

# The Economy and Technology

By Karatsu Hajime

The distinguishing feature of recent technology is the rapidity with which it changes. In order to cope with this change, Japan is increasing expenditure on research and development at a breathtaking pace. In 1999 research and development expenditures amounted to ¥17 trillion, or 3.2% of GDP. The number of Japanese enterprises which actually increased spending for R&D, despite the current economic downturn, was unexpectedly large. One result of such efforts is reflected in the number of patents granted. Consistently over the past several years, among the top ten companies in terms of patents granted in the United States, seven or eight have been Japanese.

Of even greater significance is the technological balance of payments with other countries. It has long been held that Japan is skilled at making and exporting goods, but that the technology employed is purchased abroad. This has led to a common conception which is worthy of little note now. However, five years ago, the technological balance of payments turned in Japan's favor, and in 1999 the income from exportation of technology reached 2.2 times that of expenditures for purchase. In other words, Japan has become a full-fledged exporter of technology.

However, many still believe that the Japanese people lack creativity. This serves to illustrate how difficult it is to eliminate an entrenched belief, although admittedly it has only been five years since the situation changed. Whatever the case may be, the characteristic feature of Japan is that things change rapidly. Without access to the most recent data, true understanding is always difficult.

In Japan, much is being made

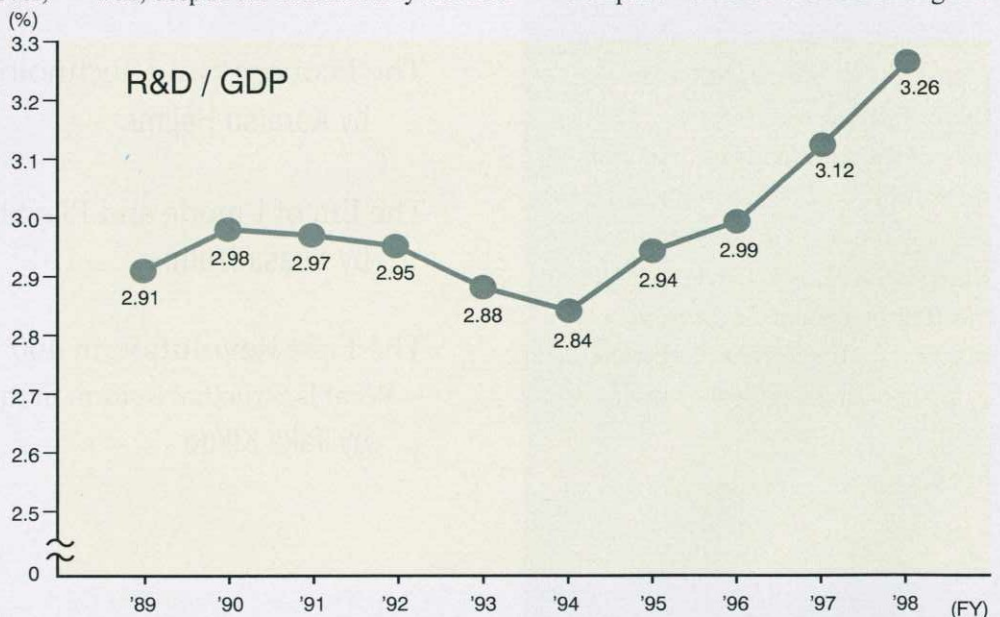
of the economic recession. Many believe the economy is foundering, but this is a major misjudgement. In reality, new technologies are developing new markets one after another. A Japan-developed digital still camera easily surpassed sales of 4 million units last year alone. Press the shutter and you can immediately see the image you have captured. Young women are very pleased with it because if they do not like a shot of themselves, they can delete it and take another. They can easily print their own pictures on stickers with different backgrounds, download them in personal computers, edit the images and send them over the Internet.

There is also a boom in mini-disks. In all likelihood, these disk players will replace the long-familiar cassette age. Such products as the mini-disk have been developed thanks to the progress achieved in semiconductor technology. Flat-screen televisions are also selling well, despite the fact that they are near-

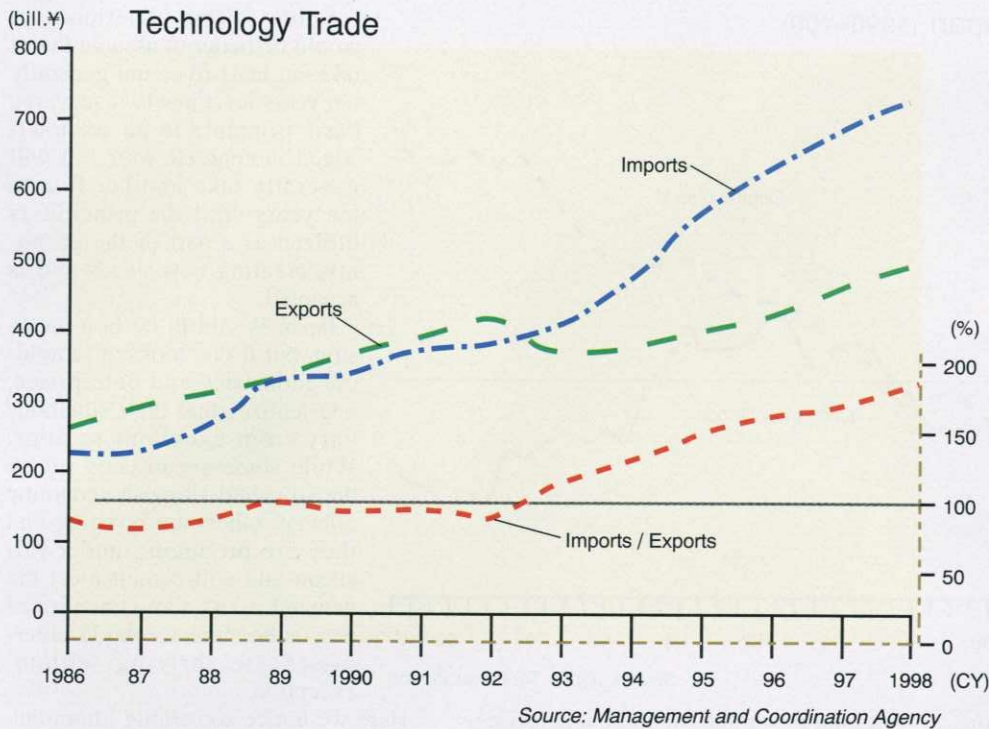
ly 20% more expensive than conventional televisions. The television has consistently been viewed as a mature product in a saturated market, but this conception does not match the reality. These are all IT (Information Technology) products, and PlayStation 2 has been a huge success.

The public is now saying that the country is facing the greatest recession since the oil crises, and the booming market that has come into being owing to technological advances is hardly ever mentioned. It is only natural that one feels like sarcastically asking the economic experts and the mass media what it is they are looking at. In the newspapers day after day, we read about such topics as finance and securities, and articles on technology, which are the driving force of the economy, are pushed onto the back pages.

However, the January 18, 1999 issue of the American magazine *Newsweek* ran a cover story on how Japanese subcompact vehicles are becoming the



Source: Management and Coordination Agency



global standard. Unique to Japan, the new compact vehicles launched last year boast the same degree of safety as a regular-sized vehicle, including measures against collisions. With significant horsepower, automatic transmission and air conditioning, these vehicles are carefully designed. They sell at unbelievably low prices. Sooner or later they will pour into the European market and become the standard even in East Asia.

### What is New Technology?

By this point it is obvious that the driving force of the economy is technological strength. It is evident that when we contemplate Japan in the 21st century, we have to accurately grasp technology. Before entering upon this subject, however, it is essential to have a clear picture of what this new technology is, otherwise we will go around in circles.

By technology we mean those technologies which serve as the driving force in producing added economic value, and not technology in the gener-

al sense meaning theoretical possibilities.

Enterprises succeed or fail by developing goods and services and providing them to the market in a timely manner. Developing a completely new technology is all very good, but adroitly grasping consumer demand is foremost. Moreover, time passes quickly, so timing is a significant factor. When one thinks about the technology of the 21st century, the first topics that come to mind are information and biotechnology. There is no doubt that as a worldwide trend there will be rapid growth in these fields, but as we have already noted in the example of household electrical appliances, if we look only at high-tech areas, we have to be very careful not to form a major misconception.

Last year, an inconceivably large number of new products were launched in Akihabara. Refrigerators, until now considered the most representative of mature products, sold quite well. The same was true for a new model of washing machine and a noiseless vacuum cleaner. In addition, a flat-screen

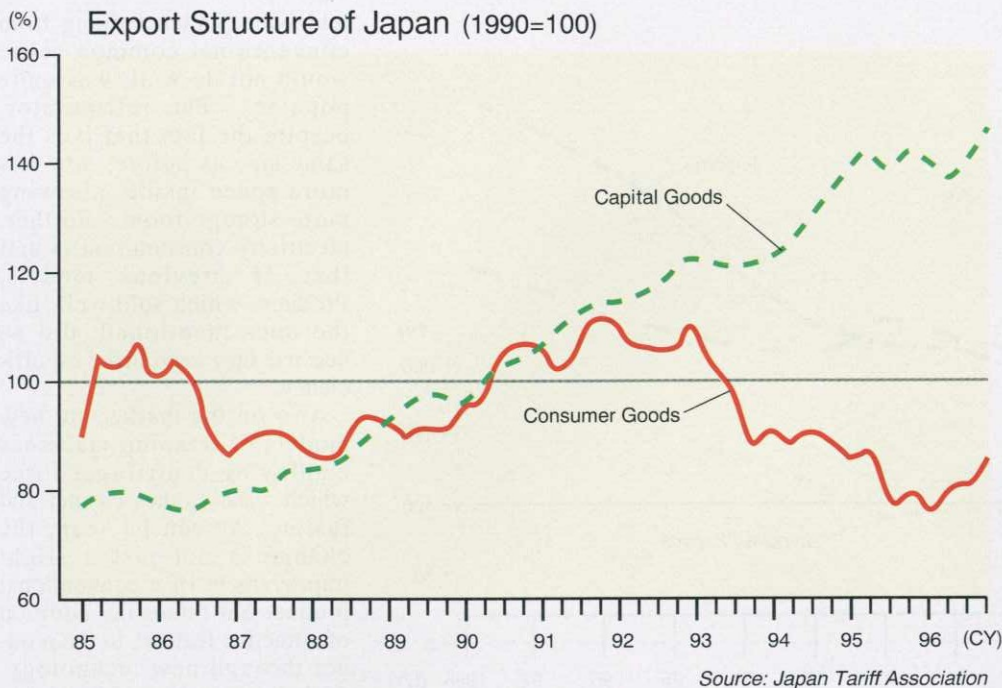
television, which judging from conventional common sense would not do well, was quite popular. The refrigerator, despite the fact that it is the same size as before, now has more space inside, allowing more storage room. Further, electricity consumption is half that of previous models. Products which sold well, like the ones mentioned, did so because they capitalized on efficiency.

Also on the market are new models of washing machines employing centrifugal force which wash clothes cleaner and faster. As can be seen, the change is not just a slight improvement of a conventional product but rather the addition of attractive features to the product through new technology. And these products sell even in what is said to be "the depths of the current recession," so it is only natural that enterprises are endeavoring to develop new technology in order to survive.

Some social critics dismiss such efforts. From the viewpoint of the preservation of natural resources, they claim, it is going too far to encourage consumers to buy new model refrigerators at the cost of throwing out an old one that still works adequately. There is justification for this view, but in my opinion it is an even greater waste of energy to keep using a refrigerator that consumes twice as much electricity. And all these innovative new products are equipped with IT.

### Obtaining Fundamental Resources

Rather than dealing with ambiguous terminology, it is more important to consider what position of advantage a particular technology or product has, whether it can create a market and what growth possibilities that market has. As one investigates, one finds the significant advantages of Japan capital goods, for example, parts, materials and production facilities that are absolutely



essential for production. Furthermore, one finds that Japan has a monopoly in a considerable number of products. This is clear from the changes in Japan's export structure. Ten years ago, it was consumer goods such as automobiles and household electric appliances which were the main exports, but now capital goods account for 70% of the total.

Among capital goods there is a wide variety such as press dies which are indispensable for the production of car bodies, steppers and dicing saws for the production of semiconductors, packaging materials for finished semiconductor chips and they come from both high-tech and large-scale heavy industries. They can only be obtained from Japanese enterprises. And the priorities of these capital goods are brought by IT, for example NC machine tools, assembly robots, precision dies and so on. Cellular phones, which have enjoyed a worldwide boom, are now miniaturized to such a degree that they fit snugly in the palm of the hand and weigh as little as 50 grams. As this miniaturization has progressed, Japanese enterprises have in fact monopolized the world market. This

does not mean that Japanese enterprises were vigorously pushing their products, but rather they suddenly found themselves without competition when their rivals in other countries ceased production. In other words, no other country was able to keep up the pace of miniaturization that Japanese enterprises maintained so tenaciously.

Therein one glimpses an important factor for Japan's survival – Japan makes things which others cannot even if they wanted to, in both high and low-tech industries. Some refer to this as a niche market. When one tries to make a certain product, one normally cannot do it without such niche products, and there is nothing unusual at all about this fact.

### Race Against Time

When considering the possibilities of technology in the twenty-first century, we do not lack for topics, including information-related technology, new energy fuels, the environment, waste processing, biotechnology and cloning. However, many of these technologies will require considerable time before they can be recognized as economically

feasible. From experience, it would be better to assume that it takes at least five, and generally ten years for a newly discovered basic principle to be acknowledged in concrete form. It will generally take another five to ten years until the principle is utilized as a part of the economy, creating new needs and is accepted.

Japan is said to be in a recession, but if one looks at individual industries and enterprises, one realizes that their situations vary from excellent to poor. While some are directly hit by the so-called sluggish economic climate, others are boasting that they are producing under full steam and still cannot meet the demand. The above-mentioned new subcompact vehicle enterprises are thriving without exception.

Here we notice something important. Often when people discuss the economy, the subjects they deal with are lopsided because they exclude technology. That is why all the arguments are abstract and not down-to-earth. More troubling is the fact that such theories, which deal with money alone, determine public policy.

Therefore I offer an important proposal. That is, when we discuss the economy from now on, we should make it a principle to include technology experts and marketing specialists who are aware of the fact that technology is needed in order to cover feasibility in an adequate manner. When we discuss the economy from now on, we should make it clear that monetary figures are not the only factors. We must consider how technology changes in order to understand the economy in an overall manner. **MITI**

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