

## **Below-Average February Sales Decline**

### ***Chip Shares Rally 1Q on AI and Memories, but Stats and 1Q Outlook are Weak***

The big picture this year remains that AI and memories are hot, but that the rest of the chip sector is struggling. March was an interesting month: the good news got better and the bad news got worse. AI drove growth at a number of late-season 4Q earnings announcements across chip, system and software companies; it was highlighted at Mobile World Congress in Barcelona early in the month and at Broadcom's analyst day later in the month; and a new chip IPO from Astera Labs (ALAB) milked AI for all it was worth. Micron's F2Q earnings also reminded us how healthy the memory market is this year. All of which helped chip sector share prices outperform last month.

Unfortunately, the rest of the semiconductor sector data is relatively downbeat: 1Q company guidance from 4Q earnings season is calling for an unusually weak decline averaging -5.1%; February industry statistics dropped worse than average sequentially at -3.1%; and half of the equities in my Tokeneke Universe have declined year-to-date through March. Yes, this is supposed to be a double-digit growth year for chip revenues led by AI and memory and automotive, but it sure isn't starting off very well—unless you're Nvidia or Astera Labs or Micron.

As I noted over the last two months, I continue to think expectations for this year will be downgraded since PCs, smartphones, servers, industrial, and communications markets are experiencing malaise or transitions—or both. In the meantime the SOX index over-extended itself even more last month versus the S&P500, and most fundamental valuations across the sector are less than attractive—and in fact, fully valued in many cases. Net-net, I would be very careful and extremely selective approaching potential chip sector opportunities at this time.

**Indigenization Updates:** I'm sticking with the regional supply chain development term 'Indigenization' to describe the 'new normal' chaos with every semiconductor company preserving its supply chain and sales in a variety of ad hoc fashions amid US technology sanctions against China—while China grows some of its own supply chains and technologies (*Huawei-ization*) with some \$150B in incentives at the dark-gray end of the spectrum of segregation.

Remember China's hoarding of equipment last year? Well, Gavekal Dragonomics is forecasting China to add more manufacturing capacity this year—a million wafers per month—than the rest of the world combined. And TrendForce expects China's share of mature technology manufacturing to grow to 39% in 2027 from 31% last year.

In the US, Samsung, TSMC and Micron have applied for US CHIPS program grants for manufacturing facilities after Microchip Technologies, GlobalFoundries and Intel received awards.

And India is making a big play in chips by dangling government subsidies for mostly back-end assembly operations at this time. The first completed wafer fab deal is 70% owned by a mix of local, regional and national government entities and 30% owned and operated by electronics conglomerate Tata with production beginning in 2026. Taiwanese foundry PSMC (not the bigger TSMC) will provide IP on a contractual basis only, without any ownership—which probably explains why there have been so many more wafer fab proposals and negotiations than actual agreements in India.

**Tokeneke Universe Update:** My Tokeneke Universe totaled 53 companies during 1Q earnings season, although I added Mobileye (MBLY) into the mix during the season. I also added Astera Labs (ALAB) after its IPO last month.

Recall that my US-equity-based Tokeneke Universe does *not* include some three-quarters of industry memory business from Samsung, SK Hynix and Kioxia. While my Universe does include Micron and Western Digital, it will probably under-perform expected industry growth in 2024 due to under-representation of more robust expected memory growth around +40%. My Tokeneke Universe also does *not* include very large international players (aforementioned memory guys plus MediaTek, Infineon, Renesas, Rohm, Winbond, Macronix, Nanya, Novatek, Realtek) although it does include wafer foundries (TSMC, UMC, GlobalFoundries, Skywater Tech, Tower Semi) and IP companies (Rambus, Xperi, Ceva, InterDigital, Arm, Adeia) that count as costs associated with manufacturing rather than industry sales. I also normalize fiscal quarters to the best fitting two out of three months. Unreported acquisition stub-periods and mergers exiting the sector can also make a difference.

While these differences are significant, most US-based investors experience the sector 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 firms (*or maybe not*).

**Below-Average February Decline:** Worldwide chip industry revenues for February declined by -3.1% sequentially on a three-month rolling average basis, according to statistics released by the Semiconductor Industry Association (SIA) earlier this week. The positive spin is that the year-to-year growth was +16.3%, although I was expecting weakness as reported due to abysmal 1Q guidance during 4Q earnings season as well as Chinese New Year landing

on February 10 this year that always creates a hole in the numbers. February has averaged a decline of -2.1% with a high of +2.5%, a low of -7.7%, and 30 declines in the last 37 years, including all of the last 19. All regions dropped: China was the worst at -4.3% followed by The Americas at -3.9%, Japan at -2.5%, Europe at -2.3% and then Asia-Pacific at -1.3%. See the Charts on Page 3 of this report.

Next month's release of March statistics is likely to be weaker than normal, in my opinion, based on abysmal 1Q guidance during 4Q earnings season. March has averaged growth of +2.2% with a high of +7.0%, a low of -6.9%, and only five declines in the last 37 years, including two of the last 20.

**Really Bad 1Q Outlook:** The 1Q revenue outlook based on management guidance is *WELL* below average after all 53 companies in my Tokeneke Universe reported. The specific weighted average revenue guidance calls for a sequential decline of -5.1% this quarter, ranging from -7.9% to -2.4%. And if I exclude Nvidia it drops to -8.1% ranging from -11.0% to -5.3%. The 1Q is seasonally the weakest quarter of the year with an average sequential revenue decline of -2.1%, a high of +9.2%, a low of -19.4%, and 25 declines in the last 37 years—including 11 of the last 12, according to industry statistics.

Micron kicked-off 2Q earnings season two weeks ago announcing its February-ended F2Q results that were well above expectations, which is not a surprise given the expected strength of memory products this year. Other than that, I have not seen any 1Q preannouncements—positive or negative—yet, which is a little bit unusual.

**Big Government Banking Deal:** Last month Intel scored \$8.5B in grants and \$11B in investment tax credits and federal loans of US CHIPS monies (yes, that's 'B' as in billions) for domestic manufacturing facilities, and Vishay Interconnect purchased Nexperia's wafer fab in Newport, UK for \$177M. Recall that Renesas backed out of its proposed purchase of Sequans Communications for \$3.03 per ADS in cash in February following an adverse tax ruling by Japanese authorities. Open and/or pending deals include: Western Digital's plan to split its hard-drive and flash operations into two separate companies 2H24; Silicon Motion suing MaxLinear for backing out of its takeover last year; and Infinera rumored to be shopping itself last March before it stumbled into a revenue recognition review triggered by EY late-3Q23.

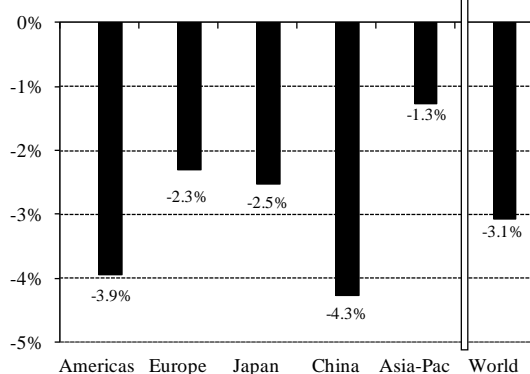
**March Chip-Rally Has Breadth:** Semiconductor sector share prices outperformed broader equity market gains last month with unusual breadth and outsized gains across my Universe. During March the Philadelphia Semiconductor Index Option (SOX) gained +3.8% and outperformed broader market indices, while 35 out of 55 stocks in my Universe advanced by an even better +4.1%. Year-to-date the SOX is significantly outperforming broader equity markets with a gain of +17.5%, although only 28 out of 54 stocks in my Universe have advanced by an underperforming average of +6.5%. Broader equity markets have gained with the NASDAQ, S&P500 and DOW up by +9.1%, +10.2%, and +5.6%, respectively.

March				1Q				Indices		
Winners (35/55)		Losers		Winners (28/55)		Losers			Mar	1Q
ALAB	106.1%	SQNS	-42.5%	ALAB	106.1%	SQNS	-86.4%	SOX	3.8%	17.5%
MU	30.1%	GSIT	-18.3%	PXLW	96.9%	WOLF	-32.2%	SMH	6.2%	28.7%
SMTc	29.7%	SKYT	-12.0%	NVDA	82.5%	MBLY	-25.8%	NASDAQ	1.8%	9.1%
MBLY	26.2%	ARM	-11.4%	ARM	66.3%	MX	-25.6%	S&P500	3.1%	10.2%
INFN	20.1%	AMBA	-9.1%	PI	42.6%	SITM	-23.6%	DOW	2.1%	5.6%
average stock +4.1%				average stock +6.5%						
SOX +3.8%				SOX +17.5%						

**Stocks Still Scary:** As I noted over the last two months, I continue to think expectations for this year will be downgraded. While AI and memory are legitimately large growth opportunities, the rest of the semiconductor industry's markets are experiencing malaise or transitions, or both. In the meantime the SOX index is way over-extended versus the S&P500 (note the relative premium of the SOX in the chart on Page 4 of this report), and most fundamental valuations across the sector are less than attractive—and in fact, fully valued in many cases. Net-net, I would be very careful and extremely selective approaching potential chip sector opportunities at this time.

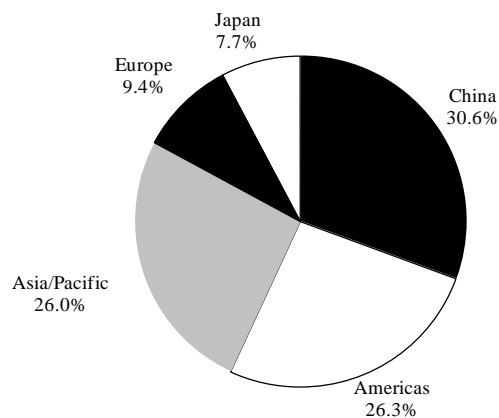
**—Dan K. Scovel**  
Semiconductor Analyst

**February 2024 Semiconductor Growth by Region**  
(compared with prior month)



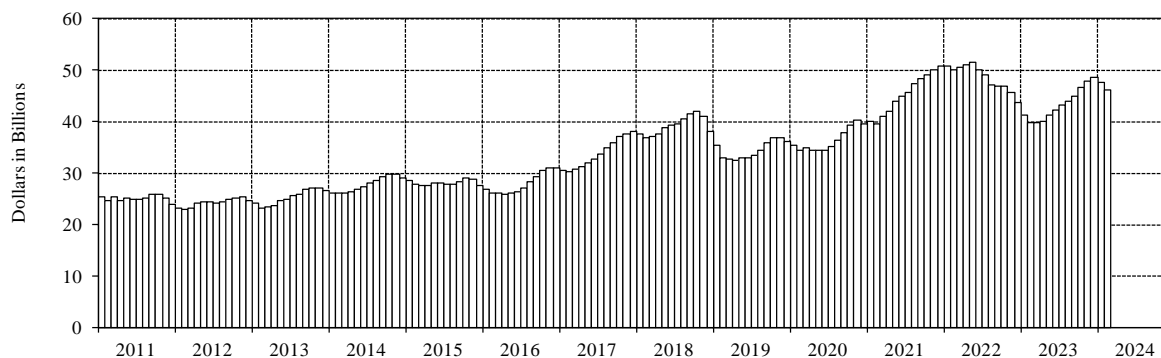
Source: WSTS and Tokeneke Research LLC

**February 2024 Semiconductor Revenue by Region**



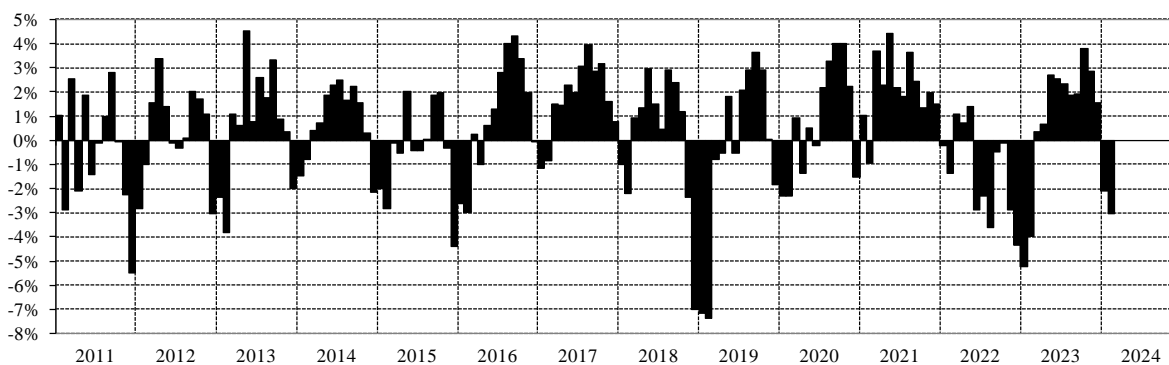
Source: WSTS and Tokeneke Research LLC

**Worldwide Semiconductor Revenues**  
3-month Rolling Average



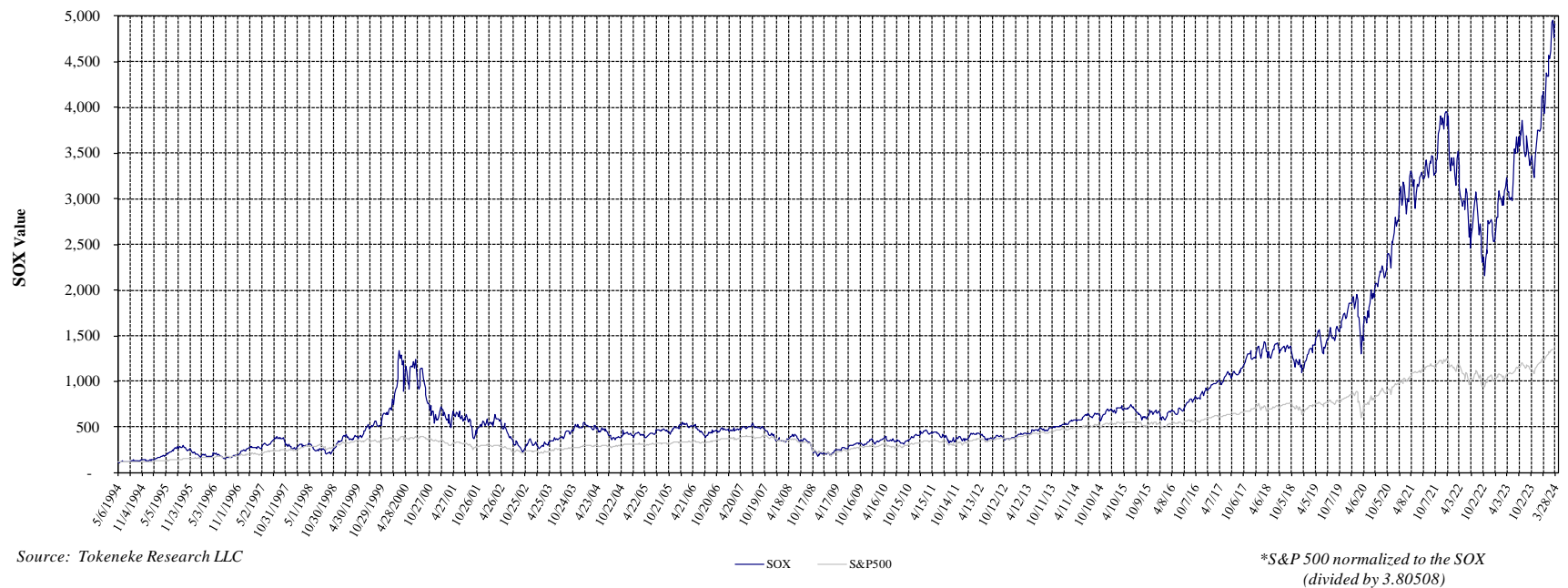
Source: WSTS and Tokeneke Research LLC

**Worldwide Semiconductor Revenue Growth**  
Sequential 3-month Rolling Average



Source: WSTS and Tokeneke Research LLC

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



### **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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### **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**  
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