Plans for Improving the International Competitive Power of Small Industries According to Changes in the Economic Environment

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Abstract

Korean small industries are currently facing a good deal of changes in the economic environment; (a) the industrial environment became more competitive than as ever in that small industries have to compete with foreign industries even for the domestic market; (b) developed countries are turning reluctant to transfer their new technology; (c) rapid economic growth of other developing countries are threatening us; (d) customer needs are becoming more and more individualized and diversified; (e) the regulation of government concerning the contamination of natural environment will be more strict. Because the only way possible to overcome this situation is considered to be technological innovation, many ways in which to enhance the level of our technology are provided and discussed in detail. Due to to consideration of efficiency, introduction of foreign technology is preferred by small industries rather than developing new technology on their own. Many different ways of introducing foreign technology are addressed including licensing, direct investment, co-investment, and venture capital. It is emphasized that small industries should be able to put together its own know-hows and introduced foreign technology in an synergistic manner by which to maximize their international competitive power.

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I. Introduction

It is widely accepted that the international economic situation is changing rapidly. Korean industries and its national economy have had the advantage of being protected by other friendly nations in return for the ideological and military alliance. However, it does not seem to be the case any longer now. The new international economic order, which centers on the United States, Japan, and the European Community(EC), necessitates trade friction due to its protective and regionalistic nature. Furthermore, the developed nations are turning reluctant to transfer their new technology to Korea and the rapid economic grouwth of developing countries such as China and South-East countries makes it more difficult for Korean economy to survive. Such being the case, Korea is confronted with both external threats and internal difficulties that might profoundly hinder its economic growth. To give some examples of the external threats, China is transforming its economic system into a market system based on its affluent manpower, high-level basic science, its tremendous market potentials, and introduction of foreign investment. Taiwan paves the way for its future economic growth through investing in the social overhead capital on a gigantic scale. Singapore concentrates on financial industries based on highly-skilled manpower and high-tech communication network. Moreover, other South-East countries are encouraging their export with the advantage of low wage, abundant natural resources, and enormous amount of investment from Japan. On the other hand, we should not overlook internal and more fundamental difficulties with which we are faced now. They might be boiled down to '3 highs and 1 low': high wage, high prices, high interest rate, and low level of technology. The overriding task we have to solve is, to put it briefly, to reverse '3 highs and 1 low' to '3 lows and 1 high.' It seems practically implausible, however, to lower wage, prices, and interest rate because it will greatly disturb the current economic order. Thus, this leads us to the only solution possible: technological innovation. In this paper, I will argue that this is the only way in which we can improve our productivity, making it possible for us to provide high quality goods and better service at a relatively low price, which will result in improving our international competitive power over other competitng countries. In fact, since the late 1980's, more and more big industries in Korea have become aware of this state of affairs and have tried to modify their strategy for export in the direction of pursuing high-quality. This strategic change of big industries in Korea seems highly likely to have a great impact on the way in which small industries manage their business. Big industries in Korea are expected to demand even higher quality parts of small industries that they subcontracted, which will be a heavy burden to small industries because of their poor accumulation of technology and managerial

resources. Furthermore, small industries cannot any longer expect to be protected by the Korean government from foreign industries. Thus, the goal of this thesis is to analyze changes in the industrial environment, inside and outside Korea, to evaluate current policies for supporting small industries, and to explore a plan for improving their international competitive power.

II. Cognition of Changes in Managerial Environment

The twenty first century we are heading for might be characterized by 'rapid changes' in every area of society and 'intensified competition among industries.' Accelerated rate of development of technology, considerable development of information industries, diversification and individualization of customer needs, and globalization of the world are some examples of the changes. It appears quite natural that the only way for an industry to survive is to become well aware of these changes and to be prepared for them. In this section, I am going to address a few changes in the managerial environment that are important and relevant to Korean industries.

First, the industrial environment is likely to be even more competitive than as ever because domestic industries have to compete with not only other domestic industries but also foreign industries. Since the concept of 'national border line' is practically meaningless in this globalized world, Korean industries should be ready to compete with foreign industries that are relatively superior in capital and technology.

Second, it will be more difficult to meet customer needs because they are becoming more and more individualized and diversified according to the general increase in income level. 'Customer satisfaction' is going to be the most important and ultimate goal of most industries in managerial strategy.

Third, the regulation of the government is expected to be mitigated and each industry will be able to make decisions of a financial kind on its own. By contrast, the governmental regulation concerning overconcentration of property and contamination of natural environment is considered to be far more strict.

Fourth, the life cycle of goods is going to be shorter as new goods or services are created in a more accelerated fashion. Accordingly, the production system of an industry will be switched to a flexible one that is appropriate to multi-kinds and small-amount production.

Fifth, Appreciable changes in the social responsibility of an industry and industrial relations between Labour and Capital are also expected. With regard to the social responsibility, it is not sufficient now for an industry just to not do such things as speculation, illegal expansion, monopolization, and contamination of the environment. Industries are expected to play an active role by leading cultural

events, environmental matters, and public welfare. Regarding relations with the Labour, industries must go a step further than merely solving conflicts with the Labour in a passive way: Managers should have the leadership to induce their workers' creativity, activeness, and specialty.

It seems very important for an industry to predict changes in the industrial environment and to have the willpower to adapt itself to changing circumstances. It is more important, however, to have the ability to adapt itself to the new industrial environment. Industries should cultivate their abilities by accumulating new technology and capital, by training their workers, and by creating their specialties.

III. Changes in the Economic Development Plan and Policies for Small Industries

The Korean government has made a number of policies for small industries since the end of the Korean war when the economic reconstruction was under way. Because the financial problems were the most urgent and fundamental ones, policies for small industries during 1950's were focused mainly on the financial provision. These early policies for small industries were systematized and extended into a series of general policies for small industries since 1962 when the economic development plan was being implemented.

In this section, I divided the history of policies for small industries into four stages according to the evolvement of the economic development plan in Korea. Details are to be discussed below.

1. The period of export-oriented industrialization (1962-1971)

During this period, small industries received substantial support from the government because they were considered to play an important role in the economic development by supporting living necessities, increasing employment, and promoting export. Major policies made during this period are as follows: First, the emphasis of policies was laid on export-oriented industrialization. Thus, available resources were concentrated on producing exportable goods. Second, the Korean government supported local industries to help the local economic growth. 7 local industrial parks were established until 1971. Third, in order to enhance the level of technology and productivity the Korean government selected 356 manufacturing industries and supported their modernization of mechanical equipment. Fourth, the government initiated managemental and technological directions for small industries. Fifth, a number of isolated small industries became organized with the help of establishment of many co-operative societies for small industries. Lastly, a law aimed at supporting small industries was enacted in 1966.

2. The period of cultivating heavy and chemical industry (1972-1979)

In this period, the policy-making for small industries was influenced by two contemporary issues. One was to develop the defense industry for the purpose of fortifying the independent national defense and the other was to switching exporting goods from labor-intensive to technology-intensive. Thus, the policies were concentrated on cultivating heavy and chemical industries including steels, mechanics, electronics, shipbuildings, and petrochemistry. Here are some major policies in this period. First, a number of factories were constructed in local areas under the influence of the "Sae-ma-eul" movement that pervaded the whole South Korea in 1970's. Second, the systematization between industries (assembly or parts) was implemented in order to stabilize transactions between industries. Third, some selected small industries came to take charge of producing specific kinds of goods that are considered to be appropriate to small industries. Fourth, the construction of local industrial parks was encouraged. It was aimed at not only developing local areas but facilitating modernization of small industries.

3. The period of stable development (1980-1987)

In 1980's, the Korean government made a series of policies for the economic stabilization as well as attempting modification of the industrial structure. In addition, policies for solving a number of problems that are derivatives of high-rate economic growth were made during this period.

4. The period of modification of the industrial structure (1988-present)

A key factor by which we could accomplish high-rate economic growth is the relatively stable economic environment surrounding Korean industries. In 1980's, however, the economic environment began to change to a great extent. Especially after the middle of 1980's, almost all the environmental factors including demand, wage, foreign exchange rate, international relations have considerably changed. Thus, policies in this period have placed an emphasis on cultivating adaptability of small industries to this new environment.

IV. The Analysis of the Structure of Domestic Small Industries

1. The present situations and the future of domestic small industries

In terms of size, the percent of industries which have less than 20 workers out

of all the small industries amounts to 61.7%. By contrast, the sum of the production and the value added of this class reach 14.2% and 15.9%, respectively. The proportion of industries whose number of workers is 20 to 100 amounts to 33.5% of all the small industries. However, in terms of the sum of production and value added, industries of this notch are responsible for 45.5% and 45.6%, respectively. The percent of industries whose number of workers is 100 to 300 reaches only 4. 8%, but their sum of production and the value added amount to no less than 40. 3% and 38.5%. On the other hand, in terms of the form of small industries, more and more small industries are becoming corporate (22.7% in 1983, 35.8% in 1991). Still, however, because the percent of the industries in the form of one-man business reaches 63.9%, we need to induce more small industries to transform their forms to corporate ones.

Now, we need to review the vicissitude of the relative importance of small industries in the context of the process of economic development. In the early 1960's, the percentage of the number of small industries was overwhelmingly high (98. 7%). Furthermore, in terms of the value added, small industries were responsible for more than 50% of the total sum, which clearly indicates that small industries played a key role in meeting national demand. However, after the economic development plan was implemented from 1960's the relative importance of small industries came to substantially wane until the end of 1970's. This shows an important fact that the rapid development of the manufacturing industry in 1960's and 1970's was led by big industries. This tendency concerning the relative importance of small industries began to reverse again at the turn of 1980's. The proportions of small industries in terms of the number of workers and the value added are 60.9% and 45% in 1989, which are close to those of 1960's. This increase in the relative importance of small industries can be explained by two factors. One is the rapid development of assembling industries that require a high degree of interdependence between industries. Among others, the development of the heavy and chemical industry that was led by big industries left a lot of room for small industries to prosper. The other factor is the change in consumer needs. As the general income level increases, more and more consumers came to prefer high-quality and diversified goods. That caused changes in the way of production into 'multi-kinds and small-amount' production, which is appropriate to small industries.

2. The trend of domestic economy and factors weakening the competitive power

Over the past few years, Korean economy has kept a high-rate of economic growth (10% per year), which caused the problem of high prices and trade deficit in a direct or indirect way. The consumer prices, which had been held at the level

of 2-3% during 1983-1987, jumped up to 7.1% in 1988 and has increased every year. The trade surplus of 11.4 billion dollars in 1988 significantly fell down, turning to trade deficit of 7 billion dollars in 1991. On the other hand, the overly high economic growth, which can bring about excessive demand, was due to the foreign demand from 1986 to 1988. However, it came to be led by the domestic demand from 1989. Thus, from the year of 1989 the increasing rate of export began to go down remarkably, whereas the amount of import jumped up incredibly, which resulted in trade deficit. These unfavorable circumstances ultimately served as weakening our competitive power in the world market, while such competing countries as Japan, Taiwan, and Singapore have enjoyed a good deal of their trade surplus.This state of affairs might be accounted for by four factors. First,I cannot but mention the rapid increase of labor cost. The increase rate of wage was around 10% per year from 1985 to 1987. However, it doubled from 1988 to 1991. It proved fatal for us to fail to cope with this high rate of wage increase in terms of the competitive power. Second, the incessant labor dispute is also an important contributor that weakens the competitive power of domestic industries. It significantly undermined laborers' motivation to work and the quality of products. Third, the high transportation cost is another factor. Since 1985, transportation demand has unprecedentedly increased owing to the substantial increase of the amount of freight and the number of automobiles. However, because of lack of social overhead capital, the transportation cost noticeably increased, weakening the international competitive power. Last, I need to point out the inefficiency of the financial mediation. It is partly because of the strict regulation by the government. What is worse, if the domestic money market is wide open to foreign investors, we have to even compete with them.

3. Tasks confronting domestic small industries

As mentioned or implied above, the overriding task confronting domestic small industries is the change in the international relations: the period of the Cold war is being followed by the period of economic war. That is, each country is pursuing its own interest over ideological or political considerations. In order for a country to have the economic power, it is no doubt necessary to have the accumulated and new technology, which makes the key for the international competitive power. In this context, the developed countries are trying hard to take the initiative in the development of technology. For instance, the United States have made a series of policies for encouraging the technological development to take the lead in the technological competitive power whereby they can maintain their status as the "Superpower." Japan is investing enormous amount of resources in developing its basic science which will make it possible to maintain its world-best

industrial competitive power. The European Community (EC) is improving its international competitive power in a collective way against the United States and Japan. Such being the case, the only way for us to survive is to develop and accumulate technology on our own. To do this, it is necessary to reform many policies that serve as obstacles to technological development that is mostly led by civilian industries, which will activate civilian development of technology.

Another important task facing domestic small industries is the economic open-door. It seems very important to examine specifically what impact it will have on domestic small industries. Basically, domestic small industries are relatively inferior to those of developed countries in technology, management skills, and capital. Moreover, domestic small industries have not had much support from the government compared with big industries. Following changes are expected to occur to small industries. First, they cannot but compete with industries from developed countries even in the domestic market. Second, they are supposed to vie with foreign industries not only for the domestic market but also for securing such production elements as skilled laborers. Third, as the domestic wage level increases, simple labor-intensive products are going to be imported from less developed countries that take the advantage of their low wage.

Here, it seems quite legimate to review some limitations inherent in the small industries that prevent their development. First of all, many small industries still have internal or structural weakness. According to a statistic reported in 1992, only 35.8% of the entire small industries take the form of corporate juridical person. Thus, banks are reluctant to lend them money even for the development of technology because it necessarily involves taking a lot of risk. Second, the domestic industrial structure is not systematized among big and small industries in terms of producing parts and assembling them, which will guarantee their interdependent coexistence. Even though some policies concerning this problem are implemented, they are in fact led by big industries. This makes the situation even worse for small industries. Third, small industries have had a hard time in securing high-quality manpower because of their low level of wage. Fourth, owing to their lack of credit and security, small industries are not favored by the money market. In addition, the domestic interest rate is a little bit too high compared with that of other countries. Even if the domestic interest rate has been decreasing since 1992, still it amounts to three times as high as that of developed countries.

V. Plans for Strengthening the Competitive Power of Small Industries

1. Review of the present situations

As emphasized above, the only way in which domestic small industries can ever

survive is to develop new technology. Thus, in addressing the problem of 'international competitive power', I am going to focus on the technologocal innovation. Our level of scientific technology took the 21st grade in the world in 1981, the 18th grade in 1988, and takes the 15th grade now, which is comparable to that of GNP (15th grade now) and that of exports (13th grade now). This shows the fact that the level of economic development is closely related to the level of scientific technology. In this section, I will mention a couple of difficulties that we must surmount to go one step up. First, domestic small industries do lack original technology or know-hows. For example, in case of memory chip and car that are our major exports, we should pay 30 % of the cost price for key parts, materials, and technological know-hows to developed countries. In case of camcorder we pay 50% and for notebook computer we pay 75%. Therefore, unless we develop and accumulate our own technology, we cannot ever expect to have the competitive power. Second, we need to encourage the basic science research that provides the basis of the industrial technology. We cannot overemphasize the importance of the basic science research because the extent to which recent high-tech industries depend on the basic science research is considerably increasing these days. Unfortunately, however, our investment in the basic science research is relatively poor. Some statistics show this situation: The percent of money that is invested in the basic research conducted in Universities out of the total amount of money for the basic research is only 6.1% whereas it amounts to 12.1% for the Unied States and 11.6% for Japan. As a result, the number of papers published in international journals was only 2,997, which comes around 27th in the world last year while Taiwan took 15th. Thus, it is out of the question for us to improve our industrial technology without investing substantially in the basic science research. Third, I should point out the deficiency of manpower, information, and investment in research, which make the core for the technological innovation. Although the total number of the entire researchers is as many as 76,000 (7th in the world), in terms of the number of researchers per ten thousand of population we take only 21st in the world. Furthermore, 95% of information in scientific technology, which is directly related to productivity, comes from developed countries. With regard to investment in research, we put in as much as 5 trillion won in 1992 that makes 12. 5% of increase compared to that in 1991. However, it amounts to only one twenty fifth of that of the United States and to one fifteenth of Japan in terms of absolute amount of money.

2. Review of the present situations regarding the introduction of technology

As already mentioned many times, Korean industries are switching their concentration from labour-intensive to capital-intensive or technology-intensive due to

the sharp increase of wage level. However, it is no doubt difficult to make such a change only with our own development of technology: It is necessary for us to introduce advanced technology from developed countries. Since the commencement of the economic development in 1962, we have so far introduced foreign technology. The number of introduced items has remarkably and consistently increased: we introduced only 7 items in 1962 but the number amounted to as many as 738 in 1990. In terms of the countries from which we purchased technology, we have introduced 3,536 items from Japan (more than 50% of all the items introduced) until 1990 and 1,836 items from the United States (26%). This is indicative of the fact that we are overly dependent on Japan and the United States in technology. In terms of the kinds of items, 1,790 of them have to do with machines, 1,642 of them with electricity-electronics, and 1,192 of them with petrochemical industry. Especially since 1987, the number of items in electricity-electronics have taken the lead, which is suggestive of the fact that electricity-electronics are becoming far more important in Korean Economics.

3. The necessity and ways of introducing technology

The overriding task confronting domestic industries is, not surprisingly, to improve their international competitive power, which is impossible without the technological innovation. Products made in Korea have had their merit or the competitive power based on the low price. However, we cannot expect 'low price' to be our merit any longer because of the sharp increase of domestic wage level. In this respect, it is only through technological innovation that we can ever improve our international competitive power. Only through this, we can overcome the trade barrier of the United States, the European Community (EC), and Japan, and survive the intense competition with other developing countries.

Roughly speaking, there are two ways of technological innovation: one is to do it on our own, the other is to introduce foreign advanced technology. The best way is undoubtedly to make the innovation by ourselves. However, it is not always the case because it is by nature a time-consuming, resource-consuming, and risk-taking job. Moreover, since the innovation is made in an accelerated fashion, it is not quite cost-efficient to make the innovation only by our own effort. Especially from the viewpoint of small industries, it takes not-affordable money and resources to develop a new technology by themselves. Therefore, they tend to prefer introducing foreign technology rather than developing it on their own. As a matter of fact, the process of the technological innovation in a given industry or country goes by putting together its own development and introduced foreign technology in a synergistic manner. What is important in introducing foreign technology is how to utilize it for practical uses and how to modify them in order to

make them appropriate to our own circumstances. Now, I am going to review many different ways of introducing foreign technology.

Licensing: Licensing is a way of transfer of technology in which the licensor provides the licensee with patent rights, brandnames, or know-hows in exchange for the royalty. Licensing is mostly used for patent right, utility patent right, brandname, technical assistance, management contract, industrial lease agreement, and engineering service. Licensing is a commonplace between developed countries because they have high levels of basic science or technology. On the other hand, licensing is not very appropriate to developing countries due to their lack of related know-hows, management skills, skilled manpower, facilities, and money. Nevertheless, licensing has some advantages for developing countries. First, they can use the technology that they cannot otherwise use because of its complexity, limited use of patent right, and high cost necessary to develop it by themselves. Second, they can obtain licensor's technological knowledge without additional price. Third, they may have better chance for marketing.

Direct overseas investment: the transfer of technology is made when advanced industries like multinational corporations directly invest overseas by founding their branches in foreign countries. In this case, many ways of transfer of technology are possible. First, technology is transferred by training people working for the branch. Second, by founding a research institute in the target country. Third, by subcontracting along with technological and financial support. Fourth, by stimulating other competing industries. The advantages of this direct overseas investment over licensing are; (a) the provider of technology can directly participate in management whereby the provider can get a lot of profit, (b) the provider can exclude the possibility of appearing of potential competitor in the future.

Co-investment: In this case, the branch is not completely owned by the foreign industry. The major characteristics of co-investment are; (a) technology is transferred through the process where the foreign industry provides technology or organization and the branch provides manpower, money, and relationship with its government. Thus, co-investment is better than licensing and worse than direct investment in terms of the degree of transfer of technology. (b) Because co-investment invloves participation of both sides, this has it over other ways in transfer of technology.

Venture capital: This is a way of purchasing technology that was not yet commercialized. Because its marketing information is not good enough, it costs less than the technology that already proved successful in marketing. However, the fact that it takes more risk warns us to make a decision with special care.

So far, I have discussed various ways of transfer of technology. Now, I am going to address a few problems we must solve in introducing foreign technology. First, the proportion of technology that was introduced by small industries is relatively

too low. Until 1990, the number of technology items introduced by small industries is 3,084 out of 6,944, which amounts to only 44.4%, whereas 99% of all the domestic industries are small industries. What is worse, the proportion of items introduced by small industries is currently decreasing. For instance, in 1990 small industries introduced 270 items, which amounts to no more than 36.6% of all introduced items. Second, we are overly dependent upon Japan and the United States in introducing technology. Out of 6,944 items that have been introduced so far, 3,536 items (50.9%) are from Japan and 1,836 items (26.3%) are from the United States. This undesirable tendency does not ever seem to be changing. We should diversify the countries from which we introduce technology. Members of European Community including Germany and France, and East European countries such as Russia might be good for us. Third, the nature of technology introduced so far has been concerned with mere assembling parts or manufacturing raw materials. We were not very interested in introducing the core technology or know-hows that are directly related to productivity. Fourth, overcompetition among domestic industries often caused waste of resources. Moreover, the introduced technology should be utilized in such a way that facilitates or stimulates the development of related domestic technology.

4. Characteristics of innovation of small industries

Compared to big industries, small industries have their own distinct characteristics in developing technology. In terms of marketing small industries have the advantage of responding quickly to the rapidly changing customer needs. Moreover, the communication within a small industry is far more efficient than that of big industries because they are less bureaucratic and are directed mostly by an ambitious enterpriser, which makes it possible to lose no time in decision-making. Besides, small industries can commercialize a new idea quickly even with small amount of capital. On the other hand, small industries have a hard time bringing in resources necessary to develop technology. They basically lack technological specialists, who prefer working for big industries. In addition, it is very difficult for small industries to finance for the purpose of development of technology, because most banks grudge investing their money in such a risk-taking business.

5. Plans for strengthening the competitive power through innovation

In order to facilitate the technological innovation, three factors seem to be needed: effort of a small industry on its own, collaboration among industries, and support from the government.

Self-effort: It is most important among others for an industry to make an every effort to develop new technology. In this section, I am going to discuss a couple of points that should be kept in mind. First, the role of the enterpriser is crucial. The enterpriser ought to be a creative and innovative-minded person. He or she should have his or her own blueprint or strategies concerning the technological innovation rather than merely following governmental directions. Second, developing skilled manpower is important. An industry accumulates its own know-hows and technology both by introducing foreign technology and by developing new technology on its own. Even though most small industries have preferred introducing foreign technology, they appear to be willing to develop it by themselves in the future. The contents of technology can be divided into 'hardware' and 'software' technology. Whereas the former refers to qualitative or quantitative changes in machines or facilities, the latter emphasizes the development of manpower. When the production output increases by training or educating workers, it can be said that the software technology is accumulated. In fact, domestic small industries have made light of the accumulation of technology through the development of manpower. I would like to argue that domestic small industries should improve the quality of their manpower by training and educating their workers. Third, utilization of external economic resources is the name of the game. Because it is difficult for an industry to develop technology on its own, it is recommendable to make use of external economic resources. 'External economic resources' signify institutes, agencies, or organizations with which industries transact. By making the most of external economic resources, small industries can obtain new ideas, use research facilities, and collaborate for a common project. Thus, small industries should be aware of the importance of external economic resources to which much attention is not often paid.

Collaboration among industries: By collaborating with other industries, they can obtain new ideas, technology, information, and management skills, because different industries have different merits. Thus, if industries are serious about exchanging their abilities, it will bring about a synergy effect: each industry will be able to solve its problems as well as extending its market. Furthermore, industries can be engaged in collaborative development of technology. The advantages of this collaborative development are, (a) each industry can save its cost, (b) they can make the most of research facilities, (c) they can disperse the risk, (d) they can remove the possibility that different industries are working on an identical problem, which is waste of resources.

Governmental support: The government can support the development of technology in a financial way. Until 1983, only limited investment trust companies could lend money to industries for their development of technology. Since 1983, it has been open to all the banks. However, most banks are reluctant to lend money

to small industries for their development of technology. Thus, it seems necessary for the government to play an active role in facilitating banks to lend money to small industries. On the other hand, the industry concerned takes the full responsibility of the risk that is indispensable to developing technology. It confines investment in development of technology and serves as a factor that inhibits banks from lending money. In fact, the government made a policy for securing the credit of small industries to help them develop new technology. However, this policy has not been implemented in a satisfying way.

In addition, the government can support the activities of small industries concerning development of technology by providing the exemption of the tax.

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