Memories Drive Slightly-Above-Average Growth for May
Still Seeking a Bottom—Very Soon, Ahead of a 3Q Seasonal Peak

The big issue in the semiconductor industry remains the difference between memories and other product types: DRAM and NAND memories are expected to grow by some +30% this year, while everything else is expected to lump along at +4%. And this is making sector generalizations highly problematic, both in terms of industry business conditions as well as chip sector investing and share price performance. Nevertheless, I am currently seeking a chip sector share price bottom sometime over the next few weeks amid current equity market volatility. Hopefully this will offer an attractive entry point just ahead of solid 2Q earnings announcements beginning mid-July that will include more inspiring guidance associated with the 3Q seasonal business peak.

Memories Drive Growth: Three months ago market researcher IC Insights raised its 2017 semiconductor industry revenue forecast to +11% from +5% primarily due to DRAM and NAND memory market price strength. A month later Gartner raised its chip industry forecast to +12.3% from +7.2% and last month the SIA/WSTS raised its forecast to +11.5% from +3.3%, both for largely the same reasons. Recall IC Insights expects DRAM growth of +39% and NAND growth of +25%, while the rest of the semiconductor industry is expected to grow by only +4%. Note that +11% is a statistical no-man's land between winners and losers.

Structural Differences: Recall also that my US-equity-based Tokeneke Universe does NOT include some three-quarters of industry DRAM and NAND business from Samsung, Hynix and Toshiba (with partner WD/SanDisk). While my Universe does include Micron, it will more closely track growth of +4% this year rather than +11%. Other structural differences in my Universe include the lack of very large international players (Samsung, Hynix, Toshiba, MediaTek, Infineon), although it includes wafer foundries (TSMC, UMC, SMIC, TowerJazz) and IP companies (Rambus, Tessera, Ceva, InterDigital and a chunk of Qualcomm) 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 (Marvell, Nvidia and Semtech have January-ending fiscal years, while Micron has an August-ending year). Unreported stub-periods associated with acquisitions are also 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 somewhat 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 isolate and benefit from current memory market strength: Only 31% of Samsung's revenue last quarter came from semiconductors, and Toshiba is currently flirting with bankruptcy due to a series of issues associated with its nuclear energy business—and, in fact, is looking to sell its NAND business in an effort to save itself.

May Gains: Worldwide semiconductor industry revenue growth for May was a slightly-above-average gain (as expected due to memory market price strength) of +1.9% sequentially on a three-month rolling average basis, according to statistics released by the Semiconductor Industry Association (SIA) earlier this week. This now reflects a run of 12 consecutive above-average months, excluding a hiccup in March. May's performance compares to its average gain of +1.5% with a high of +6.5%, a low of -7.5%, and five declines in the last 27 years—including only one in the last 12 years. Europe vaulted from last place to first place with a gain of +3.9% followed by The Americas with +2.8% and Japan at +2.3%. Asia-Pacific fell from first place to trail with a gain of +1.7%, while China brought up the rear at +0.7%.

Next month's release of June data typically reflects softer sequential growth. 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 27 years—including three in the last nine years. I expect it to be more strongly above-average as persistent memory market price strength is further supported by a slightly-delayed smartphone seasonal recovery following a channel inventory burn.

A Tale of Two 1Qs: The difference between official industry statistics (with memories) and my Universe (without memories) is pronounced, with the SIA reporting a 1Q decline of -0.4% compared to my Universe at -4.6%.

Industry statistics for 1Q came in with a very modest sequential quarterly revenue decline of -0.4% that compares quite favorably with the average decline of -2.3% with a high of +8.8% and a low of -19.4%, and contractions 18 times in the last 26 years—including 10 of the last 12.

However, 1Q for my Tokeneke Universe was a very different story, with the weighted average sales reflecting a sequential quarterly decline of -4.6% which was better than company guidance of -5.2% ranging from

-7.7% to -2.7% after a handful of preannouncements that narrowed their ranges. When I exclude Micron's memory strength the weighted average decline drops to -6.0%. The good news was that 60% of companies reporting met and/or exceeded expectations for 1Q results and 2Q guidance.

Flat 2Q: 2Q earnings season begins in a couple of weeks, and the 2Q revenue outlook based on management guidance across the Tokeneke Universe currently reflects an anemic flat-ness compared to a more typical seasonal recovery. The specific weighted average guidance for revenue is a flat +0.4% ranging from -2.6% to +3.4%. If I exclude Micron from the mix the center falls to -0.9% ranging from -3.7% to +2.0%. Only a couple of preannoucements to-date have barely moved the needle. The chip industry has averaged a 2Q sequential revenue gain of +3.7% with a high of +20.0% and a low of -19.9%, and has declined only five times in the last 27 years—including only two of the last 10 years, according to industry statistics.

Chip Sector Share Price Correction: Semiconductor sector share prices corrected and under-performed broader market indices during June. The Philadelphia Semiconductor Index Option (SOX) declined by -5.2% with only 17 out of 64 stocks in my Universe advancing, leading to an average stock drop of -0.6% compared to a decline in the NASDAQ of -0.9% but gains from the S&P500 and DOW at +0.5% and +1.6%, respectively. The chip sector continues to outperform on a year-to-date basis despite under-performing during 2Q, per the tables below.

June			
Winners *(17/64)*		Losers	
MOSY	159.1%	SQNS	-26.0%
QUIK	20.7%	NLST	-20.9%
HIMX	19.5%	QRVO	-18.8%
UMC	18.4%	AMBA	-17.1%
MX	14.6%	CAVM	-14.9%
average stock -0.6%		*SOX -5.2%*	

2Q			
Winners *(28/64)*		Losers	
MRAM	132.3%	IPHI	-29.7%
PI	60.7%	ACIA	-29.3%
NVDA	32.7%	MOSY	-18.2%
CEVA	28.0%	QUIK	-18.0%
UMC	26.4%	OIIM	-16.6%
average stock +1.6%		*SOX +2.3%*	

YTD			
Winners *(45/64)*		Losers	
IOTS	145.9%	ACIA	-32.8%
MRAM	141.0%	XPER	-32.6%
SQNS	77.0%	NPTN	-28.6%
MBLY	64.9%	MOSY	-25.7%
PXLW	63.9%	SMI	-25.2%
average stock +15.6%		*SOX +14.2%*	

Indices	*Jun*	*2Q*	*YTD*
SOX	-5.2%	2.3%	14.2%
SMH	-4.8%	2.7%	14.3%
NASDAQ	-0.9%	3.9%	14.1%
S&P500	0.5%	2.6%	8.2%
DOW	1.6%	3.3%	8.0%

M&A Time-Out: Mergers and acquisitions have been running at fever pitch driven primarily by the lack of broader sector and macroeconomic growth, in my opinion, although there appears to be a pause in the action at this time. Recent losses to my Universe include: INVN going to TDK in Japan, EXAR going to MXL, GIG going to IDTI, ACTS going private in China, AMCC sold to MTSI, ISIL going to Renesas in Japan, and LLTC going to ADI. Pending takeovers include: LSCC going private (Chinese money), MBLY going to INTC, and NXPI going to QCOM. MOSY is also pursuing 'strategic alternatives.'

Sector Risk—and Volatility: The SOX index rallied by over +4% in early-June and then declined by -9% to finish at a net loss of -5%. But the first week of July it gained a partially-offsetting +2%—the the vast majority of which occurred on Friday. It (finally!) feels like a correction, but investors continue to tumble into momentum names on dips. The relative outperformance of the semiconductor sector compared to broader equity markets continues to worry me as noted by the spread between the SOX and S&P500 in the graph on Page 4. And very recent volatility is adding to my concerns.

Bottom Coming Soon? Opportunities are still out there (MU memories, for example), but my take on the semiconductor sector remains one of caution—although my caution has evolved and my fuse is now pretty short. A few months ago I felt a correction would occur in the March/April timeframe as seasonal 1Q business softness would snap several months of chip sector share price outperformance. Then three months ago things got complicated with the pronounced split between memories and other chips and its affect on both my Universe and the chip sector overall, as noted above. In addition, there was a slow start to the 1Q earnings season that did not get fully underway until the last week of April.

I am currently seeking a chip sector share price bottom sometime over the next few weeks amid current equity market volatility—which, hopefully, will offer an attractive entry point. A solid -15% to -20% sector price correction over the next couple of weeks will take the pressure off fundamental valuations, while 2Q earnings beginning mid-July should exceed very modest expectations coupled with more inspiring guidance associated with the 3Q seasonal business peak.

If I am correct, then we will see relatively attractive fundamental valuations supported by improving near-term business conditions. However, if I'm wrong and the dips continue to provoke buyers, then the sector could very well stagnate and possibly fade over the rest of the year. Individual equity opportunities will then be required to overcome a modestly adverse tide. Stay tuned.

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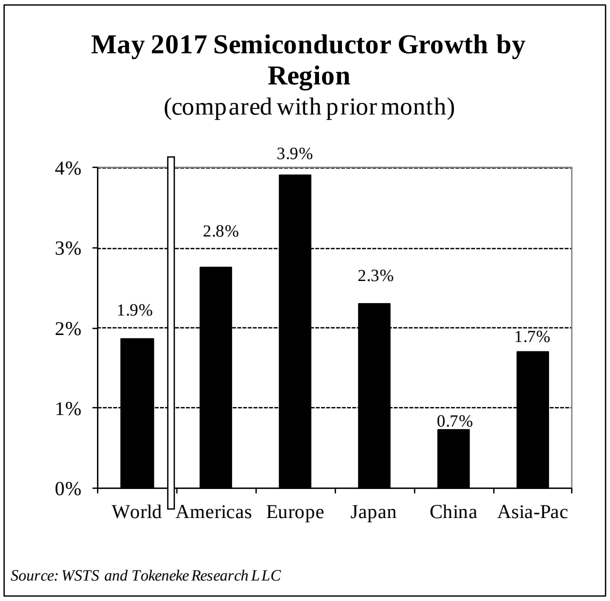
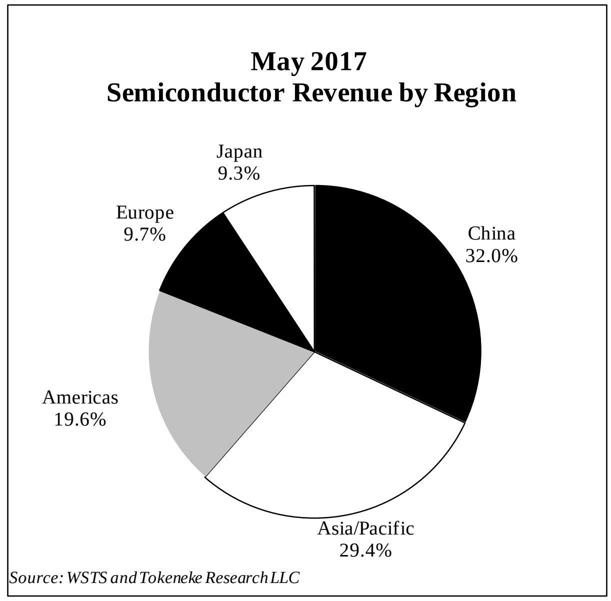
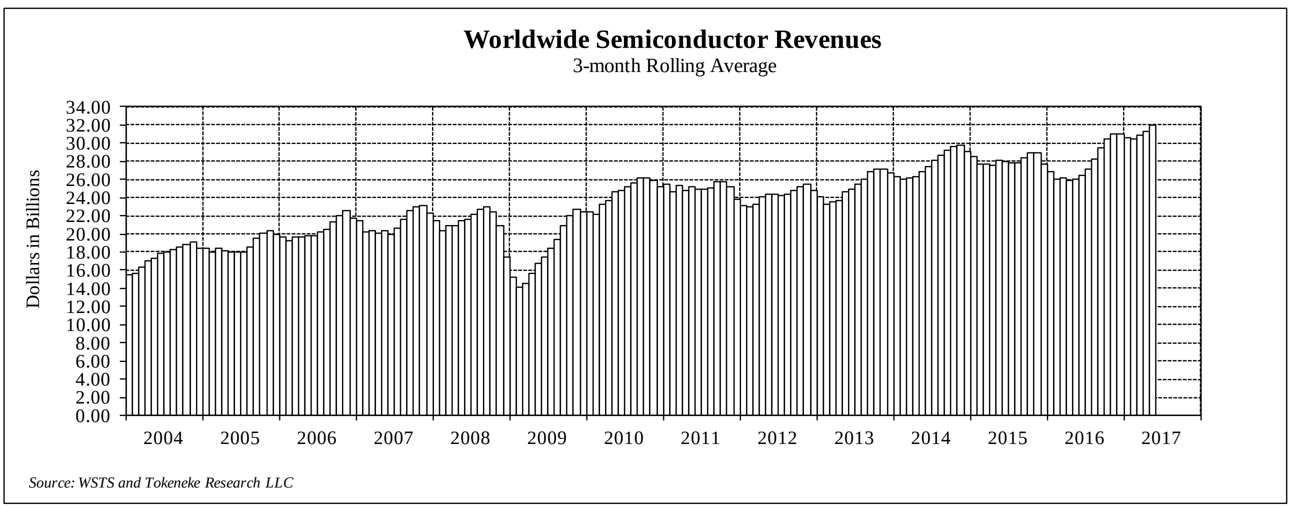
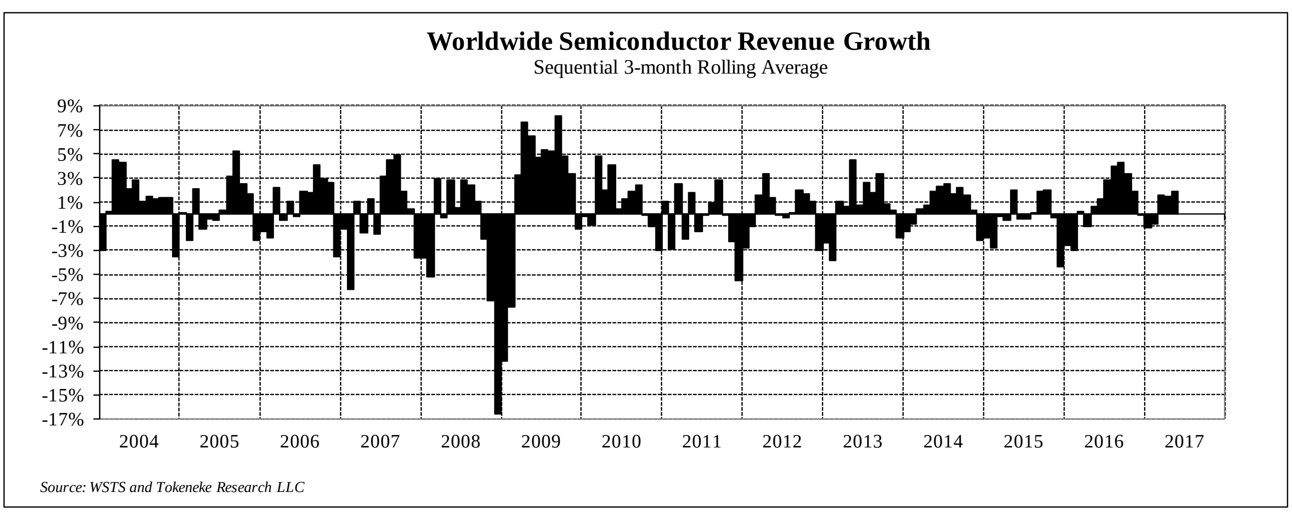
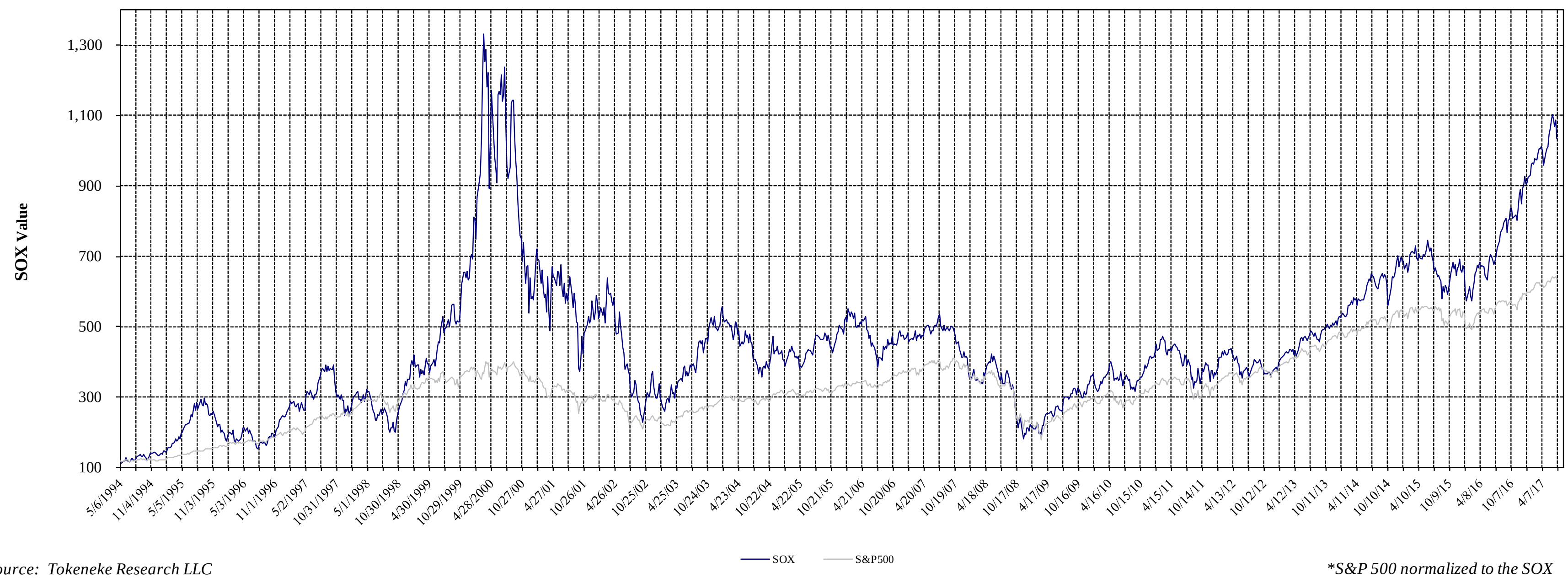

May 2017 Semiconductor Growth by Region
(compared with prior month)
4%
3%
2%
1%
0%
1.9%
2.8%
3.9%
2.3%
0.7%
1.7%
World
Americas
Europe
Japan
China
Asia-Pac
Source: WSTS and Tokeneke Research LLC


May 2017
Semiconductor Revenue by Region
Japan 9.3%
Europe 9.7%
China 32.0%
Americas 19.6%
Asia/Pacific 29.4%
Source: WSTS and Tokeneke Research LLC


Worldwide Semiconductor Revenues
3-month Rolling Average
Dollars in Billions
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
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
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%
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
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

- *Monthly Newsletter:* A summarized review of noteworthy industry business developments, sales statistics, and sector equity market performance, as well as a near-term and annual outlook for sector business fundamentals and share prices. This report typically includes two pages of text and a handful of recurring charts and tables. It is intended for relatively broad-based distribution.
- *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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