Very Strong Semiconductor Growth for May

Memory Strength and Low Expectations Likely to Result in Good 2Q Earnings

Recently released semiconductor industry statistics for May were very strong and I think the 2Q earnings season that begins in a couple of weeks will be very positive for the sector. Business is good given memory product strength, two months of solid growth already in the bag, and a handful of positive preannouncements. Expectations for 2Q results are fairly low after tepid company guidance and recent chip sector share price weakness. And 3Q guidance is positioned for strength as the seasonally strongest of the year. While the noise surrounding potential of a trade war between the US and China is scary, I think the business will persist. The divergence of share prices across the chip sector between my Tokeneke Universe and the SOX index is also opening up potential investment opportunities.

China Syndrome: Legitimate casualties in the trade war between the US and China so far include Lattice's failed purchase by Chinese entities, and ZTE for selling to Iran and North Korea (jeezsh, really?)—which isn't doing any favors for Acia's business. This week's drama has a UMC press release claiming a patent counter-suit win in a regional Chinese court against Micron—that has yet to be confirmed by either Micron or the Chinese after over 36 hours, to the best of my knowledge. While the bluster and very public negotiations between the US and China is cause for concern, I think the fears are far worse than any likely outcomes. First, I remain extremely bullish on MU, although am very interested to see how this plays out. Second, I believe the QCOM deal for NXPI will go through despite the uncertainty regarding Chinese government approval (I mean if ARM can establish a subsidiary in China, I have to believe the bankers on this deal are motivated enough to somehow preserve their fees). And third, I refuse to believe that an Apple will be sacrificed by either side. The noise is scary, but I think the business will persist.

Also, there is *NO WAY* the Chinese can become self-sufficient in semiconductors given technological and market challenges, despite committing some $150 billion to the effort. But here's my idea: Politically, China insists that Taiwan is a province. So, let the Chinese count TSMC, MediaTek, UMC and the rest of Taiwan's semiconductors as part of their world-wide contribution to the chip industry. And if you double-count the foundry and assembly business as industry revenue, voila—mission accomplished! Gosh, maybe I missed my calling . . .

Memories Still Drive Growth: DRAM and NAND memories continue to drive semiconductor industry growth. Last month the SIA/WSTS industry organization updated its semi-annual forecast, revising expected revenue growth this year to +12.4% from +7% with memories contributing +26.5%—and no other major product group exceeding the +12.4% average. In this case, memories include DRAM, SRAM, NOR Flash, NAND Flash and others.

Recall market researcher IC Insights expects 2018 revenue growth for the overall industry of +15% primarily driven by DRAM gains of +37% and NAND growth of +17%. The rest of the semiconductor industry *excluding* DRAMs (but including NAND) is expected to grow by +10%, according to IC Insights. Also recall solid double-digit annual growth has been reported from automotive, industrial, IoT and cloud-computing end-markets, while smartphone unit demand appears to be plateau-ing.

Structural Differences: Recall that my US-equity-based Tokeneke Universe does NOT include some three-quarters of industry DRAM and NAND business from Samsung, Hynix and Toshiba. While my Universe does include Micron, it will more closely track growth of +10% this year rather than +15% or +12.4%. Other structural differences in my Universe include the lack of very large international players (Samsung, Hynix, Toshiba, MediaTek, Infineon), although it does include wafer foundries (TSMC, UMC, SMIC, TowerJazz) and IP companies (Rambus, Xperi/Tessera, Ceva, and InterDigital) that, technically anyway, don't count as semiconductor industry revenues, but rather costs associated with manufacturing. I also normalize fiscal quarters to the best fitting two out of three months. Unreported stub-periods from acquisitions can also be a difference.

The bigger problem is that most US-based investors in the chip sector experience the industry from the Tokeneke Universe perspective. The Philadelphia Semiconductor Index Option (SOX) is similarly under-represented in memories, although this is mitigated by the inclusion of equipment companies supplying to memory manufacturers. And even if domestic investors are adventuresome enough to travel overseas, it is still difficult to benefit from memory strength: less than half of Samsung's revenue comes from semiconductors (including foundry), and Toshiba's overly-dramatic restructuring thanks to its nuclear energy woes is going on its second year.

Very Strong May: Worldwide semiconductor industry revenues for May grew by a very strong +3.0% sequentially on a three-month rolling average basis, according to statistics released by the Semiconductor Industry Association (SIA) earlier this week. This double-the-average metric was likely due to memory strength, as expected. May has averaged a gain of +1.5% with a high of +6.5%, a low of -7.5%, and only five declines in the last 28 years—including only one in the last 13 years. China led once again with the only above-average gain of +6.3% followed by Japan at +2.6%. Asia-Pacific under-performed at +1.2% along with The Americas at +1.1%, while Europe lagged with a gain of +1.0%.

Next month's release of June data typically reflects the softest month of the quarter. June has averaged a gain of +0.5% with a high of +5.3%, a low of -9.2%, and 12 declines in the last 28 years—including three in the last 10 years. I expect to see another better-than-average gain next month due to memory product strength.

2Q Earnings Good News: The 2Q earnings season will begin in the next couple of weeks and is very likely to include a lot of good news: business is good, expectations are low, and seasonality is favorable for 3Q guidance.

Current industry business strength is clearly evident in the above-average growth statistics reported for both April and May as memory strength re-asserted its dominance over weakness from customer Apple during 1Q.

Also, expectations for 2Q results are pretty low based on company guidance—and should be easy to beat. My (memory-light) Universe originally guided for an unusually flat 2Q with a weighted average of +0.2%, although this has already increased to +1.7% with a range of -0.1% to +3.6% after six preannouncements, including four of expected strength from INTC, MCHP, MLNX and MU. The statistical industry average (including memory) for 2Q is +3.8%. Recall 1Q results from my Universe topped the high-end of expectations at -3.6% with 56.5% of companies exceeding and/or meeting expectations. The average after seven preannouncements was -6.4% with a range of -8.7% to -4.1%. (Nevertheless, 1Q was weak: Industry statistics with memory reported -2.5% compared to the historical average of -2.2%.)

Finally, guidance for 3Q should be pretty good. It is seasonally the strongest sequential growth quarter of the year, averaging a gain of +6.5% with a high of +19.9%, a low of -11.7%, and has declined only twice in the last 28 years—including none of the last 16.

M&A Political Perturbations: While MCHP recently closed its acquisition of MSCC (shrinking my Universe to 61 companies), mergers and acquisitions activity has mostly experienced setbacks this year with the US administration disallowing both the acquisition of Lattice by Chinese investors and the hostile bid by Broadcom of Qualcomm. Pending deals include CAVM going to MRVL (this month?) and NXPI going to QCOM (with lots of drama out of China), while MOSY continues to pursue 'strategic alternatives.'

Chip Sector Gets Whacked in June: Chip sector share prices declined and underperformed broader equity markets last month. During June, the Philadelphia Semiconductor Index Option (SOX) dropped by -4.7% and significantly underperformed relative to broader equity markets, while 40 out of 61 stocks in my Universe declined by a less-pronounced average of -1.8% compared to modest moves from the NASDAQ, S&P500 and DOW at +0.9%, +0.5%, and -0.6%, respectively. While my Universe significantly outperformed the SOX, S&P and DOW last quarter, it has underperformed on a year-to-date basis compared to the SOX, NASDAQ and S&P as noted in the tables below.

June			
Winners *(21/61)*		**Losers**	
PI	23.5%	AMBA	-21.0%
MRAM	16.3%	XPER	-18.5%
OIIM	15.0%	TSEM	-15.1%
LSCC	14.1%	MXL	-15.0%
INFN	12.8%	PXLW	-13.0%
average stock -1.8%		*SOX -4.7%*	

2Q			
Winners *(35/61)*		**Losers**	
PI	69.8%	MXL	-31.5%
AMD	49.2%	AQ	-26.2%
MOSY	47.1%	QUIK	-24.3%
MTSI	38.8%	XPER	-23.9%
OIIM	35.3%	NLST	-23.6%
average stock +4.1%		*SOX -1.1%*	

YTD			
Winners *(33/61)*		**Losers**	
MOSY	57.7%	PXLW	-43.0%
INFN	56.9%	NLST	-42.6%
AMD	45.8%	MXL	-41.0%
SMTC	37.6%	TSEM	-35.4%
MLNX	30.3%	CEVA	-34.6%
average stock +1.0%		*SOX +4.8%*	

Indices	***Jun***	***2Q***	***YTD***
SOX	-4.7%	-1.1%	4.8%
SMH	-4.4%	-1.7%	4.8%
NASDAQ	0.9%	6.3%	8.8%
S&P500	0.5%	2.9%	1.7%
DOW	-0.6%	0.7%	-1.8%

Sector Volatility and Divergence: The outperformance of the chip sector continues to worry me as noted by the spread between the SOX and S&P500 in the graph on Page 4—although I am encouraged by the divergence between the SOX index and my Universe last quarter and on a year-to-date basis. The SOX was much less volatile during both May and June compared to its roller-coaster ride during April. During June it started the first week with a rally over +4%, but then plateaued and then declined by more than -8% during the second half of the period.

Opportunities Knock: While the longer-term outperformance of the SOX index and the significant difference between winning and losing sectors continues to concern me from a top-down perspective, I am actually encouraged by broader share price divergences across my Universe amid a variety of sub-sectors experiencing significant growth. See my latest Semiconductor Investment Ideas publication for specific potential opportunities.

—Dan K. Scovel
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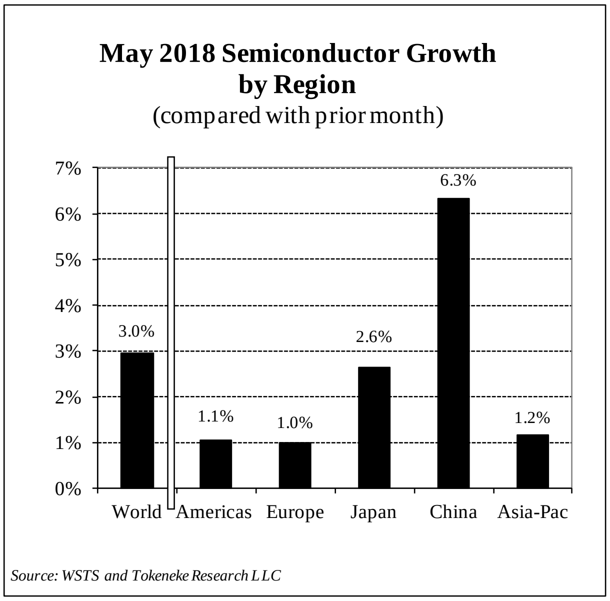
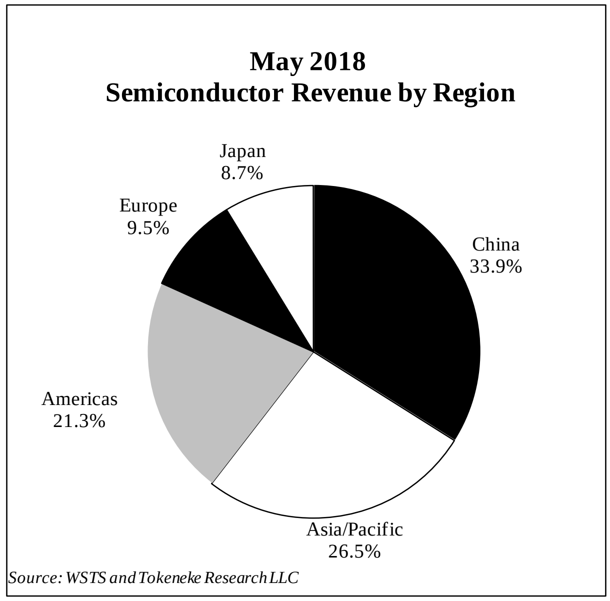
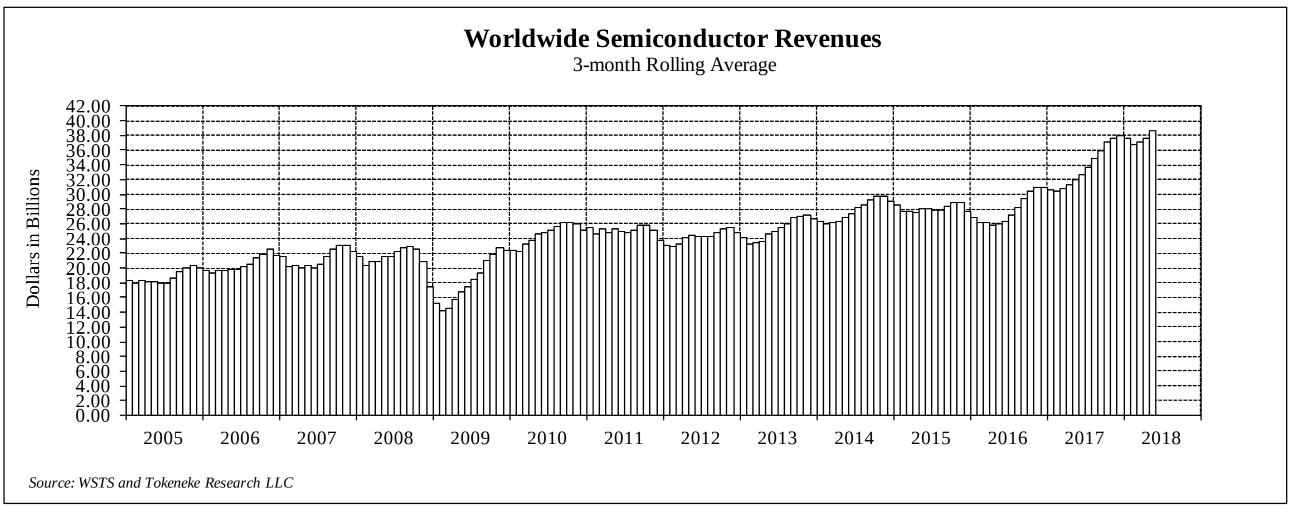
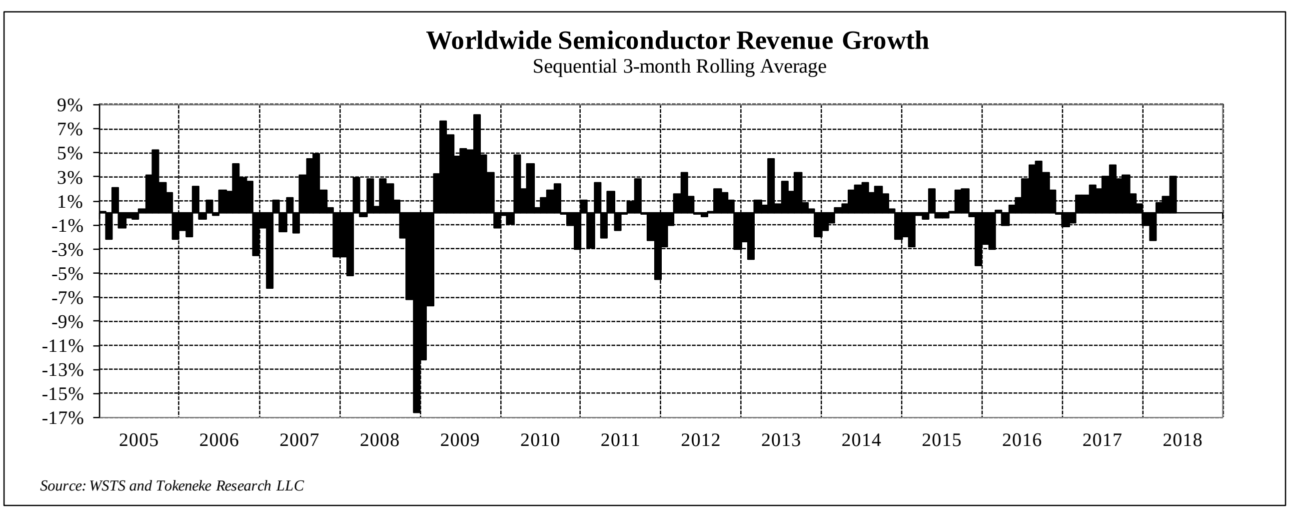

May 2018 Semiconductor Growth by Region
(compared with prior month)
7%
6%
5%
4%
3%
2%
1%
0%
3.0%
1.1%
1.0%
2.6%
6.3%
1.2%
World
Americas
Europe
Japan
China
Asia-Pac
Source: WSTS and Tokeneke Research LLC


May 2018
Semiconductor Revenue by Region
Japan 8.7%
Europe 9.5%
China 33.9%
Americas 21.3%
Asia/Pacific 26.5%
Source: WSTS and Tokeneke Research LLC


Worldwide Semiconductor Revenues
3-month Rolling Average
Dollars in Billions
42.00
40.00
38.00
36.00
34.00
32.00
30.00
28.00
26.00
24.00
22.00
20.00
18.00
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Source: WSTS and Tokeneke Research LLC


Worldwide Semiconductor Revenue Growth
Sequential 3-month Rolling Average
9%
7%
5%
3%
1%
-1%
-3%
-5%
-7%
-9%
-11%
-13%
-15%
-17%
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Source: WSTS and Tokeneke Research LLC

Weekly Philadelphia Semiconductor Index Option (SOX) vs. S&P 500

Source: Tokeneke Research LLC **S&P 500 normalized to the SOX*

The Company

Tokeneke Research is an independent research firm specializing in semiconductor industry business issues, providing fundamental research focused on US equities across all market capitalizations within the sector to investors. The company was founded in 2005 and is based in Connecticut.

The Offering

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- *Industry Reports:* Publications offering insight and perspective to industry-wide, multi-year forecast updates; periodic sub-sector product type and end-market reviews; fundamental and valuation perspectives on sector equity relationships; and industry introductory overview. These are more detailed reports with varying shelf-lives, and are intended for narrow distribution to interested clients.
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My Background

I have an electrical engineering background, nearly 12 years of semiconductor industry experience, and was on Wall Street for nearly eight years where I was selected as the Best On The Street semiconductor analyst for 2002 by The Wall Street Journal, and third-rated Best of the Best across all sectors.

I obtained my undergraduate BS degree in electrical engineering from the University of Washington, and my MBA from Santa Clara University. My industry experience consists of nearly 12 years in various technical sales and marketing roles at four different semiconductor firms located in Silicon Valley beginning with Advanced Micro Devices in 1984, followed by two small start-up companies, and ending at Cirrus Logic where I supported the firm's Japanese market development. I joined Fahnestock & Co. as a senior semiconductor analyst in 1996 and was recruited by Needham & Co. in April 2000.

My formal coverage list as a sell-side analyst included the following equities: AMD, ALSC, ALTR, ARTI, ATML, CUBE, CY, ESST, GNSS, INTC, ISSI, LSI, MOSY, MU, OIIM, OVTI, RMTR, SIII, SMSC, STEC, SVTG, TDFX, TSRA, TXN, and ZRAN.

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