Memory Mania Splits Semiconductor Personality
Slow March Growth Curtails Nine Months of Above-Average Performance

The big issue in the semiconductor industry right now is 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. I remain cautious on the sector overall due to recent share price weakness (expected) and the apparent lack of a 2Q seasonal recovery (unexpected), and am still looking for a near-term sector share price bottoming as a potential entry point for investors after the dust settles during the 1Q earnings season. See my most recent Semiconductor Investment Ideas for specific opportunities.

Thanks for the Memories: As I noted last month, 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 couple weeks ago Gartner raised its chip industry forecast to +12.3% from +7.2% for the same reasons. Recall IC Insights expects DRAMs 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.

This memory growth phenomena will also likely result in Samsung passing Intel as the world's largest semiconductor supplier this year. Intel has been the largest supplier since 1993 and accounted for over 15% of the chip industry last year. As recently as 2006 it was 60% larger than the second-largest supplier—Samsung.

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.

Anemic March Growth: Worldwide semiconductor industry revenue growth for March was a relatively weak gain of +1.6% sequentially on a three-month rolling average basis, according to statistics released by the Semiconductor Industry Association (SIA) earlier this week—thereby ending a run of nine consecutive above-average months. March's performance compares to its average gain of +2.3% with a high of +7.0%, a low of -6.9%, and only four declines in the last 27 years—including only one in the last 15 years. Europe rebounded nicely and led with an impressive gain of +5.0% followed by Japan at +3.6%, Asia-Pacific at +2.9% and China at +0.2%. The Americas trailed once again with a decline of -0.5%. The overall relative weakness was consistent with weak company guidance for 1Q, although it is disappointing to see the above-average run over the last nine months come to an end.

Next month's release of April data typically reflects modest sequential growth. April has averaged a gain of +1.2% with a high of +7.6%, a low of -4.7%, and 10 declines in the last 27 years—including seven in the last 12 years. I fear it will fall below-average given preliminary indications from company guidance for a flat 2Q that historically reflects solid seasonal gains.

A Tale of Two 1Qs: The difference between official industry statistics (with memories) and my Tokeneke Universe (without memories) remains pronounced. Recall the SIA numbers for 4Q reported a sequential revenue gain of +5.4% while my Universe reflected only +2.1%. I have an even greater difference for 1Q with the SIA at -0.4% and my Tokeneke Universe at -4.0%—so far, anyway.

Industry stats for 1Q came in with a very modest sequential decline of -0.4% that compares quite favorably with the average sequential revenue 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. Europe led with growth of 5.6% followed by Asia-Pacific at +1.7% and Japan at +0.9%. China and The Americas trailed with declines of -0.9% and -5.8%, respectively. I am somewhat surprised that 1Q did not eke a gain after the lighter-than-average declines reported for January and February that would have only required an 'average' gain from March to swing the quarter into positive territory.

1Q for my Tokeneke Universe is a very different story. After 23 out of 66 companies reporting, the weighted average sales across my Tokeneke Universe reflects a sequential quarterly decline of -4.0% which is 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 strength, the weighted average decline drops to -6.0%. Yes, there are many companies left to report—but I am not expecting a big improvement. The good news is that a solid 70% of companies reporting so far are meeting and/or exceeding expectations for 1Q results and 2Q guidance.

Flat 2Q: 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 0.0% ranging from -3.4% to +3.3%. If I exclude Micron from the mix the center falls to -2.0% ranging from -5.2% to +1.2%. Even worse, these numbers do not include the $500M downward revision by Qualcomm last Friday. The semiconductor 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 declined and underperformed broader market indices during April. The Philadelphia Semiconductor Index Option (SOX) fell by -0.6% with 35 out of 66 stocks in my Universe posting declines averaging -1.2% compared to gains from the NASDAQ, S&P500 and DOW at +2.3%, +0.9%, and +1.3%, respectively. The SOX also corrected by -5% mid-month before recovering. The SOX is now underperforming to the NASDAQ on a year-to-date basis. See the tables below.

April			
Winners *(30/66)*		**Losers**	
NLST	29.3%	MOSY	-53.6%
IOTS	28.9%	HIMX	-23.1%
PI	23.8%	ACIA	-21.8%
SQNS	23.6%	IPHI	-15.2%
MRAM	16.3%	NPTN	-13.9%
average stock -1.2%		*SOX -0.6%*	

YTD			
Winners *(49/66)*		**Losers**	
IOTS	189.2%	MOSY	-57.8%
SQNS	81.8%	NPTN	-28.2%
PXLW	74.6%	ACIA	-25.8%
MBLY	62.4%	XPER	-24.0%
STM	40.9%	AOSL	-22.2%
average stock +12.9%		*SOX +10.9%*	

Indices	***Apr***	***YTD***
SOX	-0.6%	10.9%
SMH	0.0%	11.3%
NASDAQ	2.3%	12.3%
S&P500	0.9%	6.5%
DOW	1.3%	6.0%

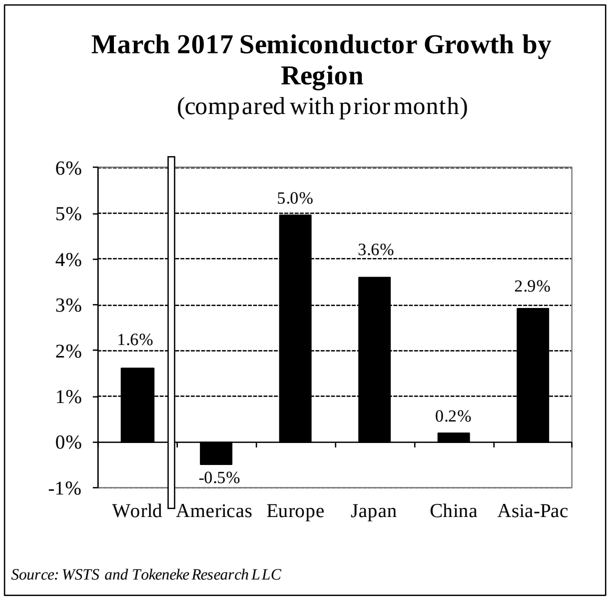
M&A Continues: Mergers and acquisitions have been running at fever pitch driven primarily by the lack of broader sector and macroeconomic growth, in my opinion. And I think it will continue, although the specifics in terms of buyers, targets, timing and price will be difficult to forecast with any precision. Recent losses to my Universe include: 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: EXAR going to MXL, INVN going to TDK in Japan, LSCC going private (Chinese money), and NXPI going to QCOM. MOSY is also pursuing 'strategic alternatives.'

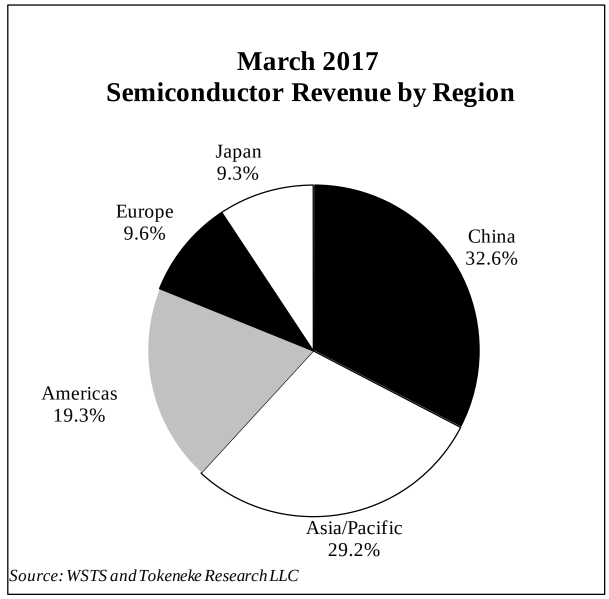
Sector Risk: The relative outperformance of the semiconductor sector compared to broader equity markets continues to worry me. The spread between the SOX and S&P500 remains stretched as noted in the graph on Page 4. While there was a nice -5.1% SOX correction mid-April, it recovered during the second half of the month as the 1Q earnings season got underway and results largely exceeded (admittedly low) expectations. However, I am not convinced this situation will persist given anemic guidance obscuring a typical seasonal 2Q recovery.

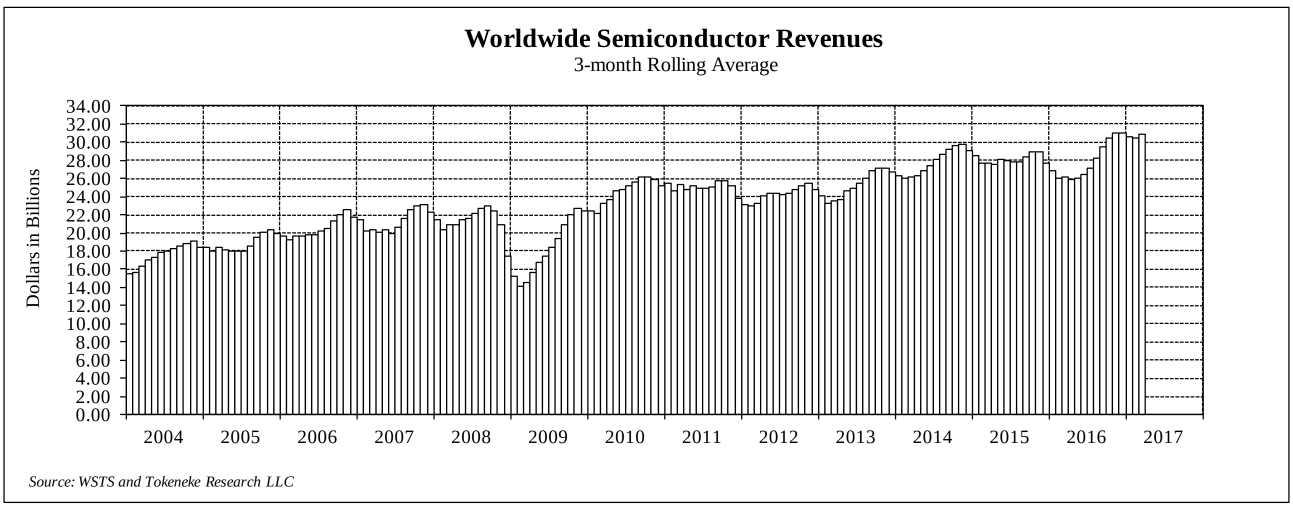
Summertime Stock-Picking? Opportunities are still out there (MU memories, for example), but my take on the semiconductor sector remains one of caution—although my caution has evolved. A couple of months ago I felt a correction would occur in the March/April timeframe as seasonal 1Q business softness would snap several months of chip sector share price outperformance. Then last month 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.

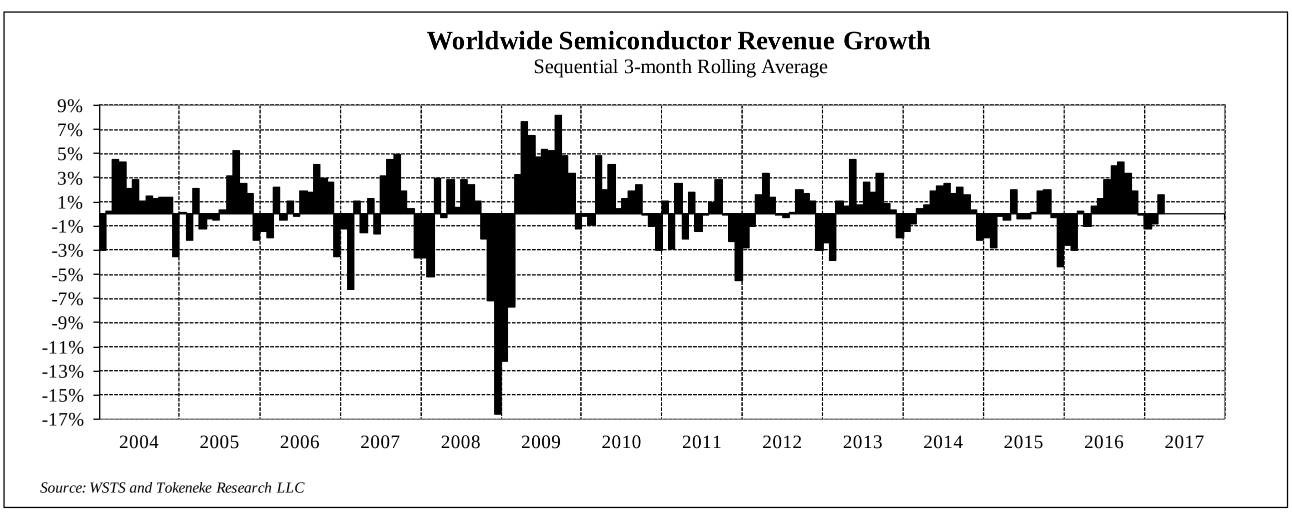
My caution now persists for two reasons: first, the several-month rally in sector share prices is finally correcting; and second, while 1Q weakness was expected, the lack of recovery for 2Q is now troubling. I feel the need to wait for the dust to settle after 1Q earning announcements become more complete. I still think an attractive bottom is coming—albeit a bit later than I had anticipated.

—Dan K. Scovel
Semiconductor Analyst

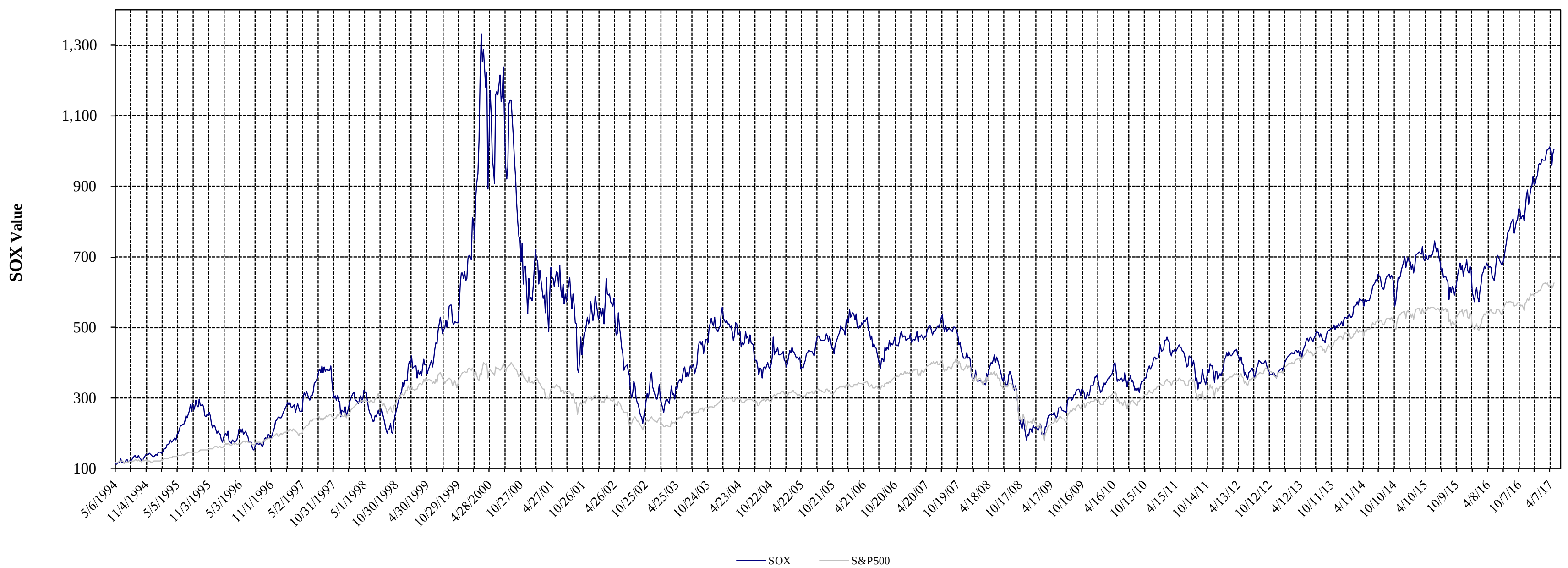

March 2017 Semiconductor Growth by Region
(compared with prior month)
6%
5%
4%
3%
2%
1%
0%
-1%
1.6%
-0.5%
5.0%
3.6%
0.2%
2.9%
World
Americas
Europe
Japan
China
Asia-Pac
Source: WSTS and Tokeneke Research LLC


March 2017
Semiconductor Revenue by Region
Japan
9.3%
Europe
9.6%
China
32.6%
Americas
19.3%
Asia/Pacific
29.2%
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

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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.

—Dan K. Scovel
Semiconductor Analyst

***Tokeneke Research* LLC**
Rowayton, CT 06853
dscovel@tokenekeresearch.com
www.tokenekeresearch.com
203-554-4621