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16146

Distr.
LIMITED

PPD.20
23 January 1987

UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

ENGLISH

PROMOTION OF SMALL AND MEDIUM INDUSTRIES IN THE REPUBLIC OF KOREA*

Prepared by the

Regional and Country Studies Branch

Studies and Research Division

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PREFACE

Within its study programme, the Regional and Country Studies Branch of UNIDO carries out country level research on policies and strategies pertaining to the development of a dynamic small and medium industry sector.

In this context an Expert Group Meeting on Policies and Strategies for Small-scale Industry Development in Asia and the Pacific Region was held in Seoul on 17-20 September 1985, organized jointly by the Regional and Country Studies Branch and the ESCAP/UNIDO Division of Industry, Human Settlements and Technology in co-operation with the Korea Advanced Institute of Science and Technology (KAIST). The analyses of the programmes and schemes for small and medium industry promotion in the Republic of Korea arose great interest at the Expert Group Meeting and it was decided that a more detailed presentation and assessment of these experiences be prepared as a follow up research study to the Meeting.

The research study which is hereby issued, has been prepared by the Regional and Country Studies Branch in co-operation with senior Korean officials or researchers as indicated in the case of each chapter.

In the first chapter current issues, policies and promotional activities, concerning the country's small and medium industry (SMI) sector are reviewed. Attention is drawn to a number of measures which would seem to be of interest to other developing countries in connexion with support for a dynamic SMI sector development. The second chapter deals with the activities of the major promotional institution for the sector, namely, the Small and Medium Industry Promotion Corporation (SMIPC). It presents a review of a number of specific programmes, such as the Modernization Programme, the Equipment Leasing Programme, the Business Start-up Programme and the Rural Industry Development Programme. In the third chapter issues relating to promotion of export-oriented small and medium industries are addressed. The experiences of the Republic of Korea, in particular its institutional infrastructural build-up, are reviewed. As illustration, the development of a specific export-oriented company and the institutional support provided in that connexion, is presented in detail in an annex.

CHAPTER I

SMALL AND MEDIUM INDUSTRIES IN THE REPUBLIC OF KOREA - CURRENT ISSUES, POLICIES AND PROMOTIONAL ACTIVITIES[1/]

1. Importance of small and medium industry

The small and medium industry (SMI) sector represents an important part of the economy of the Republic of Korea. The efforts of small businessmen are considered vital to the nation's economic growth by the policy makers. The promotion of SMI is important in order to ensure a structural balance in terms of large and small industrial sectors and urban and rural areas.

It is considered that the development of SMI ensures the supply of high quality parts and components, and intermediate products, thereby strengthening the international competitiveness of the manufacturing sector. In addition, it will stimulate technological development and innovation enabling continued growth of quality and efficiency of the overall economy.

2. Changes in growth policy

In the span of the last two decades the economy of the Republic of Korea achieved rapid growth. From 1962 to 1981, the nation's real GNP grew at an average annual rate of 8.5 per cent, while exports increased at an average annual rate of 38 per cent.

This rapid process of development was, however, accompanied by the emergence of various problems. One of them was the imbalance between large-scale and small-scale industry.

In most of the 1960s, Government policy concentrated industrial investment on light industry. SMI played a major role in this industry sector and received due attention and support from Government and banking institutions. In the 1970s, however, the Government strived for more rapid growth, and shifted investment priorities in favour of heavy industry. As a result, SMI was deprived of needed capital and showed various weaknesses, such as outdated facilities, incompetence in marketing development especially in export market, management techniques, etc. The small industry was not able to keep abreast of the rapidly changing environment and new technologies and could, for instance, not produce enough parts and components of acceptable quality for the heavy industry. Production bottlenecks began constraining the nation's economy.

Obviously this is not a uniquely Korean problem: most developing countries, have at some stage, faced the issue of balancing heavy large-scale industry with the light and small-scale industry.

1/ Based on paper presented by Yun-Sang Choi, Vice President, SMIPC, at the UNIDO/ESCAP Ad Hoc Expert Group Meeting on Policies and Strategies for Small-scale Industry Development in the Asian and the Pacific Region, held 17-20 September 1985 in Seoul, Republic of Korea.

By 1980, the Government decided to place renewed stress on the role of small business and take concrete steps to strengthen its financial and managerial structure. This decision eventually assumed concrete form with the adoption in 1982 of the 10-year Long-Term Promotion Plan for Small and Medium Industry. The basic development targets under the plan are to increase value added ratio from 35.4 per cent in 1982 to 44.8 per cent in 1991, the employment share from 47.7 per cent to 54.3 per cent; and the investment distribution ratio from 29.7 per cent to 43.7 per cent.

3. Small and medium industry promotion policy measures

The 10-Year Promotion Plan to strengthen the SMI specifies a number of policy measures.

First, under a programme begun in 1983, comprehensive financial, technological, and marketing assistance is made available to enterprises identified as promising by banks, small business promotion agencies, and various research institutions. Conversely, efforts are being made to identify the "least promising" small businesses in order to assist their conversion to more profitable business lines.

Second, a co-operative modernization programme was implemented to enable SMIs to utilize economies of scale in a number of activities. Through this programme individual SMIs are being encouraged to jointly utilize various kinds of facilities, including highly expensive equipment and antipollution devices. Experience has shown that such facilities sharing not only reduces costs but can also lead to productivity increases. For companies that choose to adopt this approach, various kinds of support are provided, including financial support from the special fund.

Third, to encourage technological development and promote managerial modernization, a number of new and/or expanded services are made available to small business. Technical and managerial extension services as well as technical training programmes are offered by the Small and Medium Industry Promotion Corporation (SMIPC), and technical information is provided by the Korea Institute for Economics and Technology (KIET). Together, these two organizations keep the country's SMIs abreast of major innovations and developments of potential value to them.

Fourth, the Government is promoting closer co-operation between large-scale industry and SMIs, particularly in the areas of parts and components production. Large companies are encouraged to establish long-term contracts with smaller subdeliveries which also receive extensive financial, technical, and managerial support in return for providing a steady flow of high quality parts and components. The Government believes that such linkage can significantly increase overall industrial efficiency. In addition, certain fields of production have been exclusively reserved for small business based on criteria of efficiency and comparative advantage.

Fifth, the Government encourages individual small industries to form co-operative associations. Such co-operatives offer a variety of services to their member firms, including marketing and purchasing services and, in some cases, research and development programmes. Government financial support is available to assist these co-operatives. The Government also supports the co-operatives' collective marketing efforts by directing that a substantial share of government supply contracts be awarded through the small business co-operatives.

Sixth, assistance measures have been reinforced to ensure the balanced development between urban and rural areas. The Government designates rural industrial estates in rural areas and firms which enter in these estates will receive various forms of assistance.

Apart from these general support policies for SMI the Government has begun last year to target special assistance for new ventures employing advanced technology. Such assistance is supplemented by direct equity investment on the part of private sector venture capital firms.

4. Financial support policy

In order to successfully implement the above-mentioned policies, financial assistance to the industry is crucial as the financial problem is at the very core of the difficulties facing small and medium industry.

The vast majority of SMIs in the Republic of Korea are privately owned and they experience considerable difficulty in securing access to capital markets. As a result, they are heavily dependent upon more informal sources of financing, such as private money lenders, also known as the "curb market", where interest rates are exorbitant. This problem is aggrevated by the fact that Korean banks tend to make loans largely on the basis of the borrower's collateral, without considering the validity of the purpose for which the loan is desired.

Under these circumstances, the Government has established the following measures to facilitate financial assistance for SMIs.

First, the Government has established the Small and Medium Industries Promotion Fund equivalent to about US $200 million endowed from Government budget. This fund provides long-term and low-interest loans to small business. The fund is operated by SMIPC.

Second, two special banks, the Small and Medium Industry Bank and the Citizens National Bank, have been set up exclusively to provide financial assistance for SMI. The Government will continue to increase capital investment in these banks and will induce overseas loans to expand their financing capability for small business.

Third, efforts are being made to provide the SMI sector with a reasonable share of the nation's private capital resources. Nationwide commercial banks, for example, are required to make available 35 per cent of their loanable funds to small businesses, and local banks must allocate 55 per cent of their loans to small- and medium-scale companies. The central bank monitors compliance with this requirement and provides financial support to private banks based on the latter's assistance to small business. In addition, the secondary financial market is being systematically fostered with a view to providing an additional source of capital for the nation's small industry.

Fourth, in order to overcome the problems caused by small businesses' poor credit rating, the Korea Credit Guarantee Fund has been established to provide credit guarantees for small industry. Moreover, banking institutions are encouraged to make direct equity investment in small businesses and to underwrite the bonds issued by small businesses.

5. Small and medium industry business law

The Government has established a comprehensive legal framework to back up implementation of small and medium industry policies and programmes which is summarized as follows:

First, the Small and Medium Industry Basic Law, which provides for the definition of small business and supports establishment of small businesses. This law also encourages business conversion and pioneers new line of products.

Second, the Small and Medium Industry Promotion Law, which stipulates the establishment of SMIPC in order to support modernization and co-operative programmes for the SMI sector.

Third, the Small and Medium Industry Co-operatives Associations Law. This law provides for the establishment of sub-co-operatives and regulates co-operatives' operations.

Fourth, the Small and Medium Industry Systematization Promotion Law, which provides incentives for the development of parts and components industries and encourages subcontracting and sound and fair business practices between large firms and components suppliers.

Fifth, the Small and Medium Industry Business Co-ordination Law, which stipulates norms for co-ordination and strengthens small business co-operatives' autonomous power to make business co-ordination.

Sixth, the Law on Payments for the Products supplied from Small and Medium Industries. This law regulates unfair practices in subcontracting and stipulates the period of payments and due interests on delayed payment by large firms for supplies from SMIs.

CHAPTER II

THE ACTIVITIES OF THE SMALL AND MEDIUM INDUSTRY PROMOTION CORPORATION (SMIPC)[1/]

The Small and Medium Industry Promotion Corporation (SMIPC) is a non-profit organization which was established in 1979 in accordance with the Small and Medium Industry Promotion Law. It has the following principal functions:

- Promotion of modernization programme and co-operative programme
- Provision of extension services and training
- Information services
- Operation and management of the Small and Medium Industry Promotion Fund (SMIPF)

SMIPC derives its financial resources mainly from government budgetary sources. The Government, annually contributes to the Small and Medium Industry Promotion Fund which SMIPC operates and manages. The activities of SMIPF are carried out within a number of programmes and services which are briefly described below.

1. The Modernization Programme

The Modernization Programme aims at promoting plant and equipment modernization along with upgrading managerial skills. The main assistance SMIPC gives to small business under this programme is the financial assistance in form of loans, which can be used for purchase of production equipment and facilities and for working capital. SMIPC loans carry interest rates slightly lower than those of the commercial banks. Attention is focused on those enterprises considered to have high growth potential as well as those in government-designated priority industrial subsectors such as the automotive, machine tool, electrical and electronic component manufacturing industries. As a supplement to financing, SMIPC provides comprehensive services as required by the modernizing enterprises. The services comprise technical assistance, management consulting, training and information services. Applicants for the modernization loans are required to prepare and submit modernization plans as set forth by SMIPC regulations.

Eligible for the Modernization Programme are SMIs which:

- employ a constant work force of over 5 persons;
- possess total assets of over 100 million won;
- specialize in a priority subsector product amounting to 50 per cent of the total productions;

1/ Prepared as basis of information provided by the Small and Medium Industry Promotion Corporation - SMIPC - of the Republic of Korea.

- have been in operation for over a year at the time of application;

- have an average capacity utilization rate of 70 per cent during the past year.

Priority assistance under the Modernization Programme will be given to those who manufacture:

- parts and components;

- products in field classified for rapid improvement;

- products for 'export or which replace imported products;

- newly developed products;

- high value added products.

2. The Equipment Leasing Programme

SMIPC leases equipment at a low fee and on a long-term basis under the Equipment Leasing Programme to those SMIs which either need to replace obsolete equipment or require modern machines to maximize production.

Eligible enterprises are SMIs belonging to any one of the following categories:

- engaged in a priority industrial subsector;

- implementing a modernization plan;

- participating in a co-operative project with approved business start-up plan;

- designated to manufacture specialized folkart products;

- engaged in technological fields for rapid development;

- participating in a systematization programme;

- recommended by the SMIPC extension service group.

Equipment available includes:

- main machinery and equipment for production;

- automatic control equipment;

- moulds and dies;

- measuring and testing equipment.

3. The Business Start-up Programme

SMIPC provides under the Business Start-up Programme financial assistance to new industries with high growth potential. When entrepreneurs plan to commercialize innovative technologies and new products, SMIPC finance their

businesses to get started. In addition, such services as management and technical extension services, training and information services are provided as a supplement to financing.

Applicants must show ability to operate business successfully; they should be young although with at least three years of experience in the same business line. The programme is intended for activities in a priority industrial subsector designed by the Government, in a high technology field or in manufacturing products for export or import substitution. Priority will be given to those who possess industrial proprietorship; new technology acknowledged by the Ministry of Science and Technology; or new technology recommended by a public R and D institute.

4. The Rural Industry Development Programme

Under the Rural Industry Development Programme, a number of small-scale industrial complexes are being developed throughout the country's rural areas. Various assistance services and tax incentives are available to companies that move into or start business in the complex.

Financial assistance is provided for building construction and installing equipment and facilities. In addition, management and technical extension services, training and information services are provided. To support marketing efforts of those in the rural industry complexes, assistance is given to obtain Government supply contracts; to arrange subcontracting with large companies; and to promote export of their products.

5. Co-operative programmes

When an individual modernization programme is too difficult or expensive for a single firm to undertake, SMIs are encouraged to combine their resources in launching such projects as joint factory projects, joint facility projects, or co-operative business management and merger projects. To qualify for SMIPC assistance, five or more businesses must form a co-operative according to the Small and Medium Industry Co-operatives Association Law.

"Joint factory project" means development of industrial complexes for companies in a single industry or in closely related industries, and/or building of large, joint occupancy factories designed to house the production facilities of several firms in close physical proximity to each other. A second type of co-operation is the joint installation, operation and utilization of facilities such as joint waste-water facilities, up-to-date production facilities and inspection and testing facilities which would be too expensive for an individual firm to install and operate itself. These facilities are utilized on a time-sharing basis. Or, alternatively, the participating firms may choose to create a separate jointly owned company to operate the facilities.

"Co-operative business management" is another form of SMI co-operation and comprises e.g. joint purchasing and marketing activities, joint R and D work to solve common bottleneck technologies and joint utilization of a common trade-mark, etc. Also promoted under the Programme is the "co-operative business merger" of several firms of marginal scale into a single industry (or in closely related industries), designed to exploit economies of scale in production and to optimize facilities.

6. Extension services

The assistance under this programme, directed to small-scale industries (SSIs), is provided in form of in-plant services by national and international consulting specialists whom SMIPC employs on a short-term basis. SMIPC also maintains a permanent staff of experts who identify technical and managerial difficulties of SSI; based on their diagnosis, they either extend services themselves or work together (as counterparts) with short-term specialists.

Extension services thus provided encompass virtually all areas of business management and production technology (production design, technology, production control, automation, etc.). Forms of extension services provided include on-the-spot diagnosis and guidance regarding productivity matters in an integrated manner as well as regarding specific problems. A particular feature are the joint extension services with large assemblers for SSI; producing parts and components to these assemblers. In order to expose its personnel to new technologies and help them enhance their skills SMIPC assists and arranges for training in industrialized countries.

7. Training services

SMIPC operates the Small Business Training Institute (SBTI) located at the Banweol Industrial Complex. Training programmes offered by SBTI include training for top management and entrepreneurship development, refresher courses for management and technical staff, training for extension service consultants, training of policy makers of SSI, etc. The Korea ACME School (located at SBTI) is a supplementary programme established for training in the state-of-the-art techniques of moulds and dies. Courses are given under correspondence school method in press tool design, jig and fixture design and plastic mould design.

8. Information services

SMIPC systematically collects and disseminates a wide range of relevant information on such subjects as patents, technological breakthroughs, and new products developed abroad. The Corporation has built an information exchange network with a number of national and foreign agencies to obtain necessary information and data. Such information, as judged to be of value to SMI, is then processed into comprehensive forms for the end users' easy understanding and application. Information services include publications (e.g. journal of SMIPC, technical news letter, on-the-spot technology guidebook, etc.), enquiry and answering service and library.

SMIPC also conducts field surveys on SMI and utilizes the data in providing guidance for the establishment of pertinent policies and in the implementation of various promotional programmes. It also provides survey data to entrepreneurs of SMIs.

9. International co-operation programmes

SMIPC encourages and promotes international industrial collaboration. SMIPC implements various bilateral co-operative programmes and maintains close relationship with many international organizations.

The Programme encompasses a variety of services and assistance activities for international collaboration of small and medium industries, in fields such as: technology transfers; joint ventures; international trade; personnel exchange programme; collection of overseas information; and international seminars and meetings.

An example of a special programme is the Korea-Germany Investment Promotion Programme which is carried out in co-operation with the Federal Republic of Germany Agency for Technical Co-operation (GTZ). The objectives of the programme are:

- to facilitate inducement of German technology, to encourage investment from the Federal Republic of Germany in the Republic of Korea and to explore ways to promote exports to the Federal Republic of Germany;

- to identify and initiate joint business between enterprises of the Republic of Korea and the Federal Republic of Germany; and

- to contribute to the goal of innovating technical capability, enhancing productivity and promoting exports for the Korean SMIs.

Another example is the Korea-French Industrial Co-operation Programme, carried out in co-operation with l'Association pour la Promotion et la Développement Industriel (APRODI).

CHAPTER III

PROMOTION OF EXPORT-ORIENTED SMALL AND MEDIUM INDUSTRIES[1/]

1. Introduction

Promotion of export-oriented small and medium industries (SMIs) combines two different aspects, promotion of export-oriented industries and promotion of SMIs. Certainly both of these two objectives are economically attractive and desirable as they mean to achieve an effective and wide-spread utilization of manpower and other local resources to earn foreign exchange. Yet we all know that in practice they are most difficult tasks and often lead to costly policies for Government with very little results. This chapter will review the approaches towards fulfilment of these two objectives, based on the experience of the Republic of Korea in this regard and on that basis draw some conclusions as to the combined promotion measures.

Particular attention will be given to the concept of small venture-capital industries. In developing countries, the economic development planners and the policy makers, encouraged by the successful stories of some advanced countries are trying to promote venture-captial industries as an effective vehicle for promotion of export-oriented small and medium scale industries in the private sector. To promote the venture-capital industry as a new form of financing for the small and medium scale industries is, however, a difficult task. Venture-capital industry cannot be created in a short time, and the promotion of venture-capital industry must be preceded by well co-ordinated national planning and the establishment of infrastructure for research and development and for access to capital. This chapter attempts to show the experience of promotion of venture-capital industry to facilitate the promotion of export-oriented SMIs in the Republic of Korea.

2. Strategy for promotion of export-oriented small and medium industries

An export-oriented industry must have the minimum economy of scale to maintain quality of product, to develop marketing, to build up credibility and to be flexible to market changes. The minimum economy of scale may vary depending on the type of industry.

Even for an export-oriented industry, the development of the local market should normally be the basis for its growth. Indeed, ignoring the local market and relying exclusively on the export market can be a short-term and dangerous market strategy for any industry. For a start, a combination of sales of 70 per cent to 80 per cent for the local market and 30 per cent to 20 per cent of export market can be regarded as a sound sales strategy.

The general strategy for the promotion of export-oriented small and medium industry is to promote SMI to reach minimum economy of scale for export by means of full utilization of the local market potential.

The issue is thus to promote small scale industries toward becoming medium scale industries. It is admittedly very difficult to find a common

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1/ Based on a paper prepared by Yeo Gyeong Yun, Executive Vice President, Korea Development Investment Corporation.

denominator for policies to promote small scale industries, because of their diversity in nature of business.

A policy strategy proposed herewith is based on following principles:

First, Government and Government agencies provide the infrastructure for small scale industries to grow. Such infrastructure includes the establishment of R and D institutes to provide engineering extension services, to assist in technology transfer, and ultimately, to carry out R and D itself. Provision of management consulting and technical training are the other services to be considered. Government should guide the financial institutions to be more active in financing small and medium industries, by way of providing preferential collateral requirements for loans to small and medium industries. There might also be mandatory requirements for financial institutes to maintain certain percentages of available funds to be loaned out to small and medium industries etc. Government can also provide special tax incentives for small and medium industries, such as lower tax rates, shorter periods for depreciation allowance and a favourable write-off arrangement on business losses.

Second, the Government and the private sector small and medium industry associations should carry out a campaign, including lectures, publications, seminars, presentation of case studies and demonstration and field trips, to encourage small and medium industries to utilize these supportive measures. The awareness creation of the benefits of facilities for small and medium industries is often neglected but is as important as actual establishment of these facilities.

If an entrepreneur is able and dynamic, he will take full advantage of available infrastructure facilities and make his business grow. If an entrepreneur ignores the facilities available to him, his business may degenerate.

In conclusion it can be said that the basis for promoting export-oriented small and medium industries is, first of all, to identify small scale industries managed by able and dynamic entrepreneurs, then to assist them to grow, and finally to lead them to build up the business to enable it to compete in the export market. It must be stressed that the success or failure of business, especially for SMIs, primarily depends on the managerial capability of the entrepreneur. No Government policy can make every business successful.

3. Experiences in the Republic of Korea

(a) Socio-economic background

The present policies to promote export-oriented small and medium industries in the Republic of Korea can best be understood by briefly examining the major stages of development of the country's economy. The socio-economic development of the Republic of Korea since the early 1960's, can be grouped into three stages; the era of reconstruction (1960s), the era of expansion (1970s) and the era of balanced development (1980s).

The era of reconstruction

The First Five-Year Economic Development Plan (1962-1966) was launched, when the GNP per capita was US $87. The primary sector of the economy contributed over 40 per cent of GNP while the secondary sector's contribution was only 16 per cent. This period was marked by the Government's massive reconstruction programmes to create social infrastructure. These programmes include repairing roads and harbours, developing communication systems, improving transportation systems, increasing electric power supply, and other projects to rebuild the war torn country. At the same time the private sector of the economy started to move into new industries based on technology transfer. These were basic industries such as cement, oil refinery, petro-chemical and steel.

Faced with ever increasing volume of technology imports from abroad, the Government realized that in order to have an effective technology transfer, the country would need to strengthen the infrastructure for science and technology. Thus the Government decided to establish a multidisciplinary, applied and contract research institute as a foundation for technology transfer, and as a centre for indigenous research and development. Such a decision was rather unique for developing countries in the early stage of development, but has turned out to be one of the most important decisions by the Government made during this period.

Accordingly, the Korea Institute of Science and Technology (KIST) was established in 1966 as a joint project between the Governments of the Republic of Korea and of the United States. The initial project start up cost was estimated at US $12 million excluding land. Although this amount may seem small by today's standards, this was one of the major investment decisions for the Government. This investment was made at the time when the per capita GNP was around US $100, and a 200,000 MT per year capacity cement plant could be constructed for only US $5 million. This investment decision was made by the Government in the hope that KIST would play a role of catalysis leading towards self-reliance in technology in the near future.

In retrospect one of the major contributions of KIST during the 1960s was to demonstrate to the local industries as well as to the Government agencies that technology had to be considered in terms of cost and benefit. Good technology would cost money but bring profit to business if well managed. Also KIST, during the 1960s, created confidence in indigeneous R and D activities and sparked substantial increases in the number of research institutes established by private companies during the following decade.

The era of expansion

The 1970s was the most rapidly growing era in the history of modern economic development in the Republic of Korea. GNP per capita increased from US $248 in 1970 to US $1,662 in 1979. The contribution to GNP from the primary sector declined from 26.5 per cent in 1970 to 18.5 per cent in 1979, whereas the secondary sector increased from 22.3 per cent to 28.7 per cent during the same period. Especially for the manufacturing industry, the production index showed dramatic increase during this period. During this period, the principle of the survival of the fittest prevailed in the business community. There were many large corporations in the early 1970s which later faltered or became bankrupt. This was also the time for establishment of many new large conglomerates. For example, in 1972 the total sales volume of the

Samsung Group was US $205 million. By the end of 1979 the sales volume was US $3,077 million and accounted for 5.1 per cent of the country's GNP. The dramatic emergence of these large companies fostered a pool of extremely competent young professional managers and engineers. Today these professionals are the main source for the future entrepreneurs for the small and medium industries.

The era of balanced development

The rapid growth of these conglomerates was largely influenced by the Government policies in the 1970s. In the 1980s the Government set out to promote small and medium scale industries. Technology-oriented small and medium scale industries were some of the major beneficiaries of the Government's policies of the early 1980s. This new emphasis was seen necessary to maintain the steady growth of the economy and to establish social equality, as the country rapidly moves towards higher levels of industrialization. These small and medium industries are seen to be backbone of the country's economy in the future.

(b) Institutional infrastructure

R and D institutes

During the late 1970s and the early 1980s when the GNP per capita had reached to US $1,600, the technology requirements for the industry of the Republic of Korea had changed drastically in terms of quality and quantity. The large corporations had accumulated technological competence and could handle the technical problems of daily operation by themselves. Their own R and D organization could carry out short-term applied research activities. On the other hand, continuous increase in demand by small and medium industry for engineering extension service was so great that it was logistically impossible for KIST to handle these problems alone. After the first oil crisis and subsequent changes in the international trading environment, it became evident that long-term applied research needed to be strengthened for the development of a technology intensive industry.

The Government therefore decided to establish spin-off research institutes in the fields of electronics, telecommunications, energy and natural resources, chemical engineering and mechanical engineering, especially to support small and medium industries. At the same time the Government encouraged with tax incentives and other financial assistance the larger corporations to establish their own research organizations. KIST changed its name to KAIST (Korea Advanced Institute of Science and Technology), and focussed on development of new materials, bio-engineering, electronic devices and a new chemical process to conserve energy and materials.

The Small and Medium Industry Promotion Corporation (SMIPC)[1/]

The Small and Medium Industry Promotion Corporation (SMIPC) was established in 1979, as a Government agency, to provide management and technical extension services and training through utilization of local and foreign experts and retained skilled technicians at home and abroad.

1/ For further details regarding SMIPC see Chapter II of the present paper.

SMIPC helps small and medium industries sharpen their competitive edge by promoting plant and equipment modernization. Under its Modernization Programme SMIPC provides the financial assistance to these enterprises in the form of loans, with slightly more favourable terms than commercial banks. The loans can be used for the purchase of production equipment and facilities and for working capital. Under another programme SMIPC leases equipment at a low fee on a long-term basis. SMIPC also has a Business Start-up Programme under which new business is supported with financial assistance to commercialize innovative technologies and new products.

The Korea Institute for Economics and Technology (KIET)

The Korea Institute for Economics and Technology (KIET) was established in 1982 as an autonomous, government sponsored, economic research institution and technical information service centre. KIET's major activities consist of area studies, industry studies, studies on international economic developments, information dissemination services and business consultation services, especially for the small and medium industries.

The Area Studies Division of KIET monitors and analyses the rapidly changing economic and business conditions of individual countries and regions to help private enterprises identify trading opportunities abroad. The Industry Studies Division deals with both micro- and macro-level analysis of industrial sectors in order to identify business opportunities in the Republic of Korea. Information Dissemination Services provide information on industrial technology, patents, and the international market environment for small and medium industries.

KIET also provides business consultation services and extension services to individual enterprises in the fields of technology, marketing and financing in co-operation with major economic associations, science and technology research institutes, financial institutions and public corporations for the promotion of small and medium industries in the country.

Promoting potential entrepreneurs

In order to assist in identifying business opportunities, especially technology oriented, a great number of R and D institutes are operating in the country - 663 institutes in 1981. Over 50 per cent of these are private. These activities play a key role for a dynamic entrepreneurial development. A cadre of potential entrepreneurs of small and medium industries are also emerging from the larger companies.

Public policy changes to promote small and medium industries

Currently the Government is drafting legislation to strengthen the promotional policy for small and medium industry, including tax incentives. Also, in recent years the financial institutions have changed the policies to become more active in supporting small and medium industries. A co-ordinating committee is sponsored by the Government, with representatives of the concerned financial institutions, SMIPC and KIET with the task of co-ordinating and reporting on activities, and seeking solutions to problems encountered by small and medium industries.

(c) Development of venture-capital industry

The venture-capital industry in the Republic of Korea is still in its early stages. Private investors and companies have not yet begun to play a major role. There are four major participants related to the venture cpaital industry in the Republic of Korea, namely the Korean Technology Advancement Corporation (K-TAC), the Korea Technology Development Corporation (KTDC), the Korea Development Investment Corporation (KDIC) and the Korea Technology Finance Corporation (KTFC).

The Korea Technology Advancement Corporation (K-TAC)

KIST, after 10 years of operation, found that many of its potentially highly valuable R and D results were not being commercialized. Some of these R and D results were suited for small and medium industries but such companies lacked the expertise to commercialize the results. In 1974 KIST established the Korea Technology Advancement Corporation (K-TAC) to carry out the commercialization of R and D results of KIST. K-TAC provides a potential client with a techno-economic feasibility study on R and D results of KIST and explores with the client the possibilities of either selling the technology to the client or going into joint venture with the client. In such a joint venture, K-TAC contributes technology as the equity of the proposed project. Although K-TAC does not contribute financially to the venture-capital industry, K-TAC did demonstrate a rational approach for the commercialization of R and D results, and K-TAC's success has had an impact on industry as well as the Government.

The Korea Technology Development Corporation (KTDC)

In the late 1970s the Ministry of Science and Technology (MOST) prepared a national plan to promote research and development activities in the country. In the plan MOST proposed to establish a bank for R and D. MOST asked the Korea Federation of Industry (KFI) to co-ordinate the activities to establish the bank for R and D with an initial fund of US $50 million as loan from the World Bank. Several years later another US $50 million loan was made by the World Bank. KFI was able to mobilize enough funds from its member companies and the Government to establish the Korea Technology Development Corporation (KTDC) in 1981. Currently the paid-in capital of KTDC is Won 22,800 million (US $25.3 million) of which Government controls 22 per cent and is the single largest shareholder. During the initial stage of the establishment of KTDC, the World Bank strongly recommended to include an equity investment feature in the corporate corporate charter. As of end of 1984, KTDC had invested or lent Won 135,100 million (US $150.1 million) in which 94 per cent was loans with guarantees or collaterals, 3 per cent conditional loans (unsecured loans which also offer royalty payments if successful), and 3 per cent for equity investment. KTDC may not be regarded strictly as a venture-capital company, but it plays an important role by promoting R and D activities and by supplying technologies to the venture-capital industry in the Republic of Korea.

The Korea Development Investment Corporation (KDIC)

The creation of the Korea Development Investment Corporation (KDIC) in December 1982 was the result of active encouragement and support provided by the Government to seven existing Seoul-based short-term finance companies. Originally KDIC was to have a two tier organization; a venture-capital

management company and a venture-capital fund. The two tier arrangement is a very popular form of venture-capital activity in the US and is designed to minimize overhead cost of the management company and to take advantage of "tax flow through concept" in the venture-capital fund. However, as venture-capital was not a well understood concept and a new form of finance in the Republic of Korea, KDIC felt that the outright adoption of a two tier system might create serious problems in the early stages of its operation.

After careful evaluation with advise of IFC, KDIC adopted the following short-term and long-term strategies:

- Initial funds mobilized upto Won 10 billion (US $11 million) would be in the form of KDIC's equity. Additional funds required within five years of initial capital funds would be arranged through management fees and performance bonus.

- The number of staff of KDIC would be kept at similar low level as that of venture-capital management companies in the US and a performance bonus system would be introduced in the corporate structure as an incentive system for the management and staff.

- In principle all of capital gains and net profits of KDIC derived from the operation of KDIC's equity would be distributed at the end of ten years of operation.

- The management of KDIC would work closely with the Government and it would be attempted to amend the tax code to provide tax exemptions on KDIC's income from capital gains, while KDIC would remain a private company under the commercial code.

As of today the paid-in capital of KDIC is Won 7,500 million (US $8.3 million) equally contributed from the seven Seoul-based short-term finance companies and IFC, AsDB and DEG of the Federal Republic of Germany. In addition, American Can Company of the US, and Credit Agricole of France have signed Subscription Agreements with KDIC, currently pending for Government approval. KDIC is also expected to add Westinghouse of the US, and Japan Associated Finance Corporation (JAFCO) as additional shareholders in the near future.

KDIC has also entered an Investment Advisory and Line of Credit Agreement for US $5 million with IFC in an attempt to develop a new vehicle to mobilize funds for future investment of KDIC. This agreement was approved by the Government in October 1985.

Since the establishment of KDIC, there were 572 project inquiries received, out of which 22 projects have been approved for investment as of September 1985. KDIC invests in the forms of common stocks, preferred stocks as a minority shareholder, convertible debentures and debentures with warrant. KDIC purchases debentures and makes short-term loans for working capital only to its portfolio companies. An actual case of KDIC support, namely, that of the TRI-GEM Computer Inc., is presented in an annex to this chapter.

Among these portfolio companies, eight companies are in the electric and electronic industries constituting 35.4 per cent of KDIC's total investment, four companies are in the metal fabrication industry with 10.5 per cent of

total investment, four companies are in the mechanical industry with 16.9 per cent of total investment, four companies in the chemical industry with 11.8 per cent, two in non-metallic mineral products with 12.3 per cent and one in food processing with 13.1 per cent.

For the future fund mobilization efforts, KDIC is planning to relay much on the formation of off-shore venture-capital funds, and later to try to form venture-capital funds in the domestic market. KDIC has demonstrated that the venture-capital industry in the Republic of Korea can be challenging and profitable and can offer numerous investment opportunities.

The Korea Technology Finance Corporation (KTFC)

The Korea Technology Finance Corporation (KTFC) was established, in November 1984 by the Korea Development Bank as a venture-capital company, with initial capatalization of Won 10 billion (US $11 million). To date, KTFC has invested in two projects in the form of equity investment (US $0.5 million) and eight projects in the form of loans with guarantees (US $1.8 million). KTFC's business is expected to grow.

4. Concluding observations

Promotion of export-oriented small-scale industries is a never-ending challenge to the economic development planners and policy makers as well as to the entrepreneurs in the developing countries. This is so because it is a very tedious, time consuming and often resource wasting process with little noticable results. The experience of the Republic of Korea in promotion of export-oriented small scale industry is by no means an entirely successful story, nor the only solution to be followed by other developing countries. The experience of the Republic of Korea is only one of many approaches, all subject to change from time.

In retrospect the country's experience in promotion of export-oriented small scale industries consisted of two separate parts, the role of the public sector and the role of the private sector. In the beginning the public sector played the leading role to establish the institutional infrastructure and to encourage the private sector to utilize this infrastructure to its advantage and to take initiatives. As the private sector more and more came to take the lead, the role of the public sector gradually changed from an active to a more passive one. During this process the co-ordination between the two sectors would be the key to the success of promotion of export-oriented small scale industries.

In the late 1960s the Government of the Republic of Korea took an initiative to create a R and D infrastructure to facilitate technology transfer and later to carry out indigenous R and D activities by establishing KIST. Also the further organizations created, such as K-TAC, had a built-in system of monitoring and adjusting themselves to respond to technological needs of industry (i.e. the spirit of contract research). These organizations demonstrated with tangible results to the industrial sector and Government agencies that indigenous R and D results could be as useful and profitable as imported technology.

It was not until the late 1970s, when the industrial community showed some positive interest in technology development for the profit maximization of their companies, that the Government established the Small and Medium

Industry Promotion Corporation (SMIPC), and in 1982, the Korea Institute of Economics and Technology (KIET) as the institutional infrastructure to promote export-oriented small scale industries. When the demand for services of this infrastructure increased, the Government started to improve the system of financial support to the small and medium industries, including the encouragement of establishing venture-capital companies. The creation of a positive incentives system for the small and medium industries by the Government is a recent feature which is of particular importance, as there are many qualified small and medium industries in the country which can take full advantages of such incentive systems.

Regarding the role of the private sector in promotion of export oriented small scale industries, it can be said that each individual entrepreneur will be the key to the success or the failure. For example, if an enterprising young person in the Republic of Korea is looking into a business idea, he can go to the Korea Institute of Economics and Technology (KIET) for information on import statistics or available technologies at home and abroad. If he decides to review, investigate or develop technology of his interest, and needs help from experts, he can go to the Korea Advanced Institute of Science and Technology (KAIST) or any one of many research institutes. Furthermore, if he needs financial assistance to utilize these R and D institutes, he can contact the Korea Technology Development Corporation (KTDC) for a loan. When he has decided to start his own business, he can contact the Korea Development Investment Corporation (KDIC), or the Korea Technology Finance Corporation (KTFC) for equity financing, and subsequent follow-up loans without collatoral or guarantee. With this financial assistance from venture-capital companies he can start business, and if he runs his business successfully for several years and has some track records, he can approach commercial banks for the additional financial assistances. Nowadays, the local commerical banks are more willing to help small enterprises supported by venture-capital companies. When his company starts to realize business profit, the promotional incentives system for small and medium industries will be brought into full effect which in turn will accelerate his business to grow into a medium scale industry, and be ready for becoming an export-oriented industry. These were the processes that TRI-GEM had followed, as presented above.

If the entrepreneur is an enterprising and dynamic person, he should know how to use the facilities of KIET, and to contact the R and D institutes to his advantage. Furthermore, he should be able to persuade a venture-capital company with his business proposal to invest in his business. He may initially concentrate his efforts in the area of import substitution. After gaining experience and being successful in the domestic market, he should start to look for the export market. If he is an able businessman, he should know how to take full advantage of the promotional incentives systems.

Thus, the public role of promotion of export-oriented small scale industry is an active one in early stages, in so far as establishment of infrastructure, in partiuclar institutions, and promotion of growth of key and basic industries is concerned. Once the institutions are there and a number of large enterprises have grown up to be self-sufficient, these institutions and enterprises will generate enough of potential entrepreneurs interested to go into own business. Then, in the case of the Republic of Korea the Government could assume a more passive role, providing and improving incentives systems with a built-in system of monitoring the progress of the promotion of export-oriented small and medium scale industries.

Annex

A case illustration: TRI-GEM Computer Inc

Dr. Y.T. Lee was one of the pioneers of introduing EDP to the Republic of Korea in the 1960s as the Deputy Director of the Computer Centre of the Korea Institute of Science and Technology (KIST) where he had established himself as a competent and enterprising engineer and an able business manager during the 1970s. It was Dr. Lee's firm belief that the Republic of Korea would have internationally comparative advantages in computer industry software as well as hardware in the near future. He was anticipating in the late 1960s that within a decade the Republic of Korea would have many relatively inexpensive but highly competent engineers and scientists available in the field of computer science.

Dr. Lee resigned from KIST and established the private Korea Software Institute (KSI) in 1977 with paid-in capital of US $60,000 which was mobilized through financial supports from his friends and relatives including his own contribution. KSI was to specialize in the development of system software for export, and their first project was to develop RPG (Report Program Generator) for IBM mini-computers (34 and 36) with several young engineers and scientists in a small rented house. Even though Dr. Lee wanted to have both the development of software and the manufacturing of hardware as long-term objectives, it was his business strategy to set up KSI first which required very little investment in fixed assets with minimum of preparation to start.

Establishment of TRI-GEM Computer Inc.

In 1980 Dr. Lee started TRI-GEM Computer Inc. with paid-in capital of US $12,000. For the key personnel for this new venture, he was able to recruite Mr. J.K. Kim, who had over ten years of manufacturing experience with one of the largest consumer electronics makers in the country, and Mr. J.K. Kang with ten years of experience in the field of electronic equipment designing and engineering at KIST. They set out to design the personnel computer, 8 bite compatible with Sharp of Japan in a rented small office space (about $40m^2$).

Production and marketing strategy

Within a year (1981) TRI-GEM was able to produce the SE-8001 model which was the first personal computer ever produced in the Republic of Korea, and obtained the first license to manufacture personal computers in the country from the Ministry of Commerce and Industry.

For marketing of TRI-GEM PC, Dr. Lee decided to establish another company, Elex Corporation, in 1981. This company would market imported mini-computers and peripherals as well as the TRI-GEM product in order to spread the overhead costs of marketing during the early stage of operation. Elex Corporation was managed by Mr. Y.K. Lee, a former KIST member, who had over ten years of successful experience in selling imported mini-computers in the Republic of Korea.

Setting up three separate companies, KSI, TRI-GEM and Elex was to give each specialist the opportunity to demonstrate his capability in an unproven business domain, the personal computer industry, and to spread the investment

risks. It was also easier for Dr. Lee to raise capital this way from his many friends and relatives. In 1981 TRI-GEM sold through Elex Corporation US $60,000 worth of the first model, which was only for educational and demonstration purposes.

Development of the 2nd model, TG 20

Even though the sales of the first model (SE-8001) went very well during the second year, and reached the annual sales of US $500,000 in 1982, TRI-GEM could see the forthcoming competition from many sources. Encouraged by the success story of TRI-GEM and illusioned by the story of the Silicon Valley, the country's large electronics appliance makers were preparing to set up personal computer manufacturing divisions, and many young entrepreneurs in the fields of electronics and computer science were rushing into setting up companies to produce personal computers all over the country. This meant that the country would be flooded with personal computers within few years. To prepare itself against the future challenge, TRI-GEM decided to develop the 2nd model, TG 20, 8 bite Apple compatible in 1982.

Expansion with TG-20

The year 1983 was a very important year for TRI-GEM. The 2nd model, TG-20, was introduced successfully in the domestic market. The model, TG-20, was very popular among schools for educational purpose, and was accepted as the best home computer available then. Some were even exported to Canada and were then the first personal computers made in the Republic of Korea to be exported.

TRI-GEM also started in 1983 to produce line printers under the license of Epson of Japan which were the first line printers ever produced in the Republic of Korea. Until then TRI-GEM had been operating in a rented space of 250m^2 which was, of course, quite a expansion comparing with 40m^2 of working space originally started from 1980, but was by 1983 very crowded with so many activities occuring.

Based on the two years of experience and the future prospects, TRI-GEM prepared a future business plan which included the purchase of a plant site and construction of a manufacuring plant, the purchase of testing equipment and the establishment of effective production lines within its own plant. With this business plan for the future, TRI-GEM approached the Korea Development Investment Corporation (KDIC), the only private venture-capital company in the country, for financial support. KDIC was impressed with the management team of TRI-GEM and the business proposal prepared by them, and decided to provide financial support in the form of the equity participation as well as debentures, to TRI-GEM. Thus, in 1983 TRI-GEM purchased 7,600m^2 working space, which was ready for operation by 1984. In 1983 the annual sales volume of TRI-GEM was US $4.4 million with paid-in capital reaching nearly US $500,000.

Reorganization of TRI-GEM

At the end of 1983, the performances of the three companies, KSI, TRI-GEM and Elex were reviewed by the managements and shareholders of these companies, and it was conculded that time had arrived for the three companies to be merged into one in order to meet the future challenge.

TRI-GEM had demonstrated its designing, engineering and production capability to be the best in the Republic of Korea, but lacked marketing capability. Elex had demonstrated that its accumulated experience in marketing of personal computers was sufficient to handle those products as the major item under close working relationship with production line. KSI had demonstrated its potential capability to develop software. It would need several more years of financial support to be viable as an independent corporation, although the manufacturing and marketing of personal computers would in the near future need a lot of technical support from the software group. In a long run software would have a tremendous export market potential.

Thus, in January 1985 the three companies, KSI, TRI-GEM and Elex, were merged to become TRI-GEM Computer Inc., with combined paid-in capital of US $1.2 million. The organization of company was completely overhauled and restructured.

Currently Dr. Lee, the founder of three companies, is the chairman of the board of TRI-GEM Computer Inc., and is not actively involved in the daily operation of TRI-GEM. The president of TRI-GEM is Mr. Y.K. Lee, the former president of Elex, who is now responsible for overall company operations and marketing. TRI-GEM has another president, Mr. J.K. Kim, the former president of TRI-GEM, who is responsible mainly for financing and production. Mr. J.K. Kang is vice president in charge of hardware research and products development. In addition, there are five major departments headed by managing directors, and these departments are department of domestic marketing, marketing department for mini-computer (imported) and Epson Printer, department for export, department of software research and general administrative department.

Competition in domestic market

During 1983 and 1984 there was the boom-and-bust phenomena in personal computer manufacturing industry in the Republic of Korea. Every major electronic equipment maker started to produce personal computers and there were numerous of small PC makers all over the country. During this chaotic period of the PC boom, everyone with some knowledges of computer science seemed to want to establish PC manufacturing companies, and, indeed, there were over 50 PC makers in the country. But the domestic PC market was not expanding fast enough to absorb all PCs produced. By the end of 1984 there were only 20 PC makers left out of over 50 manufacturers, and all of the surviving PC makers, including PC divisions of three major electronic appliance makers, had substantial losses from operations of 1984. Annual sales of TRI-GEM in 1984, however, reached US $10 million with some modest profit realized.

During this chaotic period of 1983-84, TRI-GEM had not only survived but also established itself as one of the best quality makers of personal computers in the Republic of Korea. The name of TRI-GEM, with 30 per cent of local market share, is well recognized as the leader in the PC manufacturing industry in the country. For example, in 1984 when TRI-GEM made a new recruiting announcement through local newspapers, there were 4,000 applicants for 18 openings. It is a rare luxury for the company of this size and history to attract so many qualified applicants.

Export market

Thus over three years of operation TRI-GEM had accumulated enough of know-how in designing, engineering and manufacturing personal computers to become the leader of the industry. However, in order to sustain the growth of the company, TRI-GEM had to look for opportunities in the export markets. Since 1983, TRI-GEM had started to export TG-20 in small quantities to Canada, Europe and Southeast Asian countries. For the US market which is the largest PC market in the world, the current model, TG-20, had a problem of copyright infringement with Apple Computer. Thus, TRI-GEM decided to develop a new model for the US market in 1983. The decision was to either take a route of improving TG-20 to avoid copyright infringement, or to take a route of developing a new model, 16 bite UBM PC compatible which was then very popular in the US market. TRI-GEM was competent enough to take the later route, developing a new 16 bite IBM PC compatible for the US market. It took six months for TRI-GEM in co-operation with Personnel Computer Products Inc. of US to develop TG-88 which did not have any problem of copyright infringement with IBM in the US market. The new model, TG-88, was also successful in the local market for office automation, and in the export markets, including Canada, Europe, South America and Middle East countries in 1984. In late 1985 TRI-GEM started to export TG-88 to the US market after establishing sales offices, sales and after-service networks in the US in co-operation with the ISI Corporation in Silicon Valley.

The annual sales volume for 1985 of TRI-GEM is expected to reach US $16 million. Already TRI-GEM is producing the new models which are TG-AT and TG-88 II, both IBM PC AT compatible, for the export market in 1986.