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# U.S. Competitiveness Policy Since The Young Report and Its Implications for the Hollowing Out of Japan's Manufacturing Industry

**Establishment of an International Competition Platform and Suggestions for Strengthening Innovations**

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Manufacturing and Technology Department
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# U.S. Competitiveness Policy Since The Young Report and Its Implications for the Hollowing Out of Japan's Manufacturing Industry -- Establishment of an International Competition Platform and Suggestions for Strengthening Innovations --

**Summary:** This report refers to discussions on boosting competitiveness that have arisen in the U.S. since *The Young Report* and, as the related implications for Japan, suggests measures to enhance the quality of innovation.

In the early 1980s, the U.S. was plagued by twin deficits, a fiscal deficit and a trade deficit, and began to lose its overwhelming superiority in the manufacturing industry. *The Young Report* of 1985 was the report on measures to strengthen competitiveness that was issued during this period. It set forth that new technology should be created, put to practical use and protected, that capital costs should be reduced, that human resources should be developed and that serious consideration should be given to trade policies. *The Young Report* had a great impact on U.S. industrial policy thereafter, encouraging successive administrations to implement a variety of pertinent measures. This in turn led the country toward the recovery of its international competitiveness, boosted by positive factors such as the booming IT industry in the 1990s.

Since *The Young Report*, the importance of innovation has been the central focus of discussions on competitiveness that have continued to date. Innovation, the driving force of long-term growth, will be the key to Japan being able to continue to prosper hereafter. In order to boost innovation, it is necessary to consider the components of broad categories, such as foundation-building for research and development that will lead to an increased number of patents, of course, and the activity environment for innovative endeavors. The Swiss IMD has investigated this point and found that in Japan "education at the university level is not contributing to the enhancement of competitiveness" and "an entrepreneurial spirit is lacking." Therefore, it will be necessary to improve in these areas in order to build a platform for international competition that is midway between advanced and semi-advanced countries.

As regards the environment for innovative activity, the U.S. has undertaken steps to attract human resources, such as carrying out the first major revision of the Immigration Act in 25 years in 1990. As a result of these efforts, corporation-university clusters have developed throughout the country. This report analyzed the Ben Franklin Partnership Program in Pennsylvania and the innovation emphasizing Thomas Edison Program in Ohio as examples of industrial rehabilitation type clusters in existing industrial cities in the U.S. Since clusters at the regional level fulfil an important role in innovation, the reevaluation of regional clusters, which comprise the core of innovation, is a matter of urgent necessity in Japan as well.

Lastly, although Japan is in an advantageous position in the area of number of patents acquired, the representative indicator of innovation in the country, it is not making effective use of its patents. Therefore, Japan needs to create a system for successfully matching seeds, which patents represent, and needs, which would be the application of patents to create products. In this regard, it is worth paying attention to yet2.com as concerns the circulation of patents over the Internet, and to pl-x as concerns patent valuation and marketing. Furthermore, in order to carry out effective matching, it is essential to enrich the systems and human resources that will coordinate a broad range of technological information. This coordination would include the provision of information on patents, expertise and application domains, the development of human resources to provide advice on the commercialization of patents, the establishment of companies that will match corporations with needs and corporations with seeds and the provision of funds. This report recommends that there be systematic coordination of technological information.

There is no question that in the past the practice of carefully studying the examples of other countries and eagerly drawing on what was necessary for Japan had been the driving force of the country's growth. Now once again Japan needs to take the stance of learning the necessary conditions to recover competitiveness by studying the strategy that the U.S. has promoted in order to recover its competitiveness during the period in which it lost its confidence. The Manufacturing & Technology Department of the Development Bank of Japan would be very happy if this report is able to aid this effort.

# Introduction

In the early 1980s, twin deficits, a fiscal deficit and a trade deficit plagued the U.S. At the same time, the country began to lose its overwhelming superiority in the manufacturing industry as a result of Japan, the European Union and other economies gaining ground. The demands from the industrial world for measures to boost international competitiveness intensified during this period. The representative report produced concerning these demands was what is called *The Young Report* of 1985. Since then, as a result of prodding by the industrial world, there have been constant discussions on competitive and successive administrations have undertaken a variety of efforts. The country has recovered its international competitiveness considerably, boosted by positive factors such as the booming IT industry thereafter.

Now, turning to the case of Japan, it was a threatening presence to the U.S. at the time. However, at present, with rapid rise of ASEAN and China, Japan's problems of a sharply declining trade balance and the hollowing out of its manufacturing industry are becoming increasing apparent. Now is truly the time to compile a "Japanese Version of the Young Report" and promptly move to implement it. If not, there is a great possibility that hollowing out and other problems will develop to the point of being irreparable. In that sense, it would be meaningful to analyze the original *Young Report*.

Japan is currently in the position of being compelled to be the top runner, as there is no longer anyone to overtake. In order to be able to continue to prosper hereafter, "innovation," which *The Young Report* also emphasized, will be the key. Discussions on boosting competitive continue in the U.S. even at present, and the importance of innovation, the driving force of long-term growth, continues to be at the center of such discussions.

This report examines the discussions on boosting competitiveness that have arisen in the U.S. since *The Young Report* and, as the related implications for Japan, suggests measures to enhance the quality of innovation. An effort concerning the assessment of international competitiveness is the *World Competitiveness Yearbook* by the Swiss IMD. According to it, Japan ranks 26$^{th}$ among 49 countries. By analyzing the factors responsible for this ranking and improvement measures, this report studies how to build a platform for international competition that is midway between advanced and semi-advanced countries. Next, the report analyzes human resources development, as the foundation for the promotion of innovation, and industrial rehabilitation type clusters, as industrial promotion efforts in existing industrial cities. Lastly, the report recommends creating a system for matching seeds, as represented by patents, and needs, which would be the application of patents to create products.

The preparers of this report received tremendous cooperation from Director Kawashita and others in the Washington Office in gathering reference materials in Washington, D.C., and in other related efforts. We would like to take this opportunity to express our appreciation to them.

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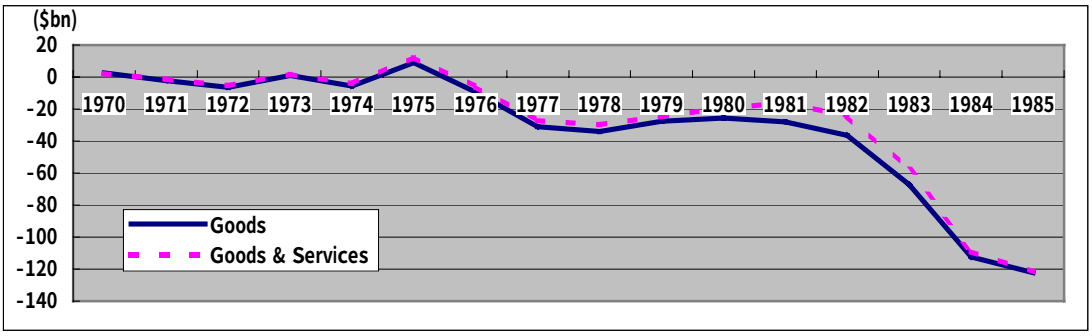
# 1. Appearance of the U.S. *Young Report*

This report begins by describing the circumstances that led to the appearance of *The Young Report* in the U.S. and its position in U.S. policy. A movement to examine competitiveness began to develop within the U.S. Government from the end of the 1970s, when it began to recognize that the trade deficit was a serious problem (Chart 1). The *President's White Paper on Competitiveness* of 1980 was the initial effort made.

Chart 1: U.S. Trade Deficit




Source: Prepared based on the U.S. Department of Commerce HP (www.doc.gov).

## (1) President's White Paper on Competitiveness (1980)

The *President's White Paper on Competitiveness* was a report on analyses of the present state of competitiveness and the measures to respond to the situation prepared by the Carter Administration. This white paper pointed out that while U.S. competitiveness was adequate in the areas of production goods, high technology and agricultural products, it had declined in the fields of consumer goods (cars, textiles, metal machinery, electric machinery, iron and steel, etc.). The white paper was recognized as significant because it was the first effort to address the problem of competitiveness in earnest and pointed out the decline in U.S. competitiveness (Chart 2). However, it did not take up the problem of the decline in competitiveness directly. Rather, it concluded that the cause of the U.S.'s declining shares in the fields of consumer goods was a temporary phenomenon related to the rise in the cost of importing oil and that it was not a structural problem.

Chart 2: Committees and Reports on U.S. Industrial Competitiveness

| President | Political Party | Committee | Report | Conclusions and Significance |
|---|---|---|---|---|
| Carter (1/77 - 1/81) | Democratic | — | President's White Paper on Competitiveness (1980) | First report earnestly examining competitiveness |
| Reagan (1/81 - 1/89) | Republican | President's Commission on Industrial Competitiveness | Young Report (1985) | Definition of competitiveness and recognition of its decline. Was not reflected in policy. |

| President | Political Party | Committee | Report | Conclusions and Significance |
|---|---|---|---|---|
| Bush (1/89 - 1/93) | Republican | President's Council on Competitiveness | — | In confrontation with the legislature |
| Clinton (1/93 - ) | Democratic | Competitiveness Policy Council | Annual Reports to the President & Congress (1992 - ) | Since the inauguration of the Clinton Administration, recommendations have been actively proposed and at the same time concrete measures have progressed. |

Source: Prepared based on Yoshikawa [2000].

## (2) The Young Report (1985)

From the latter half of the 1970s, the U.S. experienced serious economic recession brought on by stagflation. The aforementioned *President's White Paper on Competitiveness* was prepared amid these circumstances. However, critical awareness of the problems of declining industrial competitiveness and the weakening of the economy became further more conspicuous in the early 1980s, amid the appearance of what are called "the twin deficits," a fiscal deficit and a trade deficit. Therefore, in order to study measures to strengthen industrial competitiveness, in 1983 the presiding Reagan Administration established the President's Commission on Industrial Competitiveness, chaired by J. A. Young, then president of Hewlett Packard. This commission submitted the report on U.S. competitiveness "Global Competition: The New Reality" to the president in 1985. This was what is called *The Young Report*.

*The Young Report* first of all defined competitiveness. It identified competitiveness as "the degrees to which a country can produce goods and services that meet the test of international markets and at the same time maintain or expand the real incomes of its people." The report then pointed out that the main cause of the decline in competitiveness was the weakening of the manufacturing industry. It concretely presented pertinent improvement measures from the perspectives of technology, capital, human resources and trade. In its second term, the Reagan Administration realized some of the items touched upon in *The Young Report* in its policies. As discussed later, by indicating a strategic direction concerning the definition of "competitiveness" and measures to recover international competitiveness the report had a great impact on industrial policy thereafter.

### (I) Recommendations of *The Young Report*

The concept of what is called international competitiveness can be broadly divided into:

(1) Trade competitiveness as measured by the strength of traditional exporting capability;
(2) Competitiveness in standard of living, which refers only to the domestic economy and is how a country will improve the standard of living of its people;
(3) Multinational competitiveness, which considers the global scope of companies.[*1]

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*1. If one looks at the U.S. in the 1990s, it is apparent that a favorable upturn in the economic environment or an improvement in corporate earnings is often viewed as being the same as a recovery in industrial competitiveness. Therefore, it is important to define international competitiveness. The main discussions at present concerning international competitiveness can be summarized according to the three points as follows:
(1) Who are the main entities of international competitiveness? (Are they determined by nationality, which would include companies that have expanded overseas, or, are they determined by national borders, which would include all companies located within a country, regardless of a company's nationality?)

*The Young Report* defined competitiveness as "the degrees to which a country can produce goods and services that meet the test of international markets and at the same time maintain or expand the real incomes of its people"[*2]. This definition indicates that the second category of the international competitiveness of a country, which is directly linked to the standard of living its people, is important. Therefore, policies on international competitiveness thereafter have reflected this.

Chart 3 summarizes *The Young Report*. As a suggestion for Japan, the important point made is that "Although there are some foreign countries that compete by keeping wage levels low, this is not the road that the U.S. should choose to take." As a result of China and other countries giving pursuit, a trend of declining competitiveness can be seen in Japan's manufacturing industry, and it is a matter of course that there are moves to undertake efforts to reduce costs, including wages, among private companies. Nevertheless, what Japan needs to do at present is to think of a prescription for the country as a whole that is premised on the assumption that the country's labor force is said to be the most expensive in the world. The argument to lower wage costs should be considered only when no such prescription is possible.

Chart 3: Summary of *The Young Report*

| Item | Contents |
|---|---|
| Definition of competitiveness | The degrees to which a country can produce goods and services that meet the test of international markets and at the same time maintain or expand the real incomes of its people |
| Understanding of the existing situation | U.S. competitiveness is declining because of factors such as productivity, the standard of living and the trade balance. It is not due to the foreign exchange rate or similar factors, but is the result of the reduced competitiveness of the manufacturing industry. |
| Recommendations in 4 areas | Creation, practical application and protection of new technology<br>Capital cost reduction (increasing the supply of production capital)<br>Human resources development (improving the skills, adaptability and desire of the labor force)<br>Serious consideration of trade policies (international trade) |

Source: Prepared based on Commission [1985].

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(2) What are the indicators of international competitiveness? (RCA index, export share, trade balance, RIC coefficient ( = (export amount - import amount) / production amount) and international competitiveness coefficient ( = (export amount - import amount) / (export amount + import amount)), labor productivity, unit labor cost, overall productivity of components, etc.)

(3) What is international competitiveness?

Regarding the discussions concerning concept (3) above, P. Krugman points out that there is the possibility that thinking in terms of national competitiveness will produce mistaken policies that will among other things waste government funds, translate into protectionism and worsen the quality of public policy. He asserts that what is important in the sense of affecting people's standard of living is not international competitiveness, but (a) the improvement of productivity, first of all, as well as (b) income distribution and (c) unemployment. On the other hand, M. Porter defines international competitiveness as something that leads to the improvement of productivity and recognizes its importance to a certain degree. Porter points out that in order to improve national productivity, individual companies must continue to upgrade their quality on their own through efforts such as raising the quality of their products and improving efficiency. Therefore, the desirable trade mix that results from competition and pressure from overseas rivals through international trade and a shift in production to highly productive industries will contribute greatly to international competitiveness.

*2. The OECD's definition of competitiveness is "the degree to which a country can, under free and fair market conditions, produce goods and services which meet the test of international markets, while simultaneously maintaining and expanding the real incomes of its people over the long term." This is virtually the same as the definition presented by *The Young Report*.

## (II) Specific Recommendations of *The Young Report* and Their Implications for Japan

*The Young Report's* recommendations regarding international competitiveness can be broadly divided into:

(1) Creation, practical application and protection of new technology
(2) Capital cost reduction (increasing the supply of production capital)
(3) Human resources development
(4) Serious consideration of trade policies (international trade)

This section mainly introduces the recommendations that have implications for Japan today. Please refer to Chart 5, which summarizes the problems and recommendations concerning specific conditions that exist.

### (1) Creation, Practical Application and Protection of New Technology

The most important point that *The Young Report* makes is that in order to sustain international competitiveness while maintaining the national standard of living, the sources of the strength to compete are innovation and the technological superiority that results from it. The report states that this innovation and technological superiority require:

(i) The creation of a solid foundation for science and technology suited for commercialization;
(ii) The practical application of new knowledge in commercial products and manufacturing methods;
(iii) The protection of intellectual property rights through strengthened protection of patents rights, copyrights, trademark rights and trade secrets.

Furthermore, the report states that in order to achieve these goals, it is necessary to have the three players, the federal government, the industrial world and national universities, working toward them. In addition to being applicable even to the present, this is becoming increasingly important for Japan, which has become the frontrunner.

The specific pillars are:

- The national government's emphasis of basic R&D;
- Cooperation between industry, academia and the government (the spinning off of technology by the Department of Defense, the National Aeronautics and Space Administration (NASA), etc.);
- Subsidies through tax deductions for private sector R&D;
- The relaxation of regulations that impede technological innovation (abolition of the Antitrust Act's obstacles to collaborative research);
- Protection of intellectual property rights, including the establishment of international protection laws

The GATT's Uruguay Round addressed the last pillar above, the protection of intellectual property rights, and it is being achieved through international consensus. When *The Young Report* is discussed in Japan, it is frequently introduced as a report that recommended the protection of intellectual property rights.

### (2) Capital Cost Reduction

Because of the argument at the time that the enormous federal fiscal deficit was impeding the supply of capital flowing into the private sector, *The Young Report* recommended the reduction of this deficit, the abolition of double taxation of dividends, income deduction of the full amount of losses from venture investments and similar investments, stabilization of the

dollar, liberalization of capital markets and other similar proposals. Although the reduction of the federal fiscal deficit was unexpected, the report foresaw the current fall into the red. At any rate, there was improvement in the US throughout the 1990s. In Japan, the increase in the fiscal deficit has been marked. As of the present time, interest rates continue to be very low as a result of the Bank of Japan's low interest rate policy. However, there is also a great possibility that this problem will be receiving much attention in the near future.

**(3) Human Resources Development**

The report identifies a citizenry possessing vision, skills and desire as truly being the driving force of the U.S. economy and the core of potential competitiveness. In Japan as well, the declining birth rate, the declining quality of education at the secondary and university levels and the declining quality of younger workers are becoming problems. The report's recommended prescriptions for these problems included:

- Cooperation between labor and management to enhance productivity and improve the quality of products;
- Employment introduction support to have workers in sunset industries acquire new skills and find new jobs;
- Vocational training provided by employers;
- Lifelong continuing education provided by the government;
- The promotion of stock options and similar incentives;
- The strengthening of university education (especially in the sciences); etc.

Furthermore, the report recommends that use of the computer in elementary and secondary education should not be limited to the computer's reading and writing functions, but that it should be utilized as a more productive new means of learning. The novelty of this recommendation is in the fact that it proposed 15 years ago something that is recently being emphasized in Japan.

**(4) Serious Consideration of Trade Policies**

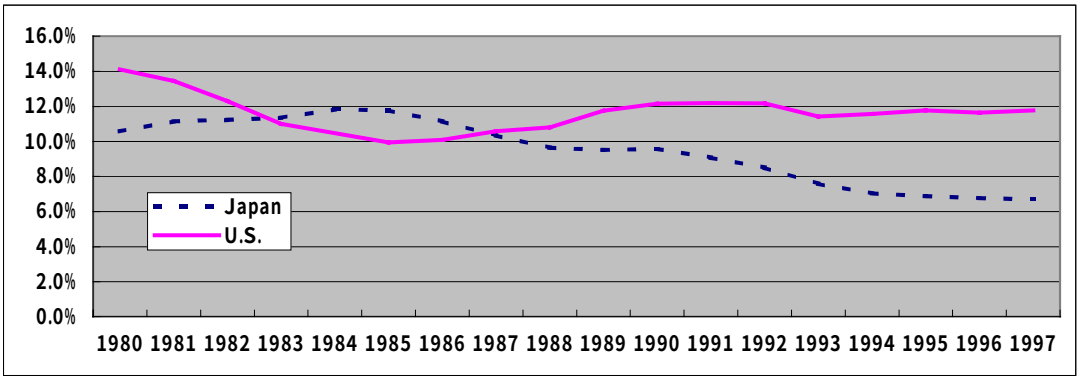
The report first of all identified trade as a national priority and recommended the following:

- A review of export regulations, such as COCOM;
- The boosting of financial aid to exporting companies provided by the U.S. Export-Import Bank and other similar financial institutions;
- The relaxation of the Antitrust Act in order to promote mergers and acquisitions in industrial sectors where the pressure of international competitiveness is severe;
- The strengthening of multinational trade systems; etc.

The appearance of increasingly powerful European and U.S. companies as a result of M&A amid the intensification of global competition is a notable development at the present time. One can assess that the relaxation of the Antitrust Act and similar developments provided the opportunities for this.

Chart 4 indicates Japan's and the U.S.'s global shares of exports of manufactured goods. As a result of *The Young Report* and efforts by the industrial world and industrial policies thereafter, the U.S.'s share bottomed out in 1985 and then began to rise. Therefore, one could say that *The Young Report* triggered the revival of the U.S. manufacturing industry.

Chart 4: Japan's and the U.S.'s Global Shares of Exports of Manufactured Goods




Source: Prepared based on NSF [2000].

Chart 5: *The Young Report*'s Recommendations in 4 Areas

| Area | Problem | Recommendation |
|---|---|---|
| (1) Creation, practical application and protection of new technology | - The field of commercialization lags behind because emphasis is placed on the fields of defense and aerospace<br>- Insufficient R&D investments by the private sector<br>- Shortage of university teaching staff<br>- Disregard for manufacturing processes, such as quality control<br>- Increased need to protect against the infringement of intellectual property rights by imitations, etc.<br>- Impediments resulting from regulations | - Create a department of science and technology in the federal government<br>- Promote preferential tax measures for R&D<br>- Abolish the Antitrust Act's obstacles to collaborative research projects<br>- Commercialize new technology by improving manufacturing technology<br>- Strengthen protection of intellectual property rights<br>- Balance the needs of industrial competitiveness and regulations |
| (2) Capital cost reduction (increasing the supply of production capital) | - Inadequate capital supply because of the low savings rate and similar factors<br>- Sharp rise in corporate capital costs<br>- Distortion of the flow of capital as a result of tax and regulatory policies | - Settlement of the deficit<br>- Tax reform<br>- Stabilization of currency policy<br>- Removal of obstacles impeding greater efficiency of the flow of capital |
| (3) Human resources development (improving the skills, adaptability and desire of the labor force) | - Conflicts in the views of parties concerned when preparing policy<br>- Traditional antagonistic relationship between labor and management<br>- Insufficient reemployment support systems for workers in sunset industries<br>- Insufficient employee training by employers | - Effective dialogue between the government, industrial world and labor unions<br>- Greater labor-management cooperation<br>- Reinforcement of employee incentives, such as stock options<br>- Support for dismissed workers |

| Area | Problem | Recommendation |
|---|---|---|
| | - Shortage of funds and deterioration of facilities in universities<br>- Dropouts and slow introduction of computer education into elementary and secondary education | - Support for technological education in universities and research institutes<br>- Support for schools offering practical training and education<br>- Cooperation between the federal government and private sector in the field of education<br>- Promotion of educational technology |
| (4) Serious consideration of trade policies (make trade a national priority) | - Inconsistencies in the decision-making process for trade policy<br>- Lack of a trade policy to deal with unfair practices by foreign countries and the slow response of the Antitrust Act's measures to deal with international competition<br>- Diverse export control<br>- Insufficient aid to exporting companies<br>- Shortcomings of international trade systems (GATT) (lack of regulations concerning services and investments, unreasonable regulations concerning agricultural trade, lack of the ability to adapt in response to nontariff measures by foreign countries, such as the expansion of industrial policies, relaxation of antitrust laws, subsidies for R&D and regulation of foreign investments) | - Improvement of trade and investment policies<br>- Review of domestic trade laws to deal with unfair trade practices by foreign countries<br>- Revisions to relax the Antitrust Act<br>- Revision of the Export Control Act to relax export regulations<br>- Relaxation of COCOM regulations to the level of other countries<br>- Expansion of the export support system<br>- Dissemination of trade information<br>- Export loans through the Export-Import Bank<br>- Enactment of legislation to establish international trading houses<br>- Promotion of multinational trade systems |

Source: Prepared based on Commission [1985].

## [Reference Material]: Discussions Concerning Strengthening Competitiveness

Up to this point this report has presented a general survey of *The Young Report*. That report also included the following type of Q&A concerning policies to strengthen competitiveness. This report presents quotes from *The Young Report* (quotations are underlined) here, because a study of the current situation reveals that many of the arguments can be applied to Japan as they stand. For instance, at present, the view has been expressed that the depreciation of the yen will alleviate the hollowing out of industry in Japan as well. This is exactly the same as the argument given in (1) below. In addition, as a result of the appearance of the production entrustment business and similar businesses, the portion of the industrial sector, including the existing manufacturing industry, categorized under the service sector has grown. However, the responses given in (2) and (3) are rich in suggestions that there is a tendency toward all industries turning into a service industry.

(1) **Argument:** Since U.S. companies are having a hard time competing because of the strong dollar, they will be able to regain lost ground if the dollar's value is lowered.

**Response:** The slow rate of growth of productivity, stagnant wages and high capital costs in the U.S. are not entirely due to the strong dollar. For example, even if the dollar depreciated, these long-term problems would not be resolved. In addition, depreciation of the dollar would mean that the buying power of U.S. consumers would be reduced, which in turn would lead to a lower standard of living for all people in the U.S..

(2) **Argument:** We are now entering the age of the service economy, and the deterioration of the manufacturing industry is the natural course of events. Some of the U.S.'s trade deficit in industrial goods has been offset by the trade surplus for the service sector. Therefore, the decline in the status of the manufacturing sector can be compensated for by the superiority of the service sector.

**Response:** The manufacturing industry's share of the economy is declining not only in the U.S., but in Japan as well, and there is no method to determine what percentage the manufacturing industry's share represents. However, the real service export volume, which is what remains after subtracting dividends, interests and other service charges from the U.S.'s foreign investments, is still small when compared with the export volume for goods.

Furthermore, services such as banking, insurance and process technology are often carried out for the manufacturing industry. Therefore, some of the competitiveness of the service sector is supported by the presence of a strong U.S. manufacturing sector. As a result, if the U.S. loses the competitiveness of its industrial goods, it will lose the foundation that supports the service sector.

(3) **Argument:** As long as the U.S. economy as a whole is doing well, matters such as which U.S. industrial sector is competitive are of no cause for concern. One dollar of wheat exports has the same value as one dollar of exports of electronic goods.

**Response:** As a matter of act, all sectors of the Japanese economy have taken on the challenge. Japan receives many benefits from the great breadth and diversity of the U.S. economy. The U.S.'s status in the manufacturing sector aids the status of related service industries. The international status of the advanced technology industry is spurring on new markets and new industries as a whole. A strong industrial foundation is an indispensable requirement for Japan's national security as well.

Source: Prepared based on Commission [1985].

## 2. Discussions on Competitiveness to Date

### (1) Ongoing Efforts by the Council on Competitiveness (1985 - )

*The Young Report*'s contents differ greatly from aforementioned *President's White Paper on Competitiveness*. It was revolutionary in that it disagreed with the U.S. government's conventional understanding of matters. However, its contents did not agree with the desires of the early Reagan Administration, which pointed toward "small government." Rather, the report emphasized policies backed by overwhelming political and diplomatic power, for example, demanding that competing countries such as Japan open their markets and improve other trade conditions. As a result, the recommendations of *The Young Report* were shelved without being reflected in the policies of that time.

The corresponding dissatisfaction of Young and the other members of the President's Commission on Industrial Competitiveness grew, and in 1986 they formed the private sector organization the Council on Competitiveness and strengthened their efforts to influence the government and the Congress[*3]. *The New Young Report* (1987) and *The Third Young Report* (1988) were representative efforts in this process (Chart 6). The Council on Competitiveness was reorganized into an NPO in 1991, and continues to actively propose recommendations concerning innovation even to this day (discussed later).

*3 At the time, Young was the president of Hewlett Packard (HP), a representative high technology company in Silicon Valley. Since the time of Young's leadership and thereafter to this day, the Council on Competitiveness continues its activities, presenting opinions representative of the industrial world. At present, Merck's R. V. Gilmartin chairs the council.

Chart 6: Main Recommendations of the Council on Competitiveness

| Year of Publication | Report | Summary |
|---|---|---|
| 1987 | America's Competitive Crisis: Confronting the New Reality (*The New Young Report*) | Definition of competitiveness; evaluation of the state of competition based on the standard of living, productivity, the trade balance, technology, human resources and capital formation; recommendations to the federal government concerning fiscal deficit reduction, trade environment improvement, trade and technology policies and human resources policies. |
| 1988 | Picking Up the Pace: The Commercial Challenge to American Innovation (*The Third Young Report*) | While *The New Young Report* covered general problems, this report focused on problems concerning technology and put forth a proposal concerning the role of the government in private-sector-led promotion of technology. |
| 1991 | Gaining New Ground, Technology Priorities for America's Future | Identified the important industries that invigorate the economy (established technological priorities) and presented measures to strengthen U.S. superiority in those fields. |
| 1992 | Industry as a Customer of the Federal Laboratories | Explained the necessity of technical transfers that conformed to the needs of industry, which is a customer of the federal laboratories. |
| 1994 | Critical Technologies Update 1994 | Reassessed U.S. competitiveness in the important industries of 1994 and reported on the recovery of U.S. superiority. |
| 1996 | Endless Frontier, Limited Resources: U.S. R&D Policy for Competitiveness | Investigated the R&D trends in six important industries and proposed how R&D based on cooperation between industry, the government and academia should ideally be. |
| 1998 | Going Global?<br>The New Shape of American Innovation | Presented the current economic and technological strengths of the U.S. and the problems concerning technological innovation. |
| 1999 | The New Challenge to America's Prosperity - Findings from the Innovation Index - | Compares the technological innovation capabilities of 25 countries since 1980 and in 2005 (Japan ranked first in 1999 and 2005; discussed later). |
| 2001 | U.S. Competitiveness 2001: Strengths, Vulnerabilities and Long-term Priorities | From the perspective of long-term prosperity, this report, while mentioning the improvement in productivity during the 1990s, also points out problems such as the low savings rate, the current deficit and the absence of basic research. It proposes the importance of technology, education, regional clusters and other similar components (discussed later). |

Source: Prepared based on Council [1987] and reports thereafter.

## (2) Made in America (1989)

During the same period, the Industrial Productivity Committee of the Massachusetts Institute of Technology (MIT) issued *Made in America*, a report addressing the problem of declining industrial

performance[*4] in eight U.S. industries (semiconductors, computers and copy machines, private aircraft, civilian electronic devices, iron and steel, chemicals, textiles, cars and machine tools). This report attracted much attention.

*Made in America* analyzed actual conditions in Japan, the U.S. and Europe, including the sites of production and labor-management relations. This report aimed to improve the level of society as a whole, attaching importance to production technology of course, but also examining production equipment, human resources, education and training and corporate training. It exhaustively analyzed the superior aspects of Japan's production sites at the time. One can say that it is a symbolic report whose contents have been actively incorporated by the U.S. manufacturing industry.

The appendix to *Made in America* compiled the policy recommendations proposed until 1989. Chart 7 provides a summary of those recommendations, which are the principal recommendations made by *The Young Report* and other reports during the 1980s. They place special emphasis on policies concerning science and technology and education and training, and provide a wealth of advice that is relevant to present day Japan.

Chart 7: Principal Policy Recommendations Made in the U.S. in the 1980s

| Category | Summary |
|---|---|
| Macroeconomic policy | - The Business Round Table (comparable to Japan's Federation of Economic Organizations (Keidanren)) proposes the reduction of the federal fiscal deficit<br>- The Cuomo Committee (committee formed by New York State Governor Mario Cuomo) proposes a budget reduction policy and the adoption of a value-added tax<br>- Dornbush, Poteluba and Summer propose a broad value-added tax and increased tobacco, alcohol and gasoline taxes |
| System-related and regulatory policy | - The President's Special Commission on Industrial Competitiveness proposes relaxation of antitrust regulations and establishment of a department of science and technology and department of trade in the federal government<br>- The Business Round Table proposes relaxation of antitrust and product liability regulations<br>- The Special Committee on Economic Development proposes the abolition of regulations concerning designated industries (electric power, gas, water supply and similar services) |
| Science and technology policy | - The Industry and Higher Education Forum proposes abolition of the tax credit for R&D expenses and designated air pollution standards, protection of intellectual property rights, promotion of cooperative R&D, support for basic research, technology transfers, etc.<br>- The President's Special Commission on Industrial Competitiveness proposes the provision of incentives for R&D, rationalization of control systems, support for university research and improvement of the management of Federal Laboratories<br>- The National Engineering Academy points out the importance of government support (for example, Semantec's development of next generation integrated circuit manufacturing technology received government support) |

*4 Industrial performance, which is used in the report, is in a broad sense a concept for a new productivity indicator. It incorporates qualitative elements that affect a company's achievements, such as quality, speed of technological innovation and the ability to deal with strategic technologies. While this is a concept that looks at performance from the perspective of industry, performance from the perspective of products is called "productive performance."

| Category | Summary |
|---|---|
| Science and technology policy (cont'd) | - It is pointed out that the ??Stevenson??-Wilder Act (1980) provided for the promotion of technology transfers from the government to private industry and that the Federal Government Technology Transfer Act (1986) make it possible to establish cooperative organizations for the transfer of technology |
| Capital formation | - The President's Special Commission on Industrial Competitiveness touches upon the state of the supply of capital, the capital costs of American industry and the mechanism to ensure capital investments for the most productive sectors<br>- The Cuomo Committee proposes a plan for the reconstruction and expansion of public infrastructure |
| Education and training | - The President's Special Commission on Industrial Competitiveness encourages that systems be established to maintain the standard of education, develop computer proficiency and foster cooperation between the government and private sectors and that the government provide aid for the ongoing training of workers<br>- The Business Round Table stresses the importance of the acquisition of basic skills<br>- The Cuomo Committee proposes the reform of elementary and secondary education, the provision of incentives for teachers and the reconstruction of the infrastructure for national education<br>- The Industry and Higher Education Forum proposes that production technology be stressed and reflected in business school curricula<br>- The National Engineering Academy proposes that incentives be provided to acquire graduate degrees and that workers receive ongoing training<br>- The President's Government Council on Productivity encourages the retraining of unemployed workers |
| Business strategy | - The President's Special Commission on Industrial Competitiveness points out that the private sector is the source of American competitiveness<br>- The National Engineering Academy demands the employment of new methods to design, develop and produce products<br>- The National Research Council points out the importance of new production technology in business strategy |
| International economic policy | - The President's Special Commission on Industrial Competitiveness recommends the establishment of a department of trade in the federal government<br>- The Business Round Table proposes the improvement of the GATT |

Source: Prepared based on MIT [1989].

## 3. Reflection in Policy

*The Young Report* had a great impact on industrial policy thereafter because it indicated a strategic direction for the definition of competitiveness and measures to recover competitiveness. As aforementioned, it did not agree with the desires of the early Reagan Administration, which pointed toward "small government." Rather, the report emphasized policies that demanded that competing countries such as Japan open their markets and improve other trade conditions. As a result, the recommendations of *The Young Report* were shelved without being reflected in the policies of that time.

However, administrations since the second term of the Reagan Administration have realized some of the items touched upon in *The Young Report* in their policies. The following sections describe specific policies implemented around the time of and after the recommendations discussed heretofore[*5].

### (1) Enactment of the Bayh-Dole Act (1980)

The Bayh-Dole Act (amendment to the Patents and Trademarks Act) was enacted during the Carter Administration. This law stipulated that intellectual property rights for research achievements financed by the federal government's budget belonged to the universities (university technology transfer agencies), research institutions and companies, not the federal government. As a result, a cooperative system of division of labor developed between universities and companies because the seeds of technological creation became concentrated and accumulated in universities, the commercialization of the results of research conducted through federal funds accelerated and research at universities came to attach importance to corporate needs.

Also in 1980, in order to promote the transfer of technology from the federal government, the U.S. enacted the Stevenson-Wilder Technological Innovation Act, which essentially mandated the establishment and funding of an office through which Federal Laboratories could promote technology transfers.

### (2) Tax Reform by the Reagan Administration (1981 and 1986)

The U.S. during the Reagan Administration was in the midst of a period of stagflation, which is the coexistence of a business slump and advancing inflation. Therefore, in 1981 the administration implemented a large tax cut in order to facilitate corporate capital investments and boost international competitiveness (Chart 8).

The 1981 investment tax cut mainly included:

(1) An Accelerated Cost Recovery System;
(2) An investment tax credit;
(3) An extension of the period for the carry-over of losses.

The Accelerated Cost Recovery System, (1), greatly shortened the length of time to recover depreciable property, and, as a general rule, divided it into four categories (3, 5, 10 and 15 years). Therefore, it became possible to defer tax payments by accelerating charge offs. In addition, the investment tax credit, (2) deducted a portion of the amount spent on capital investments from taxable income and increased the deduction rate for the majority of assets whose recovery period was three or five years. The adoption of the Accelerated Cost Recovery System not only alleviated excessive

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*5 This report referred to OECD [1987-1994], Yoshikawa [2000] and Sekishita [1996] for information regarding policy efforts.

taxation and insufficient depreciation amid inflation, but also lowered the effective tax rate for corporations and stimulated capital investments.

Thereafter, with inflation tamed, there arose criticism concerning the neutrality of the tax system, claiming that the preferential effects seemed excessive and favored heavy and large industries. Furthermore, it was pointed out that investment decisions were being perversely influenced, as seen in the phenomenon of the concentration of assets to be recovered in 5 years. Therefore, in 1986, the Reagan Administration carried out a second revision based on the general principles of neutrality, fairness and simplicity. First, the Accelerated Cost Recovery System, (1), was revised to change the number of categories for the length of time to recover depreciable property from four to eight categories. In addition, the investment tax credit, (2), was abolished. On the other hand, the maximum rate of taxation for the corporate tax was lowered from 46% to 34% and, at the same time, the taxable base was expanded.

Chart 8: The Reagan Administration's Tax Reform

| Item | Contents |
|---|---|
| Accelerated Cost Recovery system | This replaced the existing system of depreciation according to the estimated useful life. As a general rule, the system divided the asset depreciation period into four categories, 3, 5, 10 and 15 years, and implemented an accelerated depreciation (it was also possible to opt for fixed amount depreciation). The 1986 revision changed the number of categories for the length of time to recover depreciable property to eight categories, 3, 5, 7, 10, 15, 20, 27.5 and 31.5 years. |
| Investment tax credit | Under the former tax law, the tax credit was 0% for an estimated useful life of less than 3 years, 3.3% for 3 to 4 years, 6.7% for 5 to 6 years, and 10% for 7 years or longer. This was changed to 6% for 3 years and 10% for 5 years or longer. The 1986 revision abolished this tax credit. |
| Extension of the period for the carry-over of losses | Extended from 7 years to 15 years. |
| Small Business Corporate Tax | This lowered the tax rate levied on amounts of $50,000 or less of the taxable income of corporations. |
| R&D investments | This permitted a 25% tax credit (unreturnable) for increases in R&D expenses (the 1986 revision lowered it to 20%). It applied to payments made or expenditures that arose between July 1981 and the end of 1985. |

Source: Prepared based on Yoshikawa [2000].

## (3) Enactment of the Small Business Innovation Research Act (1982)

The Small Business Innovation Research Act (SBIR) was similarly enacted during the Reagan Administration. This act established a program for the principal government agencies whereby agencies with R&D budgets of $100 million or more were obligated to disburse an amount equivalent to a certain percentage to the program. This would thereby increase government spending for small high technology businesses with commercialization potential. Furthermore, when carrying out the 1986 tax reform, the government provided reduced tax rates of 15% and 20% for small businesses.

## (4) Efforts of the Clinton Administration (1993 - 2000)

All of the efforts mentioned above were important. However, concrete strengthening of industrial competitiveness began to progress from the inauguration of the Democratic Party's Clinton Administration, which set forth resuscitation of the domestic economy as the most important priority[*6]. One of the early achievements of this administration was the Fiscal Deficit Reduction Act, which was passed in August 1993. Although this law included a small business investment tax credit and R&D tax cut, in contrast to tax reform during the Republican administrations it raised the maximum tax rate for the corporate tax from 34% to 35%. In addition, the Telecommunications Law was enacted in February 1996, and barriers separating long distance communications, regional telephone services and CATV were removed as a general rule. At the time, the fiscal deficit steadily declined, long-term interest rates dropped and capital spending increased. From the early 1990s, while companies began to seriously restructure their businesses, they also undertook increasingly aggressive action to improve competitiveness, mainly through investments in information technology.

In addition, the U.S. also enacted the Small Business Protection Act (1996), which included the lowering of the legal minimum wage level and investment and R&D tax cuts in sectors not related to telecommunications as well, and the Internal Revenue Service Reform Act (1998), which included preferential measures for investments in venture capital funds by private investors.

The Competitiveness Policy Council, which was formed at the end of the Bush Administration and began full-fledged activities during the Clinton Administration, presented a comprehensive competitiveness strategy concerning measures to improve competitiveness. Chart 9 summarizes *A Competitiveness Strategy for America, Second Report to the President & Congress* (1993), which was announced one year into the Clinton Administration and became the keynote of the administration's competitiveness strategy, and *Enhancing American Competitiveness, A Progress Report to the President & Congress* (1993), which ascertains the state of progress of policies following their implementation.

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*6 As seen by the Council on Competitiveness becoming a means through which the industrial world conveys its wishes to the administration, the interests of industry and government are not always in agreement. Industry finds the R&D expense tax credit, tax cuts and similar incentives desirable. Meanwhile, government is constantly faced with the task of procuring financial resources. As revealed by the repeated directional changes in the government's attitude toward industry through changes in the political party in power, it is difficult to ensure neutrality toward all stakeholders. Finding a neutral Merkmal, or indicator, of "who would find something desirable" is difficult. Examples of measures of questionable neutrality are compensation for the asymmetric nature of information (e.g. the existence of intermediary organizations that provide technological information) and compensation for external economic efficiency (e.g. protection of the results of technological development). In addition, because industries falling under the category of what are called protected industries continue to decline while unprotected industries expand greatly, there has also been analysis of whether competitiveness improved as a result of industrial policy, and whether competitiveness was achieved independent of industrial policy or regardless of the protection resulting from the existence of industrial policy (Porter [2000]).

Chart 9: Policies of the Clinton Administration's Competitiveness Policy Council

| Item | Contents Presented in *Annual Reports to the President & Congress* | *Progress Report*'s Assessment |
|---|---|---|
| Education | Establishment of precise contents and implementation standards for implementation and improvement in line with the National Education Goals[*7], which were instituted in 1990 through the National Conference of Governors | Education is the most important prerequisite of competitiveness enhancement, and supports government reforms. |
| Worker training | Promotion of life-long continuing education, study and training programs, contract systems, joint education, increased establishment of vocational training schools, such as schools to educate leaders and improvement of worker quality | N/A |
| Commercialization of technology | Establishment of technological innovation and commercialization tax credit systems for private R&D investments, employment of the Accelerated Cost Recovery System for R&D investments to convert technology from military to civilian application, development of general technology by the Advanced Research Planning Agency and other agencies, increased joint industry-government R&D expenditures, etc. | Proposals such as the R&D tax credit and advanced research program deserve high regard, as technology policies are the core of competitiveness. |
| Trade policy | Establishment of a growth strategy, maintenance of an equilibrium rate of exchange, the Uruguay Round, NAFTA, increasingly active U.S.-Japan negotiations, increased export credit through the Export-Import Bank, improvement of the export promotion plan | It is necessary to remedy the causes of export impediments, as the trade deficit is a direct indicator of U.S. competitiveness. |
| Production activities | Tax credit system for production equipment, establishment of an industrial consortium for production cooperation and improvement of the useful life of new manufacturing process equipment | N/A |
| Infrastructure construction | Improvement of the transport network, construction of an information highway and construction and improvement of roads and bridges | Even more action is required as a precondition of competitiveness |

Source: Prepared based on Sekishita [1996]

*7 The National Education Goals are composed of the following six specific goals:
(1) Provide school education for all children;
(2) Raise the senior high school graduation rate to 90%;
(3) Have students exhibit their capabilities in academic subjects, including English, mathematics, science and geography, in the 4th, 8th and 12th grades; furthermore, have students adequately acquire responsibility as citizens, the effort to learn and productive employment, in order to better their minds;
(4) Raise the level attained in math and the sciences to the highest in the world;
(5) Have all adults be able to read and write, possess the knowledge and skills to be able to compete in the global economy; furthermore, have all adults exercise their rights and responsibilities as citizens;
(6) Have all schools be free of harmful drugs and violence and create order in the learning environment.

## (5) Policy Efforts Since *The New Young Report*

Up to this point, this report has presented an overview of the main policies. Chart 10 provides another summary of the policies based on the four recommendations of *The New Young Report*. When learning from *The New Young Report*'s recommended proposition of competitiveness enhancement, we should not stop simply at technological development policies. We should also follow the U.S.'s example of pursuing the matter comprehensively, over the long-term and strategically in a wide range of fields, such as antitrust and immigration policy relaxation, patent, employment development and commercial policies and taxation. In the case of Japan, one concern will be whether the country will be able to work out policies in this kind of broad-ranging and strategic manner in order to achieve a goal.

Chart 10: Policies Related to the 4 Recommendations of *The New Young Report*

| **(1) Creation, Practical Application and Protection of New Technology (Technological Policies)** | |
|---|---|
| 1986 | - Enactment of the Federal Technology Transfer Act.<br>Allows the organization of cooperative research and development between the government and private sectors in Federal Laboratories (Cooperative Research and Development Agreement (CRADA)). |
| 1987 | - The President's annual State of the Union Message to Congress declared that a plan for research in basic fields would be promoted.<br>- The President's Government Council on Small Businesses announced 60 recommendations to invigorate small businesses.<br>- Congress reapproved the Small Business Innovation Research (SBIR) Program. Budget: $500 million (FY 1981: $110 million)<br>- Presidential Order 12591, in April: Commencement of the Technology Share Program. Directs that technology transfers be promoted through cooperation between Federal Laboratories under the jurisdiction of the government agencies, private companies and universities.<br>- International Partnership for Commercialization of Technology (INPACT) Plan: Promotion of the Bi-national Foundation for Industrial R&D (BIRD) Program, which provides support for U.S. and foreign small businesses. The program is expanded to include Ireland (Israel (1977), India (1985) and France (1986)). |
| 1988 | - Omnibus Trade and Competitiveness Act of 1988: The Department of Commerce endeavors to disseminate advanced technology.<br>The National Institute of Standards and Technology (NIST) leads the way in promoting the dissemination of advanced technology, especially to small businesses.<br>(1) Establishes 3 regional centers for manufacturing technology transfers cooperatively with 3 private NPOs, and aids the adoption of new technology by small businesses.<br>(2) Provides advice on drafting technology policies to state governments.<br>(3) Advanced Technology Program: Supports commercialization of advanced manufacturing technology by small businesses.<br>(4) Creation of databases on technology policies at the state and municipal government levels.<br>- National Science Foundation establishes Science and Technology Centers nationwide.<br>- In November, the government financed $100 million of SEMATECH's total budget of $250 million.<br>- The secretary of commerce and the attorney general propose the relaxation of antitrust |

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|---|---|
| | regulations concerning joint ventures between companies, from the standpoint of boosting U.S. competitiveness. |
| | - The Department of Justice announces new Antitrust Act guidelines concerning overseas activities by U.S. companies. |
| | - The Technology Administration is established within the Department of Commerce. |
| | The Technology Administration is responsible for initiatives related to science and technology policies and coordinates policies related to the various departments. |
| | It promotes policies jointly with the Department of Commerce's National Institute of Standard Technology and National Technical Information Service. |
| | It promotes policies jointly with the Department of Commerce's National Institute of Standard Technology and National Technical Information Service. |
| 1989 | - $25 million invested in super conduction research by the NSF's Science and Technology Center. |
| | - In accordance with the 1988 Trade Act, the 13-member National Advisory Committee on Semi-Conductors is established. |
| | A national strategy is worked out to enable the U.S. semiconductor industry to maintain is leading position in the world. |
| | - Army Corps of Engineers: Commences a new technological research program concerning construction technology. |
| | - The Small Business Administration organizes a volunteer network of up to 12,000 people for small business promotion. |
| | Service Corps of Retired Executives (SCORE) |
| | Active Corps of Executives (ACE) |
| | - NSF establishes 11 Interdisciplinary Science and Technology Centers. |
| | Priority research fields: super conduction, robotics, biotechnology, micro-electronics |
| 1991 | - Share of the R&D related budget in the federal budget: Approx. $68.7 billion, an increase of $2.0 billion over the previous year. |
| | The increase was mainly allocated to the following agencies and fields. |
| | (1) NSF: basic research, development of scientists and engineers |
| | (2) Development of technology for both military and civilian use: robotics, semiconductors, super conduction, super computers |
| | (3) Biotechnology |
| | (4) Research in alternative energy sources |
| | (5) New transportation systems |
| | (6) NIST: support for research in early stage technology and manufacturing technology through joint projects between companies: aid for computer system research |
| | - High Performance Computing and Communication Program commences as a result of the enactment of the High Performance Computing Act. |
| | - National Cooperative Research Act is expanded. |
| | - Perpetuation of tax credit measures concerning R&D. |
| 1992 | - R&D related federal budget increases 7% over previous year, and is expected to rise to a total of $77 billion in FY 1993. |
| | - Various government regulatory relaxation initiatives: emphasis on results and the market mechanism |
| | - Information Infrastructure and Technology Act enacted. |

| | |
|---|---|
| 1993 | - National Export Strategy instituted. Export regulations on computers and telecommunications relaxed because of improvements in the political situation in Eastern Europe. Expect this to produce a $35 billion effect.<br>- Boosted high technology related exports.<br>- Shifted the government's R&D priority to the private sector.<br>Related programs: Advanced Technology Program, Manufacturing Extension Centers, SBIR program, NASA Technology Investment Package<br>- Technology Reinvestment Program: Supports companies shifting from the military to the civilian sector.<br>- Advance Technology Program: Supports high risk- high return technological development by the private sector.<br>The budget was increased greatly from $68 million in the previous year to $200 million for FY 1994.<br>- Promotion of the diversion of research results of the Pentagon, the Department of Energy and NASA to use by the private sector.<br>- Capital gains tax rate lowered for investments in small businesses.<br>- Established the National Science and Technology Council, to coordinate science and technology policies within the government and between government agencies and the business sector.<br>- NSF budget increased 7.2% over the previous year.<br>- In September, the federal government, GM, Ford and Chrysler establish a technological development consortium.<br>(1) Research in new production processes<br>(2) Research in fuel cell technology<br>(3) Research in new materials<br>Participating agencies: Department of Commerce, Pentagon, Department of Energy, Department of Transportation, Environmental Protection Agency, National Science Foundation, NASA<br>- Advanced Research Project Agency (ARPA) and 10 private sector companies form the U.S. Display Consortium<br>- Advanced Communications Technology Satellite Program: NASA, 21 private sector companies and 25 universities participate in the program. |
| 1994 | - Vice President Gore announces the Global Information Infrastructure plan, a plan to connect the information infrastructures of countries around the world and establish an information infrastructure on a global scale. |
| 1996 | - The Computing, Information and Communications (CIC) plan is inaugurated. The contents of the HPCC plan, which was inaugurated in 1991, are reorganized. |
| 1998 | - The Next Generation Internet Research Act of 1998 is enacted. The object of this law is to promote the development of technology to establish the environment for high-speed, stable Internet communications. DARPA, NIST, NASA, NSF, NIH and DOE cooperate in this undertaking. |

| (2) Capital Cost Reduction (Taxation) | |
|---|---|
| 1981 | Reagan Tax Reform<br>Investment Tax Credit: The tax deduction rate rises for assets with a short estimated useful life.<br>Useful life of 3 years - 6%<br>Useful life of 5 years or longer - 10%<br>- Accelerated Cost Recovery System: Accelerated depreciation is carried out by dividing the depreciation period for assets into 4 categories, 3, 5, 10 and 15 years.<br>- R&D investments: A 25% deduction rate is applied to increases in R&D expenses. |
| 1986 | Second Reagan Tax Reform<br>- The Investment Tax Credit is abolished<br>- Corporate Tax: The taxation rate is lowered from 46% to 34%.<br>- Accelerated Cost Recovery System: The number of categories for the cost recovery period is changed from four to eight categories, 3, 5, 7, 10, 15, 20, 27.5 and 31.5 years.<br>- R&D investments: The deduction rate is lowered to 20%. |

| (3) Human Resources Development | |
|---|---|
| 1985 | - Job Training Partnership Act<br>This provides basic training, such as to improve the literacy rate, for the unemployed. |
| 1986 | - Employment and Training Administration (ETA)<br>ETA decentralizes unemployment insurance related operations<br>*Workforce 2000*: Measures to develop a workforce that can adapt to rapid changes are announced.<br>- Trade Adjustment Assistance Program<br>This is a program for corporate and worker relief based on the 1974 Trade Act. It provides reemployment support to workers who lose their jobs or have their real working hours or income reduced as a result of increased imports. The U.S. decided to extend the program for five years, until 1991. |
| 1987 | - Workers Adjustment Assistance Program<br>This is a support program for workers who fall into difficulties because of increased imports.<br>Assisted 93,000 workers in 1986 and 115,000 workers in 1987.<br>The amount of assistance provided in FY 1987 rises to over $176 million. |
| 1989 | - Economic Dislocation and Worker Adjustment Assistance Program (EDWAA)<br>The training program is revised to be carried out more appropriately.<br>- Trade Adjustment Assistance Program: Strict application of application requirements for financial aid.<br>- Worker Adjustment and Retraining Notification Act is enacted.<br>Makes a 60-day advance notice of plant closings or large-scale layoffs mandatory. |
| 1990 | - Immigration Act: First major revision in 25 years.<br>The revision increases the quota for U.S. permanent residency for researchers, technicians, scientists and similar persons possessing advanced specialized skills by 140,000 people, to |

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|---|---|
| | three times the existing quota. |
| | - First Permanent Residency for Investors Program since 1977: Permanent residency is granted to investors who invest $1 million or more in starting a business in the U.S. and are able to provide employment opportunities for ten or more people. The quota is 10,000 people. The employment created by this program is expected to be equivalent to jobs for up to 40,000 people. |
| 1993 | - The Office of the American Workplace is established: This office aims to promote the establishment of working environments that capable of achieving a high level of performance. |
| | - Review of the Retraining Assistance Program. |
| | - Establishment of a skills training system that meets the needs of business. |
| 1998 | - Workforce Investment Act: The object of this law is to strive to boost competitiveness and build a comprehensive workforce foundation through a partnership comprised of the federal government, state and municipal governments, the industrial world and the educational world. The law has features such as the establishment of One Stop Centers, accountability of the vocational training system and the adoption of the market mechanism. |

| **(4) Trade Policies** | |
|---|---|
| 1985 | - U.S.-Israel Free Trade Agreement |
| 1986 | - The U.S. strives to liberalize trade in services and investments through the GATT. |
| | - The U.S. seeks voluntary export control at the bilateral level. Targeted fields: semiconductors, leather goods, and cigarettes |
| | - Dumping practices recognized in 71 cases. |
| 1988 | - The U.S. strives to further strengthen the GATT system. |
| | - In January, the U.S. concludes the U.S.-Canada Free Trade Agreement. |
| | - The U.S. strengthens antidumping measures through bilateral negotiations, in accordance with the 1974 Trade Act. |
| | - Enactment of the Omnibus Trade and Competitiveness Act of 1988: This law strengthens the president's powers and strives to remove tariff and nontariff barriers within the GATT framework (Article Super 301). |
| | - The Section 5021 Exxon-Florio Amendment: This incorporates a clause that enables the president to block an acquisition of an U.S. company by a foreign company that could potentially undermine national security. |
| | - The Treasury Department opposes the acquisition of Fairchild by Fujitsu. |
| | - The Small Business Administration and the Federal Bar Association cooperate to revitalize the Export Legal Assistance Network (ELAN). |
| | This is a network for legal advice related to exporting. |
| | - Trade Adjustment Assistance Program: Assistance totaling $131 million is provided to 171 companies. |
| 1989 | - The U.S.-Canada Free Trade Agreement comes into effect. |
| | - Program to liberalize trade in iron and steel |
| | The agreement concerning voluntary control of iron and steel exports is extended for 2 and a half years. |
| 1990 | - In June, the U.S.-Soviet Trade Agreement is concluded. |

| | |
|---|---|
| | - In June, the report on the Japan-U.S. Structural Impediments Initiative is issued. |
| | - In September, the president announces that free trade agreement negotiations will be held with Mexico a well. |
| | - The president asks Congress to grant fast-track authority in preparation for the Uruguay Round and NAFTA negotiations. |
| | - The term of effectiveness of Article Super 301 lapses. |
| | - Enterprise for the Americas Initiative: This is an endeavor to establish a free trade zone in the Western Hemisphere. The U.S., Bolivia, Colombia, Chile, Honduras and Costa Rica participate. |
| 1991 | - Canada joins in the U.S.-Mexico free trade negotiations. |
| 1993 | - The Clinton Administration announces the "National Export Strategy": Its sets a goal of increasing exports by 60% and aims to create 6 million new export-related jobs. |
| | - The North American Free Trade Agreement (NAFTA) passes the U.S. Congress. |
| | - The GATT Uruguay Round is concluded. |
| | - Overseas Private Investment Corporation raises the amount of compensation ceiling. |
| | - The U.S. establishes a support system for U.S. companies participating in overseas public works projects. |
| 1994 | - The Free Trade Area of the Americas (FTAA) plan is proposed at a summit meeting of countries in the Americas. |
| 1999 | - Article Super 301 is resurrected. |

Source: Prepared based on OECD [1987-1994], NSTC [1999], Uchida [1999] and GAO [2001].

# 4. Innovation Is the Key

Up to this point this report has examined the appearance of *The Young Report* and specific efforts in the U.S. The common understanding throughout these is the view that it is innovation that is the most important, moreover the only driving force of long-term growth[*8].

Furthermore, although innovation converts knowledge into new products, processes and services, this is not simply about science and technology. Along with new products and processes, innovation in marketing, distribution and services has also come to fulfill an important role (Council [1999]). This section first introduces the efforts of the Council on Competitiveness and the IMD, and then examines Japan's competitiveness ranking.

## (1) "The New Challenge to America's Prosperity - Findings from the Innovation Index -" (1999)

The Council on Competitiveness issued this report in 1999 to sound the warning bell that although the U.S. economy was expanding at present, its long-term growth capacity was declining. The report asserted that it had become uncertain whether medium and long-term growth would be possible amid the rise of countries with low wage levels. Furthermore, it declared that the task imposed upon the country was to enhance its innovative ability in order to maintain its long-term growth capacity. The report than presented the following three components as the theoretical framework for measuring innovative ability.

### (I) Is the Infrastructure for Innovation Already in Place?

This is determined by:

(1) Basic research;
(2) R&D tax incentives;
(3) The supply of risk money;
(4) The educational level;
(5) Capable human resources in the fields of science and technology;
(6) The telecommunications infrastructure;
(7) The protection of intellectual property rights;
(8) The openness of international trade and investments;
(9) A sophisticated demand.

Regarding these factors individually, as for the educational level, (4), because foreign students in part sustain the U.S.'s high educational level, there is concern about the recent marked trend of these students returning to their home countries. In addition, concerning Japan, the supply of risk money, (3), is not only in the form of U.S.-type venture capital, but there are also a variety of forms in other countries. For example, in Japan, large corporations are suppliers of risk money. Furthermore, regarding the protection of intellectual property rights, (7), it has been pointed out that in contrast to the success of the U.S. pharmaceutical industry, Japan has been inadequate protecting intellectual property rights from the past.

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*8 It is not that there is absolutely no disagreement with this view. However, there is general consensus on it among economists. Representative studies of this are the Theory of Endogenous Growth (Romer and Jones), A Historical Study of the Industrial Revolution (Landes) and Analyses of Developing Countries and Countries in Economic Transition (Gomulka) (WEF [2000]).

### (II) Are the Characteristics of Clusters in Place?

The framework is that the presence of clusters invigorate innovation, and clusters are characterized by:

(1) The high level of the elements of production;
(2) Intense competition with nearby companies;
(3) The presence of sophisticated sources of demand;
(4) The support of related industries.

### (III) The Infrastructure-Cluster Linkage for the Sake of Innovation

Innovation does not only require that the above-mentioned conditions (I) and (II) are in place. It also requires a linkage between the two. For example, how strongly are basic research and similar strengths tied to commercialization in clusters, and how much feedback do clusters provide to basic research? This mutual linkage is also taken into consideration, as innovation is stimulated all the more by it.

M. Porter and S. Stern conceived the Innovation Index as a foundation for these theoretical frameworks and measured the innovative ability of various countries. A concrete indicator of the Innovation Index is the number of international patents held by the countries. Compared with other indicators, such as the number of scientific papers submitted and the number of copyrights held, the number of international patents is deemed to have a strong correlation to a country's output based on innovation, because it usually indicates commercial success.

Chart 11 indicates the explanatory variables of this index[*9].

Chart 11: Composition of the Innovation Index

| Condition | Indicator |
|---|---|
| (I) Infrastructure for innovation | (1) Number of employers in the field of R&D (OECD statistics), (2) R&D expenditures (OECD statistics), (3) openness of international trade and investments (IMD questionnaire survey), (4) strength of intellectual property right protection (IMD questionnaire survey), (5) GDP share of secondary and higher education expenditures (World Bank statistics), (6) per capita GDP (World Bank statistics) |
| (II) Characteristics of clusters | As an indirect indicator, the share of private sector expenditures in total R&D expenditures (OECD statistics) |
| (III) Infrastructure-cluster linkage for the sake of innovation | The share of expenditures by universities in total R&D expenditures (OECD statistics) |

Source: Prepared based on Council [1999]

Forecasts using the Innovation Index (Chart 12) place Japan as the leader in 1999 and 2005. Although the U.S. implements measures to encourage applied research, such as the Bayh-Dole Act, it is inadequate in the area of basic research. In spite of its favorable macroeconomic performance, in contrast to Japan, the decline in its ranking to third place in 1999 and fifth place in 2005 is cause for concern hereafter. The Council on Competitiveness' 1999 report recommends that in order to

*9 The relationships between these actually used indicators and the theories (I), (II) and (III) have not necessarily been thoroughly explained. The Innovation Index is the use of statistics that can be actually used to solve the problem of measuring innovative ability. The theoretical frameworks serve only as a backdrop.

ensure its prosperity throughout the years to come, the U.S. needs to have an innovation strategy that is built around:

(1) Avoiding the reduction of R&D expenditures by the federal government;
(2) Development of human resources in the field of R&D;
(3) Improved protection of intellectual property rights;
(4) Sustained leadership in efforts to open markets domestically and abroad;
(5) Reexamination of the current state of regulations.

Chart 12: Rankings According to the Innovation Index

| Ranking | 1995 | 1999 (Forecasted) | 2005 (Forecasted) |
|---|---|---|---|
| 1 | U.S. | Japan | Japan |
| 2 | Switzerland | Switzerland | Finland |
| 3 | Japan | U.S. | Switzerland |
| 4 | Sweden | Sweden | Denmark |
| 5 | Germany | Germany | Sweden |
| 6 | Finland | Finland | U.S. |
| 7 | Denmark | Denmark | Germany |
| 8 | France | France | France |
| 9 | Canada | Norway | Norway |
| 10 | Norway | Canada | Canada |
| 11 | Netherlands | Australia | Australia |
| 12 | Australia | Netherlands | Austria |
| 13 | Austria | Austria | Netherlands |
| 14 | U.K. | U.K. | U.K. |
| 15 | New Zealand | New Zealand | New Zealand |
| 16 | Italy | Italy | Spain |
| 17 | Spain | Spain | Italy |

Source: Prepared based on Council [1999] (same as Chart 11).

The important point made here is that innovation is important to not short-term, but long-term growth. As already mentioned, it is possible to raise short-term competitiveness by cutting costs. However, it will be uncertain whether long-term prosperity can be sustained as economic integration advances and countries with low wage levels improve their technology. Therefore, innovation holds the key to long-term competitiveness.

It is also necessary to keep in mind that the Innovation Index is no more than competitiveness illustrated by creating an index for the U.S. based on the number of international patents. As Chart 13 indicates, Japan towers above all others in number of patents. However, the view that innovative ability can be ascertained by number of patents alone is in not reliable from the perspective of whether patents are being utilized effectively in the sense of enjoying the results through patents leading to commercialization. The series of reports by the Council on Competitiveness also have the inherent character of being a written demand to the government from the industrial world asking the federal government to increase national spending. Therefore, there is a need to take this into account when considering the claim that the U.S.'s position will decline and Japan will rise to the top.

Chart 13: Number of Patents Held by Residents (1999)

| Ranking | Country | No. of Patents |
|---|---|---|
| 1 | Japan | 133,960 |
| 2 | U.S. | 83,907 |
| 3 | Republic of Korea | 43,314 |
| 4 | Germany | 18,811 |
| 5 | Russia | 15,362 |
| 6 | France | 11,500 |
| 7 | Italy | 6,481 |
| 8 | U.K. | 4,465 |
| 9 | Netherlands | 2,960 |
| 10 | Sweden | 2,526 |

Source: Prepared based on the WIPO HP ( www.wipo.org ).

In Japan, in accordance with the University Technology Transfer Promotion Law (Japan's version of the Bayh-Dole Act), the government provides a fixed allowance in order to have the R&D achievements of universities utilized widely. However, in order to boost innovation, it is necessary to examine the R&D foundation that leads to an increase in the number of patents, of course, and also elements in the broader category of the activity environment for innovative endeavors. The IMD's effort is an important investigation of this point and is explained below.

## (2) IMD's Assessment of Global Competitiveness

The *World Competitiveness Yearbook* by the Swiss IMD is an effort concerning the assessment of international competitiveness[*10]. This survey is an effort to compare the competitiveness of 49 countries based on 224 assessment standards that were prepared using 118 items of statistical data and a questionnaire survey composed of 106 questions. Chart 14 presents the specific indicators used.

*10 Besides the IMD, another effort concerning the assessment of international competitiveness is the World Economic Forum's (WEF) "The Global Competitiveness Report." The WEF survey's definition of competitiveness is "the set of institutions and economic policies supportive of high rates of economic growth in the medium term." It is known for attaching importance to environmental efforts and can be said to include sustainable growth in its intent. It provides two indices to ascertain competitiveness, the growth competitiveness index and current competitiveness index. In the WEF [2000] survey, Japan ranks 21st according to the former index (the U.S. leads, followed by Singapore, Luxembourg, the Netherlands, Ireland, Finland and Canada) and 14th according to the latter (Finland leads, followed by the U.S., Germany, the Netherlands, Switzerland, Sweden, the U.K. and Singapore).

Chart 14: Indicators Used in the *World Competitiveness Yearbook*

| Item | Indicator |
|---|---|
| (1) Economic performance | (i) Domestic economy, (ii) trade, (iii) international investments, (iv) employment, (v) prices |
| (2) Government efficiency | (i) Public finances, (ii) fiscal policy, (iii) national systems, (iv) industrial systems, (v) education |
| (3) Industrial efficiency | (i) Productivity, (ii) labor market, (iii) financial markets, (iv) business practices, (v) internationalization |
| (4) Infrastructure | (i) Basic infrastructure, (ii) technological infrastructure, (iii) scientific infrastructure, (iv) sanitation and the environment, (v) assessment systems |

Source: Prepared based on IMD [2001]

The global competitiveness index is obtained by giving countries a ranking for each of the 20 items above (4 components (1) - (4) multiplied by 5 indicators (i) - (v) ) and giving each of the 20 items the same weight.

In the 2001 survey, Japan ranked 26th. The survey also indicated each country's ranking for the individual assessment items and the areas where a high evaluation was received and a low evaluation was received for the 20 items. This was indicated for Japan as well, which ranked 1st to 8th*11 among 49 countries in areas where a high evaluation was received and 46th to 49th in areas where a low evaluation was received. Chart 15 presents the representative items.

Chart 15: The IMD Global Competitiveness Assessment of Japan

| Item | Indicator receiving a high evaluation | Indicator receiving a low evaluation |
|---|---|---|
| (1) Economic performance | Current account balance, financial assets, foreign (outward) investments, etc. | Cost of living level, share of trade in GDP, etc. |
| (2) Government efficiency | Foreign currency reserves, educational standard, share accounted for by indirect taxes, etc. | Immigration law, openness to foreign companies in government procurements, usefulness of universities to companies, transparency of the government, fiscal deficit, the political system's adaptability to the economy, response to changes in the economic environment, fiscal management, consensus on policies in the Cabinet, etc. |
| (3) Industrial efficiency | Consumer satisfaction, employee education, labor costs in the manufacturing industry, motivation of employees, etc. | Entrepreneurial spirit, frequency of company establishment, treatment of the value of stockholders, etc. |
| (4) Infrastructure | Number of patents obtained by residents, R&D expenditures, size of R&D staff, rate of computer use, etc. | Industrial electricity costs, flexibility and adaptability, openness of the culture, etc. |

Source: Prepared based on IMD [2001] (same as Chart 14).

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*11 Of the 224 assessment criteria above, Japan ranked among the best three countries for 23 items. On the other hand, it ranked among the worst three countries (No. 47 to 49) for 26 items. Furthermore, the IMD recalculates rankings if the average level of the worst 20 items is improved. Therefore, Japan improved from 26th place to 17th place.

Generally speaking, it can be said that Japan received high evaluations for innovation potential based on the country's R&D and for total assets held, and low evaluations in areas such as the fiscal deficit, fiscal and economic policies, regulations and openness to foreigners and foreign countries. One point deserving attention is that fact that the indicators of governmental efficiency[*12] account for the majority of the indicators receiving low evaluations.

*12 As mentioned above, this survey gave the statistical data and questionnaire results the same weight of importance. However, the items with comparatively conspicuous low evaluations, such as governmental efficiency, were mostly items for which the questionnaire results were used for evaluation. Urata [2001] is one of the recent efforts that base assessments of competitiveness only on statistical data.

## [Reference Material] "U.S. Competitiveness 2001: Strengths, Vulnerabilities and Long-term Priorities" (2001)

This is the latest report by the Council on Competitiveness, and it stresses the importance of innovation.

It points out that although the U.S. achieved the prosperity of the 1990s because of ceaseless efforts at innovation, the waning of potential competitiveness has become apparent. It states that R&D and human resources development and education are the requirements for long-term U.S. prosperity[*13].

Specifically, the report points out that:

(1) The U.S. had led other countries in number of patents obtained;
(2) Furthermore, the increase in business starts has contributed to investment promotion and employment creation (accounts for one third of new jobs created), because it links the fruits of innovation to business;
(3) Venture capital in the financial markets, which support innovation, grew by six times during the five-year period since 1995, and the expansion of the stock market led to the increase in IPOs.

On the other hand, the negative phenomena are:

(1) Not only are private R&D investments predominantly in applied fields, but contribution to R&D as a country (share of R&D expenditures in the GDP) has declined as well, and R&D investments declined as a whole during the 1990s;
(2) Research facilities are becoming more and more superannuated and are not receiving adequate support;

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*13 Besides the topic of innovation, the report includes:
(I) A review of economic growth in the 1990s, accompanied by a look at:
(1) The expansion of the workforce as a result of participation in the job market by women, African-Americans and Hispanic people;
(2) The decline of the unemployment rate;
(3) The recovery of private capital investments led by IT investments since 1995;
(4) The contribution of IT adoption to increased productivity;
(5) The realization of economic growth without inflation as a result of improved productivity.

The report asserts that the government's macroeconomic policies have (1) achieved a fiscal surplus and that (2) the trade in services, high tech goods and intellectual property rights supports U.S. exports. On the other hand, in (II) the report asserts that prosperity has hidden the U.S.'s weaknesses, mainly:
(1) The expanding income gap (40% of households have not enjoyed an increase in income);
(2) The expansion of the wage gap as a result of differences in educational levels (university graduates versus people who have not graduated from high school).

Regarding macroeconomic policies, the report points out that:
(1) Because the domestic savings rate is low, the U.S. is highly dependent on foreign investors;
(2) In spite of the above-mentioned trade in services, etc., the trade deficit continues to grow as result of increased imports. (Council [2001])

In particular, the report devoted many pages to the problem of the education gap as a prominent problem for the U.S. In recent years, while the level of skills required rises, there continue to be people, mainly Hispanics, who do not graduate from high school. Moreover, a large percentage of these people experience unemployment and poverty, and there is a need to reeducate them in math, reading and writing. In addition, there are not enough computers and Internet connections available to poor and low-income people, and they are unable to receive a university education and similar opportunities sufficiently. In addition to this education gap, the math and science scores of U.S. elementary and junior high school students are inferior compared with students in other countries, and the report raises the issue of the problem of the shortage of teachers in these subjects. Furthermore, the report expresses concern over the fact that the working population is not growing and participation in the labor market by the elderly is also declining.

(3) Not only is too much importance given to the life sciences and not only has the level of computer science remained low, but there is also a tendency to neglect fields such as engineering and physics; therefore, the U.S. has lost the balance between fields;
(4) The same trend is apparent in the area of the acquisition of academic degrees;
(5) While there is a trend of increasing acquisition of doctorate degrees in science and technology fields by foreign students, it will be difficult for them to contribute to the improvement of U.S. human resources because currently these foreign students tend to return to their home countries.

Furthermore, the competitiveness of other countries has improved. The report specifically points out that in other countries:

(1) The percentage of researchers in the workforce is increasing;
(2) Improved productivity through IT investments has been observed;
(3) The rates of use of computers and the Internet are increasing sharply.

It then warns the U.S. that:

(1) Its human resources in science and engineering are poor compared with other countries;
(2) It is very conspicuous that there are countries whose R&D investments are growing greatly compared with the U.S.;
(3) The level of the number of patents of foreign countries is also high.

As a result, the U.S., which used to bear the responsibility for innovation, was been challenged by Switzerland and Japan during the 1980s, and at present the top group in innovation includes the U.S., Switzerland, Sweden, Germany, Finland, Denmark and Japan. The group immediately following includes Canada, France, Austria, Norway, Italy, Spain, the U.K., the Netherlands, Australia and New Zealand. And the developing group includes Ireland, Israel, Singapore, the Republic of Korea and Taiwan. Therefore, innovation is occurring all around the world.

Based on this, the report recommends:

(1) More federal R&D investment in basic fields;
(2) Ensuring balance between fields;
(3) Development of human resources to be scientists and engineers;
(4) Modernization of research facilities.

In addition, the report attaches importance to the role of clusters in innovation, and categorizes industry clusters as follows:

(1) Industries exposed to competition domestically and abroad, such as banking, cars and textiles;
(2) Industries closely tied to local communities, such as retailing, construction and agriculture;
(3) Industries limited to regions that yield resources, such as coal, forestry and petroleum.

The report points out that in the U.S. there are clusters in fields such as cars, IT, pharmaceuticals, and textiles in regions throughout the country, and that these regional clusters lead in acquisition of patents.

## 5. For the Future

Lastly, this report examines the future direction for improving competitiveness, based on Japan's rankings in the surveys discussed up to this point.

### (1) Japan's Innovative Ability

The Innovation Index, presented earlier in Chart 12, produced the result of Japan ranking at the top in innovation. There is no question that number of international patents, the factor used in the assessment, is an effective indicator, because patents usually indicate commercial success.

In addition, the IMD report discussed earlier evaluated Japan especially highly in the area of the environment for innovation. The country ranked in the top two in the world in areas such as number of patents acquired by residents, R&D expenditures, the size of R&D staff and the rate of computer use. Therefore, it is possible to have a certain high regard for Japan's innovative ability based on the country's high level of science and technology.

However, innovation is not limited to science and technology. As mentioned earlier, along with new products and processes, innovation in marketing, distribution and services has also come to fulfill an important role. In addition, the IMD report was based on subjective replies, not statistics. Therefore, it is necessary to keep in mind that by nature it is deeply affected by the times in which it was produced. However, one cannot deny the factors directly and indirectly impeding Japan's innovative ability, which were presented earlier in Chart 15. These impediments included:

- High industrial electricity costs and high cost of living;
- Establishing companies is not common because there is little entrepreneurial spirit;
- The rights and duties of stockholders are not transparent and are inadequate;
- The government's management of policy is not integrated;
- The country's fiscal management is inferior to that of other countries;
- University education does not contribute to the improvement of competitiveness;
- The people are not open to foreigners.

What is considered necessary at present is a strategy to raise innovative ability hereafter as the driving force of the country's long-term growth, while utilizing our superiority in science and technology in business.

### (2) Japan's Policies

Especially in the context of recovering competitiveness and industrial resuscitation, it is of course a fact that Japan has undertaken successive measures such as drafting new laws and implementing various regulatory relaxation measures. For example, it has enacted the Industrial Technology Strengthening Law and the Law for Special Measures to Resuscitate Industrial Vigor[*14].

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*14 Efforts to consider the strengthening of industrial competitiveness have become increasing vigorous in Japan in recent years. Although there are differences in economic conditions, these efforts have been affected by *The Young Report*, which was discussed earlier. The following is a summary of developments to date.

(1) The Economic Strategy Council (1998 - March 1999): This council was modeled after the U.S.'s President's Council on Economic Policy, and was an advisory organ established within the Prime Minister's Office. Composed of economists and employers, it recommended policies to strengthen industrial competitiveness, such as aid for the disposal of excess equipment, stimulation of capital spending in growth fields, strong promotion of the adoption of information technology and reform of the management structure. In addition, it proposed support for establishing companies, strategic technological development, the establishment of human resources and an intellectual foundation, etc. (February 1999 report "Strategy to Resuscitate Japan's Economy").

(2) The Council on Industrial Competitiveness (March 1999 - ): This council was modeled after the Council on Competitiveness, which prepared *The Young Report*. It is the Prime Minister's private consultative

Chart 16 summarizes Japan's pertinent policies and measures. The country has already implemented many technology transfer programs that are comparable to similar programs in the U.S.

Chart 16: Japan's Policies

(1) Promotion of Regulatory Relaxation

Three-Year Plan for the Promotion of Regulatory Relaxation (1998 - 2000)

- Strive to establish a foundation that will allow market functions to be manifested more thoroughly by reexamining business participation regulations based on the general rule of economic regulations being as a general rule liberalized and social regulations being kept to the minimum required.
- Abolition of the separate licensing system for communications charges (Notification System as a general rule; November 1998), relaxation of regulations on the rates and charges of freight transport businesses, etc. (March 1999), introduction of partial liberalization of the retail and supply of electricity (March 2000)
- The administrative reform guidelines decide on New Three-Year Plan for the Promotion of Regulatory Relaxation (March 2001). The plan includes aggressive adoption of IT related regulatory reform and policies on competitiveness.

(2) Promotion of Industry-Academia Cooperation

(1) System for Industry, Science and Technology R&D for New Industry Creation (1996; expanded in 1999) (Ministry of Economy, Trade and Industry)

- Promotion of R&D required to create a new industries and solve social problems through cooperation between industry, academia and the government.
  In particular, regarding important fields such as the adoption of information technology and the environment, create a joint government-private sector R&D system that will concurrently carry out the formation of common fundamental technology through cutting-edge and innovative technological development and practical development by private companies that use the results derived from the formation of shared fundamental technology.

(2) Enactment of the University Technology Transfer Promotion Law (Japan's version of the Bayh-Dole Act) (August 1998) (joint administration by the Ministry of Economy, Trade and Industry and the Ministry of Education, Science and Technology)

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group and is composed of Cabinet members and employers. Up to last year, it met nine times (the ninth meeting was on May 22, 2000). At the Council on Industrial Competitiveness' third meeting, the Federation of Economic Organizations (*Keidanren*) submitted "The First Recommendation to Strengthen the Competitiveness of Japanese Industry " (March 1993), which recommended measures to improve the supply structure in order to strengthen industrial competitiveness. In addition, based on the results of discussions by the council and *Keidanren*, the government announced its Industrial Competitiveness Strengthening Measures (June 1999). The main points were:

(1) Establishment of the environment for business reconstruction;
(2) Establishment of the environment for the invigoration of technological development, etc;
(3) Cultivation of small businesses and venture businesses;
(4) Taxation to strengthen industrial competitiveness.

In addition, through the series of discussions mentioned above, the Industrial Resuscitation Law (August 1999) was enacted as a law to support business reconstruction. The main points of this law are:

(1) Facilitation of business reconstruction;
(2) Support for the establishment of companies and efforts to pioneer new business fields by small businesses;
(3) Invigoration of R&D.

- Its purpose is to transfer research results related to technology produced by universities, etc., to private entrepreneurs, and promote their effective utilization in society. The law established aid measures, such as the provision of subsidies and the guarantee of obligations for legally approved technology transfer entrepreneurs (TLO approval).

(3) Enactment of the Industrial Technology Strengthening Law (April 2002 - )
- In order to create a technological development system to make technological innovation to create new businesses and markets possible, the law strives to establish the environment for the strengthening of industrial technological strength by devising measures to invigorate and strengthen collaboration by research entities.

(4) Phase Two of the Basic Plan for Science and Technology (January 2001)
- The law established a Comprehensive Science and Technology Council in the Prime Minister's Office and sets forth reform of the science and technology system as one of its priority measures. It strives to reform the system for industry-academia- government collaboration in order to promote the circulation of information and exchanges between people and advance the transfer of technology from public research institutions to industry.

(3) Consideration of the Promotion of the Internationalization of the Yen

Inauguration of the Group to Study the Promotion of the Internationalization of the Yen (September 1999; Ministry of Finance)
- In response to the report by the Foreign Exchange Council, a study group composed of people of learning and experience and people concerned with international transactions is inaugurated to broadly study the issues and problems related to the promotion of the internationalization of the yen.
- Settlement of interim issues (June 2000). It is determined that along with implementing measures to improve the convenience of yen fund procurement and management and strengthen cooperation within Asia, it is necessary to have parties concerned reexamine currency based practices in trade and capital transactions and consider the use of the yen from new angles.

(4) Acceleration of Industrial and Corporate Reorganization

(1) Revision of the Commercial Law
- Adoption of Systems for the Exchange and Transfer of Stock (October 1999 - )
  For the purpose of facilitating the creation of whole parent-subsidiary affiliations, the law adopts a system (for stock exchanges) whereby an existing joint-stock company acquires the stock of another company from that company's shareholders and as compensation grants an allotment of new stock it issues (or company stock it possesses), and, a system (for stock transfers) whereby the shareholders of an existing joint-stock company transfer their stockholdings to a newly established company and as compensation the newly established company assigns an allotment of its new stock.
- Adoption of System to Divide Companies (April 1999 - )
  This system was adopted for the purpose of expediting the division of companies as a result of corporate reorganization. It makes it possible to reorganize subsidiaries of a holding company by business division. It aims to make company division procedures more efficient by permitting capital increases on a book basis

for companies established through division and successor companies, making audits by the auditor unnecessary when dividing a company, and introducing a simplified system to divide companies.

(2) Tax Reform
- Tax reform related to corporate reorganization
  The FY 1999 Tax Reform Guidelines decide on tax measures related to corporate reorganization. They include deferment of accounting of transfer profits and losses for transferred assets, etc., deferment of accounting of stock transfer profits and losses and special measures for license registration tax, etc. (December 2000)

(3) Enactment of the Law for Special Measures to Resuscitate Industrial Vigor (August 1999)
- To ensure the early resuscitation of the vigor of Japanese industry, this law prepares a policy package (exceptional taxation measures, simplified Commercial Law related procedures, fiscal and financial measures), in order to have business resources shift quickly and smoothly from areas of low productivity to areas of high productivity and realize improved productivity through the efficient use of business assets.

(4) Enactment of the Civil Resuscitation Law (December 1999)
- This law institutes business resuscitation procedures for small businesses in place of composition. It establishes new bankruptcy disposition procedures for quick and functional rehabilitation.

(5) Correction of High Cost Structure

(1) Tax Reform
- Lowering of the Corporate Tax rate (1998 - 1999) and reexamination of the taxable base (1998)
  These reforms aim to maintain and strengthen the international competitiveness of corporations through measures such as lowering of the basic Corporate Tax rate and reexamining the systems for reserves and depreciation in order to secure international conformity.
- Consolidated tax payment system (from 2002)
  This is a corporate income tax system that considers a corporate group as one body. It makes it possible to include the losses of a subsidiary in the total for the income of other corporations within the group. It has the effect of reducing taxes for the overall consolidated group and encourages reorganization of corporate groups, such as through dividing companies and shifting to a holding company system.

(2) Regulatory Relaxation (already noted)

(3) Competitiveness Promotion Measure: Strengthening the Functions of the Fair Trade Commission
- This abolishes the counter-recession cartel system, rationalization cartel system and similar escape systems provided for by the Anti-monopoly Law.

(4) Judicial Reform

(6) Establishment of High Quality and Low Cost Industrial Infrastructure

(1) Establishment of a Communications System (Ministry of Public Management)

- To realize fixed and reduced Internet charges, this would promote enhancement of the quality of Internet connection services by opening the NTT access network and through DSLs, to establish an environment that can provide competitive service at an early date.

(2) Establishment of a Broad Area Distribution Network (Ministry of Construction and Transport)

- This promotes the establishment of the Plan to Strengthen Broad Area Connection of the Transportation Infrastructure, the construction of roads to strengthen links to airports, ports and similar facilities and the improvement of transportation nodes.

(3) Maintenance and Invigoration of Basic Industrial Integration

- In accordance with the Regional Industrial Integration Invigoration Law, measures would be undertaken to invigorate regional industrial integration, which is the foundation of Japan's economic growth (through subsidies, etc., for industrial infrastructure maintenance).

(7) Promotion of Company Establishment

Enactment of the New Business Creation Promotion Law (December 1998)

- This law creates employment opportunities by providing for wide-ranging support for individuals, small businesses and similar entities attempting to start new businesses and support for business activities that utilize the new technology of small business owners, and promoting the creation of new businesses to dispel the sense of stagnation in the economy by striving to establish a business environment that utilizes regional industrial resources. It was partially revised in 1999. It establishes the foundation that allows venture businesses to grow through self-reliance.

(8) Promotion of Technological Development

(1) Phase Two of the Basic Plan for Science and Technology (January 2001)

- The plan allocates R&D resources by attaching importance to four fields (life sciences, telecommunications, the environment and nanotechnology and materials) expected to contribute especially to strengthening industrial technology that will lead to the creation of new industries.

(2) National Industrial Technology Strategy (April 2000)

- This strategy sets reforming the technological innovation system to move from a catching up to a frontier creation type system as the broad direction of industrial technology policies, strives to strategically prioritize government R&D investments concerning industrial technology and promotes industrial technology strategy by field (biotechnology, telecommunications, etc.).

Source: Prepared based on ministry HPs.

## (3) Recommendations to Ensure Practical Effectiveness

Before establishing the environment to implement systems, first of all there is the problem of the strategy to ensure that a policy will be effective. Although it has been repeatedly mentioned that innovation is the driving force of long-term growth, without a strategy to ensure its effectiveness it would not be possible to expect results even if the environment to implement systems was established. Therefore, recommendations to ensure practical effectiveness follow here.

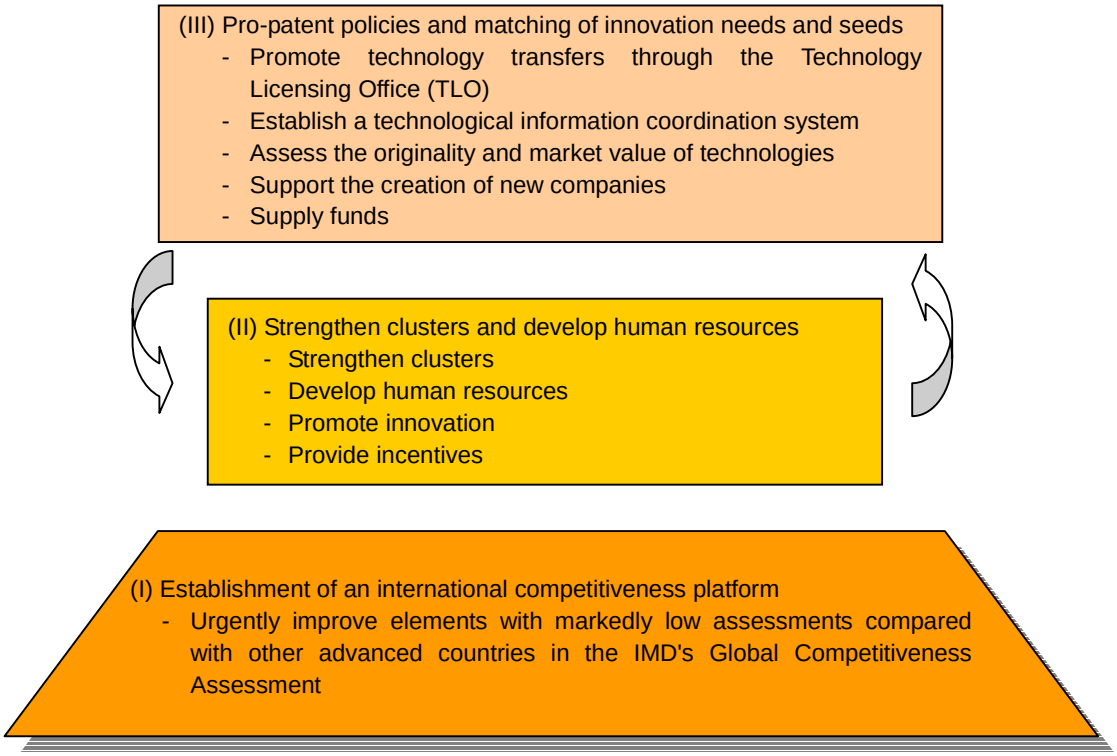
Organizing the various related matters (Chart 17) produces the following proposals to strengthen innovation.

(I) First, point out that the foundation will be the establishment of an environment that promotes innovative activity, what should be called the international competitiveness platform;

(II) Next, in regions throughout the country, discuss the necessity of strengthening the clusters that will shoulder a central role in concrete innovation integration and the necessity of developing human resources;

(III) Finally, at the level of individual players, such as corporations, offer suggestions regarding the pro-patent policies and matching of innovation needs and seeds that are required to effectively utilize patents, Japan's forte.

Chart 17: Recommendations to Ensure Practical Effectiveness (An Overall View)




### (I) Establishment of an International Competitiveness Platform

In order to improve innovative ability, it is of course important to establish the pertinent systems. However, to learn from Japan's situation, ensuring the practical effectiveness of innovations is an operational factor that has important meaning. To return to the IMD survey mentioned earlier, as seen in the criticism of Japan's "governmental efficiency" in particular, it is necessary to raise the level of the various elements of what should be called the platform for international competitiveness

to a level comparable to advanced and semi-advanced countries. The 49 countries in the comparison of competitiveness indicated earlier in Chart 15 included countries such as India, China, Malaysia, Indonesia, the Philippines, Thailand, Mexico, Chile, Brazil and Colombia. Among these countries, Japan ranked among the lowest for the elements indicated in Chart 18 in particular, and needs to improve them urgently.

If differences in culture and values are set aside, there is a level at which comparison is possible on a common plane. Therefore, countries are already focusing on the requirements to strengthen competitiveness and continuing their efforts to improve. It goes without saying that there is competition between countries in this area.

Chart 18: Elements to Improve the International Competitiveness Platform

| Representative Low Indicators Requiring Improvement | | |
|---|---|---|
| IMD Assessment | | Examples of measures believed to be necessary to improve to a level comparable to advanced and semi-advanced countries |
| Element | Ranking | |
| Usefulness of universities to corporations | 49 (total: 49 countries) | When utilizing the patents of national universities, the discretion of the universities remains narrow. Therefore, there is a need to remedy deficiencies in system management that ultimately lead to patents remaining idle, improve the overemphasis of academicism by both professors and students and to further reform the promotion system that attaches importance to publishing papers |
| Entrepreneurial spirit of management staff | 49 | Establishment of a new type of management staff that will undertake concepts and strategy building that strive to create new industries and a risk taking type of business management that will promote product innovation |
| Treatment of the value of stockholders | 48 | There should be creation of the providers of equity to promote innovation, existence of angels who allow high risk and high returns and establishment of tax measures with accompanying incentives. |
| Frequency of company establishment | 49 | Reexamine the regulatory and social environment that is as a result impeding the establishment of companies and further promote support for the creation of companies, increasing the amount of the Japanese version of SBIR, the division of businesses and MBOs. |
| Cost of living | 48 | There should be the relaxation of regulations concerning the domestic distribution structure, the setting of commodity costs at a level that corresponds to added value and the correction of the high prices set for goods and services protected by regulations (specific examples would be to lower port charges to international levels and lower Internet standing connection charges to a level comparable to the U.S.) |
| Industrial electricity costs | 47 | Liberalize the retailing of electricity other than special high-voltage electric power and further promote the lowering of consignment charges |
| Immigration Law | 48 | Reconsider matters from the perspective of global innovation competitiveness and consider the earlier mentioned program promoted in the U.S. that grants permanent residency to engineers and other people who are the core of innovation |

| Requests to the Government That Should be Listened To | | |
|---|---|---|
| Openness to foreign companies in government procurements | 49 | As an advanced country, abolish nontariff barriers and promote further competition in public works and similar projects |
| Transparency of the government | 49 | Maintain the consistency of policies among the ministries and further improve accountability concerning policies |
| Consensus on policies in the Cabinet | 49 | It cannot be denied that there has been delayed response to the worsening of the current economic environment. Therefore, execute comprehensive, long-term and strategic policies that foresee the future economic environment that will result from strengthening innovation. |
| Response to changes in the economic environment | 48 | |
| Fiscal management | 48 | |
| The political system's adaptability to the economy | 48 | Demonstrate strong political leadership, which can be expected to be one of the driving forces of recovery amid the current economic slump. |
| Elements Related the Culture and Climate | | |
| Entrepreneurial spirit | 49 | Change not only the social custom whereby the establishment of companies is not common, but also the static corporate culture within large corporations (an opportunity for change would be efforts related to intermediate forms such as in-house venture businesses, management buy-outs (MBOs) and employee buy-outs (EBOs)). |
| Flexibility and adaptability | 47 | Give consideration to improving the country's image by considering increasing foreign investments in Japan |
| Openness of the culture | 46 | |

Source: Prepared based on IMD [2001]

### (II) Cluster Reinforcement and Human Resources Training

As Japan seeks to become a science and technology-oriented nation, the priority is expected to be placed, in particular, on policies to reinforce the platform for the promotion of innovation with national budget priorities on four priority fields including biotechnology, the environment and nanotechnology and these are policies that should by all means be continued on into the future in order to assure the survival of Japan. It has also been pointed out that this platform consists of the reinforcement of management and human resources and this is an argument that is to the point. As long as competitive strength is based on the micro activities of each entity, there is an indispensable need for the setting of incentives combined with the prioritization of budget distribution or the existence of managers who are able to make that work in order to assure the effectiveness of the policies. In other words, in order to promote innovation, it is important to have mechanisms for arousing competition and enthusiasm, such as providing incentives to individual researchers or promoting budget increases or decreases based on performance by research teams, as well as mechanisms not only for realizing a gradual improvement in technology in these fields but also for highly evaluating researchers who create new concepts[*15].

Meanwhile, from the standpoint of gathering human resources that are required from the outside, mechanisms for competition and compensation are likewise important as is evident from the fact that intense competition within clusters is also considered to be a condition for innovation. In this sense, the cluster environment of companies or universities is an important example. Initiatives to attract human resources are already being implemented in the U.S., such as support programs that have been established for workers who suffer distress due to increased imports, while the Immigration Act was broadly amended in 1990 for the first time in twenty-five years (Chart 19). As a result, innovation competition is developing between companies and universities in clusters in each region. For example, in California's Silicon Valley, human resources are being enticed from around the world, while, at the same time, an environment is being established in which activities within those clusters become opportunities for human resources training.

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*15 Professor Kameoka of the Japan Advanced Institute of Science and Technology Graduate School has been conducting an international comparison of industrial technology competitiveness that includes 290 items placing importance on management, collaboration between industry and academia, standardization, supply chain and so forth, with the perception that it is important to place the emphasis on the training of human resources who have management capabilities and, rather than constantly improving production technology, to incorporate management technology in production technology. In addition, the professor also points out that, as challenges in the training of human resources with management capabilities, first of all, (1) in regard to universities, there is a high degree of exclusivity and very little fluidity of human resources and that actual business education systems in university graduate schools are undeveloped and that, (2) in regard to companies, large corporations are characterized by having a closed environment in which employees cannot express themselves actively and that, aside from the introduction of management teams from the outside, they do no more than maintain the status quo because the of the difficulty of introducing new management strategies. Moreover, as strategies for the purpose of promoting innovation, he stresses the importance of stimulating the fluidity of human resources from companies under the present circumstances and the training of human resources who have a common language (development of MBA, MOT) in universities. In addition, as a policy for the promotion of innovation, he points out the need for "techno-producers" (human resources who present new concepts and are in charge of coordination and project management).

Chart 19: U.S. Human Resources Related Policies

| Program | Contents |
|---|---|
| Job Training Partnership Act (1985) | This provides basic training, such as to improve the literacy rate, for the unemployed. |
| Trade Adjustment Assistance Program (1986) | This is a program for corporate and worker relief based on the 1974 Trade Act. It provides reemployment support to workers who lost their jobs or had their real working hours or income reduced as a result of increased imports. |
| Workers Adjustment Assistance Program (1987) | This is a support program for workers who fall into difficulties because of increased imports. |
| Immigration Act (1990) | The revision increases the quota for U.S. permanent residency for researchers, technicians, scientists and similar persons possessing advanced specialized skills. |
| The Office of the American Workplace (1993) | This office aims to promote the establishment of working environment that capable of achieving a high level of performance. |
| Workforce Investment Act (1998) | The object of this law is to strive to boost competitiveness and build a comprehensive workforce foundation through a partnership comprised of the federal government, state and municipal governments, the industrial world and the educational world. The law has features such as the establishment of One Stop Centers and accountability of the vocational training system and the adoption of the market mechanism. |

Source: Prepared based on Chart 10

The Ben Franklin Partnership Program being implemented by the State of Pennsylvania (U.S.) can be cited as an example of an initiative for the activation of clusters through the unified efforts of industry, government and academia (Chart 20). The initiatives in Pennsylvania are referred to as an industry revitalization type cluster not in newly developing cities but in existing industrial cities and this is an important case for the purpose of taking advantage of the strengths of industrial concentration in Japan.

Clusters at the regional level have an important role in achieving innovation and, also in Japan, in terms of utilizing patents, the reexamination of regional clusters, which form the core of innovation, is a matter of urgency.

Chart 20: Summary of the Ben Franklin Partnership Program

| Item | Description |
|---|---|
| Financing and coordination | Four non-profit regional centers (known as technology partners) located in Pennsylvania are primarily in charge of coordinating the collaboration of industry, government and academia and creating clusters. The four centers are divided into (1) northeastern Pennsylvania (priority field: advanced production technology), (2) central & northern Pennsylvania (priority fields: advanced element development, agriculture), (3) southeastern Pennsylvania (priority field: biotechnology) and (4) western Pennsylvania (environment and information technology) and each has financing and debt guarantee programs for entrepreneurs, development of new technology businesses and technological development. |
| Management and technological advice | At the four centers above, management advice is provided by program staff and specialists and technological advice is provided by research institutes and universities. In addition, the training of human resources using community colleges and other facilities and the coordination of research between multiple universities and technology transfers from universities to companies are also implemented. |
| Indirect support | Besides providing legal, accounting and tax services through introductions to attorneys, accountants and other specialists, it also acts as an intermediary for exchanges with investor networks and within the same and different industries. |

Source: Prepared based on the program Website (www. benfranklin.com)

Furthermore, the Thomas Edison Program, which is being implemented in the State of Ohio, is a similar initiative though it gives priority to technological development. It is a joint program established through capital investments by the state government, federal government, local industry, venture capital and so forth and is coordinated by the Ohio Department of Development. Specifically, it consists of the four programs listed in Chart 21, (1) research and development and technology support, (2) support for venture businesses, (3) promotion of technology transfers and (4) an award program.

Chart 21: Summary of the Thomas Edison Program

| Item | Description |
|---|---|
| Research and development and technology support | Seven program centers known as Edison Technology Centers ((1) Edison Materials Technology Center, (2) Edison Welding Institute, (3) Edison Biotechnology Center, (4) CAMP Inc., (5) EISC Inc., (6) TechSolve Inc. and (7) Ohio's IT Alliance) were developed and research and development and technology support are provided in the six fields of (1) advanced manufacturing, (2) polymers, (3) materials and processes, (4) welding and materials joining (5) biotechnology and (6) environment. |
| Support for venture businesses | Incubation at Edison Technology Incubators. Ten incubators, including the Lewis Incubator for Technology, have been established in Ohio. |
| Promotion of technology transfers | Technology transfers are promoted based on Technology Transfer Initiatives. Two technology transfer institutes, (1) Great Lakes Industrial Technology Center (GLITeC) and (2) Wright Technology, have been established, which promote the transfer of technology from public research institutes to the private sector. |
| Award program | This is an award program known as the Edison Award and Emerging Technology Awards. Companies are granted awards not only for their own development but also for developing technology that contributes to improvements in the quality of life of the citizens. There are two awards available, (1) the Edison Award for large corporations and (2) the Emerging Technology Award for small and medium-sized companies. |

Source: Prepared based on the program Website (www. odod.state.oh.us/tech/Edison/)

### (III) Pro-patent Policies and Matching Innovation Needs and Seeds

Finally, in terms of the effective utilization of patents, it is necessary to match needs and seeds in technology.

First of all, it is necessary as the basic assumption to recognize the importance of pro-patent policies. As indicated in the introduction, while there are many patents, which become the seeds, that have been acquired in Japan, they are not necessarily demonstrating their essential strengths due to ineffective utilization in the form of dead storage or dormant patents and there is also tolerance of patent infringements in China and elsewhere. It is necessary for us in Japan to renew our awareness of the importance of pro-patent policies set forth clearly in the Young Report introduced earlier and secure the effects of innovation. Meanwhile, in the event of excessive patent infringements, it is probably also necessary to expand our perspective to the promotion of the black-boxing of technology.

In addition, though cross licensing between companies is being pursued vigorously in Japan at present, the scope tends to be broad and ambiguous and, thus, when one company achieves success in new product development, competing products appear one after the other in succession and, as a result, it is frequently the case that first-mover and developer advantages cannot be enjoyed. This is also evident in the tendency toward excessive competition in Japan that hinders the legitimate realization of added value as the result of innovation. There is a need for a readjustment of priorities among Japanese corporations that will lead to the realization of product differentiation, for example, by striving to develop products that are outside of the scope of patent protection instead of cross licensing within a scope that is unclear. This will also lead to the avoidance of excessive but fruitless competition and also the appropriate retention of research and development funding for use in the next innovation.

Next, it is desirable to develop a mechanism for matching seeds, typified by patents, and needs for application to product development. As patent matching, efforts to develop patent information as databases and releasing them to the public have already been attempted; however, matching is not facilitated by simply creating a database containing information regarding patents numbering in the hundreds of thousands.

First of all, in the area of technology seeds, it is necessary to have expertise incidental to patents when providing patent information as well as contrivances such as providing clearly-defined and detailed information in the application area that would serve as hints for diversion to other uses. In regard to the technology in the possession of large corporations, which have conventionally been the primary entity for technological development, in particular, there are certainly many patents that are in dead storage or that are dormant and we look forward with anticipation to the development of uses different from those initially conceived through reexaminations oriented toward matching then with needs.

As an example of matching initiatives, first of all, in regard to technology in universities, it is hoped that TLOs will be established in all universities that will transfer the technology in their possession. In addition, one other recent initiative is yet2.com, which was established by Chris De Bleser, originally with Polaroid Co., and Ben Du Pont of the Du Pont family (Chart 22). The company, which was established with the participation of 3M, Agfa, Arthur D. Little, Asahi Glass, BASF and others, serves as an intermediary in patent trade on the Internet.

Chart 22: Summary of yet2.com

| Item | Description |
|---|---|
| Summary | Established: February 1999<br>Headquarters: Cambridge, Massachusetts, U.S.A.<br>CEO: Chris De Bleser, President: Ben Du Pont<br>Investors: Venrock Associates, 3i, P&G, etc. |
| Services | (1) Listing of patent information and expertise (obligation of participating companies)<br>(2) Acquisition of patent information and expertise (distributed by most recent information, keyword, etc.) |
| Features | With major corporations (3M, Agfa, Arthur D. Little, Asahi Glass, BASF, Bayer, Boeing, British Telecom, Denso, Dow Chemical, Du Pont, Ford, Hitachi, Honeywell, Kao, Mitsubishi Chemical, Mitsubishi Heavy Industries, Mitsui Chemical, NEC, NTT DoCoMo, Osaka Gas, Polaroid, P&G, Seimens, Sumitomo Chemical, Takeda Pharmaceuticals, Toray Industries, Toshiba, Toyota, etc.) as establishment sponsors, it is said that 56 participating member corporations fund 20% of the world's research and development activities and the purpose is activating patents and expertise that is lies dormant in large corporations. |

Source: Prepared based on the company's Website (www. yet2.com)

In addition, in regard to needs, it is also necessary to ascertain technological creativity and market value and train human resources to provide advice regarding patent protection and product development. In the area of patent assessment technology, The Patent & License Exchange (pl-x), established in 1999 through venture capital participation centered in Dr. Nir Kossovsky, assistant professor at UCLA, conducts patent assessments and market research (Chart 23). Once patent assessment methods are established and price formation stabilizes, it is thought that broad-based distribution will also be promoted and this could be considered an extremely interesting case in the sense of fostering patent pricing consensus.

Chart 23: Summary of pl-x

| Item | Description |
|---|---|
| Summary | Established: January 1999<br>Headquarters: Pasadena, California, U.S.A.<br>CEO: Nir Kossovsky<br>Investors: TMCT Ventures, Softbank, Ernst & Young, etc. |
| Services | (1) Intellectual property information management, assessment and marketing support<br>(2) Transaction compensation (insurance), intellectual property transaction management (temporary custody, settlement)<br>(3) Assessment of companies with intellectual property holdings |
| Features | When conducting assessments, it takes into account not only expenses required for patent acquisition and maintenance but also commercialization and uses the concept of real options applying to the "black shoals" method which considers funding necessary for patent commercialization to be execution price and development time as execution time. |

Source: Prepared based on the company's Website (www. pl-s.com)

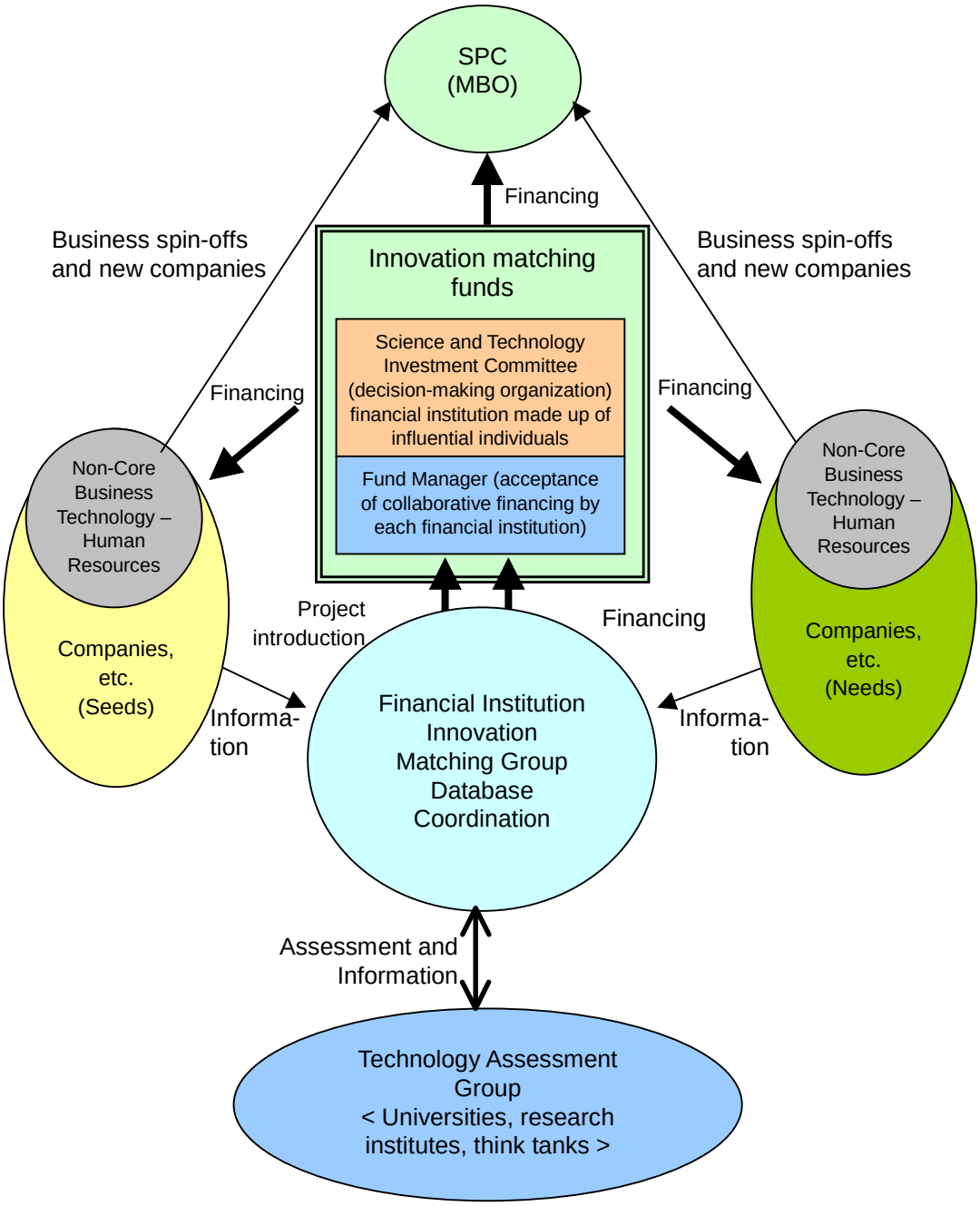
These initiatives can be evaluated as having the effect of stimulating the use of patents through the sharing of patent information, assessment and other efforts; however, in order to assure that the promotion of innovation leads to true success in the sense of achieving patent commercialization and enjoying the outcome, besides undertaking the initiatives of providing patent information and assessing technology, it is essential that there be organizations to serve as coordinators and pursue the enhancement of human resources. Specifically, there is an urgent need for total system development, including a mechanism that matches needs companies and seeds companies and creates new technological-development type companies[*16] and a mechanism for providing funds to these newly created companies[*17].

The technology information coordination that we are proposing at this time is as indicated in Chart 24.

*16 In regard to the creation of new companies, there is also the possibility of establishing so-called venture companies that have recently become a center of attention. However, in the sense of the effective use of patents of large corporations while giving life to the tradition corporate culture of Japan, management buyouts (MBOs), which separate patents and the management team intact from the large corporation, would also be a effective means.

*17 It would also be worthwhile to examine the German Steinbeis Foundation, which has more than 430 technology transfer centers around the world including Japan and provides needs-oriented technology transfer support and consulting.

Chart 24: Conceptualization of technology information coordination



## (4) Conclusion

The importance of the above clusters as platforms for innovation and the necessity of matching needs and seeds is our conclusion and there are many important points that we can learn from the strategies of the U.S. in promoting a revitalization of its competitive strength after once losing self-confidence.

We have reached the present point embroiled in many pessimistic discussions regarding the recovery of competitiveness but we must no simply give in to pessimism. There was a time in the past when it was said that Japan no longer had anything to learn from other countries and we were instead the subject of enthusiastic study by the world. Furthermore, looking back at the past, it cannot be denied that the practice of intently studying examples from around the world and enthusiastically learning from them what is necessary for Japan has been the driving force behind growth in Japan. There are now again demands that we assume that attitude in understanding the conditions that are necessary for regaining our competitive strength. I hope that this report will be of benefit to you.

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