

## Japan's electronics industry revived

By Michiyo Nakamoto

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Toshiba employees at the electronics company's Yokkaichi plant in western Japan have been asked to give up their 11-day summer holiday and churn out NAND flash memory chips instead. Demand for the flash memory chips, used in products such as mobile phones and DVD recorders, is so strong that Yokkaichi cannot afford to lose a day of production.

This is a far cry from just a few years ago when the plant's future of the plant seemed grim. Until 2001, the plant produced dynamic random access memory (D-Ram) chips, a product that was losing so much money that Toshiba decided to withdraw from the market.

At Hitachi's Gifu plant in central Japan, workers are also being asked to cut their holidays to meet surging demand for plasma display panels. Fujitsu is similarly cancelling holidays at its four semiconductor plants in the face of strong demand from manufacturers of flat-panel televisions and other consumer products.

After years of shrinking market share, falling competitiveness and declining profitability, Japan's electronics industry is making a long-awaited comeback.

Many Japanese electronics groups are forecasting a sharp improvement in their financial performance as they ramp up production to meet surging demand for new digital consumer products, from DVD recorders to cameras. Hitachi expects operating profits to rise 62 per cent to Y300bn (\$2.7bn) this year; Fujitsu is expecting a 33 per cent rise to Y200bn; and NEC is looking for a 20 per cent increase to Y220bn.

"This is the biggest boom for the electronics sector since the 1970s," says Kazuhiro Tachibana, vice-president of Hitachi. With the revival of the electronics industry, "I feel that the era of the Japanese economy has finally come." If they succeed in sustaining the upturn, Japanese electronics manufacturers could gain leadership in exciting new markets and the country's role as a global manufacturing base could be revived. If, however, they fail to seize this opportunity, they will at the least face a further round of restructuring, while weaker players could be forced out. A slowdown in the industry could have a negative impact on the Japanese economy since the sector accounted for a large proportion of overall economic growth last year.

Supporting their recovery is the growing global market for digital consumer appliances. Across the world, consumers are trading in their old film cameras for digital cameras, their bulky cathode-ray tube TVs for flat-panel screens and their VCRs for DVD recorders. The benefits are spreading beyond consumer electronics groups such as Matsushita and Sony. The trend towards digital technology is also providing Japan's integrated electronics makers - Hitachi, NEC, Toshiba, Fujitsu and Mitsubishi Electric, which make everything from semiconductors to nuclear power plants - with tremendous opportunities to capitalise on their technological expertise.

The upbeat mood contrasts with the 1990s, when Japan's electronics conglomerates suffered from overcrowded markets, high costs, poor profitability and a depressed domestic economy. The spread of digital technology at that time mainly benefited the personal computer and related industries. Japanese manufacturers, which lacked competitiveness in these fields, largely missed out on the PC and internet boom. As Hiroshi Yoshihara, electronics analyst at Merrill Lynch in Tokyo, notes: "The past 10 years were the lost decade of the electronics companies."

Rather than withdraw from the D-Ram market and focus on areas of strength or form alliances within Japan the Japanese electronics groups responded by competing with each other in a broad range of products, from D-Rams and liquid crystal displays to PCs and even vacuum cleaners.

To make matters worse, says Fumiaki Sato, electronics analyst at Deutsche Securities in Tokyo, many Japanese groups made the strategic error of making alliances with Asian competitors and transferring key technology to them to lower their own costs. Japanese electronics groups' share of the D-Ram market has fallen from 80 per cent at the peak in 1986 to 5 per cent, while that of the LCD market has gone from 100 per cent in 1993 to an

estimated 20 per cent, Mr Sato notes. Tadashi Okamura, president of Toshiba, says: "In the early 1990s, we did not expect the Koreans to catch up so quickly."

While the cost-cutting and restructuring of the 1990s helped improve Japanese producers' competitiveness, the key to their salvation has been the rapid advance of digital consumer electronics. The digital revolution represents "a major transformation similar to the shift from radio to TV", says Mr Okamura. "Information-technology culture up to now was based on networks for word data. But we have entered a period of video networks. It is a technology innovation and a cultural transformation that happens only once in several decades."

Crucially, it is a technology transformation that could benefit Japanese companies in particular, Mr Okamura argues. He says they have the expertise to drive these new consumer markets, from high quality picture-making skills to digital compression technology and expertise in small LSI chips.

Japanese manufacturers monopolise the global market for video camcorders and have more than 90 per cent of the digital still camera market, according to Deutsche Securities. They also dominate the DVD recorder market, with Matsushita alone holding about 30 per cent.

Hitachi, Fujitsu and Toshiba dominate the market for 2.5-inch hard disc drives, used in a range of portable products, and smaller HDDs, used in iPod and iPod Mini, Apple's audio devices. Sony and Fujifilm between them hold a monopoly on charge-coupled devices, the integrated circuits at the heart of digital cameras.

While Sharp is the only Japanese group with strength in LCDs - it is the largest maker of LCD TVs - Japanese companies such as Fujitsu have a stranglehold on the technology behind plasma display panels, which are suited to larger TV screens. This is likely to make it difficult for competitors to catch up. "The products, the infrastructure, the parts, are all made in Japan. That is the critical difference," says Hitachi's Mr Tachibana.

Yoshiharu Izumi, electronics analyst at JP Morgan in Tokyo, is upbeat on the sector: "Given the synchronous recovery across the industry, there is a chance that Japanese electronics companies will make a strong and sustainable comeback."

Akinobu Kanasugi, president of NEC, says that Japan's mobile network infrastructure is the world's cheapest and fastest, and Japanese digital appliances and cars have network capability. "The products, services and solutions that are born in this environment will spread to the rest of the world," he says.

Japanese mobile phone operators were the first to offer camera phones and the downloading of song clips as ringtones. Japanese groups, such as Sony and Toshiba, have launched PCs with TV tuners that cater to growing demand in Japan for multimedia terminals, which they expect will spread to other markets. This integration of the PC and TV is "a major revolution" that is happening earliest in Japan, says Toshiba's Mr Okamura (see below).

This is not only because Japanese consumers respond early to new products. They are also very particular about picture quality and speed of access, forcing manufacturers to develop high quality products. "The combination of these factors has pushed Japanese market development of new digital products," Mr Okamura says.

Japan's electronics makers believe the shift to digital technology has the potential to create huge new markets. "It's not just that TVs and new DVDs are selling but everything, from the infrastructure to product components, is changing," says Mr Tachibana. "This is not a one-time factor but a very strong trend," says Mr Okamura.

The growth of digital consumer markets is good news not just for electronics companies but also for the Japanese economy. Mobile phones, digital cameras, LCD TVs and DVD recorders contributed 12.6 per cent of the 3.2 per cent rise in Japan's domestic industrial production last year, according to government data. This is impressive, considering the contribution from cars was 2.4 per cent. The trend has also revived Japan as a manufacturing base for advanced electronics - a position it appeared in danger of losing to its Asian neighbours.



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Stung by their experience of losing leadership in D-Rams and LCDs, Japanese groups are keeping production of their most advanced products in their country to protect their intellectual property. Mr Tachibana estimates that 70-80 per cent of digital consumer products are still made in Japan.

In a rare show of confrontation, Fujitsu, which owns key patents on plasma display panel technology, sought an injunction over the import into Japan of PDPs made by Samsung SDI, a subsidiary of the Korean group, alleging it had infringed Fujitsu's patents. Samsung agreed to pay licence fees for the technology.

Although such moves may seem uncharacteristic of Japanese companies, unless they maintain leadership in key technologies by investing in R&D and protecting their intellectual property they risk repeating their past experience with D-Ram memory chips.

Despite the optimism and brave talk, Japan's large electronics groups still face formidable risks. The entry barrier to the digital sector is relatively low. In addition to South Korean and Taiwanese rivals, Hewlett-Packard and Dell have launched flat-panel TVs.

There are concerns about short-term oversupply but demand for flat-panel TVs is forecast to stay strong. Lehman Brothers expects global shipments of LCD TVs alone to grow from 1.2m units in 2002 to 21m units by 2006.

Formidable competition comes from South Korean manufacturers, with Sharp remaining the leading maker of LCD TVs with a 26 per cent market share in the second quarter of this year, and Samsung tying with Sony with 11.9 per cent, according to Displaysearch, an independent research group.

In the first quarter Samsung also for the first time overtook the joint venture Fujitsu Hitachi PDP in the market for plasma display panel TVs, with a 24 per cent share of the market.

But Japanese companies that have expertise in audio and video manufacturing believe they have an edge over their competitors. Even as they become more digital, consumer products will continue to be differentiated by their sound and picture quality. The kind of experience Japanese groups have accumulated over more than half a century as leading manufacturers of TVs and audio products places them in a strong position to achieve such standards.

Another remaining problem is that despite substantial restructuring, there are still too many Japanese companies competing in overcrowded markets. There is also a danger that the digital consumer electronics sector will go down the same path as the PC industry, where standardisation of technologies and modularisation of components led to a plunge in prices and the concentration of profits in a few hands. "We think Japanese makers would be hard-pressed to generate good profits in these conditions," Deutsche's Mr Sato warns. To avoid this fate, analysts say, Japanese electronics groups will have to do more than stay ahead in technological developments and guard their technology from competitors. They may have to join forces to reduce the number of domestic competitors and create national champions.

The digital revolution has given Japan's electronics industry which 10 years ago appeared doomed - a rare second chance. But as competitors start to catch up, the test will be whether it repeats the mistakes of the 1990s or learns to continue to innovate. "It is the last big chance" for Japanese electronics companies to regain the initiative, says Merrill Lynch's Mr Yoshihara. "If they miss this chance, there won't be another one."

## Where the computer meets the television

Earlier this summer, Sony revamped its Vaio personal computer series and launched 10 new models featuring high quality audio and video capabilities. Soon after, Toshiba unveiled a series of notebook PCs with advanced AV capability, which the group says represents a "paradigm shift" in the development of the PC.

Both Sony and Toshiba, whose PC businesses have floundered in recent years, are betting that consumers will increasingly want PCs that do more than store documents and send e-mails. They believe that the PC will be used more and more to watch TV, store and edit photos and download music and films on to discs.

"Back in 1997 [when Sony first launched the Vaio series and pioneered the entertainment PC] the media and PC vendors laughed, saying there was no market for such products," recalls Junji Tsuyuki, senior product producer in charge of Vaio PCs.

Today, however, more than 60 per cent of PCs for home use in Japan have a built-in TV tuner that can record television programmes, Mr Tsuyuki notes.

Japanese manufacturers such as Sony and Toshiba are taking the trend further by enhancing the AV features of their latest PCs. Sony even changed the colour of its Vaio PCs from light mauve to black and silver, making them look more like TVs.

One of the biggest difficulties facing manufacturers is improving the picture quality of the TV in the PC. "There are many restrictions when trying to show TV quality pictures and audio on a PC, because PCs are not made to do that," says Mr Tsuyuki.

To overcome the problem, Sony developed a graphics chip called the Motion Reality. While other PCs with TV tuners use just one large-scale integration (LSI) chip to handle all video content, the Vaio has a graphics chip to handle video content for the PC and the Motion Reality to handle video for the TV. As a result, Sony says the Vaio model offers picture quality comparable to its Wega LCD TVs.

Putting a TV tuner into a notebook PC, as Toshiba has done, is even trickier. One difficulty is that raising the picture quality requires a level of power that, in turn, heats up the notebook. So Toshiba developed a TV tuner that does not get as hot as ordinary TV tuners. Toshiba also claims its new PCs offer picture quality comparable to LCD TVs.

Japanese manufacturers lead their US counterparts in developing PCs with TV tuners, say analysts and industry officials. Indeed, while US manufacturers offer PCs with TV capability - Dell says it will make such TVs if requested - they are only beginning to express interest in strengthening this business.

Japanese consumers have been much more receptive to such products than those in the US. "Entertainment will become more and more personal, so we expect the market for AV notebook PCs to grow significantly," says Atsutoshi Nishida, president of Toshiba's Personal Computer and Network Company.

Toshiba forecasts that 40 per cent of notebook PCs will have AV capability in the next few years, compared with 13 per cent now. "Companies like Intel and Microsoft have been talking about the digital home, so there is no doubt these markets will move in that direction too," says Mr Tsuyuki. "But the question is, whether [foreign manufacturers] can achieve a high level of picture quality comparable to Japanese manufacturers.