# Almost-Average Semiconductor Growth for August

## *3Q Earnings Announcements Should be Solid, Albeit Uninspiring*

Semiconductor industry statistics for August released earlier this month reflected slightly lower-than-average growth of +1.7%, which I have to view as a disappointment after a very weak July and guidance for a solid 3Q. I blame the resumption of relatively modest memory market price erosion after an extended period of unprecedented gains. Nevertheless, the overall semiconductor business environment remains fairly healthy, in my opinion.

The 3Q earnings season begins in earnest this week and I expect the vast majority of companies to meet or exceed expectations, albeit to relatively modest magnitudes. I expect 3Q results to beat expectations, although exceeding the high-end of the range will probably prove to be overly optimistic for the vast majority of companies. Guidance for 4Q sequential growth will likely be okay, although uninspiring: the 4Q typically reflects a seasonal revenue peak, albeit with modest sequential growth that has averaged +1.6% over the last 28. Overall, I expect a respectable—albeit uninspiring—earnings season.

In the meantime, volatility has returned to chip sector share price gyrations while the divergence in performance between the SOX index and my Universe persists. In addition, the sector is now largely underperforming broader equity market indices. Note my latest Semiconductor Investment Ideas publication reflecting a couple handfuls of rating changes.

***Memories Still Drive Growth:*** DRAM and NAND memories continue to drive semiconductor industry growth. In June 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 +39% (up by 200 basis points last month) 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.

***DRAMs are Different, NAND Not-So-Much:*** DRAM product profitability is likely to persist for the foreseeable future due to: Suppler consolidation with three manufacturers currently accounting for some 96% of industry output; fragmented end-markets of PCs, smartphones, servers and automotive each requiring different product performance optimizations (density, low-power, high-speed and high-reliability, respectively); and technological complications impeding line-width shrinkage below 20nm significantly raising the capital intensity of investment and severely encumbering potential new entrants. This is why I am *NOT* concerned that the rich and motivated Chinese will spoil the DRAM market by crashing prices with oversupply anytime in the foreseeable future.

NAND flash has very different market characteristics: Tere are twice as many suppliers supporting a market almost half the size that is less fragmented by application with twice the expected growth compared to DRAMs. The expected growth of SSDs as they replace conventional HDDs (hard disk drives) over the next serveral years turbo-charges expected annual bit growth of +40%, twice that of DRAMs. However, the greater commoditization of NAND could easily result in significant market price erosion which tempers expected revenue growth: DRAM revenue is expected to grow by +39% this year as market price strength adds to bit growth, while NAND will only grow by +17% as market price erosion more than offsets bit growth.

The bottom line is that DRAM and NAND are very different markets. I believe DRAM will continue to grow and largely maintain its impressive profitability (71% gross margins at Micron last quarter) for at least the next couple—if not the next few—years. NAND, on the other hand, will probably experience greater overall growth, but that growth will be highly volatile as short-term supply dynamics risk adverse market price erosion.

***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.


*Copyright © 2018 Tokeneke Research LLC*

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 firms supplying to memory makers.

***Almost Average August:*** Worldwide semiconductor industry revenues for August grew by a slightly below-average +1.7% sequentially on a three-month rolling average basis, according to statistics released by the Semiconductor Industry Association (SIA) earlier this month. This is the second month of below-average gains and I am somewhat surprised at its relative weakness due to expected industry growth this year (especially from memories—although pricing has clearly plateaued) and company guidance for 3Q strength. August has averaged a gain of +1.9% with a high of +5.2%, a low of -3.5%, and only four declines in the last 28 years—including none in the last 16 years. The Americas took the lead over China (which had topped regional growth for four consecutive months) with growth of +3.6% followed by China at +2.1%. Every other region underperformed to the average with Asia-Pacific at +1.3%, Japan at -0.1% (again), and Europe continued to lag with a decline of -1.4%.

Next month's release of September metrics may well be lackluster given (relatively modest) memory price erosion—despite expected 3Q growth. September has averaged a gain of +3.0% with a high of +8.2%, a low of -2.5%, and only one decline in the last 28 years—including none in the last 16 years.

***Solid 3Q Growth:*** I argue that guidance for 3Q looks pretty darn good despite numerical underperformance. Why? Two reasons: First, my Universe is light on high-growth memory; and second, guidance has proven to be conservative in recent quarters where actual results have skewed to the higher-end of the range. The weighted-average sequential revenue growth across my Universe after five preannouncements (increases from HIMX, IDCC and UMC, a narrowing from SIMO, and a decline from TSM) is +5.6% ranging from +2.9% to +8.3%. 3Q is seasonally the strongest sequential growth quarter of the year: it has averaged 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. While the center-point of guidance underperforms to seasonal norms, the higher-end of the range would be quite respectable.

3Q earnings season begins in earnest this week and I expect the vast majority of companies to meet or exceed expectations, albeit to relatively modest magnitudes. I expect 3Q results to beat expectations, although exceeding the high-end of the range will probably prove to be overly optimistic for the vast majority of companies. Guidance for 4Q sequential growth will likely be okay, although uninspiring: the 4Q typically reflects a seasonal revenue peak, albeit with modest sequential growth that has averaged +1.6% over the last 28 years with declines occurring in 12 of those years—including eight of the last 11. Overall, I expect a respectable—albeit uninspiring—earnings season.

***Chip Sector Underperforms, Divergence Persists:*** Chip sector share prices are now underperforming broader market indices for last month, quarter and year-to-date, although the performance of my Universe has been much more tempered than that of the SOX. During September, the Philadelphia Semiconductor Index Option (SOX) lost –2.5% and underperformed relative to broader equity markets, while 45 out of 60 stocks in my Universe declined by an average of only -0.9% compared to the NASDAQ, S&P500 and DOW at -0.8%, +0.4%, and +1.9%, respectively. Both the SOX and my Universe have now underperformed almost all broader equity markets, per the tables below.

| September | | | |
|---|---|---|---|
| **Winners** *(15/60)* | | **Losers** | |
| NLST | 275.2% | INFN | -18.4% |
| AMD | 22.7% | AOSL | -18.2% |
| PI | 15.5% | PXLW | -18.1% |
| AVGO | 12.6% | MOSY | -17.9% |
| IDTI | 10.6% | MRAM | -17.0% |
| *average stock -0.9%* | | *SOX -2.5%* | |

| 3Q | | | |
|---|---|---|---|
| **Winners** *(22/60)* | | **Losers** | |
| NLST | 148.2% | MOSY | -60.6% |
| AMD | 106.1% | SQNS | -30.4% |
| IDTI | 47.5% | IOTS | -29.2% |
| NPTN | 33.2% | INFN | -26.5% |
| QCOM | 28.3% | NXPI | -21.8% |
| *average stock +2.5%* | | *SOX +4.0%* | |

| YTD | | | |
|---|---|---|---|
| **Winners** *(31/60)* | | **Losers** | |
| AMD | 200.5% | HIMX | -43.6% |
| SMTC | 62.6% | QUIK | -42.5% |
| IDTI | 58.1% | XPER | -39.1% |
| QTNA | 51.2% | MOSY | -37.8% |
| NVDA | 45.2% | CEVA | -37.7% |
| *average stock +2.2%* | | *SOX +9.1%* | |

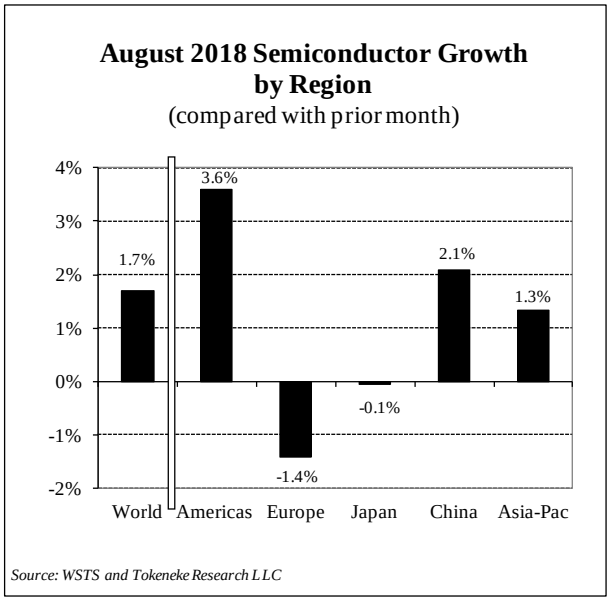
| Indices | | | |
|---|---|---|---|
| | ***Sept*** | ***3Q*** | ***YTD*** |
| SOX | -2.5% | 4.0% | 9.1% |
| SMH | -2.3% | 3.9% | 8.8% |
| NASDAQ | -0.8% | 7.1% | 16.6% |
| S&P500 | 0.4% | 7.2% | 9.0% |
| DOW | 1.9% | 9.0% | 7.0% |

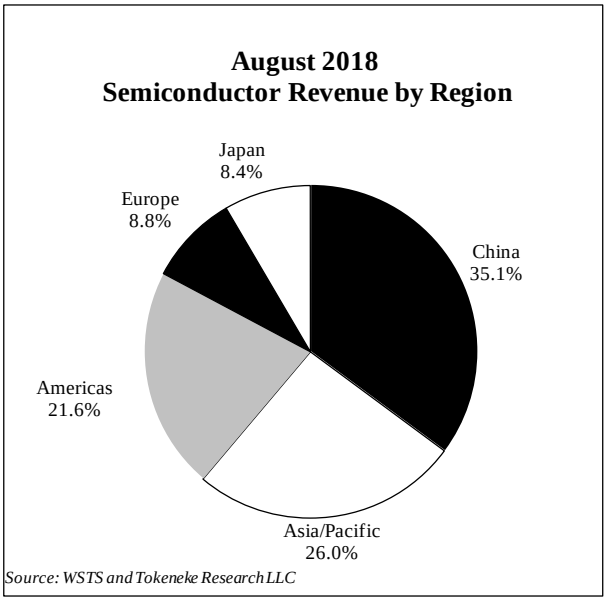
***Sector Volatility Returns:*** The SOX returned to saw-toothed volatility during September after a more subdued profile during August. It cycled over four-times during the month: +0.7%, -3.6%, +1.1%, -2.2%, +2.3%, -1.4%, +2.3%, -2.6%, then +1.1% to finish the period at a net -2.5% and value of 1,366.7.

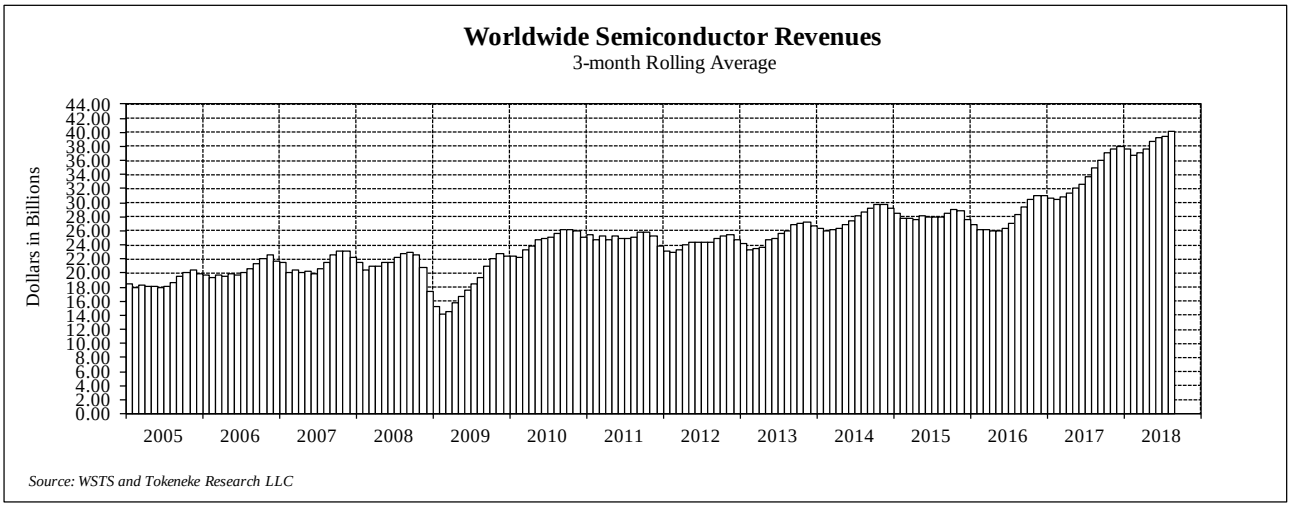
***Opportunities Persist:*** While the longer-term outperformance of the SOX index (see the chart on Page 4) and the significant difference between winning and losing sectors continues to concern me from a top-down perspective, I am actually encouraged by the divergence between the SOX index and my Universe. See my latest Semiconductor Investment Ideas publication for specific potential opportunities.

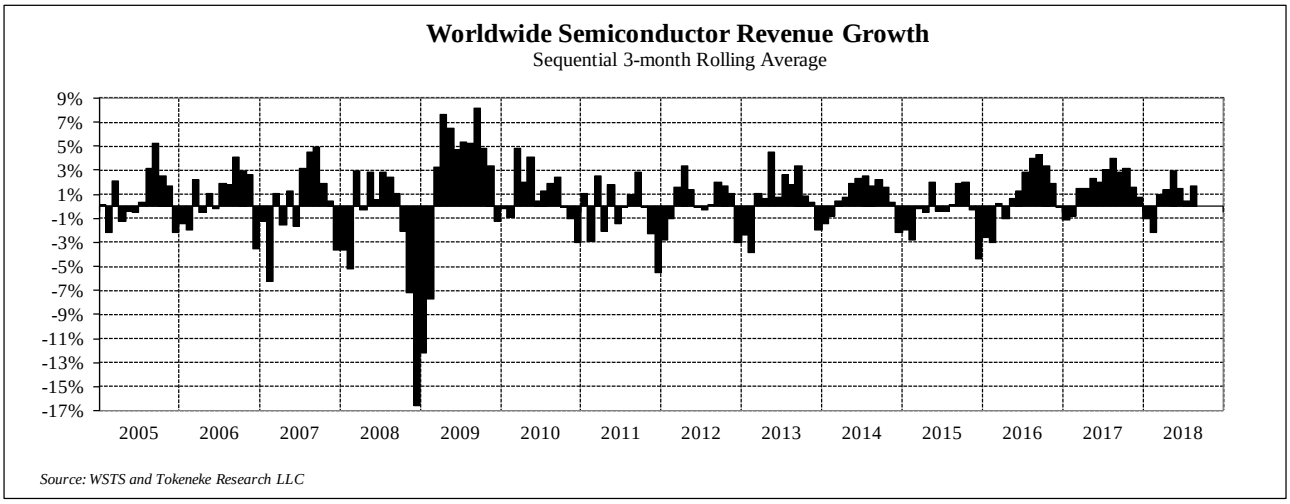
***—Dan K. Scovel***
*Semiconductor Analyst*

 *Copyright © 2018 T1okeneke Research LLC*

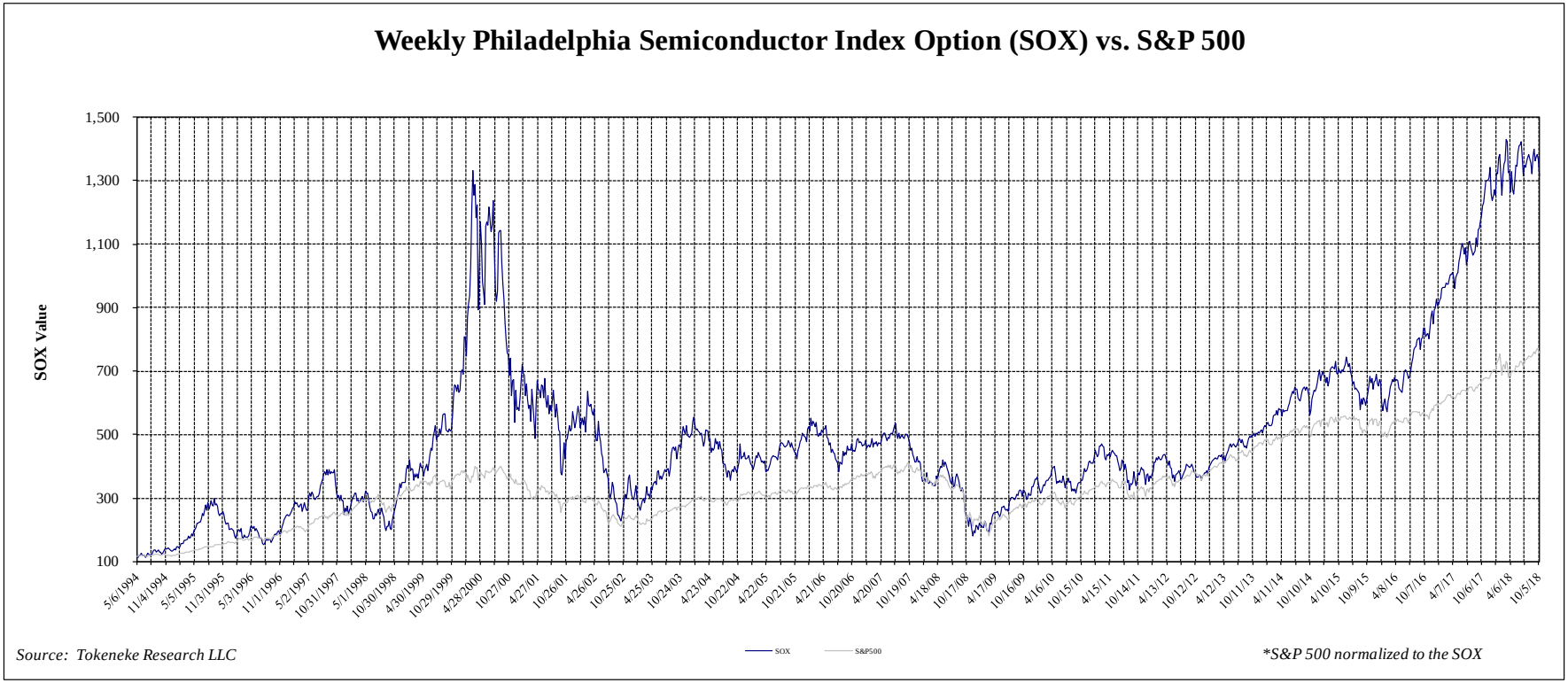



 *Copyright © 2018 T1okeneke Research LLC*




 *Copyright © 2018 Tokeneke Research LLC*

# Tokeneke Research LLC — Company Overview

*Semiconductor Industry Analysis and Insight*

## 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 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

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.