

CURRENT STATE OF THE SEMICONDUCTOR ECONOMY Q4 Recap and Q1 Expectations

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In December 2008 GSA published an article entitled “GSA Leaders Say Semiconductor Industry Will Innovate Its Way out of the Current Downturn”. For months before this article was written we spoke to hundreds of CEOs, and although none were positive about the months ahead, we were still all surprised by the intensity and swiftness of this down cycle. During earnings season last month we were shocked at some of the predications for the first quarter. It is now accepted by most that the industry will decline by at least 20% this year.

The GSA leadership feels that this will be a long, protracted recession that is reflected in the behavior of semiconductor companies. The most positive prediction we can get from CEOs is that the rate of deceleration has slowed and that Q1 might be the worst quarter we will encounter during this downturn.

To date, there have been more than 50,000 layoffs from the semiconductor community alone¹. Many companies we have spoken with have taken creative and interesting measures to manage costs, such as across-the-board salary reductions; travel moratoriums or reductions; purchase of underwater stock options; reduction in hours worked—which has equated to 20% salary decreases in some cases; forced retirement; 401K suspensions; and even canceling simple company perks such as free food, free sodas, etc.

GSA continues to maintain a close eye on the current economic situation and share this information with members as it becomes available throughout 2009. We have recently added a Webpage dedicated to help members monitor the industry’s progress during the recession. We highly encourage everyone to visit the [Current Economic Downturn Monitor](#) to stay well informed, as it contains the information within this article and downloadable files.

SALES GROWTH

As expected, fourth-quarter 2008 earnings were down quarter-over-quarter (QoQ) and year-over-year (YoY) for most semiconductor companies. Overall, the IC industry reported a QoQ² sales decline of 20% and 23% YoY³. When broken into company business models, fabless companies fell 19% YoY and 17% QoQ, compared to IDMs falling 24% YoY and 21% QoQ (Figure 1).

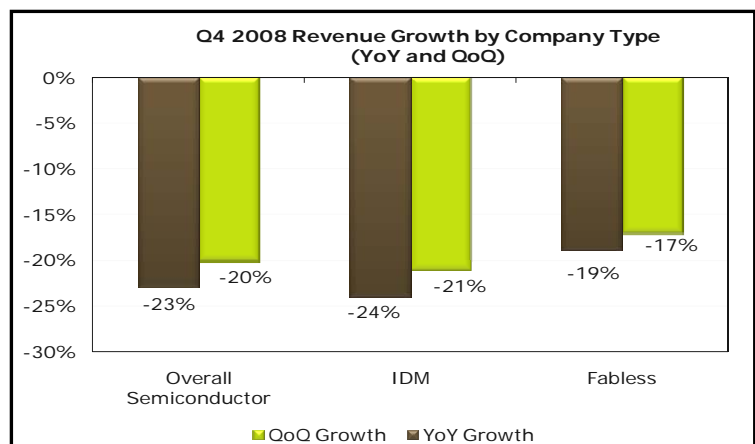


Figure 1. Q4'08 Sales Down as Expected

Semiconductor sales for 2008 totaled \$252 billion and dropped 6%, compared to 2007

¹ GSA; Total includes semiconductor companies and semiconductor suppliers

² Calendar Q4'08 over calendar Q3'08

³ Calendar Q4'08 over calendar Q4'07

sales of \$268 billion. The last quarter of the calendar year hurt growth as the market responded to the worldwide economic downturn (Figure 2).

According to analysts, the state of the semiconductor industry is not expected to trend upward until Q3 2009, which means that we expect continued deceleration in Q1 and Q2 2009.

First-quarter expectations are disappointing for many of the major chip companies. Examples include:

- NVIDIA's [NASDAQ: NVDA] Q1 sales forecast is the lowest it's been since 2005. Most other larger companies are experiencing the same sales decline.
- Silicon Laboratories' [NASDAQ: SLAB] Q1 sales expectations were lowered nearly \$12 million.
- Many companies' estimates are being lowered by analysts each day, such as Broadcom [NASDAQ: BRCM], which originally had forecasted sales of \$850 million in Q1, but has been revised downward to \$838 million.

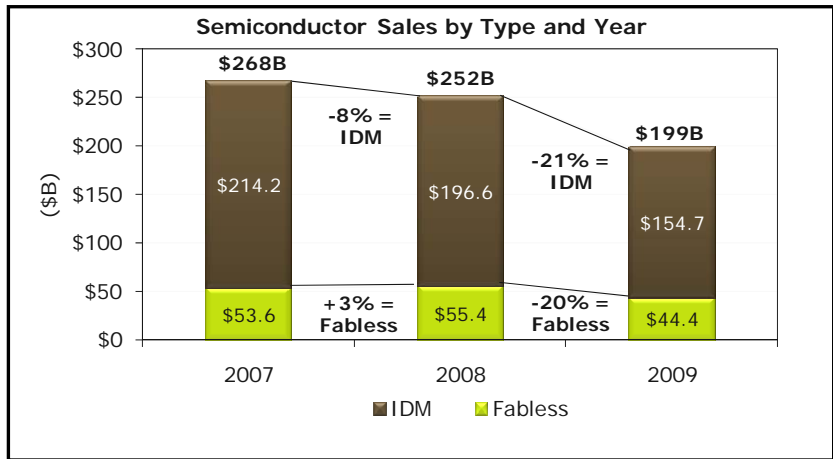


Figure 2. 2008 Sales Down 6% Overall, 2009 Expected to Drop 20% or More

2009 Forecasts by Research Firm

Company	Forecasted Growth	As of Date
Databeans	-18%	February 2009
Future Horizons	-28%	January 2009
Gartner Dataquest	-16% -20% -24%	December 2008 January 2009 February 2009
IC Insights	-10% to -16%	December 2009
IDC	-22%	February 2009
InsideChips	-20%	January 2009
InStat	-20%	February 2009
iSuppli	-9%	December 2009
JP Morgan	-20%	January 2009
Merrill Lynch	-22%	January 2009
Semico	-6%	January 2009

Source: Company announcements

Figure 3. Sales predicted to fall 20% or more in 2009

The current economic slowdown will follow the more painful L-shaped curve, said Chang, noting stability in the U.S. housing market implies that consumer confidence has improved and that's what

Several analysts predict that overall semiconductor sales will drop at least 20% in 2009 from 2008's total. This will be the largest semiconductor revenue decline since 2001's -32% growth.

Morris Chang, chairman of TSMC, said the industry will likely experience negative growth in 2009, but will start to rebound at an annual growth rate of 4-5% from 2010. He also said revenues won't return to 2008 levels until 2012.⁴

⁴ Claire Sung, Taipei; Jessie Shen, [Semiconductor industry will not recover until 2012, says TSMC chairman](#), DIGITIMES.com, (24 February 2009)

has become the key for semiconductor industry's revival, he added. The evolving world has positioned semiconductor items as commodities, and customers now possess strong market power, Chang said.

Several companies, however, expect sales to increase in 2009, including emerging companies, Cavium Networks [NASDAQ: CAVM] and Intellon [NASDAQ: ITLN]. In Q4, Intellon grew 31% and Cavium grew 26% in revenue (QoQ). Their sales growth is expected to continue in 2009 with Cavium and Intellon forecasted to grow another 6% and 28%, respectively, in 2009.

Dialog Semiconductor [XETRA: DLG.DE] announced outstanding Q4'08 earnings, despite a troubling quarter for most companies. The German fabless power management IC company reported the following:

- Sales growth: 86% YoY; 50% QoQ
- Cash balanced increased to \$37 million, up \$1.1 million YoY
- Zero debt
- Net profit grew 4.2% for 2008; 8.6% for quarter
- Increased diluted EPS to \$0.15 for 2008; \$0.10 for the quarter
- Although revenue grew 86% YoY, inventory only increased 17% during the same period.
- More than 30% of revenue was from products developed in the past 12 months.
- Successful entrance into Smartphone market
- Increased market share in portable media devices
- Increased customer geographical diversity

Dialog is also expected to grow sales by another 8% in 2009.

Companies with Positive Growth Expectations in 2009

Company	Region	2009 Revenue Est. (US\$000)	2008 Revenue (US\$000)	YoY Growth
Intellon	N. America	\$96,700	75,378	28%
Maxwell Technologies	N. America	\$98,850	\$80,090	23%
Via	Asia-Pacific	\$302,550	\$260,040	16%
Dialog Semiconductor	Europe	\$175,300	\$161,800	8%
Cree Inc.	N. America	\$559,690	\$520,000	8%
Cavium Networks	N. America	\$91,720	\$86,609	6%
MediaTek	Asia-Pacific	\$2,716,800	\$2,645,970	3%
Ramtron International	N. America	\$64,000	\$63,553	1%

Source: Various analyst reports; GSA; MSN Money

Figure 4. There are companies that expect to grow sales YoY in 2009.

NET PROFIT

Net profit dropped QoQ for most companies; however, 10 companies not only stayed in the black both quarters, but they improved net profit as well. And at least 24 semiconductor companies are expected to be profitable in Q1'09 (Figure 5).

Company	Q1'09 Net Income Forecast (\$M)	Company	Q1'09 Net Income Forecast (\$M)
Intel	\$157	Hittite Microwave	\$11
MediaTek	\$139	Cree	\$10
Linear Technology	\$50	AMCC	\$8
Altera	\$44	IDT	\$7
Xilinx	\$43	Silicon Labs	\$6
ADI	\$37	Semtech	\$6
Qlogic	\$27	Sigma Designs	\$5
Microchip	\$20	NetLogic Microsystems	\$5
NovaTek	\$18	TriQuint	\$3
Skyworks	\$16	IXYS	\$2
Microsemi	\$14	Micrel	\$1
Himax	\$13	Supertex	\$1

Figure 5. Companies with Highest Forecasted Q1'09 Profit

MARKET CAPITALIZATION

Market capitalization for the companies in GSA's portfolio grew 23.5% from November 24, 2008 through February 9, 2009. However, market cap is still 42% lower than it was in late December 2007, or basically one year ago.

BALANCE SHEETS: CASH, CURRENT RATIO, DEBT

Cash and Debt

Semiconductor companies, specifically fabless companies, in general do not have a lot of debt, and most all do not have a more debt than they have cash on hand. The term "cash is king" cannot be stressed enough. The companies with the highest cash amounts will prevail and well positioned to gain market share by benefiting from fire-sale prices of the smaller companies running out of funding with no other choice than an acquisition exit strategy.

Companies with Zero Debt , Strong Current Ratios , Strong Market Cap-to-Cash Ratios				
Company	Current Ratio	Debt (US\$)	Cash (Q4'08) (\$'000)	Market Cap to Cash Ratio
Hittite Microwave	17.0	\$0	\$183,700	448.7%
Techwell, Inc.	16.5	\$0	\$62,067	200.6%
AnalogicTech	15.2	\$0	\$109,537	117.6%
Adapteq, Inc.	13.7	\$0	\$371,213	79.4%
Microtune, Inc.	12.0	\$0	\$86,097	114.9%
O2Micro International	10.7	\$0	\$31,844	347.6%
Microchip Technology	9.9	\$0	\$1,397,611	268.3%
Exar Corporation	9.9	\$0	\$257,481	114.4%
Mellanox Technologies	9.6	\$0	\$183,157	151.6%
PLX Technology, Inc.	9.6	\$0	\$47,127	132.5%
Hifn	9.3	\$0	\$34,852	129.4%
Intellon	8.5	\$0	\$35,375	276.4%
GSI Technology	8.4	\$0	\$47,643	144.6%
California Micro Devices Corp. (CMD)	8.0	\$0	\$33,945	144.9%

Sources: GSA; Yahoo Finance / * Stock prices pulled 2/6/09

Figure 6. Companies with strong balance sheets

Semiconductor companies generally have a strong market cap-to-cash ratio, meaning these companies have stock worth more than the cash they have on hand.

Current Ratio

The average current ratio for semiconductor companies in Q4 2008 was 4.7 (Figure 7). Current ratios are an important gauge to determine companies that are in a position to pay back their liabilities, or short-term debt, with their short-term assets. A ratio under 2.0 could mean a company is unable to pay off obligations at that point in time, and none of the

companies GSA tracks reported a current ratio of less than 1.0.

Only 10 companies have less than a 2.0 ratio (Figure 8).

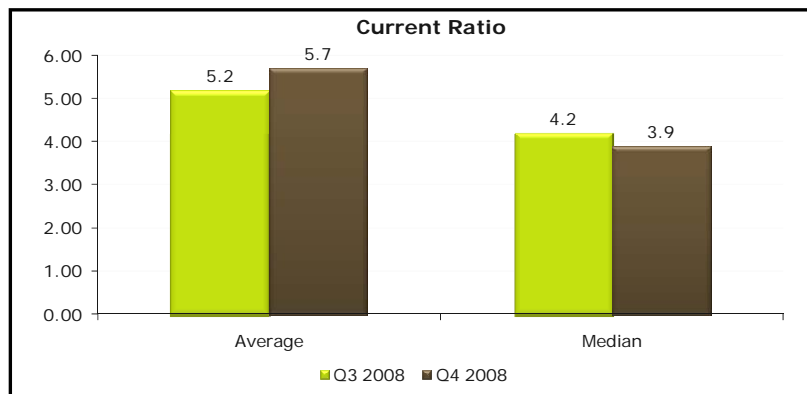


Figure 7. Current Ratio Average & Median by Quarter

Many of the companies GSA tracks slightly improved their liquidity positions QoQ in Q4 2008. The average current ratio is up QoQ by a few tenths of a point.

COMPANIES WITH CURRENT RATIO BELOW 2.0			
Company	Current Assets (\$000)	Current Liabilities (\$000)	Current Ratio (CYQ4'08)
ON Semiconductor	\$1,045,200	\$546,100	1.91
Conexant Systems, Inc.	\$238,240	\$125,677	1.90
Micron Technology	\$3,037,000	\$1,635,000	1.86
AudioCodes Ltd.	\$169,662	\$113,224	1.50
ZiLOG, Inc.	\$26,930	\$18,517	1.45
Mindspeed Technologies, Inc.	\$50,061	\$35,558	1.41
Infineon	\$5,341,000	\$4,313,000	1.24
Advanced Micro Devices, Inc. (AMD)	\$2,379,000	\$2,226,000	1.07

Source: GSA, Company Reports

Figure 8. Companies with Current Ratio Below 2.0

INVENTORIES

Chip Industry Inventory⁵

According to a recent Wachovia report, semiconductor shipments ran significantly below end market chip consumption in Q4'08, according to Wachovia, and the lower-than-consumption level of shipments will continue through Q1'09. In an effort to bring down internal inventory, chip companies have cut chip production (large IC manufacturers cutting internal production, and fabless chip companies cutting wafer foundry orders) below the level of shipments in Q1'09.

The company believes in the next few months, as inventory levels in the supply chain reach appropriately low levels, that chip shipments will hit an inflection point, rising to the level of chip consumption. In addition, chip production levels should rise to match chip shipment levels rather than running below shipment levels. This should result in a fairly sharp rebound in semiconductor utilization, perhaps as early as Q2'09.

US Retailers Appear More Conservative Going into Q1⁶

Based on past years, Q1'09 inventory levels are generally flat following the post-holiday build-up. If these patterns hold, a sustained sub-normal inventory level is possible as retailers get a sense of what lies ahead for them.

For the consumer IT and electronics products tracked in the Tech Channel Index, US Technology Retailers maintained between 10% to 20% less inventory coverage than in the same time period of 2008.

Tech Channel Index announced in a recent press release that for the first three weeks of calendar 2009 channel activity for US retailers selling consumer IT and entertainment products was down 4% overall compared to the same period in 2008. And while the US technology retail sales growth is down, some retailers are gaining ground. Companies such as Wal-Mart, Costco, Target and Office

⁵ Wachovia Capital Markets, Semiconductor Capacity Review Q4'08 (February 17, 2009)

⁶ Tech Channel Index (February 16, 2009)

Supply retailers have had positive channel activity since the beginning of the year, while companies like Best Buy and Radio Shack and Online retailers (Amazon and Newegg) have consistently remained down.

And while channel activity is below this same period last year there are signs of growth with the Electronics retailers who have been making steady improvement since the US holiday shopping season where they ended down 30%. Given the large relative share of the sales volume that flows through Electronics retailers for these product categories continued improvement may pull channel activity values on par or slightly above last year by 1%-2%.

STOCK PERFORMANCE

Dow, S&P 500, NASDAQ

The week of February 23rd, the Dow Jones Industrial Average and the S&P 500 Index hit their lowest levels since spring 1997. ⁷ The Dow has declined 34% last year, said Dave Sovie, a partner at consulting firm Oliver Wyman. ⁸ Some analysts even believe the Dow will drop to 6,500 before the market swings back up. However, the same day the Dow and S&P dropped to 12-year lows, the NASDAQ closed up - a gain on lower valuations - but not due to any sudden rebound in confidence.

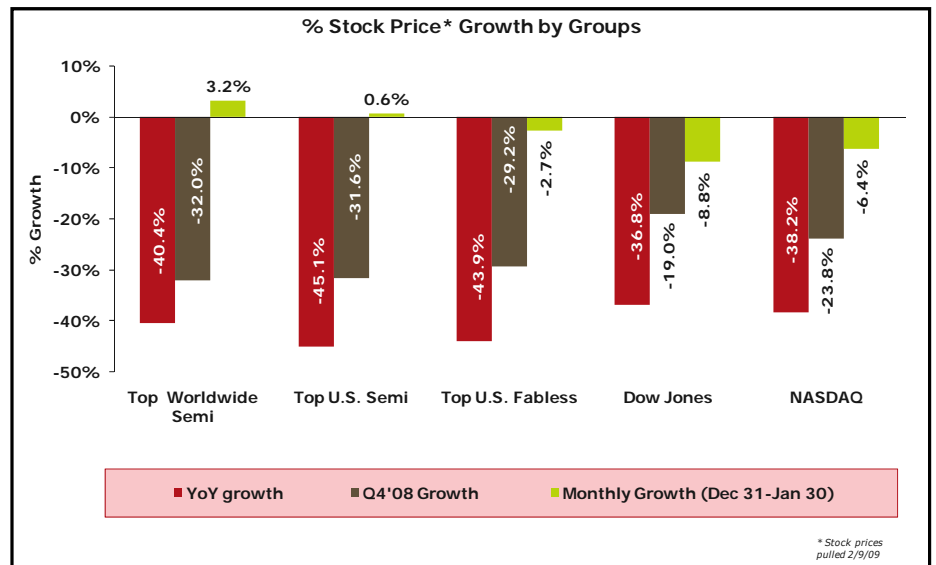


Figure 9. Stock prices are down to 1997 levels

The market value of consumer electronics companies plunged 49% last year. For hardware and semiconductor companies, it dived 48%.

Fabless Stock Index Reintroduced

GSA reintroduced the [FABLS Stock Index \(FABLS\)](#) (originally created in 1998) and introduced the Mini Fabless Stock Index (mFABLS) to track traditional fabless stocks against larger, integrated companies, foundries and other suppliers listed in the SOXX.

The price-weighted FABLS Index includes fabless companies that meet or exceed a market capitalization criterion of \$500 million, and a new mFABLS includes fabless companies with market capitalization between \$100 million and \$500 million.

⁷ Scott Reeves, [Dow Takes Trip Down Memory Lane](#) (February 24, 2009)

⁸ Jon Swartz, [New tech start-ups can rise from the economy's ashes](#), USA TODAY, (February 16, 2009)

As of February 25, 2009, the Index was only down 5% from October 1, 2008. The lowest point during this period was on November 20, 2008, when it dropped 8% to 87.2 (Figure 10). The mFABLS has not moved as much as the FABLS Index since October. It has maintained its price and is only down 3% since October 1.

GSA has created a Webpage, which includes both Indexes; a feature to download historical data into an Excel file; a table listing all the companies currently in each Index, which provides links to their Yahoo! Finance page; and links to other related financial pages on the GSA site. To track the Indexes, visit www.gsaglobal.org/resources/stockindex.

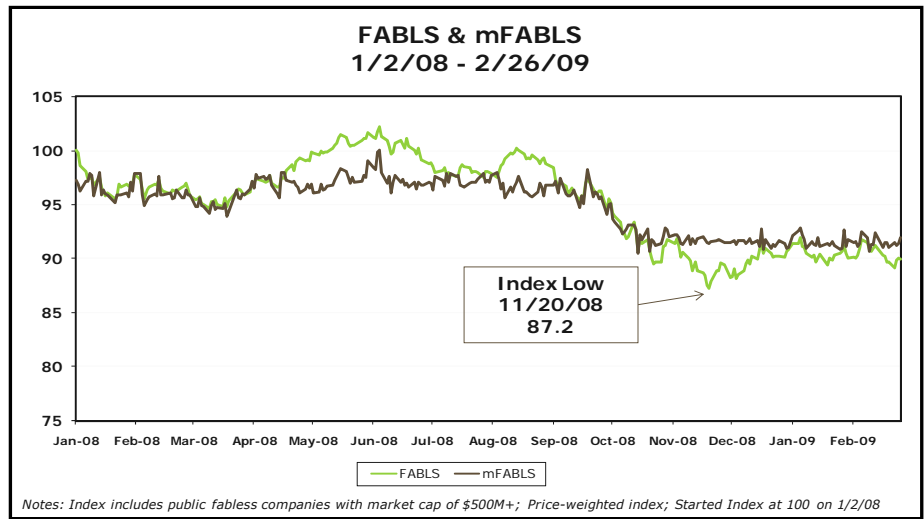


Figure 10. FABLS & mFABLS Stock Indexes

INDUSTRY SENTIMENT

The major stock index averages declined sharply on February 19, in reaction to negative economic reports and guidance provided by technology giant Hewlett-Packard, demonstrating underlying fears of traders, resulting in the Dow settling below its November lows⁹. The negative sentiment carried into February 20, with the major averages declining again. The Dow settled at a 6½ year low and the S&P 500 Index closed close to a 12-year low.¹⁰ News like this seems to be happening almost weekly, so how is this affecting the overall industry sentiment?

According to the February 2009 Bank of America Merrill Lynch Technology Sentiment Index¹¹, sentiment rallied sharply across global regions to a net 11% overweight reading. The latest U.S. investor sentiment rapidly moved to a positive reading after finally dipping below zero in January. Their research also noted that the current, relatively positive level may be a negative indicator for subsequent absolute tech stock performance.

GSA is also providing a sentiment index specifically designed for industry CEOs. J.P. Morgan and GSA are jointly publishing the monthly J.P. Morgan/GSA Semiconductor CEO Sentiment Index to report in aggregate how global semiconductor and supplier CEOs view the health of the overall industry. Each month, participating CEOs are asked to confidentially provide his/her opinion as to whether 10 separate indicators are trending up, trending down or staying the same. The results are aggregated, made anonymous, and used to create a diffusion index. The diffusion index oscillates around 50, such that a reading above/below 50 reflects expansion/contraction in the industry. Results and details from

⁹ RTTNews Daily Market Analysis, [Positive Sentiment on Financial Stocks May Help Broader Market](#) (February 23, 2009)

¹⁰ RTTNews Daily Market Analysis, [Positive Sentiment on Financial Stocks May Help Broader Market](#) (February 23, 2009)

¹¹ Bank of America Merrill Lynch February 2009 Technology Sentiment (February 18, 2009)

the survey are only available to participating CEOs¹². We highly encourage all industry CEOs to participate every month, as this Index is a great resource for companies to understand what their peers are seeing in terms of contraction and expansion and possibly when the market might turn around. We monitor this Index, but you must participate to get the details of the results. Visit www.gsaglobal.org/scsi/form.asp to be added to the distribution list.

R&D and INNOVATION

No matter what the sentiment indexes reveal, innovation is imperative to the industry in a bear market just as it is in a bull market. Clayton M. Christensen, Harvard Business School professor and author of several innovation-focused books said in a December 2008 interview¹³ that "breakthrough innovations come when the tension is greatest and the resources are most limited. That's when people are actually a lot more open to rethinking the fundamental way they do business."

This mentality has proven successful in past recessionary periods when you consider that Cisco emerged after the 1987 crash and Facebook and MySpace.com after the dot.com bust.¹⁴ "A good forest fire cleans out the prairie," says renowned venture capitalist Steve Jurvetson. Start-ups unburdened by debt or history and cash-rich big companies "thrive on disruption," he says.¹⁵

In general, semiconductor companies believe this philosophy. They are cash rich, debt free, and are continuing to invest in R&D, as the latest quarter's R&D-to-sales average shows – placing them in a better position than others in different industries during tough economic times. GSA has tracked R&D-to-sales every quarter for the past decade. Through the years, there is a definite spike in R&D-to-sales when cycles are down (2001-2002 and current), and much of this is due to actual sales being lower and R&D spending remaining the same or growing in a particular quarter—margins are lower. In Q4 2008 the R&D-to-Sales ratio for all semiconductor companies dipped slightly to 22.3% from 22.9% in Q3 2008.

"While we continue to evaluate the balance between profitability and growth as economic conditions change, we believe that the continuing regiment in R&D and new products to support our future growth is the right thing for our business," said Balu Balakrishnan, president and CEO of Power Integrations. This is a company that has dramatically increased its R&D.

Patents are on the rise, according to executives managing IP businesses. Despite the climate and the recession, the business of buying, selling and asserting patents seems to be in the rise. "Every time there's been a downturn in the economy there's been an upturn in patent assertion," said Ron Epstein, CEO of IPotential, a patent trading and consulting firm.¹⁶ (IPotential reported a 30% YoY increase in patent sales in 2008.)

According to Semiconductor Insights the number of patents on the market has picked up substantially. "Companies are looking to rationalize their patent portfolios to manage costs in terms of maintenance

¹² If your company's CEO is interested in monitoring the sentiment of global CEOs—suppliers, peers and competitors—ask them to participate in the J.P. Morgan/GSA Semiconductor CEO Sentiment Index survey. Contact Lisa Tafoya at Itafoya@Itafoya@gsaglobal.org.

¹³ WSJ.com, [How Hard Times Can Drive Innovation](#), December 2008

¹⁴ Swartz, [New tech start-ups](#)

¹⁵ Swartz, [New tech start-ups](#)

¹⁶ Rick Merritt, [Analysis: What slows down tech innovation?](#), EETimes (February 2009)

fees and in many cases are making decisions to divest segments of their portfolios," said Mike McLean, VP of professional services at Semiconductor Insights.

Although R&D-to-sales at IDMs grew 30% QoQ, the IDM ratio is traditionally less when compared to fabless companies. Average fabless R&D-to-sales in Q4 2008 was 35.2%, compared to 31.6% in Q3 2008 and 33.2% in Q4 2007. Average IDM R&D-to-sales in Q4 was 21.4%, 16.5% in Q3 2008 and 15.8% in Q4 2007. Of course, this could be a result of several reasons:

- IDMs have higher sales, on average (\$108M), than fabless companies (\$56M).
- IDMs must reserve cash for other expenditures, i.e. fab equipment.
- Fabless companies have less sales and maintain or increase R&D spending, which increases the R&D-to-sales margin.

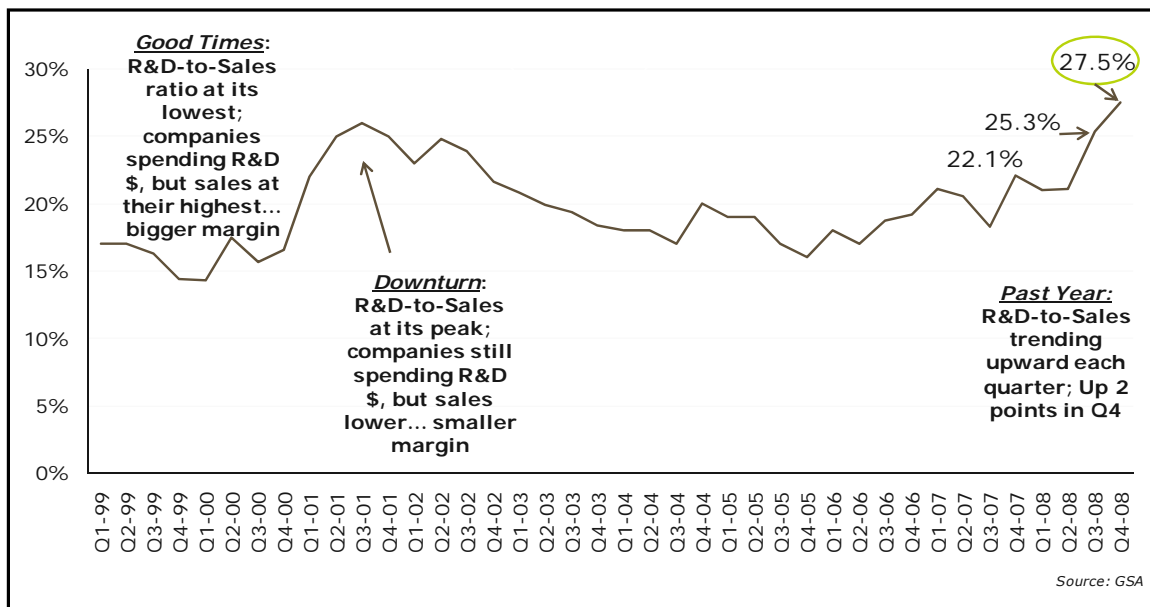


Figure 11. Average R&D-to-Sales by Quarter (1999-2008)

DIVIDENDS

Semiconductor companies are not traditionally known for offering stock dividends to shareholders; however, a few have elected to do so over the past few years. Especially now, in a time of Wall Street uncertainty, should stable, well-established companies evaluate offering dividends, as the act sends a powerful message that a company has a positive outlook on fundamentals and performance.

IDM				Fabless			
Company	Dividend Per Share* (\$)	Dividend Yield (%)	Dividend Payout Ratio	Company	Dividend Per Share* (\$)	Dividend Yield (%)	Dividend Payout Ratio
Analog Devices	0.80	3.7	28%	Altera	0.20	1.2	16%
Dataram	0.24	18.6	N/A	Himax	0.55	30.4	79%
Intel	0.56	4.0	60%	Power Integrations	0.05	0.02	N/A
Intersil	0.48	4.2	30%	QUALCOMM	0.64	1.8	38%
IXYS	0.12	1.6	19%	Wavecom	1.25	11.6	N/A
Linear Technology	0.88	3.6	46%	Xilinx	0.56	3.0	38%
Maxim	0.80	6.0	159%				
Micrel	0.14	1.8	33%				
Microchip	1.36	6.8	83%				
National Semi	0.32	2.7	21%				
Samsung	5.20	1.8	N/A				
Sony	0.37	2.0	4%				
STMicro	0.31	5.5	N/A				
Texas Inst. (TI)	0.40	2.4	27%				
Toshiba	0.52	N/A	30%				

Foundry			
Company	Dividend Per Share* (\$)	Dividend Yield (%)	Dividend Payout Ratio
TSMC	0.40	5.2	66%
UMC	0.12	6.0	80%

* = Total of the expected dividend payments over the next 12 months.
Source: MorningStar.com; Yahoo Finance

Figure 12. Latest Semiconductor Dividend Offerings by Company Type

CAPEX UPDATES

Despite record low utilization rates at the wafer suppliers, foundries are continuing to invest in new technologies—not just advanced nodes, but new processes for high voltage, mixed signal and power management as well, according to Semico. With this, not only do the foundry suppliers maintain customer loyalty, but they also inherit increased foundry costs—all while margins continue to tighten.

Company	2006 (\$B)	2007 (\$B)	2008 (\$B)	% Growth	Date	2009E (\$B)	% Growth	Date ¹
AMD	\$1.9	\$1.7	\$0.6	-65%	Jan-09	--	--	--
Intel	\$5.8	\$5.0	\$5.2	4%	Jan-09	\$5.2 or less	0%	Jan-09
Micron ²	\$1.4	\$3.6	\$2.9	-19%	Oct-08	\$0.65-\$0.75	-75%	Dec-08
Samsung	\$6.6	\$7.8	\$6.9	-12%	Jan-09	"Conservative"	--	Jan-09
TSMC	\$2.5	\$2.6	\$1.9	-27%	Jan-09	\$1.44	-24%	Oct-08
Texas Instruments	\$1.3	\$0.7	\$0.8	14%	Jan-09	\$0.3	-63%	Jan-09
UMC	\$1.0	\$0.9	\$0.4-\$0.5	-50%	Oct-08	<\$0.4	Up to -13%	Feb-09
SMI C	\$0.9	\$0.7	\$0.8	14%	Oct-08	\$0.2	-75%	Oct-08
Qimonda ³	--	\$1.3	\$1.1	-15%	Jan-09	\$0.5-\$0.6	-55%	Jan-09
Hynix	--	\$5.1	\$1.9	-63%	Oct-08	\$0.7	-63%	Dec-08
Elpida	--	\$1.4	\$0.95	-32%	Nov-08	--	--	--
Toshiba	--	--	--	--		<\$1.1	--	Jan-09

¹ Last date affirmed

² Includes Micron/Intel JV spending; excludes Micron/Nanya JV spending

³ Qimonda declared bankruptcy in Jan-09; Wachovia thinks there is a fair chance Qimonda will shut down production.

Source: Wachovia, Feb 17, 2009

Figure 13. Capex by Year

IC Insights' 2009 capital expenditure forecast is down 30% from 2008, but the research firm thinks this will likely go down to -35% as estimates continue to come in for 2009. For 2010 the firm is now forecasting a 15% increase, followed by a 22% increase in 2011 and further growth into 2011.

UTILIZATION RATES & FOUNDRY NEWS

According to a recent Wachovia report¹⁷, total U.S. industrial production declined 10.0% YoY in January, the seventh consecutive month of YoY declines, consistent with the economic slowdown we are experiencing.

- Computers and semiconductors all showed MoM declines (of approximately 4-7%) in industrial production in January. However, communications equipment showed an improvement to 1.5% month/month growth following a 1% decline in the month of December.
- Worldwide semiconductor capacity utilization fell to 69.5% in Q4'08, a sharp drop from 87.5% in Q3'08 and close to 90% in 1H'08. Although falling utilization always poses a risk, there are many elements in this and other recent semiconductor data points that Wachovia finds extremely encouraging. They believe the big drop in utilization is an indication of how rapidly chip makers have cut back production in an attempt to control inventory in the midst of falling end-market demand. They also think that the sharp cutbacks in production are helping keep inventory levels down, potentially setting the stage for an initial inflection point in demand (potentially in the June quarter) in the upstream segments of the technology manufacturing supply chain (e.g. components, such as semiconductors.)
- Although most companies are cutting back on capital investments for additional capacity, Semico forecasts capacity utilization to remain relatively low throughout 2009. The largest foundries are expecting first quarter 2009 capacity utilization levels to be at record lows.
- "The one bright spot is that demand for foundry services continue to expand. Foundry wafer demand is expected to grow by 11% CAGR (compound annual growth rate) over the next five years," says Joanne Itow, Managing Director of Semico. "Growth is coming from IDMs shifting to a fab-lite or fabless model. Due to the economic environment, growth from new fabless, start-up companies is not expected to play a major role in 2009."
- Semico also noted that on the demand side, there is a very slight chance that there could be isolated cases of capacity shortages in certain specialty technologies. While foundry wafer demand is expected to grow by over 10% over the next five years, foundry supply growth will average less than 5%.

Utilization levels at some of the industry's leading plants could fall 50% or lower in Q1'09 due to companies pulling back orders to work on "cleansing" their inventory levels – especially at OEMs who began tightening in Q4'08 even before semiconductor companies did.

TSMC

- In January, TSMC reported that Q4 2008 sales dropped 31% QoQ.
- Customers are cutting orders, driving down utilization rates to historical lows, according to a report from FBR Capital Markets. FBR Capital Markets believes there is increased probability that utilization rates at TSMC could even decline to below 40% in Q1'09,
- FBR Capital Markets said TSMC's capacity utilization rate could fall below 40% in Q1'09, potentially setting a new historical low compared to the last historical low of 41% that occurred in Q2'01.
- TSMC guided for March quarter revenue of NT\$32.00-35.00 billion, versus December quarter sales of NT\$64.56 billion.

¹⁷ David Wong, *U.S. Industrial Production/Capacity Utilization Data—Further Declines In Technology Production*, Wachovia (January 2009)

UMC

- UMC's Q4 capacity utilization rate fell to 48%, down from 79% in Q3'08 and 86% in the Q4'07.
- Capex: UMC is expected to spend less than \$400M in capex in 2009. This is down approximately 13% from 2008.
- UMC guided for December quarter wafer shipments to decline by 40-42% sequentially with average selling prices (ASPs) down 3-5% sequentially, implying a sequential decline in sales of approximately 42-45%.

Chartered Semiconductor Manufacturing

- Chartered cut its workforce by approximately 8%.
- The company reduced its capital spending outlook after Q4 sales fell 24%.
- Chartered guided for revenue to decline 31-34% sequentially in Q1'09, with ASPs flat to up 5%.

SMIC

- SMIC did not officially provide guidance for Q1'09, but did estimate a sequential decline of roughly 50%.

PACKAGING & TEST SUPPLIERS¹⁸

The trickle-down effect is in full force. Not only are the semiconductor customers not manufacturing wafers, they aren't packaging or testing them either. The major outsourced semiconductor assembly/test (OSAT) suppliers are feeling the pain as profit losses and weak sales loom.

Amkor

- Amkor Technology Inc. (Chandler, Ariz.) said Q4'08 sales of \$549 million were down 24% sequentially from Q3'08 and down 27% YoY.
- Amkor implemented further cost-reduction measures in Q1'09 that include:
- Lowering executive and other employee compensation
- Additional layoffs
- Shortened work weeks

ASE

- Q4'08 sales were down 37% YoY and down 29% QoQ.
- Net loss for ASE in Q4'08 totaled \$23.5 million, down from net income of \$108.6 million in Q4'07 and net income of \$64.9 million in Q3'08.
- ASE expects to post losses through Q3'09.
- Management guided Q1'09 sales down 35-40% QoQ.
- Gross margins guided negative low-single digits due to 40% overall utilization rates and 20% rates on testers.

Siliconware

- Management suggested Q1'09 revenues could decline as much as 35% QoQ.
- Utilization rates may fall to 45% (from 65% in Q3'08), with tester utilization rates even lower.

¹⁸ Mark LaPedus, EETimes, [Updated: IC-packaging houses see red ink](#) (February 2009)

STATS ChipPAC

- STATS ChipPAC sales decline 32% YoY in Q4 and 31% QoQ.
- STATS ChipPAC plans to cut approximately 1,600 employees, representing approximately 12% of the company's global workforce.

LAYOFFS¹⁹

The Labor Department said U.S. employers slashed 598,000 jobs in January, the most since late 1974. The unemployment rate rose to 7.6%, the highest since late 1992. For many technology companies, more layoffs could be on the way as companies alter strategies and reorganize structures. For this industry, GSA is aware of at least 50,000 layoffs to date.

Type	Company	Number	Percentage of Company	Type	Company	Number	Percentage of Company
Equip	Agilent	800		IDM	Medtronic	350	
Fabless	Ambric	60	Nearly 100%	IDM	Micrel	50	6%
IDM	AMD	3000	20%	IDM	Micron	2,000	
OSAT	Amkor	1,500		IP	MIPS	512	15%
Fabless	AnalogicTech	19	12%	IDM	National Semi	330	5%
Equip	Applied Materials	1,800		Fabless	NVIDIA	360	7%
Fabless	Broadcom	200	3%	IDM	ON Semiconductor	350	
EDA	Cadence	625	12%	Fabless	QuickLogic	27	17%
Foundry	Chartered	600	8%	IP	Rambus	90	21%
OEM	Cisco	3,000	4%	IDM	Renesas	2,500	
Fabless	Conexant	140	11%	Fabless	Saifun	80	42%
IDM	Cypress Semi	50		Fabless	SanDisk	90	12%
IDM	Diodes	500	24%	IDM	Spansion	3,000	35%
IDM	Fairchild	1,170	12%	OSAT	STATS ChipPac	1600	12%
IDM	Freescale	2,300	10% (Globally)	IDM	STMicroelectronics	325	
IDM	IBM	2,850	1%	IP	Sun Microsystems	6,000	
IDM	Infineon	3,000	10%	IDM	TI	3,400	12%
IDM	Intel	5,500	N/A	Foundry	Tower/Jazz*	400	
IDM	Intersil	128	9%	Fabless	Trident Microsystems	100	15%
Fabless	Lattice Semi	125	14%	Equip	Verigy	N/A	N/A
Fabless	Legend Silicon	150	50%	Fabless	Xilinx	250	7%
EDA	Magma	127	17%	IDM	Zarlink	50	6-8%

* = Includes layoffs/job cuts before and after merger

Source: Corporate announcements

Figure 14. Approximately 50,000 Semiconductor Layoff Announcements Since Mid-2008²⁰

FUNDING

As the global financial crisis continues, a slowdown of venture capital investment in the semiconductor industry is apparent. Total venture-capital investment in Silicon Valley dropped 8% last year, to \$8.3 billion, according to Joint Venture: Silicon Valley Network.²¹ In 2009, start-ups will likely see lesser amounts (\$250,000-\$500,000) each round.

In 2008, semiconductor companies and suppliers raised \$1.95 billion. Companies received the least amount of funding in Q3'08, when only \$385 million was raised, and the average amount was \$11.5 million. However, Q4'08 funding bounced back with \$515M in funding, or 54% higher QoQ, with an average of \$21.5 million per deal. This was all due to five key rounds raised by Icera (\$70 million),

¹⁹ Tim Paradis, [Wall Street shrugs off January job losses of 598K](#), AP Business Writer, (February 2009)

²⁰ As of 2/24/09

²¹ Swartz, [New tech start-ups](#)

Achronix Semiconductor (\$52 million), SolarFlare Communications (\$44 million), Alien Technology (\$38 million), and Advanced Micro-Fab Equipment (\$58 million) (Figure 15). In Q3, NeoPhotonics received \$30M; Only two other companies received more than \$20M.

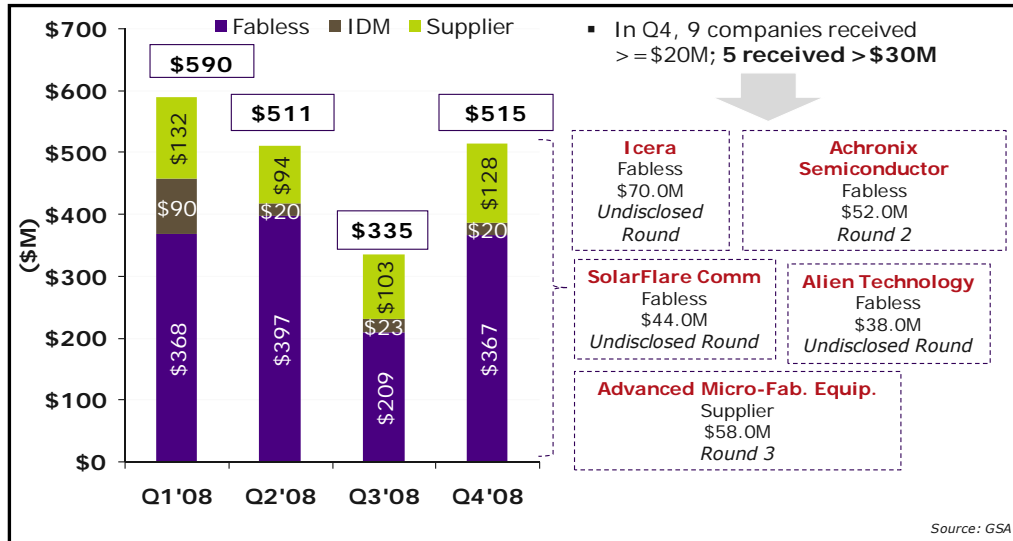


Figure 15. Several large rounds in Q4'08 boosted funding 54% higher than Q3'08

During the first month of 2009, nine semiconductor companies (i.e., fabless companies, integrated device manufacturers (IDMs) and semiconductor suppliers) raised \$110.5 million, a 29% dollar amount decrease from December 2008 and a 6% decrease from January 2008. The number of deals slightly increased by one deal month-over-month (MoM) and decreased 44% year-over-year (YoY).

While fabless/IDM investment continues to account for a larger percentage of the total funding amount, its share decreased MoM and YoY. In January 2009, six fabless/IDM companies raised \$67.8 million, a dollar amount decrease of 51% MoM and 11% YoY. The total number of fabless/IDM transactions closed in January increased by one deal MoM and decreased 25% YoY.

While semiconductor supplier investment has remained flat MoM with regards to the number of deals funded, the value of these deals increased 131%. Year-over-year, the number and value of semiconductor supplier deals decreased 63% and increased 2%, respectively.

Company	Company Type	Amount (\$M)	Round
Icera	Fabless	\$70	Undisclosed
Achronix	Fabless	\$52	2
SolarFlare Communications	Fabless	\$44	Undisclosed
Alien Technology	Fabless	\$38	Undisclosed
N-Trig	Fabless	\$24	Undisclosed
Silicon Blue Technologies	Fabless	\$24	2
Paratek Microwave	IDM	\$20	5
Staccato Communications	Fabless	\$20	Undisclosed

Figure 16. Semiconductor Funding Deals \$20M or Greater (Q4'08-Jan-09)

In January 2009, no semiconductor companies disclosed receiving early-stage funding (i.e., seed or first-round funding). The last semiconductor company that received early-stage funding was fabless company Movidia in October 2008. Movidia provides video editing and post-production capabilities for the creation of user-generated content for mobile social networking.

CONSOLIDATION

Out of Business

Since October 2008, 74 semiconductor companies have either been acquired, or they have simply shut their doors²². Much of this has been caused by the lack of funding required to keep the business in operation.

M&A Activity

In January 2009, the number of semiconductor M&As decreased 75% MoM and 73% YoY. The value of semiconductor M&As decreased significantly at a rate of 93% MoM and 47% YoY. Of the three M&A transactions in January 2009, two fabless/IDM M&As totaled \$35.4 million, while the value of one semiconductor supplier M&A deal was not disclosed, which may affect results.

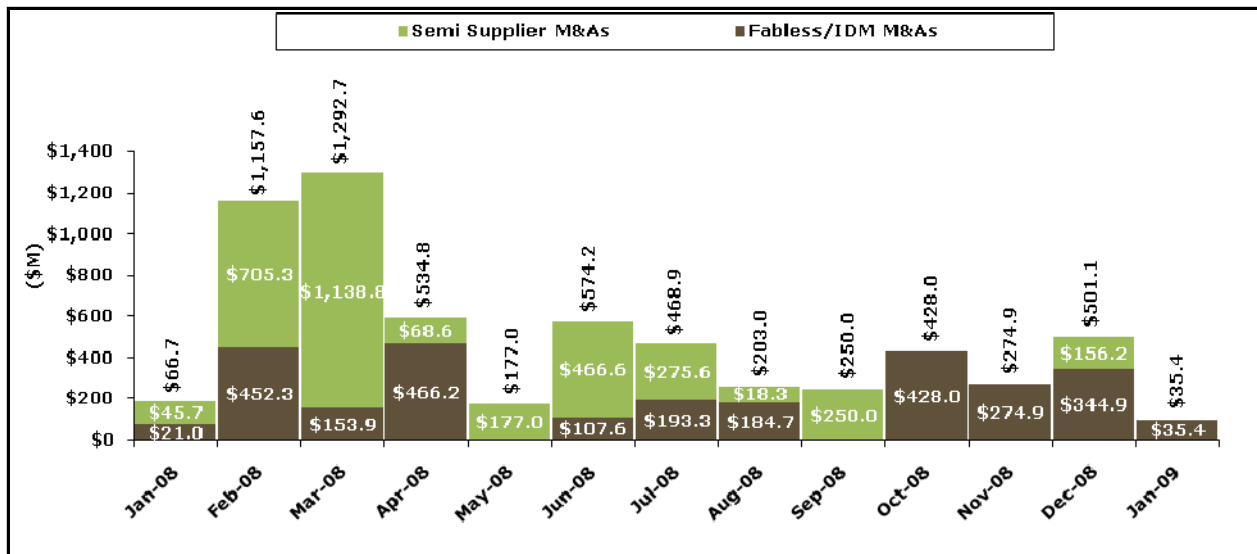


Figure 17. M&A Activity by Month

INDUSTRY SENTIMENT

The major stock index averages declined sharply on February 19, in reaction to negative economic reports and guidance provided by technology giant Hewlett-Packard, demonstrating underlying fears of traders, resulting in the Dow settling below its November lows²³. The negative sentiment carried into February 20, with the major averages declining again. The Dow settled at a 6½ year low and the S&P 500 Index closed close to a 12-year low.²⁴ News like this seems to be happening almost weekly, so how is this affecting the overall industry sentiment?

²² As of 2/24/09

²³ RTTNews Daily Market Analysis, [Positive Sentiment on Financial Stocks May Help Broader Market](#) (February 23, 2009)

²⁴ RTTNews Daily Market Analysis, [Positive Sentiment on Financial Stocks May Help Broader Market](#) (February 23, 2009)



According to the February 2009 Bank of America Merrill Lynch Technology Sentiment Index²⁵, sentiment rallied sharply across global regions to a net 11% overweight reading. The latest U.S. investor sentiment rapidly moved to a positive reading after finally dipping below zero in January. Their research also noted that the current, relatively positive level may be a negative indicator for subsequent absolute tech stock performance.

GSA is also providing a sentiment index specifically designed for industry CEOs. J.P. Morgan and GSA are jointly publishing the monthly J.P. Morgan/GSA Semiconductor CEO Sentiment Index to report in aggregate how global semiconductor and supplier CEOs view the health of the overall industry. Each month, participating CEOs are asked to confidentially provide his/her opinion as to whether 10 separate indicators are trending up, trending down or staying the same. The results are aggregated, made anonymous, and used to create a diffusion index. The diffusion index oscillates around 50, such that a reading above/below 50 reflects expansion/contraction in the industry. Results and details from the survey are only available to participating CEOs²⁶. We highly encourage all industry CEOs to participate every month, as this Index is a great resource for companies to understand what their peers are seeing in terms of contraction and expansion and possibly when the market might turn around. We monitor this Index, but you must participate to get the details of the results. Visit www.gsaglobal.org/scsi/form.asp to be added to the distribution list.

CONCLUSION

Our members are asking the GSA how we are holding up during these challenging times, and there is no doubt that the organization will be impacted by the state of the industry we represent. The GSA has always depended on membership dues to operate, rather than expos and big conferences or charging for products and tools that we distribute as membership benefits. And because of that, we need our members to show support during this time. We have always maintained a dues structure that would not be exceptionally difficult for companies to justify. Plus, we have only adjusted dues in the past and have never raised dues across the board. We feel that the industry needs us and has demonstrated its support and loyalty to GSA. The organization is unique and has been remarkably productive and efficient over the years.

The GSA will not only survive this downturn, but it will thrive and help find ways to serve our members more efficiently. Offerings such as the CEO Sentiment Index, the FABLS Stock Index, and the Current Downturn Monitor, just to name a few, will help us ultimately help our members as we ride this wave to better times.

²⁵ Bank of America Merrill Lynch February 2009 Technology Sentiment (February 18, 2009)

²⁶ If your company's CEO is interested in monitoring the sentiment of global CEOs—suppliers, peers and competitors—ask them to participate in the J.P. Morgan/GSA Semiconductor CEO Sentiment Index survey. Contact Lisa Tafoya at ltafoya@gsaglobal.org or visit www.gsaglobal.org/scsi/form.asp.