

Average February Semiconductor Seasonal Softness Memory Strength Offsets Chinese New Year Dip and Broader Weakness

DRAM and NAND memory products continue to account for disproportionate growth across the chip industry. And those products boot-strapped seasonally soft February industry revenue statistics up to the average sequential decline of -2.2% by offsetting both the traditional dip introduced by Chinese New Year as well as unusually weak 1Q guidance offered by companies during the recently completed 4Q earnings season.

In the mean time, chip sector share price declines last month actually fared better than broader equity markets. In addition, the divergence between the SOX index and my Universe persists: Share prices across my Universe outperformed the SOX and broader equities last month, although they continue to significantly underperform both on a year-to-date basis. We are also now exiting annual seasonal weakness with respect to semiconductor industry business conditions, and 1Q earnings reports should include 2Q guidance for growth.

While the persistent outperformance of the SOX index and the significant difference between growth rates between memory and non-memory products continues to concern me from a top-down perspective, I am actually encouraged by broader share price weakness across my Universe as we enter seasonal strength amid a year of expected growth. Good news and lower prices should be a positive combination from a bottoms-up perspective.

Memories Still Drive Growth: DRAM and NAND memories continue to drive semiconductor industry growth. 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%—both primarily due to market price increases. The rest of semiconductor industry products *excluding* DRAMs (but including NAND) is expected to grow by +10%. Last year overall semiconductor industry revenue growth totaled +21.6% which was led by DRAM and NAND that together grew by an astonishing +61.5% primarily due to market price gains, while the rest of the industry advanced by a much less impressive +10% according to the Semiconductor Industry Association.

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%. 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, 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, Analog Devices and Broadcom fiscal years' end in October, while Micron's ends in August). 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: 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.

Average February Weakness: Worldwide semiconductor industry revenues for February declined by -2.2% sequentially on a three-month rolling average basis, according to statistics released by the Semiconductor Industry Association (SIA) earlier this week. This metric nailed the long-term average for the month consistent with my expectations for a weaker-than-January decline due to the void associated with Chinese New Year, offset by memory strength. February has averaged a loss of -2.2% with a high of +1.9%, a low of -7.7%, and 23 drops in the last 28 years—including every one of the last 13 years. Europe led once again with a small gain of +0.9% while the rest of the world posted declines with Japan at -0.9%, Asia-Pacific at -1.5%, China at -2.6%, and The Americas bringing up the rear (also once again) at -4.3%.

Next month's release of March data typically reflects the beginning of annual seasonal strength with a sequential gain. March has averaged a gain of +2.2% with a high of +7.0%, a low of -6.9%, and only four declines in the last 28 years—including only one in the last 16 years. I expect to see an average gain—or slightly better than average gain—as memory product strength offsets very weak 1Q guidance across the Tokeneke Universe.

4Q Better with Memory: The difference between official industry statistics (with memories) and my Universe (without) was significant, with the SIA reporting a 4Q sequential gain of +5.7% compared to my Universe at +4.8%.

Industry statistics for 4Q came in with strong sequential quarterly revenue growth of +5.7% that compares very favorably with average growth of +1.4%, a high of +16.0%, a low of -24.2%, and declines 12 times in the last 27 years—including eight of the last 10.

However, 4Q for my Tokeneke Universe was a different story, with weighted average sales reflecting a sequential quarterly gain of +4.8%. This was much better than company guidance of +1.8% ranging from -0.8% to +4.3% after a couple handfuls of relatively uneventful preannouncements. When I exclude Micron’s memory strength the weighted average fell to a gain of +4.2%. A plurality of 48% of 61 companies reported ‘mixed’ results that simultaneously missed, met, and/or exceeded expectations for 4Q results and 1Q guidance. Some 10% were underperformers who missed and/or met those expectations, while 43% met and/or exceeded such expectations.

Below-Average 1Q Seasonal Weakness: The 1Q revenue outlook based on management guidance across my Universe during the 4Q earnings season reflects a weaker-than-average seasonal decline. The specific weighted average guidance for revenue was -6.2% ranging from -8.6% to -3.8%. If I exclude Micron from the mix the center decreases to -7.5% ranging from -10.1% to -5.0%. The chip industry has averaged a 1Q sequential revenue decline of -2.2% with a high of +8.8% and a low of -19.4%, and has declined 18 of the last 27 years—including 11 of the last 13 years, according to industry statistics. While memories will likely result in a cumulative metric above the average, my Universe is positioned to underperform. With any luck, this low-bar of expectations and industry average 2Q sequential revenue growth of +3.7% should position the chip sector for favorable 1Q earnings reports.

Chip Sector Whacked in March—Only Slightly Less So: Chip sector share prices declined last month, although slightly less so than broader equity markets. In addition, the average decline of all the stocks in my Universe actually outperformed the SOX as the divergence between the two continues. During March, the Philadelphia Semiconductor Index Option (SOX) declined slightly less than broader equity markets at -2.4% with 33 out of 62 stocks in my Universe dropping by an average of -1.9% compared to declines from the NASDAQ, S&P500 and DOW at -2.9%, -2.7%, and -3.7%, respectively. While the SOX has significantly outperformed broader equity markets on a year-to-date basis, my Universe has underperformed to both the NASDAQ and S&P500 with an average stock decline of -1.8% as noted below.

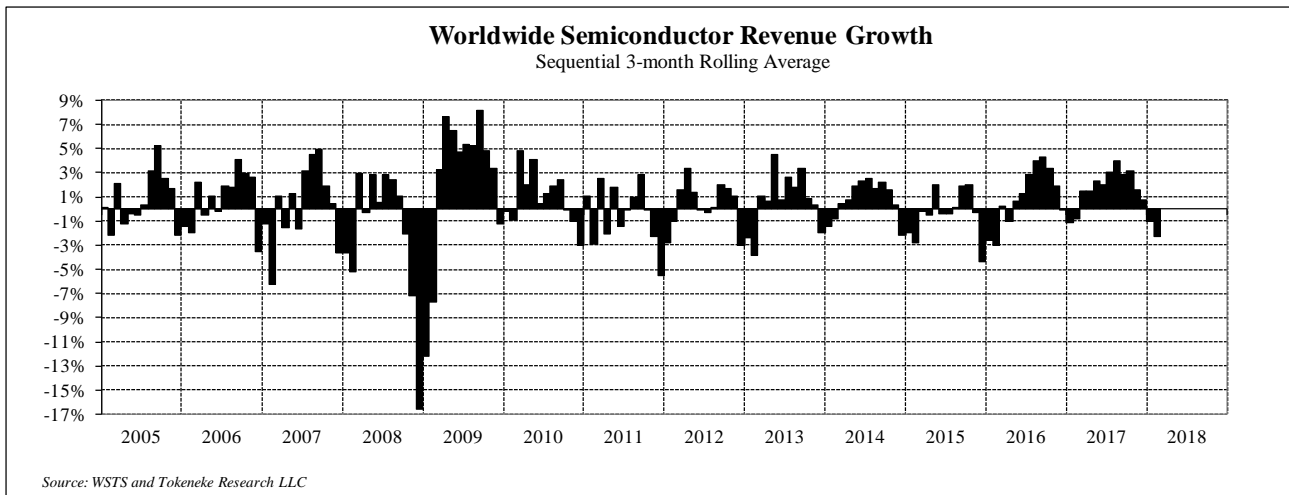
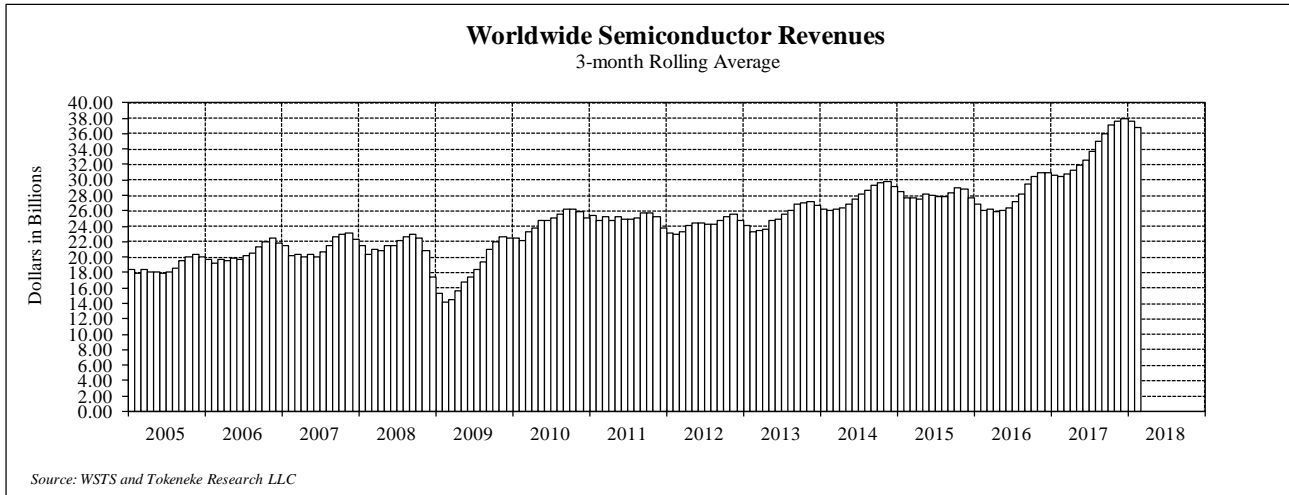
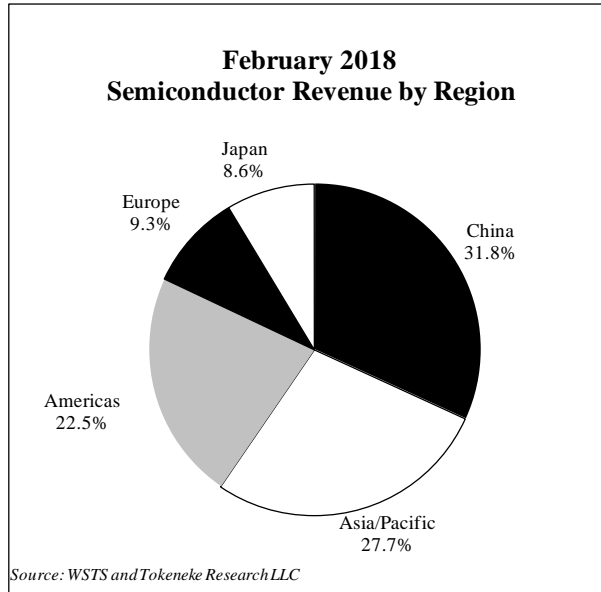
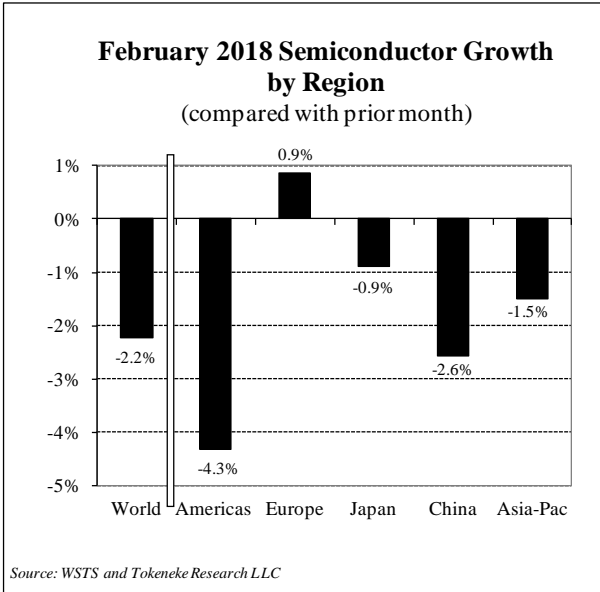
March				1Q				Indices			
Winners (29/62)		Losers		Winners (29/62)		Losers			Mar	1Q	
SMTC	16.0%	HIMX	-24.6%	INFN	71.6%	MTSI	-49.0%	SOX	-2.4%	6.1%	
IOTS	14.7%	MTSI	-22.2%	AQ	38.6%	PI	-42.2%	SMH	-2.1%	6.6%	
AQ	13.8%	NLST	-21.8%	MU	26.8%	HIMX	-40.9%	NASDAQ	-2.9%	2.3%	
NPTN	12.9%	AMD	-17.0%	MSCC	25.3%	PXLW	-38.9%	S&P500	-2.7%	-1.2%	
INFN	9.1%	MOSY	-16.2%	NVDA	19.7%	NLST	-24.9%	DOW	-3.7%	-2.5%	
average stock -1.9%				average stock -1.8%				SOX -2.4%			
								SOX +6.1%			

M&A Setbacks: Mergers and acquisitions activity has experienced setbacks of late with the US administration disallowing the acquisition of Lattice by Chinese investors and the hostile bid by Broadcom of Qualcomm. This year we have already seen IXYS go to Littlefuse and most of what was left of SIGM go to SLAB. Pending deals include NXPI going to QCOM (with lots of drama), CAVM going to MRVL, and MSCC going to MCHP. MOSY continues to pursue ‘strategic alternatives.’

Sector Risk 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—as well as the volatility and divergence between the SOX index and my Universe as noted above. In fact, the SOX was on a bit of a roller-coaster last month with a gain of +6% during the first half, followed by an extended -8% decline, and then in quick secession: a gain of +4%, drop of -6%, and recovery of +2% in the closing days.

Opportunities Knock: While the persistent outperformance of the SOX index and the significant difference between growth rates between memory and non-memory products continues to concern me from a top-down perspective, I am actually encouraged by broader share price weakness across my Universe as we enter seasonal strength amid a year of expected growth. Good news and lower prices should be a positive combination from a bottoms-up perspective. See my latest Semiconductor Investment Ideas publication for specific potential opportunities.

—Dan K. Scovel
Semiconductor Analyst



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.
- *Company Reports:* Fundamental equity research including earnings estimates and customized valuation analysis.
- *Consulting:* Special projects of limited or extended duration, as well as periodic access of varying frequency.

Publications are distributed via email in .pdf format, unless otherwise requested. Client confidentiality and customized research exclusivity accommodated. Rates vary with the nature, duration, and terms of offerings.

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 Fahnstock & 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

Copyright © 2018 Tokeneke Research LLC. All rights reserved. This report is for information purposes only and does not constitute a solicitation or an offer to buy or sell any security or to participate in any investment or trading strategy. Opinions expressed in this report reflect the judgment of Tokeneke Research LLC on the topics addressed as of the date of the report, and are subject to change without notice. Tokeneke Research LLC makes every effort to use reliable and comprehensive information but makes no representation that the information in this report is accurate or complete, nor does it undertake to update or revise this report at any time or for any reason. This report contains forward-looking statements that involve risks and uncertainties, both known and unknown, as well as assumptions that, if they do not fully materialize or prove incorrect, could cause actual results to differ materially from those expressed or implied by such forward-looking statements. Actual results and trends may differ materially from historical results or those projected in any such forward-looking statements depending on a variety of factors. This report does not provide individually tailored investment advice and has been prepared without regard to the specific individual financial situation, objectives and needs of those who receive it. Securities discussed in this report may not be suitable for the reader. Tokeneke Research LLC and/or Dan Scovel may have a long or short position in the securities of a company or companies mentioned in this report and, at any time, may change that position. Tokeneke Research LLC accepts no liability whatsoever for any loss or damage of any kind arising out of the use of any part, or all, of this report. All company and product names mentioned in this report may be trademarks or registered trademarks of their respective holders and are used for identification purposes only. Reproduction or distribution of this report, even for internal distribution, is strictly prohibited unless specifically authorized by Tokeneke Research LLC.