

PROSPECTS FOR KOREA'S SEMICONDUCTOR INDUSTRY IN 2001

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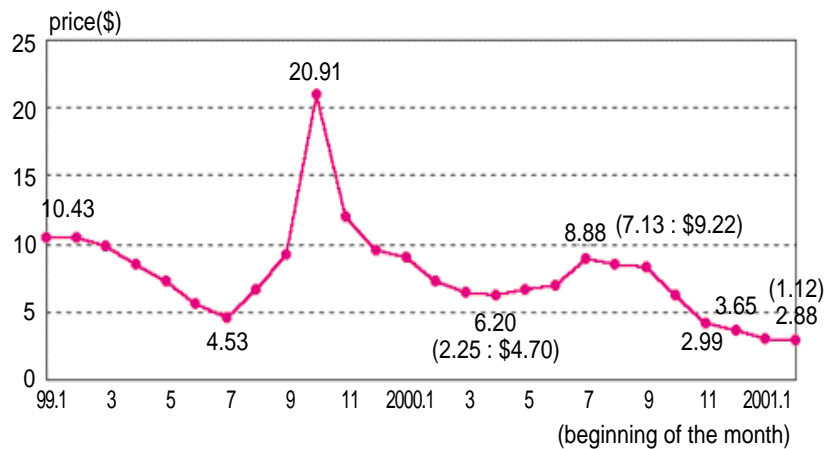
Semiconductors account for about 15% of Korea's exports, so changes in the semiconductor industry are reflected in the economy as a whole. The recent drop in the price of DRAM semiconductors will not only bring woes to the semiconductor market but will also damage the entire economy. The recovery of the semiconductor market is a matter of keen interest to the Korean economy, which has already entered a downturn in the business cycle.

Semiconductor market in 2000

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In 2000, semiconductor prices fluctuated widely. At the start of the year, after seeing few problems with the Y2K bug, DRAM semiconductor prices (for 64M SDRAM PC 100 on the North American spot market) fell to 4.7 dollars in February. Afterwards, with computer manufacturers buying semiconductors in advance in anticipation of a DRAM chip shortage in the second half, prices took an upturn to reach 9.2 dollars in July. However, in September, prices went on a downturn again, and the fourth quarter, which is a peak period for the industry, also showed continued price declines. This was because computer manufacturers, released into the market

Figure 1. Prices of 64M DRAM



the inventory of DRAM that they had stockpiled in the first half, and also because of a great increase in supply due to higher yield in the 0.18 μm line. Going into 2001, the price declines have continued although the rate of decline has slowed. On January 12, 2001, DRAM prices recorded 2.88 dollars.

The economy has seen its fortunes change with the fluctuations in semiconductor prices. The semiconductor market, which entered a boom in 1999, was expected to continue thriving in 2000. Such hopes were bolstered by the hike of DRAM price in the middle of 2000. Although prices started to fall in the fourth quarter, overall semiconductor market conditions in 2000 were extremely strong. This is because overall product prices in 2000 were higher than the production cost of semiconductors, which was 3.5 to 4.5 dollars. However, with continued price declines, some are voicing the view that the market boom has ended. In addition, because prices fell below production costs in December, it is possible that the market conditions will worsen further in 2001. The current focus is when the semiconductor market will recover, an event that is closely tied with demand for computers and semiconductor production capacity.

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Prospects for the semiconductor market in 2001

1) Demand

Demand for DRAM semiconductors is not expected to recover in the short run. Because of the slowdown of the U.S. economy and anxiety due to high oil prices, demand for computers -the main demand source of semiconductors- is not expected to recover in the first half of 2001. Another factor in the low demand from the computer industry is that there is pent-up demand for computer upgrades rather than new computers. The most that can be expected in the first half of 2001 is a number of sales from the reduced price of PC's.

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In the mid to long term, the DRAM demand is forecast to increase with a rebound in demand for PC's. Although computer markets in advanced countries seem to be nearing saturation, new demand for computers is expected from developing countries where digitalization and internet usage are still making inroads. In addition, demand from the advanced countries is expected to increase with the need for faster computers to handle the ever-increasing requirements for video, graphics, and software.

DRAM demand is expected to recover in the second half of 2001. In that period, there is a good chance that the basic memory of PC's will increase from 64MB to 128MB. This time may arrive earlier because of the currently low price of memory.

Also, with the expected introduction of the Pentium IV processor and “Whistler”, a new operating system, the demand for PC’s is likely to expand greatly. The demand for DRAM may increase as early as the first quarter if computer makers choose to buy DRAM in advance, anticipating higher demand in the second half.

2) Supply

In the short term, semiconductor prices are expected to fall.

In the short term, semiconductor prices are expected to fall. Until the end of the first quarter, market supply will probably expand, because both Taiwanese manufacturers, who are in difficult financial straits, as well as Micron Technologies, which is nearing its closing of accounts, are expected to dump their stock onto the market.

In the medium to long term however, product supply is expected to be stable. Because the semiconductor market was not as strong as expected, manufacturers are not likely to make new facility investments. Supply capacity is not expected to change greatly this year, as new production lines for 12 inch wafers are not forecast to be operated. Meanwhile, the decrease in circuit line width and increase in yield, which was a factor in increased supply in 2000, is not expected to be very significant. This is because even if a line with 0.15 μm circuit width is adopted, the increase in net die due to reduced circuit line width is expected to be marginal, and a lot of time will be needed to normalize production line functions and raise yield.

— Table 1. Reduction in Circuit Line Width and Increase of Net Die in 64M DRAM—

| | 0.25 μm | 0.20 μm | 0.18 μm |
|---------------------------------------|--------------------|--------------------|--------------------|
| Chip Size(mm²) | 102.0 | 51.3 | 38.0 |
| Net Die | 262 | 520 | 700 |
| Percentage Increase of Net Die | | 98.4 | 34.6 |

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Considering the supply and demand conditions described above, DRAM prices are expected to fall at a moderate rate in the first quarter of 2001, maintain a certain level in the second quarter, and begin to increase in the third quarter. Therefore, the semiconductor market will continue to weaken in the first quarter, be relatively stable in the second quarter, and enter a recovery in the third quarter. Such a rebound will be based on a supply shortage and is forecast to continue until 2002. **VIP**