

**Global Semiconductor End-Use Forecast—
Is Anyone Buying?**

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Executive Summary

The current downturn is a result of factors external to the semiconductor industry and its markets. Accordingly, In-Stat expects that the effects will be felt broadly across all market segments. This is unlike the 2001 downturn that was demand driven and more strongly felt in some segments than in others.

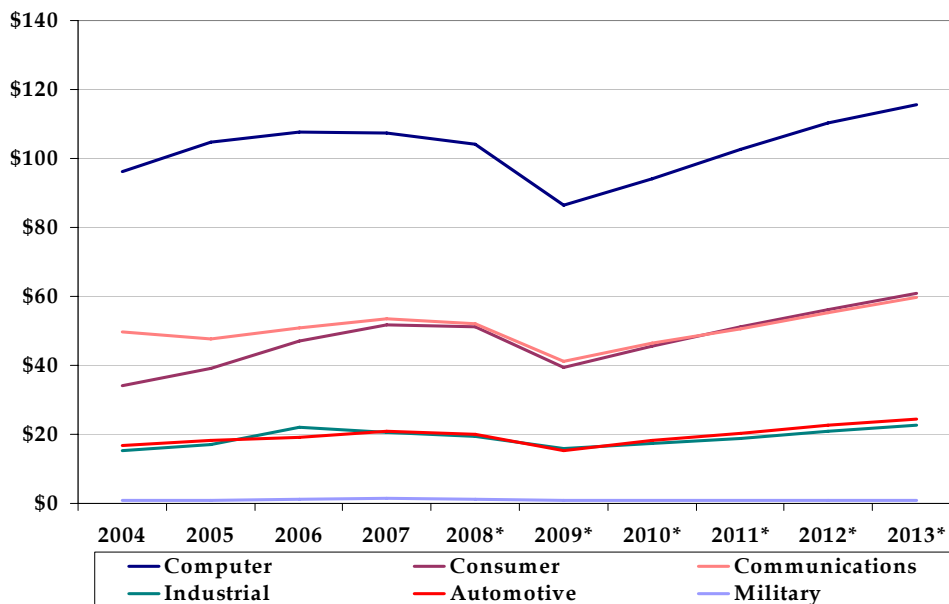
Overall, semiconductor revenue is expected to drop by 19.6% in 2009, followed by 11.8% growth in 2010, 9.7% in 2011, 8.8% in 2012, and 6.8% in 2013.

The computer segment, whose share has been trending downward since 2000, is forecasted to remain the largest segment by a wide margin. It is expected to slightly out perform the overall semiconductor market in 2009, but, by 2013, its share of overall semiconductor revenue is expected to be 40.7%, well below the 50% + levels of the 1990s.

HIGHLIGHTS

- All major end-use market segments will suffer during the current downturn.
- Long term, the computer segment will lose share while the consumer and automotive segments gain share.
- The computer segment will remain the largest well beyond the forecast period.

Figure 1. Worldwide Semiconductor Revenue by End-Use Category, 2004–2013 (US\$ in Billions)



Source: In-Stat, 1/09

The communications segment has become dominated by its wireless sub-segment, which, in turn, is largely dominated by the mobile telephony market. Although mobile telephone service is unlikely to be a major victim of the downturn, consumers are expected to delay handset upgrades, causing the

communications segment to slightly under perform the overall semiconductor market in 2009. The segment is, however, expected to exceed its 2007 share of the market by the end of the forecast period.

The consumer segment has been driven by a succession of very different products, ranging from digital still cameras to DVD players to MP3 players. It is expected to lag the overall semiconductor market in 2009 as consumers react to the downturn, but it is also expected to recover relatively quickly as consumers opt to spend a few hundred dollars for an entertainment device while still deferring larger priced purchases. After 2010, the consumer segment is expected to resume hitting new highs in semiconductor market share annually.

The industrial segment will suffer from cutbacks in capital equipment spending, but the large and growing medical sub-segment will balance this and keep this segment tracking closely to the overall semiconductor market.

The automotive segment is expected to suffer more than most in 2009 because cars are a high-priced item and are very dependant on credit availability in the US and some other key markets. However, the real unit growth in the years to come will be at the low end of the market, in places like China and India, which are expected to maintain growing economies during the downturn. Accordingly, we expect semiconductor sales to the automotive segment to decline sharply in 2009, but to recover more quickly than most other segments.

The Military segment has become too small for its data to be useful and is included only for completeness.

Figure 1 and Table 1 present the trending and forecast for worldwide semiconductor revenue by major end-use market segment.

Table 1. Worldwide Semiconductor Revenue, by End-Use Category, 2004–2013 (US\$ in Billions)

	2004	2005	2006	2007	2008*	2009*	2010*	2011*	2012*	2013*
Computer	\$ 96.3	\$ 104.7	\$ 107.6	\$ 107.4	\$ 104.2	\$ 86.4	\$ 94.1	\$ 102.7	\$ 110.1	\$ 115.7
% of Total	45.2%	46.0%	43.5%	42.0%	42.1%	43.4%	42.3%	42.0%	41.4%	40.7%
% Change	24.2%	8.8%	2.8%	-0.2%	-3.0%	-17.0%	8.9%	9.1%	7.3%	5.0%
Consumer	\$ 34.0	\$ 39.1	\$ 47.0	\$ 51.8	\$ 51.2	\$ 39.4	\$ 45.7	\$ 51.1	\$ 56.2	\$ 60.9
% of Total	16.0%	17.2%	19.0%	20.2%	20.7%	19.8%	20.5%	20.9%	21.1%	21.4%
% Change	34.8%	14.9%	20.1%	10.2%	-1.1%	-23.0%	16.0%	11.8%	10.1%	8.3%
Communications	\$ 49.7	\$ 47.6	\$ 50.8	\$ 53.4	\$ 51.9	\$ 41.2	\$ 46.5	\$ 50.6	\$ 55.4	\$ 59.8
% of Total	23.4%	20.9%	20.5%	20.9%	21.0%	20.7%	20.9%	20.7%	20.8%	21.0%
% Change	34.0%	-4.2%	6.6%	5.2%	-2.8%	-20.6%	12.7%	9.0%	9.5%	7.9%
Industrial	\$ 15.4	\$ 17.0	\$ 22.0	\$ 20.5	\$ 19.3	\$ 16.0	\$ 17.4	\$ 18.9	\$ 20.7	\$ 22.5
% of Total	7.2%	7.5%	8.9%	8.0%	7.8%	8.0%	7.8%	7.7%	7.8%	7.9%
% Change	32.5%	10.1%	29.7%	-7.0%	-5.5%	-17.4%	9.0%	8.4%	9.8%	8.5%
Automotive	\$ 16.8	\$ 18.2	\$ 19.1	\$ 20.9	\$ 19.9	\$ 15.4	\$ 18.2	\$ 20.3	\$ 22.5	\$ 24.3
% of Total	7.9%	8.0%	7.7%	8.2%	8.0%	7.7%	8.2%	8.3%	8.5%	8.6%
% Change	23.1%	7.9%	5.1%	9.5%	-5.0%	-22.7%	18.8%	11.5%	10.6%	8.1%
Military	\$ 0.7	\$ 0.9	\$ 1.2	\$ 1.6	\$ 1.2	\$ 0.8	\$ 0.8	\$ 0.8	\$ 0.9	\$ 0.9
% of Total	0.3%	0.4%	0.5%	0.6%	0.5%	0.4%	0.4%	0.3%	0.3%	0.3%
% Change	-39.9%	20.7%	29.6%	40.0%	-28.2%	-31.4%	-1.0%	3.4%	5.1%	4.9%
Total	\$ 213.0	\$ 227.5	\$ 247.7	\$ 255.6	\$ 247.7	\$ 199.2	\$ 222.7	\$ 244.4	\$ 265.9	\$ 284.1
% Change	28.0%	6.8%	8.9%	3.2%	-3.1%	-19.6%	11.8%	9.7%	8.8%	6.8%

Source: In-Stat 01/09

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Introduction

Economic conditions, worldwide, have deteriorated considerably since last year's *Global Semiconductor End-Use Forecast—Market Diversity, It's a Good Thing* (report #IN0804278SSF) and nearly all semiconductor end-use markets are contracting. Although we correctly anticipated that 2008 semiconductor revenue growth would be significantly lower than 2007's growth, we also anticipated a short correction with a rebound in 2009, which clearly will not happen.

Consumer and business confidence levels and spending have declined, worldwide as liquidity has dried up, affecting major markets such as PCs, mobile handsets, automobiles, and many consumer products, as well as many smaller niche markets. Even medical equipment is looking at a slow down as many hospitals tighten their belts.

This report will look at the semiconductor forecast from an end-use perspective. It builds upon the analysis of the overall economic climate, semiconductor industry supply and demand, and outlook for specific semiconductor product types that is presented in the companion report, *Global Semiconductor Product Market Forecast—Help Wanted: Spenders and Lenders* (#IN0904559SSF).

Following an introductory prologue that will describe recent trends and current status in the end-use market segments, the top-level forecast from the Semiconductor Product Forecast report will be presented, followed by a more detailed analysis of each of the major end-use market segments—computer, communications, consumer, industrial, automotive, and military, broken out by region and by major product type. This is followed by a series of regional and product type forecasts broken out by end use.

All historic and forecast data in this report are consistent with, and tie out to, the corresponding data in the Product Forecast report.

Prologue

The semiconductor industry's growth has been driven by a succession of primary markets. Initially, the military market was the key driver, providing both development funding and markets for specific products. It was quickly replaced by the mainframe computer market, which, in turn, was followed by the minicomputer market and then by personal computers. A turning point came in 1994, when Mosaic released version 2.0 of its web browser, which quickly made the web the primary driver. This further increased demand for PCs and also generated demand for servers, routers, and other network-related hardware. At about the same time, the communications segment was also increasing its demand for semiconductors for mobile telephony. By the late 1990s, mobile handsets were shipping in the 100s of millions of units annually. The combination of mobile telephone and web networking demand pushed the communications segment share of the total market to a peak of 24.5% in 2000.

The most recent major semiconductor industry downturn, that took place in 2001, was primarily a result of overcapacity in web-related end markets, and by the time stability had been restored, some major shifts in end-use market shares had taken place. Communications, which had been the fastest growing segment in the run-up to 2001, lost share and saw its growth rate slow considerably, as many customers in the wired portion of that segment found they had sufficient installed capacity for years to come. The computer segment, which also took a hit in 2001 reflecting excess server and client capacity, recovered somewhat, but began to experience the start of a long, slow share decline as PC ASPs fell. Wireless communications and consumer products became the key demand drivers. Automotive gained a few percentage points of share due to increased electronic content, while industrial held a more or less constant share.

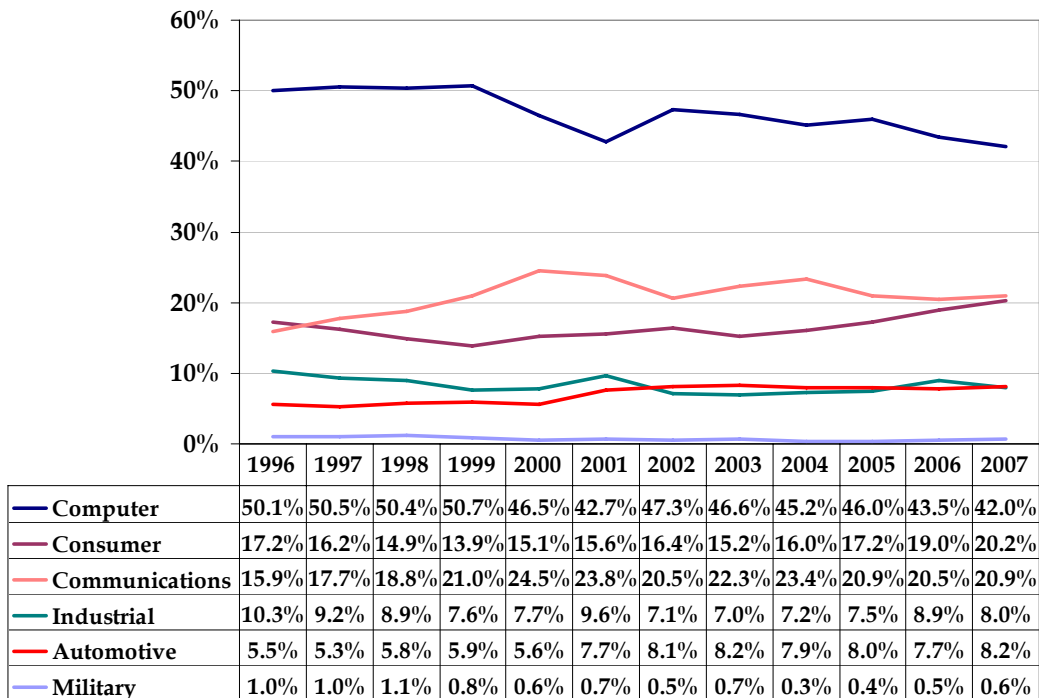
The good news was that since the recovery from the 2001 downturn, growth was somewhat evenly balanced over the end-use segments, with only the consumer segment showing strong and consistently above average growth. The consumer segment growth was not, however, the result of any one end product, but rather was the result of a sequence of products, including digital cameras, DVD players, MP3 players, and digital televisions. No single market could cause another problem like the 2001 downturn.

But there was another, less visible, change that is also important. When the end-use market segments were originally defined, only the consumer and automotive segments relied on consumer spending to any great extent. The computer and communications segments were dominated by business spending. No consumers bought mainframe computers or telephone switching equipment.

Estimates vary, but as a rough approximation, in the current overall economy, consumption is divided between consumers, businesses, and governments in a 60:20:20 proportion. Consistent with this, over half of the personal computers and mobile handsets sold today are sold to consumers rather than to businesses. So, regardless of the spread of semiconductor revenue over the traditional market segments, consumer spending is key to the health of the semiconductor industry.

Figure 2, below, shows how the total semiconductor revenue was divided between the major end-use segments from 1996 through 2007. As we look at the future, the impact of the consumer on each of these segments will be of the utmost importance.

**Figure 2. Worldwide Semiconductor Sales by End-Use Market, 1996–2007
(% of Total Revenue)**



Source: In-Stat, 1/09

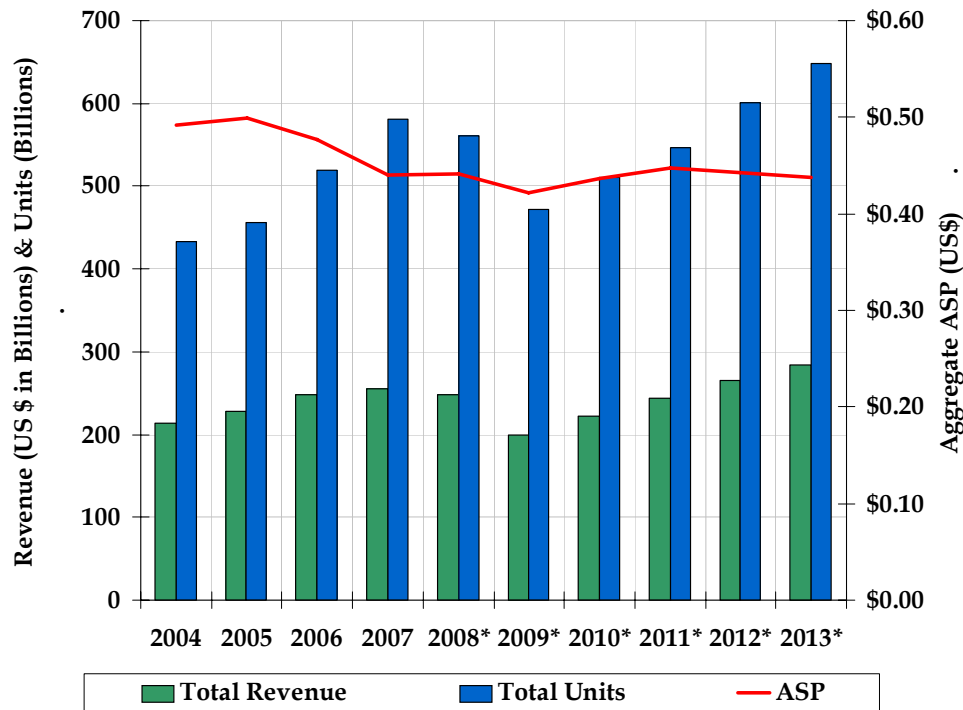
This report is intended to be used in conjunction with the *Global Semiconductor Product Market Forecast—Help Wanted: Spenders and Lenders*, Report #IN0904559SSF, which is being published concurrently and includes a more detailed discussion of the economic environment, the semiconductor industry capacity situation, investment outlook, and forecast breakouts, by product type and region. After a restatement of the top level forecast taken from that report, this report will be limited in scope to breakouts by end-use.

The Worldwide Semiconductor Forecast

This section is taken from the Executive Summary of the *Global Semiconductor Product Market Forecast—Help Wanted: Spenders and Lenders*, report #IN0904559SSF, which is being published concurrently with this report.

Our outlook for the semiconductor industry is predicated on the fundamental precept that the consumers of the PCs, mobile handsets, and other products that drive semiconductor demand cannot spend money that they do not have or can not borrow. The global erosion of asset prices, reduction in credit availability, and declining personal and business income will be reflected in reduced semiconductor revenue. Further, declining confidence levels, resulting from recent shocks and increased uncertainty about the future, will lead to more conservative spending practices even after liquidity improves and the recovery is well underway.

Figure 3. Worldwide Semiconductor Revenue, 2004–2013 (US\$ in Billions), Unit Shipments (in Billions), and ASP (US\$)



Source: In-Stat, 1/09

Our current forecast is for a 19.6% decline in semiconductor revenue, to \$199.2 billion, in 2009, as the downturn that began in the final quarter of 2008 continues well into 2009. Although recovery is expected to start in the second half of 2009, growth in 2010 is forecasted to be modest, at 11.8%, followed by 9.7% in 2011 and 8.8% in 2012. Annual revenue is not expected to surpass its 2007 level until 2012.

This forecast assumes that governments and central banks around the world continue the aggressive fiscal and monetary actions that they began to take in 2008 and that these actions are largely successful in reversing the downward spiral. The errors that were made in the 1930s are unlikely to be repeated, but there is always the possibility of new, previously unknown errors being made. Consumer and business confidence are key to recovery and subsequent growth, and confidence is even less of a science than economics.

In its most recent cycle, semiconductor fab capacity utilization had peaked at 90%, early in 2008, and had dropped to 87% in the third quarter. These are not high utilizations by historic standards and capital expenditures (capex) would have been modest in 2009. With utilization now dropping rapidly, (and capital funds limited) capex will certainly drop substantially as well, resulting in excess capacity and declining ASPs in 2009. However, the 2008 ASPs were dragged down by excess DRAM capacity. With DRAM spot pricing at the end of 2008 below variable production cost for some suppliers, we expect a DRAM industry shakeout of some type in 2009, with the net result of less active DRAM capacity and less downward pressure on DRAM pricing. This will somewhat temper the overall ASP decline in 2009. The lack of capex will enable some ASP growth in 2010 and 2011, but, by 2012, we expect that ASPs will have stabilized at levels below those of the early 2000s and that annual changes will become smaller.

Figure 3 and Table 2 show the annual detail for revenue, unit shipments, and ASP through 2013.

Table 2. Worldwide Semiconductor Revenue, 2004–2013 (US\$ in Billions), Unit Shipments (in Billions), and ASP (US\$)

Semiconductor	2004	2005	2006	2007	2008*	2009*	2010*	2011*	2012*	2013*
Total Revenue	\$ 213.0	\$ 227.5	\$ 247.7	\$ 255.6	\$ 247.7	\$ 199.2	\$ 222.7	\$ 244.4	\$ 265.9	\$ 284.1
% Change	28.0%	6.8%	8.9%	3.2%	-3.1%	-19.6%	11.8%	9.7%	8.8%	6.8%
Total Units	433.5	455.5	519.2	580.2	561.5	472.4	510.2	546.6	601.6	648.7
% Change	18.2%	5.1%	14.0%	11.8%	-3.2%	-15.9%	8.0%	7.1%	10.1%	7.8%
ASP	\$ 0.491	\$ 0.499	\$ 0.477	\$ 0.441	\$ 0.441	\$ 0.422	\$ 0.436	\$ 0.447	\$ 0.442	\$ 0.438
% Change	8.3%	1.6%	-4.5%	-7.7%	0.1%	-4.4%	3.5%	2.4%	-1.1%	-0.9%

Source: In-Stat 01/09

Semiconductor End-Use Markets

Definitions

In-Stat follows the practice of the SIA (Semiconductor Industry Association) and, at the top level, divides the semiconductor market into six major end-use market segments: computer, communications, consumer, industrial, automotive, and military, which are defined as follows.

Computer

The computer end-use market segment is comprised of all semiconductor devices used in computers (super computers, servers, personal computers, etc.), computer peripheral equipment, and office equipment. The computer peripheral market includes displays (computer monitors, printers, and other terminal equipment), storage devices (magnetic tape units, disk storage apparatus, optical storage units, and central storage units), and other peripheral equipment, including keyboards, scanning devices, etc. Office equipment is composed of photocopy equipment, cash registers, point-of-sale equipment, dictation equipment, and other electronic equipment used in the business environment.

Communications

The communications semiconductor end-use market includes all semiconductor devices used in wired, wireless, and civilian radar and navigation communications applications. Wired applications are comprised of routers and switches (data, telephonic, and telegraphic apparatus, including customer premise and exchange equipment), transmission (carrier systems, line apparatus for long distance communication, relay equipment, and microwave systems), and other wired equipment (telephone sets, facsimile equipment, other terminal equipment and accessories and parts). Wireless applications are composed of mobile systems (cellular transmission and receiving equipment, mobile pagers, mobile radio, wireless networks, etc.) and other radio broadcast equipment (non-mobile transmitters, receivers, television cameras for professional use, and accessories and parts). Radar and navigation equipment is composed of radar systems and navigational equipment for ground, ship borne, and aircraft applications.

Consumer

The consumer semiconductor end-use market segment includes all semiconductor devices used in products that are typically consumed in, or identified with, the retail electronics market. Consumer electronics can be subdivided into video equipment, audio equipment, and other consumer equipment. Video equipment is comprised of color and black and white, analog and digital television receivers, set-top boxes of all types, VCRs, DVD players and recorders, video game consoles, and other interactive TV equipment. Audio equipment includes portable radios, car radios, audio tape recorders, compact disk players, MP3 players, and personal radio receivers. Other consumer equipment includes digital cameras, camcorders, clocks, watches, sports equipment, personal appliances, home appliances, games, and other consumer apparatus not specifically mentioned. Although personal computers (PCs) are increasingly being sold into the consumer end-use retail market, SIA includes PCs in the computer end-use market segment. Mobile handsets, which have also become popular consumer items, are included in the communications segment.

Automotive

The automotive semiconductor end-use market segment includes all semiconductor devices used in the manufacture of automotive vehicles or associated accessories, including performance and environmental sensors and controls for the engine and power train, safety equipment, including air bags, stability control systems, etc., and all other parts and automotive applications. All audio equipment (radios, speakers, and CD and tape players) and other communications equipment within the vehicle are included in the consumer end-use market segment.

Industrial

The Industrial semiconductor end-use market includes all semiconductor devices used in factory and laboratory, test, control and measurement equipment. The industrial semiconductor end-use market can be further divided into two major sub-segments: instrumentation and industrial electronics. The instrumentation sub-segment includes industrial instruments (industrial process control and systems), measuring instruments (analytical instruments, oscilloscopes, electrical measuring instruments, and other testing and measurement instruments), as well as medical instruments (x-ray equipment, radiation equipment, and electro-medical equipment). The industrial electronics sub-segment includes signaling equipment for rail, traffic, security systems, laser systems, and induction and dielectric heating systems.

Military

The military semiconductor end-use market segment includes all semiconductor products purchased by government agencies to military specifications. The military segment also includes some civil aerospace products when manufacturers purchase military specification parts.

Interpreting End-Use Definitions

The traditional SIA market segmentation provides a broad and useful means of tracking the semiconductor industry; however, it is important to note that these definitions are gradually becoming less coherent due to the integration of several product functions onto a single device.

One prime example of this transformation is the video game market, which remains a consumer end-use product, although it is comprised of components such as CPUs, DRAM, hard disks, DVD players, and television monitors. Game consoles could conceivably be considered part of the computer end-use market based on their components and their function of receiving a user input to affect a desired output. As online gaming gains popularity, they could also be viewed as communications devices.

Another difficulty with the SIA segmentation is the manner in which the end products are being used. Personal computers, which once were predominantly used in business applications, have become predominantly consumer products used more for entertainment (audio, video, and gaming) and communication (Internet, and email, etc.) applications. Mobile phones have also become more of a consumer product than a business product. Many take photos, some play music, and style has become as much a selling point as function and performance. To further complicate matters, the military markets are increasingly using standard computer and communications equipment, thus further skewing the traditional lines of segmentation. To the extent that industrial computers use industry

standard components, such as processors, chipsets, and memory, some industrial applications may be classified as computers.

These types of reporting problems present a potential flaw in the data and the SIA readily admits that some participants may sometimes report their data improperly. A good example is the civil aerospace industry, where the same corporation (e.g. Boeing) may purchase semiconductors for both military and industrial end-use equipment, which can easily lead to incorrect reporting. Another example would be companies, such as IBM, that make both computer and communications gear. Some suppliers may not know exactly which end products their parts are being used in and default to categorizing all of IBM's purchases as going to the computer segment.

Occasionally, the historic data shows a one-year discontinuity that is reversed in the following year. We believe that these discontinuities are due to reporting errors and have made no attempt to either explain them away or incorporate them in our analysis.

Although these, and other, flaws with the traditional SIA classification will continue to become apparent as semiconductor function and consumption patterns increasingly overlap, the SIA's six end-use segments, with their historic database, still provide the most effective data set and working model of classification available.

End-Use Forecast

Overview

As discussed earlier in this report, the semiconductor industry has been experiencing relatively balanced growth since its recovery from the 2001 downturn. However, the current downturn is a result of factors external to the semiconductor industry and to its markets. The industry is not hurting because of reduced demand for semiconductor using end products; it is hurting because that demand can not be satisfied because the customers, who still want the products, are unable to buy them.

As the downturn spreads throughout the economy, some business demand has certainly gone away (or at least been deferred), but the consumer demand that drives the bulk of industry sales hasn't gone away, it has been thwarted by the lack of liquidity and associated drop in consumer confidence.

There will certainly be some prioritization, as buyers allocate their limited spending to more highly valued items. But, in general, all segments of the semiconductor markets will take the hit. This is in stark contrast to the 2001 downturn, which had roots in specific markets and that saw segment-specific declines in revenue. When the downturn ends, we anticipate that there will be no substantial shifts from 2007's distribution of semiconductor revenue over the major market segments.

Going forward, we expect the major end-use market segment to behave as follows over the course of the forecast period:

Computer: The computer segment will remain the largest segment during, and well beyond, the forecast period. Although it may fare slightly better than the overall semiconductor market in 2009 because PCs have become necessities rather than luxuries in so much of today's society, we expect that it will grow more slowly than the overall semiconductor industry during the recovery, as its share of the market continues its slow decline. The major constituents of this market are DRAM and microprocessors. NAND flash memory is growing in the storage sub-segment and has excellent long-term potential as a hard disk drive (HDD) replacement in mobile PCs. Lower cost products, like "netbooks" will satisfy an increasing portion of the traditional PC market, eroding semiconductor content per PC.

Communications: The communications segment has become nearly synonymous with the mobile handset business. In-Stat estimates that 80% of communications revenue is associated with wireless products, which are primarily mobile telephony related, but which also include wireless networking. Unlike the wired communications products that dominated the communications segment in the 1990s, wireless products tend to be consumer products with relatively low price points. In the US and other markets, operator subsidies can make handsets "free." Although high-end data phones may see slower growth (Blackberries have been mainstays of the troubled financial services industries) and mobile handset penetration of emerging economies may slow, the communications segment is expected to grow slightly faster than the overall semiconductor industry during the recovery period.

Consumer: Growth in the consumer segment has slightly exceeded overall semiconductor growth in recent years as a rapid succession of popular semiconductor-based products have captured consumer

imagination. It could be argued that much of the functionality of many consumer electronics products, such as digital still cameras and MP3 players, will eventually be integrated into mobile handsets, enabling users to carry only one electronic gizmo. This may indeed happen over the longer term, however, over the forecast period, we expect consumer electronics items to, for the most part, remain standalone products. And, just as people were willing to spend a few dollars on movies and other entertainment during the recovery from the Great Depression in the 1930s, we expect that low-priced consumer electronics gadgets will be in favor during the next recovery, allowing the consumer electronic segment to slightly out perform the overall semiconductor industry once the recovery kicks in late in 2009 or in 2010.

Industrial: The industrial segment is expected to roughly track the overall growth of the semiconductor market as new developments in the medical equipment industry and increased demand for medical care in aging developed economies balance declines in traditional industrial markets, where standard computer and communications hardware are increasingly taking the place of custom industrial-specific hardware.

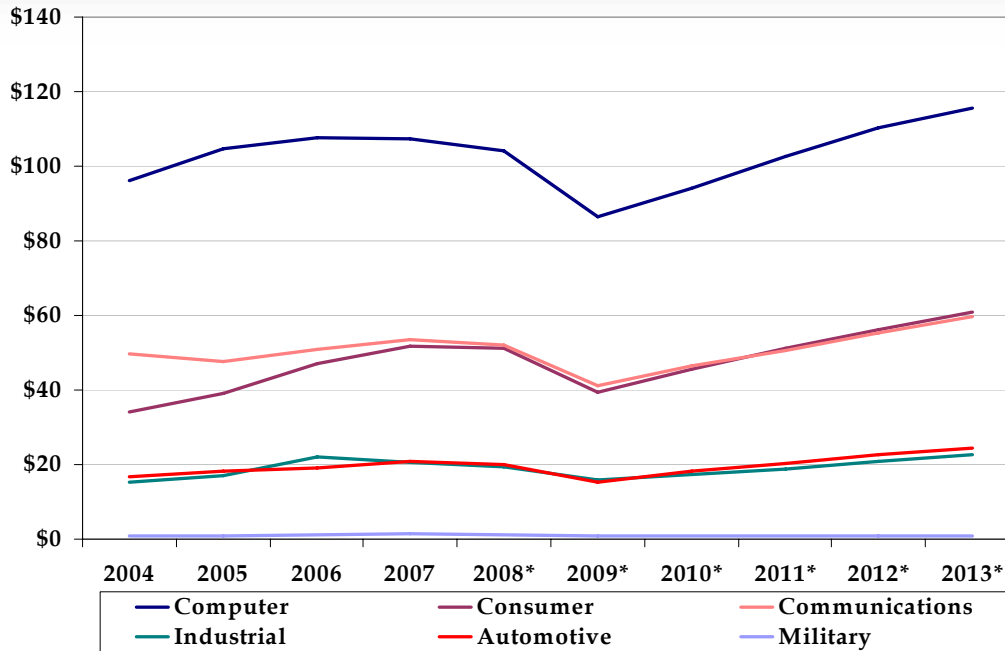
Automotive: Although the automotive industry has been increasing its consumption of semiconductors for safety, performance, and comfort related features, the industry is famous for the extreme price pressure it applies to its suppliers. In addition, the upside potential for unit growth in automobile sales is in developing countries, where the need is for basic transportation and not for GPS or back seat entertainment. There has been a lot of press about the impending explosive growth in the Chinese and Indian automobile markets, but these vehicles will be predominantly low-end, without many of the “frills” (such as air bags), that have long been standard equipment in the advanced economies. For example, the Nano “people’s car” recently announced by India’s Tata Motors, has a \$2,500 selling price, which leaves little opportunity for semiconductor usage. The much publicized troubles of the US automobile makers should not be taken as an indicator of worldwide disaster. The US market is more dependant on credit than most other markets and the US domestic industry suffers from many long standing, self inflicted problems. Because cars are a high price ticket item, the automotive segment will decline more than the overall semiconductor market in 2009, but long-term, demand for cars in emerging economies will keep the automotive segment growing at slightly above average rates.

Military: We are projecting a continued decline in share for the military market, although it has become so small that the accuracy of its reported data is questionable and the trending of that data seems to reflect reporting variations more than market variations. Like the industrial segment, the military has been increasing its usage of standard products that are reported under the other segments. It may briefly hold its share during the downturn as government spending continues apace, but this segment is so small (0.6% of the total semiconductor market in 2007) that any changes are at the noise level. We include this segment only for completeness.

Figure 4 shows the revenue history and forecast for each segment, while Figure 5 presents the same data as a percentage of total semiconductor revenue to better show the shifts between segments. Table 3 contains the actual revenue and share figures, as well as annual change data.

Each segment is discussed in more detail in the following sections.

**Figure 4. Worldwide Semiconductor Sales, by End-Use Market, 2004–2013
(US\$ in Billions)**



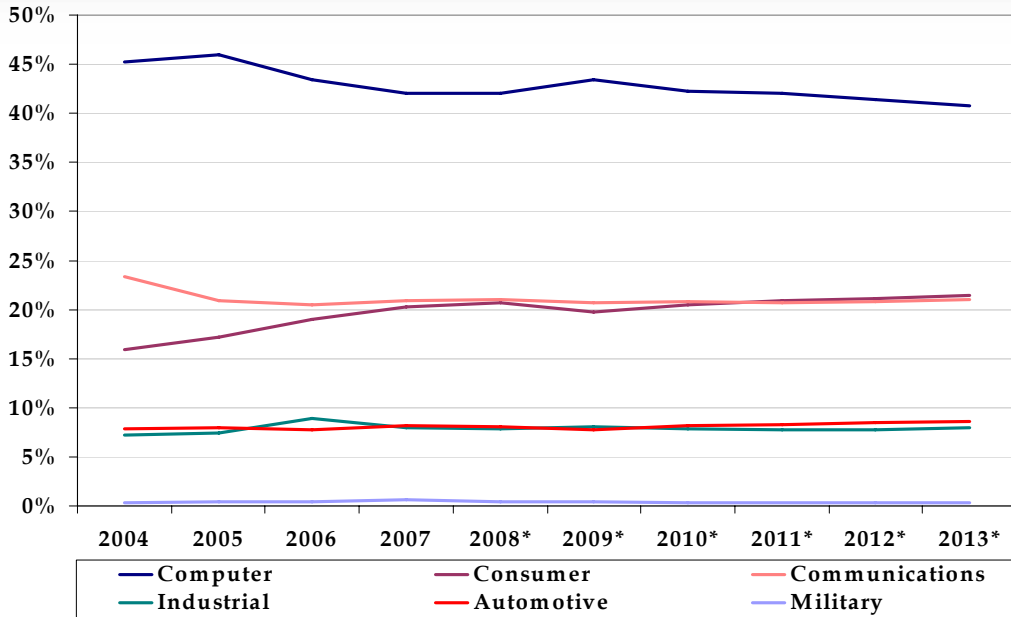
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% Change	24.2%	8.8%	2.8%	-0.2%	-3.0%	-17.0%	8.9%	9.1%	7.3%	5.0%
Consumer	\$ 34.0	\$ 39.1	\$ 47.0	\$ 51.8	\$ 51.2	\$ 39.4	\$ 45.7	\$ 51.1	\$ 56.2	\$ 60.9
% of Total	16.0%	17.2%	19.0%	20.2%	20.7%	19.8%	20.5%	20.9%	21.1%	21.4%
% Change	34.8%	14.9%	20.1%	10.2%	-1.1%	-23.0%	16.0%	11.8%	10.1%	8.3%
Communications	\$ 49.7	\$ 47.6	\$ 50.8	\$ 53.4	\$ 51.9	\$ 41.2	\$ 46.5	\$ 50.6	\$ 55.4	\$ 59.8
% of Total	23.4%	20.9%	20.5%	20.9%	21.0%	20.7%	20.9%	20.7%	20.8%	21.0%
% Change	34.0%	-4.2%	6.6%	5.2%	-2.8%	-20.6%	12.7%	9.0%	9.5%	7.9%
Industrial	\$ 15.4	\$ 17.0	\$ 22.0	\$ 20.5	\$ 19.3	\$ 16.0	\$ 17.4	\$ 18.9	\$ 20.7	\$ 22.5
% of Total	7.2%	7.5%	8.9%	8.0%	7.8%	8.0%	7.8%	7.7%	7.8%	7.9%
% Change	32.5%	10.1%	29.7%	-7.0%	-5.5%	-17.4%	9.0%	8.4%	9.8%	8.5%
Automotive	\$ 16.8	\$ 18.2	\$ 19.1	\$ 20.9	\$ 19.9	\$ 15.4	\$ 18.2	\$ 20.3	\$ 22.5	\$ 24.3
% of Total	7.9%	8.0%	7.7%	8.2%	8.0%	7.7%	8.2%	8.3%	8.5%	8.6%
% Change	23.1%	7.9%	5.1%	9.5%	-5.0%	-22.7%	18.8%	11.5%	10.6%	8.1%
Military	\$ 0.7	\$ 0.9	\$ 1.2	\$ 1.6	\$ 1.2	\$ 0.8	\$ 0.8	\$ 0.8	\$ 0.9	\$ 0.9
% of Total	0.3%	0.4%	0.5%	0.6%	0.5%	0.4%	0.4%	0.3%	0.3%	0.3%
% Change	-39.9%	20.7%	29.6%	40.0%	-28.2%	-31.4%	-1.0%	3.4%	5.1%	4.9%
Total	\$ 213.0	\$ 227.5	\$ 247.7	\$ 255.6	\$ 247.7	\$ 199.2	\$ 222.7	\$ 244.4	\$ 265.9	\$ 284.1
% Change	28.0%	6.8%	8.9%	3.2%	-3.1%	-19.6%	11.8%	9.7%	8.8%	6.8%

Source: In-Stat 01/09

**Figure 5. Worldwide Semiconductor Sales, by End-Use Market, 2004–2013
(% of Total Revenue)**



Source: In-Stat, 1/09

Computer

The computer segment of the semiconductor market continued its slow fade by losing another one and a half percentage points of share in 2007, slightly less than the two and a half percentage share points it lost in 2006. Revenue for the segment dropped by 0.2%, while overall semiconductor revenue grew by 3.2%. Only the industrial segment did worse, with a 7.0% revenue decline, but this followed a 29.7% gain in the prior year. Granted, the computer segment was still larger than any other two segments combined (communications totaled 20.9% while consumer constituted 20.2% for a combined 41.1%), but the long-term trend has been clearly downward.

But the computer segment has looked like it was in decline before. In 1994, when release of version 2.0 of Mosaic’s browser brought the early web to the masses and initiated a tremendous market push for the PC, the computer segment constituted 45.3% of the overall semiconductor market. By 1995, there was a DRAM shortage pushing DRAM prices up and, with over 70% of memory revenue now coming from the computer segment, the overall computer segment rose above 50% of semiconductor revenue for the first time in the PC era. Computer revenue remained over half of all semiconductor revenue through 1999, until the communication segment overreached itself in the frenzy that was 2000 and, in the ensuing technology driven downturn, the computer segment dropped to a 46.5% revenue share, despite annual revenue growth of 25.6% in that year.

So, while it is true that the computer segment has lost share in six of the eight years after its 1999 peak, its 42.0% share in 2007 is only a few percentage points below its 1993 share of 45.3%. It has withstood the rise of mobile handsets, which has been the all time unit volume leader in the electronic

equipment field, and the onslaught of several “hot” consumer products, including digital still cameras and MP3 players, without falling below a 42% share of semiconductor revenue.

There are several factors that could lead to below semiconductor industry average revenue growth for the computer segment, including the rise of low-cost netbooks (more formally known as ultra mobile PCs or UMPCs), which cater to potential notebook PC customers who are only interested in email and web browsing. These products can be bought for as little as \$300 to \$400, a price that will undoubtedly decline. Related to this is the advent of lower cost microprocessors, such as Intel’s x86 Atom that is intended for mobile Internet devices, which will reduce overall microprocessor ASPs.

On the other hand, there are also some opportunities for increased semiconductor content in PCs, most notably in the area of NAND flash-based, solid state disks, which have started to replace hard disk drives in some notebook PCs. With 256GB NAND disks now available, and 512GB models expected to be on the market in 2009, they clearly have enough capacity to be a contender. Performance is more complex to assess than capacity because it depends on how the PC is being used, but under some conditions, the NAND alternative can be faster and consume less power, which adds to its enabling of faster boot-up time and crash resistance as selling points.

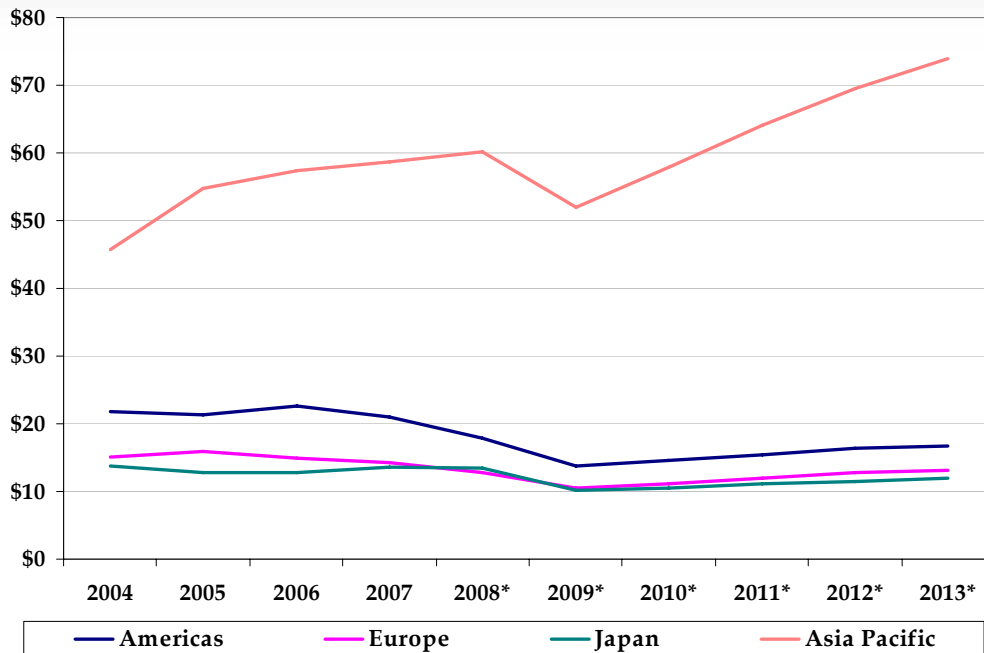
From a regional perspective, consumption of semiconductors for use in computer products continues to shift to Asia/Pacific, although the rate of increase there has slowed. The small increases in Japan’s share in 2007 seem to be an aberration and we expect all regions to see ongoing small shifts of share to Asia/Pacific. The computer segment has the highest percentage of sales in Asia/Pacific of all the segments because the personal computer product set tends to be high-volume and low-mix, which facilitates extensive use of off shore manufacturing. The ongoing shift from desktops to notebooks is also a factor because the smaller and lighter notebooks are more likely to be fully configured off-shore, whereas some desktops may have expensive processors and/or memory installed closer to the end user. Figure 6 shows sales to the computer market, by region, while Figure 7 shows the same data expressed in terms of % of total revenue. Table 4 contains the data for these two figures.

From a semiconductor product type perspective, the computer segment is dominated by MOS micros (MPUs) and memory (DRAM), with logic (which has included chipsets since 2002) a close third. In 2006, for the first time since the DRAM shortages on the mid 1990s, MOS memory sales to the computer segment exceeded MOS micro sales to the segment, as DRAM prices rose slightly and MOS micro prices declined. We estimate that the memory share of the computer segment sales dropped by 7.7 percentage points between 2006 and 2008, largely as a result of large declines in DRAM ASP. We expect that a combination of rising DRAM prices and increased use of NAND flash disks will result in 2008 being a low point for memory share, which will see annual increases until the next round of DRAM ASP reductions in 2013.

Figure 8 shows semiconductor sales to the computer segment broken out by product type, while Figure 9 shows the same data in percent of total revenue format. Table 5, following the figures, contains the data.

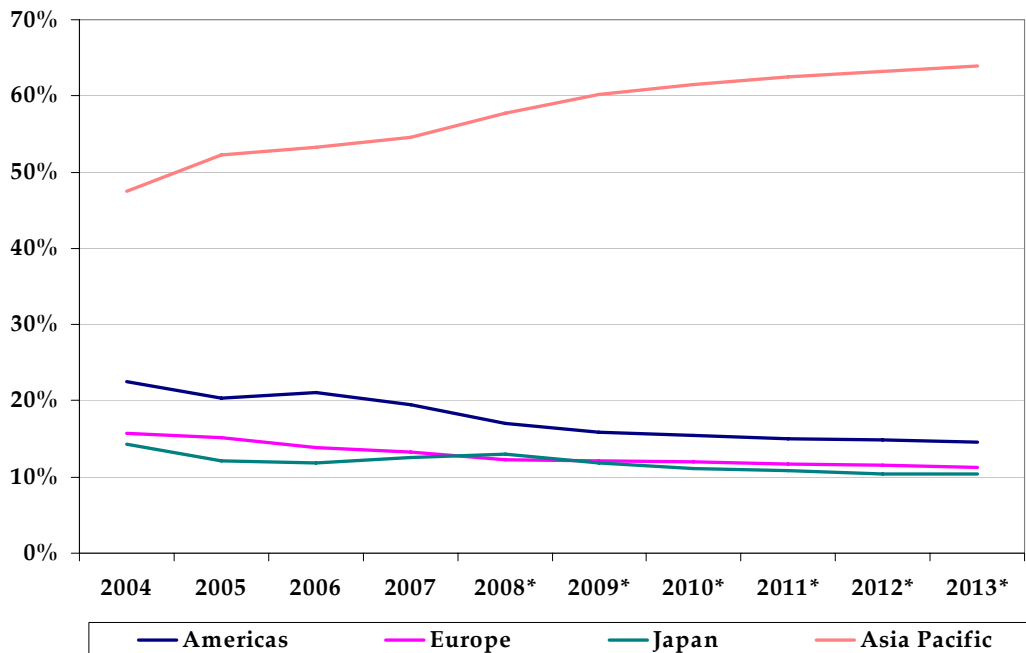
Overall, the computer segment remains more than twice the size of the next largest segment, and will continue to dominate the semiconductor market well beyond the end of the forecast period.

Figure 6. Semiconductor Sales to the Computer Market, by Region, 2004–2013 (US\$ in Billions)



Source: In-Stat, 1/09

Figure 7. Semiconductor Sales to the Computer Market, by Region, 2004–2013 (% of Total Revenue)



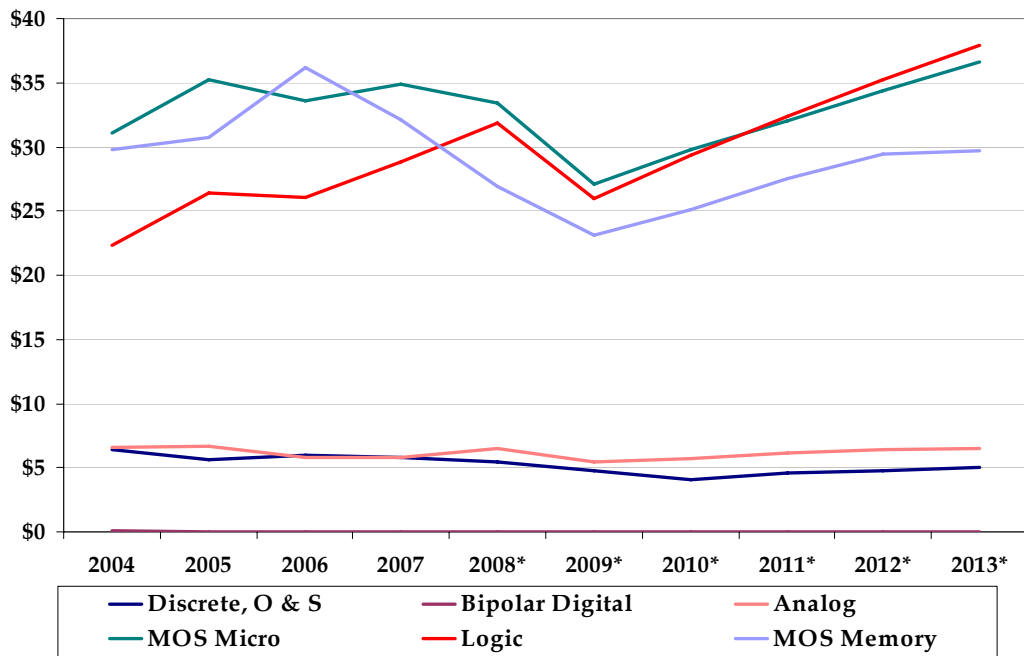
Source: In-Stat, 1/09

**Table 4. Semiconductor Sales to the Computer Market, by Region, 2004–2013
(US\$ in Billions)**

	2004	2005	2006	2007	2008*	2009*	2010*	2011*	2012*	2013*
Americas	\$ 21.7	\$ 21.3	\$ 22.7	\$ 20.9	\$ 17.8	\$ 13.7	\$ 14.5	\$ 15.4	\$ 16.3	\$ 16.8
% of Total	22.6%	20.4%	21.1%	19.5%	17.1%	15.9%	15.4%	15.0%	14.8%	14.5%
% Change	18.5%	-1.8%	6.3%	-7.8%	-14.8%	-23.0%	6.0%	6.2%	5.7%	2.8%
Europe	\$ 15.1	\$ 15.9	\$ 14.9	\$ 14.3	\$ 12.7	\$ 10.5	\$ 11.2	\$ 12.0	\$ 12.7	\$ 13.0
% of Total	15.7%	15.2%	13.8%	13.3%	12.2%	12.1%	11.9%	11.7%	11.6%	11.3%
% Change	17.9%	5.2%	-6.4%	-3.5%	-11.1%	-17.8%	7.1%	7.0%	6.1%	2.4%
Japan	\$ 13.7	\$ 12.7	\$ 12.7	\$ 13.5	\$ 13.5	\$ 10.2	\$ 10.5	\$ 11.1	\$ 11.5	\$ 12.0
% of Total	14.3%	12.2%	11.8%	12.6%	12.9%	11.8%	11.1%	10.8%	10.4%	10.3%
% Change	12.9%	-7.3%	0.0%	6.3%	-0.5%	-24.1%	2.6%	6.2%	3.2%	4.2%
Asia Pacific	\$ 45.7	\$ 54.7	\$ 57.4	\$ 58.7	\$ 60.2	\$ 52.0	\$ 57.9	\$ 64.1	\$ 69.6	\$ 73.9
% of Total	47.5%	52.3%	53.3%	54.6%	57.7%	60.2%	61.5%	62.4%	63.2%	63.9%
% Change	33.6%	19.8%	4.8%	2.2%	2.6%	-13.5%	11.3%	10.7%	8.6%	6.2%
Total	\$ 96.3	\$ 104.7	\$ 107.6	\$ 107.4	\$ 104.2	\$ 86.4	\$ 94.1	\$ 102.7	\$ 110.1	\$ 115.7
% Change	24.2%	8.8%	2.8%	-0.2%	-3.0%	-17.0%	8.9%	9.1%	7.3%	5.0%

Source: In-Stat, 01/09

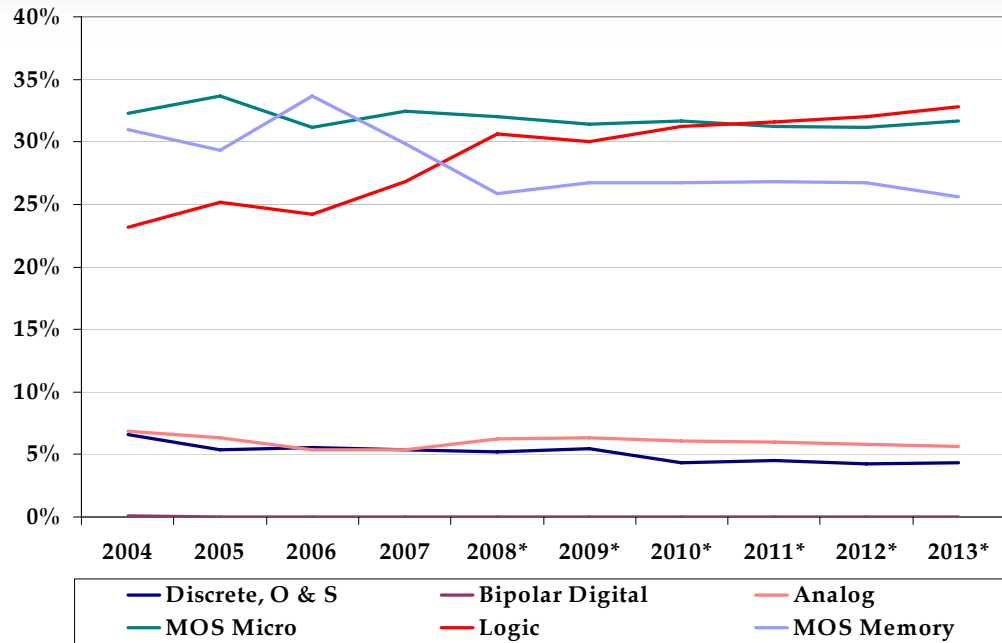
**Figure 8. Semiconductor Sales to the Computer Market, by Product Type, 2004–2013
(US\$ in Billions)**



Note: Discrete, O & S = Discrete, Optoelectronic and Sensor.

Source: In-Stat, 1/09

**Figure 9. Semiconductor Sales to the Computer Market, by Product Type, 2004–2013
(% of Total Revenue)**



Note: Discrete, O & S = Discrete, Optoelectronic and Sensor.
Source: In-Stat, 1/09

**Table 5. Semiconductor Sales to the Computer Market, by Product Type, 2004–2013
(US\$ in Billions)**

	2004	2005	2006	2007	2008*	2009*	2010*	2011*	2012*	2013*
Discrete, O & S	\$ 6.4	\$ 5.6	\$ 6.0	\$ 5.8	\$ 5.4	\$ 4.7	\$ 4.1	\$ 4.6	\$ 4.7	\$ 5.0
% of Total	6.6%	5.4%	5.5%	5.4%	5.2%	5.5%	4.3%	4.5%	4.3%	4.3%
% Change	23.5%	-11.5%	5.4%	-2.2%	-6.7%	-12.7%	-14.3%	13.3%	2.6%	5.8%
Bipolar Digital	\$ 0.1	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
% of Total	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
% Change	35.8%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Analog	\$ 6.6	\$ 6.7	\$ 5.8	\$ 5.8	\$ 6.5	\$ 5.4	\$ 5.7	\$ 6.1	\$ 6.4	\$ 6.5
% of Total	6.8%	6.4%	5.4%	5.4%	6.3%	6.3%	6.1%	6.0%	5.8%	5.6%
% Change	20.1%	1.5%	-12.4%	-0.3%	12.2%	-16.7%	5.3%	6.7%	4.9%	1.1%
MOS Micro	\$ 31.1	\$ 35.2	\$ 33.6	\$ 34.9	\$ 33.4	\$ 27.1	\$ 29.8	\$ 32.0	\$ 34.3	\$ 36.6
% of Total	32.3%	33.7%	31.2%	32.5%	32.1%	31.4%	31.7%	31.2%	31.2%	31.7%
% Change	12.9%	13.5%	-4.8%	4.0%	-4.3%	-18.8%	9.9%	7.4%	7.2%	6.6%
Logic	\$ 22.3	\$ 26.4	\$ 26.1	\$ 28.8	\$ 31.9	\$ 26.0	\$ 29.4	\$ 32.4	\$ 35.2	\$ 37.9
% of Total	23.2%	25.2%	24.2%	26.8%	30.6%	30.1%	31.2%	31.6%	32.0%	32.8%
% Change	30.2%	18.1%	-1.0%	10.3%	10.8%	-18.6%	13.1%	10.3%	8.6%	7.7%
MOS Memory	\$ 29.8	\$ 30.7	\$ 36.2	\$ 32.1	\$ 26.9	\$ 23.1	\$ 25.1	\$ 27.5	\$ 29.5	\$ 29.7
% of Total	31.0%	29.4%	33.6%	29.9%	25.8%	26.8%	26.7%	26.8%	26.7%	25.6%
% Change	34.6%	3.1%	17.7%	-11.3%	-16.1%	-14.1%	8.5%	9.5%	7.1%	0.7%
Total	\$ 96.3	\$ 104.7	\$ 107.6	\$ 107.4	\$ 104.2	\$ 86.4	\$ 94.1	\$ 102.7	\$ 110.1	\$ 115.7
% Change	24.2%	8.8%	2.8%	-0.2%	-3.0%	-17.0%	8.9%	9.1%	7.3%	5.0%

Note: Discrete, O & S = Discrete, Optoelectronic and Sensor.
Source: In-Stat 01/09

Communications

From 1993 to 2000, the communications segment added 10 percentage points to its share of the semiconductor market, rising from 14.6% to a peak of 24.5%. After thrashing around a bit in the wake of the 2001 downturn, this share seems to have become relatively stable, staying in the 20.5% to 20.9% range from 2005 through 2007.

The communications segment has two major, and somewhat unrelated, sub-segments—wired and wireless. Being somewhat unrelated, their markets can and do move in different directions. The wired sub-segment includes networking equipment used in applications from Internet infrastructure to some local area networks. Wired networks tend to have relatively large economic capacity increments and, although much of their demand is generated by consumer web traffic, much of the wired spending is subject to capital budgets of large firms. Wireless, on the other hand, is centered on the mobile handset market, and also includes home routers and other Wi-Fi (802.11) hardware and is, in many respects, similar to the consumer market.

Close to half of all ICs can be considered to be “application specific” (equivalent to about 42% of all semiconductors). This includes parts in the analog, MCU, DSP, and logic categories. Using the ratio of wired and wireless application specific parts as a proxy for the entire semiconductor product set, wireless constitutes 78% of all communications (both for all of 2007 and the first 10 months of 2008). So, the fate of the communication market segment is largely in the hands of the mobile handset users. With many of them more attached to their mobile service than to their consumer products, and with some consumer product functionality becoming more prevalent in mobile handsets (digital cameras e.g.), we expect that the communications segment will slightly outperform the consumer segment in the coming years as both gain share.

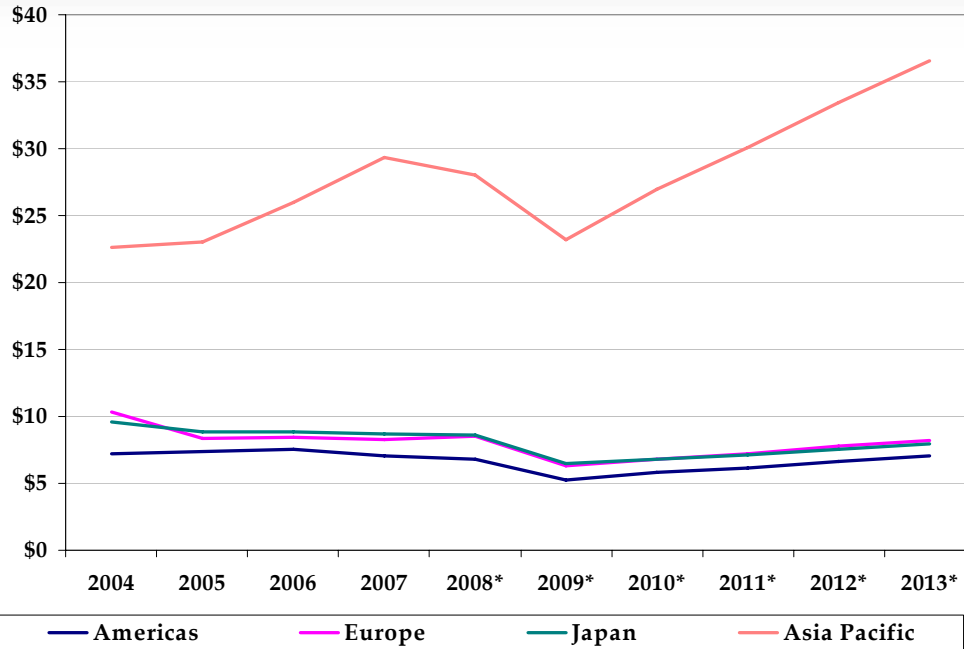
From a product viewpoint, there was a sharp drop in discrete optoelectronics and sensors sold to the communications segment in 2005 that was partially recovered in 2006 and restored to trend in 2007. This was a result of a corresponding increase, and subsequent reduction, in the industrial segment. We can see no reason for this (it was concentrated in the optoelectronics part) and attribute it to anomalies in data reporting. The major change that we anticipate, at the product level, is an increase in memory content as mobile handsets become increasingly used for web and data applications.

Regionally, we expect the shift to the Asia/Pacific region to continue, albeit at a slower pace, as this shift has been in process since 2002 and is approaching the end point.

Regional revenues are shown in Figure 10, while Figure 11 shows the same data expressed as a percentage of the worldwide revenue total. Table 6 contains the corresponding data.

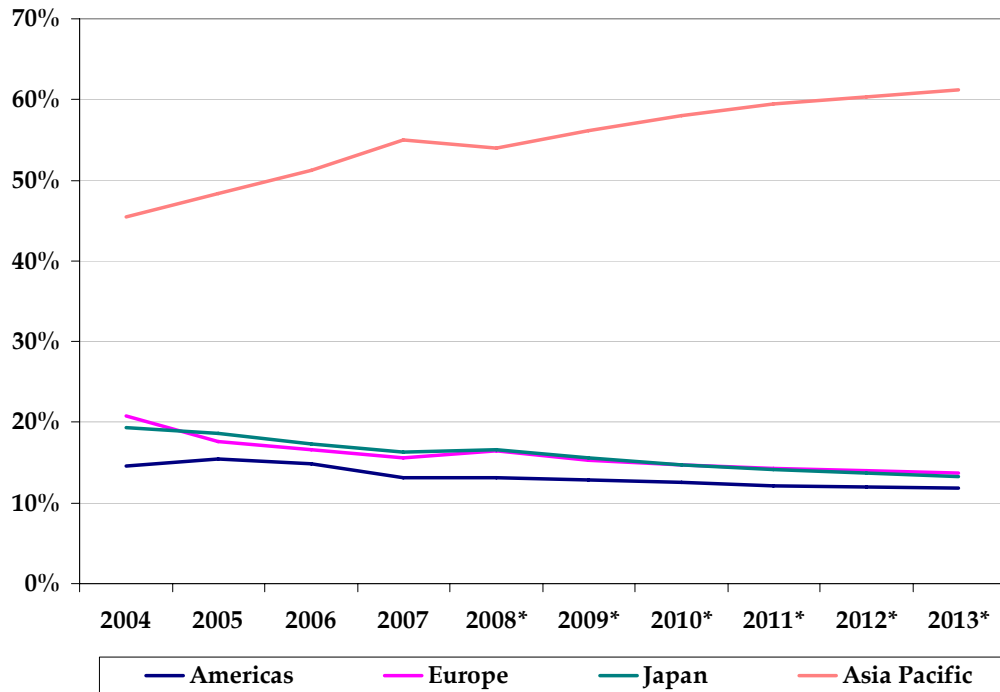
Product type detail for the communications segment is shown in Figures 12 and 13, while Table 7, following the figures, contains the data.

**Figure 10. Semiconductor Sales to the Communications Market, by Region, 2004–2013
(US\$ in Billions)**



Source: In-Stat, 1/09

**Figure 11. Semiconductor Sales to the Communications Market, by Region, 2004–2013
(% of Total Revenue)**



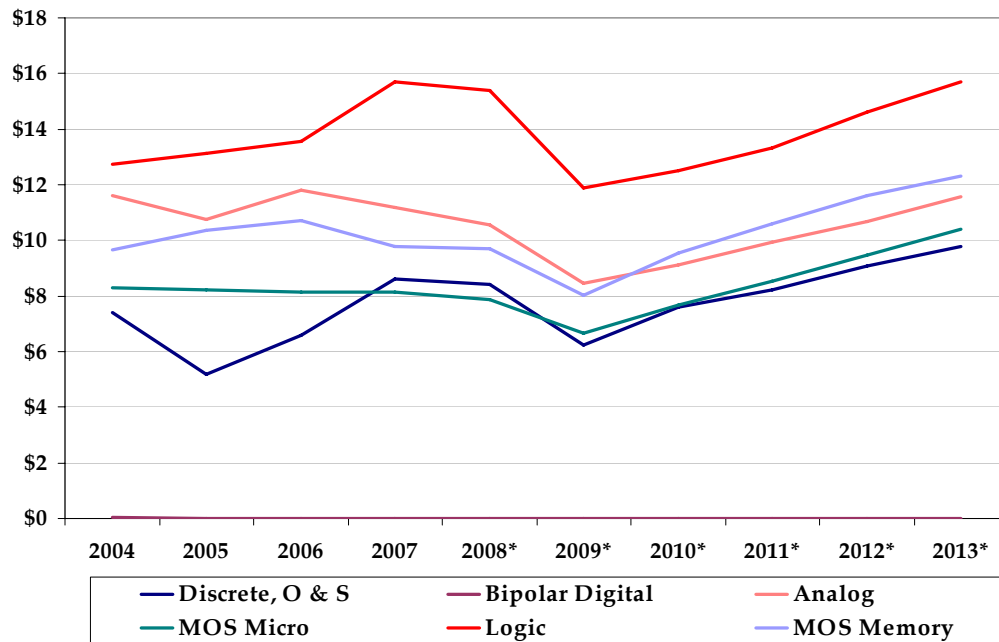
Source: In-Stat, 1/09

**Table 6. Semiconductor Sales to the Communications Market, by Region, 2004–2013
(US\$ in Billions)**

	2004	2005	2006	2007	2008*	2009*	2010*	2011*	2012*	2013*
Americas	\$ 7.2	\$ 7.4	\$ 7.5	\$ 7.0	\$ 6.8	\$ 5.3	\$ 5.8	\$ 6.2	\$ 6.7	\$ 7.1
% of Total	14.5%	15.5%	14.8%	13.2%	13.1%	12.8%	12.5%	12.2%	12.0%	11.9%
% Change	31.0%	2.3%	1.9%	-6.4%	-3.6%	-22.2%	9.9%	6.4%	8.1%	6.2%
Europe	\$ 10.3	\$ 8.4	\$ 8.5	\$ 8.3	\$ 8.5	\$ 6.3	\$ 6.8	\$ 7.2	\$ 7.8	\$ 8.2
% of Total	20.7%	17.6%	16.6%	15.6%	16.4%	15.4%	14.7%	14.3%	14.0%	13.7%
% Change	26.7%	-18.6%	0.6%	-1.7%	2.5%	-25.6%	8.0%	5.6%	7.4%	5.7%
Japan	\$ 9.6	\$ 8.8	\$ 8.8	\$ 8.7	\$ 8.6	\$ 6.5	\$ 6.8	\$ 7.1	\$ 7.6	\$ 8.0
% of Total	19.3%	18.6%	17.4%	16.3%	16.6%	15.6%	14.7%	14.1%	13.7%	13.3%
% Change	3.6%	-8.0%	-0.3%	-1.2%	-1.0%	-25.3%	5.8%	4.5%	6.2%	5.0%
Asia Pacific	\$ 22.6	\$ 23.0	\$ 26.0	\$ 29.4	\$ 28.0	\$ 23.2	\$ 27.0	\$ 30.1	\$ 33.4	\$ 36.5
% of Total	45.4%	48.3%	51.2%	55.0%	53.9%	56.2%	58.1%	59.4%	60.3%	61.1%
% Change	59.4%	1.9%	13.0%	12.9%	-4.7%	-17.3%	16.5%	11.5%	11.0%	9.3%
Total	\$ 49.7	\$ 47.6	\$ 50.8	\$ 53.4	\$ 51.9	\$ 41.2	\$ 46.5	\$ 50.6	\$ 55.4	\$ 59.8
% Change	34.0%	-4.2%	6.6%	5.2%	-2.8%	-20.6%	12.7%	9.0%	9.5%	7.9%

Source: In-Stat, 01/09

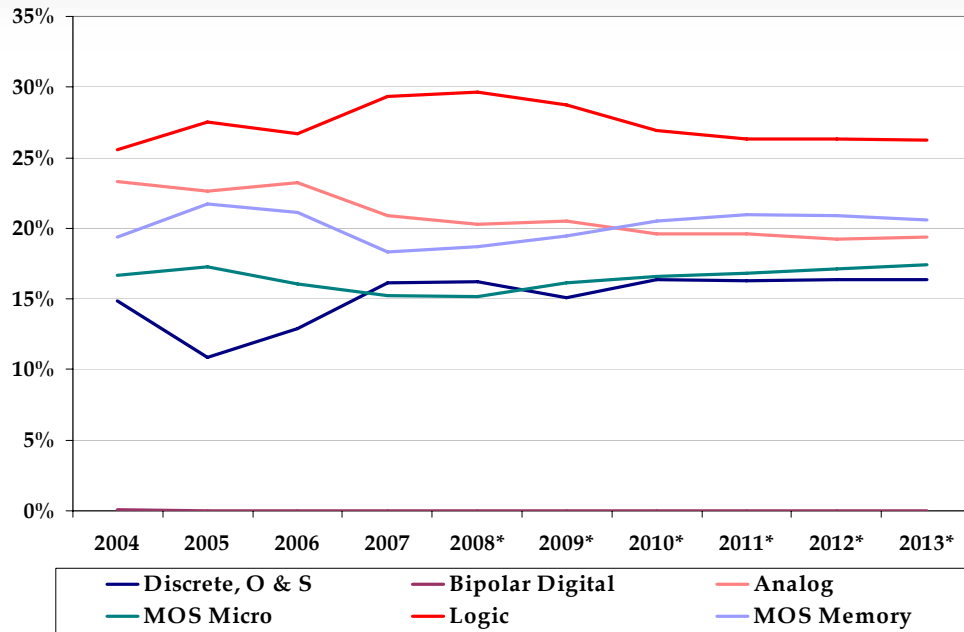
**Figure 12. Semiconductor Sales to the Communications Market, by Product Type, 2004–2013
(US\$ in Billions)**



Note: Discrete, O & S = Discrete, Optoelectronic and Sensor.

Source: In-Stat, 1/09

**Figure 13. Semiconductor Sales to the Communications Market, by Product Type, 2004–2013
(% of Total Revenue)**



Note: Discrete, O & S = Discrete, Optoelectronic and Sensor.
Source: In-Stat, 1/09

**Table 7. Semiconductor Sales to the Communications Market, by Product Type, 2004–2013
(US\$ in Billions)**

	2004	2005	2006	2007	2008*	2009*	2010*	2011*	2012*	2013*
Discrete, O & S	\$ 7.4	\$ 5.2	\$ 6.6	\$ 8.6	\$ 8.4	\$ 6.2	\$ 7.6	\$ 8.2	\$ 9.1	\$ 9.8
% of Total	14.9%	10.9%	12.9%	16.1%	16.2%	15.1%	16.4%	16.3%	16.4%	16.4%
% Change	22.6%	-30.0%	26.6%	31.3%	-2.6%	-26.0%	22.4%	8.1%	10.2%	7.9%
Bipolar Digital	\$ 0.0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
% of Total	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
% Change	-21.2%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Analog	\$ 11.6	\$ 10.8	\$ 11.8	\$ 11.2	\$ 10.5	\$ 8.5	\$ 9.1	\$ 9.9	\$ 10.7	\$ 11.6
% of Total	23.3%	22.6%	23.2%	20.9%	20.3%	20.5%	19.6%	19.6%	19.3%	19.4%
% Change	22.8%	-7.3%	9.6%	-5.4%	-5.5%	-19.8%	7.6%	9.2%	7.5%	8.3%
MOS Micro	\$ 8.3	\$ 8.2	\$ 8.1	\$ 8.2	\$ 7.9	\$ 6.7	\$ 7.7	\$ 8.5	\$ 9.5	\$ 10.4
% of Total	16.7%	17.2%	16.0%	15.3%	15.2%	16.2%	16.6%	16.8%	17.1%	17.4%
% Change	40.7%	-0.9%	-0.8%	0.0%	-3.3%	-15.4%	15.5%	10.8%	11.1%	9.8%
Logic	\$ 12.7	\$ 13.1	\$ 13.6	\$ 15.7	\$ 15.4	\$ 11.9	\$ 12.5	\$ 13.3	\$ 14.6	\$ 15.7
% of Total	25.6%	27.6%	26.7%	29.4%	29.6%	28.8%	26.9%	26.3%	26.4%	26.3%
% Change	18.8%	3.1%	3.3%	15.7%	-1.9%	-22.9%	5.4%	6.6%	9.5%	7.5%
MOS Memory	\$ 9.7	\$ 10.3	\$ 10.7	\$ 9.8	\$ 9.7	\$ 8.0	\$ 9.5	\$ 10.6	\$ 11.6	\$ 12.3
% of Total	19.4%	21.7%	21.1%	18.3%	18.7%	19.5%	20.5%	20.9%	20.9%	20.6%
% Change	94.8%	7.2%	3.6%	-8.6%	-0.9%	-17.3%	18.8%	11.2%	9.4%	6.2%
Total	\$ 49.7	\$ 47.6	\$ 50.8	\$ 53.4	\$ 51.9	\$ 41.2	\$ 46.5	\$ 50.6	\$ 55.4	\$ 59.8
% Change	34.0%	-4.2%	6.6%	5.2%	-2.8%	-20.6%	12.7%	9.0%	9.5%	7.9%

Note: Discrete, O & S = Discrete, Optoelectronic and Sensor.
Source: In-Stat 01/09

Consumer

The consumer segment is better described as the “consumer electronics” segment. It includes things like televisions, cameras, and DVD players, but excludes personal computers, mobile handsets, and other traditional business products, which are increasingly being sold to consumers.

The consumer segment is characterized by a wide variety of products that are produced and sold in moderate volumes. Many of them enable new consumer activities or new ways of doing traditional consumer activities. Products like the DVD player, digital still camera, and MP3 player became huge consumer hits, enjoyed a rapid growth period, and then saw sales growth slow, or even decline, as the market became saturated in only a few years. With the exception of the high end of the digital television market, most volume consumer electronic products are moderately priced, making them almost impulse buys for some consumers.

During moderate downturns, consumer electronics can still do well, as people who cut back on other, more expensive, recreational spending allow themselves the luxury of a new entertainment device. A DVD player can be bought for less than a good dinner for two. But this is no ordinary downturn and consumer spending is being impacted as much by fear as by cash availability. All indications are that consumer electronic spending may not disappear, but it will be reduced. In the US at least, many people will see reduced spending on electronic entertainment as a way to continue paying the monthly mobile telephone service bill. A particularly bad sign is the recent belt tightening at a large electronic game software firm. If consumers are cutting back on software for hardware that they already own, they are unlikely to be spending for new hardware.

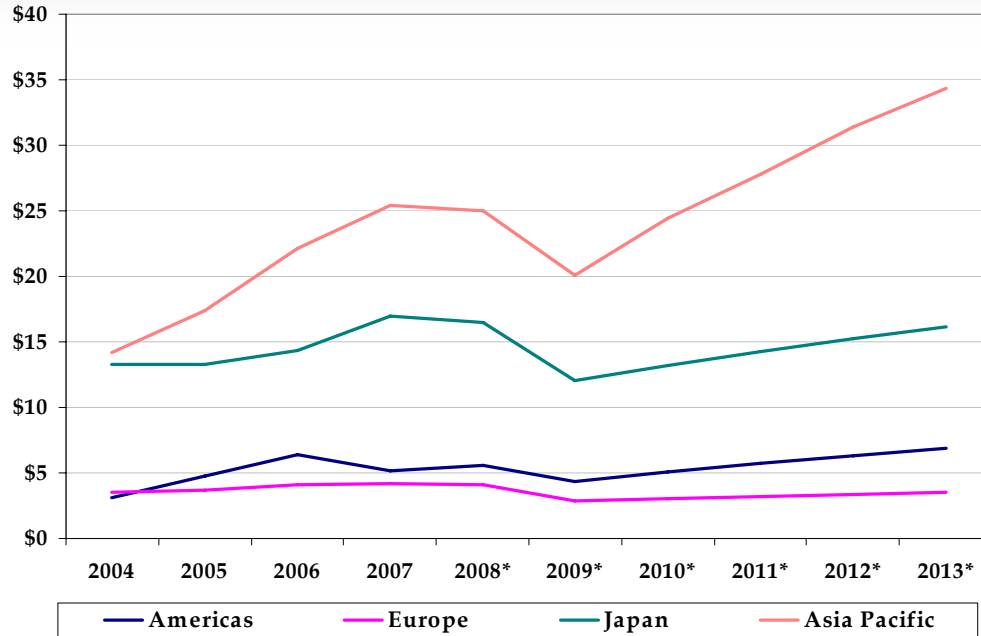
Our forecast for the recovery and ensuing years is predicated on the assumption that the industry continues to roll out new and compelling products to replace the recent products that are, or soon will be, past their peaks. There is some risk in this assumption as product development will certainly suffer budget cuts during the downturn. And, after first quarter 2009, the US digital television conversion will be over, drastically reducing demand for converter boxes and digital TVs.

Regionally, Japan had traditionally dominated the consumer segment, but in 2004 it was overtaken by Asia/Pacific. We expect that Japan will continue to lose share to Asia/Pacific, but at a very slow rate. Time-to-market is important in the consumer electronics market and many models of these products have very short lives. There is value in keeping manufacturing close to the designers and marketers to maintain speed and flexibility. Figure 14 and Figure 15 show the regional breakout of semiconductor sales to the consumer segment in US dollars and percent of total revenue, respectively, while the data is contained in Table 8.

As a general trend, we anticipate that analog will slowly give way to logic (although some functions will always require analog), that memory will become a larger part of the consumer semiconductor mix, and NAND flash increasingly sees use for video storage, as well as for audio storage.

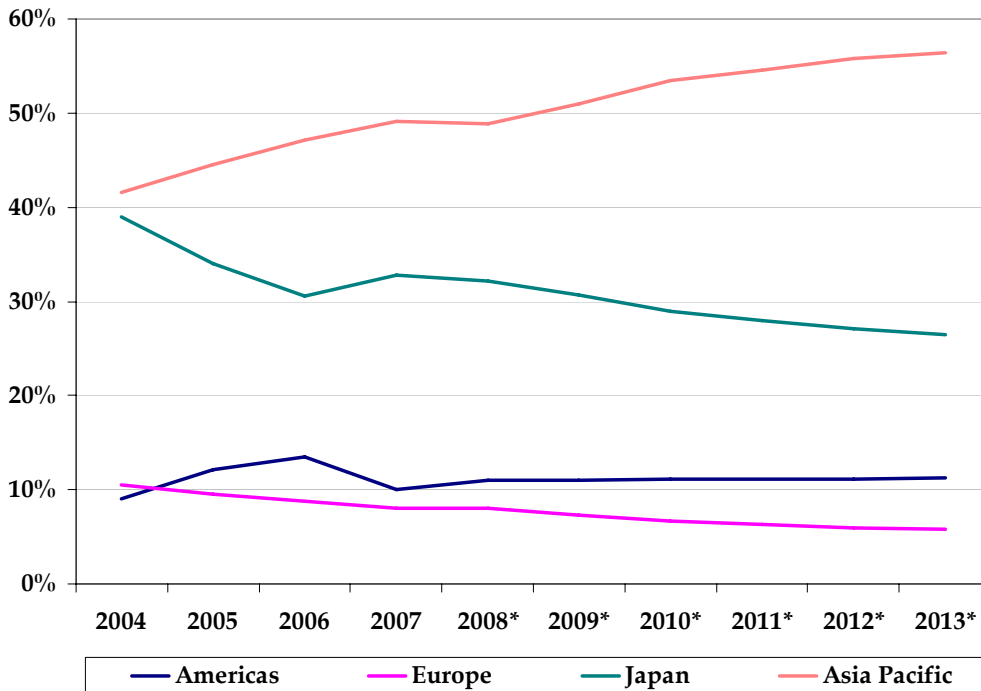
Figures 16 and 17 show consumer semiconductor consumption, by product type, and by percentage of total revenue, respectively. Table 9, following the figures, contains the data.

**Figure 14. Semiconductor Sales to the Consumer Market, by Region, 2004–2013
(US\$ in Billions)**



Source: In-Stat, 1/09

**Figure 15. Semiconductor Sales to the Consumer Market, by Region, 2004–2013
(% of Total Revenue)**



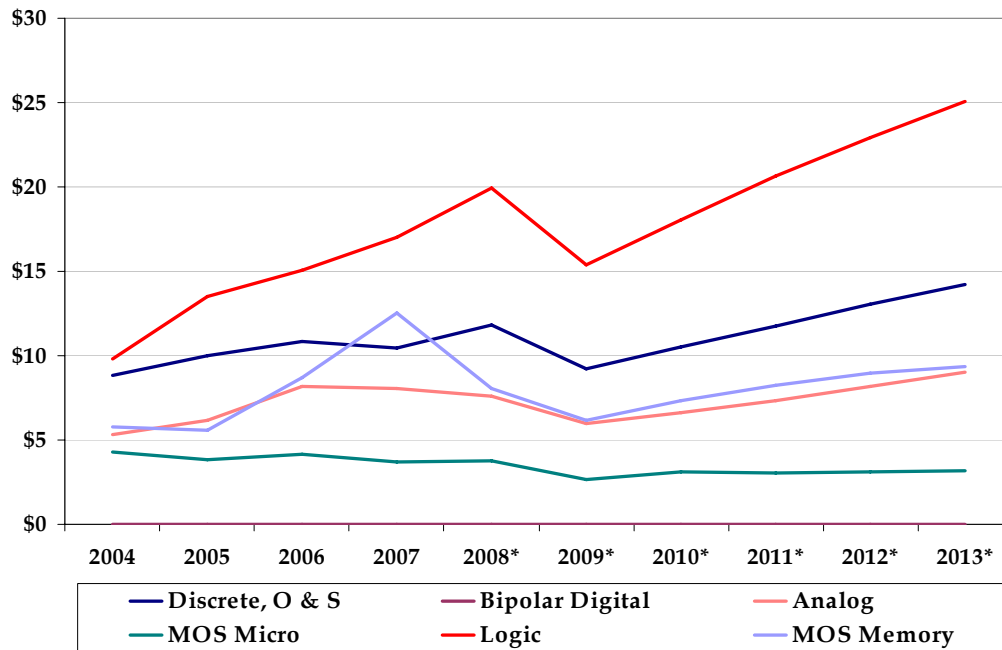
Source: In-Stat, 1/09

**Table 8. Semiconductor Sales to the Consumer Market, by Region, 2004–2013
(US\$ in Billions)**

	2004	2005	2006	2007	2008*	2009*	2010*	2011*	2012*	2013*
Americas	\$ 3.1	\$ 4.7	\$ 6.4	\$ 5.2	\$ 5.6	\$ 4.4	\$ 5.1	\$ 5.7	\$ 6.3	\$ 6.9
% of Total	9.1%	12.1%	13.5%	10.0%	11.0%	11.1%	11.1%	11.2%	11.2%	11.3%
% Change	27.9%	53.4%	34.5%	-18.4%	8.0%	-22.2%	16.2%	12.9%	9.8%	9.3%
Europe	\$ 3.6	\$ 3.7	\$ 4.1	\$ 4.2	\$ 4.1	\$ 2.9	\$ 3.0	\$ 3.2	\$ 3.4	\$ 3.5
% of Total	10.5%	9.5%	8.8%	8.1%	8.0%	7.2%	6.6%	6.3%	6.0%	5.8%
% Change	40.5%	4.1%	11.4%	1.0%	-1.8%	-30.3%	6.2%	6.5%	3.9%	5.4%
Japan	\$ 13.3	\$ 13.3	\$ 14.4	\$ 17.0	\$ 16.5	\$ 12.1	\$ 13.2	\$ 14.3	\$ 15.2	\$ 16.1
% of Total	38.9%	34.0%	30.6%	32.8%	32.2%	30.7%	28.9%	28.0%	27.1%	26.5%
% Change	25.6%	0.3%	8.1%	18.1%	-2.8%	-26.7%	9.2%	8.3%	6.6%	6.0%
Asia Pacific	\$ 14.1	\$ 17.4	\$ 22.1	\$ 25.4	\$ 25.0	\$ 20.1	\$ 24.4	\$ 27.8	\$ 31.4	\$ 34.3
% of Total	41.5%	44.5%	47.1%	49.2%	48.8%	51.0%	53.4%	54.5%	55.8%	56.4%
% Change	44.8%	23.0%	27.2%	15.0%	-1.8%	-19.5%	21.3%	14.1%	12.7%	9.5%
Total	\$ 34.0	\$ 39.1	\$ 47.0	\$ 51.8	\$ 51.2	\$ 39.4	\$ 45.7	\$ 51.1	\$ 56.2	\$ 60.9
% Change	34.8%	14.9%	20.1%	10.2%	-1.1%	-23.0%	16.0%	11.8%	10.1%	8.3%

Source: In-Stat, 01/09

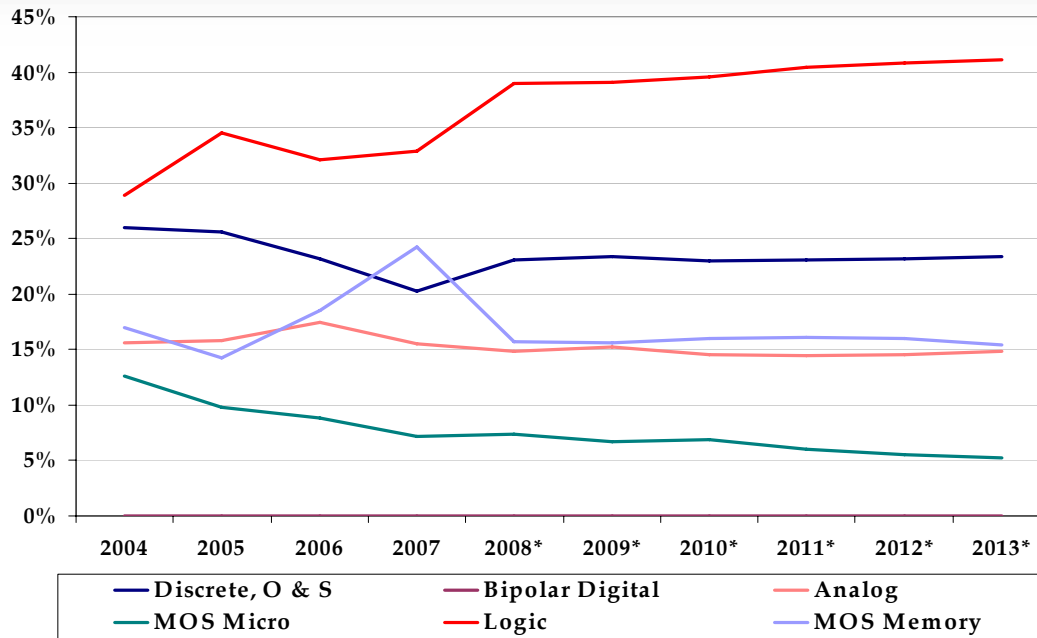
**Figure 16. Semiconductor Sales to the Consumer Market, by Product Type, 2004–2013
(US\$ in Billions)**



Note: Discrete, O & S = Discrete, Optoelectronic and Sensor.

Source: In-Stat, 1/09

Figure 17. Semiconductor Sales to the Consumer Market, by Product Type, 2004–2013
(% of Total Revenue)



Note: Discrete, O & S = Discrete, Optoelectronic and Sensor.
Source: In-Stat, 1/09

Table 9. Semiconductor Sales to the Consumer Market, by Product Type, 2004–2013
(US\$ in Billions)

	2004	2005	2006	2007	2008*	2009*	2010*	2011*	2012*	2013*
Discrete, O & S	\$ 8.8	\$ 10.0	\$ 10.9	\$ 10.5	\$ 11.8	\$ 9.2	\$ 10.5	\$ 11.8	\$ 13.0	\$ 14.2
% of Total	26.0%	25.6%	23.1%	20.2%	23.1%	23.4%	23.0%	23.0%	23.2%	23.4%
% Change	34.1%	13.4%	8.4%	-3.7%	12.8%	-21.9%	14.0%	11.8%	10.9%	9.1%
Bipolar Digital	\$ 0.0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
% of Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
% Change	-62.2%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Analog	\$ 5.3	\$ 6.2	\$ 8.2	\$ 8.0	\$ 7.6	\$ 6.0	\$ 6.6	\$ 7.4	\$ 8.2	\$ 9.0
% of Total	15.6%	15.8%	17.4%	15.5%	14.9%	15.2%	14.5%	14.4%	14.6%	14.9%
% Change	9.2%	16.8%	32.1%	-1.6%	-5.4%	-21.4%	10.7%	11.1%	11.2%	10.5%
MOS Micro	\$ 4.3	\$ 3.8	\$ 4.1	\$ 3.7	\$ 3.8	\$ 2.6	\$ 3.1	\$ 3.1	\$ 3.1	\$ 3.2
% of Total	12.6%	9.8%	8.8%	7.2%	7.4%	6.7%	6.9%	6.0%	5.5%	5.2%
% Change	11.7%	-10.7%	8.0%	-10.3%	1.6%	-30.1%	19.1%	-2.3%	0.7%	3.4%
Logic	\$ 9.8	\$ 13.5	\$ 15.1	\$ 17.0	\$ 19.9	\$ 15.4	\$ 18.1	\$ 20.7	\$ 22.9	\$ 25.1
% of Total	28.9%	34.5%	32.1%	32.9%	39.0%	39.1%	39.6%	40.5%	40.8%	41.2%
% Change	51.9%	37.4%	11.8%	12.7%	17.2%	-22.7%	17.3%	14.3%	11.1%	9.2%
MOS Memory	\$ 5.8	\$ 5.6	\$ 8.7	\$ 12.5	\$ 8.0	\$ 6.1	\$ 7.3	\$ 8.2	\$ 9.0	\$ 9.4
% of Total	17.0%	14.2%	18.5%	24.2%	15.7%	15.6%	16.0%	16.1%	16.0%	15.4%
% Change	65.3%	-3.5%	56.2%	44.0%	-35.9%	-23.6%	19.3%	12.1%	9.2%	4.4%
Total	\$ 34.0	\$ 39.1	\$ 47.0	\$ 51.8	\$ 51.2	\$ 39.4	\$ 45.7	\$ 51.1	\$ 56.2	\$ 60.9
% Change	34.8%	14.9%	20.1%	10.2%	-1.1%	-23.0%	16.0%	11.8%	10.1%	8.3%

Note: Discrete, O & S = Discrete, Optoelectronic and Sensor.
Source: In-Stat 01/09

Industrial

The industrial semiconductor market segment's share of the overall semiconductor market fell from 11.8% in 1993 to a low of 7.0% in 2003, but since then it has recovered some and is now in the 7% to 8% area, where we believe it will remain for the foreseeable future.

The industrial market includes traditional industrial products, like machine tools and automated assembly equipment, but it also includes medical equipment. While the traditional markets declined as standard PCs and communications gear with customized software replaced the custom hardware that once was required for specialized tasks, the medical markets grew as spending on medical care rose. Much medical equipment remains specific to the market segment, either because of unique functionality or because of government, or other agency, approval requirements.

The medical equipment market has good prospects, both because of advances in medical technology making new things possible and because of rising living standards in developing countries, which makes existing technology more widely available. Under normal circumstances, medical equipment could be thought of as somewhat immune to the economic situation, which, if anything, would increase the need for medical care due to increased stress levels. However, this is not a typical downturn and we are already seeing news items describing delays in hospital expansions, which are a driver of medical equipment sales.

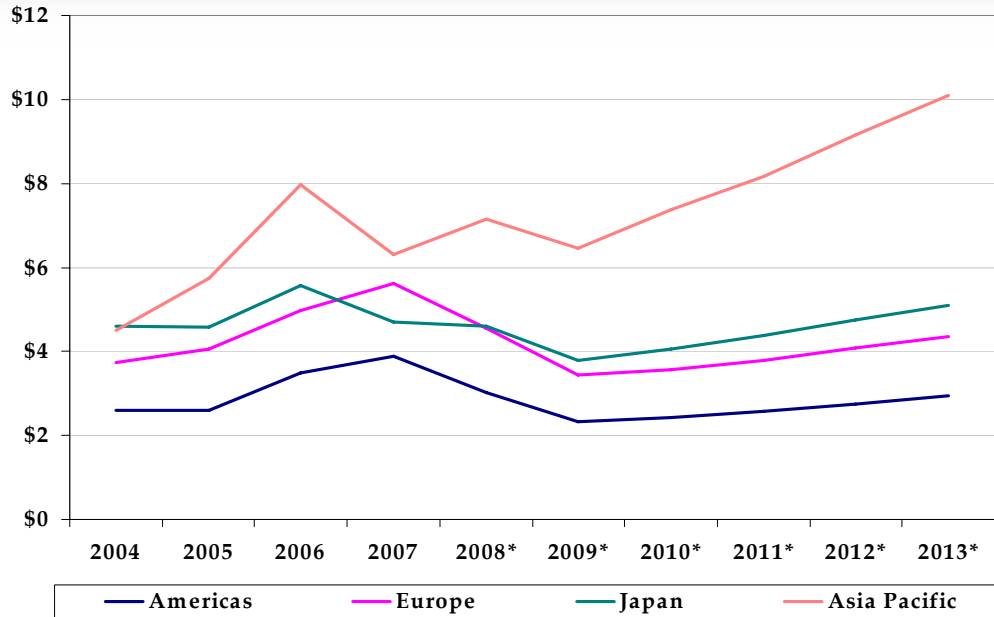
On balance, while we expect that the traditional industrial equipments markets (which include semiconductor capital equipment) will suffer more than the economy as a whole, the medical portion of the segment will suffer less. Overall we expect sales to the industrial segment to roughly follow the overall semiconductor market.

Regionally, we expect recent patterns to continue with a continuing increase in consumption in Asia/Pacific due to low-cost manufacturing opportunities there, however industrial is expected to retain a larger portion of its consumption outside Asia/Pacific because of controls on the manufacture of medical equipment and because many industrial products are produced in relatively low volume or with customized features. Uniquely, Asia/Pacific lost share in the industrial market segment in 2007, while the Americas and Europe both gained.

Figure 18 and Figure 19 show semiconductor sales to the industrial segment, by region, and percent of total revenue, respectively. The data is contained in Table 10, which follows the figures.

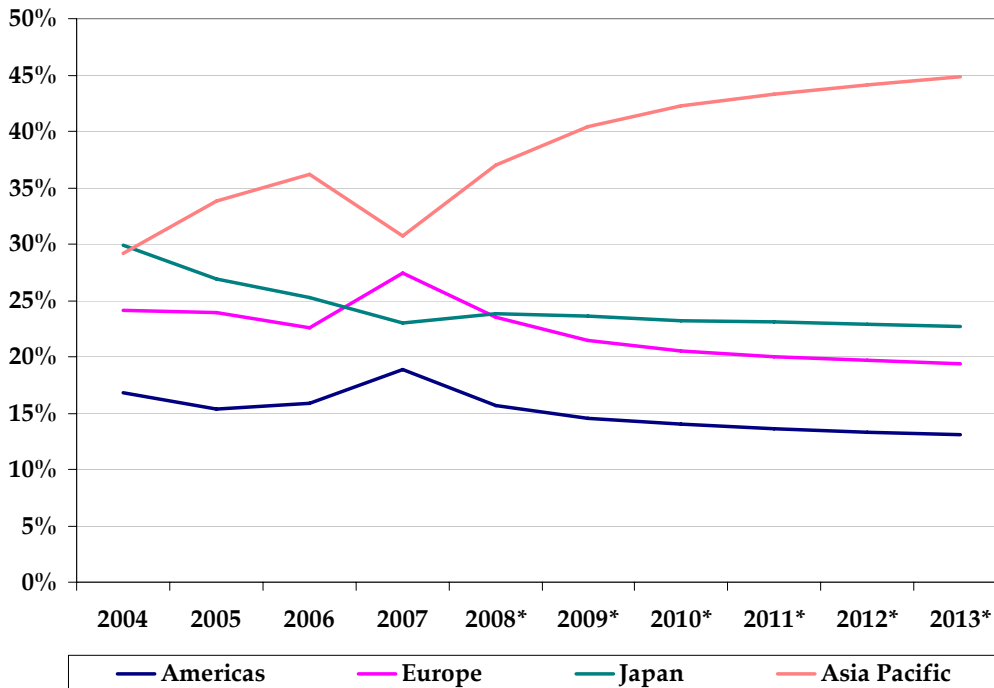
Being a relatively small segment of the overall market, with a diverse mix of relatively low-volume products, the semiconductor product type mix tends to change more from year to year than it does in other segments. Overall, we do expect any long-term changes, as can be seen in Figure 20, Figure 21, and Table 11.

**Figure 18. Semiconductor Sales to the Industrial Market, by Region, 2004–2013
(US\$ in Billions)**



Source: In-Stat, 1/09

**Figure 19. Semiconductor Sales to the Industrial Market, by Region, 2004–2013
(% of Total Revenue)**



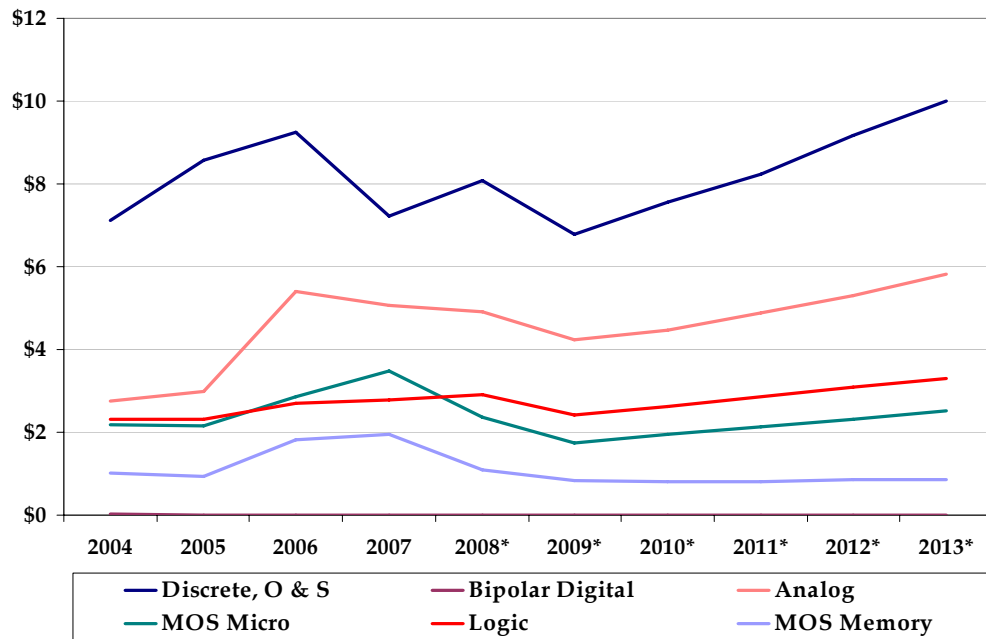
Source: In-Stat, 1/09

**Table 10. Semiconductor Sales to the Industrial Market, by Region, 2004–2013
(US\$ in Billions)**

	2004	2005	2006	2007	2008*	2009*	2010*	2011*	2012*	2013*
Americas	\$ 2.6	\$ 2.6	\$ 3.5	\$ 3.9	\$ 3.0	\$ 2.3	\$ 2.4	\$ 2.6	\$ 2.8	\$ 2.9
% of Total	16.8%	15.4%	15.9%	18.9%	15.6%	14.5%	14.0%	13.6%	13.3%	13.1%
% Change	28.8%	0.8%	33.9%	10.9%	-21.8%	-23.5%	5.2%	5.5%	7.2%	6.9%
Europe	\$ 3.7	\$ 4.1	\$ 5.0	\$ 5.6	\$ 4.6	\$ 3.4	\$ 3.6	\$ 3.8	\$ 4.1	\$ 4.4
% of Total	24.2%	23.9%	22.6%	27.4%	23.5%	21.5%	20.5%	20.0%	19.6%	19.4%
% Change	12.4%	8.8%	22.7%	12.7%	-18.8%	-24.6%	3.9%	5.9%	7.7%	7.2%
Japan	\$ 4.6	\$ 4.6	\$ 5.6	\$ 4.7	\$ 4.6	\$ 3.8	\$ 4.0	\$ 4.4	\$ 4.8	\$ 5.1
% of Total	29.9%	26.9%	25.3%	23.0%	23.8%	23.6%	23.2%	23.1%	22.9%	22.7%
% Change	34.5%	-0.9%	22.0%	-15.6%	-2.1%	-18.0%	7.2%	7.9%	8.8%	7.3%
Asia Pacific	\$ 4.5	\$ 5.7	\$ 8.0	\$ 6.3	\$ 7.2	\$ 6.5	\$ 7.4	\$ 8.2	\$ 9.2	\$ 10.1
% of Total	29.1%	33.8%	36.2%	30.7%	37.0%	40.4%	42.3%	43.3%	44.1%	44.8%
% Change	55.7%	27.9%	38.9%	-21.1%	13.7%	-9.7%	14.1%	10.8%	12.0%	10.2%
Total	\$ 15.4	\$ 17.0	\$ 22.0	\$ 20.5	\$ 19.3	\$ 16.0	\$ 17.4	\$ 18.9	\$ 20.7	\$ 22.5
% Change	32.5%	10.1%	29.7%	-7.0%	-5.5%	-17.4%	9.0%	8.4%	9.8%	8.5%

Source: In-Stat, 01/09

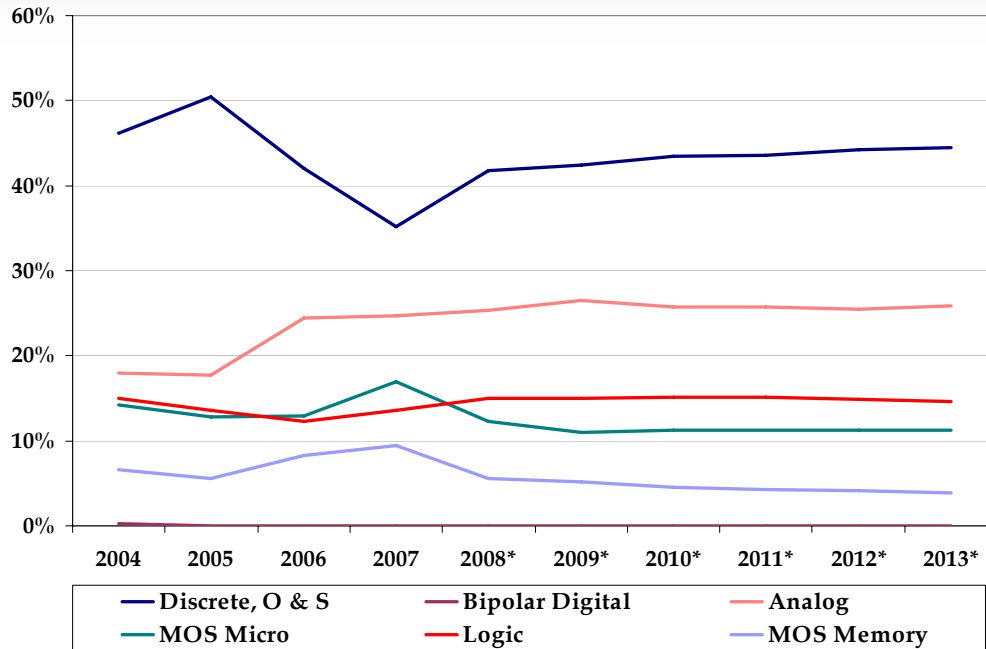
**Figure 20. Semiconductor Sales to the Industrial Market, by Product Type, 2004–2013
(US\$ in Billions)**



Note: Discrete, O & S = Discrete, Optoelectronic and Sensor.

Source: In-Stat, 1/09

**Figure 21. Semiconductor Sales to the Industrial Market, by Product Type, 2004–2013
(% of Total Revenue)**



Note: Discrete, O & S = Discrete, Optoelectronic and Sensor.
Source: In-Stat, 1/09

**Table 11. Semiconductor Sales to the Industrial Market, by Product Type, 2004–2013
(US\$ in Billions)**

	2004	2005	2006	2007	2008*	2009*	2010*	2011*	2012*	2013*
Discrete, O & S	\$ 7.1	\$ 8.6	\$ 9.3	\$ 7.2	\$ 8.1	\$ 6.8	\$ 7.6	\$ 8.2	\$ 9.2	\$ 10.0
% of Total	46.2%	50.4%	42.0%	35.2%	41.8%	42.4%	43.4%	43.6%	44.3%	44.4%
% Change	64.8%	20.3%	8.2%	-22.1%	12.1%	-16.1%	11.5%	8.9%	11.5%	8.9%
Bipolar Digital	\$ 0.0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
% of Total	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
% Change	-20.6%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Analog	\$ 2.8	\$ 3.0	\$ 5.4	\$ 5.1	\$ 4.9	\$ 4.2	\$ 4.5	\$ 4.9	\$ 5.3	\$ 5.8
% of Total	17.9%	17.7%	24.5%	24.7%	25.4%	26.5%	25.7%	25.8%	25.5%	25.9%
% Change	15.7%	8.5%	79.8%	-6.0%	-3.0%	-13.8%	5.8%	8.8%	8.7%	10.1%
MOS Micro	\$ 2.2	\$ 2.2	\$ 2.9	\$ 3.5	\$ 2.4	\$ 1.7	\$ 2.0	\$ 2.1	\$ 2.3	\$ 2.5
% of Total	14.2%	12.8%	13.0%	17.0%	12.2%	10.9%	11.2%	11.2%	11.2%	11.2%
% Change	-3.7%	-0.8%	31.8%	22.0%	-32.0%	-26.2%	11.9%	8.5%	9.4%	8.5%
Logic	\$ 2.3	\$ 2.3	\$ 2.7	\$ 2.8	\$ 2.9	\$ 2.4	\$ 2.6	\$ 2.8	\$ 3.1	\$ 3.3
% of Total	15.0%	13.6%	12.3%	13.6%	15.0%	15.1%	15.1%	15.1%	14.9%	14.6%
% Change	57.9%	-0.1%	16.7%	3.1%	4.2%	-17.0%	9.3%	8.2%	8.1%	6.7%
MOS Memory	\$ 1.0	\$ 0.9	\$ 1.8	\$ 1.9	\$ 1.1	\$ 0.8	\$ 0.8	\$ 0.8	\$ 0.9	\$ 0.9
% of Total	6.5%	5.5%	8.3%	9.5%	5.6%	5.1%	4.6%	4.3%	4.1%	3.8%
% Change	-12.8%	-6.8%	93.6%	6.8%	-44.2%	-24.4%	-2.5%	2.4%	4.8%	0.7%
Total	\$ 15.4	\$ 17.0	\$ 22.0	\$ 20.5	\$ 19.3	\$ 16.0	\$ 17.4	\$ 18.9	\$ 20.7	\$ 22.5
% Change	32.5%	10.1%	29.7%	-7.0%	-5.5%	-17.4%	9.0%	8.4%	9.8%	8.5%

Note: Discrete, O & S = Discrete, Optoelectronic and Sensor.
Source: In-Stat 01/09

Automotive

Not too long ago, the automotive market was a stogy place where the semiconductor industry sold diodes and low-cost microcontrollers. But enhancements to the performance, safety, and comfort (which includes entertainment) subsystems of cars are requiring a broader array of higher end and more expensive semiconductor products.

Where the automotive market segment was about 5% of the overall semiconductor market throughout most of the 1990s, its share began to rise during the 2001 semiconductor crash and has run between 7.7% and 8.2% since then. This would be good news, except for the fact that the automobile industry is in the vanguard of industries feeling the effects of the recession.

There are two fundamental drivers of semiconductor sales in any market, growth in end units sold and growth in semiconductor content per unit. In the case of automobiles, unit growth is being driven by emerging markets, while growth in content is driven by established markets. Although the economic problems will certainly suppress demand worldwide, demand for low-end cars, such as those being manufactured in China and India, should recover more quickly than demand for the higher end models made and sold in the US, Europe, and Japan.

A large part of the US automobile market is a replacement market and replacements can always be deferred for a year or so. When they can't be, there is the option of a used car rather than a new one. The impetus to replace gas hog SUVs with better mileage smaller cars has lessened with dropping gas prices, and, even if gas prices were to increase, the payback period lengthens when the trade-in value of the gas guzzler drops. So unit sales will suffer in the US and other advanced economy markets, but many of the cars that are sold will continue to have air bags, stability control, GPS, and other semiconductor consuming features. Complicating the problem in the US and other advanced economies is the high inventory levels that have caused extended plant shutdowns, and, particularly in the US, the high percentage of automobile purchases made on credit.

In the emerging markets, however, many sales are to first-time buyers. In China and India, for example, less than 1% of potential drivers own cars. In these and other emerging markets, cars are more apt to be bought with savings than with credit. So readers in the US should not extend the problems of the US auto industry to the rest of the world. The auto industry will certainly suffer, and semiconductor sales to the automotive segment will suffer along with it, but the slowdown will be less severe in developing countries. Toyota, when announcing in December 2008 that it expected its unit sales to be down about 15% in the year ending March 2009, also said that it expected worldwide car sales to be off only 4% in calendar 2008. Keep in mind, however, that even in a good year, car sales unit growth is less than semiconductor revenue growth. This means that semiconductor content per vehicle must grow in order for the automotive segment's share of all semiconductor revenue to remain flat.

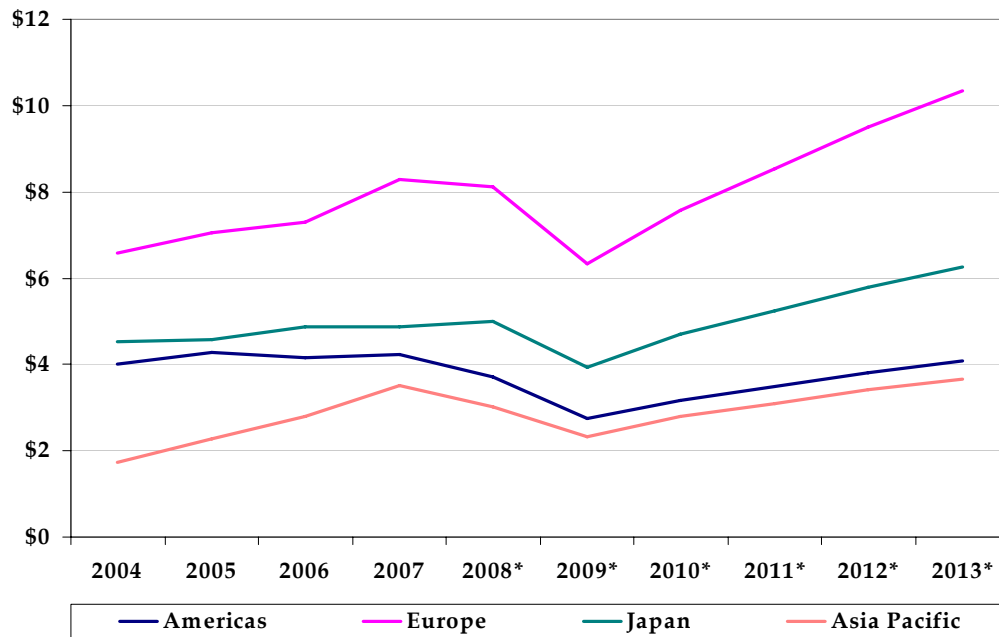
On balance, we expect that the continued development of new semiconductor-based features, and the dispersion throughout automotive product lines of features now found only on high-end vehicles, will keep the automotive semiconductor market growing steadily, if not rapidly, and that the automotive segment will maintain a share of the overall semiconductor market in the 7% to 8% range. No major shifts in the types of semiconductors consumed are foreseen.

Regionally, Europe has been the leader in recent years, and this is expected to continue because the early adopters of new electronic features are likely to be high-end vehicles, such as Mercedes, BMW, and Audi. Japan is expected to maintain its second place ranking, driven by its high-end brands, including Lexus, Infinity, and Acura. The Americas share is expected to decline slightly, with the slowing of consumption by US-based firms being partially balanced by increased consumption by US plants owned by non-US makers. The semiconductor content of the average car is slightly over US\$350, and the labor savings that would be realized by low-cost Asia/Pacific assembly of electronic sub-assemblies is small, compared to supply chain (“kanban”) savings that result from keeping this work close to the final assembly lines. The increase in forecasted Asia/Pacific share is due to consumption for local production rather than off-shoring.

Figure 22 and Figure 23 show the regional distribution of automotive semiconductor revenues. The data is in Table 12, which follows the figures.

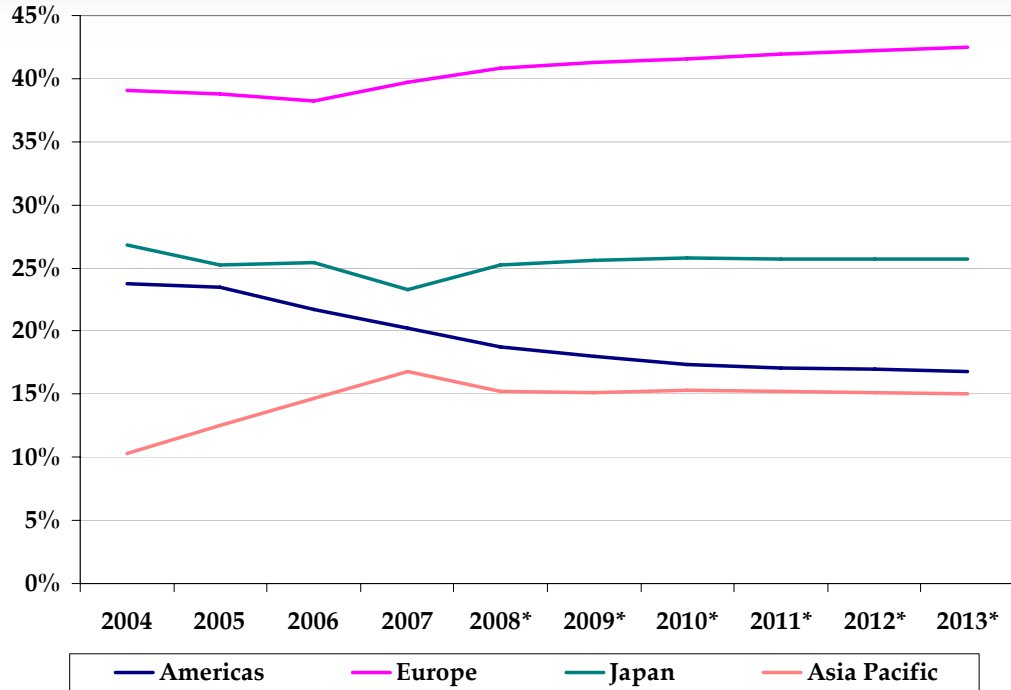
The mix of major product categories has also been relatively stable and that can be seen in Figure 24 and Figure 25, with the data contained in Table 13, following the figures.

**Figure 22. Semiconductor Sales to the Automotive Market, by Region, 2004–2013
(US\$ in Billions)**



Source: In-Stat, 1/09

**Figure 23. Semiconductor Sales to the Automotive Market, by Region, 2004–2013
(% of Total Revenue)**



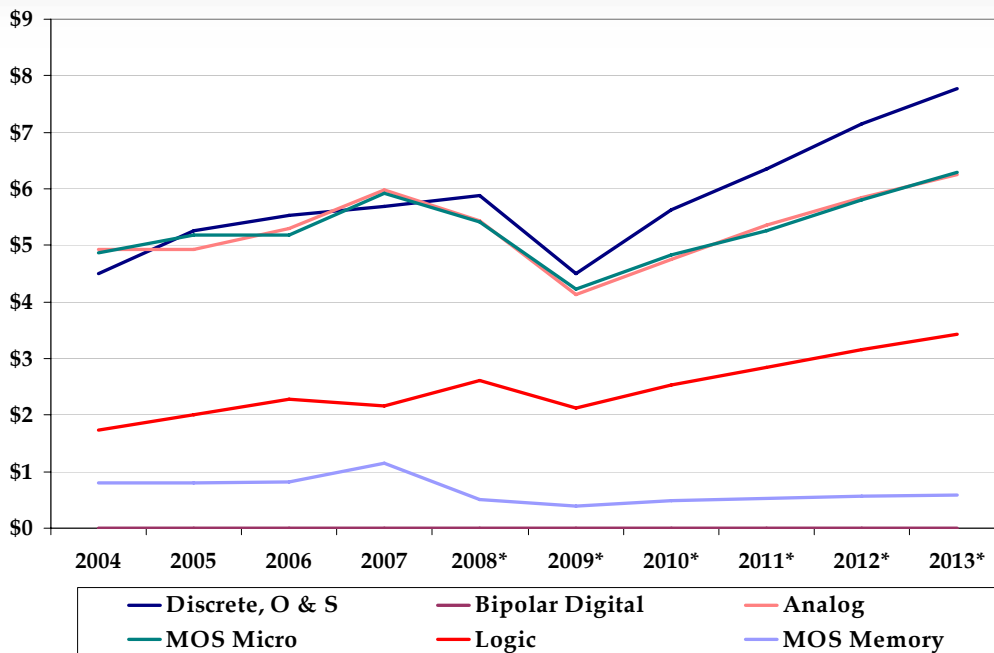
Source: In-Stat, 1/09

**Table 12. Semiconductor Sales to the Automotive Market, by Region, 2004–2013
(US\$ in Billions)**

	2004	2005	2006	2007	2008*	2009*	2010*	2011*	2012*	2013*
Americas	\$ 4.0	\$ 4.3	\$ 4.2	\$ 4.2	\$ 3.7	\$ 2.8	\$ 3.2	\$ 3.5	\$ 3.8	\$ 4.1
% of Total	23.8%	23.5%	21.7%	20.3%	18.7%	18.0%	17.4%	17.1%	17.0%	16.8%
% Change	17.1%	6.7%	-2.8%	2.1%	-12.3%	-25.9%	14.9%	9.8%	9.6%	7.3%
Europe	\$ 6.6	\$ 7.0	\$ 7.3	\$ 8.3	\$ 8.1	\$ 6.3	\$ 7.6	\$ 8.5	\$ 9.5	\$ 10.3
% of Total	39.1%	38.8%	38.2%	39.7%	40.9%	41.3%	41.6%	41.9%	42.2%	42.5%
% Change	26.7%	7.1%	3.5%	13.8%	-2.2%	-22.0%	19.7%	12.5%	11.3%	8.9%
Japan	\$ 4.5	\$ 4.6	\$ 4.9	\$ 4.9	\$ 5.0	\$ 3.9	\$ 4.7	\$ 5.2	\$ 5.8	\$ 6.2
% of Total	26.9%	25.2%	25.4%	23.2%	25.2%	25.6%	25.7%	25.7%	25.7%	25.7%
% Change	30.2%	1.4%	6.0%	0.0%	3.0%	-21.3%	19.2%	11.4%	10.5%	8.0%
Asia Pacific	\$ 1.7	\$ 2.3	\$ 2.8	\$ 3.5	\$ 3.0	\$ 2.3	\$ 2.8	\$ 3.1	\$ 3.4	\$ 3.7
% of Total	10.3%	12.5%	14.6%	16.8%	15.2%	15.1%	15.3%	15.2%	15.2%	15.0%
% Change	8.7%	30.7%	23.0%	25.8%	-13.9%	-23.2%	20.0%	10.9%	10.3%	7.2%
Total	\$ 16.8	\$ 18.2	\$ 19.1	\$ 20.9	\$ 19.9	\$ 15.4	\$ 18.2	\$ 20.3	\$ 22.5	\$ 24.3
% Change	23.1%	7.9%	5.1%	9.5%	-5.0%	-22.7%	18.8%	11.5%	10.6%	8.1%

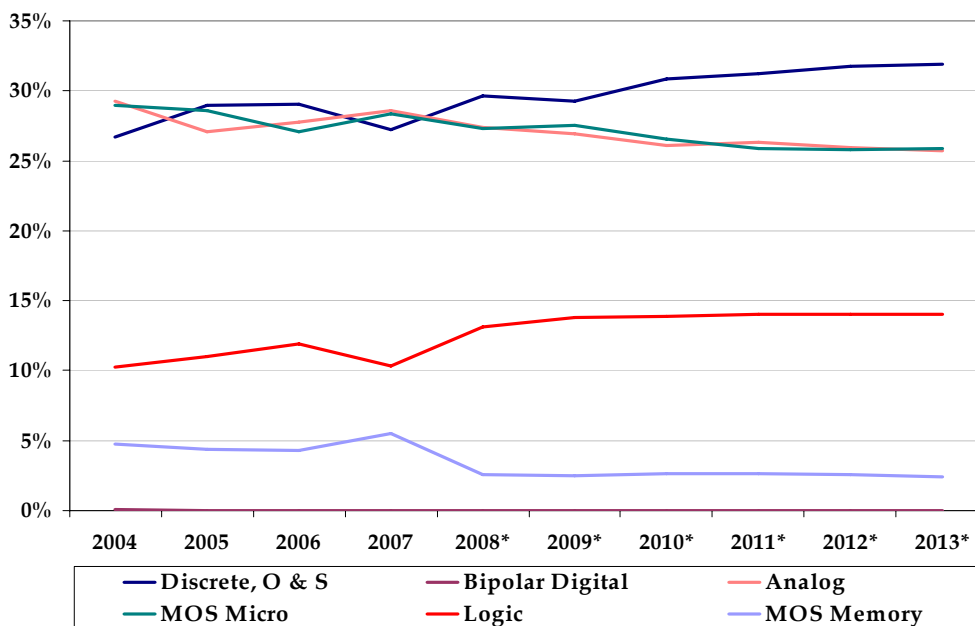
Source: In-Stat, 01/09

**Figure 24. Semiconductor Sales to the Automotive Market, by Product Type, 2004–2013
(US\$ in Billions)**



Note: Discrete, O & S = Discrete, Optoelectronic and Sensor.
Source: In-Stat, 1/09

**Figure 25. Semiconductor Sales to the Automotive Market, by Product Type, 2004–2013
(% of Total Revenue)**



Note: Discrete, O & S = Discrete, Optoelectronic and Sensor.
Source: In-Stat, 1/09

**Table 13. Semiconductor Sales to the Automotive Market, by Product Type, 2004–2013
(US\$ in Billions)**

	2004	2005	2006	2007	2008*	2009*	2010*	2011*	2012*	2013*
Discrete, O & S	\$ 4.5	\$ 5.3	\$ 5.5	\$ 5.7	\$ 5.9	\$ 4.5	\$ 5.6	\$ 6.3	\$ 7.1	\$ 7.8
% of Total	26.7%	29.0%	29.0%	27.2%	29.6%	29.2%	30.9%	31.2%	31.7%	31.9%
% Change	11.7%	17.0%	5.3%	2.8%	3.4%	-23.7%	25.3%	12.7%	12.5%	8.8%
Bipolar Digital	\$ 0.0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
% of Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
% Change	-70.5%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Analog	\$ 4.9	\$ 4.9	\$ 5.3	\$ 6.0	\$ 5.4	\$ 4.1	\$ 4.8	\$ 5.4	\$ 5.8	\$ 6.3
% of Total	29.2%	27.1%	27.7%	28.6%	27.4%	26.9%	26.1%	26.3%	25.9%	25.7%
% Change	18.9%	0.0%	7.7%	12.8%	-9.0%	-24.1%	15.2%	12.5%	9.0%	7.2%
MOS Micro	\$ 4.9	\$ 5.2	\$ 5.2	\$ 5.9	\$ 5.4	\$ 4.2	\$ 4.8	\$ 5.3	\$ 5.8	\$ 6.3
% of Total	29.0%	28.6%	27.1%	28.3%	27.3%	27.5%	26.5%	25.9%	25.8%	25.9%
% Change	25.5%	6.4%	-0.3%	14.6%	-8.6%	-22.0%	14.5%	8.8%	10.3%	8.5%
Logic	\$ 1.7	\$ 2.0	\$ 2.3	\$ 2.2	\$ 2.6	\$ 2.1	\$ 2.5	\$ 2.8	\$ 3.2	\$ 3.4
% of Total	10.3%	11.0%	11.9%	10.4%	13.1%	13.8%	13.9%	14.0%	14.0%	14.1%
% Change	85.8%	15.7%	13.7%	-4.8%	20.4%	-18.6%	19.1%	12.7%	10.6%	8.6%
MOS Memory	\$ 0.8	\$ 0.8	\$ 0.8	\$ 1.2	\$ 0.5	\$ 0.4	\$ 0.5	\$ 0.5	\$ 0.6	\$ 0.6
% of Total	4.8%	4.4%	4.3%	5.5%	2.6%	2.5%	2.6%	2.6%	2.5%	2.4%
% Change	20.0%	-0.8%	2.4%	41.3%	-55.3%	-25.9%	25.9%	10.2%	7.9%	2.6%
Total	\$ 16.8	\$ 18.2	\$ 19.1	\$ 20.9	\$ 19.9	\$ 15.4	\$ 18.2	\$ 20.3	\$ 22.5	\$ 24.3
% Change	23.1%	7.9%	5.1%	9.5%	-5.0%	-22.7%	18.8%	11.5%	10.6%	8.1%

Note: Discrete, O & S = Discrete, Optoelectronic and Sensor.
Source: In-Stat 01/09

Military

The military market (sometimes called the government market) share of the overall semiconductor market has been declining for many years, as the reliability of standard products has improved allowing them to replace the traditional “mil spec” parts in many military applications.

The military share of all semiconductors fell below 1% in 1999 and it has not risen above that level since then. Despite above average growth in 2005 through 2007, which may be due to replenishment of equipment lost in activities in the Middle East, we expect the military market to decline to its earlier level.

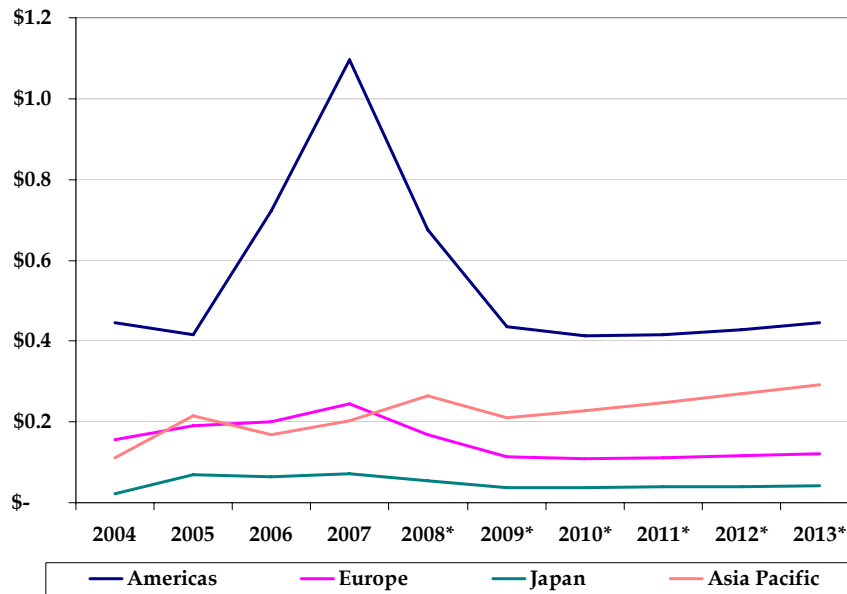
At such a low level, the historical reported data becomes suspect, both because there is tendency to apply more effort to compiling data for the larger segments and because small errors can have a large effect on the numbers. The product level detail (see Figure 29 and Table 15 later in this report) shows some large and uncorrelated year-to-year variations for individual categories (particularly in 2007), which increases our suspicion that some of the reported data is erroneous. For the purposes of this forecast we have assumed that the recent trending will continue, and have ignored the random one year spikes in revenue and share.

Although military hardware is often subject to government restrictions on outsourcing, we believe that the cost advantages of Asia/Pacific manufacturing will result in an ongoing, albeit slow, shifting of semiconductor consumption from the US to Asia/Pacific for use in less security sensitive products, and

that the 2006 and 2007 regional data points are an anomaly, perhaps related to urgent replenishment of electronic products that were used in Iraq.

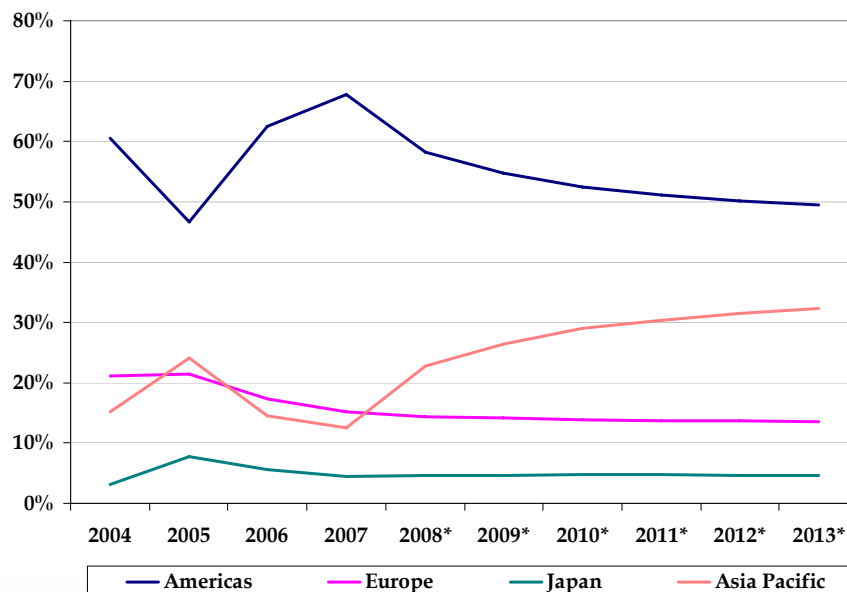
The regional data is shown in Figure 26, Figure 27, and Table 14. The product type detail is in Figure 28, Figure 29, and Table 15.

Figure 26. Semiconductor Sales to the Military Market, by Region, 2004–2013 (US\$ in Billions)



Source: In-Stat, 1/09

Figure 27. Semiconductor Sales to the Military Market, by Region, 2004–2013 (% of Total Revenue)



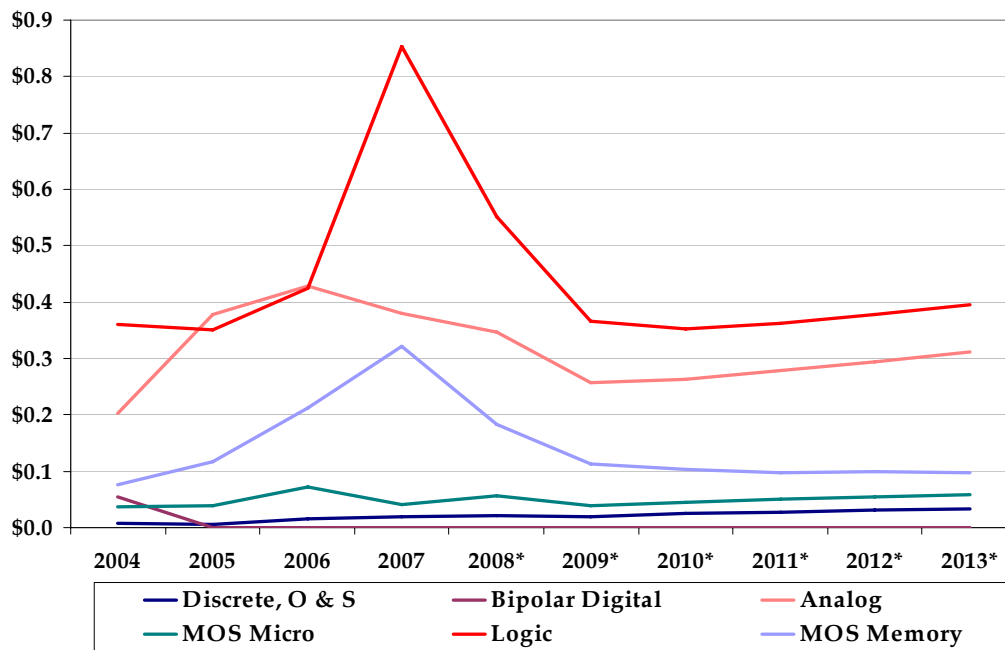
Source: In-Stat, 1/09

**Table 14. Semiconductor Sales to the Military Market, by Region, 2004–2013
(US\$ in Billions)**

	2004	2005	2006	2007	2008*	2009*	2010*	2011*	2012*	2013*
Americas	\$ 0.4	\$ 0.4	\$ 0.7	\$ 1.1	\$ 0.7	\$ 0.4	\$ 0.4	\$ 0.4	\$ 0.4	\$ 0.4
% of Total	60.5%	46.7%	62.5%	67.8%	58.3%	54.7%	52.4%	51.1%	50.1%	49.5%
% Change	-30.7%	-6.8%	73.5%	51.7%	-38.3%	-35.6%	-5.2%	0.8%	3.1%	3.6%
Europe	\$ 0.2	\$ 0.2	\$ 0.2	\$ 0.2	\$ 0.2	\$ 0.1	\$ 0.1	\$ 0.1	\$ 0.1	\$ 0.1
% of Total	21.2%	21.5%	17.3%	15.2%	14.4%	14.2%	13.9%	13.8%	13.7%	13.5%
% Change	-52.3%	22.4%	4.4%	23.1%	-31.9%	-32.2%	-3.7%	2.6%	4.7%	3.2%
Japan	\$ 0.0	\$ 0.1	\$ 0.1	\$ 0.1	\$ 0.1	\$ 0.0	\$ 0.0	\$ 0.0	\$ 0.0	\$ 0.0
% of Total	3.1%	7.7%	5.6%	4.4%	4.6%	4.7%	4.7%	4.7%	4.6%	4.6%
% Change	-51.9%	202.5%	-5.6%	10.4%	-25.1%	-30.4%	0.4%	3.1%	1.8%	5.5%
Asia Pacific	\$ 0.1	\$ 0.2	\$ 0.2	\$ 0.2	\$ 0.3	\$ 0.2	\$ 0.2	\$ 0.2	\$ 0.3	\$ 0.3
% of Total	15.2%	24.1%	14.6%	12.6%	22.7%	26.3%	29.0%	30.4%	31.6%	32.4%
% Change	-46.3%	90.9%	-21.8%	20.9%	29.7%	-20.5%	9.1%	8.4%	9.1%	7.6%
Total	\$ 0.7	\$ 0.9	\$ 1.2	\$ 1.6	\$ 1.2	\$ 0.8	\$ 0.8	\$ 0.8	\$ 0.9	\$ 0.9
% Change	-39.9%	20.7%	29.6%	40.0%	-28.2%	-31.4%	-1.0%	3.4%	5.1%	4.9%

Source: In-Stat, 01/09

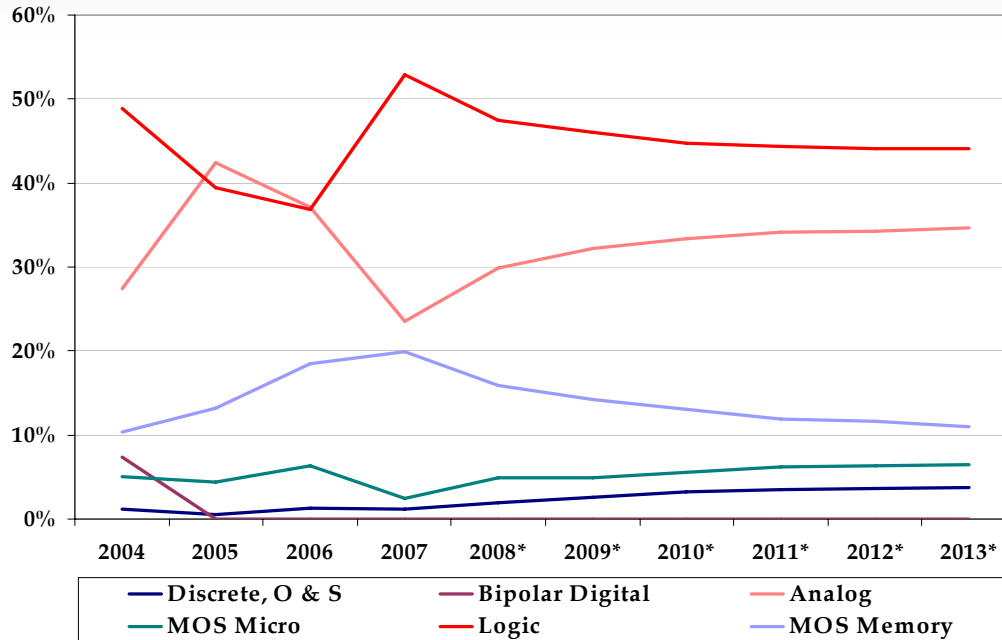
**Figure 28. Semiconductor Sales to the Military Market, by Product Type, 2004–2013
(US\$ in Billions)**



Note: Discrete, O & S = Discrete, Optoelectronic and Sensor.

Source: In-Stat, 1/09

**Figure 29. Semiconductor Sales to the Military Market, by Product Type, 2004–2013
(% of Total Revenue)**



Note: Discrete, O & S = Discrete, Optoelectronic and Sensor.
Source: In-Stat, 1/09

**Table 15. Semiconductor Sales to the Military Market, by Product Type, 2004–2013
(US\$ in Billions)**

	2004	2005	2006	2007	2008*	2009*	2010*	2011*	2012*	2013*
Discrete, O & S	\$ 0.0	\$ 0.0	\$ 0.0	\$ 0.0	\$ 0.0	\$ 0.0	\$ 0.0	\$ 0.0	\$ 0.0	\$ 0.0
% of Total	1.1%	0.6%	1.3%	1.2%	1.9%	2.5%	3.2%	3.5%	3.6%	3.8%
% Change	-97.4%	-39.8%	201.2%	32.4%	13.6%	-9.2%	26.5%	10.7%	10.2%	8.4%
Bipolar Digital	\$ 0.1	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
% of Total	7.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
% Change	211.7%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Analog	\$ 0.2	\$ 0.4	\$ 0.4	\$ 0.4	\$ 0.3	\$ 0.3	\$ 0.3	\$ 0.3	\$ 0.3	\$ 0.3
% of Total	27.3%	42.5%	37.1%	23.6%	29.9%	32.2%	33.4%	34.1%	34.3%	34.7%
% Change	-58.9%	87.3%	13.3%	-11.2%	-8.8%	-26.0%	2.4%	5.7%	5.7%	6.1%
MOS Micro	\$ 0.0	\$ 0.0	\$ 0.1	\$ 0.0	\$ 0.1	\$ 0.0	\$ 0.0	\$ 0.1	\$ 0.1	\$ 0.1
% of Total	5.0%	4.3%	6.3%	2.5%	4.9%	5.0%	5.6%	6.1%	6.3%	6.4%
% Change	-73.1%	4.9%	87.4%	-44.0%	39.4%	-30.3%	11.9%	13.3%	7.9%	7.3%
Logic	\$ 0.4	\$ 0.4	\$ 0.4	\$ 0.9	\$ 0.6	\$ 0.4	\$ 0.4	\$ 0.4	\$ 0.4	\$ 0.4
% of Total	48.8%	39.4%	36.9%	52.9%	47.4%	46.0%	44.7%	44.4%	44.1%	44.1%
% Change	92.9%	-2.6%	21.3%	100.7%	-35.5%	-33.5%	-3.7%	2.7%	4.5%	4.9%
MOS Memory	\$ 0.1	\$ 0.1	\$ 0.2	\$ 0.3	\$ 0.2	\$ 0.1	\$ 0.1	\$ 0.1	\$ 0.1	\$ 0.1
% of Total	10.3%	13.2%	18.5%	19.9%	15.9%	14.3%	13.1%	11.9%	11.6%	11.0%
% Change	-8.6%	54.8%	80.9%	50.7%	-42.7%	-38.3%	-9.1%	-6.0%	2.6%	-1.1%
Total	\$ 0.7	\$ 0.9	\$ 1.2	\$ 1.6	\$ 1.2	\$ 0.8	\$ 0.8	\$ 0.8	\$ 0.9	\$ 0.9
% Change	-39.9%	20.7%	29.6%	40.0%	-28.2%	-31.4%	-1.0%	3.4%	5.1%	4.9%

Note: Discrete, O & S = Discrete, Optoelectronic and Sensor.
Source: In-Stat 01/09

Regional Detail

Americas

The Americas region, which had held top regional ranking thru 2000, dropped behind Asia/Pacific in 2001, fell behind Japan in 2003, and, in 2004, dropped to last place, behind Europe. Asia/Pacific and Japan remain ahead, but the race with Europe has become a close one. In 2005, the Americas pulled back into third place and remained there in 2006 with a two percentage point edge. In 2007, the gap narrowed and, in 2008, became so small that Americas' place won't be known until the final numbers are tallied, although it now appears that Europe will be third by two tenths of a percentage point.

It would seem that, ultimately, Americas will fall into permanent occupancy of the cellar. Although the mass exodus of electronic manufacturing that picked up speed as a result of the 2001 downturn has slowed to a trickle, it has not stopped. We expect that the Americas share of semiconductor consumption to continue to decline throughout the forecast period.

Asia/Pacific's share has risen to over 50% on the strength of low-cost manufacturing. Japan's manufacturing model, while allowing offshore manufacturing, particularly for products slated for export markets, favors domestic manufacturing and short supply lines that would keep sub-assembly manufacturing near final assembly plants. Europe tends to lag the Americas in losing share because it is more difficult to close factories and eliminate workers in many countries in Europe than it is in the US. But the trend is downward in Europe and this is likely to prevent the Americas from recapturing third place during the current downturn.

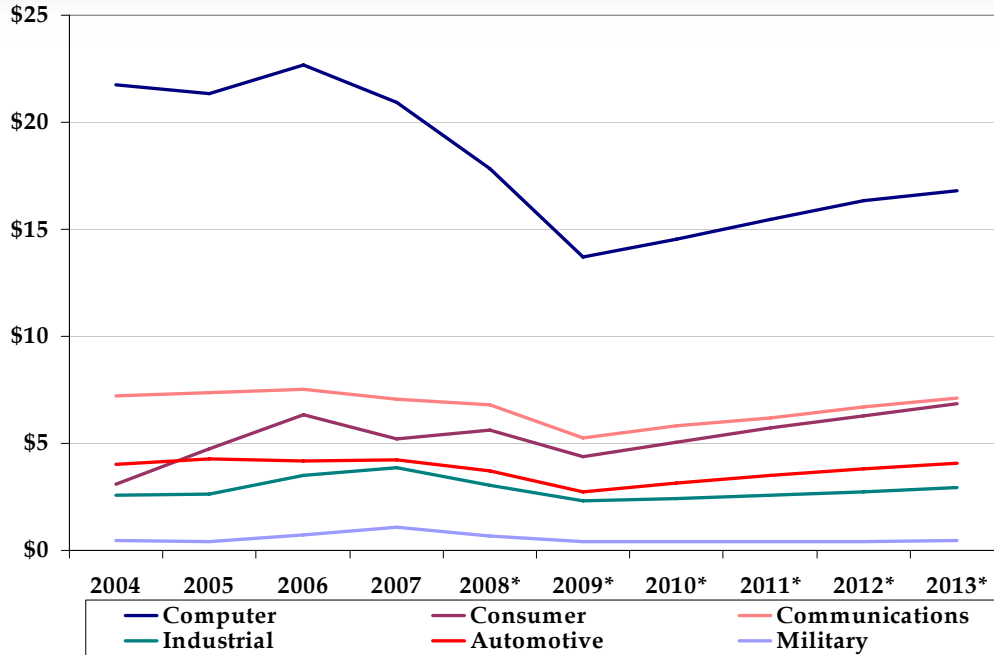
In addition, the Americas are becoming a smaller portion of the worldwide economy. The US, which is the dominant economy in the Americas, accounted for over 23% of worldwide GDP from 1996 through 2002. By 2007, this had declined to only 21.3%, as China, India, and other Asian countries grew their shares. These growing economies will consume an increasing share of electronic end products, which makes it unlikely that any significant amount of electronics manufacturing, and its associated semiconductor consumption, will revert to the Americas.

The caveats to this include trade barriers and developments in Mexico and Brazil. During the recent US presidential campaign, there was talk of raising trade barriers and there is always a risk of this happening during any periods of rising unemployment. However, most economists now agree that higher tariffs were a major factor in extending the 1930s depression and we think it unlikely that there will be any significant raising of trade barriers during the current downturn.

Elsewhere in the Americas, Mexico and Brazil are both large countries with potential for stronger economies that could boost domestic demand, which could be, at least partially, satisfied by local production. However, this would have only a minor effect on the overall Americas region.

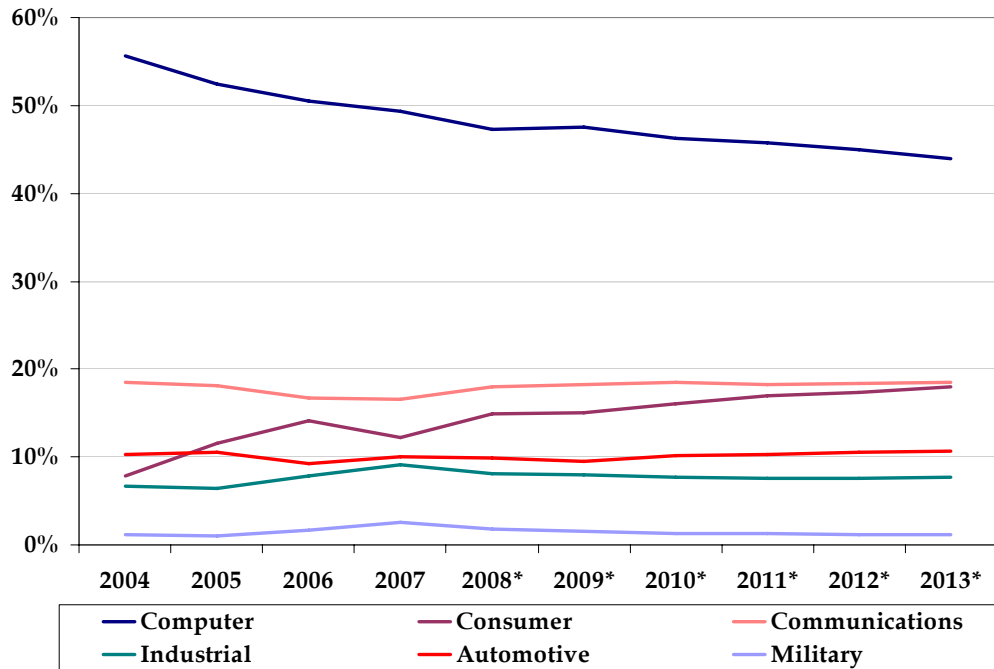
The Americas end-use forecast is shown in Figures 30 and 31, with the numbers included in Table 16, which follows the figures.

**Figure 30. Semiconductor Sales, by End-Use Market in the Americas, 2004–2013
(US\$ in Billions)**



Source: In-Stat, 1/09

**Figure 31. Semiconductor Sales, by End-Use Market in the Americas, 2004–2013
(% of Total Revenue)**



Source: In-Stat, 1/09

**Table 16. Semiconductor Sales, by End-Use Market in the Americas, 2004–2013
(US\$ in Billions)**

	2004	2005	2006	2007	2008*	2009*	2010*	2011*	2012*	2013*
Computer	\$ 21.7	\$ 21.3	\$ 22.7	\$ 20.9	\$ 17.8	\$ 13.7	\$ 14.5	\$ 15.4	\$ 16.3	\$ 16.8
% of Total	55.6%	52.4%	50.5%	49.4%	47.3%	47.5%	46.3%	45.7%	45.0%	43.9%
% Change	18.5%	-1.8%	6.3%	-7.8%	-14.8%	-23.0%	6.0%	6.2%	5.7%	2.8%
Consumer	\$ 3.1	\$ 4.7	\$ 6.4	\$ 5.2	\$ 5.6	\$ 4.4	\$ 5.1	\$ 5.7	\$ 6.3	\$ 6.9
% of Total	7.9%	11.6%	14.2%	12.3%	14.9%	15.1%	16.1%	16.9%	17.3%	17.9%
% Change	27.9%	53.4%	34.5%	-18.4%	8.0%	-22.2%	16.2%	12.9%	9.8%	9.3%
Communications	\$ 7.2	\$ 7.4	\$ 7.5	\$ 7.0	\$ 6.8	\$ 5.3	\$ 5.8	\$ 6.2	\$ 6.7	\$ 7.1
% of Total	18.5%	18.1%	16.7%	16.6%	18.0%	18.3%	18.5%	18.3%	18.4%	18.6%
% Change	31.0%	2.3%	1.9%	-6.4%	-3.6%	-22.2%	9.9%	6.4%	8.1%	6.2%
Industrial	\$ 2.6	\$ 2.6	\$ 3.5	\$ 3.9	\$ 3.0	\$ 2.3	\$ 2.4	\$ 2.6	\$ 2.8	\$ 2.9
% of Total	6.6%	6.4%	7.8%	9.1%	8.0%	8.0%	7.8%	7.6%	7.6%	7.7%
% Change	28.8%	0.8%	33.9%	10.9%	-21.8%	-23.5%	5.2%	5.5%	7.2%	6.9%
Automotive	\$ 4.0	\$ 4.3	\$ 4.2	\$ 4.2	\$ 3.7	\$ 2.8	\$ 3.2	\$ 3.5	\$ 3.8	\$ 4.1
% of Total	10.2%	10.5%	9.2%	10.0%	9.9%	9.6%	10.1%	10.3%	10.5%	10.7%
% Change	17.1%	6.7%	-2.8%	2.1%	-12.3%	-25.9%	14.9%	9.8%	9.6%	7.3%
Military	\$ 0.4	\$ 0.4	\$ 0.7	\$ 1.1	\$ 0.7	\$ 0.4	\$ 0.4	\$ 0.4	\$ 0.4	\$ 0.4
% of Total	1.1%	1.0%	1.6%	2.6%	1.8%	1.5%	1.3%	1.2%	1.2%	1.2%
% Change	-30.7%	-6.8%	73.5%	51.7%	-38.3%	-35.6%	-5.2%	0.8%	3.1%	3.6%
Total	\$ 39.1	\$ 40.7	\$ 44.9	\$ 42.3	\$ 37.6	\$ 28.9	\$ 31.4	\$ 33.8	\$ 36.3	\$ 38.2
% Change	20.8%	4.3%	10.3%	-5.7%	-11.1%	-23.3%	8.8%	7.6%	7.3%	5.3%

Source: In-Stat, 01/09

Europe

Europe's share of worldwide semiconductor sales has continued to drop. We estimate that, in 2008, its share was 15.4%, just barely ahead of the Americas' 15.2%. These positions could easily reverse when the final numbers for the year are tallied.

Both the Americas and Europe have been losing share to Asia/Pacific since the 2001 downturn increased the emphasis on cost and accelerated the shift to offshore manufacturing. But Europe has tended to lag the Americas in this shift because it is more difficult to close factories and eliminate workers in many European countries than it is in the US. Where the reaction to the downturn in the US may be to shift more manufacturing to lower cost areas, the reaction in Europe is more likely to be to slow the rate of shifting to preserve jobs. The Qimonda "bail out" effort is an early example of this.

Overall, we expect that the European economy will follow the US economy down with a slight time lag, European growth will bottom out at a slightly higher level than US growth, and European recovery will be slightly faster. This suggests that Europe will remain ahead of the Americas during the downturn and may slightly widen the gap.

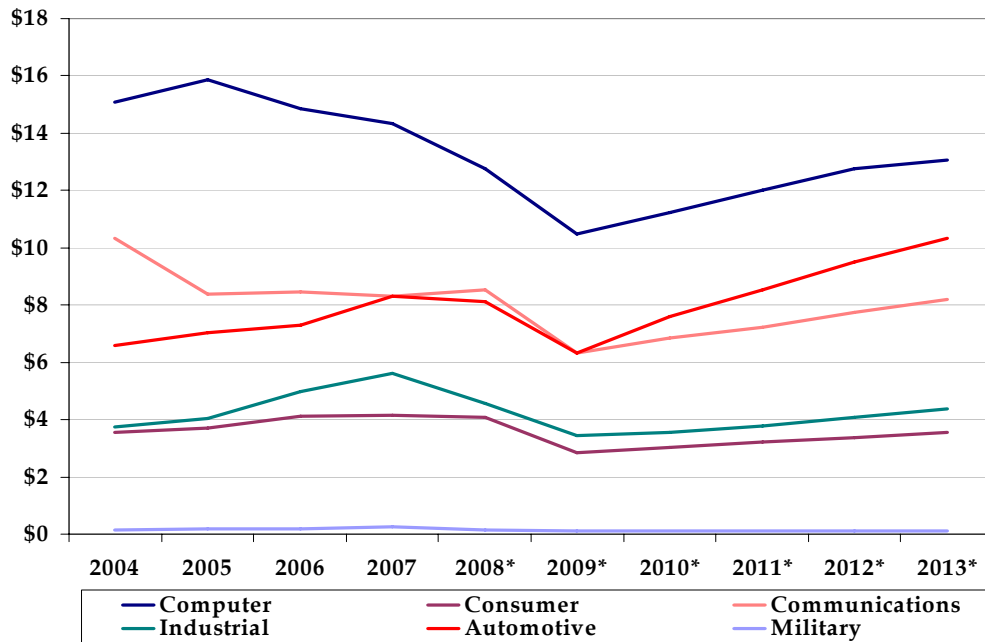
Europe's end-use profile differs most from the worldwide profile in that the automotive segment accounts for about 20% of semiconductor consumption, over double the worldwide share. This is in large part due to the high-end automobile business based there (Mercedes, BMW, Audi, etc.). These brands offer the advanced features with the greatest semiconductor content. But there is also large scale production of lower priced cars (Volkswagen, Renault, Fiat, etc.) that accounts for significant unit volume, and the Japanese brands have not gained the market share in Europe that they have in the US.

The industrial segment is also strong in Europe, accounting for 13.7% of semiconductor sales in 2007, compared to 8.0% worldwide. Certain countries, such as Germany, have long had a strong export

market for industrial machinery and further industrial development in China, India, and elsewhere should keep this industry strong in the long term.

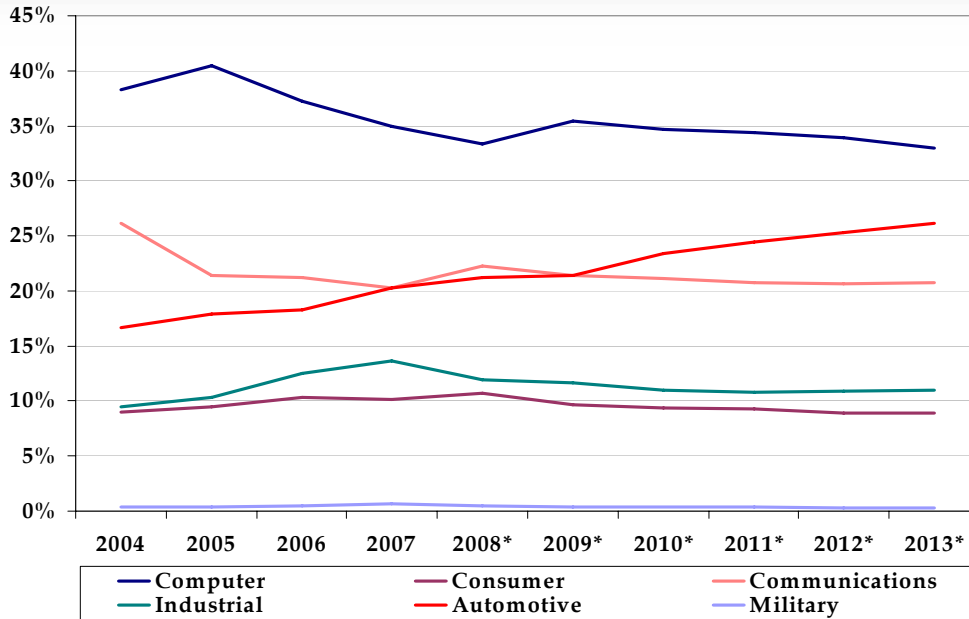
Figures 32 and 33 show the European recent history and forecast broken out by end-use segment. The corresponding data is in Table 17, following the figures.

**Figure 32. Semiconductor Sales, by End-Use Market in Europe, 2004–2013
(US\$ in Billions)**



Source: In-Stat, 1/09

**Figure 33. Semiconductor Sales, by End-Use Market in Europe, 2004–2013
(% of Total Revenue)**



Source: In-Stat, 1/09

**Table 17. Semiconductor Sales, by End-Use Market in Europe, 2004–2013
(US\$ in Billions)**

	2004	2005	2006	2007	2008*	2009*	2010*	2011*	2012*	2013*
Computer	\$ 15.1	\$ 15.9	\$ 14.9	\$ 14.3	\$ 12.7	\$ 10.5	\$ 11.2	\$ 12.0	\$ 12.7	\$ 13.0
% of Total	38.3%	40.4%	37.2%	35.0%	33.4%	35.4%	34.7%	34.4%	33.9%	32.9%
% Change	17.9%	5.2%	-6.4%	-3.5%	-11.1%	-17.8%	7.1%	7.0%	6.1%	2.4%
Consumer	\$ 3.6	\$ 3.7	\$ 4.1	\$ 4.2	\$ 4.1	\$ 2.9	\$ 3.0	\$ 3.2	\$ 3.4	\$ 3.5
% of Total	9.0%	9.4%	10.3%	10.2%	10.7%	9.7%	9.4%	9.3%	8.9%	8.9%
% Change	40.5%	4.1%	11.4%	1.0%	-1.8%	-30.3%	6.2%	6.5%	3.9%	5.4%
Communications	\$ 10.3	\$ 8.4	\$ 8.5	\$ 8.3	\$ 8.5	\$ 6.3	\$ 6.8	\$ 7.2	\$ 7.8	\$ 8.2
% of Total	26.2%	21.4%	21.2%	20.3%	22.3%	21.4%	21.1%	20.7%	20.7%	20.7%
% Change	26.7%	-18.6%	0.6%	-1.7%	2.5%	-25.6%	8.0%	5.6%	7.4%	5.7%
Industrial	\$ 3.7	\$ 4.1	\$ 5.0	\$ 5.6	\$ 4.6	\$ 3.4	\$ 3.6	\$ 3.8	\$ 4.1	\$ 4.4
% of Total	9.5%	10.3%	12.5%	13.7%	11.9%	11.6%	11.0%	10.8%	10.9%	11.0%
% Change	12.4%	8.8%	22.7%	12.7%	-18.8%	-24.6%	3.9%	5.9%	7.7%	7.2%
Automotive	\$ 6.6	\$ 7.0	\$ 7.3	\$ 8.3	\$ 8.1	\$ 6.3	\$ 7.6	\$ 8.5	\$ 9.5	\$ 10.3
% of Total	16.7%	17.9%	18.3%	20.3%	21.3%	21.4%	23.4%	24.5%	25.3%	26.1%
% Change	26.7%	7.1%	3.5%	13.8%	-2.2%	-22.0%	19.7%	12.5%	11.3%	8.9%
Military	\$ 0.2	\$ 0.2	\$ 0.2	\$ 0.2	\$ 0.2	\$ 0.1	\$ 0.1	\$ 0.1	\$ 0.1	\$ 0.1
% of Total	0.4%	0.5%	0.5%	0.6%	0.4%	0.4%	0.3%	0.3%	0.3%	0.3%
% Change	-52.3%	22.4%	4.4%	23.1%	-31.9%	-32.2%	-3.7%	2.6%	4.7%	3.2%
Total	\$ 39.4	\$ 39.3	\$ 39.9	\$ 41.0	\$ 38.2	\$ 29.5	\$ 32.4	\$ 34.9	\$ 37.5	\$ 39.6
% Change	22.0%	-0.4%	1.6%	2.7%	-6.8%	-22.6%	9.5%	7.8%	7.6%	5.5%

Source: In-Stat, 01/09

Japan

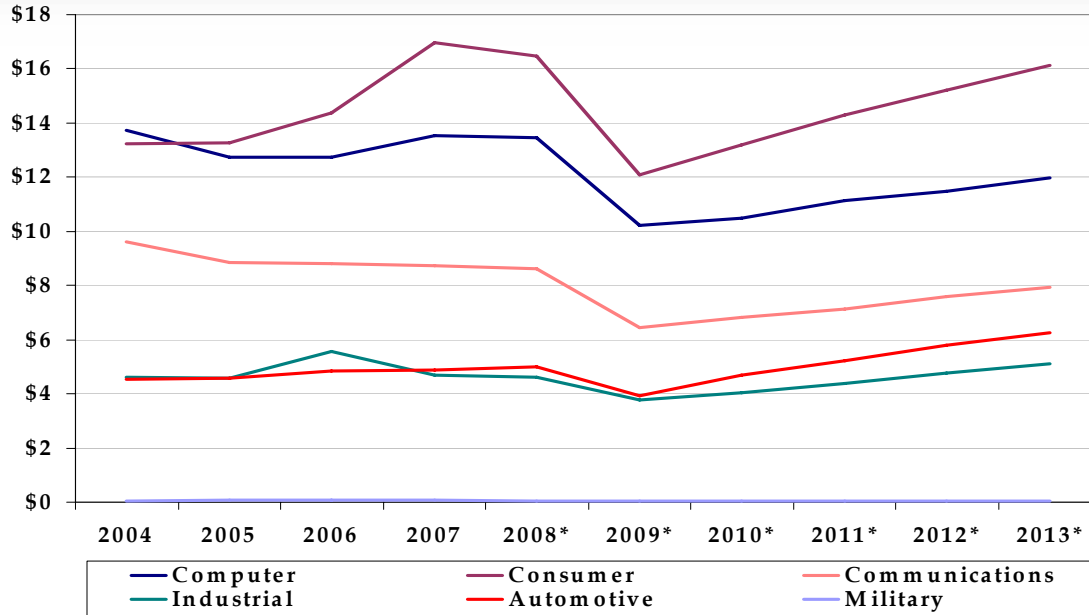
Japan's share of the worldwide semiconductor market is estimated to have been 19.5% in 2008, up slightly from 2007's 19.1%. Although there have been occasional up years recently, the general trend is downward, and we expect that Japan will continue to experience small declines in share throughout the forecast period. However, we also expect that Japan will maintain its second place ranking ahead of both the Americas and Europe.

Although Japan accounted for only 6.6% of worldwide GDP in 2007, it was responsible for 19.1% of semiconductor revenue, which is indicative of its dependence on exports. It has had its own economic problems for over a decade, but was beginning to see GDP growth approach that of the world's other advanced economies. The downturn will undoubtedly interrupt this recovery some, but Japan may be hurt less than some other advanced economies because many of the underlying problems facing other countries have already been dealt with in Japan. Also, its proximity to the Chinese market, and its early involvement there, will provide some support to its exports.

A large part of Japan's semiconductor usage is in the consumer segment. Where about 20% of the worldwide semiconductor market is in the consumer segment, in Japan that share is over 30%. Japan is the only region where the consumer segment has a larger share than the computer segment. This gives Japan a unique profile of semiconductor type consumption. MOS micros and memory form a smaller share of the Japanese market than they do of the other regional markets, while other types have higher shares.

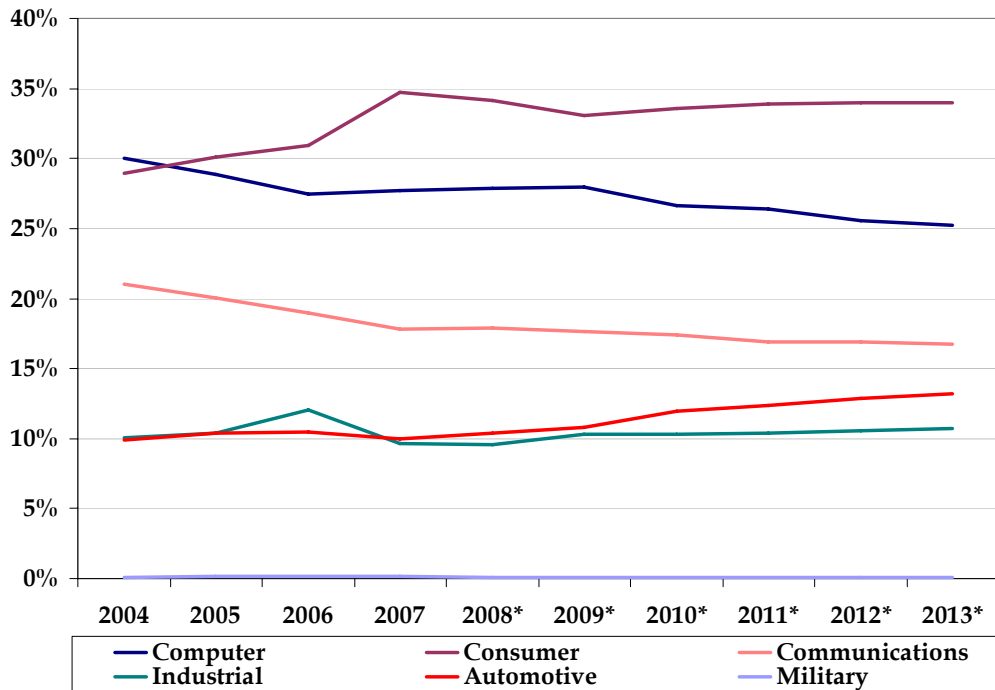
The forecasted revenue, by market segment, is shown in Figure 34 with the percent of total revenue data plotted in Figure 35. The data for both graphs is included in Table 18, which follows the figures.

**Figure 34. Semiconductor Sales, by End-Use Market in Japan, 2004–2013
(US\$ in Billions)**



Source: In-Stat, 1/09

**Figure 35. Semiconductor Sales, by End-Use Market in Japan, 2004–2013
(% of Total Revenue)**



Source: In-Stat, 1/09

**Table 18. Semiconductor Sales, by End-Use Market in Japan, 2004–2013
(US\$ in Billions)**

	2004	2005	2006	2007	2008*	2009*	2010*	2011*	2012*	2013*
Computer	\$ 13.7	\$ 12.7	\$ 12.7	\$ 13.5	\$ 13.5	\$ 10.2	\$ 10.5	\$ 11.1	\$ 11.5	\$ 12.0
% of Total	30.0%	28.9%	27.4%	27.7%	27.9%	28.0%	26.7%	26.4%	25.6%	25.2%
% Change	12.9%	-7.3%	0.0%	6.3%	-0.5%	-24.1%	2.6%	6.2%	3.2%	4.2%
Consumer	\$ 13.3	\$ 13.3	\$ 14.4	\$ 17.0	\$ 16.5	\$ 12.1	\$ 13.2	\$ 14.3	\$ 15.2	\$ 16.1
% of Total	29.0%	30.1%	31.0%	34.7%	34.2%	33.1%	33.6%	33.9%	33.9%	34.0%
% Change	25.6%	0.3%	8.1%	18.1%	-2.8%	-26.7%	9.2%	8.3%	6.6%	6.0%
Communications	\$ 9.6	\$ 8.8	\$ 8.8	\$ 8.7	\$ 8.6	\$ 6.5	\$ 6.8	\$ 7.1	\$ 7.6	\$ 8.0
% of Total	21.0%	20.1%	19.0%	17.8%	17.9%	17.7%	17.4%	16.9%	16.9%	16.8%
% Change	3.6%	-8.0%	-0.3%	-1.2%	-1.0%	-25.3%	5.8%	4.5%	6.2%	5.0%
Industrial	\$ 4.6	\$ 4.6	\$ 5.6	\$ 4.7	\$ 4.6	\$ 3.8	\$ 4.0	\$ 4.4	\$ 4.8	\$ 5.1
% of Total	10.1%	10.4%	12.0%	9.6%	9.5%	10.3%	10.3%	10.4%	10.6%	10.7%
% Change	34.5%	-0.9%	22.0%	-15.6%	-2.1%	-18.0%	7.2%	7.9%	8.8%	7.3%
Automotive	\$ 4.5	\$ 4.6	\$ 4.9	\$ 4.9	\$ 5.0	\$ 3.9	\$ 4.7	\$ 5.2	\$ 5.8	\$ 6.2
% of Total	9.9%	10.4%	10.5%	10.0%	10.4%	10.8%	12.0%	12.4%	12.9%	13.2%
% Change	30.2%	1.4%	6.0%	0.0%	3.0%	-21.3%	19.2%	11.4%	10.5%	8.0%
Military	\$ 0.0	\$ 0.1	\$ 0.1	\$ 0.1	\$ 0.1	\$ 0.0	\$ 0.0	\$ 0.0	\$ 0.0	\$ 0.0
% of Total	0.0%	0.2%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
% Change	-51.9%	202.5%	-5.6%	10.4%	-25.1%	-30.4%	0.4%	3.1%	1.8%	5.5%
Total	\$ 45.8	\$ 44.1	\$ 46.4	\$ 48.8	\$ 48.3	\$ 36.5	\$ 39.3	\$ 42.2	\$ 44.9	\$ 47.5
% Change	17.5%	-3.7%	5.3%	5.2%	-1.2%	-24.4%	7.6%	7.4%	6.4%	5.8%

Source: In-Stat, 01/09

Asia/Pacific

Asia/Pacific once again grew its share of semiconductor consumption, breaking through the 50% level in mid 2008, but falling back somewhat at year end. It is estimated to have ended the year with 49.9%, up from 48.3% in 2007. In 2009, the Asia/Pacific share is expected to exceed 50% for the first time ever. No single region has accounted for over half of all semiconductor sales since the Americas dropped below that level in 1984 (when the Japanese share increased thanks to high DRAM prices). At that time, the Asia/Pacific share was 6%!

Although Asia/Pacific is synonymous with China for many people, less than half of the Asia/Pacific semiconductor sales were actually in China. This is consistent with the electronic production data reported by In-Stat's sister company, Reed Electronic Research, which showed 47% of 2008 electronic production to be in Asia/Pacific, including 25% in China. About three quarters of the remaining Asia/Pacific electronic production is done in (in decreasing order) South Korea, Malaysia, Singapore, Taiwan, Thailand, India, and the Philippines.

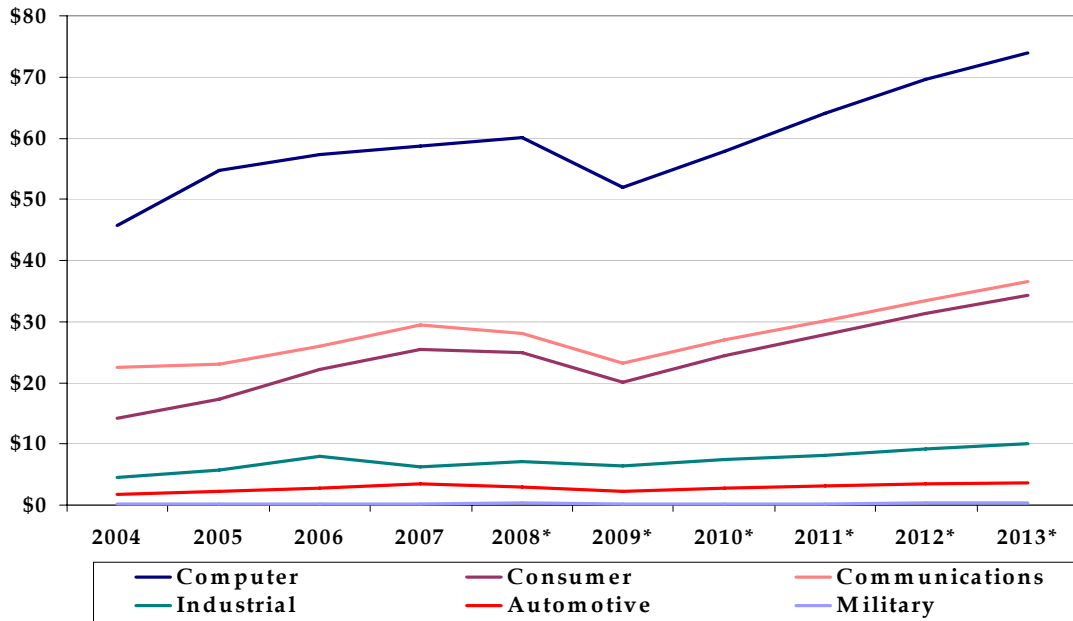
Asia/Pacific has nearly doubled its share of semiconductor consumption since 2000, when it first hit the 25% share level. This growth was driven by shifts of production from the other regions to lower production costs. Some future gains may come from additional "offshoring" in the advanced economies, but domestic demand will play an increasing role in Asia/Pacific's growth. This will be particularly important during the 2009 downturn, when developing and emerging economies are expected to see stronger economic performance than the advanced economies that constitute Asia/Pacific's export markets.

At such a large share of the worldwide market, Asia/Pacific's profile closely resembles the profile of the worldwide market. The largest difference is in the automotive segment, where Asia/Pacific's 2% to 3% share is well below the worldwide figure, which is in the 8% area. This difference is due to the automobile industry's emphasis on just-in-time inventory systems, which require sub-assembly manufacturing to be

done in close proximity to assembly lines. Since semiconductors are a very small part of the factory cost of an automobile, this is unlikely to change.

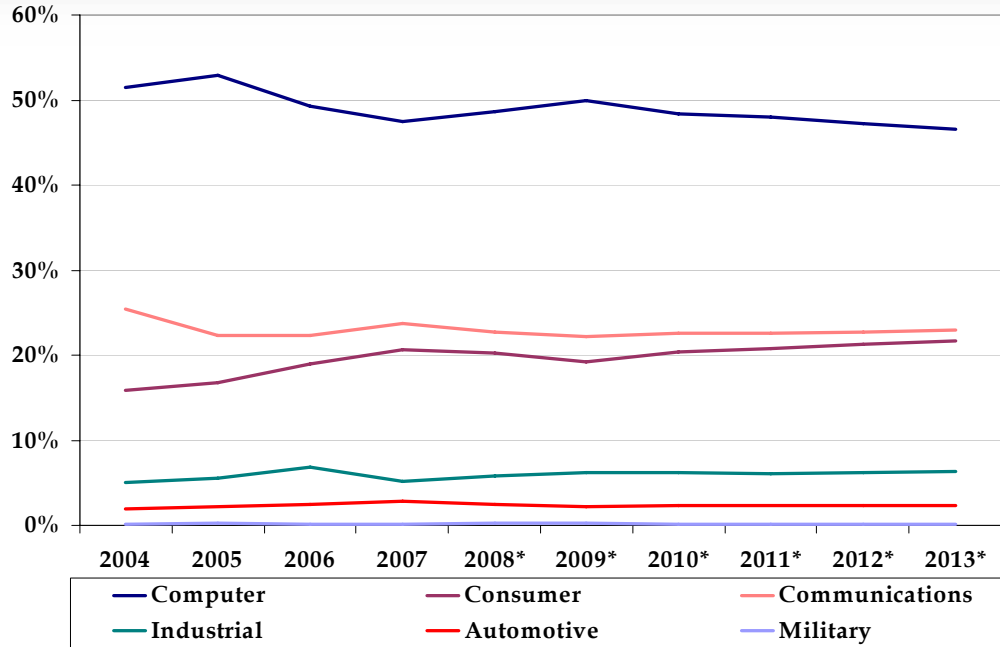
Figures 36 and 37 show the revenue by end-use segment and percent of total revenue, respectively, while the numbers behind these graphs are in Table 19, following the figures.

**Figure 36. Semiconductor Sales, by End-Use Market in Asia/Pacific, 2004–2013
(US\$ in Billions)**



Source: In-Stat, 1/09

Figure 37. Semiconductor Sales, by End-Use Market in Asia/Pacific, 2004–2013
(% of Total Revenue)



Source: In-Stat, 1/09

Table 19. Semiconductor Sales, by End-Use Market in Asia/Pacific, 2004–2013
(US\$ in Billions)

	2004	2005	2006	2007	2008*	2009*	2010*	2011*	2012*	2013*
Computer	\$ 45.7	\$ 54.7	\$ 57.4	\$ 58.7	\$ 60.2	\$ 52.0	\$ 57.9	\$ 64.1	\$ 69.6	\$ 73.9
% of Total	51.5%	52.9%	49.3%	47.5%	48.7%	49.9%	48.4%	48.0%	47.3%	46.5%
% Change	33.6%	19.8%	4.8%	2.2%	2.6%	-13.5%	11.3%	10.7%	8.6%	6.2%
Consumer	\$ 14.1	\$ 17.4	\$ 22.1	\$ 25.4	\$ 25.0	\$ 20.1	\$ 24.4	\$ 27.8	\$ 31.4	\$ 34.3
% of Total	15.9%	16.8%	19.0%	20.6%	20.2%	19.3%	20.4%	20.8%	21.3%	21.6%
% Change	44.8%	23.0%	27.2%	15.0%	-1.8%	-19.5%	21.3%	14.1%	12.7%	9.5%
Communications	\$ 22.6	\$ 23.0	\$ 26.0	\$ 29.4	\$ 28.0	\$ 23.2	\$ 27.0	\$ 30.1	\$ 33.4	\$ 36.5
% of Total	25.4%	22.3%	22.3%	23.8%	22.7%	22.2%	22.6%	22.5%	22.7%	23.0%
% Change	59.4%	1.9%	13.0%	12.9%	-4.7%	-17.3%	16.5%	11.5%	11.0%	9.3%
Industrial	\$ 4.5	\$ 5.7	\$ 8.0	\$ 6.3	\$ 7.2	\$ 6.5	\$ 7.4	\$ 8.2	\$ 9.2	\$ 10.1
% of Total	5.1%	5.6%	6.8%	5.1%	5.8%	6.2%	6.2%	6.1%	6.2%	6.4%
% Change	55.7%	27.9%	38.9%	-21.1%	13.7%	-9.7%	14.1%	10.8%	12.0%	10.2%
Automotive	\$ 1.7	\$ 2.3	\$ 2.8	\$ 3.5	\$ 3.0	\$ 2.3	\$ 2.8	\$ 3.1	\$ 3.4	\$ 3.7
% of Total	2.0%	2.2%	2.4%	2.8%	2.5%	2.2%	2.3%	2.3%	2.3%	2.3%
% Change	8.7%	30.7%	23.0%	25.8%	-13.9%	-23.2%	20.0%	10.9%	10.3%	7.2%
Military	\$ 0.1	\$ 0.2	\$ 0.2	\$ 0.2	\$ 0.3	\$ 0.2	\$ 0.2	\$ 0.2	\$ 0.3	\$ 0.3
% of Total	0.1%	0.2%	0.1%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
% Change	-46.3%	90.9%	-21.8%	20.9%	29.7%	-20.5%	9.1%	8.4%	9.1%	7.6%
Total	\$ 88.8	\$ 103.4	\$ 116.5	\$ 123.5	\$ 123.6	\$ 104.3	\$ 119.6	\$ 133.5	\$ 147.2	\$ 158.8
% Change	41.3%	16.5%	12.7%	6.0%	0.1%	-15.6%	14.7%	11.6%	10.2%	7.9%

Source: In-Stat, 01/09

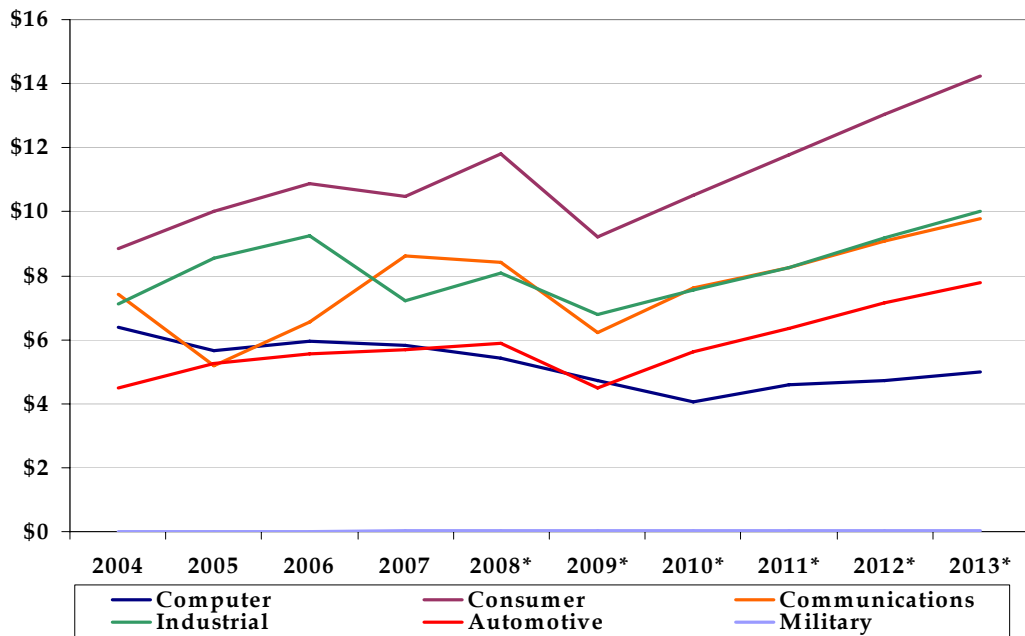
Product Detail

The detailed breakouts in the earlier sections of this report can be combined to result in a set of data that breaks out each product category by application. For completeness, those breakouts have been generated and are presented below for the reader’s convenience without further commentary.

Discrete, Optical and Sensor

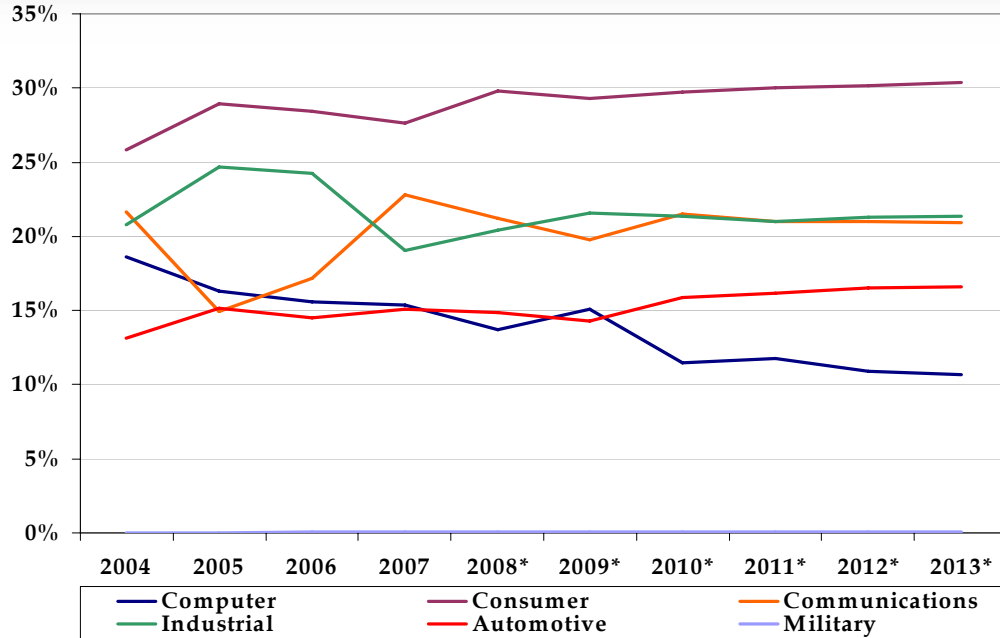
Note that in the figures and tables earlier in this report, this category may have been abbreviated to D, O & S.

**Figure 38. Discrete, Optical, and Sensor Sales, by End-Use, 2004–2013
(US\$ in Billions)**



Source: In-Stat, 1/09

**Figure 39. Discrete, Optical, and Sensor Sales, by End-Use, 2004–2013
(% of Total Revenue)**



Source: In-Stat, 1/09

**Table 20. Discrete, Optical, and Sensor Sales, by End-Use, 2004–2013
(US\$ in Billions)**

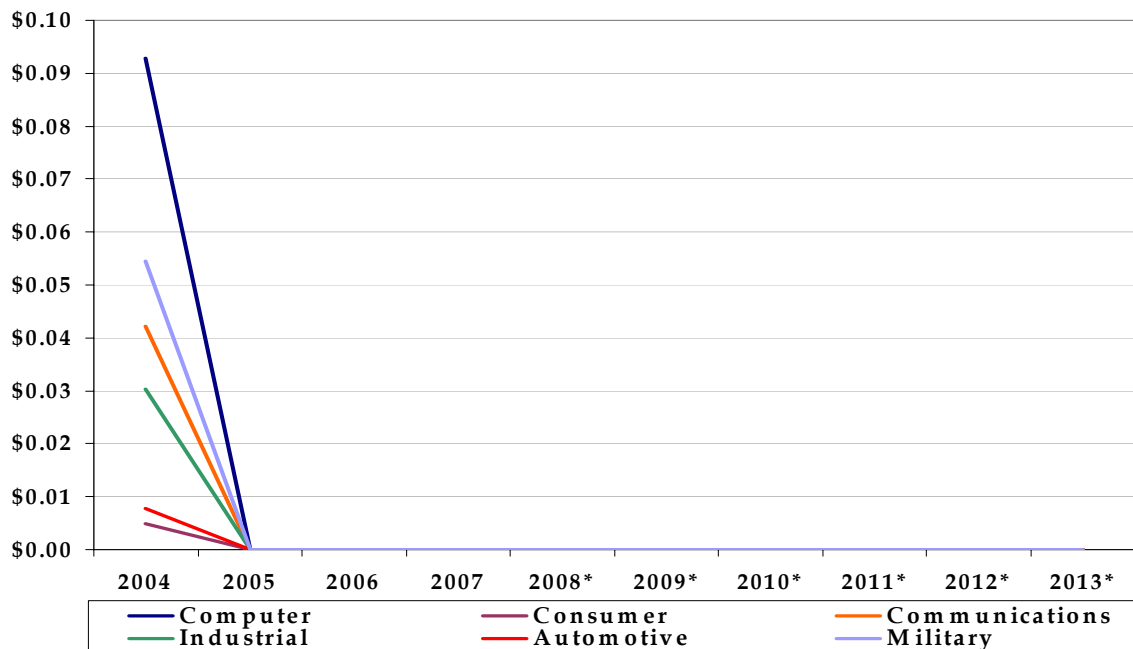
	2004	2005	2006	2007	2008*	2009*	2010*	2011*	2012*	2013*
Computer	\$ 6.4	\$ 5.6	\$ 6.0	\$ 5.8	\$ 5.4	\$ 4.7	\$ 4.1	\$ 4.6	\$ 4.7	\$ 5.0
% of Total	18.6%	16.3%	15.6%	15.4%	13.7%	15.1%	11.5%	11.7%	10.9%	10.7%
% Change	23.5%	-11.5%	5.4%	-2.2%	-6.7%	-12.7%	-14.3%	13.3%	2.6%	5.8%
Consumer	\$ 8.8	\$ 10.0	\$ 10.9	\$ 10.5	\$ 11.8	\$ 9.2	\$ 10.5	\$ 11.8	\$ 13.0	\$ 14.2
% of Total	25.8%	28.9%	28.5%	27.7%	29.8%	29.3%	29.7%	30.0%	30.2%	30.4%
% Change	34.1%	13.4%	8.4%	-3.7%	12.8%	-21.9%	14.0%	11.8%	10.9%	9.1%
Communications	\$ 7.4	\$ 5.2	\$ 6.6	\$ 8.6	\$ 8.4	\$ 6.2	\$ 7.6	\$ 8.2	\$ 9.1	\$ 9.8
% of Total	21.6%	15.0%	17.2%	22.8%	21.2%	19.8%	21.5%	21.0%	21.0%	20.9%
% Change	22.6%	-30.0%	26.6%	31.3%	-2.6%	-26.0%	22.4%	8.1%	10.2%	7.9%
Industrial	\$ 7.1	\$ 8.6	\$ 9.3	\$ 7.2	\$ 8.1	\$ 6.8	\$ 7.6	\$ 8.2	\$ 9.2	\$ 10.0
% of Total	20.8%	24.7%	24.2%	19.1%	20.4%	21.6%	21.4%	21.0%	21.3%	21.4%
% Change	64.8%	20.3%	8.2%	-22.1%	12.1%	-16.1%	11.5%	8.9%	11.5%	8.9%
Automotive	\$ 4.5	\$ 5.3	\$ 5.5	\$ 5.7	\$ 5.9	\$ 4.5	\$ 5.6	\$ 6.3	\$ 7.1	\$ 7.8
% of Total	13.1%	15.2%	14.5%	15.1%	14.9%	14.3%	15.9%	16.2%	16.5%	16.6%
% Change	11.7%	17.0%	5.3%	2.8%	3.4%	-23.7%	25.3%	12.7%	12.5%	8.8%
Military	\$ 0.0	\$ 0.0	\$ 0.0	\$ 0.0	\$ 0.0	\$ 0.0	\$ 0.0	\$ 0.0	\$ 0.0	\$ 0.0
% of Total	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
% Change	-97.4%	-39.8%	201.2%	32.4%	13.6%	-9.2%	26.5%	10.7%	10.2%	8.4%
Total	\$ 34.3	\$ 34.7	\$ 38.2	\$ 37.8	\$ 39.6	\$ 31.5	\$ 35.4	\$ 39.2	\$ 43.2	\$ 46.8
% Change	29.5%	1.3%	10.1%	-1.0%	4.8%	-20.6%	12.5%	10.7%	10.2%	8.4%

Source: In-Stat 01/09

Digital Bipolar

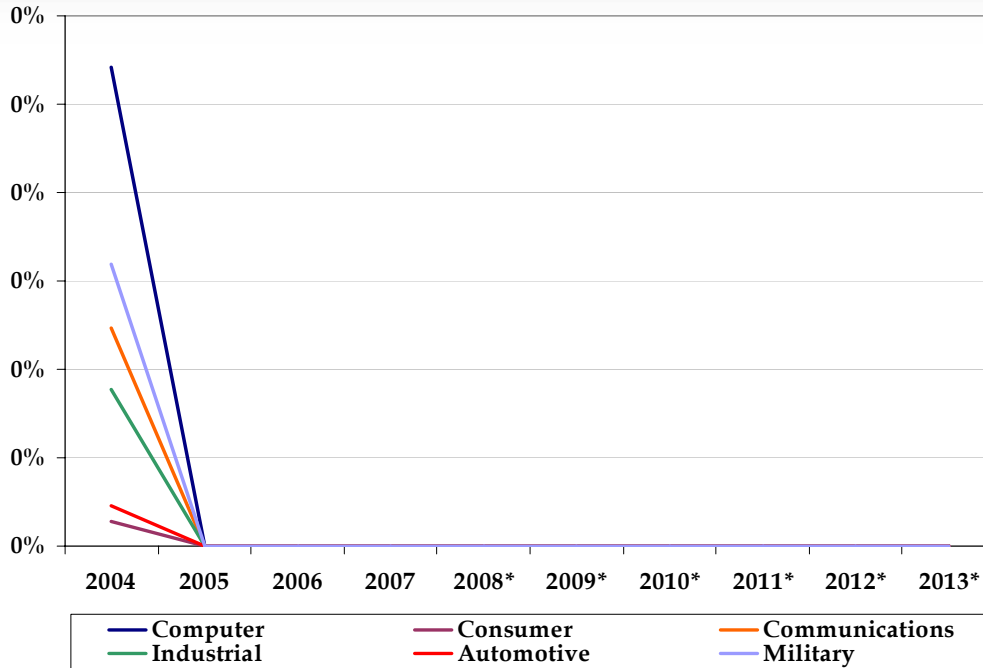
Digital bipolar is no longer a separate category. Since 2005, digital bipolar parts have been included in the logic category. See the *Global Semiconductor Product Market Forecast—Help Wanted: Spenders and Lenders* report #IN0904559SSF, for more details. The following tables and figures show historical data through 2004 and are included for completeness.

Figure 40. Digital Bipolar Sales, by End-Use, 2004–2013 (US\$ in Billions)



Source: In-Stat, 1/09

**Figure 41. Digital Bipolar Sales, by End-Use, 2004–2013
(% of Total Revenue)**



Source: In-Stat, 1/09

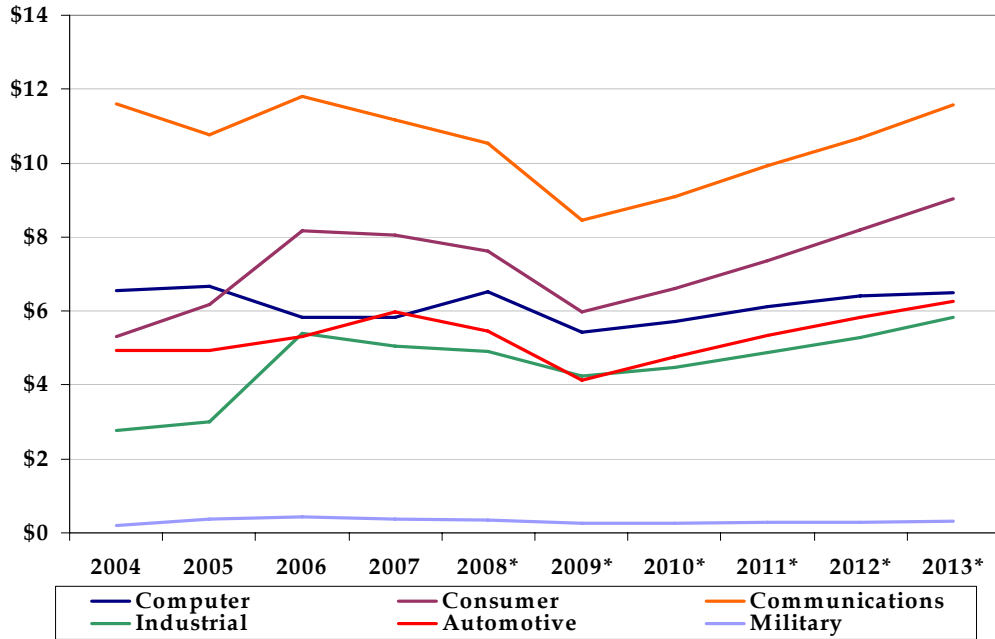
**Table 21. Digital Bipolar Sales by End-Use, 2004–2013
(US\$ in Billions)**

	2004	2005	2006	2007	2008*	2009*	2010*	2011*	2012*	2013*
Computer	\$ 0.1	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
% of Total	0.3%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
% Change	35.8%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Consumer	\$ 0.0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
% of Total	0.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
% Change	-62.2%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Communications	\$ 0.0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
% of Total	0.1%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
% Change	-21.2%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Industrial	\$ 0.0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
% of Total	0.1%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
% Change	-20.6%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Automotive	\$ 0.0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
% of Total	0.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
% Change	-70.5%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Military	\$ 0.1	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
% of Total	0.2%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
% Change	211.7%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Total	\$ 0.2	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
% Change	7.2%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Source: In-Stat 01/09

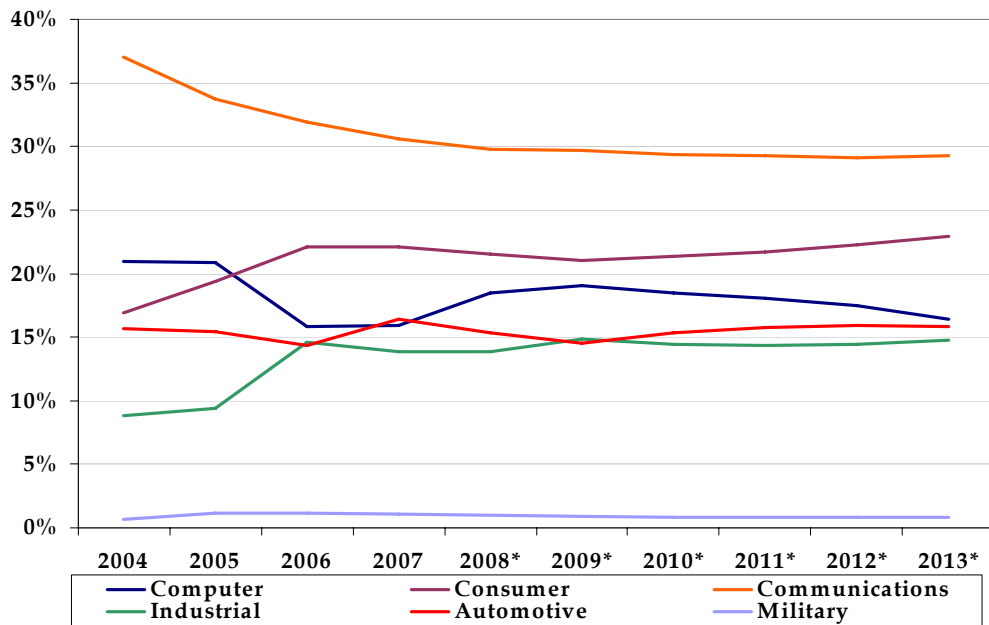
Analog

**Figure 42. Analog Sales, by End-Use, 2004–2013
(US\$ in Billions)**



Source: In-Stat, 1/09

**Figure 43. Analog Sales, by End-Use, 2004–2013
(% of Total Revenue)**



Source: In-Stat, 1/09

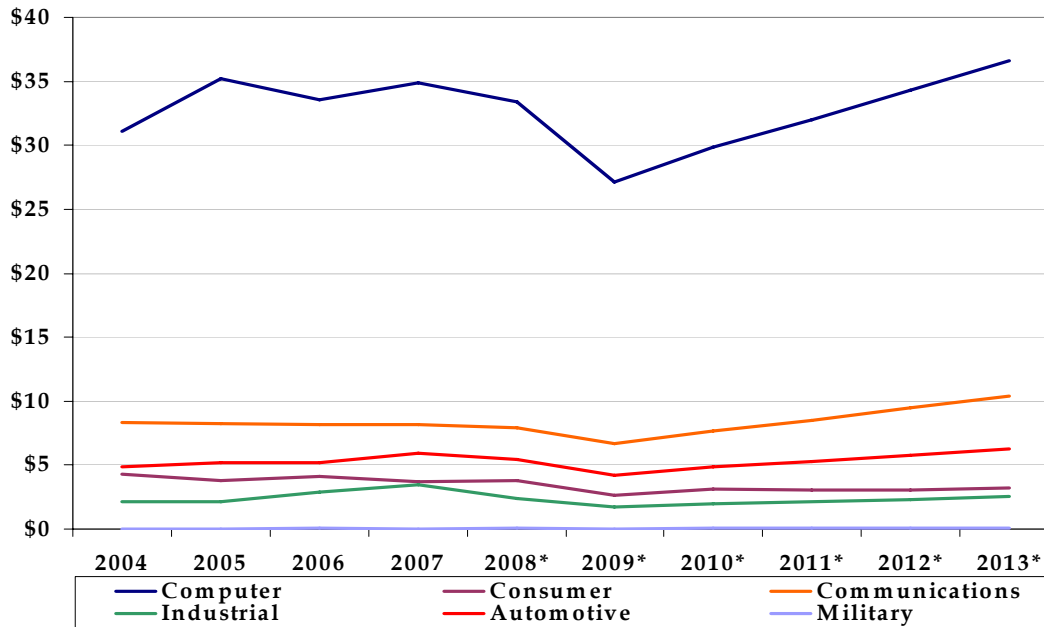
**Table 22. Analog Sales, by End-Use, 2004–2013
(US\$ in Billions)**

	2004	2005	2006	2007	2008*	2009*	2010*	2011*	2012*	2013*
Computer	\$ 6.6	\$ 6.7	\$ 5.8	\$ 5.8	\$ 6.5	\$ 5.4	\$ 5.7	\$ 6.1	\$ 6.4	\$ 6.5
% of Total	20.9%	20.9%	15.8%	16.0%	18.5%	19.1%	18.5%	18.0%	17.5%	16.4%
% Change	20.1%	1.5%	-12.4%	-0.3%	12.2%	-16.7%	5.3%	6.7%	4.9%	1.1%
Consumer	\$ 5.3	\$ 6.2	\$ 8.2	\$ 8.0	\$ 7.6	\$ 6.0	\$ 6.6	\$ 7.4	\$ 8.2	\$ 9.0
% of Total	16.9%	19.4%	22.1%	22.1%	21.5%	21.0%	21.4%	21.7%	22.3%	22.9%
% Change	9.2%	16.8%	32.1%	-1.6%	-5.4%	-21.4%	10.7%	11.1%	11.2%	10.5%
Communications	\$ 11.6	\$ 10.8	\$ 11.8	\$ 11.2	\$ 10.5	\$ 8.5	\$ 9.1	\$ 9.9	\$ 10.7	\$ 11.6
% of Total	37.0%	33.7%	32.0%	30.6%	29.8%	29.7%	29.4%	29.3%	29.1%	29.3%
% Change	22.8%	-7.3%	9.6%	-5.4%	-5.5%	-19.8%	7.6%	9.2%	7.5%	8.3%
Industrial	\$ 2.8	\$ 3.0	\$ 5.4	\$ 5.1	\$ 4.9	\$ 4.2	\$ 4.5	\$ 4.9	\$ 5.3	\$ 5.8
% of Total	8.8%	9.4%	14.6%	13.9%	13.9%	14.9%	14.5%	14.4%	14.4%	14.8%
% Change	15.7%	8.5%	79.8%	-6.0%	-3.0%	-13.8%	5.8%	8.8%	8.7%	10.1%
Automotive	\$ 4.9	\$ 4.9	\$ 5.3	\$ 6.0	\$ 5.4	\$ 4.1	\$ 4.8	\$ 5.4	\$ 5.8	\$ 6.3
% of Total	15.7%	15.4%	14.3%	16.4%	15.4%	14.5%	15.4%	15.8%	15.9%	15.8%
% Change	18.9%	0.0%	7.7%	12.8%	-9.0%	-24.1%	15.2%	12.5%	9.0%	7.2%
Military	\$ 0.2	\$ 0.4	\$ 0.4	\$ 0.4	\$ 0.3	\$ 0.3	\$ 0.3	\$ 0.3	\$ 0.3	\$ 0.3
% of Total	0.6%	1.2%	1.2%	1.0%	1.0%	0.9%	0.8%	0.8%	0.8%	0.8%
% Change	-58.9%	87.3%	13.3%	-11.2%	-8.8%	-26.0%	2.4%	5.7%	5.7%	6.1%
Total	\$ 31.4	\$ 31.9	\$ 36.9	\$ 36.5	\$ 35.4	\$ 28.5	\$ 31.0	\$ 33.9	\$ 36.7	\$ 39.5
% Change	17.1%	1.8%	15.7%	-1.3%	-2.9%	-19.5%	8.6%	9.5%	8.2%	7.6%

Source: In-Stat 01/09

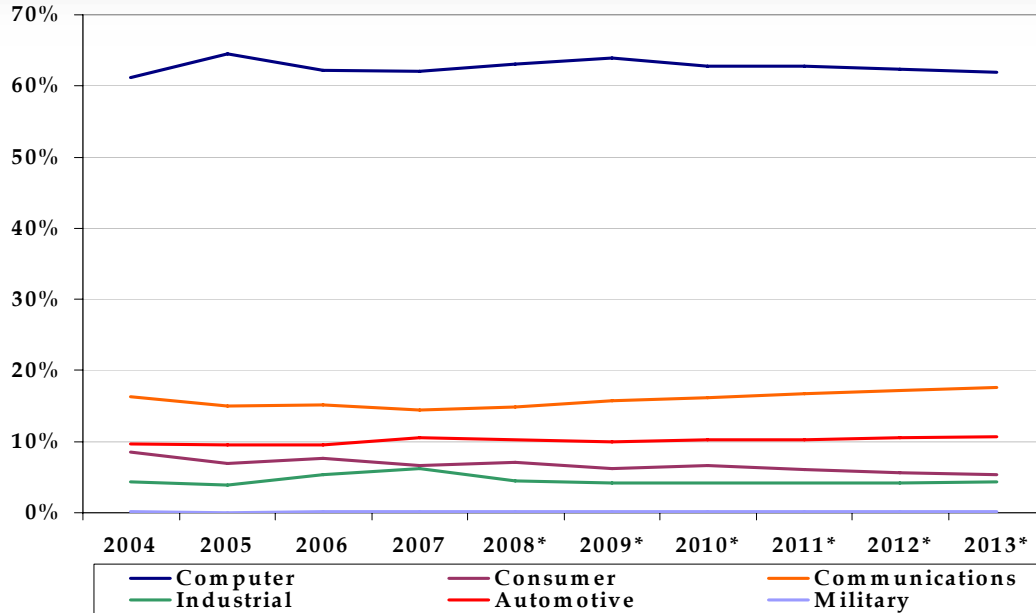
MOS Micro

**Figure 44. MOS Micro Sales, by End-Use, 2004–2013
(US\$ in Billions)**



Source: In-Stat, 1/09

**Figure 45. MOS Micro Sales, by End-Use, 2004–2013
(% of Total Revenue)**



Source: In-Stat, 1/09

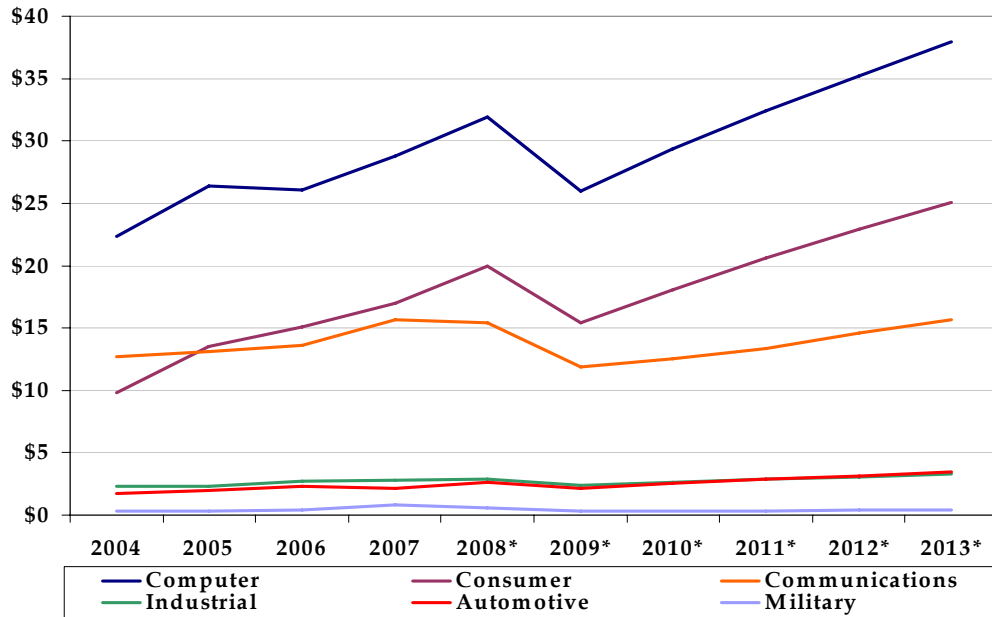
**Table 23. MOS Micro Sales, by End-Use, 2004–2013
(US\$ in Billions)**

	2004	2005	2006	2007	2008*	2009*	2010*	2011*	2012*	2013*
Computer	\$ 31.1	\$ 35.2	\$ 33.6	\$ 34.9	\$ 33.4	\$ 27.1	\$ 29.8	\$ 32.0	\$ 34.3	\$ 36.6
% of Total	61.2%	64.5%	62.2%	62.1%	63.1%	63.9%	62.8%	62.7%	62.3%	62.0%
% Change	12.9%	13.5%	-4.8%	4.0%	-4.3%	-18.8%	9.9%	7.4%	7.2%	6.6%
Consumer	\$ 4.3	\$ 3.8	\$ 4.1	\$ 3.7	\$ 3.8	\$ 2.6	\$ 3.1	\$ 3.1	\$ 3.1	\$ 3.2
% of Total	8.4%	7.0%	7.7%	6.6%	7.1%	6.2%	6.6%	6.0%	5.6%	5.4%
% Change	11.7%	-10.7%	8.0%	-10.3%	1.6%	-30.1%	19.1%	-2.3%	0.7%	3.4%
Communications	\$ 8.3	\$ 8.2	\$ 8.1	\$ 8.2	\$ 7.9	\$ 6.7	\$ 7.7	\$ 8.5	\$ 9.5	\$ 10.4
% of Total	16.3%	15.0%	15.1%	14.5%	14.9%	15.7%	16.2%	16.7%	17.2%	17.6%
% Change	40.7%	-0.9%	-0.8%	0.0%	-3.3%	-15.4%	15.5%	10.8%	11.1%	9.8%
Industrial	\$ 2.2	\$ 2.2	\$ 2.9	\$ 3.5	\$ 2.4	\$ 1.7	\$ 2.0	\$ 2.1	\$ 2.3	\$ 2.5
% of Total	4.3%	4.0%	5.3%	6.2%	4.5%	4.1%	4.1%	4.2%	4.2%	4.3%
% Change	-3.7%	-0.8%	31.8%	22.0%	-32.0%	-26.2%	11.9%	8.5%	9.4%	8.5%
Automotive	\$ 4.9	\$ 5.2	\$ 5.2	\$ 5.9	\$ 5.4	\$ 4.2	\$ 4.8	\$ 5.3	\$ 5.8	\$ 6.3
% of Total	9.6%	9.5%	9.6%	10.5%	10.3%	10.0%	10.2%	10.3%	10.5%	10.7%
% Change	25.5%	6.4%	-0.3%	14.6%	-8.6%	-22.0%	14.5%	8.8%	10.3%	8.5%
Military	\$ 0.0	\$ 0.0	\$ 0.1	\$ 0.0	\$ 0.1	\$ 0.0	\$ 0.0	\$ 0.1	\$ 0.1	\$ 0.1
% of Total	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
% Change	-73.1%	4.9%	87.4%	-44.0%	39.4%	-30.3%	11.9%	13.3%	7.9%	7.3%
Total	\$ 50.7	\$ 54.7	\$ 53.9	\$ 56.2	\$ 52.9	\$ 42.4	\$ 47.5	\$ 51.1	\$ 55.1	\$ 59.1
% Change	16.6%	7.8%	-1.4%	4.2%	-5.9%	-19.8%	11.9%	7.5%	7.9%	7.3%

Source: In-Stat 01/09

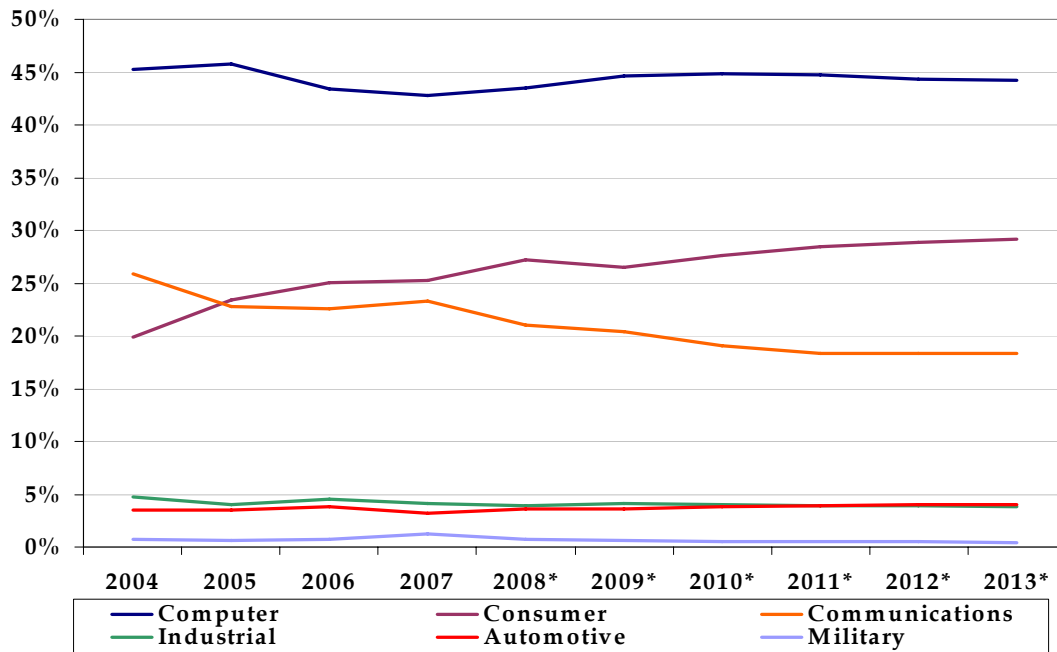
Logic

Figure 46. Logic Sales, by End-Use, 2004–2013
(US\$ in Billions)



Source: In-Stat, 1/09

Figure 47. Logic Sales, by End-Use, 2004–2013
(% of Total Revenue)



Source: In-Stat, 1/09

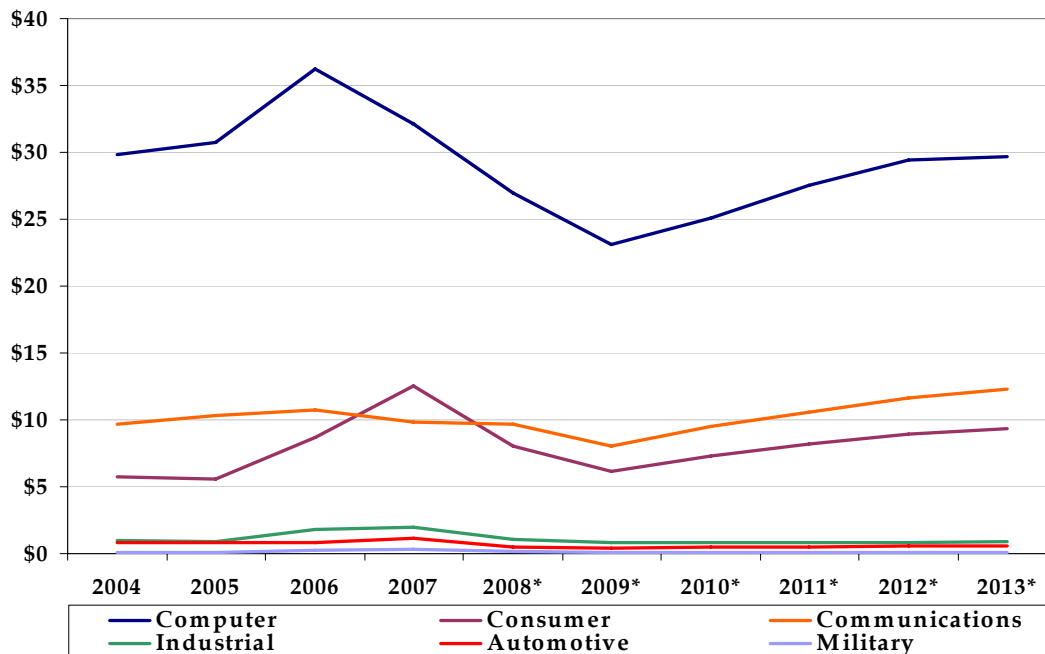
**Table 24. MOS Logic Sales, by End-Use, 2004–2013
(US\$ in Billions)**

	2004	2005	2006	2007	2008*	2009*	2010*	2011*	2012*	2013*
Computer	\$ 22.3	\$ 26.4	\$ 26.1	\$ 28.8	\$ 31.9	\$ 26.0	\$ 29.4	\$ 32.4	\$ 35.2	\$ 37.9
% of Total	45.3%	45.7%	43.4%	42.8%	43.5%	44.7%	44.9%	44.7%	44.4%	44.2%
% Change	30.2%	18.1%	-1.0%	10.3%	10.8%	-18.6%	13.1%	10.3%	8.6%	7.7%
Consumer	\$ 9.8	\$ 13.5	\$ 15.1	\$ 17.0	\$ 19.9	\$ 15.4	\$ 18.1	\$ 20.7	\$ 22.9	\$ 25.1
% of Total	19.9%	23.4%	25.1%	25.3%	27.2%	26.5%	27.6%	28.5%	28.9%	29.2%
% Change	51.9%	37.4%	11.8%	12.7%	17.2%	-22.7%	17.3%	14.3%	11.1%	9.2%
Communications	\$ 12.7	\$ 13.1	\$ 13.6	\$ 15.7	\$ 15.4	\$ 11.9	\$ 12.5	\$ 13.3	\$ 14.6	\$ 15.7
% of Total	25.8%	22.8%	22.6%	23.3%	21.0%	20.4%	19.1%	18.4%	18.4%	18.3%
% Change	18.8%	3.1%	3.3%	15.7%	-1.9%	-22.9%	5.4%	6.6%	9.5%	7.5%
Industrial	\$ 2.3	\$ 2.3	\$ 2.7	\$ 2.8	\$ 2.9	\$ 2.4	\$ 2.6	\$ 2.8	\$ 3.1	\$ 3.3
% of Total	4.7%	4.0%	4.5%	4.1%	4.0%	4.1%	4.0%	3.9%	3.9%	3.8%
% Change	57.9%	-0.1%	16.7%	3.1%	4.2%	-17.0%	9.3%	8.2%	8.1%	6.7%
Automotive	\$ 1.7	\$ 2.0	\$ 2.3	\$ 2.2	\$ 2.6	\$ 2.1	\$ 2.5	\$ 2.8	\$ 3.2	\$ 3.4
% of Total	3.5%	3.5%	3.8%	3.2%	3.6%	3.7%	3.9%	3.9%	4.0%	4.0%
% Change	85.8%	15.7%	13.7%	-4.8%	20.4%	-18.6%	19.1%	12.7%	10.6%	8.6%
Military	\$ 0.4	\$ 0.4	\$ 0.4	\$ 0.9	\$ 0.6	\$ 0.4	\$ 0.4	\$ 0.4	\$ 0.4	\$ 0.4
% of Total	0.7%	0.6%	0.7%	1.3%	0.8%	0.6%	0.5%	0.5%	0.5%	0.5%
% Change	92.9%	-2.6%	21.3%	100.7%	-35.5%	-33.5%	-3.7%	2.7%	4.5%	4.9%
Total	\$ 49.3	\$ 57.7	\$ 60.2	\$ 67.3	\$ 73.3	\$ 58.2	\$ 65.5	\$ 72.5	\$ 79.4	\$ 85.8
% Change	33.5%	17.0%	4.3%	11.9%	8.9%	-20.7%	12.6%	10.7%	9.5%	8.1%

Source: In-Stat 01/09

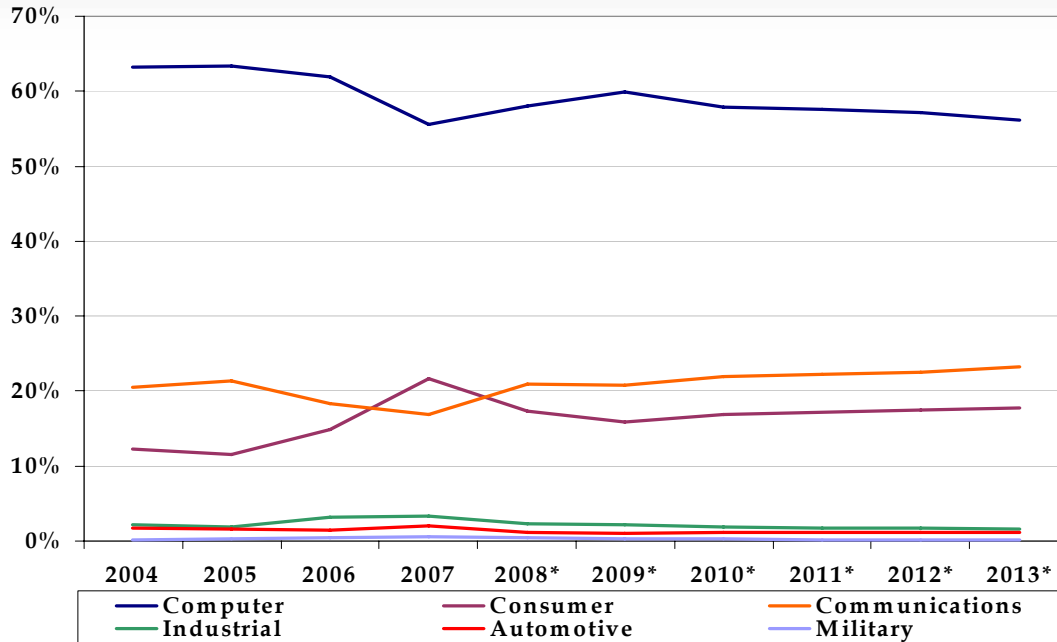
MOS Memory

**Figure 48. MOS Memory Sales, by End-Use, 2004–2013
(US\$ in Billions)**



Source: In-Stat, 1/09

Figure 49. MOS Memory Sales, by End-Use, 2004–2013
(% of Total Revenue)



Source: In-Stat, 1/09

Table 25. MOS Memory Sales, by End-Use, 2004–2013
(US\$ in Billions)

	2004	2005	2006	2007	2008*	2009*	2010*	2011*	2012*	2013*
Computer	\$ 29.8	\$ 30.7	\$ 36.2	\$ 32.1	\$ 26.9	\$ 23.1	\$ 25.1	\$ 27.5	\$ 29.5	\$ 29.7
% of Total	63.3%	63.4%	61.9%	55.5%	58.0%	59.9%	57.9%	57.6%	57.1%	56.1%
% Change	34.6%	3.1%	17.7%	-11.3%	-16.1%	-14.1%	8.5%	9.5%	7.1%	0.7%
Consumer	\$ 5.8	\$ 5.6	\$ 8.7	\$ 12.5	\$ 8.0	\$ 6.1	\$ 7.3	\$ 8.2	\$ 9.0	\$ 9.4
% of Total	12.2%	11.5%	14.9%	21.7%	17.3%	15.9%	16.9%	17.2%	17.4%	17.7%
% Change	65.3%	-3.5%	56.2%	44.0%	-35.9%	-23.6%	19.3%	12.1%	9.2%	4.4%
Communications	\$ 9.7	\$ 10.3	\$ 10.7	\$ 9.8	\$ 9.7	\$ 8.0	\$ 9.5	\$ 10.6	\$ 11.6	\$ 12.3
% of Total	20.5%	21.3%	18.3%	16.9%	20.9%	20.8%	22.0%	22.2%	22.5%	23.3%
% Change	94.8%	7.2%	3.6%	-8.6%	-0.9%	-17.3%	18.8%	11.2%	9.4%	6.2%
Industrial	\$ 1.0	\$ 0.9	\$ 1.8	\$ 1.9	\$ 1.1	\$ 0.8	\$ 0.8	\$ 0.8	\$ 0.9	\$ 0.9
% of Total	2.1%	1.9%	3.1%	3.4%	2.3%	2.1%	1.8%	1.7%	1.7%	1.6%
% Change	-12.8%	-6.8%	93.6%	6.8%	-44.2%	-24.4%	-2.5%	2.4%	4.8%	0.7%
Automotive	\$ 0.8	\$ 0.8	\$ 0.8	\$ 1.2	\$ 0.5	\$ 0.4	\$ 0.5	\$ 0.5	\$ 0.6	\$ 0.6
% of Total	1.7%	1.6%	1.4%	2.0%	1.1%	1.0%	1.1%	1.1%	1.1%	1.1%
% Change	20.0%	-0.8%	2.4%	41.3%	-55.3%	-25.9%	25.9%	10.2%	7.9%	2.6%
Military	\$ 0.1	\$ 0.1	\$ 0.2	\$ 0.3	\$ 0.2	\$ 0.1	\$ 0.1	\$ 0.1	\$ 0.1	\$ 0.1
% of Total	0.2%	0.2%	0.4%	0.6%	0.4%	0.3%	0.2%	0.2%	0.2%	0.2%
% Change	-8.6%	54.8%	80.9%	50.7%	-42.7%	-38.3%	-9.1%	-6.0%	2.6%	-1.1%
Total	\$ 47.1	\$ 48.5	\$ 58.5	\$ 57.9	\$ 46.5	\$ 38.6	\$ 43.4	\$ 47.8	\$ 51.6	\$ 52.9
% Change	45.0%	2.9%	20.5%	-1.1%	-19.7%	-16.9%	12.3%	10.2%	7.9%	2.6%

Source: In-Stat 01/09

Methodology

This In-Stat Semiconductor End Use Forecast continues our past practice of conforming to SIA World Semiconductor Trade Statistics (WSTS) categories. All historical data in this report ties to WSTS reported data. All forecasts are based on WSTS category definitions.

This forecast is based upon the *Global Semiconductor Product Market Forecast—Help Wanted: Spenders and Lenders*, report #IN0904559SSF, which is being published concurrently, and all revenues, both historic and forecasted, in this report tie to the product, regional, and overall totals that appear in report #IN0904559SSF.

This end-use forecast was developed in the following sequence. First the total revenues for each of the product types were allocated to one of the six end-use categories based upon the outlook for the particular product segments and recent trending. Then each product/end-use forecast was further broken out by region based upon our expectations of changes in consumption patterns and recent trending. Note that because end products are not necessarily produced where they will be consumed, changes in semiconductor consumption may differ substantially from changes in end-product consumption. Finally, the regional totals, by product, are obtained and the necessary adjustments are made to tie this total to the top-level regional forecasts. This results in a consistent three-dimensional matrix of product types (5), regions (4), and end-uses (6) for each year, with totals that tie to the top-level forecast that is presented in this report.

Note that digital bipolar stopped being a separate product category in 2004. We have retained the historical data using that category, but all data, historical and forecast, for 2005 and beyond include digital bipolar in the logic category where it represents less than 0.1% of the total revenue. As a result of this change, the former MOS logic category is now called logic.

Note also that all data tables are generated from data with additional digits of precision and are subject to rounding and truncating errors in the final digit. Therefore, some “% change” and “% of total” figures may differ slightly from those that would result from a direct calculation using the figures in the tables.

Throughout the report, data associated with a year marked by an asterisk (*) is forecasted data. This report is being written late in 2008. Accordingly, 2008 data represents eleven months actual data and a December forecast. End-use detail is an annual number, which typically does not become available until May of the following year. Therefore, all end-use breakouts for 2008 are forecasts. In the tables and figures, 2008 data is marked as forecasted data, although some of it includes eleven months of actual data.

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Related In-Stat Reports

- #IN0904559SSF *Global Semiconductor Product Market Forecast—Help Wanted: Spenders and Lenders*, January 2009
<http://www.instat.com/abstract.asp?id=322&SKU=IN0904559SSF>
- #IN0804337RE *The Yearbook of World Electronics Data, Volume 3, 2008/2009—Emerging Countries & World Summary*, October 2008
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