

# Japan's Capacity for Industrial Revival and R&D

By *Karatsu Hajime*

JAPAN continues to be the No. 1 car producer in the world. The total varies from year to year, but normally around 10 million vehicles roll off the production line. One might argue that the United States is the No. 1 automobile nation in the world, but in terms of figures, Japan has a firm grip on the top spot. When I visited France last year and was asked the reason, I could reply straightaway: "It's because Japanese cars are top quality," to which they asked, "What do you mean by 'top quality'?" I replied, "They don't break down." The questions stopped.

At present many Japanese industries are ranked No. 1 in the world. If we look at home appliances, Japanese VCRs, for example, are one of the many kinds of original products that are sold in incredible numbers all over the world. Japan is No. 1 in terms of industrial machinery, metal molds and robots for manufacturing. There are also several areas where Japan has the top share in the materials and parts used in manufacturing. Japan has 70% of the market share of silicon for the semiconductors

used in the current IT boom, and produces almost all of the world's epoxy resin and ceramics for the packaging that houses completed semiconductors. The latest mobile phones are now much smaller in size, and the lithium batteries that make this possible are not only a product of Japanese technology, but Japan also has a giant share of the market. Most people are unaware that Japan is No. 1 in so many areas of industry.

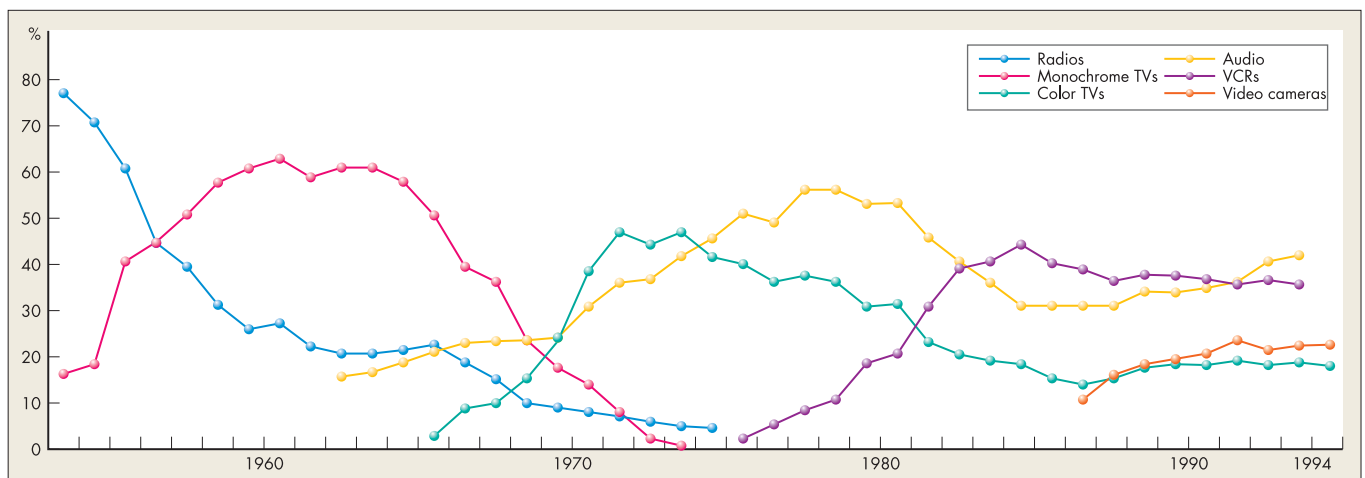
After the bursting of the "bubble economy" until very recently, Japan's economic recession has cast a dark shadow over the country's economy. In this context, certain economics experts have discussed a range of issues regarding the future of Japan, but there has been little discussion carried out on the basis that Japan still has industries that are performing so well as to make them No. 1 in the world. The focus has been on those areas that are not doing so well, creating an atmosphere of gloom and doom.

During the trade friction between Japan and the United States in the

1980s, I went to Washington almost every year in connection with the particularly bitter friction over semiconductors. While I was there, one thing that irritated me was the attitude of the Japanese media. They played up the American side of the story as if it were everything. However, closer inspection revealed that the press data included numerous inaccuracies. The worst example from that period involved the figure stated by US Trade Representative Michael Kantor, that 70% of Japan's trade surplus was due to automobiles. If we ask ourselves just what the trade surplus represents, we recognize that it is the difference between Japan's exports and imports. Calculating it this way, we certainly do see that 70% of the trade surplus was due to the export of cars. But cars only counted for 30% of Japan's total exports. Even prominent Japanese analysts quoted this figure of 70% as representing exports and criticized automobile manufacturers for having gone too far.

Incensed, I wrote to the editor of

Figure 1 Innovation of Technology



Source: Japan Electronics and Information Technology Industries Association

Japan's top economic newspaper, pointing out the inaccuracies involved in the coverage. Obviously a sincere man, he sent me a letter of apology, which I have kept as proof that even famous newspapers can make this sort of mistake.

It goes without saying that if every effort is made to make top quality products, Japanese manufactured goods will remain No. 1 in their respective areas. That is certainly my expectation, but unfortunately there are those who suggest that Japanese management practices are flawed. In my opinion, such talk simply leaves people deflated. That Japan has the top share in so many areas of industry surely proves that Japanese management ranks alongside the best in the world. In management, results are crucial, and a specific industry cannot become No. 1 in the world if it employs substandard management practices.

In Japanese manufacturing industry, TQM (total quality management) occurs as a matter of course, and it is well known that small groups in companies play an extremely important role in producing world-class products. Also, the method whereby those in the workshop pool their ideas in order to overcome problems once and for all is something that Western corporations raised on a

diet of doing things only according to the manual cannot even hope to copy.

Their approach is based on the thinking that workers should do nothing more than faithfully carry out their tasks according to the production manual. I have facilitated the quality control (QC) circle in a manufacturing company, and in those days, it was not uncommon for foreign delegations to come to take a look at what they had heard about Japanese systems.

During one such visit, when I asked a young female worker to tell the guests a story about a successful improvement she had thought up straightaway, the following question was put by one of the foreign visitors: "Don't you think that in your job it is important to work according to the production manual, and that you don't actually have an obligation to the company to spend time beyond your work hours getting together to analyze data and think up proposals?"

She gave a brilliant reply. "I suppose that is one way of looking at things. But at the same time, we are the most knowledgeable people in the company when it comes to this particular part of the production process, so when we noticed a problem we put our heads together and came up with a solution.

The proposal we put to the company was adopted and we managed to reduce the defect ratio to a fifth of what it was. Is there anything wrong with that?"

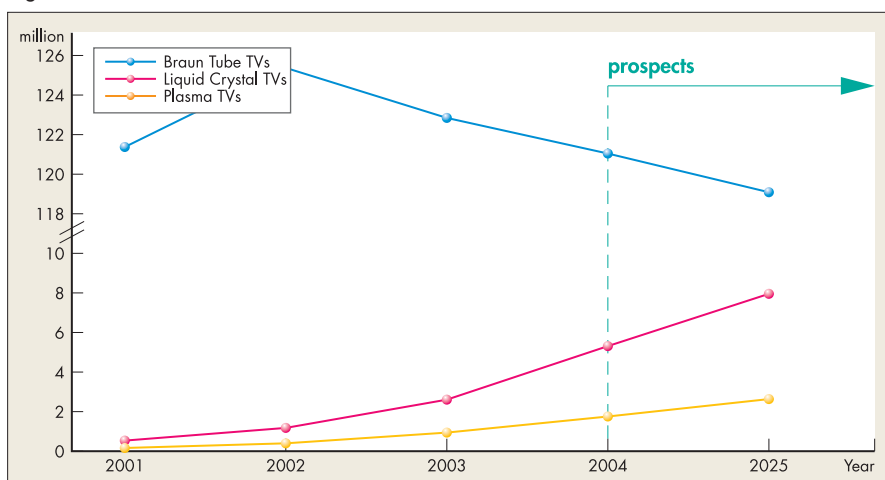
This is how Japanese TQM works. A production manual that may seem to be perfect in theory will fall short when put into practice. The best products are the result of a process in which, one by one, even the smallest of problems are solved.

**I**N recent years there have been rapid advances in technology. This in turn brings change, and new methods inevitably lead to new challenges. The success of the production process ultimately depends upon how quickly such problematic issues can be resolved.

Some analysts, ignorant of the realities of the factory floor, please themselves in their choice of ridiculous statements. They suggest that Japanese heavy industry is already a thing of the past and that there are no indications of future growth, pronouncing that the era of IT is upon us. Statistics for each industry are useful here. The ceramics and cement industry falls into the category of heavy industry, and its annual production is worth ¥9.4 trillion, with ¥4.4 trillion of added value. In other words, half of its production figure represents added value, making it a highly profitable industry. The steel industry has a production level of ¥13 trillion, with ¥4.5 trillion of added value, the same as that of the automobile industry. The steel industry earns profits through sales of high-tensile steel that other countries hardly produce. It has also succeeded in developing ultra-steel, which is twice as strong as conventional steel.

Lauded though it might be, the IT industry faces its own challenges. Until recently, Japan had a monopoly in the production of liquid crystal panels, but Taiwanese and Korean products are catching up fast, and price competition is becoming increasingly fierce. The key to success is to create the best possible quality products and component parts. The color displays in mobile phones are a recent development, and in this area Japan has an unchallenged monopoly.

Figure 2 International TV Sales



Source: Nihon Keizai Shimbun (Dec. 20, 2004)

Notes: Researched by Japan Electronics and Information Technology Industries Association.  
Liquid crystal TVs have 10 inch or bigger screens

The same logic applies to automobiles. Making products of the highest quality is the only way to sustain Japan in the 21<sup>st</sup> century.

Japan's future depends upon manufacturing industries that operate with high added value. Whether it is heavy or light industry does not matter here. We can safely ignore the plausible claptrap of a small minority of commentators who do not know the actual situation on the factory floor. Our sole focus should be to provide the world market with products of the highest quality.

This is clear from the manufacturing statistics for each product.

I have already stated that Japan is the world's No. 1 car producer, but I should mention that this is also a reflection of the superior quality of the parts and materials used in that production process. It is well known that Japan is No. 1 in the manufacture of home appliances, but possibly not so well known that the machine tools and robots that make them are also the best around. In particular, 70% of the robotic machine tools in operation

in the world are working in Japan. One reason for this has to do with Japan's unique employment relations.

In other countries, an engineer or technician enters into a contract with the company that focuses on a person's skills, but in Japan a company employs its staff as individuals. If a new technology emerges, leading to changes in the

changes, the normal approach is to retrain current staff to enable them to learn the new technology and continue working.

This social convention that values the individual is something inherently Japanese, and is a fundamental aspect of industrial relations. It is, however, not common in other countries. Basically, it

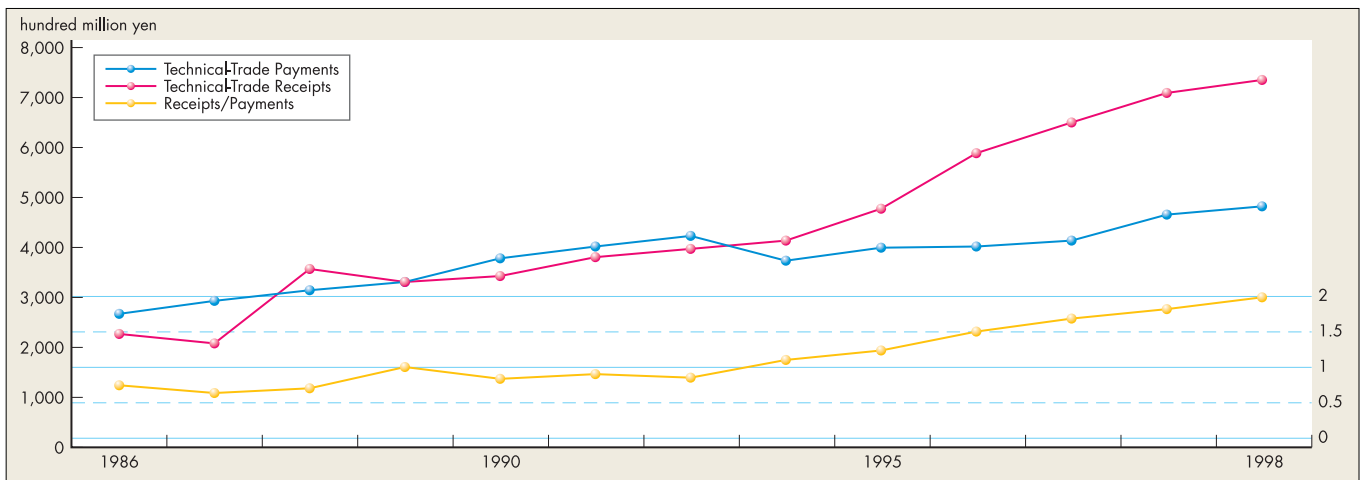
boils down to staff being seen as family. Some rather radical labor relations did appear overseas a decade or so ago, but these days, situations where companies treat their staff as family are indeed rare. In the context of the employer-employee relationship being seen around the world as adversarial, it is not difficult to understand how the practices formulated in Japan are indeed unique.

Of course, the Japanese economy has seen its fair share of business downturns and unemployment in the past, but it is difficult to find figures indicating ongoing industrial unrest in the form of strikes. Thus we need to appreciate the significance of Japan's unique labor relations and social structure.



production process, those involved in the application of the previous technology are replaced in overseas companies, but in Japan, the focus is on the individual rather than their specific skills. Therefore, even if the technology

Figure 3 Technical Trade



Source: Development Bank of Japan

Table 1 Automobiles--- 6 Major Companies' Achievement  
Manufactures, Sales and Exports in 2004

	Domestic Manufactures	Domestic Sales	Exports	Overseas Manufactures
TOYOTA	<b>3,680,946</b> (4.6)	<b>1,758,843</b> (2.5)	<b>1,951,742</b> (6.3)	<b>3,042,728</b> (19.0)
NISSAN	<b>1,439,007</b> (▲2.2)	<b>826,822</b> (0.2)	<b>728,929</b> (2.9)	<b>1,755,112</b> (18.1)
HONDA	<b>1,242,528</b> (6.1)	<b>743,071</b> (1.1)	<b>513,627</b> (10.3)	<b>1,939,096</b> (7.9)
MITSUBISHI MOTORS	<b>639,883</b> (▲14.6)	<b>255,221</b> (▲30.5)	<b>363,061</b> (▲6.9)	<b>773,520</b> (▲6.9)
MAZDA	<b>818,730</b> (2.2)	<b>282,507</b> (1.7)	<b>576,181</b> (4.0)	<b>315,691</b> (31.1)
SUZUKI	<b>1,045,735</b> (6.6)	<b>663,565</b> (5.7)	<b>273,654</b> (▲0.4)	<b>941,014</b> (15.5)

Source: Nihon Keizai Shimbun (Jan. 26, 2005)

Notes : ( ) = %, growth rate from previous year ▲ = minus

HERE is the issue of what happens from here. One recent characteristic of Japan is that of "change." This in turn is fueled by new technologies and new styles, and it is from there that new markets are born.

One only has to go to Akihabara in Tokyo or Nippombashi in Osaka to witness just how fast and furious the pace of that change is. If we are talking about fashion, then it is Ginza and Shinsaibashi in Osaka. Just like the Champs Elysées in Paris, or 5<sup>th</sup> Avenue in Manhattan, an absence of just a couple of months sees dramatic changes in these places. A recent characteristic of Ginza, in Tokyo, is the increase in the number of boutiques that have been opened by famous overseas luxury fashion brands. There is no longer any need to go seeking them abroad; they come to us.

Indeed the fact of life is that the world's top fashion styles are now being transmitted from Japan to the outside world instead of coming to Japan.

Thanks to the efforts of our predecessors, Japan is at the forefront among the nations of the world. The most important issue for us is how we should focus our efforts from now on; in other words, how we should manage our destiny.

The truth of the matter is that Japan has already built the pillars of economic success. The most easily recognizable example is any product in the home appliance category. The range of goods is almost unlimited, extending from AV equipment right through to the Japanese animation that is proving so popular these days.

Automobiles are another good example. Ever since the energy crises of the 1970s Japanese cars have been popular throughout the world for their superior fuel economy and low level of exhaust emissions. In other words, Japanese companies have constantly been striving to overcome the problems that have arisen. In the United States, when the issue of exhaust emissions appeared, the first thing American manufacturers did was apply pressure on the government to relax the regulations, but Japanese corporations took the opposite approach, doing

their utmost to solve the problem, and as a result achieved spectacular success.

This kind of problem-solving oriented approach is important.

JAPAN has few natural resources, and is geographically far away from what are historically seen as the other advanced nations. Volcanic activity and earthquakes also combine to make a nation with a relatively adverse natural environment. It is quite something that such a country accounts for 15% of the world's economic activity. The driving force is clearly the added value brought by the manufacture of industrial goods.

Every year, ¥16 trillion is spent on research and development in Japan. This equates to 3.2% of Japan's GNP of ¥500 trillion. In the EU, 2.5% of total GNP is spent on R&D, indicating that Japanese companies are making every effort to be prepared for the future. It is therefore no wonder that the number of patents acquired by Japanese companies is relatively large. According to statistics released in the United States, seven of the top 10 companies registering patents are Japanese. It is also encouraging to see that the number of theoretical patents is increasing.

The blue-color light-emitting diode, which has been the object of much attention recently, and is used in traffic lights all over the world, was developed

by a medium-sized company in Tokushima Prefecture. The company's patent-related earnings alone have reached tens of billions of yen.

IN this context, I would like to point out an important element — that Japan is a country of change.

I have a friend who works in the US Department of Defense following the latest trends in technology. He used to come to Japan once a year in May, but for the past two years he has been making a second trip in November. The pace of change in Japan is too fast to keep track of otherwise. However, living in the midst of this change, we think little of it.

When I told this story to a writer from a certain English newspaper, it was reported with an interesting cartoon attached. Two passengers playing a leisurely game of *go* were sitting in a train moving at great speed. A third person, a friend, was watching.

This is just like Japan. When viewed from outside, Japan seems to be traveling at breakneck speed, but those of us on board do not really notice. Be that as it may, there is no doubt that the pace of change in Japan is far greater than in the rest of the world. This change is sustaining the Japan of tomorrow, so we must not allow it to stop. Rather, we should pay close attention to those changes and make the most of them. **JS**

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