qualcomm on the Licensing front. The NXP acquisition helps from a diversification standpoint and management is forecasting $500m/yr in synergies. Assuming $150m in synergies in the first year, we expect the deal to be more than 20% accretive to QCOM's Non-GAAP EPS in CY18. Given the skepticism regarding the timely closure (spread at 7%), we think QCOM stock could benefit if the deal were to close on time.

Fig 6 NXP Accretion Analysis (CY2018E)

	QCOM	NXPI	Adjustments	Combined
Revenue	24,906	8,490		33,397
Cost of goods sold	9,301	3,906	(50)	13,156
Gross profit	15,606	4,585		20,241
Gross margin	62.7%	54.0%		60.6%
Operating expenses	7,030	2,005		8,935
Research and development	5,046	1,332	(50)	6,328
Sales, general, and administrative	1,984	673	(50)	2,607
Operating income	8,576	2,580		11,305
Operating margin	34.4%	30.4%		33.9%
Other income	200	(217)	(592)	(609)
Pre-tax income	8,776	2,363		10,696
Tax	(1,558)	231		(1,789)
Tax rate	(17.8%)	9.8%		(16.7%)
Net income	7,218	2,132		8,908
Stock comp	956	300		1,256
Net income (adjusted for stock comp)	6,092	1,832		7,442
Non-GAAP EPS	$4.77	$6.18		$5.89
Accretion				**$1.12**
Accretion %				**23%**
Non-GAAP EPS (stock comp adjusted)	$4.03	$5.31		$4.92
Accretion				$0.89
Accretion %				22%

Source: Company data, Factset, Macquarie Capital (USA), March 2017

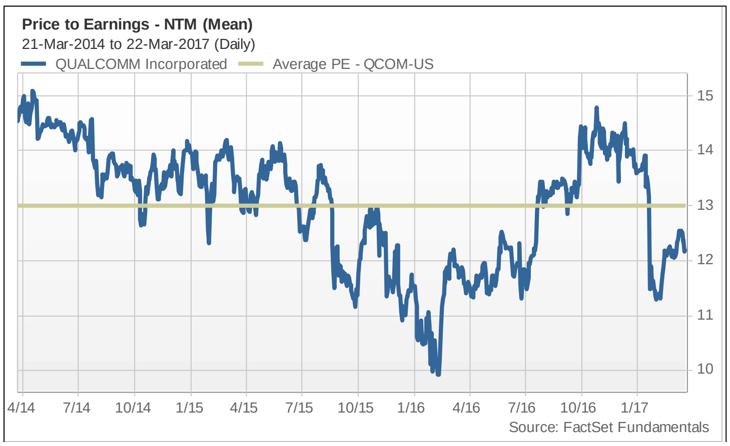
Valuation

Our price target assumes that the stock trades near current PE multiple until Apple litigation is resolved

To its credit, Qualcomm's cash returns have been among the best in the industry. The company's share count declined 13% in the past two fiscal years and the current dividend yield is 3.9% on FY17E, which is best among the large cap Semi names we cover. The company is paying out about 40% of its free cash flow and we expect dividend growth to sustain for the next few years.

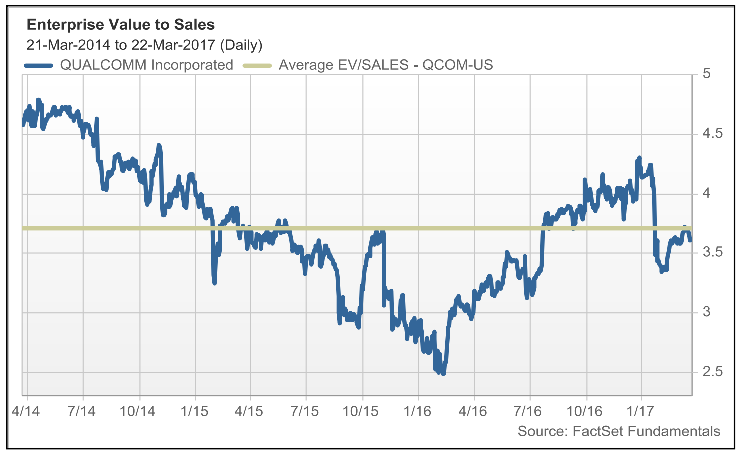
At 12x PE on our CY17 Non-GAAP estimates, the stock is at a slight discount to its 3-year average. However, our estimates do not currently incorporate NXP accretion. Adding NXP accretion would bring the PE to about 10x, or about a 25% discount to the 3-year average. Our price target assumes that the stock trades near current PE multiple until Apple litigation is resolved.

Fig 7 QCOM Historical PE



Source: Factset, Macquarie Capital (USA), March 2017

Fig 8 QCOM Historical EV/S



Source: Factset, Macquarie Capital (USA), March 2017

Macquarie vs consensus EPS

Fig 9 We are -1.1% vs consensus in 2018E

	F17E	F18E	F19E
MQ/Consensus (EPS %)	0.4	-1.1	-5.5

Source: Company data, Macquarie Capital (USA), March 2017

Qualcomm
Income statement

(US$mn/%) FYE Sept	1Q16 Dec-15Q	2Q16 Mar-16Q	3Q16 Jun-16Q	4Q16 Sep-16Q	1Q17 Dec-16Q	2Q17E Mar-17Q	3Q17E Jun-17Q	4Q17E Sep-17Q	FY15	FY16	FY17E	FY18E
Revenues	5,766	5,539	6,032	6,170	5,985	5,900	6,013	6,026	**25,277**	**23,507**	**23,923**	**24,701**
Cost of Sales	2,377	2,017	2,395	2,430	2,337	2,023	2,224	2,254	**10,059**	**9,219**	**8,838**	**9,252**
Gross Profit	3,389	3,522	3,637	3,740	3,648	3,876	3,789	3,771	**15,218**	**14,288**	**15,085**	**15,449**
Operating Exp	1,648	1,637	1,605	1,564	1,575	1,691	1,725	1,725	**6,654**	**6,454**	**6,715**	**7,000**
R&D	1,182	1,138	1,093	1,089	1,125	1,209	1,234	1,234	**4,787**	**4,502**	**4,802**	**5,021**
SG&A	466	499	512	475	450	482	491	491	**1,847**	**1,952**	**1,914**	**1,979**
Other	-	-	-	-	-	-	-	-	**20**	**-**	**-**	**-**
Operating Inc	1,741	1,885	2,032	2,176	2,073	2,185	2,065	2,047	**8,564**	**7,834**	**8,369**	**8,449**
Non-operating Inc	38	12	104	169	118	-	-	-	**746**	**323**	**118**	**150**
Pretax Income	1,779	1,897	2,136	2,345	2,191	2,185	2,065	2,047	**9,310**	**8,157**	**8,487**	**8,599**
Prov for Taxes	(310)	(345)	(407)	(440)	(408)	(407)	(384)	(381)	**(1,670)**	**(1,502)**	**(1,580)**	**(1,545)**
Eff. Tax Rate	17.4%	18.2%	19.1%	18.8%	18.6%	18.6%	18.6%	18.6%	**17.9%**	**18.4%**	**18.6%**	**18.0%**
Net Income (continuing op	1,469	1,552	1,729	1,905	1,783	1,778	1,680	1,666	**7,640**	**6,655**	**6,907**	**7,053**
Discontinued Operations	-	-	-	-	-	50	-	-	**-**	**-**	**50**	**-**
Net Income	1,469	1,552	1,729	1,905	1,783	1,828	1,680	1,666	**7,640**	**6,655**	**6,957**	**7,053**
Non-GAAP EPS	**0.97**	**1.04**	**1.16**	**1.28**	**1.19**	**1.22**	**1.12**	**1.11**	**4.66**	**4.45**	**4.64**	**4.68**
GAAP EPS*	**0.99**	**0.78**	**0.97**	**1.07**	**0.46**	**1.02**	**0.96**	**0.96**	**3.80**	**3.81**	**3.39**	**4.05**
Shares Outstanding	1,517	1,498	1,486	1,491	1,495	1,500	1,500	1,500	**1,639**	**1,498**	**1,499**	**1,506**
Free cash flow per share	1.72	0.41	1.15	1.30	0.84	1.32	1.22	1.23	**2.75**	**4.58**	**4.60**	**5.12**
% Sales												
Gross Profit	59%	64%	60%	61%	61%	66%	63%	63%	**60%**	**61%**	**63%**	**63%**
Operating Exp	29%	30%	27%	25%	26%	29%	29%	29%	**26%**	**27%**	**28%**	**28%**
R&D	20%	21%	18%	18%	19%	20%	21%	20%	**19%**	**19%**	**20%**	**20%**
SG&A	8%	9%	8%	8%	8%	8%	8%	8%	**7%**	**8%**	**8%**	**8%**
Operating Margin	30%	34%	34%	35%	35%	37%	34%	34%	**34%**	**33%**	**35%**	**34%**
Net Income	25%	28%	29%	31%	30%	31%	28%	28%	**30%**	**28%**	**29%**	**29%**
% YoY												
Revenues	-19%	-20%	3%	13%	4%	7%	0%	-2%	**-5%**	**-7%**	**2%**	**3%**
Gross Profit	-18%	-19%	6%	13%	8%	10%	4%	1%	**-5%**	**-6%**	**6%**	**2%**
Operating Expenses	3%	0%	-8%	-7%	-4%	3%	7%	10%	**-7%**	**-3%**	**4%**	**4%**
Operating Income	-31%	-30%	19%	35%	19%	16%	2%	-6%	**-4%**	**-9%**	**7%**	**1%**
Net Income	-35%	-34%	7%	33%	21%	18%	-3%	-13%	**-15%**	**-13%**	**5%**	**1%**
% QoQ												
Revenues	6%	-4%	9%	2%	-3%	-1%	2%	0%				
Gross Profit	3%	4%	3%	3%	-2%	6%	-2%	0%				
Operating Expenses	-2%	-1%	-2%	-3%	1%	7%	2%	0%				
Operating Income	8%	8%	8%	7%	-5%	5%	-6%	-1%				
Net Income	3%	6%	11%	10%	-6%	3%	-8%	-1%				

Source: Company data, FactSet, Macquarie Capital (USA), March 2017

Balance Sheet

	Dec-15Q	Mar-16Q	Jun-16Q	Sep-16Q	Dec-16Q	FY15	FY16
Assets							
Current Assets	20,338	20,157	20,979	22,981	15,779	**22,099**	**22,981**
Cash and Equivalents	6,913	5,775	5,885	5,946	6,885	**7,560**	**5,946**
Marketable Securities	9,615	10,627	11,225	12,702	3,927	**9,761**	**12,702**
Accounts Receivable	1,323	1,738	1,939	2,219	2,085	**1,964**	**2,219**
Inventories	1,216	1,427	1,338	1,556	1,910	**1,492**	**1,556**
Deferred Tax Assets	607	-	-	-	-	**635**	**0**
Other Current Assets	664	590	592	558	972	**687**	**558**
Long-Term Assets	29,891	29,903	29,807	29,378	36,587	**28,697**	**29,378**
Marketable Securities	14,063	13,582	13,922	13,702	18,973	**13,626**	**13,702**
Deferred Tax Assets	1,616	2,203	2,075	2,030	2,312	**1,453**	**2,030**
PPE, net	2,484	2,391	2,341	2,306	2,270	**2,534**	**2,306**
Goodwill & Intangibles, net	9,737	9,553	9,326	9,179	9,024	**9,221**	**9,179**
Other Assets	1,991	2,174	2,143	2,161	4,008	**1,863**	**2,161**
Total Assets	**50,229**	**50,060**	**50,786**	**52,359**	**52,366**	**50,796**	**52,359**
Liabilities and Equity							
Current Liabilities	6,503	7,026	6,843	7,311	7,994	**6,100**	**7,311**
Accounts Payable	1,359	1,452	1,572	1,858	1,648	**1,300**	**1,858**
Payroll and other Benefits	895	785	874	934	865	**861**	**934**
Unearned Revenues	639	791	535	509	487	**583**	**509**
Short-term Debt	1,000	1,949	1,749	1,749	1,749		
Other Current Liabilities	2,610	2,049	2,113	2,261	3,245	**2,356**	**2,261**
Long-Term Liabilities	13,493	13,397	13,305	13,280	13,166	**13,282**	**13,280**
Unearned Revenues	2,630	2,526	2,426	2,377	2,278	**2,496**	**2,377**
Long-term Debt	9,950	9,993	10,024	10,008	9,935		
Other Liabilities	913	878	855	895	953	**817**	**895**
Total Liabilities	19,996	20,423	20,148	20,591	21,160	**19,382**	**20,591**
Stockholders' Equity	30,233	29,637	30,647	31,768	31,215	**31,414**	**31,768**
Total Liabilities and Equity	**50,229**	**50,060**	**50,786**	**52,359**	**52,366**	**50,796**	**52,359**

Source: Company data, FactSet, Macquarie Capital (USA), March 2017

QCOM Ratio Analysis	Dec-14Q 1Q15	Mar-15Q 2Q15	Jun-15Q 3Q15	Sep-15Q 4Q15	Dec-15Q 1Q16	Mar-16Q 2Q16	Jun-16Q 3Q16	Sep-16Q 4Q16	Dec-16Q 1Q17	F14	F15	F16
Profitability Analysis												
Return on Assets (Pretax)	17.0%	11.2%	9.9%	8.8%	13.3%	11.3%	12.6%	14.0%	5.9%	**16.0%**	**11.6%**	**12.6%**
Return on Equity (Aftertax)	20.2%	11.0%	13.3%	13.1%	19.4%	15.6%	19.2%	20.5%	8.7%	**21.2%**	**14.9%**	**18.1%**
Return on Operating Capital (Pretax)	79.1%	46.9%	45.0%	33.2%	51.3%	43.4%	49.3%	56.8%	21.3%	**71.6%**	**42.0%**	**51.2%**
Cash Conversion Cycle (Days)	7	33	37	40	16	27	20	22	41	**8**	**35**	**23**
DSOs	28	27	30	32	21	28	29	32	31	**33**	**28**	**34**
Days of Inventory	52	64	58	62	43	61	48	56	71	**49**	**52**	**58**
Days Payables Outstanding	74	58	52	54	49	62	56	66	61	**74**	**46**	**69**
Liquidity Analysis												
Current Ratio	3.6x	3.4x	4.3x	3.6x	3.1x	2.9x	3.1x	3.1x	2.0x	**3.7x**	**3.6x**	**3.1x**
Quick Ratio	3.1x	2.9x	3.8x	3.2x	2.7x	2.6x	2.8x	2.9x	1.6x	**3.3x**	**3.2x**	**2.9x**
Debt/Solvency Analysis												
Debt/Total Capital	0.0%	2.8%	24.7%	25.9%	26.6%	28.7%	27.8%	27.0%	27.2%	**0.0%**	**0.0%**	**0.0%**
Debt/Common Equity	0.0%	2.9%	32.9%	34.9%	36.2%	40.3%	38.4%	37.0%	37.4%	**0.0%**	**0.0%**	**0.0%**
Asset Values												
Book Value/Share	$23.02	$22.70	$20.38	$19.97	$19.93	$19.78	$20.62	$21.31	$20.88	**$22.85**	**$19.17**	**$21.21**
Tangible Book Value/Share	$18.93	$18.57	$16.29	$14.11	$13.51	$13.41	$14.35	$15.15	$14.84	**$18.73**	**$13.54**	**$15.08**
Total Cash & Equiv/Share	$18.74	$17.76	$21.62	$19.67	$20.17	$20.02	$20.88	$21.70	$19.92	**$18.68**	**$18.88**	**$21.60**
Net Cash/Share	$18.74	$17.10	$14.92	$12.70	$12.95	$12.04	$12.96	$13.81	$12.11	**$18.68**	**$12.19**	**$13.75**

Source: Company data, FactSet, Macquarie Capital (USA), March 2017

Companies mentioned:

Apple (AAPL US, US$140.88, Outperform, TP: US$156.00, Ben Schachter)

NXP (NXPI, Not covered)

Intel (INTC, $35.60, Outperform, TP: $40.00)

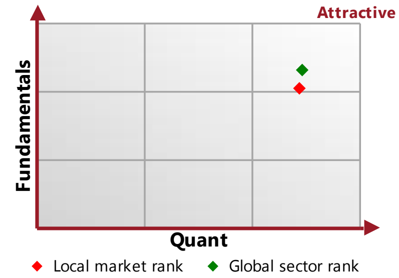
Macquarie Quant View

The quant model currently holds a reasonably positive view on QUALCOMM. The strongest style exposure is Valuations, indicating this stock is under-priced in the market relative to its peers. The weakest style exposure is Price Momentum, indicating this stock has had weak medium to long term returns which often persist into the future.

64/355

Global rank in
Semiconductors & Semiconductor Equip.

% of BUY recommendations	50% (14/28)
Number of Price Target downgrades	1
Number of Price Target upgrades	0

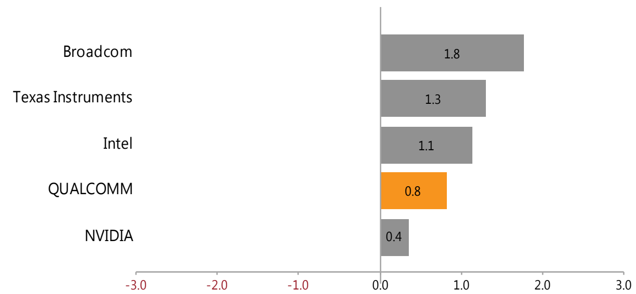


Displays where the company's ranked based on the fundamental consensus Price Target and Macquarie's Quantitative Alpha model.

Two rankings: Local market (United States) and Global sector (Semiconductors & Semiconductor Equip.)

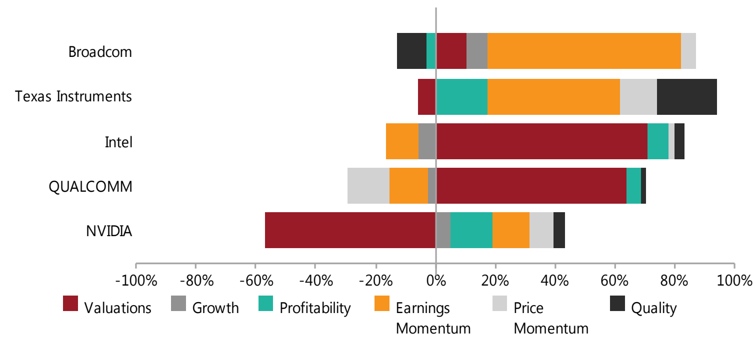
Macquarie Alpha Model ranking

A list of comparable companies and their Macquarie Alpha model score (higher is better).



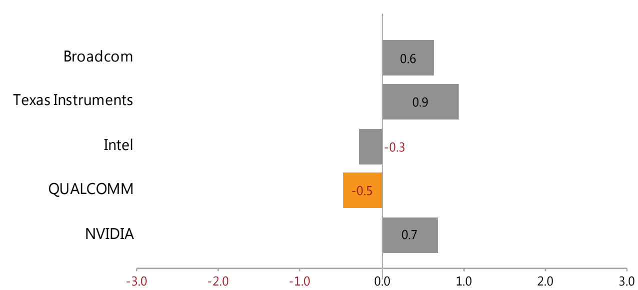
Factors driving the Alpha Model

For the comparable firms this chart shows the key underlying styles and their contribution to the current overall Alpha score.



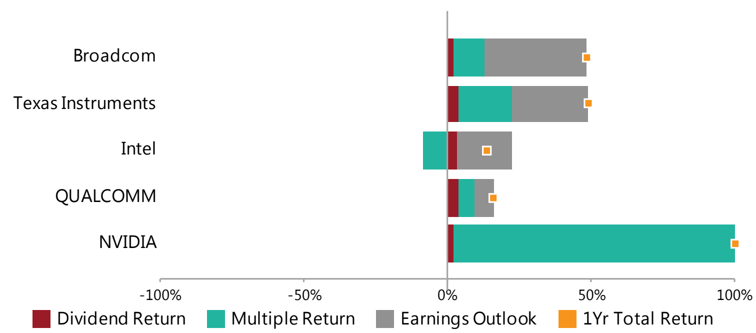
Macquarie Earnings Sentiment Indicator

The Macquarie Sentiment Indicator is an enhanced earnings revisions signal that favours analysts who have more timely and higher conviction revisions. Current score shown below.



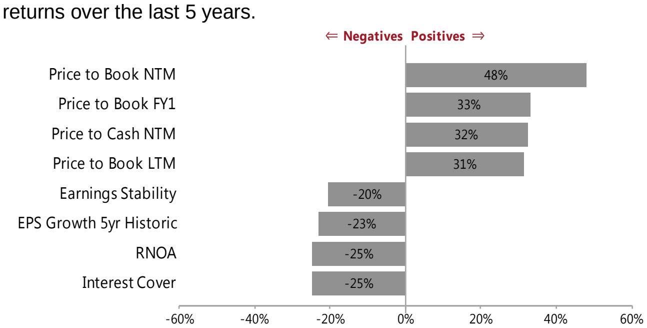
Drivers of Stock Return

Breakdown of 1 year total return (local currency) into returns from dividends, changes in forward earnings estimates and the resulting change in earnings multiple.



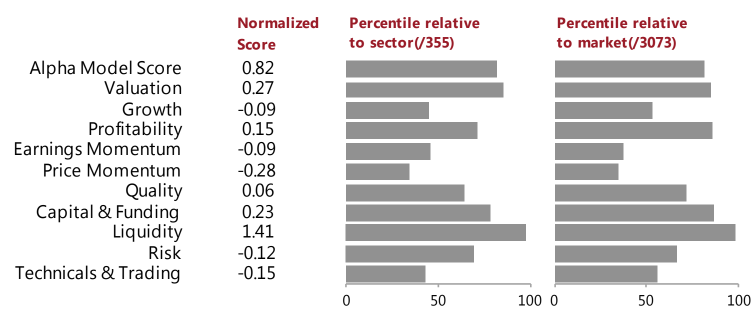
What drove this Company in the last 5 years

Which factor score has had the greatest correlation with the company's returns over the last 5 years.



How it looks on the Alpha model

A more granular view of the underlying style scores that drive the alpha (higher is better) and the percentile rank relative to the sector and market.



Source (all charts): FactSet, Thomson Reuters, and Macquarie Research. For more details on the Macquarie Alpha model or for more customised analysis and screens, please contact the Macquarie Global Quantitative/Custom Products Group (cpg@macquarie.com)

UNITED STATES

QRVO US — Neutral

Price (at CLOSE#, 28 Mar 2017) US$68.25

Valuation - PER	**US$**	**70.00**
12-month target	**US$**	**70.00**
12-month TSR	**%**	**+2.6**

GICS sector
Semiconductors & Semiconductor Equipment

Market cap	**US$m**	**8,634**
30-day avg turnover	**US$m**	**85.2**
Number shares on issue	**m**	**126.5**

Investment fundamentals

Year end 31 Mar		2016A	2017E	2018E	2019E
Revenue	m	2,606.9	3,019.0	3,250.6	3,533.7
EBIT	m	683.2	804.8	898.7	1,052.1
CFPS	US$	5.57	6.11	7.43	8.21
CFPS growth	%	-47.7	9.7	21.6	10.5
PGCFPS	x	12.3	11.2	9.2	8.3
EPS adj	US$	4.34	4.52	5.75	6.58
EPS adj growth	%	-71.1	4.2	27.2	14.4
PER adj	x	15.7	15.1	11.9	10.4
Total DPS	US$	0.00	0.00	0.00	0.00

Source: FactSet, Macquarie Capital (USA), March 2017
(all figures in USD unless noted)

Analyst(s)
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30 March 2017
Macquarie Capital (USA) Inc.

Qorvo

RF story still solid, but upside limited

Initiating with a Neutral

Qorvo is a leading supplier of radio frequency (RF) components, a sub-segment benefiting from secular content expansion in smartphones. The upcoming iPhone 7S/X cycle could drive some upside given the company's 35-40% exposure to Apple. We also see tailwinds in the coming quarters from Samsung GS8 builds and new model ramps at Chinese customers. The stock has had a strong move YTD, and we believe further upside is limited due to 1) limited exposure to mid-tier phones at Samsung and in China, where we see stronger content expansion this year; 2) GM execution improving but upside to management's target appears limited; 3) Free cash flow metrics well below peers despite slowing capex. At 13x PE on our CY17 estimates, the stock trades at a discount to SWKS but is at a double-digit premium on an EV/FCF basis.

A key beneficiary from the upcoming iPhone 7S/X cycle

We expect overall RF content to increase slightly in the upcoming iPhone7S/X due to more complex carrier aggregation and possibly implementation of MIMO architecture. QRVO should benefit from iPhone unit strength in 2H17 and in 2018, but it's less clear to us as to what extent Qorvo's content will increase. We expect Qorvo to continue to supply a low-band PAD, envelope tracker, and antenna switch into Intel-based iPhones. While Qorvo could benefit if Intel were to gain share at Apple, we do not expect baseband supplier market shares to change materially despite Apple's litigation with Qualcomm.

High-end wins at Samsung and Huawei to ramp in 1H17

Qorvo primarily supplies into high-end models at Samsung, and we expect modest content expansion this year. The company's exposure at Huawei is also skewed toward high-end flagship models. We expect QRVO to benefit from Samsung GS8 and Huawei P10 ramps in the next 1 – 2 quarters. However, the company's exposure to mid-tier models is somewhat limited, especially at Samsung. We expect stronger content expansion in the mid-tier this year (from a lower base) due to the adoption of carrier aggregation in China, SKU consolidation at Samsung, and 4G transition in emerging markets such as India and Indonesia.

Gross margin execution improving, but not expecting upside

The gross margin headwinds that impacted the stock in 2016 appear largely behind them. Management expects gross margins to improve gradually and reach 50% levels by the end of FY17. Low-band PAD yields are not expected to get that much better until a redesign but mix and factory utilization should help. Price pressures are less of a concern this year as the content continues to increase in the China market, but the company could face some competitive pressures in discrete components from Murata and Qualcomm/TDK. As such, we see little room for upside on the gross margin front. Capex is expected to decline 20% in FY18, which should drive strong growth in free cash flow. However, capex is still around 12% of sales, compared to 6-7% at rivals Skyworks and Broadcom. Valuation is at a discount on a PE basis to SWKS but at a double-digit premium on an EV/FCF basis.

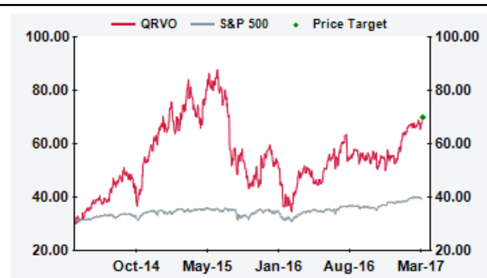
Inside

Qorvo

Company profile

- Qorvo, Inc. engages in the provision of core technologies and radio frequency solutions for mobile, infrastructure, and aerospace or defense applications.
- The company operates through two segments: mobile products, and infrastructure and defense products. The mobile products segment supplies RF solutions that perform various functions in the increasingly complex cellular radio front end section of smartphones and other cellular devices. The infrastructure and defense products segment supplies RF solutions that support diverse global applications, including ubiquitous high-speed network connectivity to the cloud, data center communications, rapid internet connectivity throughout the home and workplace, and upgraded military capabilities across the globe. Its products include amplifiers, control products, discrete transistors and integrated circuits, filters and duplexers, frequency converters, integrated modules, optical components, oscillators, passives and switches.
- The company was founded on December 13, 2013 and is headquartered in Greensboro, NC.

Fig 1 QRVO US vs S&P 500, & rec history



Note: Recommendation timeline - if not a continuous line, then there was no Macquarie coverage at the time or there was an embargo period.

Source: FactSet, Macquarie Capital (USA), March 2017

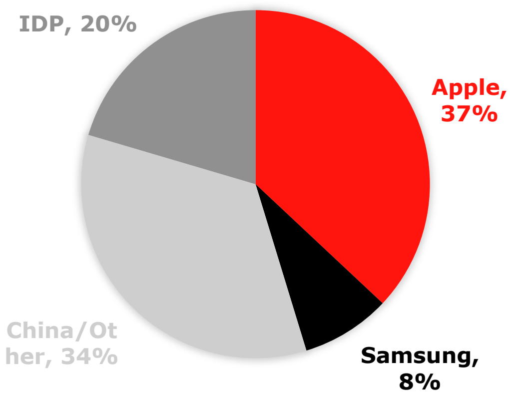
(all figures in USD unless noted)

RF story still solid, but upside limited

Initiating with a Neutral

We are initiating on Qorvo with a Neutral rating and $70 PT. Our estimates are largely in line with consensus. Qorvo is a leading supplier of premium filters, which are benefiting from growing radio frequency complexity in smartphones. The company has 35-40% exposure to Apple and should benefit from the highly-anticipated iPhone 7S/X builds. We also see tailwinds in the coming quarters from Samsung GS8 builds and new model ramps at Chinese customers. While we expect QRVO's revenues to outgrow the (ex-memory) Semi industry in the next 2 years, the stock has had a strong move and we believe further upside is limited due to 1) limited exposure to mid-tier phones at Samsung and in China, where we expect stronger content expansion, 2) limited margin upside potential and 3) below average free cash flow metrics.

Fig 2 Sales by segment (Dec-16Q)



Source: Company data, Macquarie Capital (USA), March 2017

Fig 3 Estimates Summary

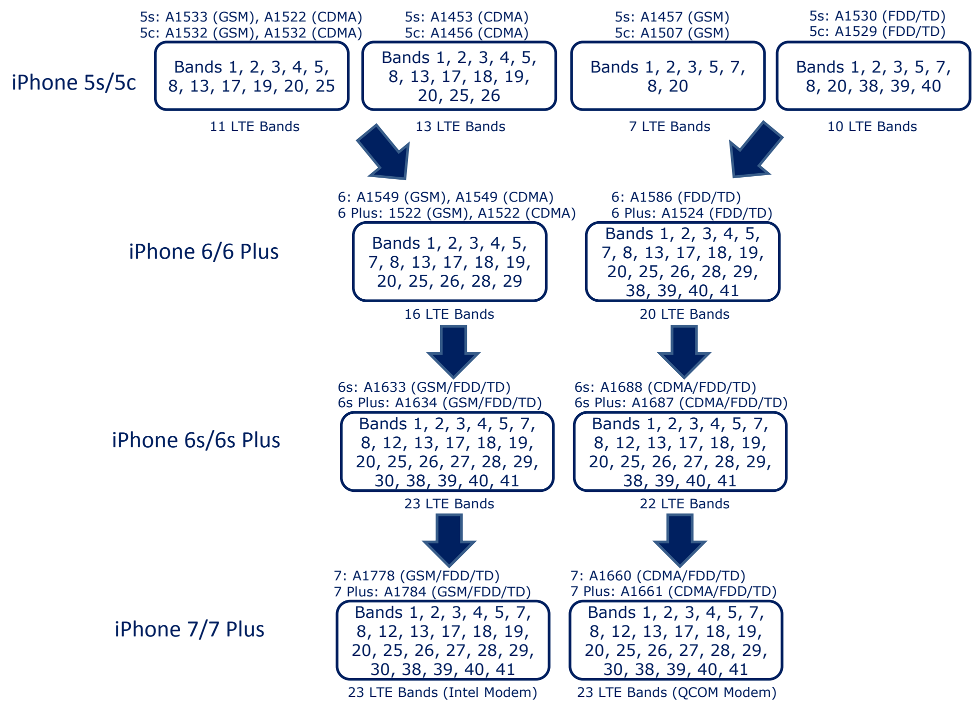
	CY16	CY17E	CY18E
Revenue (US$m)	2994	3118	3480
YoY change (%)	13.7%	4.2%	11.6%
Gross margin (%)	46%	47%	49%
Operating margin (%)	25%	26%	30%
EPS - Non-GAAP (US$)	4.71	5.24	6.49
PE (X) @US$68.25	14.5	13.0	10.5
EV/FCF @US$68.25	33.9	18.9	12.2

Source: Company data, Macquarie Capital (USA), March 2017

A key beneficiary from iPhone X cycle

Macquarie's Ben Schachter expects Apple iPhone 7S/X to drive a strong replacement cycle due to new features such as OLED screen, facial recognition, and potentially a new form-factor. We expect overall RF content to increase slightly in the iPhone 7S/X due to more complex carrier aggregation and possibly, implementation of MIMO architecture. QRVO should benefit from unit strength but it's less clear to us if the company's content will increase meaningfully. We expect Qorvo to continue to supply a low-band PAD, envelope tracker, and antenna switch into Intel-based iPhones. While Qorvo will benefit if Intel were to gain share at Apple, we do not expect baseband supplier market shares to change materially despite Apple's litigation with Qualcomm. Longer term, we see opportunity for the company's BAW filters at Apple but expect AVGO to maintain 100% share in the mid- and high-band PADs for the foreseeable future.

Fig 4 iPhone LTE band and SKU consolidation trend

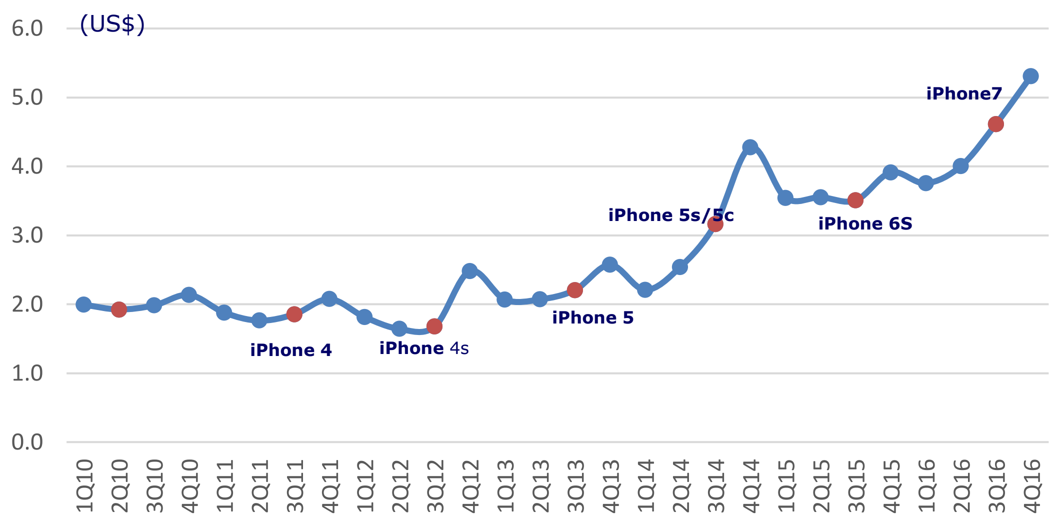


Source: Company data, Macquarie Capital (USA), March 2017

Content expansion picking up pace in the mid-tier

Qorvo primarily supplies into high-end models at Samsung, and we expect modest content expansion this year. The company's exposure at Huawei is also skewed toward high-end flagship models. We expect QRVO to benefit from Samsung GS8 and Huawei P10 ramps in the next 1 – 2 quarters. However, the company's exposure to mid-tier models is somewhat limited, especially at Samsung. We expect stronger content expansion in the mid-tier this year (from a lower base) due to the adoption of carrier aggregation in China, SKU consolidation at Samsung, and 4G transition in emerging markets such as India and Indonesia.

Fig 5 Overall RF content per phone trend

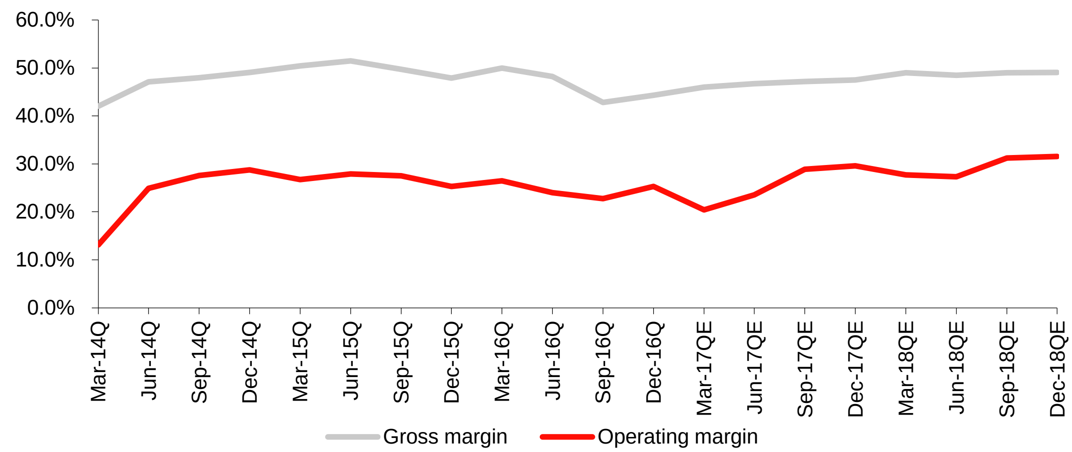


Source: Company data, Macquarie Capital (USA), March 2017

Gross margin recovery on track, but not expecting upside

The gross margin headwinds that impacted the stock in 2016 appear largely behind them. Management expects gross margins to improve gradually and reach 50% levels by the end of FY17. Low-band PAD yields are not expected to get that much better until a redesign, which we are not expecting this year. However, mix and factory utilization should help in the coming quarters. Price pressures are less of a concern this year as the content continues to increase in the China market, though the company could face some competitive pressures in discrete components from Murata and Qualcomm/TDK.

Fig 6 Gross & operating margin



Source: FactSet, Macquarie Capital (USA), March 2017

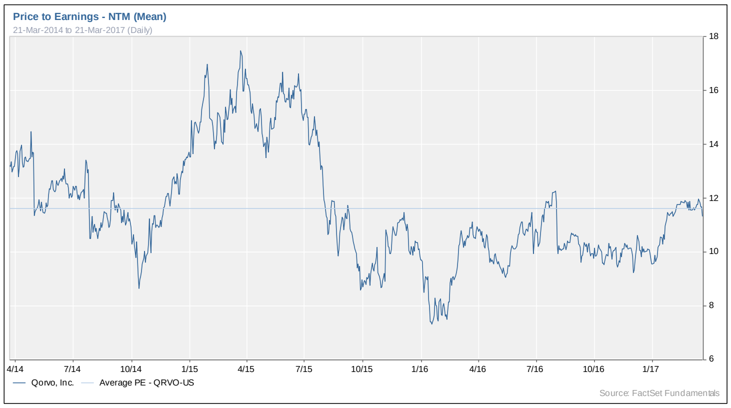
Free cash flow has room for improvement

Management expects free cash flow to double in FY18 from depressed levels in FY17. The company expects capex to decline ~20% in FY18, but it is still around 12% of sales, almost 2x that of rivals Skyworks and Broadcom. While the company's investments are understandable, the stock is trading at a 19x EV/FCF after the recent run up, which is at a ~19% premium to Skyworks.

Valuation, recommendation, risks

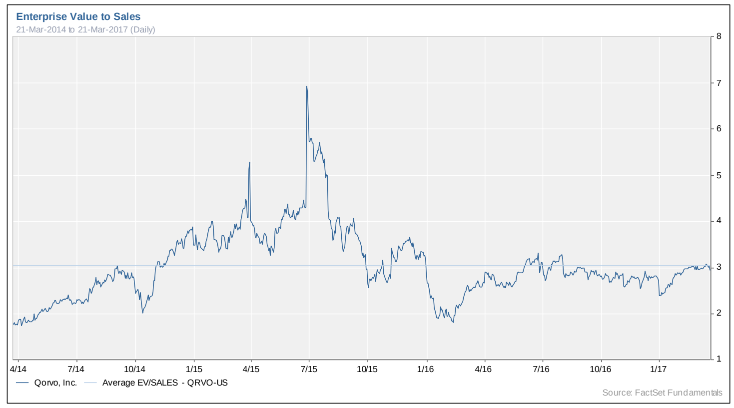
We are initiating coverage with a Neutral rating and a $70 price target. At a 13x PE on our CY17 estimate, the stock is trading at a slight premium to its 3-year average and a slight discount to peers AVGO, QCOM, and SWKS. However, at 19x EV/FCF the stock is at a meaningful premium to peers. We believe limited upside potential to gross margins and lower FCF metrics will limit upside to the stock.

Fig 7 QRVO Historical PE



Source: Company data, Macquarie Capital (USA), March 2017

Fig 8 QRVO Historical EV/Sales



Source: Company data, Macquarie Capital (USA), March 2017

Fig 9 Macquarie vs consensus

QRVO	17E	18E	19E
MQ/Consensus (Rev %)	-0.1	-0.3	-0.6
MQ/Consensus (EPS %)	-0.2	-1.0	-1.1

Source: FactSet, Macquarie Capital (USA), March 2017

Qorvo
Income Statement

($million/%)	F3Q16	F4Q16	F1Q17	F2Q17	F3Q17	F4Q17	F1Q18					
FYE Mar	**Dec-15Q**	**Mar-16Q**	**Jun-16Q**	**Sep-16Q**	**Dec-16Q**	**Mar-17QE**	**Jun-17QE**	**FY15***	**FY16**	**FY17E**	**FY18E**	**FY19E**
Revenue	620	607	698	864	825	632	696	**2,054**	**2,607**	**3,019**	**3,251**	**3,534**
Cost of goods sold	323	304	361	494	460	341	371	**1,048**	**1,309**	**1,656**	**1,703**	**1,805**
Gross profit	297	304	336	370	366	291	326	**1,006**	**1,298**	**1,363**	**1,548**	**1,729**
Operating expenses	140	143	169	173	157	162	162	**445**	**598**	**660**	**649**	**677**
Research and development	95	96	111	116	105	108	108	**283**	**402**	**439**	**433**	**446**
Marketing and selling	26	27	34	33	52	54	54	**107**	**113**	**172**	**216**	**231**
General and administrative	19	20	24	25	0	0	0	**54**	**82**	**49**	**0**	**0**
Other	0	0	0	0	0	0	0	**0**	**0**	**0**	**0**	**0**
Operating income	157	161	168	197	209	129	164	**561**	**700**	**702**	**899**	**1,052**
Other	(8)	(14)	(15)	(16)	(16)	(14)	(15)	**(1)**	**(21)**	**(61)**	**(60)**	**(60)**
Income before income taxe:	149	147	153	181	193	115	149	**561**	**679**	**642**	**839**	**992**
Tax	(1)	(4)	(10)	(11)	(15)	(9)	(12)	**(34)**	**(36)**	**(45)**	**(68)**	**(84)**
Tax rate	0.7%	2.8%	6.3%	6.0%	7.9%	8.0%	8.0%	**6.1%**	**5.3%**	**7.0%**	**8.1%**	**8.5%**
Net income	148	143	143	170	177	106	137	**527**	**642**	**597**	**771**	**908**
EPS (Diluted)	**$1.03**	**$1.00**	**$1.08**	**$1.29**	**$1.35**	**$0.80**	**$1.03**	**$3.50**	**$4.35**	**$4.52**	**$5.75**	**$6.58**
EPS (Diluted) (stock comp ε	$0.88	$0.88	$0.92	$1.15	$1.26	$0.72	$0.94	**$3.16**	**$3.68**	**$4.04**	**$5.40**	**$6.38**
FCF/Share	$1.09	$0.53	($0.54)	$0.98	$0.64	$0.76	$0.48	**$0.90**	**$2.52**	**$1.84**	**$3.76**	**$5.46**
Shares outstanding	144	142	133	132	131	131	132	**151**	**148**	**132**	**134**	**138**
% of sales												
Gross profit	47.9%	50.0%	48.2%	42.8%	44.3%	46.0%	46.8%	**49.0%**	**49.8%**	**45.1%**	**47.6%**	**48.9%**
Operating expenses	22.6%	23.5%	24.2%	20.0%	19.0%	25.6%	23.2%	**21.6%**	**22.9%**	**21.9%**	**20.0%**	**19.2%**
Research and development	15.3%	15.9%	15.9%	13.4%	12.7%	17.1%	15.5%	**13.8%**	**15.4%**	**14.6%**	**13.3%**	**12.6%**
Marketing and selling	4.1%	4.5%	4.9%	3.8%	6.3%	8.5%	7.7%	**5.2%**	**4.4%**	**5.7%**	**6.7%**	**6.5%**
General and administrative	3.1%	3.2%	3.4%	2.9%	0.0%	0.0%	0.0%	**2.6%**	**3.2%**	**1.6%**	**0.0%**	**0.0%**
Operating income	25.3%	26.4%	24.0%	22.8%	25.3%	20.4%	23.5%	**27.3%**	**26.9%**	**23.3%**	**27.6%**	**29.8%**
Net income	23.9%	23.5%	20.5%	19.7%	21.5%	16.7%	19.7%	**25.6%**	**24.6%**	**19.8%**	**23.7%**	**25.7%**
% YoY												
Revenue	(16%)	(4%)	4%	22%	33%	4%	(0%)	**79%**	**27%**	**16%**	**8%**	**9%**
Gross profit	(18%)	(5%)	(3%)	5%	23%	(4%)	(3%)	**130%**	**29%**	**5%**	**14%**	**12%**
Operating expenses	(7%)	(5%)	6%	10%	12%	13%	(4%)	**49%**	**35%**	**10%**	**(2%)**	**4%**
Operating income	(26%)	(5%)	(11%)	1%	33%	(20%)	(2%)	**305%**	**25%**	**0%**	**28%**	**17%**
Net income	(25%)	(15%)	(15%)	(7%)	20%	(26%)	(4%)	**307%**	**22%**	**(7%)**	**29%**	**18%**
% QoQ												
Revenue	(12%)	(2%)	15%	24%	(4%)	(23%)	10%					
Gross profit	(16%)	2%	11%	10%	(1%)	(20%)	12%					
Operating expenses	(11%)	2%	18%	3%	(9%)	3%	0%					
Operating income	(19%)	2%	4%	17%	6%	(38%)	27%					
Net income	(19%)	(4%)	0%	19%	4%	(40%)	29%					

*FY15 includes 2 quarters of TriQuint

Source: Company data, FactSet, Macquarie Capital (USA), March 2017

Balance Sheet ($million/%) FYE Mar	F1Q16 Jun-15Q	F2Q16 Sep-15Q	F3Q16 Dec-15Q	F4Q16 Mar-16Q	F1Q17 Jun-16Q	F2Q17 Sep-16Q	F3Q17 Dec-16Q	FY14*	FY15	FY16
ASSETS										
Current assets	1,580	1,276	1,844	1,490	1,485	1,583	1,488	**537**	**1,500**	**1,490**
Cash and cash equivalent	326	170	852	426	433	469	496	**172**	**300**	**426**
Short-term investments, Restricted cash	233	26	174	187	14	0	0	**72**	**245**	**187**
Accounts receivable, net	408	438	297	316	401	491	421	**137**	**354**	**316**
Inventories	364	394	407	428	456	437	405	**126**	**347**	**428**
Other current assets	250	248	115	134	182	185	166	**30**	**255**	**134**
Property and equipment, net	940	972	1,013	1,047	1,161	1,240	1,336	**196**	**883**	**1,047**
Goodwill	2,137	2,136	2,136	2,136	2,175	2,175	2,174	**104**	**2,141**	**2,136**
Intangible assets, net	2,184	2,055	1,927	1,813	1,776	1,656	1,534	**55**	**2,307**	**1,813**
Long-term investments	4	29	29	26	26	35	35	**4**	**4**	**26**
Other non-current assets	65	64	62	66	65	63	58	**24**	**57**	**66**
Total assets	**6,910**	**6,532**	**7,011**	**6,578**	**6,688**	**6,752**	**6,625**	**920**	**6,892**	**6,578**
LIABILITIES AND SHAREHOLDERS' EQUITY										
Current liabilities	335	355	301	355	420	557	549	**220**	**325**	**355**
Accounts payable	206	205	205	343	406	536	425	**80**	**182**	**343**
Accrued liabilities	129	147	95	0	0	0	0	**52**	**132**	**0**
Current portion of long-term debt, net	0	0	0	0	0	0	0	**87**	**0**	**0**
Other current liabilities	1	3	1	12	14	22	124	**1**	**11**	**12**
Long-term debt, net	0	75	988	988	988	989	989	**0**	**0**	**988**
Other long-term liabilities	396	390	228	235	246	229	224	**24**	**394**	**235**
Total liabilities	732	820	1,517	1,578	1,654	1,775	1,762	**244**	**719**	**1,578**
Retained earnings	(409)	(404)	(385)	(384)	(359)	(321)	(383)	**(607)**	**(411)**	**(384)**
Other	6,587	6,117	5,879	5,384	5,393	5,298	5,246	**1,284**	**6,584**	**5,384**
Shareholders' equity	6,178	5,712	5,494	5,000	5,034	4,976	4,863	**676**	**6,173**	**5,000**
Total liabilities and SE	**6,910**	**6,532**	**7,011**	**6,578**	**6,688**	**6,752**	**6,625**	**920**	**6,892**	**6,578**

*Does not include TriQuint

Source: Company data, FactSet, Macquarie Capital (USA), March 2017

Qorvo

Ratio analysis

FYE Mar	**F1Q16 Jun-15Q**	**F2Q16 Sep-15Q**	**F3Q16 Dec-15Q**	**F4Q16 Mar-16Q**	**F1Q17 Jun-16Q**	**F2Q17 Sep-16Q**	**F3Q17 Dec-16Q**	**FY15**	**FY16**
Profitability Analysis									
Return on Assets (Pretax)**	(0.1%)	1.1%	(0.8%)	0.5%	0.3%	2.7%	3.7%	**5.1%**	**0.2%**
Return on Equity (Aftertax)**	0.1%	0.3%	(0.8%)	(1.8%)	(0.5%)	0.9%	(6.4%)	**7.5%**	**(0.5%)**
ROIC (Pretax)**	(0.1%)	1.2%	(0.9%)	0.6%	0.4%	3.2%	4.4%	**3.3%**	**0.2%**
Cash Conversion Cycle (Days)	98	103	99	72	64	33	42	**118**	**67**
DSOs	55	56	43	47	52	51	46	**62**	**44**
Days of Inventory	100	100	113	127	114	80	79	**119**	**118**
Days Payable Outstanding	57	52	57	101	101	97	83	**63**	**94**
Liquidity Analysis									
Current Ratio	4.7x	3.6x	6.1x	4.2x	3.5x	2.8x	2.7x	**4.6x**	**4.2x**
Quick Ratio	2.9x	1.8x	4.4x	2.6x	2.0x	1.7x	1.7x	**2.8x**	**2.6x**
Debt/Solvency Analysis									
Debt/Total Capital	0.0%	1.3%	15.2%	16.5%	16.4%	16.6%	16.9%	**0.0%**	**16.5%**
Debt/Equity	0.0%	1.3%	18.0%	19.8%	19.6%	19.9%	20.3%	**0.0%**	**19.8%**
Asset Values									
Book Value/Share	$40.00	$37.88	$38.13	$35.21	$37.96	$37.61	$36.99	**$41.01**	**$33.82**
Tangible Book Value/Share	$12.03	$10.09	$9.93	$7.40	$8.17	$8.65	$8.79	**$11.46**	**$7.11**
Total Cash & Equiv/Share	$3.64	$1.49	$7.32	$4.50	$3.57	$3.81	$4.04	**$3.65**	**$4.32**
Net Cash/Share	$3.64	$0.99	$0.46	($2.46)	($3.89)	($3.66)	($3.49)	**$3.65**	**($2.36)**

*RF Micro Devices only (no TriQuint)

**Based on GAAP

Source: Company data, FactSet, Macquarie Capital (USA), March 2017

Companies mentioned:

Broadcom (AVGO US, $220.95, Outperform, TP$265.00)

QUALCOMM (QCOM US, $57.38, Neutral, TP $60.00)

Skyworks Solutions (SWKS US, $97.93, Outperform, TP$110)

Macquarie Quant View

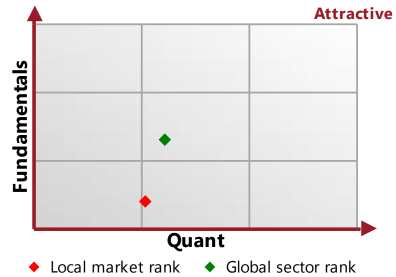
The quant model currently holds a neutral view on Qorvo. The strongest style exposure is Price Momentum, indicating this stock has had strong medium to long term returns which often persist into the future. The weakest style exposure is Earnings Momentum, indicating this stock has received earnings downgrades and is not well liked by sell side analysts.

213/357

Global rank in

Semiconductors & Semiconductor Equip.

% of BUY recommendations	48% (11/23)
Number of Price Target downgrades	0
Number of Price Target upgrades	3

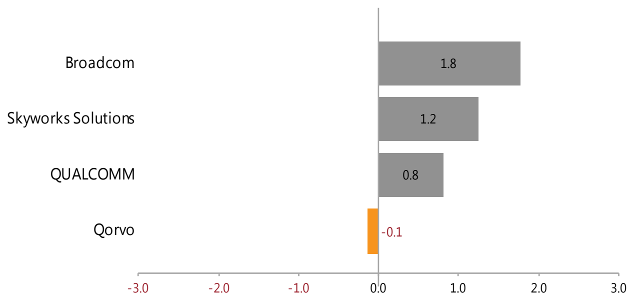


Displays where the company's ranked based on the fundamental consensus Price Target and Macquarie's Quantitative Alpha model.

Two rankings: Local market (United States) and Global sector (Semiconductors & Semiconductor Equip.)

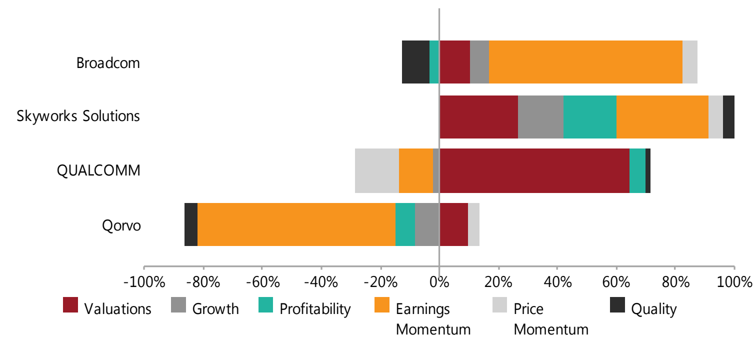
Macquarie Alpha Model ranking

A list of comparable companies and their Macquarie Alpha model score (higher is better).



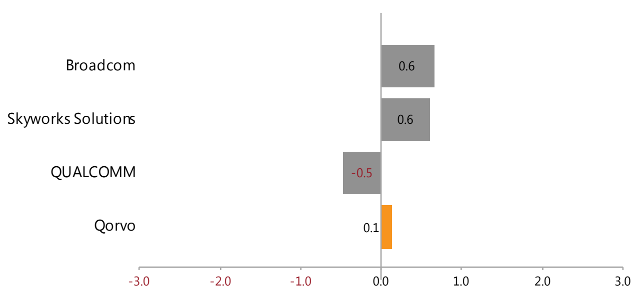
Factors driving the Alpha Model

For the comparable firms this chart shows the key underlying styles and their contribution to the current overall Alpha score.



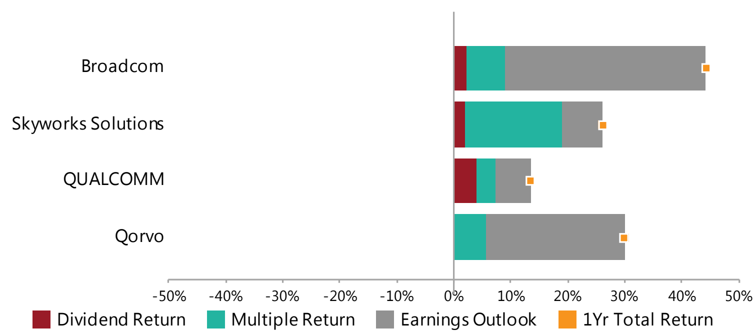
Macquarie Earnings Sentiment Indicator

The Macquarie Sentiment Indicator is an enhanced earnings revisions signal that favours analysts who have more timely and higher conviction revisions. Current score shown below.



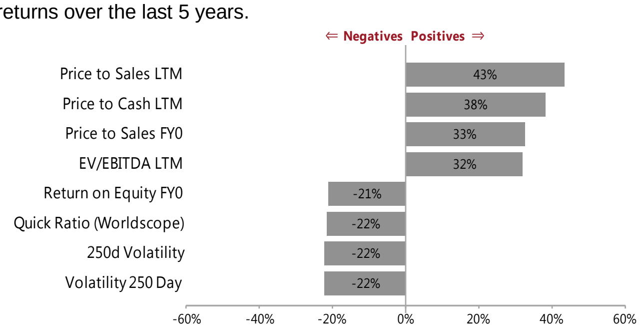
Drivers of Stock Return

Breakdown of 1 year total return (local currency) into returns from dividends, changes in forward earnings estimates and the resulting change in earnings multiple.



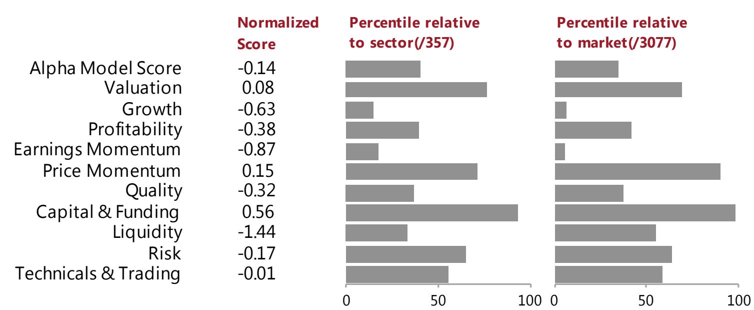
What drove this Company in the last 5 years

Which factor score has had the greatest correlation with the company's returns over the last 5 years.



How it looks on the Alpha model

A more granular view of the underlying style scores that drive the alpha (higher is better) and the percentile rank relative to the sector and market.



Source (all charts): FactSet, Thomson Reuters, and Macquarie Research. For more details on the Macquarie Alpha model or for more customised analysis and screens, please contact the Macquarie Global Quantitative/Custom Products Group (cpg@macquarie.com

UNITED STATES

MRVL US		Neutral
Price (at CLOSE#, 28 Mar 2017)		US$15.70
Valuation - PER	**US$**	**16.00**
12-month target	**US$**	**16.00**
12-month TSR	**%**	**+3.4**
GICS sector Semiconductors & Semiconductor Equipment		
Market cap	**US$m**	**7,974**
30-day avg turnover	**US$m**	**111.6**
Number shares on issue	**m**	**507.9**

Investment fundamentals

Year end 31 Jan		2017A	2018E	2019E	2020E
Revenue	m	2,393.0	2,367.9	2,412.9	2,414.4
CFPS	US$	0.81	1.19	1.21	1.22
CFPS growth	%	34.4	47.9	1.2	0.7
PGCFPS	x	19.4	13.1	13.0	12.9
EPS adj	US$	0.60	0.99	1.05	1.06
EPS adj growth	%	46.9	65.0	5.8	0.6
PER adj	x	26.1	15.8	15.0	14.9
Total DPS	US$	0.24	0.24	0.24	0.24
Total div yield	%	1.5	1.5	1.5	1.5
EV/EBITDA	x	13.7	10.4	10.3	10.2

Source: FactSet, Macquarie Capital (USA), March 2017
(all figures in USD unless noted)

Analyst(s)
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30 March 2017
Macquarie Capital (USA) Inc.

Marvell Technology Group

Good job so far, in need of some M&A

Initiating coverage with a Neutral

We initiate coverage with a Neutral rating and $16 PT. We believe Marvell's new management has done an excellent job of restructuring & improving the margin profile. The company is also benefiting from near term strength in Storage and new design wins in Networking & Connectivity markets. While 2H17 estimates appear reasonable, we are skeptical that MRVL can grow in line with peers in the next 1 – 2 years given its current product portfolio. We view SSD transition as a neutral at best given the company's strong presence in notebook HDD controllers. Lack of Data Center switching presence limits company's growth prospects in Networking. At 12x CY17 EV/FCF, valuation is reasonable and cash flow metrics are solid. However, we do not see many catalysts and believe that the company needs to expand into additional growth markets through M&A and/or aggressive R&D investments.

SSD transition presents risks & opportunities

We estimate that Notebook & Enterprise HDD controllers currently account for 25-30% of sales and 40%-50% of profits for the company. While NAND supply constraints are limiting SSD transition, we expect SSD adoption to accelerate in 2H17 as NAND supply situation improves. Marvell is the leader in SSD controllers for notebooks, which should help offset the HDD declines to some extent. However, with Samsung relying on internal controllers, the merchant silicon unit opportunity is much smaller compared to the HDD market (100% of HDDs use merchant controllers). We also expect SSD controller market to be more competitive than the duopolistic HDD controller market, which could negatively impact margins. On the other hand, we view the enterprise SSD as an incremental opportunity given MRVL's low market share in enterprise HDD controllers, and the higher ASPs associated with enterprise SSD controllers.

Networking solid but needs to beef up Data Center presence

MRVL made good progress in Networking in 2016 after several years of underperforming peers. MRVL has a strong presence in enterprise/campus switching market and stands to benefit from 2.5GE (NBase-T) adoption in the next few years. The company should also benefit as Chinese Networking OEMs gain share from Cisco, who relies mostly on internal silicon. That said, MRVL appears to exiting some niche business, which could limit near term growth. Marvell also needs aggressive R&D spending and/or M&A in order to be viewed as a viable supplier in the fast growing Data Center switching market. In WiFi, the company has a strong position in enterprise access points and gaming, and we see tailwinds from technology transitions (802.11ac and .ax). We also see incremental opportunities in automotive and IoT markets but don't expect this segment to move the needle much.

Strong balance sheet could lead to M&A

At a PE of 16x and EV/FCF of 12x on our CY17 estimates, valuation is at a slight discount to historic averages. Given the changes to management and the restructuring, Marvell has been viewed as an M&A target for some time. However, we do not see many immediate takers. On the contrary, we view Marvell as a potential acquirer given the strong balance sheet ($1.7b net cash) and gaps in its product portfolio. We think the stock could become attractive if the company targets the right product areas through M&A and leverages its favourable tax structure. Until then, we do not see many catalysts and believe that downside is also limited given the strong balance sheet, cash flow, and reasonable valuation.

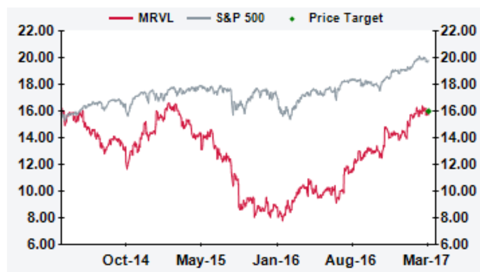
Inside

Marvell Technology Group

Company profile

- Marvell Technology Group Ltd. engages in the business of providing semiconductors to high-performance application-specific standard products. The company focuses on the development of complex System-on-a-Chip devices leveraging extensive technology portfolio of intellectual property in the areas of analog, mixed-signal, digital signal processing, and embedded and standalone integrated circuits. Its product portfolio includes devices for data storage, enterprise-class Ethernet data switching, Ethernet physical-layer transceivers, mobile handsets, connectivity and other consumer electronics.
- The company was founded by Sehat Sutardja, Weili Dai and Pantas Sutardja in January 1995 and is headquartered in Hamilton, Bermuda.

Fig 1 MRVL US vs S&P 500, & rec history



Note: Recommendation timeline - if not a continuous line, then there was no Macquarie coverage at the time or there was an embargo period.

Source: FactSet, Macquarie Capital (USA), March 2017

(all figures in USD unless noted)

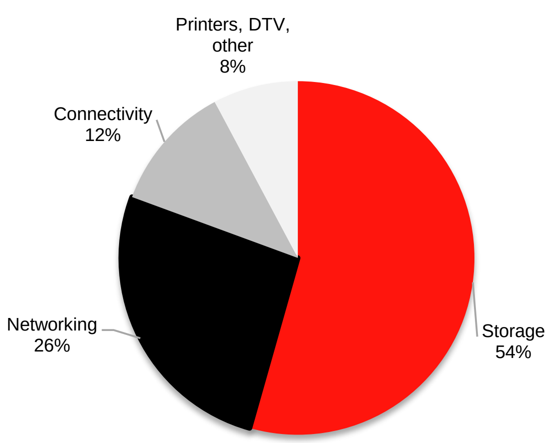
Good job so far, in need of some M&A

Initiating with Neutral

We are sceptical that MRVL can grow in line with peers given its current product portfolio

We are initiating coverage with a Neutral rating and $16 PT. We believe Marvell's new management has done an excellent job of restructuring & improving the margin profile. The company is also benefiting from near term strength in the Storage market and secular trends in Networking. While 2H17 estimates appear reasonable, we are skeptical that MRVL can grow in line with peers in the next 1 – 2 years given its current portfolio. We view SSD transition as a neutral to slightly negative given the company's strong presence in notebook HDD controllers, which we believe are most vulnerable to SSD transition. Lack of Data Center switching presence limits company's growth prospects in Networking. At 12x CY17 EV/FCF, valuation is reasonable and cash flow metrics are solid. However, we do not see many catalysts and believe that the company needs to expand into additional growth markets through M&A and/or aggressive R&D investments

Fig 2 Sales by segment (Dec-16Q)



Source: Company data, Macquarie Capital (USA), March 2017

Fig 3 Estimates Summary*

	CY16A	CY17E	CY18E
Revenue (US$m)	2393	2368	2413
YoY change (%)	-12.2%	-1.0%	1.9%
Gross margin (%)	55%	59%	59%
Operating margin (%)	13%	22%	23%
Non-GAAP EPS (US$)	0.60	0.99	1.05
PE (X) @US$15.70	26.0	15.8	15.0
EV/FCF @US$15.70	-15.8	12.0	12.0

**Since MRVL's FY ends in Jan, we approximate FY18 estimates as CY17 estimates, and FY19 estimates as CY18 estimates*

Source: Company data, Macquarie Capital (USA), March 2017

SSD transition presents risks & opportunities

Samsung uses internal controllers for its SSD, which limits the opportunity for merchant silicon suppliers such as MRVL

We estimate that Notebook HDD controllers account for about 15% of sales and Enterprise HDD controllers account for 10 – 15% of sales currently. We expect SSD adoption to accelerate in 2H17 as the NAND supply situation improves on the back of 3D NAND spending in the industry. Marvell is the leader in SSD controllers for notebooks, which should help offset the HDD declines to some extent. However, with Samsung relying on internal controllers, the merchant silicon unit opportunity is much smaller compared to the HDD market, where 100% of the drives use merchant solutions. We estimate that MRVL's market share in client SSD controllers is well-below its Notebook HDD controller share of more than 90%. We also expect Notebook SSD ASP and margin pressures to be higher due to lower complexity and more intense competition (Silicon Motion, Phison, etc). On the enterprise side, while in-house and custom solutions limit merchant silicon opportunity, MRVL's low share in enterprise HDD controllers and much higher ASP for enterprise SSD controllers may mean that the transition is slightly beneficial to the company.

Fig 4 HDD OEM shipments and controller suppliers (2016)

	Notebook	Desktop	Enterprise
Total HDD Units (2016)	167.4m	101.7m	65.9m
WD	MRVL	MRVL, AVGO	AVGO
STX	MRVL	AVGO	MRVL , AVGO
Toshiba	MRVL	AVGO	AVGO

Source: IDC, Company data, Macquarie Capital (USA), March 2017

Fig 5 Client SSD market share (38m units in 4Q16) and controller suppliers

Samsung	38.1%	Internal
WDC/Sandisk	16.9%	MRVL, SIMO, Internal
Kingston	8.2%	MRVL, SIMO
Toshiba	8.1%	MRVL
Lite-on	6.9%	MRVL, SIMO
Micron	6.1%	MRVL, SIMO
Intel	5.5%	SIMO, Internal
Other	10.3%	SIMO, Phison, MRVL

Source: IDC, Company data, Macquarie Capital (USA), March 2017

Networking progress encouraging but needs additional R&D or M&A

MRVL has made good progress in Networking in 2016 after several years of underperforming peers in this segment. We are generally optimistic about the company's prospects although the company has a long way to go to catch up to the leader Broadcom. MRVL has a strong presence in enterprise/campus switching and stands to benefit from 2.5GE (NBase-T) adoption in the next few years. The company should also benefit as Chinese Networking OEMs gain share from Cisco, who relies mostly on internal silicon. That said, Marvell appears to be exiting certain niche businesses (such as Network processors) that could blunt growth in the near term. We believe the company needs aggressive R&D spending and or M&A in order to be viewed as a viable supplier in the fast growing Data Center and Cloud switching markets.

Not many catalysts in other markets

Other markets, we see decent prospects in Connectivity as the company should benefit from its strong presence in enterprise access points and gaming markets. Marvell is also making progress in automotive and home automation application though we don't expect these markets to move the needle much in the near term. The Other segment, which includes printer ASICs, is expected to decline 30% this year as the company deemphasizes investments in these areas.

Strong balance sheet could lead to M&A

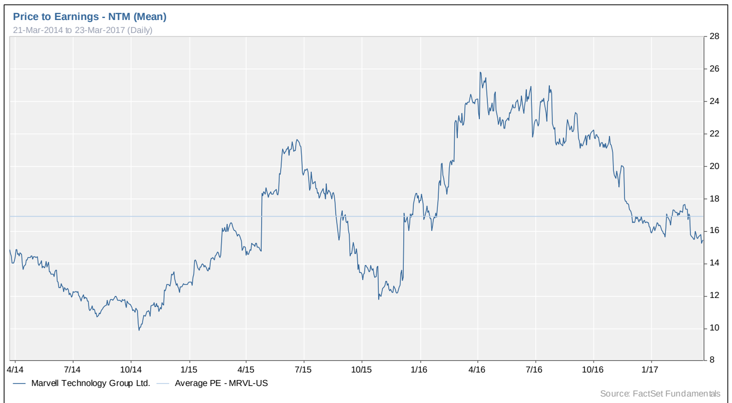
At a PE of 16x and EV/FCF of 12x CY17E, valuation is in line with historic averages. Given the changes to management and the restructuring, Marvell has been viewed as an M&A target for some time. However, we do not see many immediate takers. On the contrary, we view Marvell as a potential acquirer given the strong balance sheet ($1.7b net cash) and gaps in its product portfolio. We think the stock could become attractive if the company targets the right product areas through M&A and leverages its favourable tax structure. Until then, we do not see many catalysts and believe that downside is also limited given the strong balance sheet, cash flow, and reasonable valuation.

Valuation

We are initiating coverage with Neutral rating and a $16 price target.

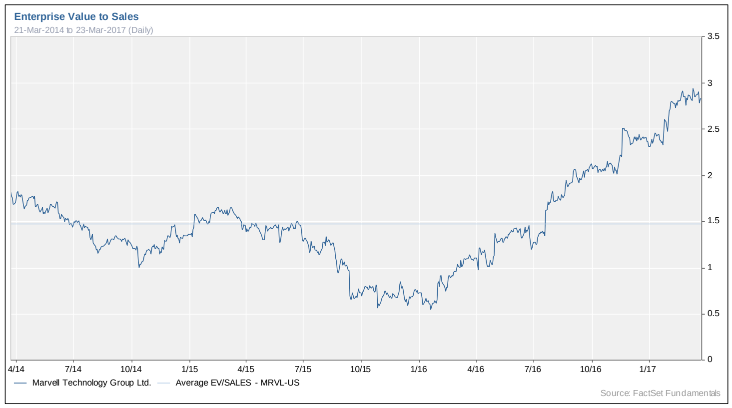
On a Non-GAAP basis, the stock is trading at 16x our CY17 estimates, which is at a slight discount to 3-year average. The stock is at a 10% discount to the broader Semis on a PE basis (and more than 30% discount on an EV/FCF basis), which we feel is justified given our view that MRVL will struggle to grow in line with peers in the next 1 – 2 years given its current portfolio.

Fig 6 MRVL Historical PE



Source: Factset, Macquarie Capital (USA), March 2017

Fig 7 MRVL EV/Sales



Source: Factset, Macquarie Capital (USA), March 2017

Macquarie vs consensus

Fig 8 Broadly in line on 18E numbers

MRVL	18E	19E	20E
MQ/Consensus (Rev %)	-0.1	-1.4	-2.0
MQ/Consensus (EPS %)	-1.8	-9.9	-19.0

Source: FactSet, Macquarie Capital (USA), March 2017

Marvell Technology Group
Income Statement

(FY ends in Jan)	**1Q17**	**2Q17**	**3Q17**	**4Q17**	**1Q18E**	**2Q18E**	**CY16**	**CY17E**	**CY18E**	**CY19E**
($m/%)	**Apr-16**	**Jul-16**	**Oct-16**	**Jan-17**	**Apr-17E**	**Jul-17E**	**FY17**	**FY18E**	**FY19E**	**FY20E**
Revenues	540.8	626.4	654.4	571.4	570.8	588.8	**2393.0**	**2367.9**	**2412.9**	**2414.4**
Cost of Sales	256.9	284.3	283.4	242.2	234.0	241.8	**1066.8**	**973.1**	**992.2**	**995.0**
Gross Profit	283.9	342.1	371.1	329.2	336.8	347.0	**1326.2**	**1394.8**	**1420.8**	**1419.4**
Operating Exp	279.9	261.8	255.9	218.2	218.2	218.2	**1015.8**	**873.2**	**873.4**	**874.1**
R&D	216.1	200.1	202.5	169.5	169.5	169.5	**788.2**	**677.8**	**677.8**	**677.8**
SM	28.1	27.8	27.6	24.9	24.9	24.9	**108.5**	**99.7**	**99.3**	**99.1**
G&A	35.7	33.8	25.8	23.8	23.8	23.8	**119.1**	**95.7**	**96.3**	**97.1**
Operating Inc	4.0	80.4	115.2	110.9	118.5	128.8	**310.4**	**521.6**	**547.3**	**545.3**
Non-operating Inc	1.5	6.3	5.5	3.8	3.0	3.0	**17.0**	**12.0**	**12.0**	**12.0**
Pretax Income	5.4	86.6	120.6	114.7	121.5	131.8	**327.4**	**533.6**	**559.3**	**557.3**
Provision for Taxes	-1.1	-5.5	15.8	0.5	4.9	2.6	**9.8**	**13.1**	**13.7**	**13.7**
Net Income	6.5	92.2	104.8	114.2	116.7	129.1	**317.7**	**520.5**	**545.6**	**543.6**
Non-GAAP EPS	**$ 0.01**	**$ 0.18**	**$ 0.20**	**$ 0.22**	**$ 0.22**	**$ 0.25**	**$0.60**	**$0.99**	**$1.05**	**$1.06**
Non-GAAP EPS (inc stock comp)	**$ (0.03)**	**$ 0.10**	**$ 0.14**	**$ 0.17**	**$ 0.18**	**$ 0.20**	**$ 0.39**	**$ 0.82**	**$ 1.05**	**$ 1.06**
FCF per share	$ (1.32)	$ 0.09	$ 0.21	$ 0.22	$ 0.27	$ 0.23	**($0.79)**	**$1.08**	**$1.09**	**$1.11**
Shares Outstanding	521.3	526.5	531.8	528.1	526.9	525.6	**526.9**	**525.0**	**520.0**	**515.0**
% of Revenues										
Cost of Sales	47.5%	45.4%	43.3%	42.4%	41.0%	41.1%	**44.6%**	**41.1%**	**41.1%**	**41.2%**
Gross Profit	52.5%	54.6%	56.7%	57.6%	59.0%	58.9%	**55.4%**	**58.9%**	**58.9%**	**58.8%**
Operating Exp	51.8%	41.8%	39.1%	38.2%	38.2%	37.1%	**42.4%**	**36.9%**	**36.2%**	**36.2%**
Operating Inc	0.7%	12.8%	17.6%	19.4%	20.8%	21.9%	**13.0%**	**22.0%**	**22.7%**	**22.6%**
Non-operating Inc	0.3%	1.0%	0.8%	0.7%	0.5%	0.5%	**0.7%**	**0.5%**	**0.5%**	**0.5%**
Pretax Inc	1.0%	13.8%	18.4%	20.1%	21.3%	22.4%	**13.7%**	**22.5%**	**23.2%**	**23.1%**
Effective Tax Rate	-19.7%	-6.4%	13.1%	0.5%	4.0%	2.0%	**3.0%**	**2.5%**	**2.5%**	**2.5%**
Net Income	1.2%	14.7%	16.0%	20.0%	20.4%	21.9%	**13.3%**	**22.0%**	**22.6%**	**22.5%**
YoY Change										
Revenues	-25%	-12%	-3%	-7%	6%	-6%	**-12%**	**-1%**	**2%**	**0%**
Gross Profit	-24%	-2%	20%	3%	19%	1%	**-2%**	**5%**	**2%**	**0%**
Pretax Income	-92%	60%	281%	114%	2131%	52%	**55%**	**63%**	**5%**	**0%**
Net Income	-91%	48%	275%	109%	1690%	40%	**47%**	**64%**	**5%**	**0%**
QoQ Change										
Revenues	-12%	16%	4%	-13%	0%	3%				
Gross Profit	-11%	21%	8%	-11%	2%	3%				
Pretax Income	-90%	1491%	39%	-5%	6%	8%				
Net Income	-88%	1314%	14%	9%	2%	11%				

Source: Company data, FactSet, Macquarie Capital (USA), March 2017

*since MRVL's FY ends in Jan, we approximate FY18 estimates as CY17 estimates.

Marvell Technology Group
Balance Sheet

(FY ends in Jan)	1Q17	2Q17	3Q17	4Q17	CY15	CY16
($m/%)	Apr-16	Jul-16	Oct-16	Jan-17	FY16	FY17
Assets						
Current Assets	2,149.8	2,230.3	2,261.1	2,280.3	3,344.0	2,918.6
Cash and Equivalents	1,615.2	1,624.0	1,650.4	1,668.4	1,211.0	2,282.7
Short-term Investments	0.0	0.0	0.0	0.0	1,318.6	0.0
A/R, Net	280.7	348.7	362.2	335.4	421.0	323.3
Inventories/Net	196.7	202.7	198.8	172.0	308.2	210.0
Prepaids, Other Current Assets	57.1	54.9	49.7	104.6	85.4	102.6
Non-Current Assets	2,507.3	2,486.4	2,493.3	2,368.3	2,540.3	2,523.5
Plant/Equipment, Net	283.6	274.8	266.0	243.4	340.6	299.5
Long-term Investments	9.0	9.0	9.0	4.6	10.2	11.3
Goodwill	2,045.0	2,042.1	2,039.3	2,007.0	2,060.6	2,048.0
Deposits, Other Assets	169.8	160.6	179.1	113.3	128.8	164.7
Total Assets	**4,657.1**	**4,716.7**	**4,754.4**	**4,648.7**	**5,884.4**	**5,442.1**
Liabilities/Owners' Equity						
Current Liabilities	484.7	504.5	503.2	496.4	637.4	1,225.8
Accounts Payable	193.7	213.0	183.3	143.5	282.9	180.4
Accrued Liabilities	236.5	219.5	256.3	283.1	286.4	253.7
Income Taxes Payable	0.0	0.0	0.0	0.0	0.0	0.0
Deferred Revenue	54.5	72.0	63.7	68.1	68.1	55.7
LT Debt, Current	0.0	0.0	0.0	1.7	0.0	736.0
Capital lease obligations	0.0	0.0	0.0	0.0	0.0	0.0
Long-Term Obligations	0.0	0.0	0.0	0.0	0.0	0.0
Other long-term liabilities	72.6	53.1	70.7	124.6	100.9	76.2
Total Liabilities	557.3	557.6	574.0	621.0	738.3	1,302.0
Stockholders' Equity	4,099.8	4,159.1	4,180.5	4,027.7	5,146.1	4,140.1
Total Liabilities & Equity	**4,657.1**	**4,716.7**	**4,754.4**	**4,648.7**		

Source: Company data, FactSet, Macquarie Capital (USA), March 2017

Marvell Technology Group
Ratio Analysis

(FY ends in Jan)	1Q17 Apr-16	2Q17 Jul-16	3Q17 Oct-16	4Q17 Jan-17	CY15 FY16	CY16 FY17
Profitability Analysis (%)						
Return on Assets (Pretax)	-2%	3%	7%	-1%	**-8%**	**2%**
Return on Equity (Aftertax)	-2%	5%	7%	-7%	**-10%**	**1%**
Return on Operating Capital (Preta	-4%	6%	13%	-2%	**-17%**	**3%**
Cash Conversion Cycle (Days)	48	47	55	63	**50**	**60**
DSOs	47	50	50	53	**43**	**50**
Days of Inventory	69	64	63	64	**55**	**58**
Days Payables Outstanding	68	67	58	53	**47**	**48**
Liquidity Analysis (x)						
Current Ratio	4.4	4.4	4.5	4.6	**2.4**	**4.6**
Quick Ratio	3.9	3.9	4.0	4.0	**2.1**	**4.0**
Debt/Solvency Analysis (%)						
Debt/Total Capital	-	-	-	0.0	**13.5**	**0.0**
Debt/Common Equity	-	-	-	0.0	**17.8**	**0.0**
Asset Values						
Book Value/Share	8.06	8.09	8.01	7.93	**8.05**	**7.85**
Tangible Book Value/Share	4.04	4.12	4.10	3.98	**4.07**	**3.94**
Total Cash & Equiv/Share	3.19	3.18	3.18	3.29	**4.46**	**3.26**
Net Cash/Share	3.19	3.18	3.18	3.29	**3.03**	**3.26**
Other						
Capital Spending ($mil)	11,868	12,509	13,347	6,786	13,347	6,786
Depreciation and Amortization ($	27,114	26,866	27,188	26,683	27,188	26,683

Source: Company data, FactSet, Macquarie Capital (USA), March 2017

Companies Mentioned:

Broadcom (AVGO US, US$220.95, Outperform, TP: US$265.00)

Micron Technology (MU US, US$28.43, Outperform, TP: US$35.00)

Intel (INTC US, US$35.04, Neutral, TP: US$40.00)

Western Digital (WDC, Not covered)

Seagate (STX, Not covered)

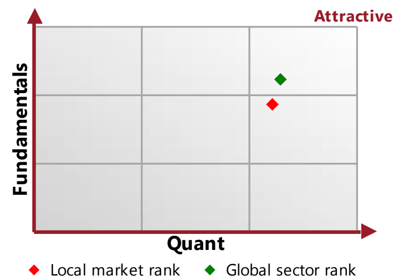
Macquarie Quant View

The quant model currently holds a reasonably positive view on Marvell Technology Group. The strongest style exposure is Earnings Momentum, indicating this stock has received earnings upgrades and is well liked by sell side analysts. The weakest style exposure is Quality, indicating this stock is likely to have a weaker and less stable underlying earnings stream.

85/357

Global rank in Semiconductors & Semiconductor Equip.

% of BUY recommendations	44% (11/25)
Number of Price Target downgrades	0
Number of Price Target upgrades	22

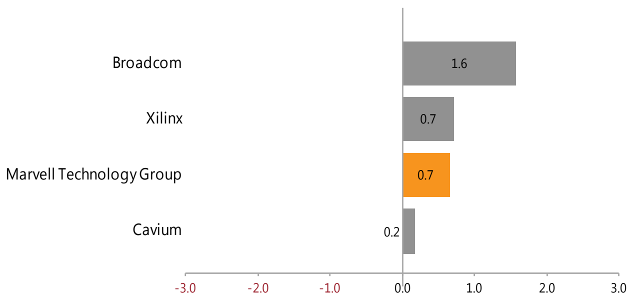


Displays where the company's ranked based on the fundamental consensus Price Target and Macquarie's Quantitative Alpha model.

Two rankings: Local market (United States) and Global sector (Semiconductors & Semiconductor Equip.)

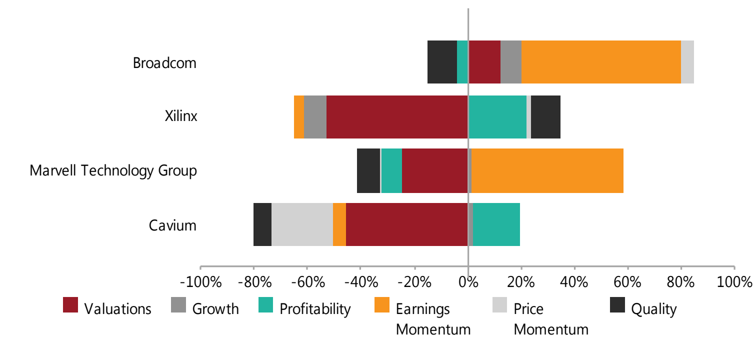
Macquarie Alpha Model ranking

A list of comparable companies and their Macquarie Alpha model score (higher is better).



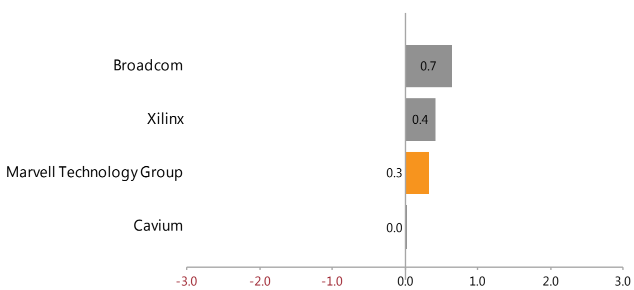
Factors driving the Alpha Model

For the comparable firms this chart shows the key underlying styles and their contribution to the current overall Alpha score.



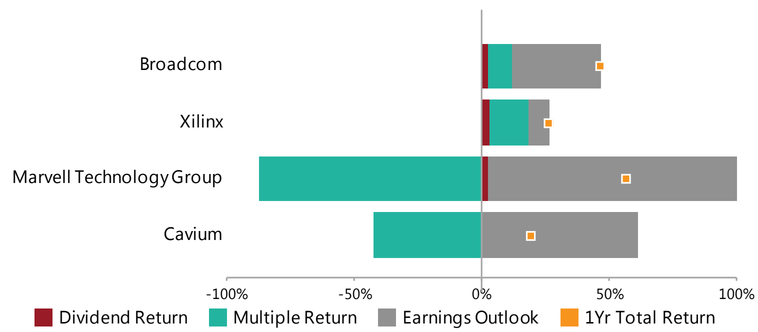
Macquarie Earnings Sentiment Indicator

The Macquarie Sentiment Indicator is an enhanced earnings revisions signal that favours analysts who have more timely and higher conviction revisions. Current score shown below.



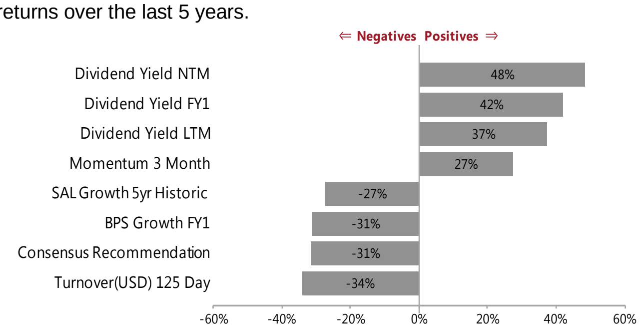
Drivers of Stock Return

Breakdown of 1 year total return (local currency) into returns from dividends, changes in forward earnings estimates and the resulting change in earnings multiple.



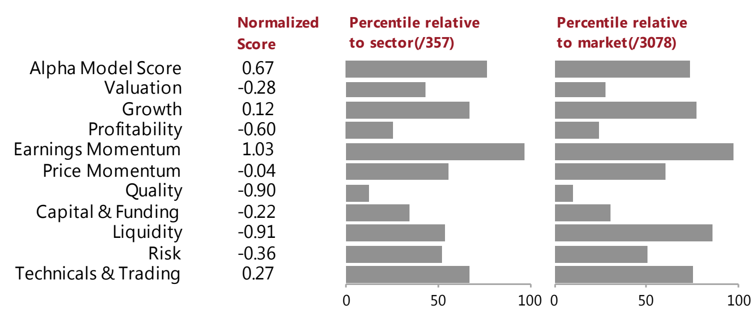
What drove this Company in the last 5 years

Which factor score has had the greatest correlation with the company's returns over the last 5 years.



How it looks on the Alpha model

A more granular view of the underlying style scores that drive the alpha (higher is better) and the percentile rank relative to the sector and market.



Source (all charts): FactSet, Thomson Reuters, and Macquarie Research. For more details on the Macquarie Alpha model or for more customised analysis and screens, please contact the Macquarie Global Quantitative/Custom Products Group (cpg@macquarie.com

UNITED STATES

TXN US		Neutral
Price (at CLOSE#, 28 Mar 2017)		US$80.56
Valuation - PER	**US$**	**82.00**
12-month target	**US$**	**82.00**
12-month TSR	**%**	**+4.3**
GICS sector Semiconductors & Semiconductor Equipment		
Market cap	**US$m**	**80,528**
30-day avg turnover	**US$m**	**388.9**
Number shares on issue	**m**	**999.6**

Investment fundamentals

Year end 31 Dec		2016A	2017E	2018E	2019E
Revenue	m	13,370	14,031	14,534	15,104
EBIT	m	5,218	5,818	6,086	6,445
Reported profit	m	3,552	3,694	3,899	4,150
CFPS	US$	4.84	4.97	5.22	5.53
CFPS growth	%	12.4	2.7	5.0	6.1
PGCFPS	x	16.7	16.2	15.4	14.6
EPS rep	US$	3.48	3.67	3.92	4.22
EPS rep growth	%	23.3	5.4	6.9	7.7
PER rep	x	23.2	22.0	20.5	19.1
Total DPS	US$	1.64	2.00	2.00	2.00
Total div yield	%	2.0	2.5	2.5	2.5
EV/EBITDA	x	13.8	12.5	11.9	11.2

Source: FactSet, Macquarie Capital (USA), March 2017
(all figures in USD unless noted)

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30 March 2017
Macquarie Capital (USA) Inc.

Texas Instruments

Solid story but well understood

Initiating with a Neutral

We are initiating on Texas Instruments with a Neutral rating and $82 target. The company's diversified business model, margin execution, and cash returns have all helped drive significant outperformance in the stock over the past 3 years. We expect TXN's topline to continue to benefit from secular trends in industrial and automotive semiconductor markets, and see further tailwinds to gross margins as the company transitions more products to its lower-cost 300mm factories. TXN's tax rate is among the highest in the Semi industry, and any corporate tax reform should be a positive. We expect TI to slightly outgrow the Analog Semi market this year and some potential for upside to Street estimates. However, we believe premium valuation and slowing YoY revenue momentum will keep the stock range bound.

Diversified business benefiting from secular trends

Texas Instruments shifted its focus away from lower margin wireless into higher margin industrial and automotive markets a few years ago, and that strategy continues to pay off. The industrial segment, which grew at a 4.5% CAGR over the past 2 years, should continue to benefit from factory automation and internet of things (IoT). The automotive segment is growing at an impressive 20% rate. Growing electronics content and the move toward self-driving cars should continue to drive double digit growth in TI's automotive business for the next several years.

Margin expansion to continue, albeit at a more modest pace

Management's decision to invest aggressively in (low-cost) manufacturing tools during the industry downturn gave the company a significant cost advantage. The company opex execution has also been impressive and its opex/sales is the lowest among peers. While opex restructuring appears largely behind it, TI's manufacturing facilities have significant slack capacity (30% utilization) and we believe could drive additional gross margin upside in the coming years even with modest topline growth.

Solid cash returns; a key beneficiary of potential tax reform

TI has set an example in the industry by returning nearly 100% of its FCF through buybacks and dividends in the past 3 years. The company's business model enables significant cash flow generation (FCF 30% of sales) and we expect aggressive cash returns to continue. TI's tax rate is among the highest in the industry, which enables the company to keep most of its FCF in the US and return it to shareholders. Any corporate tax reform will benefit TXN's earnings much more than many of its Semi peers who have lower tax rates.

Premium valuation justified, but stock range bound

The stock is trading at a 22x PE and 19x EV/FCF on our CY17 estimates, which is at a premium to the company's 3-year average and large cap Semi peers. We expect dividend growth to continue at the rate of earnings growth. While an accretive M&A could act as a potential catalyst, management's comments suggest that a larger deal is less likely in the near term. We expect the stock to be range bound given the premium valuation and slowing YoY growth momentum.

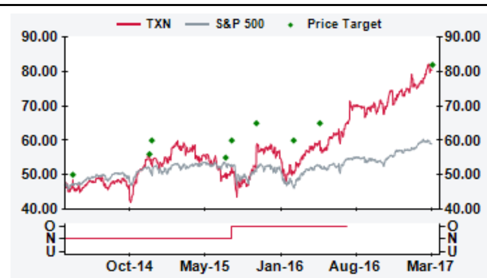
Inside

Texas Instruments Incorporated

Company profile

- Texas Instruments Incorporated engages in the design and manufacture of semiconductor solutions for analog and digital embedded and application processing. It operates through Analog & Embedded Processing segments, and supplies into a variety of end markets including Industrial, Auto, and Personal Electronics.
- The Analog semiconductors change real-world signals such as sound, temperature, pressure or images, by conditioning them, amplifying them and often converting them to a stream of digital data that can be processed by other semiconductors, such as embedded processors.
- The Embedded Processing segment is designed to handle specific tasks and can be optimized for various combinations of performance, power and cost, depending on the application.
- The company was founded by Cecil H. Green, Patrick Eugene Haggerty, John Erik Jonsson and Eugene McDermott in 1930 and is headquartered in Dallas, TX.

Fig 1 TXN US vs S&P 500, & rec history



Note: Recommendation timeline - if not a continuous line, then there was no Macquarie coverage at the time or there was an embargo period.

Source: FactSet, Macquarie Capital (USA), March 2017

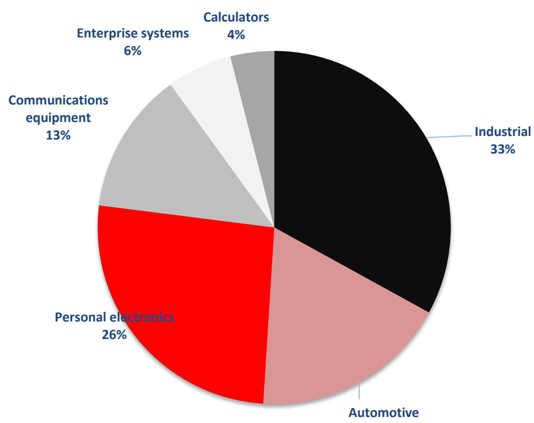
(all figures in USD unless noted)

Solid story but well understood

Initiating with a Neutral

We are initiating coverage of Texas Instruments with a Neutral rating and $82 target. The company's diversified business model, margin execution, and cash returns have all helped drive significant outperformance in the stock over the past 3 years. We expect TI's topline to continue to benefit from secular trends in industrial and automotive semiconductor markets, and see further tailwinds to gross margins as the company transitions more products to its lower-cost 300mm factories. TI's tax rate is among the highest in the Semi industry, therefore any corporate tax reform should be an incremental positive for the stock. We expect TI to slightly outgrow the Analog Semi market this year and see some potential for upside to Street estimates. However, YoY revenue growth momentum is likely to slow in the coming quarters, which could keep the stock in a range given the rich valuation.

Fig 2 Sales by segment (Dec-16Q)



Source: Company data, Macquarie Capital (USA), March 2017

Fig 3 Estimates Summary

	CY16	CY17E	CY18E
Revenue (US$m)	13370	14031	14534
YoY change (%)	2.8%	4.9%	3.6%
Gross margin (%)	62%	63%	63%
Operating margin (%)	33%	36%	38%
GAAP EPS (US$)	3.48	3.67	3.92
PE (X) @US$80.56	23.2	22.0	20.5
EV/FCF @US$80.56	20.0	18.9	18.4

Source: Company data, Macquarie Capital (USA), March 2017

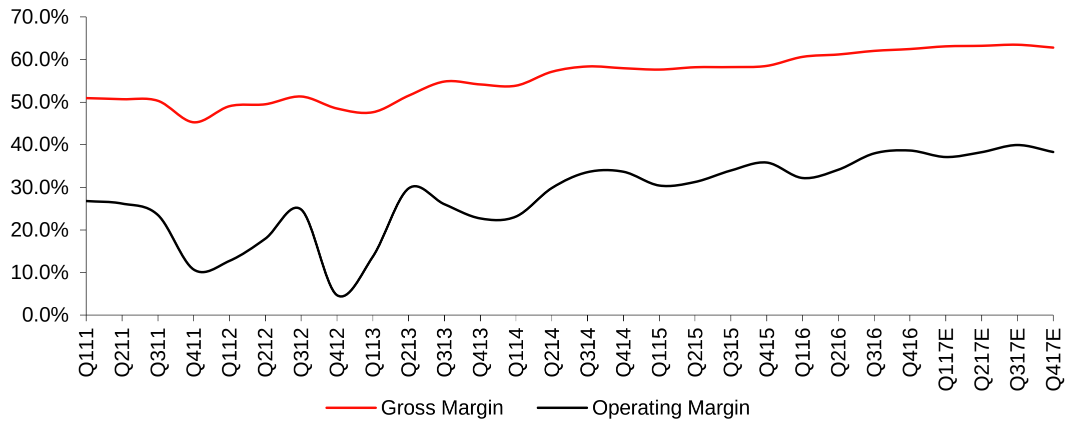
Diversified business benefiting from secular trends

Texas Instruments has shifted its focus away from lower margin wireless into higher margin industrial and automotive markets, and that strategy continues to pay off. The Industrial segment, which grew at a 4.5% CAGR over the past 2 years, should continue to benefit from factory automation and internet of things (IoT). The Automotive segment has grown at nearly 20% rate over the last two years. We believe the increasing use of electronic content in cars and the move toward self-driving cars should continue to drive double digit growth in TI's automotive business. Overall, we expect TI's topline to continue to outgrow the broader non-memory IC industry growth.

Margin expansion to continue, albeit at a more modest pace

Management's decision to invest aggressively in (low-cost) manufacturing tools during the industry downturn gave the company a significant cost advantage. The company's opex execution has also been impressive and its opex/sales is the lowest among peers. While opex restructuring appears largely behind it, the company's manufacturing facilities have significant slack capacity (30% utilization) and could drive additional gross margin upside in the coming years even with modest topline growth.

Fig 4 Gross and Operating margins



Source: Company data, Macquarie Capital (USA), March 2017

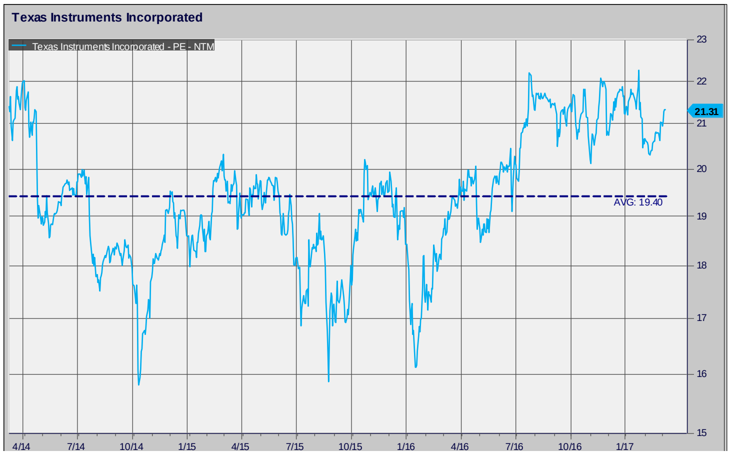
Cash returns among the best; a key beneficiary of potential tax reform

TI has set an example in the industry by returning nearly all of its FCF through buybacks and dividends in the past 3 years. The company's business model enables significant cash flow generation (FCF 30%) and we expect aggressive cash returns to continue. TI's tax rate of about 30% is among the highest in the industry, which enables the company to keep most of its FCF in the US and return it to shareholders. Therefore, any corporate tax reform will benefit TXN's earnings much more than many of its Semi peers who have lower tax rates.

Valuation, recommendation, risks

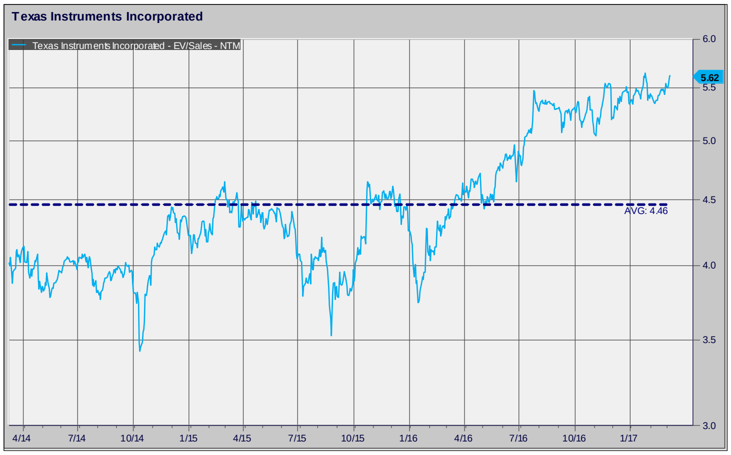
The stock is trading at a 22x PE our CY17 estimates, which is at a meaningful premium to the company's 3-year average 19x, and the large cap Semi peers. We expect dividend growth to continue at the rate of earnings growth. While an accretive M&A could act as a potential catalyst, management's comments suggest that a larger deal is less likely in the near term. We see limited upside to the stock given the slowing YoY growth momentum and would wait for a better entry point.

Fig 5 TXN historical PE



Source: FactSet, Macquarie Capital (USA), March 2017

Fig 6 TXN historical EV/S



Source: FactSet, Macquarie Capital (USA), March 2017

Macquarie vs consensus EPS

Fig 7 We are broadly in line with consensus

TXN	17E	18E	19E
MQ/Consensus (EPS %)	-0.1	-0.2	-0.1

Source: FactSet, Macquarie Capital (USA), March 2017

Texas Instruments
Income Statement

(FYE Dec/$mil)	Q116	Q216	Q316	Q416	Q117E	Q217E	FY2015	FY2016	FY2017E	FY2018E	FY2019E
Revenues	3,008	3,273	3,675	3,414	3,301	3,496	**13,000**	**13,370**	**14,031**	**14,534**	**15,104**
Cost of Sales	1,184	1,270	1,395	1,281	1,218	1,285	**5,440**	**5,130**	**5,168**	**5,317**	**5,447**
Gross Profit	1,824	2,003	2,280	2,133	2,083	2,210	**7,560**	**8,240**	**8,863**	**9,217**	**9,656**
Operating Exp	856	886	885	814	858	874	**3,286**	**3,441**	**3,470**	**3,556**	**3,635**
R&D	326	345	356	343	357	364	**1,280**	**1,370**	**1,448**	**1,512**	**1,575**
SG&A	448	460	448	411	421	430	**1,748**	**1,767**	**1,702**	**1,724**	**1,741**
Other	82	81	81	60	80	80	**258**	**304**	**320**	**320**	**320**
Operating Inc	968	1,117	1,395	1,319	1,225	1,337	**4,274**	**4,799**	**5,393**	**5,661**	**6,021**
Non-operating Inc	-18	-15	-14	178	-9	-13	**-58**	**131**	**-48**	**-24**	**-24**
Pretax Income	950	1,102	1,381	1,497	1,216	1,324	**4,216**	**4,930**	**5,345**	**5,637**	**5,997**
Prov for Taxes	239	283	363	450	365	397	**1,230**	**1,335**	**1,603**	**1,691**	**1,799**
Net Income	711	819	1,018	1,047	851	927	**2,986**	**3,595**	**3,741**	**3,946**	**4,198**
Discontinued Ops.	0	0	0	0	0	0	**0**	**0**	**0**	**0**	**0**
Net Income (GAAP)	711	819	1,018	1,047	851	927	**2,986**	**3,595**	**3,741**	**3,946**	**4,198**
Less: Income allocated to RSUs	-9	-10	-11	-13	-11	-12	**-42**	**-43**	**-47**	**-47**	**-48**
Net Income for EPS calculation	702	809	1,007	1,034	840	915	**2,944**	**3,552**	**3,694**	**3,899**	**4,150**
EPS (GAAP)	**$ 0.69**	**$ 0.79**	**$ 0.98**	**$ 1.02**	**$ 0.83**	**$ 0.91**	**$ 2.82**	**$ 3.48**	**$ 3.67**	**$ 3.92**	**$ 4.22**
Free cash flow per share	$ 0.52	$ 0.93	$ 1.30	$ 1.25	$ 1.04	$ 0.97	**$ 3.56**	**$ 3.94**	**$ 4.23**	**$ 4.42**	**$ 4.74**
Diluted Shares	1,022	1,020	1,023	1,018	1,013	1,008	**1,044**	**1,021**	**1,007**	**995**	**983**
% of Revenues											
Gross Profit	60.6%	61.2%	62.0%	62.5%	63.1%	63.2%	**58.2%**	**61.6%**	**63.2%**	**63.4%**	**63.9%**
Operating Exp	28.5%	27.1%	24.1%	23.8%	26.0%	25.0%	**25.3%**	**25.7%**	**24.7%**	**24.5%**	**24.1%**
R&D	10.8%	10.5%	9.7%	10.0%	10.8%	10.4%	**9.8%**	**10.2%**	**10.3%**	**10.4%**	**10.4%**
SG&A	14.9%	14.1%	12.2%	12.0%	12.8%	12.3%	**13.4%**	**13.2%**	**12.1%**	**11.9%**	**11.5%**
Operating Inc	32.2%	34.1%	38.0%	38.6%	37.1%	38.2%	**32.9%**	**35.9%**	**38.4%**	**39.0%**	**39.9%**
Non-operating Inc	-0.6%	-0.5%	-0.4%	5.2%	-0.3%	-0.4%	**-0.4%**	**1.0%**	**-0.3%**	**-0.2%**	**-0.2%**
Pretax Income	31.6%	33.7%	37.6%	43.8%	36.8%	37.9%	**32.4%**	**36.9%**	**38.1%**	**38.8%**	**39.7%**
Eff Tax Rate	25.2%	25.7%	26.3%	30.1%	30.0%	30.0%	**29.2%**	**27.1%**	**30.0%**	**30.0%**	**30.0%**
Net Income (GAAP)	23.6%	25.0%	27.7%	30.7%	25.8%	26.5%	**23.0%**	**26.9%**	**26.7%**	**27.1%**	**27.8%**
YoY Growth											
Revenues	-5%	1%	7%	7%	10%	7%	**0%**	**3%**	**5%**	**4%**	**4%**
Gross Profit	0%	6%	14%	14%	14%	10%	**2%**	**9%**	**8%**	**4%**	**5%**
Operating Income	1%	11%	20%	15%	27%	20%	**8%**	**12%**	**12%**	**5%**	**6%**
Net Income (GAAP)	8%	18%	28%	25%	20%	13%	**6%**	**20%**	**4%**	**5%**	**6%**
QoQ Growth											
Revenues	-6%	9%	12%	-7%	-3%	6%					
Gross Profit	-2%	10%	14%	-6%	-2%	6%					
Operating Income	-15%	15%	25%	-5%	-7%	9%					
Net Income (GAAP)	-15%	15%	24%	3%	-19%	9%					

Source: Company data, FactSet, Macquarie Capital (USA), March 2017

Texas Instruments

Balance Sheet (FYE Dec / $mil)	Q415	Q116	Q216	Q316	Q416	FY2015	FY2016
Assets							
Current Assets	7,074	6,659	6,689	7,181	7,457	7,074	7,457
Cash and Equivalents	1,000	1,281	1,235	1,369	1,154	1,000	1,154
Short Term Investments	2,218	1,519	1,304	1,768	2,336	2,218	2,336
A/R, Net	1,165	1,269	1,348	1,447	1,267	1,165	1,267
Inventories/Net	1,691	1,805	1,876	1,808	1,790	1,691	1,790
Deferred Income Taxes	0	0	0	0	0	0	0
Other Current Assets	1,000	785	926	789	910	1,000	910
Non-Current Assets	9,156	9,027	9,004	9,035	8,974	9,156	8,974
Plant/Equipment, Net	2,596	2,554	2,557	2,545	2,512	2,596	2,512
Long Term Investments	221	220	224	233	235	221	235
Goodwill and acquisition related intangibles	5,945	5,865	5,786	5,706	5,626	5,945	5,626
Deferred Income Taxes	201	175	231	355	374	201	374
Other Assets	193	213	206	196	227	193	227
Total Assets	**16,230**	**15,686**	**15,693**	**16,216**	**16,431**	**16,230**	**16,431**
Liabilities and Stockholders' Equity							
Current Liabilities	2,555	2,420	1,991	2,170	2,264	2,555	2,264
Current portion of LT debt	1,000	1,249	637	634	631	1,000	631
Account Payables and accrued expenses	796	764	803	821	840	796	840
Income taxes payable	95	67	58	68	83	95	83
Accrued retirement	664	340	493	647	710	664	710
Other	0	0	0	0	0	0	0
Long-Term Liabilities	3,729	3,484	3,740	3,760	3,694	3,729	3,694
Long Term Debt	3,120	2,869	2,975	2,977	2,978	3,120	2,978
Deferred income taxes	37	38	40	35	33	37	33
Accrued retirement costs	196	195	193	201	129	196	129
Deferred credits & Other LT Liabilities	376	382	532	547	554	376	554
Total Liabilities	6,284	5,904	5,731	5,930	5,958	6,284	5,958
Stockholders' Equity	9,946	9,782	9,962	10,286	10,473	9,946	10,473
Total Liabilities & Stockholders' Equity	**16,230**	**15,686**	**15,693**	**16,216**	**16,431**	**16,230**	**16,431**

Source: Company data, FactSet, Macquarie Capital (USA), March 2017

Texas Instruments

Ratio Analysis (FYE Dec)	Q415	Q116	Q216	Q316	Q416	FY2015	FY2016
Profitability Analysis							
Return on Assets (Pretax)	27.9%	24.3%	28.5%	35.0%	32.3%	**25.2%**	**29.4%**
Return on Equity (Aftertax)	33.6%	28.8%	33.2%	40.2%	40.3%	**29.4%**	**35.2%**
Return on Invested Capital (Pretax)	42.0%	37.0%	41.3%	50.6%	48.9%	**38.9%**	**45.4%**
Cash Conversion Cycle (Days)	90	122	116	96	99	**91**	**102**
DSOs	33	38	37	35	33	**32**	**34**
Days of Inventory	115	137	133	117	126	**112**	**126**
Days Payables Outstanding	58	53	54	56	60	**54**	**58**
Liquidity Analysis							
Current Ratio	2.8x	2.8x	3.4x	3.3x	3.3x	**2.8x**	**3.3x**
Quick Ratio	1.7x	1.7x	2.0x	2.1x	2.1x	**1.7x**	**2.1x**
Debt/Solvency Analysis							
Debt/Total Capital	29.3%	29.6%	26.6%	26.0%	25.6%	**29.3%**	**25.6%**
Debt/Equity	41.4%	42.1%	36.3%	35.1%	34.5%	**41.4%**	**34.5%**
Asset Values							
Book Value/Share	$ 9.68	$ 9.57	$ 9.77	$ 10.05	$ 10.29	**$ 9.53**	**$ 10.26**
Tangible Book Value/Share	$ 3.90	$ 3.83	$ 4.09	$ 4.48	$ 4.76	**$ 3.83**	**$ 4.75**
Total Cash & Equiv/Share	$ 3.13	$ 2.74	$ 2.49	$ 3.07	$ 3.43	**$ 3.08**	**$ 3.42**
Net Cash/Share	$ (0.88)	$ (1.29)	$ (1.05)	$ (0.46)	$ (0.12)	**$ (0.86)**	**$ (0.12)**
Other							
Capital Spending ($ mil)	164	124	158	139	110	**551**	**531**
Depreciation ($ mil)	172	161	155	150	139	**766**	**605**

Source: Company data, FactSet, Macquarie Capital (USA), March 2017

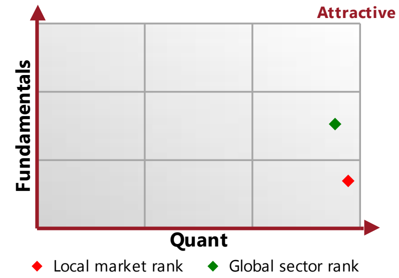
Macquarie Quant View

The quant model currently holds a strong positive view on Texas Instruments. The strongest style exposure is Quality, indicating this stock is likely to have a superior and more stable underlying earnings stream. The weakest style exposure is Valuations, indicating this stock is over-priced in the market relative to its peers.

28/357

Global rank in Semiconductors & Semiconductor Equip.

% of BUY recommendations	46% (16/35)
Number of Price Target downgrades	0
Number of Price Target upgrades	0

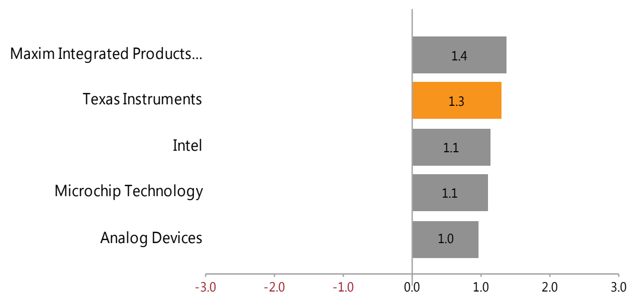


Displays where the company's ranked based on the fundamental consensus Price Target and Macquarie's Quantitative Alpha model.

Two rankings: Local market (United States) and Global sector (Semiconductors & Semiconductor Equip.)

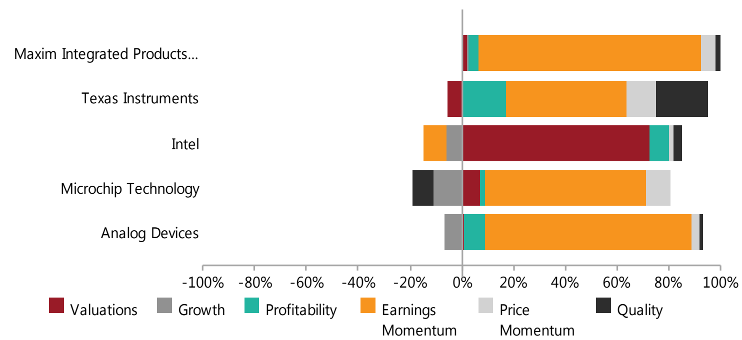
Macquarie Alpha Model ranking

A list of comparable companies and their Macquarie Alpha model score (higher is better).



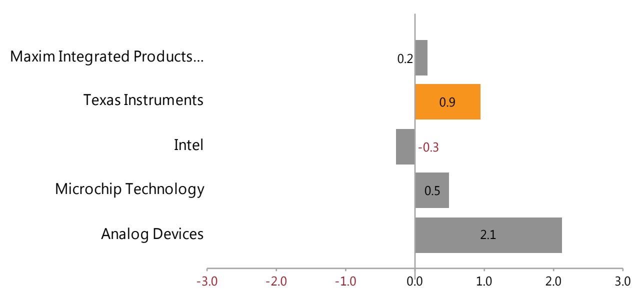
Factors driving the Alpha Model

For the comparable firms this chart shows the key underlying styles and their contribution to the current overall Alpha score.



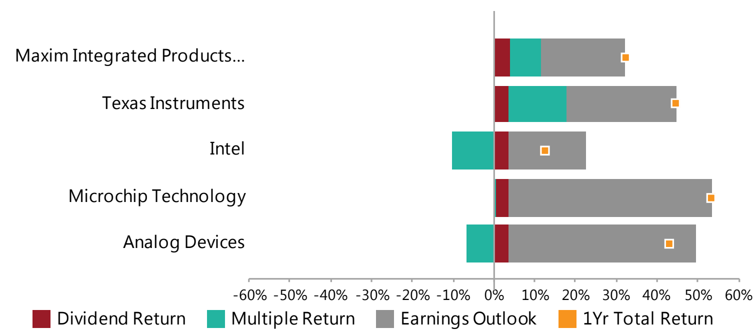
Macquarie Earnings Sentiment Indicator

The Macquarie Sentiment Indicator is an enhanced earnings revisions signal that favours analysts who have more timely and higher conviction revisions. Current score shown below.



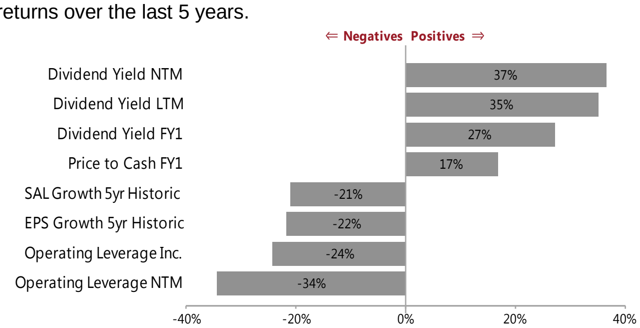
Drivers of Stock Return

Breakdown of 1 year total return (local currency) into returns from dividends, changes in forward earnings estimates and the resulting change in earnings multiple.



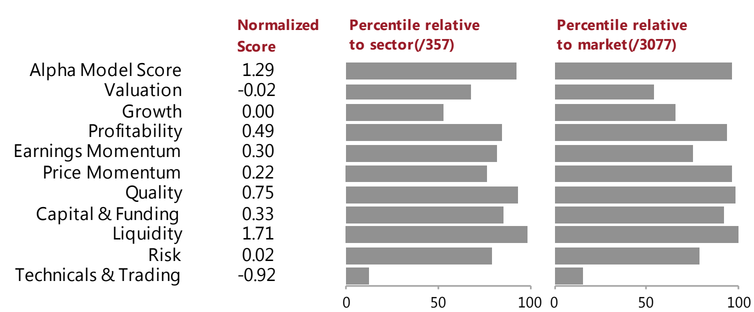
What drove this Company in the last 5 years

Which factor score has had the greatest correlation with the company's returns over the last 5 years.



How it looks on the Alpha model

A more granular view of the underlying style scores that drive the alpha (higher is better) and the percentile rank relative to the sector and market.



Source (all charts): FactSet, Thomson Reuters, and Macquarie Research. For more details on the Macquarie Alpha model or for more customised analysis and screens, please contact the Macquarie Global Quantitative/Custom Products Group (cpg@macquarie.com)

UNITED STATES

XLNX US		Neutral
Price (at CLOSE#, 28 Mar 2017)		US$57.97
Valuation - PER	**US$**	**55.00-60.00**
12-month target	**US$**	**60.00**
12-month TSR	**%**	**+5.8**
GICS sector Semiconductors & Semiconductor Equipment		
Market cap	**US$m**	**14,429**
30-day avg turnover	**US$m**	**110.9**
Number shares on issue	**m**	**248.9**

Investment fundamentals

Year end 31 Mar		2016A	2017E	2018E	2019E
Revenue	m	2,213.9	2,345.5	2,475.3	2,625.8
EBIT	m	781.9	820.8	871.4	938.3
CFPS	US$	2.75	2.99	3.11	3.32
CFPS growth	%	-12.4	8.8	4.0	7.0
PGCFPS	x	21.1	19.4	18.7	17.4
EPS rep	US$	2.05	2.29	2.39	2.61
PER rep	x	28.3	25.4	24.2	22.2
Total DPS	US$	1.24	1.30	1.32	1.32
Total div yield	%	2.1	2.2	2.3	2.3
EV/EBITDA	x	19.0	18.4	17.4	16.2

Source: FactSet, Macquarie Capital (USA), March 2017
(all figures in USD unless noted)

Analyst(s)
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30 March 2017
Macquarie Capital (USA) Inc.

Xilinx

Balanced risk/reward

Initiating with Neutral

We initiate coverage of XLNX with a Neutral rating and $60 TP. Xilinx is benefiting from share gains at the advanced node, which should sustain through 2017. The company has also become a viable second source in automotive ADAS and its recent progress in the data center acceleration market is promising. Margin execution, return metrics, and shareholder returns are solid. On the other hand, we do not see many catalysts in the traditional telecom market until meaningful 5G rollouts begin, which could take a couple of years. We also believe M&A is less likely in the near term, as companies we view as potential acquirers including Qualcomm and Broadcom recently announced other large deals. At 25x CY17 PE (and 19x EV/FCF), valuation is at a premium and we believe that the stock needs additional near-term catalysts to work.

Leadership at 16nm driving share gains

Xilinx is a leading supplier of programmable chips (PLDs), a market characterized by a profitable duopoly as well as inconsistent growth. PLD companies heavily rely on Moore's Law, and early technology leads during process node transitions create opportunities for share gains. We believe Xilinx has roughly a one-year lead over rival Altera (Intel) at the current leading edge (16nm) node. While we expect Intel to eventually catch up, we expect Xilinx to maintain a majority share at 16nm node, which should remain a tailwind throughout CY17 and CY18.

Making progress in auto; data center opportunity promising

Xilinx has become a solid alternative (we believe #2 market share) to Mobileye at Tier 1 suppliers and carmakers who are looking to differentiate their ADAS features. We expect automotive tailwinds to continue, though near-term headwinds in infotainment are blunting growth. In data center, recent announcements by Amazon AWS to offer Xilinx's FPGA technology as a service (EC2 F1 instance) adds a new dimension to Xilinx's growth. We believe Intel's $17b acquisition of Altera was driven by the attractiveness of FPGAs for data center applications such as machine learning and artificial intelligence. While Intel is bundling (and eventually will integrate) Altera's FPGAs with Xeon processors, we see a fair share of opportunities for Xilinx. That said, we expect NVIDIA to dominate this market in the near term and believe meaningful revenue ramps for Xilinx are several quarters away.

Balance sheet/cashflow metrics solid, valuation reasonable

We expect the telecom business to remain lumpy despite the recent uptick. 5G is the next major catalyst as Xilinx should benefit from additional dollar content due to higher baseband complexity and more radio heads. However, we expect early 5G related ramps to begin in late 2018 and do not view 5G as a catalyst in the near term. All in all, we expect Xilinx to grow largely in line with the Semiconductor industry in the near term. The company's disciplined pricing strategy should keep gross margins in the 70% range and FCF margins in the 30% range. We expect aggressive cash returns to continue (dividends/buybacks accounted for nearly 100% of FCF in the last two years). Overall, we expect the stock to trade slightly above current levels but do not see many immediate catalysts for meaningful outperformance.

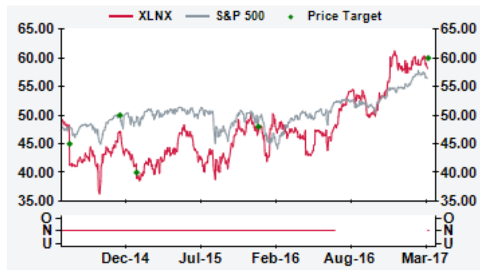
Inside

Xilinx

Company profile

- Xilinx, Inc. designs, develops and markets programmable devices and associated technologies. It offers programmable platforms, it also provides design services, customer training, field engineering and technical support.
- The company was founded by Ross Freeman, Bernard Vonderschmitt, and James V. Barnett II in February 1984 and is headquartered in San Jose, CA.

Fig 1 XLNX US vs S&P 500, & rec history



Note: Recommendation timeline - if not a continuous line, then there was no Macquarie coverage at the time or there was an embargo period.

Source: FactSet, Macquarie Capital (USA), March 2017

(all figures in USD unless noted)

Balanced risk/reward

Initiating with a Neutral

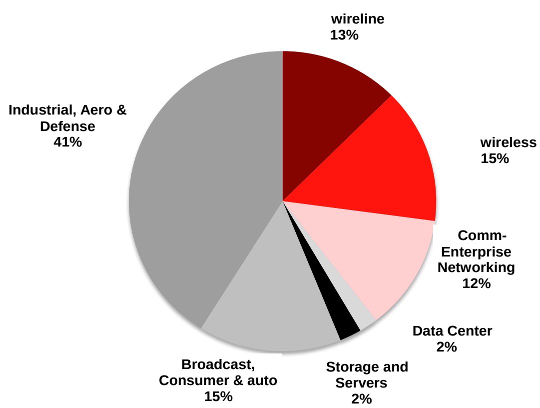
Automotive ADAS and data center offer areas of growth

We are initiating coverage of XLNX with a Neutral rating and a $60 TP. Xilinx should benefit from share gains at the advanced node (14/16nm) this year given its early lead over rival Altera (Intel). Xilinx has become a viable second source in automotive ADAS, which is growing at a 20% rate. Recent progress in the fast-growing data center acceleration market (incl. at Amazon AWS) is encouraging, despite its modest near-term contribution. The company's margin execution, return metrics, and shareholder returns are solid.

Telecom growth lumpy – no catalyst until 5G rollout

On the other hand, we do not see many catalysts in the traditional telecom market until meaningful 5G rollouts begin, which could take a couple of years. We also believe M&A is less likely in the near term, as companies we view as potential acquirers including Qualcomm and Broadcom recently announced other large deals. At 19x EV/FCF, we believe the stock needs more meaningful revenue contribution from data center acceleration to continue to work.

Fig 2 Sales by segment (Dec-16Q)



Source: Company data, Macquarie Capital (USA), March 2017

Fig 3 Estimates Summary

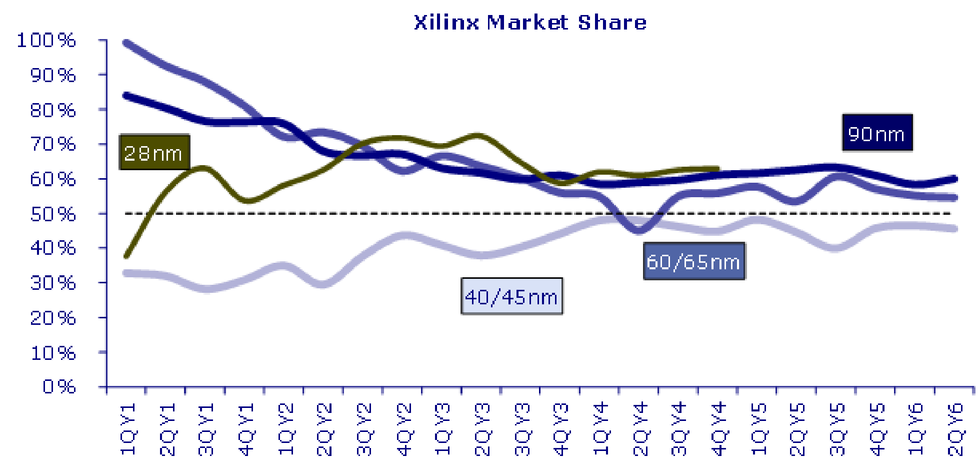
	CY16	CY17E	CY18E
Revenue (US$m)	2311	2449	2580
YoY change (%)	4.6%	6.0%	5.4%
Gross margin (%)	70%	70%	69%
Operating margin (%)	30%	30%	30%
GAAP EPS (US$)	2.28	2.32	2.54
PE (X) @US$57.97	25.4	25.0	22.8
EV/FCF @US$57.97	20.2	18.9	17.6

Source: Company data, Macquarie Capital (USA), March 2017

Leadership in 16nm driving share gains

Xilinx is a leading supplier of programmable chips (PLDs), a market characterized by a duopoly and inconsistent growth. PLD companies heavily rely on Moore's Law and an early technology lead during process node transitions create opportunities for share gains. Xilinx took an early lead at 20nm and gained significant market share (we estimate 80%). At 16nm, which competes with Altera's 14nm solution, we believe Xilinx has roughly a one-year lead. Early leadership often results in a majority share for the life of the node. While we expect Intel to eventually catch up, Xilinx should maintain majority share at 16nm node, which could remain a tailwind throughout CY17 and 18.

Fig 4 XLNX market share by process node



Source: Company data, Macquarie Capital (USA), March 2017

Making progress in auto; data center opportunity promising

Xilinx has become an alternative to Mobileye at tier-1 suppliers and carmakers who are looking differentiate their ADAS features. Xilinx's auto ADAS business accounts for 5-7% of sales and grew over 25% in 2016. We are modeling more than 20% growth on the back of design wins at Bosch, Autolive, and others but expect headwinds from infotainment to offset some of the growth. In data center, recent announcements by Amazon AWS to offer Xilinx's FPGA technology as a service (EC2 F1 instance) adds a new dimension to Xilinx's growth. We believe Intel's $17b acquisition of Altera was driven by the attractiveness of FPGAs for emerging applications in data centers such as machine learning and artificial intelligence. While Intel is bundling (and eventually will integrate) Altera's FPGAs with Xeon processors, we see a fair share of opportunities for Xilinx in both public and private cloud markets. That said, we expect NVIDIA to dominate this market in the near term and believe meaningful revenue ramps for Xilinx are several quarters away.

5G is the next big catalyst in telecom, but a few years away

Telecom, and, in particular, wireless, is a lumpy business by nature. The PLD industry benefited from 4G ramps in China in 2015 but the market has gone through a correction in 2016 as China builds slowed. China spending recovered a bit recently and 4G rollouts in India are also helping. Spending in US, Europe and other regions remains tepid. Overall, we are modeling flattish growth for the Wireless business this year. 5G is the next major catalyst in wireless as Xilinx should benefit from additional content due to the adoption of massive MIMO (more antennas in radio heads) and more complex baseband processing. However, we expect early 5G-related ramps to begin in late-2018 and do not view it as a catalyst in the near term. In wireline and networking, the spending environment appears slightly better due to optical transport network (OTN) rollouts while the company also appears to be faring well with its Zynq SoC products in some sub-segments. Overall, we are modeling low-single digit growth in the communications segment this year and see limited room for upside.

Solid margin execution, FCF and cash returns

We expect Xilinx to grow largely in line with the Semiconductor industry in the near term. The company's disciplined pricing strategy should keep gross margins in the 70%-range and FCF margins in the 30% range. We expect cash returns to continue (dividends and buybacks accounted for nearly 100% of FCF in the last two years). Overall, we expect the stock to trade slightly above current levels but do not see many immediate catalysts for meaningful outperformance.

Valuation, recommendation, risks

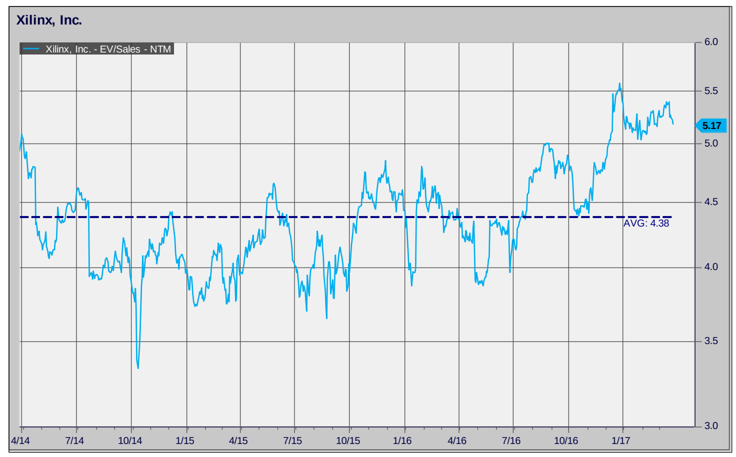
Neutral and $60 price target

We are initiating coverage with a Neutral rating and a $60 price target. At 25x CY17 PE, the stock is trading at a 20% premium to its historical average and a meaningful premium to the peer group. We believe it needs additional near-term catalysts to work given the premium valuation and lumpy telecom business.

Fig 5 XLNX Historical PE

Source: FactSet, Macquarie Capital (USA), March 2017

Fig 6 XLNX Historical EV/S



Source: FactSet, Macquarie Capital (USA), March 2017

Macquarie vs consensus EPS

Fig 7 We are slightly below consensus for FY18E

	17E	18E	19E
MQ/Consensus (EPS %)	0.1	-1.1	-3.1

Source: Company data, Macquarie Capital (USA), March 2017

Xilinx
Income Statement

(FYE Mar/$mil/%)	Mar-16 Q416	Jun-16 Q117	Sep-16 Q217	Dec-16 Q317	Mar-17 Q417E	Jun-17 Q118E	FY15	FY16	FY17E	FY18E	FY19E
Revenues	571.1	575.0	579.2	585.7	605.6	612.8	**2,377.3**	**2,213.9**	**2,345.5**	**2,475.3**	**2,625.8**
Cost of Sales	175.8	168.3	175.9	178.2	187.7	190.0	**708.8**	**671.9**	**710.2**	**767.3**	**814.0**
Gross Profit	395.3	406.7	403.3	407.5	417.9	422.9	**1,668.5**	**1,542.0**	**1,635.4**	**1,708.0**	**1,811.8**
Operating Expenses	217.2	220.5	226.5	244.5	244.0	240.0	**913.4**	**872.1**	**935.5**	**960.1**	**997.0**
R&D	135.6	136.1	141.8	159.2	159.2	156.1	**525.7**	**533.9**	**596.4**	**611.7**	**619.2**
SG&A	80.3	83.1	83.5	83.8	83.8	82.9	**353.7**	**331.7**	**334.1**	**344.3**	**373.8**
One time charges	1.2	1.2	1.2	1.5	1.0	1.0	**34.0**	**6.6**	**4.9**	**4.0**	**4.0**
Operating Income	178.1	186.2	176.8	163.0	173.9	182.8	**755.1**	**669.9**	**699.9**	**747.9**	**814.8**
Non Op. Income	(8.3)	(4.6)	(1.2)	(0.4)	(4.0)	(2.0)	**(15.0)**	**(33.1)**	**(10.1)**	**(8.0)**	**(8.0)**
Pretax Income	169.8	181.6	175.7	162.6	169.9	180.8	**740.1**	**636.8**	**689.7**	**739.9**	**806.8**
Provision for taxes	24.8	18.6	11.5	20.7	23.8	23.5	**91.9**	**86.0**	**74.6**	**96.2**	**104.9**
Effective tax rate	15%	10%	7%	13%	14%	13%	**12%**	**13%**	**11%**	**13%**	**13%**
Net income (GAAP)	145.0	163.0	164.2	141.8	146.1	157.3	**648.2**	**550.9**	**615.2**	**643.7**	**701.9**
GAAP EPS	$ 0.54	$ 0.61	$ 0.61	$ 0.52	$ 0.54	$ 0.59	**$ 2.35**	**$ 2.05**	**$ 2.29**	**$ 2.39**	**$ 2.61**
FCF per share	$ 0.40	$ 1.19	$ 0.64	$ 0.32	$ 0.63	$ 0.69	**$ 2.76**	**$ 2.59**	**$ 2.77**	**$ 2.81**	**$ 3.01**
Diluted Shares	268	266	270	271	269	269	**276**	**269**	**269**	**269**	**269**
% Sales											
Gross Profit	69.2%	70.7%	69.6%	69.6%	69.0%	69.0%	**70.2%**	**69.7%**	**69.7%**	**69.0%**	**69.0%**
Operating Expenses	38.0%	38.3%	39.1%	41.7%	40.3%	39.2%	**38.4%**	**39.4%**	**39.9%**	**38.8%**	**38.0%**
R&D	23.8%	23.7%	24.5%	27.2%	26.3%	25.5%	**22.1%**	**24.1%**	**25.4%**	**24.7%**	**23.6%**
SG&A	14.1%	14.5%	14.4%	14.3%	13.8%	13.5%	**14.9%**	**15.0%**	**14.2%**	**13.9%**	**14.2%**
Operating Income	31.2%	32.4%	30.5%	27.8%	28.7%	29.8%	**31.8%**	**30.3%**	**29.8%**	**30.2%**	**31.0%**
Net Income (GAAP)	25.4%	28.4%	28.3%	24.2%	24.1%	25.7%	**27.3%**	**24.9%**	**26.2%**	**26.0%**	**26.7%**
% YoY											
Revenues	1%	5%	10%	3%	6%	7%	**0%**	**-7%**	**6%**	**6%**	**6%**
Gross Profit	0%	5%	9%	5%	6%	4%	**2%**	**-8%**	**6%**	**4%**	**6%**
Operating Expenses	-9%	5%	5%	7%	12%	9%	**3%**	**-5%**	**7%**	**3%**	**4%**
Operating Income	12%	4%	15%	2%	-2%	-2%	**1%**	**-11%**	**4%**	**7%**	**9%**
Net Income (GAAP)	8%	10%	29%	8%	1%	-4%	**3%**	**-15%**	**12%**	**5%**	**9%**
% QoQ											
Revenues	1%	1%	1%	1%	3%	1%					
Gross Profit	2%	3%	-1%	1%	3%	1%					
Operating Expenses	-5%	2%	3%	8%	0%	-2%					
Operating Income	11%	5%	-5%	-8%	7%	5%					
Net Income (GAAP)	11%	12%	1%	-14%	3%	8%					

Source: Company data, FactSet, Macquarie Capital (USA), March 2017

Xilinx
Balance Sheet

(FY Mar/$mil)	Mar-16 Q416	Jun-16 Q117	Sep-16 Q217	Dec-16 Q317	FY15	FY16
Assets						
Current Assets	3,918.9	4,021.7	4,019.2	3,916.1	**3,935.1**	**3,918.9**
Cash	503.8	582.4	690.5	839.5	**892.6**	**503.8**
Short-term investments	2,833.9	2,935.6	2,799.3	2,414.6	**2,410.5**	**2,833.9**
Accounts receivable, net	307.5	217.0	227.8	340.9	**246.6**	**307.5**
Inventories	178.6	195.3	196.9	205.9	**231.3**	**178.6**
Other Current Assets	95.2	91.4	104.7	115.1	**154.0**	**95.2**
Non-current Assets	904.2	904.8	926.5	920.2	**963.0**	**904.2**
PP&E	283.3	292.4	292.5	301.5	**301.0**	**283.3**
Long term Investments	220.8	209.0	198.5	183.1	**266.9**	**220.8**
Investment in UMC	-	-	-	-	-	-
Goodwill and other investments	-	-	-	161.3	**172.0**	-
Other	400.1	403.4	435.5	274.4	**223.0**	**400.1**
Total Assets	**4,823.2**	**4,926.5**	**4,945.7**	**4,836.3**	**4,898.1**	**4,823.2**
Liabilities and Stockholders' Equity						
Current Liabilities	946.1	1,051.4	997.8	1,010.0	**963.2**	**946.1**
Accounts Payables	307.2	391.3	348.7	361.6	**80.1**	**307.2**
Accrued Liabilities	-	-	-	-	**221.3**	-
Deferred Income	51.8	71.5	57.4	53.6	**66.1**	**51.8**
Deferred tax liabilities	-	-	-	-	**19.7**	-
Current obligations under capital lease	587.1	588.5	591.7	594.8	**576.1**	**587.1**
Long Term Liabilities	1,287.2	1,285.4	1,322.8	1,346.6	**1,299.3**	**1,287.2**
LT Debt	995.8	994.0	994.4	994.8	**994.8**	**995.8**
Deferred tax liabilities	261.5	263.4	294.9	323.8	**289.9**	**261.5**
Other liabilities	29.9	28.0	33.4	28.0	**14.6**	**29.9**
Total Liabilities	2,233.3	2,336.8	2,320.6	2,356.7	**2,262.5**	**2,233.3**
Total stockholders' equity	2,589.9	2,589.7	2,625.1	2,479.6	**2,635.5**	**2,589.9**
Total Liabilities & Stockholders' Equity	**4,823.2**	**4,926.5**	**4,945.7**	**4,836.3**	**4,898.1**	**4,823.2**

Source: Company data, FactSet, Macquarie Capital (USA), March 2017

Xilinx

Ratio Analysis

(FYE Mar)	Mar-16 Q416	Jun-16 Q117	Sep-16 Q217	Dec-16 Q317	FY15	FY16
Profitability Analysis						
Return on Assets (Pretax)	14.7%	15.3%	14.3%	13.3%	**15.2%**	**13.8%**
Return on Equity (Aftertax)	22.3%	25.2%	25.2%	22.2%	**23.9%**	**21.1%**
Return on Invested Capital (Pretax)	77.7%	90.7%	89.1%	71.0%	**27.6%**	**19.3%**
Cash Conversion Cycle (Days)	(34)	(51)	(40)	(16)	**116**	**(33)**
DSOs	48	34	35	52	**38**	**51**
Days of Inventory	92	106	102	105	**119**	**97**
Days Payables Outstanding	175	190	177	174	**41**	**181**
Liquidity Analysis						
Current Ratio	4.1	3.8	4.0	3.9	**4.1**	**4.1**
Quick Ratio	4.0	3.6	3.8	3.7	**3.8**	**4.0**
Debt/Solvency Analysis						
Debt/Total Capital	37.9%	37.9%	37.7%	39.1%	**37.3%**	**37.9%**
Debt/Equity	61.1%	61.1%	60.4%	64.1%	**59.6%**	**61.1%**
Asset Values						
Book Value/Share	$9.65	$9.73	$9.71	$9.16	**$9.54**	**$9.64**
Tangible Book Value/Share	$9.65	$9.73	$9.71	$8.56	**$8.92**	**$9.64**
Total Cash & Equiv/Share	$13.26	$14.00	$13.64	$12.69	**$12.93**	**$13.24**
Net Cash/Share	$7.31	$8.01	$7.74	$6.80	**$7.15**	**$7.30**
Other						
Capital Spending ($mil)	14.8	20.6	11.3	19.9	**29.6**	**34.0**
Depreciation and Amortization ($mil)	16.5	15.3	15.2	16.0	**74.9**	**68.4**

Source: Company data, FactSet, Macquarie Capital (USA), March 2017

Companies mentioned:

Mobileye (MBLY, Not Rated)

NVIDIA (NVDA, $107.69, Neutral, TP: $110.00)

Intel (INTC, $35.60, Outperform, TP: $40.00)

Amazon.com (AMZN US, US$846.82, Outperform, TP: US$895.00, Ben Schachter)

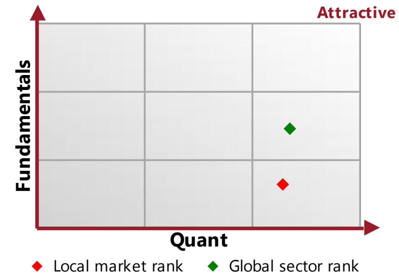
Macquarie Quant View

The quant model currently holds a reasonably positive view on Xilinx. The strongest style exposure is Profitability, indicating this stock is efficiently converting investments to earnings; proxied by ratios like ROE or ROA. The weakest style exposure is Growth, indicating this stock has weak historic and/or forecast growth. Growth metrics focus on both top and bottom line items.

78/357

Global rank in
Semiconductors & Semiconductor Equip.

% of BUY recommendations	26% (6/23)
Number of Price Target downgrades	0
Number of Price Target upgrades	0

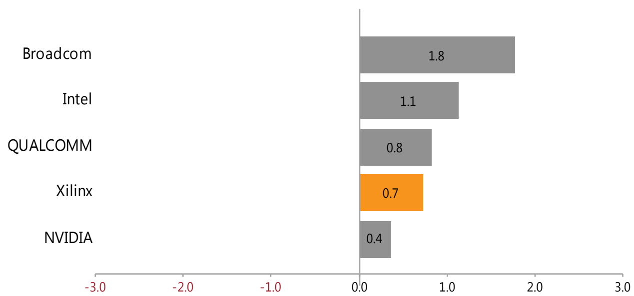


Displays where the company's ranked based on the fundamental consensus Price Target and Macquarie's Quantitative Alpha model.

Two rankings: Local market (United States) and Global sector (Semiconductors & Semiconductor Equip.)

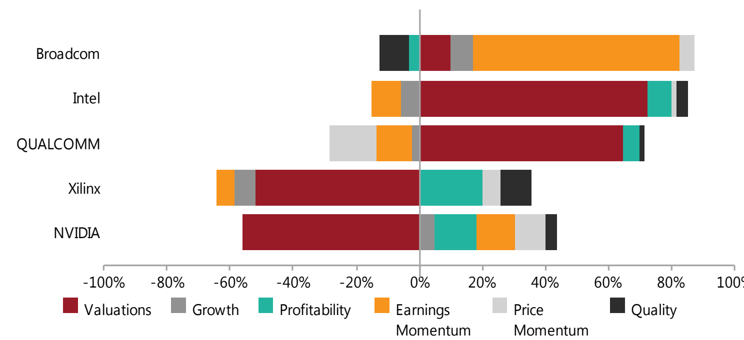
Macquarie Alpha Model ranking

A list of comparable companies and their Macquarie Alpha model score (higher is better).



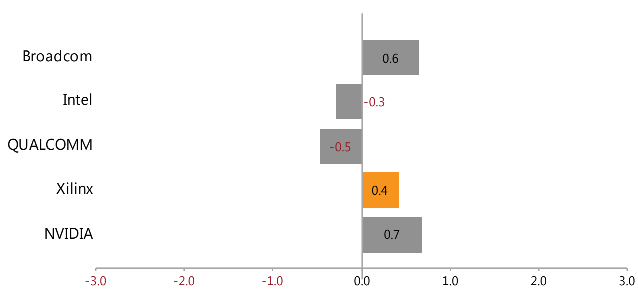
Factors driving the Alpha Model

For the comparable firms this chart shows the key underlying styles and their contribution to the current overall Alpha score.



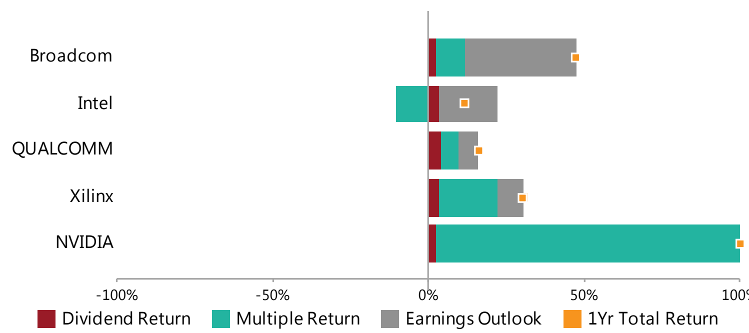
Macquarie Earnings Sentiment Indicator

The Macquarie Sentiment Indicator is an enhanced earnings revisions signal that favours analysts who have more timely and higher conviction revisions. Current score shown below.



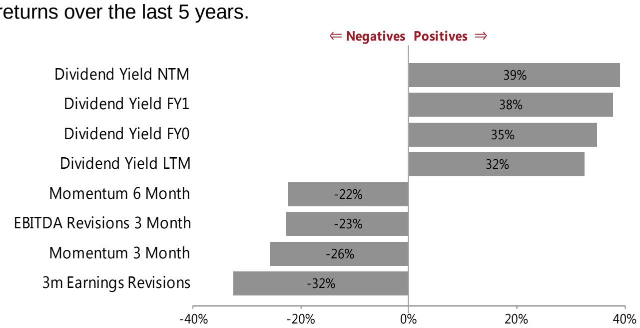
Drivers of Stock Return

Breakdown of 1 year total return (local currency) into returns from dividends, changes in forward earnings estimates and the resulting change in earnings multiple.



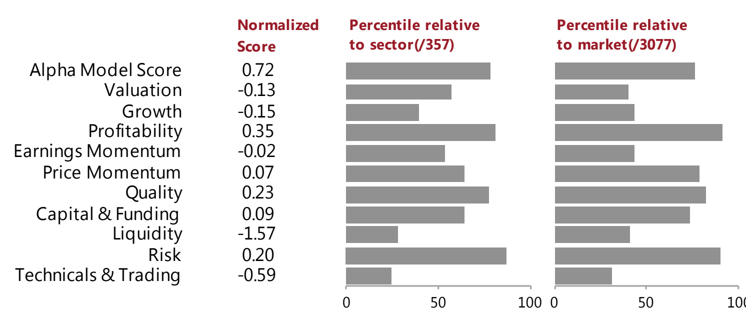
What drove this Company in the last 5 years

Which factor score has had the greatest correlation with the company's returns over the last 5 years.



How it looks on the Alpha model

A more granular view of the underlying style scores that drive the alpha (higher is better) and the percentile rank relative to the sector and market.



Source (all charts): FactSet, Thomson Reuters, and Macquarie Research. For more details on the Macquarie Alpha model or for more customised analysis and screens, please contact the Macquarie Global Quantitative/Custom Products Group (cpg@macquarie.com)

Important disclosures:

Recommendation definitions

Macquarie - Australia/New Zealand
Outperform – return >3% in excess of benchmark return
Neutral – return within 3% of benchmark return
Underperform – return >3% below benchmark return

Benchmark return is determined by long term nominal GDP growth plus 12 month forward market dividend yield

Macquarie – Asia/Europe
Outperform – expected return >+10%
Neutral – expected return from -10% to +10%
Underperform – expected return <-10%

Macquarie – South Africa
Outperform – expected return >+10%
Neutral – expected return from -10% to +10%
Underperform – expected return <-10%

Macquarie - Canada
Outperform – return >5% in excess of benchmark return
Neutral – return within 5% of benchmark return
Underperform – return >5% below benchmark return

Macquarie - USA
Outperform (Buy) – return >5% in excess of Russell 3000 index return
Neutral (Hold) – return within 5% of Russell 3000 index return
Underperform (Sell)– return >5% below Russell 3000 index return

Volatility index definition*

This is calculated from the volatility of historical price movements.

Very high–highest risk – Stock should be expected to move up or down 60–100% in a year – investors should be aware this stock is highly speculative.

High – stock should be expected to move up or down at least 40–60% in a year – investors should be aware this stock could be speculative.

Medium – stock should be expected to move up or down at least 30–40% in a year.

Low–medium – stock should be expected to move up or down at least 25–30% in a year.

Low – stock should be expected to move up or down at least 15–25% in a year.
* Applicable to Asia/Australian/NZ/Canada stocks only

Recommendations – 12 months
Note: Quant recommendations may differ from Fundamental Analyst recommendations

Financial definitions

All "Adjusted" data items have had the following adjustments made:
Added back: goodwill amortisation, provision for catastrophe reserves, IFRS derivatives & hedging, IFRS impairments & IFRS interest expense
Excluded: non recurring items, asset revals, property revals, appraisal value uplift, preference dividends & minority interests

EPS = adjusted net profit / efpowa*
ROA = adjusted ebit / average total assets
ROA Banks/Insurance = adjusted net profit /average total assets
ROE = adjusted net profit / average shareholders funds
Gross cashflow = adjusted net profit + depreciation
*equivalent fully paid ordinary weighted average number of shares

All Reported numbers for Australian/NZ listed stocks are modelled under IFRS (International Financial Reporting Standards).

Recommendation proportions – For quarter ending 31 December 2016

	AU/NZ	Asia	RSA	USA	CA	EUR	
Outperform	57.53%	50.72%	45.57%	42.28%	60.58%	52.79%	(for global coverage by Macquarie, 8.71% of stocks followed are investment banking clients)
Neutral	33.90%	33.97%	43.04%	50.11%	37.23%	35.62%	(for global coverage by Macquarie, 8.05% of stocks followed are investment banking clients)
Underperform	8.56%	15.30%	11.39%	7.61%	2.19%	11.59%	(for global coverage by Macquarie, 4.63% of stocks followed are investment banking clients)

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