Section 4 ESTIMATION OF POTENTIAL CAPITAL INVESTMENT REQUIRED FOR THE LINKAGE-TYPE INDUSTRY

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4.1 Methodology of the Estimation

In this Chapter, an estimation is made on the potential capital investment required to the linkage-type metalworking industry in the near future. The required capital investment is considered to be induced by an increase in the demand for domestically manufactured metalworking products.

The following two factors may cause the demand increases.

1) Increase in local content or localization ratio (progress of localization).

2) Increase as a result of growth of national economy (economic growth)

The former increase is in accordance with import substitution by domestically manufactured products even if growth of national economy remains stable. The latter increase is in accordance with the expansion of the national economy even if the localization ratio remains at the same level.

It must be noted, however, that the localization ratio will not improve without the enforcement of the proper development policies and their smooth implementation. In addition, even if the demand exists, the production volume will not follow the demand unless fund corresponding to the required amount of investment is directed to this subsector. Here, the amount of the capital demand is estimated presupposing that the demand for local production should be satisfied by investment by means of expansion, renovation and rehabilitation of existing facilities or installment of new facilities. Policies and implementation programs to materialize investment are examined in the Main Report.

The method to estimate the capital demand consists of three stages; firstly, production volume for the assembly-type industry is forecasted, secondly the volume is converted to demand of production for the linkage-type industry (expressed in tons) and finally, the required capital investment is estimated for the linkage-type industry to meet the demand of production. The methods to estimate the demand increase and to convert the demand increase to the required capital investment are described in the following section.

4.1.1 Estimated Method for Production of Assembly-Type Machine Industry

The market of the linkage-type metal processing industry will be the assembly-type machine industry as subcontracting business. The production of the linkage-type industry will increase in accordance with the domestic production volume of the assembly-type industry.

Therefore, in order to estimate the demand volume for the linkage-type industry, the production volume of the assembly-type industry should first be estimated.

The estimation of the domestic production volume of the assembly-type industry involves the following two factors.

1) Transition of the localization ratio.

2) Transition of the production volume in accordance with the demand reflecting the expansion of the national economy.

The increased demand for domestically manufactured products can be given as the total of 1) and 2). Here, the increased demand for domestically manufactured products is automatically regarded as the actual local production volume because export of machinery and equipment from Indonesia could be assumed as negligibly small in the near future. Estimates have been made for 1985, 1990 and 1995.

(1) Estimate of the localization ratio

Firstly, the major types of machines are selected for each of the following industrial fields.

Machine tools	7	Types of machines
Agricultural machinery	8	"
Construction machinery	4	"
Electrical machinery & appliances	10	"
Automotive	1	"
Motorcycle	1	"
General-use diesel engines	1	"
Total	32	Types of machines

A representative model is selected for these 32 types of machines and the major components for each machine are then listed. After the weight for each of these components has been calculated, the metal processing volume to be given to each component has been computed in weight under the following five different metalworking processes.

1) Casting
2) Forging/heat treatment
3) Machining
4) Sheet work/welding
5) Press work

Different grade of difficulty is involved in each component in view of the processing technology and the precision, and the utilization of domestically manufactured products is imposed by the deletion programs for some components. When these two factors are taken into account, the knowledge and information obtained by field survey is reflected. In the case of those components whose deletion programs could not be executed according to their respective schedules, their implementation period are accordingly adjusted. In short, the work volume by process is calculated in weight (kg/unit) as well as localization ratio for each of the 32 machines for 1985, 1990 and 1995. Details are explained in the paragraph 4.2.1(1).

With regard to the shipbuilding industry, the localization ratio is not specifically forecasted because a demand for the linkage-type industry is directly estimated, as explained in a later section, in different method from the one above.

Components for process plant equipment are not individually examined due to the numerous types, as well as the huge volumes, of equipment involved in a single plant and also due to the large number of different types of process plants. Instead, the comprehensive localization ratio for plant equipment is estimated based on the data provided by "The Feasibility Report on the Development of Plant Processing Equipment Industry in the Republic of Indonesia" which was submitted to the Government of Indonesia by the Japan International Cooperation Agency in February, 1985. Some modifications, however, have been made to the data based on information and data possessed by the JICA Study Team.

(2) Estimate of natural increase due to expansion of the national economy

The concrete estimation methods for each industry and machinery are explained in the sections dealing with individual industries. In regard to the 32 types of machines mentioned previously, growth rate estimate for each industrial field (machine tools and agricultural machinery, etc.) are made based on the estimated GDP growth rate by REPELITA IV and other economic indicators.

As far as the shipbuilding industry and the plant equipment industry are concerned, the projected number of ships and process plants are used as the calculation basis. In addition, the estimated production volumes have been cross-checked in order to exclude contradictions with the growth of the total demand in Indonesia and the trends of imports.

(3) Estimate of coverage ratio

Even though selected 32 machines representing each of the assembly-type machine industries are examined, the selected number of machines cannot cover all the machines categorized in the industrial field. An extent of the selected ones to the all is called as the coverage ratio in this Study. Total demand volume in that particular industrial field can be calculated dividing the figure for the selected machine by the coverage ratio. As for the automotive, motorcycle and shipbuilding industries, the coverage ratio is assumed as 100%, since the total number of production has been captured in the production volume forecast.

(4) Summary of estimation method

The estimation method described above can be expressed by the following formula.

Domestic production volume (32 Selected machines)	=	Present production volume x Localization ratio x growth rate
Total domestic production volume for the father-type industry	=	Domestic production volume (32 Machines) / Coverage ratio

4.1.2 Estimation Method of Demand for Linkage-Type Metalworking Industry

Since the estimated volume of domestic production given in 4.1.1 is the demand for the assembly-type machine industry, it does not necessarily mean that the same volume is subcontracted to the linakge-type metalworking industry. In the case of some products, a part of or most parts of their components are manufactured by the assembly-type industries themselves as in-house manufacturing.

The ratio of external orders is estimated for each of the five categories of metalworking processes by the 32 machines. The criteria for determination of externally ordered components ratio are as follows.

1) Components designated as out-house products under the deletion program.

2) Components unsuitable for in-house production by the assembly-type industries because of the smallness in production volume.

3) Components which do not require extremely high technologies or know-how, and those where no technological secrets are involved on the side of the assembly companies in terms of technical design.

4) Components whose subcontracting is considered to be more efficient for both the assembly- and linkage-type industries when the situation of advanced countries is referred to.

However, subcontracting cannot be developed for the shipbuilding industry without re-structure of the current production system. In general, the modern shipbuilding industry subcontracts components including out-fittings, and establishes itself as an assembly industry like the automotive industry. In comparison, the shipbuilding industry in Indonesia produces all the components in-house and, therefore, is inefficient in production. The condition that the shipbuilding industry be gradually modernized and that the out-fitting sector will be subcontracted until 1990 at a certain amount is assumed in this study. It must be noted, however, that this sub contracting of out-fittings to the linkage-type industry cannot be completed without strong administrative guidance by the Government of Indonesia.

4.1.3 Estimation Method for Capital Investment Required

With regard to the 32 types of machine mentioned previously, the production demands in terms of tonnage for the 5 processing methods, i.e. 1) casting, 2) forging and heat treatment, 3) machining, 4) sheetwork and welding and 5) press work are totalized for 1985, 1990 and 1995. On the other hand, plant cost for 5 processing methods has been estimated in Section 9 in terms of US$/ton of products. Thus, the capital investment requirements can be measured multiplying the demand for production (ton) by the plant cost (US$/ton).

The method is summarized as follows:

a) Deduct the volumes of the production demands in 1985 from the figures for 1990 to obtain the demand increase during these 5 years. Use the same calculation method to for the 5 years between 1990 and 1995.

b) Multiply the results of a) i.e. increase in the volume of the production demand for every 5 years by the unit plant cost per ton to get the amount of incremental capital demand for expansion of production capacity.

c) Sum up the amounts of capital demands for 5 types of processing work to get the total capital demand until 1990 and 1995.

A subcontractor usually linkages to both shipbuilding and plant equipment industries because those assembly-type industries will make outside order for similar or same components which can be manufactured in a factory equipped with the same production line.

The subcontractor shall provide with plural processing section, e.g. cutting and welding of steel structure, sheet work and welding for fabrication of tanks, vessels, etc., and machining for finishing. Taking these facts into consideration, the same method is used to estimate capital demand for the linkage-type industry from the two assembly-type shipbuilding and plant equipment industries.

a) Demand of work volume to subcontractors is estimated in total tonnage (ton) including several processing methods required to linkage-to the assembly-type industries.

b) A unit plant cost ($/ton) is estimated by designing a typical factory which can reply the requirements from the assembly-type industries.

Capital demand for the subcontractors is able to be computed by multiplying work volume (ton) from a) by the unit plant cost ($/ton) from b).

In addition to the above mentioned method, the following two other methods are also examined to estimate the capital demand for the linkage-type industry:

a) Estimate on the basis of collected data through questionnaire to enterprises.

b) Estimate on the basis of macro national economy data.

4.2 Demand for Production to the Linkage-Type Metalworking Industry

4.2.1 Demand from the Heavy Machinery, Electrical Machinery, and Land Transportation Machinery

(1) Demand increase by the progress of localization

In Tables A-4.1 thru A-4.5, the progress of localization ratio in 1985, 1990 and 1995 is presumed by 5 work processes for the selected 32 types of machines assembled by the assembly-type industries, that is, 7 for machine tools, 8 for agricultural machine, 4 for construction equipment, 10 for electrical machine (5 for industrial use and 5 for household appliances) and each 1 machine type for automotive, motor-cycle and general use diesel engine. Further, the work volume on the 32 types of machines by the respective work process is also indicated in terms of weight per unit of a machine. Taking lathe in Figure A-4.1 an example, the standard specifications of lathe were determined as center distance = 1,500 mm, center height = 200 mm and machine weight = 2,500 kg/unit, and the work volume (kg/unit) necessary for a complete unit of this lathe was indicated.

Lathe	Total Processing Volume (kg/unit)	Localization Ratio (%)		
		1985	1990	1995
Casting	1,800	8	50	100
Forging/heat treatment	150	0	13	20
Machining	2,250	22	56	100
Sheetwork/welding	300	67	100	100
Presswork	70	100	100	100

To complete a unit of lathe, the work volume of casting: 1,800 kg/unit, forging: 150 kg/unit, etc. is required. When totaling the weight by work process, the work volume surpasses the weight of machine of 2,500 kg/unit due to the fact that same components are often processed by two or more work processes. The localization ratio in 1985, 1990 and 1995 is shown in percentage. The localization ratio of casting is estimated as 8%, 50% and 100%. For example, 8% of domestically manufactured components by casting process in 1985 stands for that the remaining 92% of cast products is manufactured overseas and imported. Therefore, when multiplying the work volume (kg/unit)

by the localization ratio, the work volume per unit to be domestically manufactured by Cash work process can be obtained. Tables A-4.6 through A-4.10 show the work volume calculated by such method for the 32 types of machines. However, since the same number of units to be manufactured in 1985 is also applied to 1990 and 1995, it comes to indicate the increasing work volume only by the progress of localization.

(Note) The figures do not include engines other than for automotive and motorcycle. Diesel engines for general use will be examined as an individual item hereinafter.

(2) Domestic production demand increase by the economic growth

The industrial production will also increase accompanied with the national economic growth, or the economic growth to be aimed in REPELITA IV is materialized by growing the industrial production. The growth rate of real GDP is estimated as 5% in REPELITA IV and in it the basic metal and machinery industry aims at the growth rate of 17%. In addition to the increase in the production demand from the progress of localization, an increase in number of production units derived from economic growth of industry sector shall be considered to project total production volume increase for Indonesia.

1) Machine tools

According to Table A-2.2, while the total demand in Indonesia in 1984/85 is of 19,104 units, the number of units domestically produced was only of 790 units or 4.1% of the total demand, and the production capacity is also of 2,275 units or 12% of that. On the one hand, the production capacity provided with the license by the deletion program is 15,295 units. This production capacity is scheduled to be accomplished in 1987, however, there is a contradiction between the licensed capacity and the estimate of the Ministry of Industry (Table ANX III-4) which projects production capacity in 1987/88 as 4,550 units and the actual production as 3,235 units.

Hereupon, the number of domestically produced units of machine tools in 1990 is supposed as 6,000 units, approximately 40% of the production capacity provided with the license. Later on, it is presumed that the number of produced units will grow at 17% (real growth rate in the machine industry sector in the REPELITA IV) until 1995.

	Number of Units	Index
1985:	725 units	100
1990:	6,000 units	828
1995:	13,000 units	1,793

2) Agricultural machine

Table A-2.5 indicates the production volume of 7,135 units or self sufficiency rate of 6.8% to the total demand of 104,500 units in 1984/85 and the production capacity is only 21,270 units or 27% of the total demand. The domestic production is being promoted by the deletion program, however, it is stagnant by the competition with imported ones. According to the estimate of the Ministry of Industry (Table ANX III-6), the demand in 1987/88 is estimated as 274,000 units, the production capacity remains in 1984/85 level of 21,270 units (7.8% against the total demand) and the actual production increases by higher capacity utilization to 16,470 units (6% against the same). Though it seems that the demand growth is excessively estimated, the lowering in the self-sufficiency ratio contradicts with the policy. It is more reasonable to assume a higher self-sufficiency rate than the estimate made by MOI because the technology involved in manufacturing of agriculture machine is not so complicated.

Here, *assuming that total demand will increase from 1985 till 1995* by 5% annual growth rate and the self-sufficiency ratio to the demand will reach to 15% in 1990 and to 30% in 1995, the actual production quantity is projected as follows:

	Total Demand (*units*)	Self-Sufficiency	Production (*units*)	Index
1985	104,500	6.8%	7,135	100
1990	133,371	15%	20,006	280
1995	170,219	30%	51,066	716

3) Construction Equipment

Table A-2.8 shows demand/supply in 1984/85 for 4 representative types of construction equipment as 2,295 units of production capacity, 957 units of actual production, and 1,200 units of total demand. Those figures indicate that self-sufficiency is 80% to the demand and 1.9 times of production capacity to the existing total demand.

As for 4 machine types, there are stipulation for utilization of domestically manufactured components in the deletion program, however, as the self-sufficiency ratio is already high with regard to the above data, it may be considered that the production quantity required will grow annually with 5% as the same as the growth rate for the construction industry in REPELITA IV (Table A-1.16).

	Production Quantity (units)	Index
1985	957	100
1990	1,221	128
1995	1,558	163

4) Electrical machine

Items from (1) to (5) in Table A-4.9 are electrical household appliances. The production (assembly) capacity has excess against in total demand. It may be considered that the consumption or production of these products, which are consumer goods for households, will grow in proportion to the GDP, namely at 5%. Items from (6) to (10) being categorized in electrical machine apparatus for industrial use is assumed to increase their production at the annual rate of 9.5%, which is the same growth rate of manufacturing industry sector.

	Production Index of Electrical Household Appliances (5%/year)	Production Index of Electrical Machine (17%/year)
1985	100	100
1990	128	157
1995	163	248

5) Automotives, motorcycles and general use diesel engines

After automotives (commercial cars) and motorcycle industry recorded the highest demand and production from 1980 to 1982, it has rapidly lowered by recession in 1984. The view of the people engaged in this industry is that demand will continue to be stable in a few years, and the demand at past peak will be recovered until 1990. Thereupon, it is assumed that production to be in 1990 will be the same level as 1981, and after that the demand will increase at annual growth rate of 10% until 1995. Domestic manufacturing of passenger cars is disregarded in this Study supposing that importation of CKD would continue for these years.

	Automotive		Motorcycle	
	Production (1,000 units)	Index	Production (1,000 units)	Index
1985	130	100	248	100
1990	183	136	503	203
1995	295	227	810	327

Total demand of diesel engines for general use i.e. for the agricultural machine, construction equipment, motor boats, etc. is estimated by MOI as 164,000 units of less than 34 HP in 1984/85. On the other hand, domestic production is 63,200 at self-sufficiency ratio of 38.5% and the production capacity is of 93,400 units or 57% of the total demand. As the self-sufficiency ratio is relatively high and capacity allowance exists, it is supposed that the production will increase proportionally with 9.5% of the growth rate in the manufacturing industry sector.

	Index
1985	100
1990	157
1995	248

(3) Coverage ratio

In the field of the machine assembly industry, the 32 types of machines were selected for the demand projection as has been discussed above, however, the selected machines do not cover all the machinery and equipment of the corresponding industry field. The ratio of the selected machines to the whole in the industry field is called as "coverage ratio" in this Study. This coverage ratio can not be precisely calculated because of lack of data, but roughly supposed by the number of units and the price proportion referring to the statistics for industrial production and export and import as follows:

Machine tools	60%
Agricultural machine	60%
Construction equipment	50%
Electrical machine and appliances	50%
Automotive and motorcycle	100%
Diesel engines (general use)	100%

The coverage ratio for automotive, motorcycle and diesel engine can be regarded as 100% because the total units for such unit machines are entirely captured in the above data.

(4) Subcontracting to the linkage-type metalworking industry

Demand forecast for the domestic production which have been studied above is for the machine assembly industry. This demand is not always materialized as the demand for the subcontractors, that is, the linkage-type metalworking industry. The ratio of subcontract to the total demand for the assembly-type industry is here called as "subcontract ratio" which is estimated in Table A-4.11. The method of estimate has been previously explained in the paragraph 4.1.2. Table A-4.12 as a summary of Tables A-4.6 thru A-4.10, shows the demand in 1985, 1990 and 1995 of work volume for the assembly-type industry increased only by the progress of localization. Multiplying the demand by the subcontract ratio (Table A-4.11), the work volume to the linkage-type industry is estimated as Table A-4.13. This basic demand

for subcontractors is further adjusted by increase in production volume caused by economic growth as well as the coverage ratio to reach a total work volume to be subcontracted to the linkage-type industry as shown in Table A-4.14.

4.2.2 Demand from Shipbuilding Industry

(1) Type of linkage business to shipbuilding industry

Shipbuilding companies in Indonesia purchase materials and component, separately in each shipyard and manufacture other components as in-house manufuacturing. It can not be expected any development of linkage industry to shipbuilding industry as far as this manufacturing system for shipbuilding may be continued.

Here in this Study, it is assumed that shipbuilding industry will make efforts for division of labors, for specialization and will be restructured modern shipyard which will concentrate to mainly build hull steel and to assemble purchased components into a complete ship. Regarding the purchase of components, parts and materials, it is recommendable that those items shall be classified into a) items which government will purchase by centralized purchase system, b) items which each shipyard will purchase separately by each order, c) items to be ordered to the linkage-type industry as subcontract.

In Table A-4.15, the movement of imported products, local procurement and orders to subcontract companies in 1985, 1990, 1995 per each component is shown on the bases of the recommendable system. Table A-4.16 shows the industrial fields which will have linkage with shipbuilding industry. The table indicates that there are many and various linkage industries to the shipbuilding industry.

In this Study, the demand of shipbuilding industry to linkage-type metalworking industry is estimated basing on the scheme in the Table A-4.15 and following assumptions:

1) In 1985, outside orders from shipbuilding industry to linkage-type metalworking industry may be nil.

2) In 1990, outside orders of out-fittings made of steel structures and steel fabricated products will have started in certain-amount, which will be demand to linkage-type metalworking industry.

3) In 1995, the volume of order of the out-fittings to the linkage-type industry will be doubled since 1990.

Out-fittings are masts, posts, booms, mooring metals, ladders, smoke ducts, air ducts, vent ducts chimneies, etc. Steel structures and steel fabricated products are steel structures, steel frames, containers and tanks etc. Metalworking processes involved in the subcontractors are to be plate processing of cutting, bending, welding, etc. and steel fabrication.

(2) Domestic production of ships

Table ANX III-24 in the ANNEX III shows demand quantity of vessels under 10,000 BRT until 1995 quoted from "Development Pattern of Indonesia's Shipbuilding Industry 1983". Now in Indonesia, maximum 5,000 BRT vessels can be built, and in 1990, it will become possible to build somehow 10,000 BRT vessels.

Then, total manufacturing tonnages will be as below on the assumption that local production will meet the demand upto maximum size of 5,000 and below BRT in 1985 and upto 10,000 BRT in 1990, 1995:

1985: 100,970 BRT (Upto 5,000 BRT)
1990: 188,120 BRT (Upto 10,000 BRT)
1995: 273,310 BRT (- do -)

(3) Estimate of volume for subcontract

The following process is taken in order to calculate the weight of out-fittings which will be ordered to the linkage-type industry.

1) Vessel DWT
2) Hull steel weight
3) Total vessel weight
4) Weight of out-fitting

1) Vessel DWT

As BRT equals to GT, it is necessary to divide BRT figures by 0.68 to get approximate DWT as below:

1985: 148,485 DWT
1990: 276,647 DWT
1995: 401,926 DWT

2) Hull steel weight

It is necessary to use Figure A-4.1 in order to get hull steel weight from DWT, and that of smaller vessel comes near to 20%. In Indonesia, mainly between 501 BRT (740 DWT) and 5,000 BRT (7,350 DWT), so, use the ratio of hull steel weight to DWT at 21%. The hull steel weight is as below:

1985: 148,485 DWT x 0.21 = 31,181 H.S. ton
1990: 276,647 DWT x 0.21 = 58,096 H.S. ton
1995: 401,926 DWT x 0.21 = 84,404 H.S. ton

3) Total vessel weight

Total vessel weight shall be calculated from Table A-4.17. In the top column of the table, there is a ratio of the hull steel to total vessel weight is indicated.

For example, as for 15,600 DWT vessel, 63.5% is the weight of hull steel in total vessel weight. Since, Indonesian domestic vessels are smaller than this weight, the ratio becomes lower to about 61%. Then, total vessel wegiht is as below:

1985: 31,181 H.S. ton/0.61 = 51,116 Ship ton
1990: 58,096 H.S. ton/0.61 = 95,239 Ship ton
1995: 84,404 H.S. ton/0.61 = 138,367 Ship ton

4) Outside ordered out-fitting weight

Table A-4.17 shows each ratios of a) hull steel, b) centralized purchaisng component, c) purcahsing material of the shipyard and d) subcontract material of shipyard against the total vessel weight, and Figure A-4.2 shows it graphically. As for small vessel, each figure as a) 60 - 63%, b) 15 - 25% c) 8% -20% d) 4% - 11%. Here, the figures of d) subcontract material of shipyard, out-fittings, is necessary. Taking 8% for standard, then outside ordered out-fittings weight is computed as below:

1985: 51,116 Ship ton x 0.08 = 4,090 ton
1990: 95,329 Ship ton x 0.08 = 7,620 ton
1995: 138,367 Ship ton x 0.08 = 11,070 ton

(4) Subcontract order and coverage ratio

Under existing conditions of 1985, above 4,090 ton are wholly manufactured within shipyards or imported, therefore, subcontract order is zero.

In 1990, it is assumed that two steel fabrication plants with 1,500 ton/year of out-fitting production would have been in operation. The production will cover 40% of total production. It is also assumed that two more plants having each capacity of 1,500 t/y would have been in operation until 1995, where in total capacity in Indonesia will reach to 6,000 t/y (1,500 t/y x 4 units) occupying 54% of the total demand for Indonesia.

As a result, ordered quantity to the linkage-type industry is as below:

1985: 0 -
1990: 3,000 ton (40% of total demand)
1995: 6,000 ton (54% of total demand)

These industries shall be constructed equally in Jakarta and Surabaya area.

4.2.3 Demand from Plant Equipment Manufacturing Industry

(1) Sources of basic data

The data provided in "The Feasibility Study Report on the Development of Plant Processing Equipment Industry in the Republic of Indoneisa", submitted to the Government of Indonesia by JICA, 1985 were referred to for estimating the demand and the localization ratio of the plant equipment manufacturing industry.

The above-mentioned F/S was carried out on the following 9 types of plants in 5 business categories.

a) Cement
b) Sugar
c) Fertilizer

c-1) Ammonia
c-2) Urea
c-3) ZA (Ammonium sulfate)

c-4) Phosphoric acid
c-5) TSP (Triple super phosphate)

d) Pulp and paper
e) Palm oil

In addition, the demands were preliminarily estimated for oil refineries and petrochemical plants, power generating and transmission facilities, boilers, watergates and bridges and plant repairing.

The F/S was intended to carry out a feasibility study on the modification, as well as the expansion, plants for 3 state-own plant equipment manufactures, namely P.T. Barata Indonesia (4 plants), P.T. Boma Bisma Indra (2 plants) and P.T. Boma Stork (1 plant). (These 3 manufacturers are jointly called BABIBO.) The construction demands of new capacity for the above-mentioned 9 plants in 5 categories were estimated as part of the F/S on the basis of the following assumptions.

a) The production volumes (of cement, sugar, fertilizer, pulp and paper and palm oil) of these plants would proportionally increase in accordance with the GDP growth. The elasticity to the GDP was individually set up for each product.

b) The supply shortage due to the increased demand for a particular product would supposedly be fully met by the construction of a new plant in Indonesia. In other words, the possibility of meeting the shortage by imports was not considered.

c) It was assumed that plant equipment whose domestic production was technologically feasible in Indonesia would be of domestic origin. In actual cases, equipment that could have even been domestically produced were often imported due to the lack of competitiveness in terms of quality, delivery date, price and deliverable volume.

The estimated demands for plant equipment by the F/S should, therefore, be treated as indications of the maximum potentials.

(2) Localization ratio

The metalworking volume by 3 processing methods (steel structure, sheet work and machining) for plant equipment in 5 business categories is taken from the F/S as Table A-4.18. The localization ratio for plant equipment for these 9 plants in 5 business categories is estimated to be 63.1% in terms of monetary value.

The total volume of metalworking necessary for the plant equipment industry is estimated by each plant of the 9 and by each process of 3 for 1984 to 1998 in Table A-4.19. Table A-4.20 shows local content in the total volume stated in Table A-4.19. In short, the total production weight in Table A-4.19 is multiplied by the localization ratio given in Table A-4.18 to achieve the local content given in Table A-4.20.

One problem here is that the localization ratio is assumed to be stable for the 15 years between 1984 to 1998. Take an ammonia and urea plant for example, a large project is usually financed by foreign funds. In the case of the ASEAN Aceh Project, the local procurement of plant equipment was virtually nil except for construction materials such as pipes, structural steel, etc. In the case of the ammonia and urea plant in Kalimantan whose construction is about to begin, although the utilization of domestically manufactured products is called for by GDI, the local procurement ratio as high as projected in F/S as shown in Table A-4.18 will not be achieved.

As a result, in this Study, the average localization ratio of all plants is modified as given below, considering the above localization ratio to be an ideal value for 1998.

	Localization Ratio (%)		
	1985	1990	1995
Structural work	50	65	80
Sheet work	25	35	45
Machining	12	16	20

Based on the above localization ratios, the average localization ratios for the 9 plants in 5 business categories (total value in Table A-4.18) are 32% for 1985, 42% for 1990 and 54% for 1995. The total demand for plant equipment in 1982 is said to have been 200,000 tons with a share of domestically manfuctured products of 30% or approximately 60,000 tons.

(3) Metalworking volumes for plant equipment

The last column of Table A-4.19 shows the total production weights by metalworking subsector in 5 business categories. The estimated weight

is based on a scheduled installation of new plants as shown in Table A-4.22. Though the schedule takes into account the Government development plan in the near future, it seems rather optimistic in materialization.

Since industries of sugar, cement and palm oil are suffering from depression over the world it is doubtful for investors to build up new capacity in recent years. In addition, rapid expansion of farming area for agricultural raw materials such like sugar cane and palm does not seem easy. New installation of Ammonia and Urea plant is to be for exportation because domestic demand for the fertilizers are sufficiently supplied by the existing plants, which menas that the new investment to those plants will depend upon supply/demand suituation in the world.

Taking the above observation into consideration, it is more realistic to assume that implementation of the schedule in Table A-4.22 would be late. Thus, it is presumed in this Study that the realization rate to the above schedule would be as much as 80%. The followings are revised demand for metalworking industry from the plant equipment industry:

TOTAL DEMAND

(Unit: 1,000 ton)

	Steel Structure	Plate Work	Machine Work	Total
1985	16.1	25.7	9.8	51.6
1990	18.3	30.3	11.0	59.6
1995	18.6	32.2	11.0	61.8

Demand for local manufacturing can be obtained by multiplying the volume with the localization ratio as below:

LOCAL PRODUCTION

(Unit: 1,000 ton)

	Steel Structure	Plate Work	Machine Work	Total
1985	16.1 x 0.5 = 8.1	25.7 x 0.25 = 6.4	9.8 x 0.12 = 1.2	15.7
1990	18.3 x 0.65 = 11.9	30.3 x 0.35 = 10.6	11.0 x 0.16 = 1.8	24.3
1995	18.6 x 0.80 = 14.9	32.2 x 0.45 = 14.5	11.0 x 0.20 = 2.2	31.6

The estimated demands for other plants and repair/maintenance work are also referred to from the F/S as shown in Table A-4.21. The figures in the table are already for domestic production. However, the localization ratios used for the estimate in the table are based on the ideal situation in 1998 and the figures for 1985, 1990 and 1995 should be downwardly modified using the localization ratios given in (2) above, and should be multiplied by the achievable rate of 80% as same as done for the above 5 business categories.

The modified results are as follows.

OTHER PLANTS AND REPAIR WORK

(Unit: 1,000 t/y)

	Steel Structure	Sheet Work	Machining	Total
1985	40.3	5.9	2.1	48.3
1990	54.1	12.2	3.0	69.3
1995	67.3	16.5	4.7	88.5

(4) Coverage ratios and demands for subcontractors

As well as the plants described in (3) above, iron/steel plants, coal/mining plants, nonferrous plants, petroleum gas plants, plywood-related plants, agriculture-related plants and construction-related plants, etc. require the supply of plant machinery and equipment. It is assumed that plants dealt with by (3) cover some 60% of the total number of plants. Based on the coverage ratio of 60%, the total demand will be as follows.

	Captured Demand 1/	Non-Captured Demand 2/	Total Demand
1985	64.0	42.7	106.7
1990	93.6	62.4	156.0
1995	120.1	80.1	200.2

Notes 1/ 60% of the total demand
2/ 40% of the same

While the membership of the Plant Equipment Manufacturer's Association (AIPPI) consists of 46 companies of all sizes, the 3 state-own companies mentioned earlier (BABIBO) are said to have a total market share of around 60%. The F/S in February, 1985 provides a modification and additional facility program to continuously secure a 60% share in the future.

The remaining 40% of the total demand may be shared by medium- and small-size companies. it is also conceivable that BABIBO subcontracts some of the production work to medium- and small-size company. While assuming that BABIBO will gradually become specialised in the final assembly of plant equipment rather than carrying out in-house manufacturing of all components, the ratio of work subcontracted to medium- and small-size companies in the total production demand for plant equipment is assumed in this Study as follows.

1985: 40%
1990: 50%
1995: 60%

The estimated demands for the linkage-type metalworking industry based on the arguments so far are as follows.

1985: 106.7 x 0.4 = 42,700 tons
1990: 156.0 x 0.5 = 78,000 tons
1995: 200.2 x 0.6 = 120,100 tons

4.3 Measurement of Potential Capital Requirement for Investment

4.3.1 Measurement from the Work Volume for the Linakge-Type Metalworking Industry

(1) Prerequisite and unit construction cost

In the preceding paragraph the work volume was estimated in such sence that it will be made in the form of the subcontract from the large-scale machine assembly industry to the linkage-type metalworking industry. This increased demand should be locally fulfilled by increase in production capacity by new investment. If the investment is not performed, both the production of import substitutes in REPELITA IV and the scheduled GDP may be made difficult for their attainment. The following calculation expression is used to obtain the investment amount necessary for producing the increased demand.

Required investment amount = Increase in work volume (tons) x Unit investment cost ($/ton)

To use the unit investment amount, it has been considered that the purchase of several unit machines, partial expansion of the existing factory as well as construction of a new set of plant will come for increase of production so that it is more practical to apply the same unit investment for all the cases.

The linkage-type metalworking industry was classified as follows, the respective model plants were preliminarily designed, and the construction cost was estimated.

a) Casting
b) Forging/heat treatment
c) Machining
d) Sheetwork/welding
e) Presswork for small items
f) Presswork for large and medium items
g) Steel fabrication

The presswork for small items in e) is for electrical products, automotives and motorcycles, and the press work for large and medium items are for engine covers, bonnets, etc. of machine tools, agricultural machinery and construction machinery. A steel fabrication plant in g) is applied to the linkage-type industry to shipbuilding and plants machi-

nery and equipment industry which fabricates steel structures, boiler, tanks and the similar components.

The unit construction cost of each plant is shown in Table A-4.23 having basic assumption and data in Section 9. Unit investment costs for each metalworking factory are summarized as below. It is noticed that the tonnage stands for tons of metalworking products.

a) Casting plant	:	$1,500/ton
b) Forging/heat treatment plant	:	$1,800/ton
c) Machining	:	$12,700/ton
d) Sheet metal/welding plant	:	$1,140/ton
e) Presswork plant for small items	:	$1,220/ton
f) Presswork plant for large items	:	$6,680/ton
g) Steel fabrication (ship & plant)	:	$3,210/ton

(2) Demand quantity of work quantity

In Table A-4.14, the forecast of work volume by work process in 1985, 1990 and 1995 is shown. Some revision should be made to cope this value with the plant classification in the above a) through g).

1) The total work volume for press work is divided into that for small items and that for large items.

2) The machining plant is designed mainly for the precise machining and finishing. A machining section for preliminary machining is provided in each plant. However, the machining quantity in Table A-4.14 contains the portion of the preliminary machining, so this portion should be deducted at an assumed rate of 30% of the total machining quantity.

POTENTIAL DEMAND INCREASE IN METALWORKING VOLUME TO SUBCONTRACTORS

(1,000 ton)

	(1985-1990)	(1990-1995)
a) Casting	26.0	49.5
b) Forging/heat treatment	28.4	31.1
c) Machining	20.7	38.0
d) Sheetmetal/welding	19.4	31.8
e) Press (small items)	24.4	39.7
f) Press (large items)	3.5	6.9
g) Steel fabrication (ship)	3.0	3.0
h) Steel fabrication (plant)	35.3	42.1

(3) Potential capital demand for investment

Table A-4.24 shows work volume for metalworking industry for 1985, 1990 and 1995 as well as increase during every five years, which can be summarized as follows:

The potential required capital investment for 5 years from 1985 till 1990 is estimated as approximately 18.6 million in U.S. dollars terms, and that for next 5 years from 1990 till 1995 is of 888 million U.S. dollars which is obtained by multiplying the unit investment cost with the potential demand increase as estimated in the sub-paragraphs (1) and (2) above respectively. The subsector of machining occupies 47.7% and the linkage industry to plant equipment share 20.5% of total capital demand in the first five years. The machining industry shall grow at higher rate than average growth rate of metalworking industry because all the metalworking products is to be finished by machining work, and also precise machining will be required due to progress of localization to higher technological processing. Concerning the plant equipment, the big quantity and various kinds of machinery and equipment required for a plant will create big market for the metalworking industry. It may be noted that the Indonesian Government should support utilization of domestically manfuactured components to the large-sized project to create the market in this field. When distributing the total capital requirement equally to each year till 1990, the following are obtained:

(US$ 1,000)

	1986	1987	1988	1989	1990	Total
1985 constant price	103.7	103.7	103.7	103.7	103.7	518.6
With 8% inflation	112.0	121.0	130.6	141.1	152.3	657.0

4.3.2 Measurement by Data Obtained from the Questionnaire to Enterprieses

(1) Method of estimate

In the survey by the questionnaire, 159 companies out of 219 companies answered that they have plans to expand their capacity in the near future, 121 companies of which have offered an amount of investment required for such expansion. On the basis of the answer, capital investment required for the linkage-type industry will be measured in this section. Before that, total population of the companies engaged in the said industry in Indonesia shall be estimated. The answered capital demand per company is multiplied by the total population.

(2) Estimate of total population (total number of companies)

The estimate of total number of companies (population) in the subsector was made using data in The Study Report The Medium- and Small-Scale Metalwork Industry by the Technonet Asia-JICA and the Industrialy Census (1979) made by the Central Bureau of Statistics (BPS). As shown in Figure A-4.3, in the industrial census (1979) the total number of large, medium- and small-scale industries of the metal and machine manufacture (5 subsectors: metal products, general machine, electrical machine, transportation machine and precision machine) is of 7,583 companies, and among them the companies corresponding to 3 subsectors (general machinery, electrical machinery and transportation machinery) in objective of this Study are of 1,786 companies. On the one hand, in the Technonet Asia-JICA survey performed in 1980, the total number of companies (5 to 200 employees) in the metal and machine industry (5 subsectors) was estimated as 4,000 companies, furthermore, the share of companies in 3 subsectors was 43% or 1,720 companies. It is considered that there is no large difference between both figures 1,786 from the census and 1,720 from Technonet. However, the Technonet's survey was performed 5 years back compared with this study.

Since the statistical data to directly estimate the present number of establishments of medium- and small-scale industry in the machinery and

metal industry is not available, it is assumed that the number of establishment would have increased at the same growth rate of the manufacturing industry sector or 8.8% per annum during 1980 to 1985. This method could be justified by the fact that the annual growth rate of number of establishment during 1974 to 1979 was 17% (3,454 to 7,583) against the growth rate of 15% for the manufacturing industry sector during 1975 to 1980. It is observed that there is some correlation between the two growth rates. Taking 1,720 companies in 1980 and 8.8% of annual growth rate as basic figures, the number of establishments is estimated as 2,600 companies having 5 to 200 employees in the 3 subsectors.

(3) Estimate of a potential capital demand for investment

In the questionnaire survey the questionnaire was made to 219 medium- and small-scale enterprises, and as the result, 159 companies answered that they have an intention to expand their production capacity in the near future. Furthermore, among them 121 companies have offered required investment as much as 84.0 billion Rupiahs in total around the middle of 1987. Dividing the total capital demand of 84.5 billion Rupiahs by the total number of company questionnaired of 219 to get average capital demand per company, and multipling that by the total population of 2,600, the total potential capital demand for the objective industry category of this Study was obtained:

$$(\text{Rp.}84.0\ \text{bill.}/219) \times 2{,}600 = \text{Rp.}997.3\ \text{bill.}$$
$$= \text{US\$}898\ \text{mill.}$$
$$(\text{US\$}1 = \text{Rp.}1{,}110)$$

The average year for investment by the answer is in the middle of 1987 including answers before and behind it, and even if it is scheduled to be made within 3 years, it is usually late in implementation. Thus, this figure might be considered as required amount for 5 years and made as follows when equally distributed to each year.

(US$ 1,000)

	1985	1987	1988	1989	1990	Total
1985 constant price	179.6	179.6	179.6	179.6	179.6	898.0
With 8% inflation	194.0	209.5	226.3	244.4	264.0	1,138.2

4.3.3 Estimate of Potential Capital Demand by the Macro Economic Indicator

(1) Method of measurement

It is known that there are a correlation between the value-added and the fixed assets formation (investment) in the industry. The amount in a certain ratio of the value-added created by a certain industrial sector is turned to the re-investment. In this subparagraph, the principle is utlized, first, value-added of the linkage-type metalworking industry sector is to be estimated. Then ratio of fixed assets formation (investment) to the value-added in the subsector is examined.

(2) Value-added in the metalworking and machinery and equipment industry sectors

After 1985 the value-added amount in the manufacturing industry is not indicated in REPELITA IV but only the ratio in the manufacturing industry against the GDP in 1988/89 of 19.4% and actual value of 1983/84 as 15.7% (see item of 2/1 in the following table) is available. According to the REPELITA IV, the GDP will grow at 5% per annum comprising 9.5% of the manufacturing industry sector. Thus, the manufacturing industry sector will grow at 1.095/1.05 times of GDP annually. The value-added in the manufacturing industry sector is projected using the ratio against GDP.

On the one hand, seeing the value-added ratio between the manufacturing industry sector and the sector of the metalworking, machinery and equipment industries, 9.2% in 1983/84 is known (see item 3/2 in the following table). Since the former growth rate of the latter sector is projected as 17% in REPELITA IV, the latter will grow at 1.17/1.095 times of the former annually. The item (3)/(2) in the table show the projected ratio of these two sectors.

VALUE-ADDED FOR FABRICATED METAL PRODUCTS AND MACHINERY AND EUIPMENT

	(1)GDP	(2)Manfuac-turing	(3)Metal Products & M/E	(2)/ (1)	(3)/ (2)	Indicator for 3
	(Rp. bill.)	(Rp. bill.)	(Rp. bill.)	(%)	(%)	(1985=1.0)
1983/84 1/	79,815	12,531	1,153	15.7	9.2	-
1985 1/	96,578	16,515	1,842	17.1	11.2	1.00
1990 2/	123,261	26,008	4,057	21.1	15.6	2.20
1995 2/	157,315	40,902	8,875	26.0	21.7	4.82

Notes: 1/ Current price
2/ 1985 constant price

(3) Value-added in the metalworking industry sector

The number of companies of metalworking industry is estimated as 2,600 companies in the preceding paragraph, and among them it is stated that large- and medium-scale companies is 22.5% and small-scale companies is 77.5% in the Technonet Asia JICA Study. Applying the same percentages to 2,600 companies, number of large-and medium-scale company is calculated as 585 and small-scale companies as 2,015. On the one hand, the value-added per establishment of large- and medium-scale companies is of 992 million rupiahs in 1983 as shown in Table A-1.30. Only old data is available as data on small companies, and the following are obtained from Table A-1.34 and A-1.35.

	1974/75	1979
Numberof establishments	2,957	6,814
Total value-added (Rp. mill.)	3,900	14,200
Value added per establishment (Rp. mill.)	1.3	2.08

It has become 1.56 times during approximately 5 years. If it grows till 1983 at the same rate, the value-added per establishment of the small-scale industry is estimated as approximately 3 million Rupiahs at the current price in 1983.

Therefore, the total value-added amount against 2,600 companies in 1983 price is obtained as follows:

(in 1983 price)

585 companies (large and medium) x Rp.992 mill.	= Rp.580.3 bill.
2,015 companies (small) x Rp.3 mill.	= Rp.6.0 bill.
2,600 companies	Rp.586.3 bill.

Note According to the questionnaire survey, the value-added per establishment of the linakge-type metalworking industry (most of them is medium-scale) is Rp.414.8 mill.

Assuming an inflation rate of 8% annually for 2 years from 1983 till 1985, the above-mentioned total value added amount is made as Rp.684 billion.

To project value added in 1990 and 1995 on the basis of Rp.684 billion in 1985, the same growth rate of the metal products machinery and equipment industry is used, namely the "indicator for 3" in the previous table.

The total value-added resuts as below.

	Rp. bill.	US$ mill.
1985	684	616
1990	1,505	1,356
1995	3,297	2,970

(1US$ = 1,110 RP.)

(4) Fixed assets formation and capital demand

It was already described in (1) that there is an interrelation between the value-added amount and the capital formation amount (investment). In Table ANX II-23 in ANNEX II, the past ratio of fixed assets formation value-added in the metal products, machinery and equipment industries is shown as follows:

1980	15.2%
1981	13.5%
1982	28.1%
1983	15.8%

This ratio varies by the increased amount of the respective values, and does not always become the constant ratio, however, here it is presumed as 15% of constant ratio for simplification. The investment amount is obtained by multiplying this ratio to the value-added amount.

Thus, the capital investment required for the metalworking industry is estimated as follows:

(US$ mill.)

	Investment Amount	Annually Increase
1985	616 x 0.15 = 92.4	-
1990	1,356 x 0.15 = 203.4	22.2
1995	2,970 x 0.15 = 445.5	48.4

The required total investment amount for 5 years from 1986 till 1990 can be roughly calculated as follows:

1986 - 90: ((92.4 + 22.2) + 203.4)/2 x 5 years = US$795.0 mill.

From 1991 till 1995:

1991 - 95: ((203.4 + 48.4) + 445.5)/2 x 5 years = US$1,743.3 mill.

When distributing the capital demand required for the metalworking industry from 1986 till 1990 to the corresponding values, the following are obtained.

(US$ mill.)

	1986	1987	1988	1989	1990	Total
1985 constant price	159.0	159.0	159.0	159.0	159.0	795.0
With 8% inflation	171.7	185.5	200.3	216.3	233.6	1,007.4

4.3.4 Comparison of Results Measured by Three Different Methods

The potential capital demand for the metalworking industry estimated by 3 different methods over 1986 to 1990 are summarized as below.

POTENTIAL CAPITAL DEMAND (1986-1990)

(US$ mill.)

Method of Estimate	per year (in 1985 price)	5 years (in 1985 price)	5 years 1/ (in current price)
1) Work volume	103.7	518.6	657.0
2) Questionnaire	179.6	898.0	1,138.2
3) Economic indicator	159.0	795.0	1,007.4

Note: 1/ With 8% inflation.

It should be noted that the total population of 2,600 metalworking companies which was used as a key factor for the methods of 2) and 3) in the above table covers somewhat wider area than that for 3) because the 2,600 companies are neither confined to so-called linkage-type industry nor to medium- and small-scale industry due to the number of employees from 5 to 200.

Ratio to total investment to the private sector projected in REPELITA IV are computed as follows on the basis of the current price and the exchange rate of Rp.1,110/US$.

(%)

	1986	1987	1988
1) Work volume	1.0	0.9	0.8
2) Questionnaire	1.7	1.5	1.4
3) Economic indicator	1.5	1.3	1.2

As a conclusion, the potential capital demand for the linkage-type metalworking industry is estimated with a range from US$700 million to US$1,145 million in 1985 constant price term, which will be equivalent to around 1% to 2% of the total investment for the private sector in whole Indonesia.

It should be, however, noticed that the estimated demands indicate merely "potential capital demand", so that what extent of the potentials will be actualized is to be another discussion.

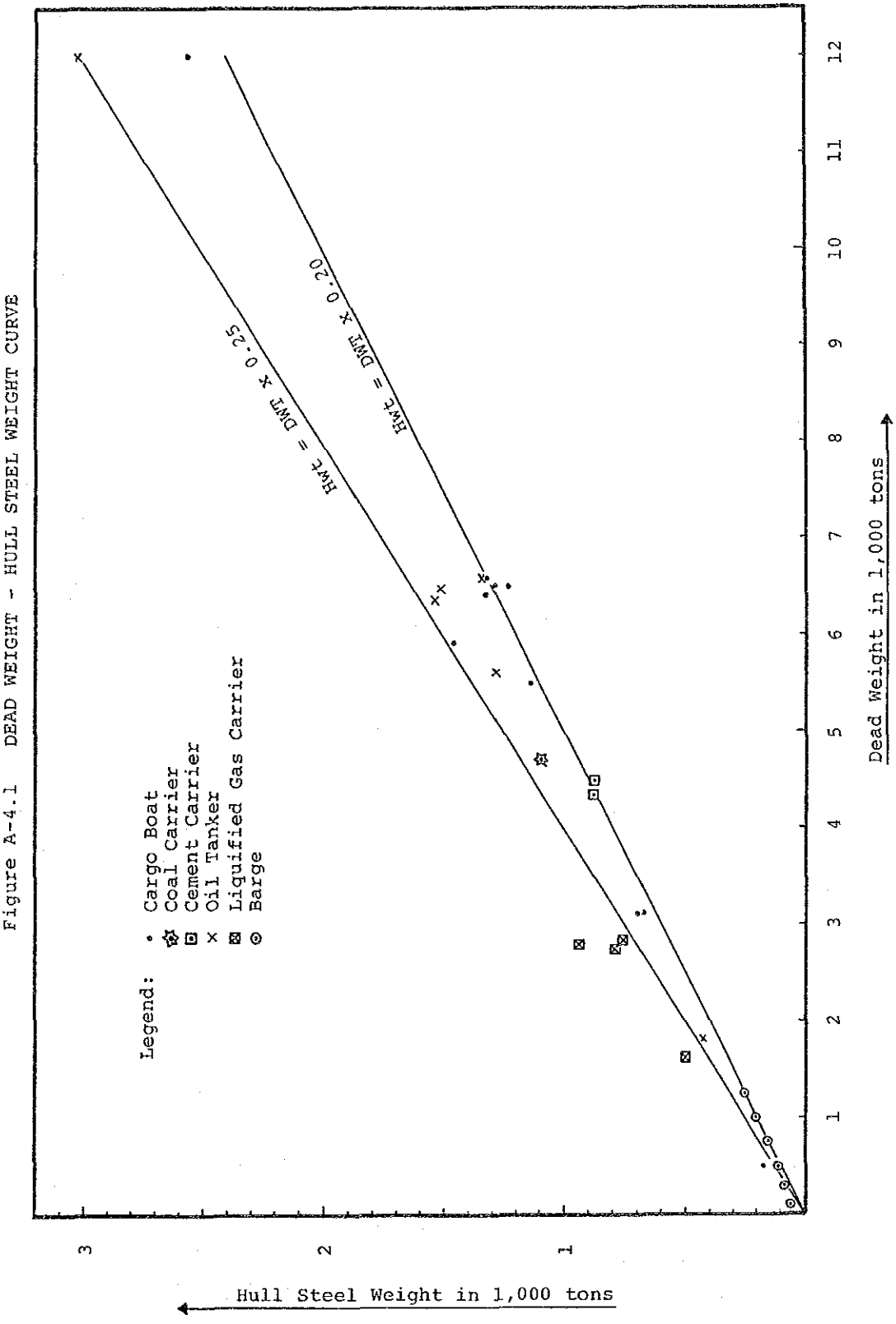
Figure A-4.1 DEAD WEIGHT - HULL STEEL WEIGHT CURVE
Legend:
• Cargo Boat
☆ Coal Carrier
⊡ Cement Carrier
× Oil Tanker
⊠ Liquified Gas Carrier
⊙ Barge
Hwt = DWT x 0.25
Hwt = DWT x 0.20
Hull Steel Weight in 1,000 tons
Dead Weight in 1,000 tons
1
2
3
1
2
3
4
5
6
7
8
9
10
11
12

Figure A-4.2 WEIGHT(%) CURVE OF TOTAL OUT FITTING MATERIAL PROCURED, OUT FITTING MATERIAL PURCHASED AND SUB-CONTRACTED IN JAPANESE SHIPYARDS TO THE SHIP'S WEIGHT BASED ON DEAD WEIGHT

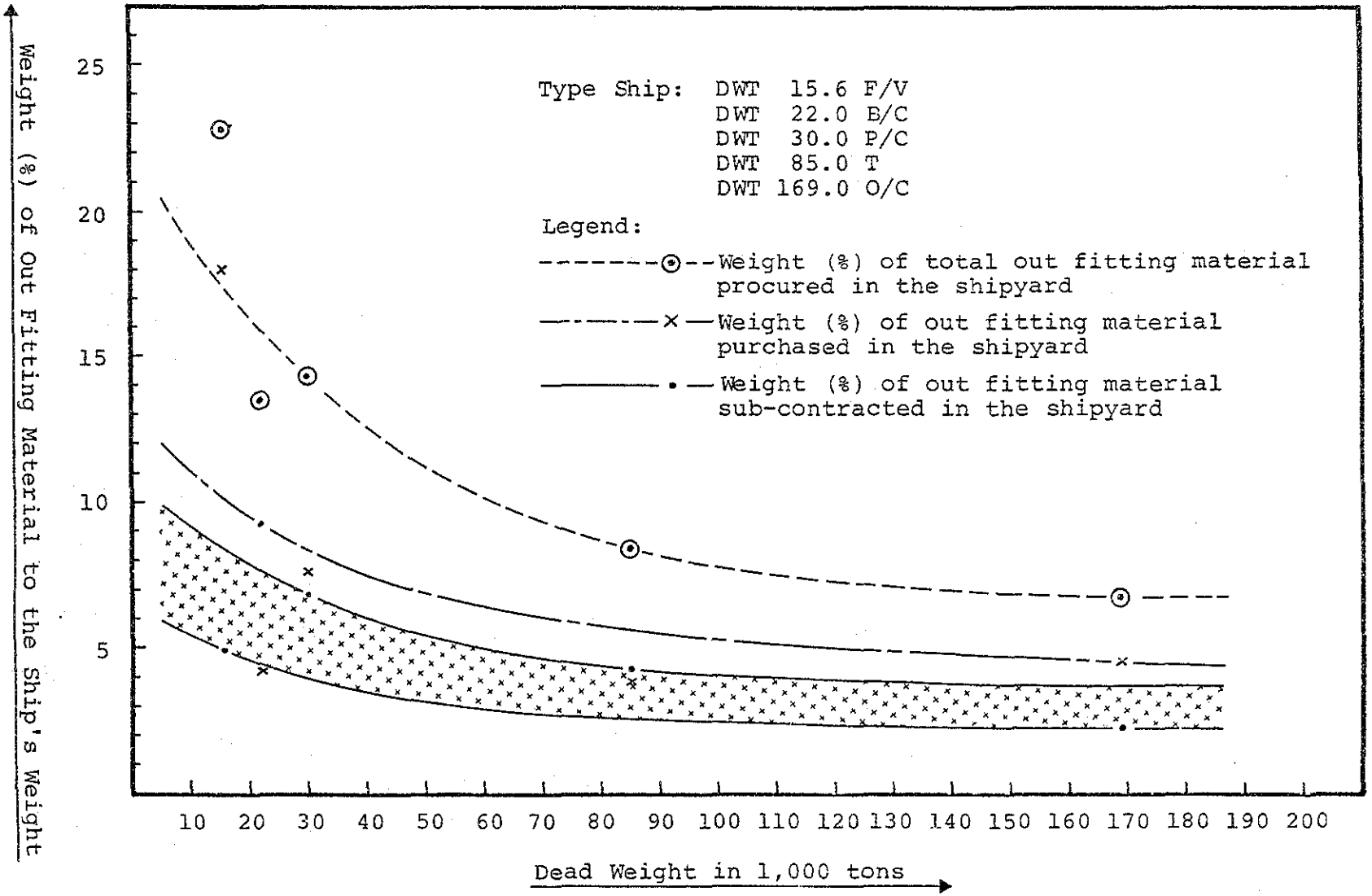

Figure A-4.3 NUMBER OF MACHINE AND METAL WORKING ESTABLISHMENTS[1)] BY SIZE OF EMPLOYMENT, ACCORDING TO INDUSTRIAL SURVEYS

Size of Employment	Category (BPS)	Industrial Census (BPS) 1974	Industrial Census (BPS) 1979	Industrial Census (BPS) 1982	TECHNONET[4)] -JICA 1980	This Survey (1985)[6)] MSI	This Survey (1985)[6)] Sub-con of LSI
	Cottage Industry	15,432[1)] (1,832)[2)]				3%	1%
5					30%		
10	Small Industry	2,956 (651)	6,814 (1,385)			32%	26%
20					40%		
30						27%	24%
50	Medium Industry	362 (169)			11%		
100			769 (401)	839 (453)	11%	18%	13%
200					8%	11%	9%
	Large Industry	136 (77)				9%	26%
Total number[1)] (Excluding cottage I.)		3,454	7,583	(839)[3)]	4,000	-	-
Total number of the three sub-sectors[2)]		897	1,786	(453)	1,720[5)]	2,600[5)]	
Sample size		-	-	-	384	219	91

Note: 1) Metal products (ISIC code 381), General machinery (382), Electrical machinery (383), Transportation machinery (384), Scientific, measuring & optical equipment (385).
2) General machinery (382), Electrical machinery (383), Transportation machinery (384).
3) Large and medium industry
4) Small & Medium Metal Working Industries - Technonet Asia & JICA, 1981.
5) Estimated figure.
6) ANNEX IV-3 SMES-30100, LMES-60300.

Table A-4.1 VOLUME OF METALWORK PROCESSING PER UNIT OF E & M AND ITS LOCALIZATION RATE
(MACHINE TOOL)

(Localization: %)

Equipment & Machinery	Casting				Forging/Heat Treatment				Machining				Sheet Work/Welding				Press Work			
	(Kg/unit)	(1985)	(1990)	(1995)	(Kg/unit)	(1985)	(1990)	(1995)	(Kg/unit)	(1985)	(1990)	(1995)	(Kg/unit)	(1985)	(1990)	(1995)	(Kg/unit)	(1985)	(1990)	(1995)
1. Lathe	1,800	8	50	100	150	0	13	20	2,250	22	56	100	300	67	100	100	70	100	100	100
2. Drilling m/c	40	50	100	100	20	0	50	100	110	64	100	100	50	100	100	100	10	100	100	100
3. Sawing m/c	350	71	100	100	20	0	50	100	600	83	100	100	250	100	100	100	50	100	100	100
4. Milling m/c	300	50	100	100	150	0	7	33	720	65	86	100	270	100	100	100	30	100	100	100
5. Grinding m/c	650	46	62	100	50	0	20	60	950	58	79	100	250	100	100	100	50	100	100	100
6. Rolling m/c	450	33	67	100	800	0	13	63	1,750	49	80	100	500	80	100	100	50	100	100	100
7. Shearing m/c	600	50	67	100	200	0	25	50	1,450	59	86	100	500	80	100	100	50	100	100	100

Notes: (Kg/unit) = Volume of process involved in a unit of the manufactured and assembled equipment & machinery.
(1985)(1990)(1995) = Localization rate (%) of each process on (Kg/unit) for each year.
Standard specification;
(Lathe) Center distance = 1,500 mm, Center height = 200 mm, Weight = 2,500 Kg/unit (Drilling m/c) Bit dia = 13 mm, weight = 1,200 Kg/unit
(Sawing m/c) Dia = 180 mm, Weight = 650 Kg/unit (Milling m/c) Table size = 240 mm x 600 mm, Bit dia = 32 mm, weight 750 Kg/unit
(Grinding m/c) Table size = 220 mm x 500 mm, Weight = 1,000 Kg/unit (Rolling m/c) Plate size = 2,500 mm x 3 mm, Weight = 1,800 Kg/unit

Source: JICA Team Estimate

Table A-4.2 VOLUME OF METALWORK PROCESSING PER UNIT OF E & M AND ITS LOCALIZATION RATE
(AGRICULTURE MACHINE)

(Localization: %)

Equipment & Machinery	Casting				Forging/Heat Treatment				Machining				Sheet Work/Welding				Press Work			
	(Kg/unit)	(1985)	(1990)	(1995)	(Kg/unit)	(1985)	(1990)	(1995)	(Kg/unit)	(1985)	(1990)	(1995)	(Kg/unit)	(1985)	(1990)	(1995)	(Kg/unit)	(1985)	(1990)	(1995)
1. Tractor (60HP)	500	0	30	80	370	0	40	60	1,050	10	40	70	1,050	10	40	70	380	5	30	80
2. Mini tractor	280	20	80	100	190	0	60	90	540	40	70	90	100	90	100	100	200	60	80	100
3. Hand tractor	90	70	100	100	35	20	60	90	140	80	100	100	30	100	100	100	40	60	100	100
4. Thresher	15	100	100	100	-	-	-	-	90	100	100	100	50	100	100	100	20	100	100	100
5. Huller	95	70	100	100	-	-	-	-	120	80	100	100	20	100	100	100	15	60	80	100
6. Polisher	60	20	50	100	30	10	30	80	350	60	80	90	450	90	100	100	180	70	90	90
7. Rice miller	60	20	50	100	30	10	30	80	350	60	80	90	450	90	100	100	180	70	90	90
8. Irrigation pump	65	80	100	100	5	40	80	100	85	80	100	100	85	80	100	100	-	-	-	-

Notes: (Kg/unit) = Volume of process involved in a unit of the manufactured and assembled equipment & machinery.
(1985)(1990)(1995) = Localization rate (%) of each process on (Kg/unit) for each year.

Source: JICA Team Estimate

Table A-4.3 VOLUME OF METALWORK PROCESSING PER UNIT OF E & M AND ITS LOCALIZATION RATE
(CONSTRUCTION EQUIPMENT)

(Localization: %)

Equipment & Machinery	Casting				Forging/Heat Treatment				Machining				Sheet Work/Welding				Press Work			
	(Kg/unit)	(1985)	(1990)	(1995)	(Kg/unit)	(1985)	(1990)	(1995)	(Kg/unit)	(1985)	(1990)	(1995)	(Kg/unit)	(1985)	(1990)	(1995)	(Kg/unit)	(1985)	(1990)	(1995)
1. Crawler bulldozer	3,840	2	45	95	2,160	2	45	95	7,200	10	45	95	17,520	10	80	100	1,200	10	80	100
2. Hydraulic excavator	2,400	2	45	95	1,350	2	45	95	4,500	10	45	95	10,950	10	80	100	750	10	80	100
3. Motor grader	920	2	45	95	570	2	45	95	1,720	10	45	95	9,770	10	80	100	570	10	80	100
4. Wheel loader	1,400	2	45	95	870	2	45	95	2,620	10	45	95	14,870	10	80	100	870	10	80	100

Notes: (Kg/unit) = Volume of process involved in a unit of the manufactured and assembled equipment & machinery.
(1985)(1990)(1995) = Localization rate (%) of each process on (Kg/unit) for each year.
Standard specification;
(Crawler bulldozer) 200PS, 24 ton/unit (Hydraulic excavator) 100PS, 15 ton/unit
(Motor grader) 125PS, 11.5 ton/unit (Wheel loader) 200PS, 17.5 ton/unit

Source: JICA Team Estimate

Table A-4.4 VOLUME OF METALWORK PROCESSING PER UNIT OF E & M AND ITS LOCALIZATION RATE
(ELECTRICAL APPARATUS AND MACHINE)

(Localization: %)

Equipment & Machinery	Casting				Forging/Heat Treatment				Machining				Sheet Work/Welding				Press Work			
	(Kg/unit)	(1985)	(1990)	(1995)	(Kg/unit)	(1985)	(1990)	(1995)	(Kg/unit)	(1985)	(1990)	(1995)	(Kg/unit)	(1985)	(1990)	(1995)	(Kg/unit)	(1985)	(1990)	(1995)
1. Room fan (200W)	-	-	-	-	0.12	50	100	100	-	-	-	-	-	-	-	-	1.6	0	80	100
2. Rice cooker (6 l)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.26	0	70	100
3. Fluoresent lamp (40Wx2)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.75	100	100	100
4. Electric iron (450W)	1.4	100	100	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5. Refrigerator (200 l)	-	-	-	-	-	-	-	-	-	-	-	-	11.7	100	100	100	0.4	100	100	100
6. Motor (3.7KW)	14	100	100	100	6	50	100	100	-	-	-	-	-	-	-	-	5	0	100	100
7. Generator (2KV)	-	-	-	-	0.96	50	100	100	-	-	-	-	7.76	50	100	100	14.5	0	100	100
8. KWH meter (220Vx15A)	-	-	-	-	-	-	-	-	0.1	0	100	100	-	-	-	-	0.8	100	100	100
9. Panel (60Wx200Dx800H)	-	-	-	-	-	-	-	-	-	-	-	-	27.5	100	100	100	-	-	-	-
10. Transformer (6KV,30KVA)	-	-	-	-	-	-	-	-	-	-	-	-	41.1	100	100	100	46.5	80	100	100

Notes: (Kg/unit) = Volume of process involved in a unit of the manufactured and assembled equipment & machinery.
(1985)(1990)(1995) = Localization rate (%) of each process on (Kg/unit) for each year.

Source: JICA Team Estimate

Table A-4.5 VOLUME OF METALWORK PROCESSING PER UNIT OF E & M AND ITS LOCALIZATION RATE
(AUTOMOTIVE, MOTORCYCLE, DIESEL ENGINE)

(Localization: %)

Equipment & Machinery		Casting				Forging/Heat Treatment				Machining				Sheet Work/Welding				Press Work			
		(Kg/unit)	(1985)	(1990)	(1995)	(Kg/unit)	(1985)	(1990)	(1995)	(Kg/unit)	(1985)	(1990)	(1995)	(Kg/unit)	(1985)	(1990)	(1995)	(Kg/unit)	(1985)	(1990)	(1995)
Automotive	FC	120	0	80	95	108	0	80	95	276	0	80	90	-	-	-	-	624	90	90	90
	AC	48	0	60	70																
Motorcycle	FC	4	0	90	100	18	0	80	100	38	30	80	90	-	-	-	-	56	95	100	100
	AC	16	20	95	95																
Diesel engine		70	0	70	100	30	0	25	50	135	20	60	90	5	100	100	100	10	80	100	100

Notes: (Kg/unit) = Volume of process involved in a unit of the manufactured and assembled equipment & machinery.
(1985)(1990)(1995) = Localization (%) of each process on (Kg/unit) for each year.
Standard specification;
(Automotive) weight 1.2 ton/unit, Sheet metal = 52%, Forging = 9%, Casting (FC) = 10%, Casting (Al) = 4%
(Motorcycle) weight 100 Kg/unit, Sheet metal = 56%, Forging = 18%, Casting (FC) = 4%, Casting (Al) = 16%, Plating = 15%
(Diesel engine) 34PS, for general use excluding automotive use

FC: Iron Casting
AC: Al Casting

Source: JICA Team Estimate

Table A-4.6 INCREASE IN METALWORKING VOLUME BY PROGRESS OF LOCALIZATION

(MACHINE TOOL)

(tons)

Equipment & Machinery	Unit 1/	Casting			Forging/Heat Treat			Machining			Sheet Work/Welding			Presswork		
		(1985)	(1990)	(1995)	(1985)	(1990)	(1995)	(1985)	(1990)	(1995)	(1985)	(1990)	(1995)	(1985)	(1990)	(1995)
1. Lathe	300	34	270	540	0	6	9	149	378	675	60	90	90	21	21	21
2. Drilling m/c	225	5	9	9	0	2	5	16	25	25	11	11	11	2	2	2
3. Sawing m/c	50	12	18	18	0	1	1	25	30	30	13	13	13	3	3	3
4. Milling m/c	50	8	15	15	0	1	2	23	31	36	14	14	14	2	2	2
5. Grinding m/c	25	7	10	16	0	0	1	14	19	24	6	6	6	1	1	1
6. Rolling m/c	25	4	8	11	0	3	13	21	35	44	10	13	13	1	1	1
7. Shearing m/c	50	15	20	30	0	3	5	43	62	73	20	25	25	3	3	3
Total	725	85	350	639	0	16	36	291	580	907	134	172	172	33	33	33

Note: 1/ Number of units domestically manufactured in 1985.

Source: JICA Team Estimate

Table A-4.7 INCREASE IN METALWORKING VOLUME BY PROGRESS OF LOCALIZATION

(AGRICULTURE MACHINE)

(tons)

Equipment & Machinery	Unit 1/	Casting			Forging/Heat Treat			Machining			Sheet Work/Welding			Presswork		
		(1985)	(1990)	(1995)	(1985)	(1990)	(1995)	(1985)	(1990)	(1995)	(1985)	(1990)	(1995)	(1985)	(1990)	(1995)
1. Tractor	10	0	2	4	0	1	2	1	4	7	1	4	7	0	1	3
2. Mini tractor	125	7	28	35	0	14	21	27	47	61	11	13	13	15	20	25
3. Hand tractor	1,500	95	135	135	11	32	47	168	210	210	45	45	45	36	60	60
4. Thresher	1,500	23	23	23	-	-	-	135	135	135	75	75	75	30	30	30
5. Huller	2,000	133	190	190	-	-	-	192	240	240	40	40	40	18	24	30
6. Polisher	1,000	12	30	60	3	9	24	210	280	315	405	450	450	126	162	162
7. Rice miller	1,000	12	30	60	3	9	24	210	280	315	405	450	450	126	162	162
8. Irrigation pump	5,000	260	325	325	10	20	25	340	425	425	340	425	425	-	-	-
Total		542	763	832	27	85	143	1,283	1,621	1,708	1,322	1,502	1,505	351	459	472

Note: 1/ Number of units domestically manufactured in 1985.

Source: JICA Team Estimate

Table A-4.8 INCREASE IN METALWORKING VOLUME BY PROGRESS OF LOCALIZATION

(CONSTRUCTION EQUIPMENT)

(tons)

Equipment & Machinery	Unit 1/	Casting			Forging/Heat Treat			Machining			Sheet Work/Welding			Presswork		
		(1985)	(1990)	(1995)	(1985)	(1990)	(1995)	(1985)	(1990)	(1995)	(1985)	(1990)	(1995)	(1985)	(1990)	(1995)
1. Crawler bulldozer	530	41	916	1,933	23	515	1,088	382	1,717	3,625	929	7,428	9,286	64	509	636
2. Hydraulic Excavator	160	8	173	365	4	97	205	72	324	684	175	1,402	1,752	12	96	120
3. Motor grader	147	3	61	128	2	38	80	25	114	240	144	1,149	1,436	8	67	84
4. Wheel loader	120	3	76	160	2	47	99	31	141	299	178	1,428	1,784	10	84	104
Total	957	55	1,226	2,586	31	697	1,472	510	2,296	4,848	1,426	11,407	14,258	94	756	944

Note: 1/ Number of units domestically manufactured in 1985.

Source: JICA Team Estimate

Table A-4.9 INCREASE IN METALWORKING VOLUME BY PROGRESS OF LOCALIZATION

(ELECTRICAL APPLIANCE AND MACHINE)

(tons)

Equipment & Machinery	Unit 1/	Casting			Forging/Heat Treat			Machining			Sheet Work/Welding			Presswork		
		(1985)	(1990)	(1995)	(1985)	(1990)	(1995)	(1985)	(1990)	(1995)	(1985)	(1990)	(1995)	(1985)	(1990)	(1995)
1. Room fan	1,056	-	-	-	63	127	127	-	-	-	-	-	-	0	1,352	1,670
2. Rice cooker	58	-	-	-	-	-	-	-	-	-	-	-	-	0	173	247
3. Lamp hanger	2,840	-	-	-	-	-	-	-	-	-	-	-	-	2,130	2,130	2,130
4. Electric iron	40	56	56	56	-	-	-	-	-	-	-	-	-	-	-	-
5. Refrigerator	186	-	-	-	-	-	-	-	-	-	2,176	2,176	2,176	74	74	74
6. Motor	36	504	504	504	108	216	216	-	-	-	-	-	-	0	180	180
7. Generator	37	-	-	-	18	36	36	-	-	-	144	287	287	0	537	537
8. KWH meter	1,120	-	-	-	-	-	-	0	112	112	-	-	-	896	896	896
9. Panel	19	-	-	-	-	-	-	-	-	-	523	523	523	-	-	-
10. Transformer	10	-	-	-	-	-	-	-	-	-	411	411	411	372	465	465
Total	5,402	560	560	560	189	379	379	0	112	112	3,254	3,397	3,397	3,472	5,807	6,199

Note: 1/ Number of units 1,000 domestically manufactured in 1985.

Source: JICA Team Estimate

Table A-4.10 INCREASE IN METALWORKING VOLUME BY PROGRESS OF LOCALIZATION

(AUTOMOTIVE, MOTORCYCLE, DIESEL ENGINE)

(tons)

Equipment & Machinery	Unit 1/	Casting			Forging/Heat Treat			Machining			Sheet Work/Welding			Presswork		
		(1985)	(1990)	(1995)	(1985)	(1990)	(1995)	(1985)	(1990)	(1995)	(1985)	(1990)	(1995)	(1985)	(1990)	(1995)
1. Automotive	130	0	16,224	19,188	0	11,232	13,338	0	28,704	32,292	-	-	-	73,008	73,008	73,008
2. Motorcycle	248	794	4,663	4,762	0	3,571	4,464	2,827	7,539	8,482	-	-	-	13,194	13,888	13,888
3. Diesel engine	96	0	4,704	6,720	0	720	1,440	2,592	7,776	11,664	480	480	480	768	960	960
Total	474	794	25,591	30,670	0	15,523	19,242	5,419	44,019	52,438	480	480	480	86,970	87,856	87,856

Note: 1/ Number of units 1,000 domestically manufactured in 1985.

Source: JICA Team Estimate

Table A-4.11 RATIO OF SUBCONTRACTING BUSINESS TO TOTAL VOLUME OF DOMESTIC METALWORK PROCESSING

(%)

	Casting			Forging/ Heat treatment			Machining			Sheet work/ Welding			Press work		
	(1985)	(1990)	(1995)	(1985)	(1990)	(1995)	(1985)	(1990)	(1995)	(1985)	(1990)	(1995)	(1985)	(1990)	(1995)
1. Machine tool	60	70	80	95	95	95	15	25	40	15	25	40	15	25	40
2. Agriculture machine	100	100	100	100	100	100	30	50	70	30	50	70	60	80	100
3. Construction equipment	95	95	95	95	95	95	30	50	70	30	50	70	50	75	100
4. Electrical machine	100	100	100	0	0	0	0	0	0	50	50	50	40	60	100
5. Electrical appliances	100	100	100	0	100	100	-	-	-	100	100	100	50	75	100
6. Automotive	0	31	41	0	100	100	0	30	30	-	-	-	28	28	28
7. Motorcycle	0	28	29	0	100	100	10	30	30	-	-	-	40	40	40
8. Diesel engine	0	20	40	0	20	40	10	30	50	80	95	95	100	100	100

Source: JICA Team Estimate

Table A-4.12 TOTAL VOLUME TO BE DOMESTICALLY PROCESSED WITH CONSTANT PRODUCTION VOLUME IN 1985

(tons)

	Casting			Forging/ Heat treatment			Machining			Sheet work/ Welding			Press work		
	(1985)	(1990)	(1995)	(1985)	(1990)	(1995)	(1985)	(1990)	(1995)	(1985)	(1990)	(1995)	(1985)	(1990)	(1995)
1. Machine tool	85	350	639	0	16	36	291	580	907	134	172	172	33	33	33
2. Agriculture machine	542	763	832	27	85	143	1,283	1,621	1,708	1,322	1,502	1,505	351	459	472
3. Construction equipment	55	1,226	2,586	31	697	1,472	510	2,296	4,848	1,426	11,407	14,258	94	756	944
4. Electrical machine	504	504	504	126	252	252	0	112	112	1,078	1,221	1,221	1,268	2,078	2,078
5. Electrical appliances	56	56	56	63	127	127	-	-	-	2,176	2,176	2,176	2,204	3,729	4,121
6. Automotive	0	16,224	19,188	0	11,232	13,338	0	28,704	32,292	-	-	-	73,008	73,008	73,008
7. Motorcycle	794	4,663	4,762	0	3,571	4,464	2,827	7,539	8,482	-	-	-	13,194	13,888	13,888
8. Diesel engine	0	4,704	6,720	0	720	1,440	2,592	7,776	11,664	480	480	480	766	960	960
Total	2,036	28,490	35,287	247	16,700	21,272	7,503	48,628	60,013	6,616	16,958	19,812	90,920	94,911	95,504

Source: JICA Team Estimate

Table A-4.13 DEMAND FOR SUB-CONTRACTORS WITH 1985 CONSTANT VOLUME

(tons)

	Casting			Forging/ Heat treatment			Machining			Sheet work/ Welding			Press work		
	(1985)	(1990)	(1995)	(1985)	(1990)	(1995)	(1985)	(1990)	(1995)	(1985)	(1990)	(1995)	(1985)	(1990)	(1995)
1. Machine tool	51	245	511	0	15	34	44	145	363	20	43	69	5	8	13
2. Agriculture machine	542	763	832	27	85	143	385	811	1,196	397	751	1,054	211	368	472
3. Construction equipment	52	1,165	2,457	29	662	1,398	153	1,148	3,394	428	5,704	9,981	47	567	944
4. Electrical machine	504	504	504	0	0	0	0	0	0	539	611	611	507	1,247	2,078
5. Electrical appliances	56	56	56	0	127	127	-	-	-	2,176	2,176	2,176	1,102	2,797	4,121
6. Automotive	0	5,029	7,867	0	11,232	13,338	0	8,611	9,688	-	-	-	20,442	20,442	20,442
7. Motorcycle	0	1,306	1,381	0	3,571	4,464	283	2,262	2,545	-	-	-	5,278	5,555	5,555
8. Diesel engine	0	941	2,688	0	144	576	259	2,333	5,832	384	456	456	768	960	960
Total	1,205	10,009	16,296	56	15,836	20,080	1,124	15,310	23,018	3,944	9,741	14,347	28,360	31,944	34,585

Source: JICA Team Estimate

Table A-4.14 DEMAND FOR SUB-CONTRACTORS WITH PROJECTED PRODUCTION VOLUME AND ADJUSTMENT BY COVERAGE RATIO

(ton)

	Casting			Forging/ Heat treatment			Machining			Sheet work/ Welding			Press work		
	(1985)	(1990)	(1995)	(1985)	(1990)	(1995)	(1985)	(1990)	(1995)	(1985)	(1990)	(1995)	(1985)	(1990)	(1995)
1. Machine tool	85	3,381	15,270	0	207	1,016	73	2,001	10,848	33	593	2,062	8	110	388
2. Agriculture machine	903	3,561	9,929	45	397	1,706	642	3,785	14,272	662	3,505	12,578	352	1,717	5,633
3. Construction equipment	104	2,982	8,010	58	1,695	4,557	306	2,939	11,064	856	14,602	32,538	94	1,452	3,077
4. Electrical machine	1,008	1,583	2,500	0	0	0	0	0	0	1,078	1,919	3,031	1,014	3,916	10,307
5. Electrical appliances	112	143	183	0	325	414	-	-	-	4,352	5,571	7,094	2,204	7,160	13,434
6. Automotive	0	7,091	17,858	0	15,837	30,277	0	12,142	21,992	-	-	-	20,442	28,823	46,403
7. Motorcycle	0	2,651	4,516	0	7,249	14,597	283	4,592	8,322	-	-	-	5,278	11,277	18,165
8. Diesel engine	0	1,477	6,666	0	226	1,428	259	3,663	14,463	384	716	1,131	768	1,507	2,381
Total	2,212	22,869	64,932	103	25,936	53,995	1,563	29,122	80,961	7,365	26,906	58,434	30,160	55,962	99,788

Source: JICA Team Estimate

Table A-4.15 ANTICIPATING PROGRESS OF MATERIAL PROCUREMENT OF NEW SHIPBUILDING IN INDONESIA'S SHIPYARDS FOCUSED IN 1985, 1990 & 1995

(1/4)

Item No.	Description	Material Procurement (- 1985)				Material Procurement (1986 - 1990)				Material Procurement (1991 - 1995)			
		Import	Self-Prod.	Local Purchase	Local Sub-Con	Import	Self-Prod.	Local Purchase	Local Sub-Con	Import	Self-Prod.	Local Purchase	Local Sub-Con
A	Raw material												
1.	Steel plate	X						X				X	
2.	Steel section (angle, flat bar, round bar, channel etc.)	X						X Welded pipe Gas pipe				X	
3.	Steel pipe	X				X		X				X	
4.	Copper & Msc. Alloy pipe	X				X				X		X	
5.	PVC pipe			X				X				X	
B	Material for welding												
1.	Electrode, wire & flux.	Wire & flux X		X		Wire & flux X		X				X	
2.	Brazing & soldering wire (silver etc) solder & flux			X				X				X	
C	Others												
1.	Timber & plywood			X				X				X	
2.	Cement & sand, deck composition	DK Comp. X		X				X				X	
3.	Cable	X				X						X	
4.	Steel wire, manila rope, fiber rope			Steel wire				Steel wire				X	
		X		X		X		X				X	
5.	Paint			X				X					
D	Machineries and main components					R/G		M/E		R/G		M/E	
1.	Main engine and reduction gear	X				X		X		X		X	
2.	Propeller, shaft, stern tube, oil seal					Forging	Machining	Propeller	Parts	Forging	Machining	Propeller	Parts
		X				X	X	X	X	X	X	X	X
3.	Misc. pumps	X						X				X	
4.	Air compressor							Motor only					
		X				X		X				X	

Table A-4.15 (Continued)

Item No.	Description	Material Procurement (- 1985)				Material Procurement (1986 - 1990)				Material Procurement (1991 - 1995)			
		Import	Self-Prod.	Local Purchase	Local Sub-Con	Import	Self-Prod.	Local Purchase	Local Sub-Con	Import	Self-Prod.	Local Purchase	Local Sub-Con
B 5.	Boiler	X				X				X		X	
6.	Generator sets	X						X				X	
7.	Main switch board	X						X				X	
8.	Transformer	X						X				X	
9.	Distilled plant	X				X		X		X		X	
10.	Heat exchanger, heater & cooler	X				X		X		X		X	
11.	F.O. purifier, L.O. purifier	X				X				X			
12.	Lathe, drilling machine, grinder, etc.	X						X				X	
13.	Navigation equipment, compass	X				X				X			
14.	Gyro compass, echo sounder	X				X				X			
15.	Radar	X						X				X	
16.	Loran	X				X				X			
17.	Transmitter, radio, public addressor battery	X						X				X	
18.	Radio telephone, telephone, general alarm	X						X				X	
19.	Lighting bulb			X				X				X	
20.	Direction finder	X				X				X			
21.	Steering gear	X				X	&	X				X	
22.	Windlass, mooring winch	X				X	&	X				X	
23.	Cargo winch	X				X	&	X				X	
24.	Refrigerating compressor							Motor only					
		X				X		X				X	
25.	Refrigerator			X				X				X	
26.	Gallery equipment, cooking range, oven. water boiler	X						X				X	
27.	Air conditioning unit	X				X		X				X	
28.	Vent fan	X						X				X	
29.	Stern frame	X					X	X			X	X	
30.	Rudder and rudder carrier	X					X	X			X	X	
31.	Anchor & chain, chain.controller				Controller				Controller				Controller
		X			X			X	X			X	X
32.	Hawse pipe, SC	X						X				X	
33.	Life boat, life raft, life buoy, davit & winch, etc.	Raft & Winch				Raft & Winch				Raft			
		X		X		X	X	X		X		X	
34.	Accommodation ladder, winch and davit			Davit									
		X		X				X				X	
35.	Wharf ladder			X				X				X	
36.	Emergency fire pump	X						X				X	

Table A-4.15 (Continued)

Item No.	Description	Material Procurement (~ 1985)				Material Procurement (1986 ~ 1990)				Material Procurement (1991 ~ 1995)			
		Import	Self-Prod.	Local Purchase	Local Sub-Con	Import	Self-Prod.	Local Purchase	Local Sub-Con	Import	Self-Prod.	Local Purchase	Local Sub-Con
D 37.	Valves FC, SF, SC/BC, SC/SUS, & special valves	X				X				Special X		X	
38.	Valve BC, cock	X						X				X	
39.	Elbow, tee for piping	X				X		Gas pipe X				X	
40.	Flange for piping	X				Forged FL X		Welded pipe X				X	
41.	Screw bass, plug & other pipe components			X				X				X	
42.	Bath tub, water closet urinal, wash basin, shower			X				X				X	
43.	Bosun & carpenters equipment			X				X				X	
E	Main fabricated components												
1.	Funnel		X						X				X
2.	Main engine exhaust gas pipe		X						X				X
3.	Misc. tanks		X						X				X
4.	Misc. pipes		X						X				X
5.	Hawse pipe, steel plate		X						X				X
6.	Mast. derrick post, radar post, antenna pole, boom, davit		X						X				X
7.	Mooring fitting, bollard, fair leader, mooring hole, deck roller		X		X				X				X
8.	Hatch cover	X					X	X	X		X	X	X
9.	Foundations for machineries & Msc. tanks		X						X				X
10.	Vent trunks, & duct, ventilator		X		X				X				X
11.	Deck stand	X	X						X				X
12.	Pipe support		X		X				X				X
13.	Strainer	X	X			X			X	X			X
14.	Furniture, steel (berth, wardrobe, desk & chair, etc)			X	X			X	X			X	X
15.	Furniture, wood (" " ")				X				X				X
16.	Door steel		X						X				X
17.	Door, wood			X or	X			X or	X				X
18.	Door, FRP	X						X				X	
19.	W.T. door		X						X				X
20.	Shelving & grating		X						X				X
21.	Grating, floor plate, ladder		X						X				X
22.	Hand rail and stanchion		X						X				X

Table A-4.15 (Continued)

(4/4)

Item No.	Description	Material Procurement (- 1985)				Material Procurement (1986 - 1990)				Material Procurement (1991 - 1995)			
		Import	Self-Prod.	Local Purchase	Local Sub-Con	Import	Self-Prod.	Local Purchase	Local Sub-Con	Import	Self-Prod.	Local Purchase	Local Sub-Con
E 23.	W.T. hatch, manhole	Special Fitting X	X						X				X
24.	Window, side scuttle	Window X		X				X	X			X	X
25.	Misc. bearing	X				X		X		X		X	
26.	Cable way and support		X	X					X				X
27.	Power distribution box, misc. terminal, switch box			X					X				X
28.	Misc. name plate		X	X				X				X	
29.	Misc. fittings (draft mark, oil pan, misc. cover, liner for foundations, lifting beam, eye plate, hand grip etc)		X						X				X
30.	Telephone box		X						X				X

Table A-4.16 SHIPBUILDING LINKAGE INDUSTRIES AND PRODUCTS

(1/5)

Item No.	Linkage industries	Products
1.	Steel mill	Steel plate, Steel section (Angle, Channel, Bar, etc) Steel pipe
2.	Non-ferrous manufacture	Copper pipe Alloy pipe
3.	Non-metal manufacture	P.V.C pipe Rubber sheet Asbestos etc
4.	Welding material manufacture	Electrode Welding wire Welding flux
5.	Painting material manufacture	Paint Thinner
6.	Engine manufacture	Diesel engine Kerosine engine, gasoline engine Reduction gear Outboard motor Engine parts and accessories
7.	Marine boiler manufacture	Main boiler Auxiliary boiler Soot blower and other boiler fittings
8.	Pump manufacture	Fuel oil pump, Lubricating oil pump, Cargo oil pump and stripping pump Feed water pump, Fresh water pump Sea water pump Bilge pump Sewage pump etc

Table A-4.16 (Continued)

(2/5)

Item No.	Linkage Industries	Products
9.	Air machinenry manufacture	Air compressor Blower Ventilation fan
10.	Oil purifier manufacture	Fuel oil purifier Lubricating oil purifier
11.	Evaporator manufacture	Distilled water plant or evaporator
12.	Heat exchanger manufacture	Condenser Water heater, water cooler Oil heater, oil cooler
13.	Propeller and shafting etc Manufacture	Propeller Propeller shaft, Intermediate shaft Bearing Stern tube bearing
14.	Machine tools manufacture	Lathe Milling and universal machine Drilling machine Grinder etc
15.	Deck machinery manufacture	Windlass Mooring winch Cargo winch Capstan Steering gear
16.	Rudder manufacture	Rudder Rudder carrier
17.	Anchor, anchor cable and Misc rope's manufacture	Anchor Anchor cable Steel wire Manilla rope Fiber rope

Table A-4.16 (Continued)

Item No.	Linkage Industries	Products
18.	Life saving . Fire fighting equipment manufacture	Life boat and davit, Winch Life raft Life buoy, Life jacket fire pump Emergency fire pump Fire extinguisher, CO_2 system and Other fire fighting system Fire detector
19.	Navigation equipment and other fixtures manufacture	Radar, Loran, Gyro compass, Compass Signal, siren etc
20.	Refrigerating equipment manufacture	Refrigerating compressor and Refrigerator Accessories
21.	Galley equipment manufacture	Cooking range Oven Water heater or water boiler etc
22.	Air conditioning equipment manufacture	Air conditioning plant Air conditioning unit
23.	Rising and falling equipment manufacture	Elevator Accommodation laddar, Davit and winch Wharf ladder
24.	Valve manufacture	Valve, FC, SF, SC/BC, SC/SUS Special valve Valve, BC Cock
25.	Pipe fitting manufacture	Flange, SF, SS Elbow, Tee Screw boss, Plug Other pipe components

Table A-4.16 (Continued)

(4/5)

Item No.	Linkage Industries	Products
26.	Sanitary equipment manufacture	Bath tub, Water closet, Urinal wash basin Shower sets
27.	Insulation material manufacture	Insulation material Sheathing plate
28.	Bosun and carpenter's equipment manufacture	Mise, Equipments
29.	Electric machinery and main equipment manufacture	Generator sets Main switch board Transformer Motor
30.	Marine electric cable	Electric cable
31.	Lighting equipment	Lighting bulb, Navigation light Panel and Other lighting equipment
32.	Wireless equipment manufacture	Transmitter and Receiver Radio, Public addressor Battery Radio telephone, telephone Direction finder
33.	Main casting and forging manufacture	Stern frame Hawse pipe, SC Rudder main piece and Rudder stork Side scuttle Window

Table A-4.16 (Continued)

(5/5)

Item No.	Linkage Industries	Products
34.	Wooden working linkage-type manufacture	Wooden joiner wall, Ceiling etc Wooden furniture (Berth, Wardrobe, Desk and chair etc) wooden door
35.	Steel outfitting component Linkage-type manufacture (Plate thickness = 3.2-16 MM)	Funnel Main engine exhaust gas pipe Mise. tanks, Mise pipe Hawse pipe, steel plate Mast, Derrick post, Radar post, Antenna Pole, Boom, Davit Mooring fitting, Bollard, Fair leader, Mooring hole, Deck roller Hatch cover Foundations for machineries & Mise. tanks Ventilator Deck stand Pipe support Strainer W.T. door Shelving & grating Accommodation ladder Grating, Floor plate, Ladder Hand rail and Stanchion W.T. hatch, manhole Mise fitting (Draft mark, Oil pan, Mise cover, Liner for foundations, Lifting beam, Eye plate, Hand grip etc)
36.	Out fitting sheetwork component linkage - type manufacture (Plate thickness = 0.8-4.5 MM)	Vent trunk & duct Steel furniture (Berth, Wardrobe, Desk & chair, etc) Steel door Shelving Cable way and support Power Distribution box, mise, terminal, Switch box Mise name plate Telephone box

Table A-4.17 RATIOS OF WEIGHT AND COST BASED ON COST ACCOUNTING CLASSIFICATION OF JAPANESE NEW VESSELS

Cost Classification				Kind of Vessels	DWT 15.6 F/V		DWT 22. B/C		DWT 30. P/C		DWT 85. T		DWT 169. O/C	
					WT(%)	Cost(%)	WT(%)	Cost(%)	WT(%)	Cost(%)	WT(%)	Cost(%)	WT(%)	Cost(%)
Production Cost	Material Cost	Hull steel			63.5	11.1	72.6	17.0	70.5	9.7	76.2	17.6	84.5	24.6
		Out Fitting Materials	Centralized purchasing components	Outfitting components SUB. DIV.	5.6	9.0	2.4	4.6	1.2	1.9	0.6	0.9	0.4	1.0
					3.3	3.8	4.0	3.4	6.4	6.9	7.0	9.1	3.7	4.7
				Machinery components SUB. DIV.	2.6	7.8	4.9	12.6	3.9	12.1	5.3	12.6	3.1	8.2
					1.2	2.9	1.8	3.8	2.8	3.8	1.9	4.4	1.2	3.3
				Electrical components SUB. DIV.	-	-	-	-	-	-	-	-	0.0	0.9
					1.0	3.1	0.9	4.1	1.0	3.3	0.7	3.2	0.4	2.4
			Purchasing materials of the shipyard	Outfitting materials	15.0	13.3	2.0	9.5	5.6	12.4	3.0	6.0	3.9	6.9
				Machinery materials	2.8	1.8	1.9	1.0	1.4	1.5	0.6	1.0	0.4	1.0
				Electrical materials	0.2	0.8	0.3	0.6	0.5	0.8	0.3	0.6	0.2	0.4
				Field work	-	-	-	-	-	-	-	-	-	-
			Sub-contract materials of the shipyard	Hull parts	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
				Outfitting materials	3.3	2.2	7.9	2.6	4.4	2.4	3.1	2.3	1.3	1.3
				Machinery materials	1.5	0.9	1.2	1.1	2.1	1.1	1.3	1.0	0.8	0.8
				Electrical materials	0.0	0.2	0.1	0.1	0.2	0.2	0.0	0.1	0.1	0.1
	Manufacturing cost			(Weight total)	(100)	-	(100)	-	(100)	-	(100)	-	(100)	-
						20.9		26.9		25.1		24.4		27.8
	Expenditure cost			Design cost		2.0		2.2		6.9		5.2		4.6
				General expenditure		10.7		3.2		3.1		3.8		3.8
	Total					90.5		92.7		91.2		92.2		91.8
Over head, etc						9.5		7.3		8.8		7.8		8.2
Total cost						100		100		100		100		100

Table A-4.18 SUMMARY OF LOCALIZATION PLAN BY KINDS OF WORKS

(Unit: ton)

Plant	Structure Work			Plate Work			Machine Work			Total			Remarks
	Local	Import	Sub-Total	Local	Import	Sub-Total	Local	Import	Sub-Total	Local	Import	Sub-Total	
Cement	7,606 (100%)	- (0%)	7,606 (100%)	2,123 (32.5%)	4,412 (67.5%)	6,535 (100%)	1,793 (23.3%)	5,886 (76.7%)	7,679 (100%)	11,522 (52.8%)	10,298 (47.2%)	21,820 (100%)	excl.electrical and instrumentation
Sugar	2,408 (98.4%)	38 (1.6%)	2,446 (100%)	3,267 (68.3%)	1,518 (31.7%)	4,785 (100%)	644 (40.5%)	945 (59.5%)	1,589 (100%)	6,319 (71.6%)	2,501 (28.4%)	8,820 (100%)	excl.electrical and instrumentaiton
Fertilizer													
Ammonia	4,280 (88.8%)	540 (11.2%)	4,820 (100%)	5,690 (50.9%)	5,491 (49.1%)	11,181 (100%)	38 (7.1%)	497 (92.9%)	535 (100%)	10,008 (60.5%)	6,528 (39.5%)	16,536 (100%)	
Urea	1,660 (86%)	270 (14%)	1,930 (100%)	2,083 (51.4%)	1,972 (48.6%)	4,055 (100%)	17 (4.9%)	329 (95.1%)	346 (100%)	3,760 (59.4%)	2,571 (40.6%)	6,331 (100%)	
ZA	2,220 (91.7%)	200 (8.3%)	2,420 (100%)	2,086 (55%)	1,704 (45%)	3,790 (100%)	64 (17%)	312 (83%)	376 (100%)	4,370 (66.4%)	2,216 (33.6%)	6,586 (100%)	
Phosphoric Acid	1,900 (93.6%)	130 (6.4%)	2,030 (100%)	713 (69.6%)	311 (30.4%)	1,024 (100%)	5 (8.2%)	56 (91.8%)	61 (100%)	2,618 (84%)	497 (16%)	3,115 (100%)	
TSP	2,410 (93.8%)	160 (6.2%)	2,570 (100%)	1,051 (58.4%)	749 (41.6%)	1,800 (100%)	44 (72.1%)	17 (27.9%)	61 (100%)	3,505 (79.1%)	926 (20.9%)	4,431 (100%)	
Sub-total	12,610 (90.7%)	1,300 (9.3%)	13,910 (100%)	11,623 (53.2%)	10,227 (46.8%)	21,850 (100%)	168 (12.2%)	1,211 (87.8%)	1,379 (100%)	24,261 (65.6%)	12,738 (34.4%)	36,999 (100%)	
Pulp & Paper	3,358 (94.9%)	181 (5.1%)	3,539 (100%)	3,930 (56.5%)	3,023 (43.5%)	6,953 (100%)	- (0%)	346 (100%)	346 (100%)	7,288 (67.2%)	3,550 (32.8%)	10,838 (100%)	
Palm Oil	80 (98.8%)	1 (1.2%)	81 (100%)	147 (94.8%)	8 (5.2%)	155 (100%)	61 (96.8%)	2 (3.2%)	63 (100%)	288 (96.3%)	11 (3.7%)	299 (100%)	
Total	26,062 (94.5%)	1,520 (5.5%)	27,582 (100%)	21,090 (52.4%)	19,188 (47.6%)	40,278 (100%)	2,666 (24.1%)	8,390 (75.9%)	11,056 (100%)	49,678 (63.1%)	29,098 (36.9%)	78,776 (100%)	

Source: The Feasibility Study Report on the Development of Plant Processing Equipment Industry in the Republic of Indonesia, JICA, Feb. 1985, Table 3-57

Table A-4.19 TOTAL DEMAND PROSPECTS OF PLANT PROCESSING EQUIPMENT

(Unit: ton)

Plant	Products	REPELITA IV					REPELITA V					REPELITA VI				
		1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Cement plant	Steel structure	7,606	7,606	7,606	7,606			7,606	7,606	7,606	7,606	7,606		7,606		7,606
	Plate works	6,535	6,535	6,535	6,535			6,535	6,535	6,535	6,535	6,535		6,535		6,535
	Machine works	7,679	7,679	7,679	7,679			7,679	7,679	7,679	7,679	7,679		7,679		7,679
	Sub-total	21,820	21,820	21,820	21,820			21,820	21,820	21,820	21,820	21,820		21,820		21,820
Sugar plant	Steel structure	7,338	7,338	7,338	7,338	7,338	9,784	9,784	9,784	9,784	9,784	12,230	12,230	12,230	12,230	12,230
	Plate works	14,355	14,355	14,355	14,355	14,355	19,140	19,140	19,140	19,140	19,140	23,925	23,925	23,925	23,925	23,925
	Machine works	4,767	4,767	4,767	4,767	4,767	6,356	6,356	6,356	6,356	6,356	7,945	7,945	7,945	7,945	7,945
	Sub-total	26,460	26,460	26,460	26,460	26,460	35,280	35,280	35,280	35,280	35,280	44,100	44,100	44,100	44,100	44,100
Ammonia plant	Steel structure	4,820		4,820			4,820			4,820			4,820			4,820
	Plate works	11,181		11,181			11,181			11,181			11,181			11,181
	Machine works	535		535			535			535			535			535
	Sub-total	16,536		16,536			16,536			16,536			16,536			16,536
Urea plant	Steel structure	1,930		1,930			1,930			1,930			1,930			1,930
	Plate works	4,055		4,055			4,055			4,055			4,055			4,055
	Machine works	346		346			346			346			346			346
	Sub-total	6,331		6,331			6,331			6,331			6,331			6,331
ZA plant	Steel structure			2,420				2,420				2,420				2,420
	Plate works			3,790				3,790				3,790				3,790
	Machine works			376				376				376				376
	Sub-total			6,586				6,586				6,586				6,586

(Continued)

Table A-4.19 (Continued)

(Unit: ton)

Plant	Products	REPELITA IV					REPELITA V					REPELITA VI				
		1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Phosphoric acid plant	Steel structure			2,030				2,030						2,030		
	Plate works			1,024				1,024						1,024		
	Machine works			61				61						61		
	Sub-total			3,115				3,115						3,115		
TSP plant	Steel structure		2,570		2,570			2,570			2,570			2,570		
	Plate works		1,800		1,800			1,800			1,800			1,800		
	Machine works		61		61			61			61			61		
	Sub-total		4,431		4,431			4,431			4,431			4,431		
Pulp & paper plant	Steel structure		2,922		2,922		2,922		2,922		2,922		2,922		2,922	
	Plate works		7,570		7,570		7,570		7,570		7,570		7,570		7,570	
	Machine works		346		346		346		346		346		346		346	
	Sub-total		10,838		10,838		10,838		10,838		10,838		10,838		10,838	
Palm oil plant	Steel structure	891	891	891	891	891	648	648	648	648	648	648	648	648	648	648
	Plate works	1,705	1,705	1,705	1,705	1,705	1,240	1,240	1,240	1,240	1,240	1,240	1,240	1,240	1,240	1,240
	Machine works	693	893	693	693	693	504	504	504	504	504	504	504	504	504	504
	Sub-total	3,289	3,289	3,289	3,289	3,289	2,392	2,392	2,392	2,392	2,392	2,392	2,392	2,392	2,392	2,392
Total	Steel structure	22,585	21,327	27,035	21,327	8,229	20,104	25,058	20,960	24,788	23,530	22,904	22,550	25,084	15,800	29,654
	Plate works	37,831	31,965	42,645	31,965	16,060	43,186	33,529	34,485	42,151	36,285	35,490	47,971	34,524	32,735	50,726
	Machine works	14,020	13,546	14,457	13,546	5,460	8,087	15,037	14,885	15,420	14,946	16,504	9,676	16,250	8,795	17,385
	Total	74,436	66,838	84,137	66,838	29,749	71,377	73,624	70,330	82,359	74,761	74,898	80,197	75,858	57,330	97,765
Yearly average	Steel structure			20,101					22,888					23,198		
	Plate works			32,093					37,927					40,289		
	Machine works			12,206					13,675					13,722		
	Total			64,400					74,490					77,209		

Source: The Feasibility Study Report on the Development of Plant Processing Equipment Industry in the Republic of Indonesia, JICA, Feb. 1985, Table 3-58

Table A-4.20 DEMAND PROSPECTS OF PLANT PROCESSING EQUIPMENT FOR LOCALIZATION

(Unit: ton)

Plant	Products	REPELITA IV					REPELITA V					REPELITA VI				
		1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Cement plant	Steel structure	7,606	7,606	7,606	7,606			7,606	7,606	7,606	7,606	7,606		7,606		7,606
	Plate works	2,123	2,123	2,123	2,123			2,123	2,123	2,123	2,123	2,123		2,123		2,123
	Machine works	1,793	1,793	1,793	1,793			1,793	1,793	1,793	1,793	1,793		1,793		1,793
	Sub-total	11,522	11,522	11,522	11,522			11,522	11,522	11,522	11,522	11,522		11,522		11,522
Sugar plant	Steel structure	7,224	7,224	7,224	7,224	7,224	9,632	9,632	9,632	9,632	9,632	12,040	12,040	12,040	12,040	12,040
	Plate works	9,801	9,801	9,801	9,801	9,801	13,068	13,068	13,068	13,068	13,068	16,335	16,335	16,335	16,335	16,335
	Machine works	1,932	1,932	1,932	1,932	1,932	2,576	2,576	2,576	2,576	2,576	3,220	3,220	3,220	3,220	3,220
	Sub-total	18,957	18,957	18,957	18,957	18,957	25,276	25,276	25,276	25,276	25,276	31,595	31,595	31,595	31,595	31,595
Ammonia plant	Steel structure	4,280		4,280			4,280			4,280			4,280			4,280
	Plate works	5,690		5,690			5,690			5,690			5,690			5,690
	Machine works	38		38			38			38			38			38
	Sub-total	10,008		10,008			10,008			10,008			10,008			10,008
Urea plant	Steel structure	1,660		1,660			1,660			1,660			1,660			1,660
	Plate works	2,083		2,083			2,083			2,083			2,083			2,083
	Machine works	17		17			17			17			17			17
	Sub-total	3,760		3,760			3,760			3,760			3,760			3,760
2A plant	Steel structure			2,220				2,220				2,220				2,220
	Plate works			2,086				2,086				2,086				2,086
	Machine works			64				64				64				64
	Sub-total			4,370				4,370				4,370				4,370

(Continued)

Table A-4.20 (Continued)

(Unit: ton)

Plant	Products	REPELITA IV					REPELITA V					REPELITA VI				
		1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Phosphoric acid plant	Steel structure			1,900				1,900						1,900		
	Plate works			713				713						713		
	Machine works			5				5						5		
	Sub-total			2,618				2,618						2,618		
TSP plant	Steel structure		2,410		2,410			2,410			2,410			2,410		
	Plate works		1,051		1,051			1,051			1,051			1,051		
	Machine works		44		44			44			44			44		
	Sub-total		3,505		3,505			3,505			3,505			3,505		
Pulp & paper plant	Steel structure		2,741		2,741		2,741		2,741		2,741		2,741		2,741	
	Plate works		4,547		4,547		4,547		4,547		4,547		4,547		4,547	
	Machine works		0		0		0		0		0		0		0	
	Sub-total		7,288		7,288		7,288		7,288		7,288		7,288		7,288	
Palm oil plant	Steel structure	880	880	880	880	880	640	640	640	640	640	640	640	640	640	640
	Plate works	1,617	1,617	1,617	1,617	1,617	1,176	1,176	1,176	1,176	1,176	1,176	1,176	1,176	1,176	1,176
	Machine works	671	671	671	671	671	488	488	488	488	488	488	488	488	488	488
	Sub-total	3,168	3,168	3,168	3,168	3,168	2,304	2,304	2,304	2,304	2,304	2,304	2,304	2,304	2,304	2,304
Total	Steel structure	21,650	20,861	25,770	20,861	8,104	18,953	24,408	20,619	23,818	23,029	22,506	21,361	24,596	15,421	28,446
	Plate works	21,314	19,139	24,113	19,139	11,418	26,564	20,217	20,914	24,140	21,965	21,720	29,831	21,398	22,058	29,493
	Machine works	4,451	4,440	4,520	4,440	2,603	3,119	4,970	4,857	4,912	4,901	5,565	3,763	5,550	3,708	5,620
	Total	47,415	44,440	54,403	44,440	22,125	48,636	49,595	46,390	52,870	49,895	49,791	54,955	51,544	41,187	63,559
Yearly average	Steel structure			19,449					22,165					22,466		
	Plate works			19,025					22,760					24,900		
	Machine works			4,091					4,552					4,841		
	Total			42,565					49,477					52,207		

Source: The Feasibility Study Report on the Development of Plant Processing Equipment Industry in the Republic of Indonesia, JICA, Feb. 1985, Table 3-59

Table A-4.21 TOTAL DEMAND OF OTHER PLANTS AND REPAIRING FOR LOCALIZATION

(Unit: 1,000 T/Y)

REPELITA	Other Than 5 Designated Plants 1/			Reshelling 2/			Rehabilitation 3/			Total		
	S	P	M	S	P	M	S	P	M	S	P	M
REPELITA IV (1984-88)	90.1	15.4	0.7	-	-	3.9	5.0	5.0	0.5	95.1	15.4	5.1
REPELITA V (1989-93)	93.0	19.0	1.0	-	-	4.7	5.0	5.0	0.5	98.0	22.7	6.2
REPELITA VI (1994-98)	93.9	19.0	1.0	-	-	5.8	5.0	5.0	0.5	98.9	24.0	7.1

Notes: 1/ including
1) equipment of refinery and petrochemical plants
2) equipment of power plants and transmission tower
3) boilers
4) water gate and bridge

2/ rehabilitation of sugar plant and reshelling of mill rolls
S: Structure work
P: Plate work
M: Machine work

Source: The Feasibility Study Report on the Development of Plant Processing Equipment Industry in the Republic of Indonesia, JICA, Feb. 1985

Table A-4.22 SUMMARY OF PLANT CONSTRUCTION PROSPECTS

PLANT	REPELITA IV					REPELITA V					REPELITA VI				
	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Cement Plant (1 Million T/Y)	1.5	1.5	1.5	1.5			1.5	1.5	1.5	1.5	1.5		1.5		1.5
Sugar Plant (4,000TCD)	3	3	3	3	3	4	4	4	4	4	5	5	5	5	5
Fertilizer Plant															
- Ammonia Plant (1,000 T/D)	1		1		1	1			1			1			1
- Urea Plant (1,700 T/D)	1		1		1	1			1			1			1
- Ammonium			1				1				1				1
Sulphate Plant (200,000 T/Y)					1										
- Phosphoric Acid			1				1						1		
Plant (625TP$_2O_5$/D)															
- TSP Plant (500,000 T/Y)		1		1			1			1			1		
Pulp & Paper Plant (90,000 T/Y)		1		1		1		1		1		1		1	
Palm Oil Plant (30 TFFB/H)	11	11	11	11	11	8	8	8	8	8	8	8	8	8	8

Source: The Feasibility Study Report on the Development of Plant Processing Equipment Industry in the Republic of Indonesia, JICA, Feb. 1985, Table 3-46.

Table A-4.23 ESTIMATED PROJECT COST OF MODEL PLANT

(Unit: US$ 1,000)

Item	Casting	Forging/ Heat Treatment	Machining	Sheet work Welding	Press (Small Item)	Press (Heavy Item)	Steel Fabrication
1. Plant Direct Cost	5,619.4	3,208	3,658.6	428.5	485.2	520.0	704.6
2. Ocean Freight Insurance, Inland Transportation	276.8	139.5	148.6	23.7	24.7	33.9	79.3
3. Civil & Erection	3,643.5	1,010.4	882.7	407.0	287.9	276.0	2,129.6
4. Office Accommodation	98.4	62.7	71.7	8.4	9.5	11.2	13.6
5. Engineering & Supervising	167.1	153.0	225.5	40.4	17.8	32.7	74.5
6. Overhead Expenses	980.5	457.4	498.7	90.8	82.5	87.4	300.2
Sub Total	10,785.7	5,031.0	5,485.8	998.8	907.6	961.2	3,301.8
7. Tax & Duty	1,571.2	782.5	861.5	134.2	129.6	140.4	383.3
8. Working Capital	2,174.2	979.6	406.9	290.9	366.0	69.5	325.8
9. Contingency	2,906.2	1,358.7	1,350.1	284.8	280.6	234.2	798.2
Total	17,437.3	8,151.8	8,104.3	1,708.7	1,683.8	1,405.3	4,809.1
Investment Cost per ton of product ($/T)	1,500	1,800	12,700	1,140	1,220	6,680	3,210
Productin Capacity (T/Y)	12,000	4,600	639	1,500	1,380	212	1,500

Table A-4.24 CAPITAL INVESTMENT REQUIRED FOR LINKAGE-TYPE METALWORKING INDUSTRY

(in 1985 constant price)

	Production (ton)			Increase (ton)		Unit Investment	Total Investment ($'000)	
	(1985)	(1990)	(1995)	(1985-90)	(1990-95)	($/ton)	(1985-90)	(1990-95)
a) Casting	2,212	22,869	64,932	20,657	42,063	1,500	30,986	63,095
b) Forging/heat treatment	103	25,936	53,995	25,833	28,059	1,800	46,499	50,506
c) Machining 1/	1,094	20,385	56,673	19,291	36,288	12,700	244,996	460,858
d) Sheet work/welding	7,365	26,906	58,434	19,541	31,528	1,140	22,277	35,942
e) Press work (Small item) 2/	28,938	51,176	88,309	22,238	37,133	1,220	27,130	45,302
f) Press work (Heavy item) 3/	1,222	4,786	11,479	3,564	6,693	6,680	23,808	44,709
g) Steel fabrication (Ship building)	0	3,000	6,000	3,000	3,000	3,210	9,630	9,630
h) Steel fabrication (Plant equipment)	42,700	78,000	120,100	35,300	42,100	3,210	113,313	135,141
Total							518,639	845,183

Annual average: 1985-1990 = US$110.4 million/year
1990-1995 = US$177.6 million/year

Notes: 1/ 70% of total machining volume in Table A-4.14
2/ Electric machine, Electric appliances, Automotive and Motorcycle in Table A-4.14
3/ Machine tool, Agriculture machine, Construction Equipment and Diesel Engine in Table A-4.14

Source: JICA Team Estimate

Section 5 CURRENT STATE AND PROBLEMS OF DELETION PROGRAM

Section 5 CURRENT STATE AND PROBLEMS OF DELETION PROGRAM

5.1 General

5.1.1 Background of Deletion Program

As has been discussed earlier, the assembly-type machinery industries are heavily dependent on imported components and parts. Increasing local-made components contained in the assembled/manufactured final goods such as automobiles, agricultural machinery, electrical machinery and so on is one of the principal policies adopted by the Government of Indonesia for the development of industries particularly related to the machinery and basic metal industries in the country.

To meet this objective, the Government has been pursuing the implementation of a program called "Deletion Program" which is to guide the machinery manufacturers in Indonesia to increase the use of local-made components and parts under the achievement programs specifically set by the Government.

5.1.2 Implementation of the Program

The Ministry of Industry is responsible to pursue the implementation of the deletion program. The Ministry sets the programs for achievement of localization on the individual subsectors of machinery industries, which are announced as the Decree of the Minister of Industry for implementation. The Decree sets forth the names of components designated for the use of local-made ones and the time schedule for achievement of the localization for each designated component. These programs are prepared in due consideration of prevalent conditions and future outlook of the industries in Indonesia and also in consultations with the representatives of the industries so that the programs can be implemented efficiently by the relevant industries. In the course of the preparation and implementation of the programs, the Ministry closely coordinates with other ministries or government agencies concerned.

5.1.3 CBU and CKD

The implemention of the deletion program was started with the import embargo of complete built-up components (CBU) replacing by the import of complete knock-down components (CKD) for domestic assembly. The

next stage is to designate some of the CKD components to be manufactured locally. Incomplete knock-down, which excludes these localized components, is called minus-CKD.

When the imports of some components have decreased to a minor quantity because of the progress in the localization of components, such components are removed from the list of CKD components and are thereafter treated as "spare parts" subject to higher tariff rates.

5.1.4 In-House and Out-House Productions

The local production of designated components is enforced with two distinctive ways of production, namely "in-house" and "out-house". As for the components designated for out-house production, assemblers are obligated to use those manufactured by outside manufacturers in Indonesia, while they are allowed to engage themselves in manufacturing the components designated for in-house production. The in-house production is allowed only for those requiring a large amount of investment, highly advanced technology, or product specifications specially developed by the individual assemblers.

The promotion of out-house production could stimulate the expansion of markets for local subcontracting manufacturers. For some items of the components designated for out-house production, the Ministry has a policy to limit the number of manufacturers to whom production license is granted, with a view to avoiding excessive competition among manufacturers and also maintaining economic production scale for each manufacturer.

5.1.5 Import Policy for Components

In connection with the deletion program, the Government has a policy to take measures for protecting the domestic production of designated components, which are adjustment of tariff rates or import control. For example, the tariff rate on CKD or minus CKD components is 5% while the tariff rate of 30% is imposed on the same components if they are removed from the "CKD list" and treated as "spare parts". In addition, the import of the components which can be substituted by local-made components is closed, although an import is allowed with quota for those closed items when the domestic production is insufficient to meet the demands.

5.2 Contents of Deletion Programs by Industry and Situation of their Implementation

The deletion programs mainly consist of those Minister of Industry Decrees concerning "Stipulation on the use of Domestically Manufactured Components", and appendices, supplements and amendments.

Since the use of domestically manufactured components is a stipulation which applies to assemblers, it can be considered as a step-by-step import prohibition or reduction schedule for components, aiming at assembly-type industries. It does not directly apply, therefore, to the linkage-type industries which are in fact parts suppliers.

Those components which are locally assembled with adding some processing work upon their import as incomplete or semi-finished products are authorized as domestically manfuactured components. In addition, those components which cannot be imported as "components of CKD" may be imported as "spare parts" subject to the higher tariff rates unless they are designated as import prohibited items.

The deletion programs for each of the assembly-type industries subject to the present study are summarized below based on Minister of Industry Decrees which the JICA Study Team had acquired by July, 1985.

5.2.1 Machine Tools

Minister of Industry Decrees concerning machine tools are as follows:

- Minister of Industry Decree No.1/M/SK/1/1985 (January 4, 1985)

  Stipulation on nomination of machine tool manufactures

- Minister of Industry Decree No.28/M/SK/1/1985 (January 21, 1985)

  Stipulation on the use of domestically manufactured components in the production of machine tools such as lathe, drill combination milling machine, knee-type milling machine, surface grinder, saving machine, table-type boring machine, column type boring machine, plate folding machine, pipe bender, forging machine, press brake, shearing machine, plate rolling machine and punching machine

The deletion program for machine tools has commenced with the designation of the manufacturers for machine tools on January 4, 1985. Table

ANX V-1 shows the names of the 11 designated companies, the names of the machine tools which they may manufacture, and the numbers of machine tools which they may manufacture, pursuant to Decree No.1/M/SK1/1985. Apart from the provision which requires these companies to start production before July 1, 1985, they must also submit reports to the Ministry of Industry on the implementation of the deletion program every six months.

Concrete localization programs are stipulated by Minister of Industry Decree No.28/M/SK/1/1985 with 14 types of machine tools. Table ANX V-2, ANX V-3 and ANX V-4 in ANNEX V are summaries of the programs for 4 types of machine tools, i.e., lathes, knee-type milling machines, surface grinding machines and column-type boring machines. For the other 10 types of machine tools, the components which are allowed to import are designated as shown in Table ANX V-5 with the conditions that "these machine tools are not domestically manufactured at present".

As can be seen in Table ANX V-2, localization programs start with the casting and sheet metal processing of carbon steel products which can be manufactured by relatively simple machine processing, then moving to the stages where forging, heat treatment and precise machining are required. While the use of domestically manufactured components will be required for most machine tools in 1987, chucks, spindles and coolant pumps are exempted from the use of domestically manufactured components until 1987.

As the program only started in January, 1985 with the appointment of 11 machine tool manufacturers, it has not yet reached the stage where the effects of its implementation can be assessed.

5.2.2 Agricultural Machinery

The deletion program for tractors was stipulated by a Minister Decree on June 9, 1983 as follows:

- Minister of Industry Decree No.199/M/SK/6/1983
  The use of domestically manufactured components for the assembling of non-simple, single-axle, hand-operated tractors

- Minister of Industry Decree No.200/M/SK/6/1983
  The use of domestically manufactured components for the assembling of mini-tractors

- Minister of Industry Decree No.201/M/SK/6/1983
  Stipulation on CKD condition of medium-size tractors for agriculture and plantations, capacity of 22.5 up to 45 kW and large-size, capacity of up to 80 kW

As the use of domestically manufactured components for hand-operated tractors, subject to Decree No.199 above, became compulsory for most components between 1983 and 1984, only the assembly of transmissions and rotary implements equipment will be subject to the deletion program after September, 1985. A summary of the deletion program is shown in Table ANX V-6. With regard to the actual utilization of domestically manufactured components, the submission of documented reports to the Directorate General for Machine and Basic Metal Industries, the Ministry of Industry, is compulsory at the end of every year.

As Decree No.200 stipulates the use of domestically manufactured components for the mini-tractor assembly industry, the deletion program for Septermber, 1983 to September, 1984 was decided as shown in Table ANX V-7. As can be clearly seen in the Table, the localization measures for the frame/body-related components and implements have already been implemented and the remaining major components to be localized within 2 years from now are the driving, steering and the hydraulic systems.

The components for hand-operated tractors and mini-tractors which will face regulations under the deletion programs in the future mostly consist of axles and gears for transmission systems and many of them are classified as out-house components. While these components require high quality materials, production technology and machinery, some degree of mass-production systems are also required. In particular, forging and heat treatment are two fields where medium- and small-size enterprises in Indonesia are least developed.

As a result, a certain size of investment and intensive technological assistance will be required for Indonesian companies to acquire facilities and technology, both of which are necessary for the industries to become viable linkage-type industries. In addition, certain period of time will also be required.

Decree No.201 designates the scope of the components to be used for medium- and large-size tractors. It is believed that concrete provisions in view of the deletion programs will be stipulated in the future.

With regard to the advancement of the localization of tractors, the situation varies depending on the types of tractors and the manufacturers.

As it is impossible to know all the details of the current progress, the judgement has been made based on the situations of the companies to which the JICA Study Team has visited.

The import of tractors with 22.5 kW or over is currently permitted in the form of CKD and, therefore, all components except batteries and paints are imported. If the ratio of in-house manufactured components by assemblers, plus those components purchased from domestic manufacturers against the entire components required (shown in value), "the real localization ratio", is calculated, the localization ratio for medium and large-size tractors with 22.5 kW or over is approximately 5%.

In the case of a certain manufacturer of mini-tractors under 22.5 kW, their production has ceased for the time being due to the depression of market. The localization ratio for hand-operated tractors is about 50% and the ratio for implements attached to the tractors is considered to be 100%.

Other agricultural machines are subject to the respective Decrees given below. The utilization of domestically manufactured components from April, 1985 is stipulated in each Decree. The components to be localized include frames, bodies, bolts, nuts and driving axles. Bearings may be imported, however, on the condition that no domestic products exist.

- Minister of Industry Decree No.21/M/SK/1/1984 (January 16, 1984)
  The use of domestic made components for the assembling of rice polishing machines

- Minister of Industry Decree No.22/M/SK/1/1984 (January 16, 1984)
  Stipulation on the use of domestic made components for the assembling of single inducted paddy grinding machines

- Minister of Industry Decree No.23/M/SK/1/1984 (January 16, 1984)
  Stipulation on the use of domestic components in the assembling fo rice hullers

The localization ratios for these machines are 65% for rice polishing machines, 80% for paddy grinding machines and 100% for rice hullers.

5.2.3 Construction Equipment

The deletion program for Construction Machines was clearly announced by Minister of Industry Decree No.138/M/SK/4/1984, issued on April 23,

1984. This Decree stipulates the use of domestically manufactured components for the assembling of crawler bulldozers, hydraulic excavators, motor graders and wheel loaders.

- Minister of Industry Decree No.138/M/SK/4/1984 (April 4, 1984)
  Stipulation on the use of heavy construction equipment, i.e. crawler bulldozers, hydraulic excavators, motor graders and wheel loaders

The import tariffs for these 4 types of machines were designated as follows by Minister of Finance Decree No.313, issued on May 3, 1983.

In the case of CBU:

Import tax 20%	Import sales tax 10%

In the case of CKD:

First stage	Import tax 0%, Import sales tax 0%
Second stage	Import tax 0%, Import sales tax 5%
Third stage	Import tax 5%, Import sales tax 5%

The Decree also stipulated that the period of the above each stage be decided by another Minister of Industry Decree, watching at the progress of related local industries development. While encouraging imports of CKD, the Decree imposed high tax rates on imports of CBU.

An import quota system for built-up products was also implemented with the purpose of protecting domestic products, stipulating the number of imports to be 100 in 1984 and 0 (imports prohibited) in 1985.

Table ANX V-8 is, as an example of the contents of the Deletion Program for construction equipment, a summary of the localization schedule for crawler bulldozers. The other 3 types of machines are also under schedules similar to the one shown in the Table. The schedules for the step-by-step localization of the components for the 4 types of construction machines are designated in the Program. It was stipulated that the localization would be completed in 5 years, starting in 1984 and ending in 1988. In addition, in-house and out-house components are indicated in the decree.

By 1982, prior to the decrees 3 companies had already acquired manufacturing (assembling) licenses for the 4 types of machines designated by the deletion program. Table ANX V-9 shows the types of machines and the production capacities allocated to these 3 companies. The machines to be produced were allocated at a ratio of 2 companies for 1 type of

machine. Therefore, these designated manufacturers will take the primary responsibility for the implementation of the deletion program in the future. The 3 manufacturers established new companies between 1981 and 1982 and consolidated their production systems in accordance with their progress in obtaining production licenses, commencing assembling of CKD at the end of 1982.

With the announcement of the deletion program in April, 1984 and the setting up of the localization schedule, each manufacturer is currently implementing localization measures pursuant to the Decree. The components to be localized in 1984, the first year of the program, were counter weights, blade blocks, draw bars, guards, bonnets, sweepers, rops/fops and batteries in the case of bulldozers. It appears that the localization of these components has been successfully carried out. In terms of the program's future prospects, manfuacturers have been making their subcontractors undergo intensive guidance and training in order to follow the program's original schedule. They have, however, requested Government permission to import half-finished components such as thick bent steel plate (for example, HT60 and HT100, etc.) which cannot be obtained in the domestic market. Moreover, manufacturers are employing a policy of the maximum utilization of those components in other fields which have already been localized, such as automotives and motorcycles, etc.

Manufacturers have begun to foster subcontractors. For the time being, however, they assign subcontractors with the processing work for those components whose materials can be obtained domestically, under their technical assistance. Pressworking and sheet metal/welding using cast iron/cast steel products or ordinary steel plates are the examples of subcontracted work. No suitable factories exist, however, in the heat treatment field. In some cases, manufacturers jointly foster subcontractors based on their technical cooperation. One example is the joint development of the mold for urethane foam used for operators' seats, reducing the development cost of the mold. This suggests that the cooperation between manufacturers may solve problems which single manufacturers find difficult to solve by themselves. Discussions to introduce joint work at an association of the construction equipment (HINABI) are currently underway.

5.2.4 Electrical Machines

Minister of Industry Decrees concerning the use of domestically manufactured components for the electrical and electronic fields are as follows:

- Minister of Industry Decree No.475/M/SK/6/1983 (June 9, 1983)
  Stipulation regarding the use of domestically manufactured components for the manufacture of electric generators with a capacity of up to 5 KVA or more than 5 KVA up to 750 KVA

- Minister of Industry Decree No.140/M/SK/4/1984 (April 23, 1984)
  Stipulation on the use of domestically manufactured components in the assembling of one phase-class 2 KWH meter

- Minister of Industry Decree No.124/M/SK/4/1985 (April 6, 1985)
  Stipulation regarding the use of domestically manufactured components for the assembly of electric motors for industrial use with a capacity of upto 7.5kW, more than 7.5kW upto 20kW, more than 70kW upto 75kW or more than 75kW

(1) Electric generator

The schedule under the deletion program for electric generators with a capacity of up to 5 KVA given by Decree No.475 is shown in Table ANX V-10. The schedule is very similar to the one for electric generators with a capacity of more than 5 KVA and up to 750 KVA. The target date for the completion of the deletion program was set at April, 1986. An overwhelming number of components were designated as out-house components while in-house components only included armature clamps for rotors and protection covers and bearing covers for staters.

Out of the 12 manufacturers or assemblers of electric generators, 9 are joint-ventures with foreign capital or technical cooperation. According to "BUKU PEGANGAN PENGGUNAAN PRODUKSI DALAM NEGER BUKU I 1984", published by MOI, the production capacity was 62,000 units/year. This figure, however, appears to include the production capacities of those factories which have not yet started operation. The state of localization for the total 12 companies has not yet been studied but one Japanese-affiliated company is building up additional facilities to its factory in view of promoting localization. As this company is currently making preparations to achieve the 1986 target, it can be assumed that the company achieved the target for 1984. It can be further assumed that the company has achieved some 50% of the deletion program's targets at present and will achieve the final target in 1986.

(2) Integrating wattmeter

Decree No.140 stipulates the deletion program for integrating wattmeters and the program is summarized in Table ANX V-11. The deletion program is scheduled to be completed by the end of 1985.

At present, home-use integrating wattmeters are produced. Although the deletion program is relatively new, based on the Decree issued in 1984, 7 companies have obtained production licenses and 2 of them have started local production and the marketing of their products. Other two companies are currently preparing for local production.

The deletion program does not stipulate the distinction between in-house and out-house components. As a result, one of the companies that started earlier intends to use mostly out-house press products, nuts and bolts and packings which are all subject to the deletion program, while the others intend to produce these components by themselves.

It is said that when the deletion program is 100% achieved in 1986, the ratio of imported components will still remain at the level of some 28%. Therefore, the ultimate localization ratio is 72% with some 38% being achieved as of 1984 in terms of "real localization ratio".

(3) Electric motors for industrial use

Decreee No.124, newly introduced in April, 1985, stipulates the localization schedules for each of 4 categories of electric motors for industrial use. The schedules are stipulated up until July, 1987 for the first 2 categories, while the schedule is stipulated up until July, 1988 for motors with a capacity of more than 20kW upto 75kW. Only enamel wire is subject to the use of local made ones for motors with a capacity over 75kW.

The import of some components for motors with a capacity upto 75kW may be permitted after the localization schedules have been completed in 1987 or 1988. These components include coil adjusters, capacitors, silicon diodes, permanent magnets, bind wire and rivets, etc. As this Decree was also only introduced recently, its achievement is not yet observed.

(4) Home electrical appliances

No deletion program based on a Minister of Industry Decree exists for home electrical appliances, but localization is instead promoted by

administrative guidance. However, the Minister of Commerce Decree issued on December 2, 1983 (Decree No.717/KP/XII/83) introduced an import license system for refrigerators, washing machines, electric fans, televisions, radios, telephone receivers, lamps, audio equipment and their parts. While imports of CBU or CKD are technically permitted, the use of domestic products is encouraged by the introduction of regulatory measures such as higher tariff rates for imported products and restrictions on the number of products that may be imported.

Based on the purchase cost, the localization ratio is 30-35% and manufacturers consider that a target figure of around 50% will be satisfactory for some time to come. Parts for home electrical appliances mostly consist of plastics, rubber, wood and electronics-related items. The advancement of the localization of home electrical appliances, however, will not necessarily achieve the growth of the demand for metal processing except for a few items such as external frames for refrigerators.

5.2.5 Automobiles

The deletion program gives priority to the localization of commercial vehicles. There is no deletion program for passenger automotives and the local assembly work is carried out based on CKD imports. The import tax is 100% of the CIF price for CKD of passenger cars. No import tax is imposed in the case of CKD commercial vehicles.

The deletion program started with the following Decree which was issued on August 2, 1976.

- Minister of Industry Decree No.307/M/SK/8/1976
  Stipulation on the use of domestically manufactured components for the assembling of commercial vehicles

However, as it was found to be difficult to implement the schedule, the implementation of the deletion program was temporarily suspended by the following Decree which was issued on November 29, 1978.

- Minister of Industry Decree No.231/M/SK/11/1978
  Suspension of implementation of the minister of industry Decree No.307/M/SK/8/1976 concerning the use of domestically manufactured components for the assembling of commercial vehicles

In the following year, i.e. 1979, the deletion program was restarted with the announcement of the following Decree, including re-scheduling of the program, issued on September 6, 1979.

- Minister of Industry Decree No.168/M/SK/9/1979
  Confirmation of reapplication of the minister of industry Decree No.307/M/SK/8/1976 stipulating the use of domestically manufactured components for the assembling of commercial vehicles

This Decree No.168 was partially amended by the Circulation Letter No.1269/DJ-LD/XI/193 and the localization schedules for engines and other components were clarified by the Decree on September 28, 1983.

- Minister of Industry Decree No.371/M/SK/9/1983
  The use of domestically manufactured components for the assembling of commercial vehicles

The current situation is summarized in Table ANX V-12.

The deletion program for commercial vehicles promotes localization and is assisted by decrees issued by related ministries concerning the required localization of components or the tariff rates imposed on imported components. In view of the schedule anticipated by the deletion program, the localization of those components designated by Minister of Industry Decree No.168/M/SK/9/1979 can be considered as the first stage of deletion program and localization pursuant to Decree No.371/M/SK/9/1983 as the second stage. The latter includes engines, clutches, transmission axles, propeller shafts, steering systems, braking sytems, wheel rims and cabins/chassises/frames of Categories III and IV while the former includes those components which are not mentioned above.

Assemblers have dealt with the requirements of the first stage deletion program concerning mostly body-related components with their own manufactured components and the schedule has been almost 100% achieved. The import of some parts of these components, however, is permitted and the localization ratio in terms of the cost is said to be 60-70% excluding parts of engine, clutch, transmission axles etc. So the real localization ratio in terms of cost to a complete vehicle including, such parts is to be 50-60% at this moment. This ratio is expected to increase to 70-80% when the second stage of deletion program is completed.

As the period for the second stage of deletion program is from 1984 to 1988, manufacturers have either already started operation or have been preparing the construction of new factories. Table ANX V-13 shows the various measures taken by manufacturers.

5.2.6 Two-Wheel Automatic Vehicles (Motorcycles and Scooters)

The deletion program for two-wheel automatic vehicles has met with several difficulties and, therefore, has been amended to match the actual situation. The related Minister of Industry Decrees are as follows:

- Minister of Industry Decree No.08/M/SK/1/1977 (January 11, 1977)
  Stipulation on the use of domestically manufactured components and on import of components for the assembling of two-wheel automatic vehicles (motorcycles and scooters)

- Minister of Industry Decree No.651/M/SK/11/1981 (November 25, 1981)
  Stipulation on the use of domestically manufactured components and on import of components fo the assembling of two-wheel automatic vehicles (motorcycles and scooters)

- Directorate General for Multifarious Industries Decree No.127/DJAI/SK/VIII/1982 (August 13, 1982)
  Execution of Minister of Industry Decree No.651/M/SK/11/1981 issued on November 25, 1981

- Minister of Industry Decree No.505/M/SK/12/1983 (December 27, 1983)
  Stipulation on the use of domestically manufactured engine components with the frame work of assembly and manufacturing of two-wheel automatic vehicles (motorcycles and scooters)

Decree No.08/M/SK/1/1977 announced the use of certain components and introduced the localization schedule from 1977 to 1980. With the amendments made in later years, Decree No.651/M/SK/11/1981 was enforced. However, manufacturers could not act in unison at the time and, therefore, readjustments were made to the schedules, etc. in order to provide a more detailed deletion program which was then announced as Decree No.127/DJAI/SK/VIII/1982. This Decree No.127 introduced the percentage requirements for domestically manufactured components in the total cost of a completed motorcycle or scooter as the evaluation criteria for the minimum percentage level for the localization of CKD motorcycles or scooters would be 72% in the total value by 1982.

A summary of the cost percentages stipulated for motorcycles and scooters is given below.

MOTORCYCLES

(%)

	Cub	100cc		125cc
		Sport	Trail	
Body group	69.67	71.14	71.10	70.33
Electrical group	10.03	8.36	8.40	8.07
Engine & transmission group	20.00	20.50	20.50	21.60
	100	100	100	100

SCOOTERS

(%)

150cc	100c	
Body group	72.29	75.54
Electrical group	7.03	4.43
Engine & transmission group	20.68	20.03
	100	100

The deletion program which should have been completed by 1982 was called the first stage deletion program and mostly consisted of body and electrical components as shown in Table ANX V-14. The first stage deletion program which intended the achievement of a localization ratio of 72% has alreay been achieved, however, some 10% of the 72% domestically manufactured components contain imported parts.

The second stage of deletion program is the deletion program for engines, starting in 1984 and ending in 1987, pursuant to Decree No.505/M/SK/12/1983. This program is summarized in Table ANX V-15 for in-house components and Table ANX V-16 for out-house components.

Table ANX V-17 is a list of engine manufacturers, based on the successful applications for manufacturing permission by vehicle manufacturers. The localization of engines will become a full-scale operation after 1986, using 1984 and 1985 as preparatory years. In the case of motorcycles and scooters, vehicle manufactures could not work in unison at the beginning due to the facts that the manufacturers had different engine

specifications, i.e. either 2 cycles or 4 cycles, and each manufacturer had its own individual characteristics such as using alumium die cast products, etc.

As a result, the deletion program was not completely harmonized between the manufacturers. Adjustments were later successfully made to the program to achieve its smooth implementaion. However, manufacturers appear to have a profitability problem due to the large equipment cost, as in the case of automotive production.

5.2.7 Other Assembly-Type Machine Industries

As plant equipment, shipbuilding and off-shore structures are assembled from a number of components, they are not exclusively covered by a single deletion program.

With regard to the heavy machine industry, as it partially overlaps with the plant equipment, heavy electrical machine, construction machine or agricultural machine industries, no single program exclusively covers the heavy machine industry. Therfore, the deletion programs for diesel engines and industrial boilers, both of which appear to be included in the assembly-type industries although they are not classified in previously examined six industry categories, and related decrees will be reviewed here.

(1) Diesel engines

Minister of Industry Decrees concerning the use of domestically manufactured components for diesel engines (motors) are as follows:

- Minister of Industry Decree No.198/M/SK/6/1983 (June 9, 1983)
  The use of domestically manufactrured components for the assembling of diesel motors with capacity from 2 kW up to 25 kW

- Minister of Industry Decree No.202/M/SK/6/1983 (June 9, 1983)
  The use of domestically manufactured components for the assembling of diesel motors with capacity from 26 kW up to 37 kW

As previously described, the deletion programs for automotive engines and two-wheel engines are separately stilpulated. The subjects of the above Decrees are, therefore, general motors to be used for electricity

generating, agrilultural machines, construction equipment and boats, etc. The localization schedule stipulated by Decree No.202 is shown in Table ANX V-18.

As the table clearly shows, most of the components for the engine body are in-house components. out-house components mostly consist of unit accessories such as electrical goods, filter pumps and coolers, etc. Therefore, in terms of the connection with linkage-type industries, parts manufacturers will become more important for engine assemblers rather than process subcontractors such as machining, welding, pressworking and plating, etc.

From the state of the implementation of those manufacturers visited by the JICA Study Team, the degree of the implementation of the Deletion Program for Diesel Engines is, on the whole, estimated to be as follows.

The import ratio of Company A is approximately 70% in value with 14 items of high accuracy being imported, namely fuel pumps, crank shafts, cylinder heads, cam shaft connecting rods and nozzles, etc. The implementation of the deletion program is behind schedule due to the sluggish market situation. As the technical level of subcontractors is questionable in regard to cast products, the Company will be obliged to produce them in-house.

Company B had basically implemented the deletion program within the limits of profitable operation due to the slump in the market. Although a 92% localization ratio is required in order to achieve the program by September, 1985, the third year of the program, Company B does not believe that this is achieved.

As of July, 1985, the localization rate appeared to be around 70% in terms of the number of components. With regard to cast products, Company B reported that it would import them for an indefinite period as their localization would be rather difficult.

(2) Industrial boilers

The deletion program for industrial boilers with a capacity of up to 100 tons/hour commenced with the following Decree.

- Minister of Industry Decree No.73/M/SK/2/1985 (February 23, 1985)
  The obligation to use domestic components in the manufacturing of industrial boilers with a steam capacity of up to 100 tons/hour

The program is summarized in Table ANX V-19. While it is intended that the program be completed in two years, from July, 1985 to July, 1987, the import of such components as steel plates, tubes, instruments and ash removers is allowed for the time being. As boilers for exclusive use by power plants are not within the scope of the program, boilers for process plant are the program's main subjects.

Although the deletion program provides separate schedules for boilers with a capacity of up to 5 tons/hour and those of over 5 tons/hour, there is no provision for the steam pressure. As implementation of the program has just begun, its results cannot be assessed for some time to come.

(3) Shipbuilding and plant equipment

As ships are made of the machines, components and parts which have so far been described, not specific deletion program exists for shipbuilding. However, according to the Directorate for Shipbuilding Industries, items which have either been localized or which will be localized are anchors, windlasses, winches, pulleys, propellers and propeller shafts, wire ropes, bollard electrodes, carbide, oxygen, LPG, fuel and lubricants, side scuttles, life-buoys and life jackets, canvas, skylights and radio communication equipment.

As plant equipment has a similar background to shipbuilding, no specific deletion program exists for particular process plants. In addition, in the case of the construction of a large plant using a foreign loan, imported components may be used upon permission being granted by the Investment Coordination Committee (BKPM) if the existing domestic components pose problems in view of the supply volume, delivery date and quality of performance guarantee.

BKPM Decree No.66/AI/1981, issued on August 28, 1981 removed most machines for sugar or palm oil plants from the master list of components which may be imported, therefore prohibiting their import.

5.3 Some Difficulties Encountered in Implementation of Deletion Program

The deletion program has been playing an important role as the measures for pursuing the Government's policy to promote the development of machinery and metalworking industries in Indonesia. The large-scale assembly-type machinery manufacturers existing in Indonesia, in recognition of the importance of the program, have been devoting to adjust or reform their operations to meet the objectives of the program.

Nevertheless, despite the Government's efforts which have been taken for efficient implementation of the program, there seems to be some areas where the industries currently face the difficulties to cope with the achievement programs set by the Government, especially under the market conditions currently depressed in the country. Summarized below are observations on these problem areas found through the field surveys.

(1) Achievement schedule for the localization

Although most programs stipulate to be achieved within three years, in general it seems to be too tight. Particularly for the localization of components requiring advanced technology, it may require to have longer time for achievement, in view of time requirements for sub-contracting manufacturers to catch up such technology.

(2) Needs for adjusting the schedule

As the market conditions fluctuate, reflecting world trends as well as the economic conditions of the country, some manufacturers are causious to make additional investments which are required for adjusting or reforming their operations in line with the achievement schedule. There may be needs for considerations to adjust the programs to meet such conditions and also provide some incentives to them so that they may positively follow the achievement schedule set in the programs.

(3) Needs for guidance to the manufacturers

Some assembly-type machinery manufacturers face the following difficulties in interpretation of the guidelines:

1) If some of the in-house components which have so far been manufactured by a production line are designated as out-house components, the utilization ratio of the production line will drop and excessive personnel will be generated. In view of such problems, some manufacturers face difficulties to take immediate reaction.

2) There are some intermediate goods used for different final goods. Such intermediate goods are simultaneously subject to two or three achievement schedules for the localization of components which were individually set on each subsector of manufacturing and assembling into individual final goods. For example, 3 deletion programs exist for engines, which were set for automobile engines, two-wheel engines and unit diesel engines respectively with different schedules for the achievement of localization under these situations, the engine manufacturers who are engaged in manufacturing various types of engines have confusions to determine the direction of their operations.

In view of these facts, it is observed that, in order to promote the efficient implementation of the programs, it would be necessary for the government authorities to provide more practical guidances with the manufacturers so that they can follow the program in the most efficient manner.

(4) Needs for expanding reliable subcontractors

It is obvious that the effective implementation of the deletion program is largely dependent on the existence of reliable subcontractors who can manufacture required quality of components and parts at economical costs. As has been discussed earlier, the Indonesian metalworking industries are situated in shortcoming of the reliable subcontracting manufacturers. Along with the progress of the deletion program, it is important to take immediate measures for fostering and expanding reliable subcontracting manufacturers of components and parts which is the objective of this present study.

Section 6 FINANCIAL SYSTEM AND INSTITUTIONAL FINANCE IN INDONESIA

Section 6 FINANCIAL SYSTEM AND INSTITUTIONAL FINANCE IN INDONESIA

6.1 Organizational Structure of Financial Sector and the Activities of Main Banking System

6.1.1 Outline of Banking System

The financial system in Indonesia has been developed being based on the Principal Regulation on Banking enacted in 1968 (ACT No.14) and the Act concerning Central Bank of 1968 (ACT No.13), (hereinafter, reffered to as "the Central Bank Act"). Figure A-6.1 illustrates the present structure of official financial system in Indonesia.

The banking system in Indonesia is controlled by the Monetary Council and Bank Indonesia (BI), the central bank, and it comprises:

1) Deposit Money Banks mainly handling demand deposits,

2) Non Deposit Money Banks mainly handling activities other than the demand deposits, and

3) Non-Bank Financial Institutions (NBFIs).

The Deposit Money Banks consist of commercial banks mainly lending short-term loan and development banks lending medium- and long-term credits. The Non Deposit Money Banks consist of saving banks and rural banks (called as the secondary banks).

The NBFIs comprise State Pawn Services, development finance companies, investment finance companies, housing finance company, several insurance companies, credit cooperatives[1/], which belong to the direct control of the Ministry of Finance. Among them, two development finance companies and P.T. Askrindo, the state-owned credit insurance company, are based on the BI's equity participation.

There are also "Tunkula", providing merchant finance, "Arisan", a kind of mutual loan, and private pawn shops, which are traditionally engaged in non-organized financing to inhabitants or small establishments in the regions.

Note: 1/ Beside the credit cooperatives, there are five cooperative banks, which are classified into the commerical banks.

In the banking system, five state-owned commerical banks and one state-owned development bank have a dominant share of lending. These banks have 739 branch offices and their outstanding credits amounted to Rp.13,345 billions as of the end of 1984, accounting for 74.1% of the outstanding credits of the Indonesia's banking system excluding the BI's direct credits (Table A-6.1).

Beside the state banks, there are 69 private national banks, having 351 branch offices in total. The outstanding credits of these commercial banks amounted to Rp.3,042 billions as of the end of 1984, accounting for 16.9% of the country's banking system as defined above. In addition, there are 11 foreign banks (21 branch offices), 27 regional development banks (194 branch offices), and 5,823 rural banks. The amount of their outstanding credit and the respective share in the outstanding credit of the prescribed banking system was Rp.1,046 billions (5.8%) for the foreign banks, Rp. 510 billions (2.8%) for the regional development banks, and Rp.16 billions (0.1%) for the rural banks.

6.1.2 Monetary Council

The banking system in Indonesia is controlled by the Monetary Council. According to the Central Bank Act, the role of the Monetary Council is (a) to examine the monetary policy for the Government's decision aiming at the stabilization of currency, increase in employment and the improvement of living standard, and also (b) to monitor and coordinate the monetary management according to the Government's policy and under its responsibility.

The Council consists of the Finance Minister, the Minister of Trade and the governer of Bank Indonesia, among which the Finance Minister serves as the chairman of the Council. It is an independent organization and not the top organ for the central bank (Bank Indonesia). The secretariat of the Council is under control of the Ministry of Finance.

6.1.3 Bank Indonesia

Bank Indonesia functions as the central bank not engaging in commercial banking business under the Central Bank Act. The main role of Bank Indonesia includes the following four areas.

1) Issue of notes and coins

2) Administration of official gold and foreign reserves (including the control of payments and comittments in foreign exchange, and the preparation of foreign exchange budget)

3) Receipts and payments other than those made by the branch of the Ministry of Finance, and the lending of credit to the government within the approved national budget

4) Promotion of development in sound banking (the determination of interest level and interest structure, the preparation of lending budget, and the establishment of lending policy)

Bank Indonesia is responsible to supervise the operation of the banking system according to the Principal Regulations on Banking and the Central Bank Act. In this connection Bank Indonesia operates the following systems.

a) Provision of liquidity credit to refinance the credits lended at low interest rates by the handling banks under the institutional finance system. (The detailed description of the institutional finance is given in the subsequent part.)

b) Legislation of the commerical banks' reserves. At the time of financial sector reform in June, 1983, Bank Indonesia legislated the compulsory reserve to be made by the commercial banks, which was formerly set as an operational guidance. It requires the commerical banks to make reserve of 15% of the outstanding of demand deposit at the time of daily business closing and of 10% of the outstanding of the time deposit at the time of monthly business closing, which shall consist of 30% by current deposit in BI and the remaining 70% by cash and the securities designated by BI.

c) Discount window which is a means for financial adjustment established in June 1984. It is a system that Bank Indonesia discounts bills issued by the banks. As well as the systems mentioned in d) and e), this system aims at entering into open market. At present, however, this system proved effectiveness for stabilizing Rupiah currency in the movement of buying U.S. dollar due to weakness of Rupiah currency. The discount rate reached 21.5% in June, 1985, but it prevailed in around 19.5% in July of the year. The discount is made against one to three months of bill sight and within a ceiling set for each bank.

d) Deposit certificate of Bank Indonesia, which was established in February, 1984, as a means for absorbing a surplus fund of the banks. The deposit interest rate is 15% as of 1985.

e) Direct operation in market, which is based on a system that BI rediscounts the private paper issued by the designated eight companies and discounted by the banks. The rediscount is made against the sight of one to three months and with a ceiling of Rp.1 billion for each bank. The rediscount rate by Bank Indonesia is 18% point as of the mid-1985.

f) Special credit facility, which is a system established in September, 1984 when the Rupiah value suddenly fell against U.S. dollar due to a rush in buying U.S. dollar. This system proved effectiveness for the stabilization of Rupiah value. The credit is provided within Rp.1 billion for one lending and with a ceiling designated for each bank. The repayment is to be made within 6 months for 50% of the credit and within one year for the remaining 50%. BI's guidance is to cause the banks to make the repayments with deposits so that they can maintain a sound banking management.

In addition to the foregoing systems, Bank Indonesia provides direct credits to public enterprises. The outstanding of the direct credits amounted to Rp.2,356 billions as of the end of 1983. After that year, however, the credits decreased since a part of the credits had been paid out and also had been transferred to liquidity credit to banks. The outstanding of the direct credits decreased to Rp.870 billions at the end of 1984.

The outstanding of BI's credits, including the liquidity credits provided to the banking system, accounted for 53% of the total outstanding of credits provided by the banking system at the end of 1980. After that the share decreased gradually, and it was 41% at the end of 1984 (Table A-6.1).

6.1.4 Commerical Banks

The lending of short-term credits is the main business activities of the commerical banks as defined in Article 3 (1) b of the Principal Regulations on Banking. In this connection, demand and time deposits are also handled mainly by the commercial banks.

At present, there are 85 commercial banks consisting of 5 state banks (739 branch offices), 69 private national banks (351 branch offices), and 11 foreign banks (21 branch offices).

(1) State commercial banks

The state commerical banks are listed below. All of these banks were established in 1968 under the relevant acts.

a) Bank Negara Indonesia 1946 (BNI'46)
b) Bank Rakyat Indonesia (BRI)
c) Bank Expor Impor Indonesia (BEII)
d) Bank Bumi Daya (BBD)
e) Bank Dagang Negara (BDN)

They locate the principal offices in Jakarta and branch offices in the major cities. They are authorized for foreign exchange transactions.

The main fields for their business are formally designated as follows.

BNI'46:	Manufacturing sector
BRI:	Cooperatives, farmers, and fisheries
BEII:	Producers, processors and traders of export commodities
BBD:	Agricultural estates, forestry, and logging
BDN:	Minings

Currently, however, they are expanding their business fields so as to meet changes in economic activities, generally destining to trades, manufacturing and construction sectors. The state commerical banks have a dominant share in the lending of credits. The outstanding of their credits amounted to Rp.12,036 billions at the end of 1984, accounting for 66.8% of the total outstandings of the credits provided by the banking system, excluding the BI's direct credits. The outstanding of the credits provided by the six state banks, including the state development bank, amounted to Rp.13,345 billions, accounting for 74.1% of the total outstandings except for the BI's direct credits (Table A-6.1).

(2) Private national banks

There are 69 private national banks (351 branch offices) operating as of the end of March, 1984. They are limited liability companies owned by the individuals of Indonesian nationality and/or by the organizations or entities which are in the ownership and management of Indonesian nationality under the legislated restrictions.

There are 45 banks locating the principal offices in Jakarta, 7 banks in Surabaya, 5 banks in Bandung, 3 banks in Medan and 9 banks in other cities. These banks in general are engaged in the banking business mainly with traders and small-scale manufacturers. The assets of the private national banks are small as compared to those of the state banks.

Bank Indonesia has promoted the amalgamation among the private national banks to enhance their management capability and also improve their operational efficiency. The credits of the private national banks currently showed a rapid growth, and the outstanding of their credits reached Rp.3,042 billions at the end of 1984, although its share was still 16.9% of the total outstanding of credits provided by the banking system excluding the BI's direct credit.

(3) Foreign banks

Foreign banks were permitted to establish their branch offices in Indonesia according to the Government Regulation No. 3 on Foreign Banks enacted in 1968. That regulation provides for the legal status of foreign banks, equity capital, the employment of staff, the remittance of profits, the location of branch offices, the fields of business, and the procedure for establishing the branch offices.

There exist 11 foreign banks including one joint-venture between a foreign bank and a national private bank. They locate the principal offices in Jakarta and are engaged in the banking business in this area.

6.1.5 Development Banks

The main business of the development banks is to provide medium- and long-term credits as defined in Article 3 (1) b of the Principal Regulations on Banking. The Act also provides that the development banks shall raise funds by means of time deposits and the issuance of medium- and long-term bonds. However, there are difficulties in raising funds through the issuance of bonds, because of undeveloped capital market in Indonesia. Under these situations, the development banks are dependent on funding with the fund of provincial/central governments, foreign aid, pension funds and BI's liquidity credits.

There are 29 development banks consisting of one state development bank (Bank Pembangunan Indonesia-BAPINDO), one private development bank (P.T. Bank Pembangunan Industri) and 27 regional development banks (Bank Pembangunan Daerah-BPD).

(1) State development bank (BAPINDO)

BAPINDO is a state development bank which was formed by reorganizing the Bank Industry Negara, a state bank established in 1951. The bank provides medium- and long-term credits and capital investment for industrial development projects mainly in manufacturing, marine transport, tourism and construction sectors. In the manufacturing sector, the credits for metal processing projects have currently been increasing, but the majority of those projects are large-scale ones.

In comparison with the state commercial banks, the amount of credits provided by BAPINDO is comparatively small. The outstanding of BAPINDO's credits accounted for 9.8% of the total outstanding of credits provided by the six state banks at the end of 1984.

BAPINDO also made capital investment, aiming at enhancing the capital structure of private pribumi enterprises, increasing the equity capital of Indonesian investors in joint-ventures formed with foreign investors, and thereby promoting localization of industries. However, the achievement is not so distinctive.

Beside the foregoing activities, BAPINDO undertakes participation in syndicate loans, co-finance with regional development banks, and technical assistances to local banks.

(2) Regional development banks

The regional development banks are established under the Provincial Act, and are engaged in banking business under the license granted by the Ministry of Finance according to the recommendation made by the BI's Board of Director and the Minister of Internal Affairs. The regional development banks mobilize funds available in the regions and provide credits to private enterprises which can contribute to regional development, while undertaking the receipts and payments of the provincial governments. There are 27 regional development banks, each established in 27 provinces and having 194 branch offices located in the main cities of each province.

Their business scale in terms of provided credits is extremely small as compared to the state banks. Their share is about 3% of the total credits provided by the banking system except for the BI's direct credits (Table A-6.1).

(3) Private development bank

P.T. Bank Pembangunan Industri is the only private development bank. The bank operates in limited activities and with a small amount of credits provided.

6.1.6 Other Financing Institutions

Beside the major banks, there are a innumerable number of financing institutions. These institutions are saving banks, rural banks, state pawn services, development finance companies, investment finance companies and insurance companies.

(1) Saving banks

There are one state saving bank and two private saving banks. The Principal Regulations on Banking [Article 3 (1) c] defines the main activities of the saving banks as those undertaking investment to securities with the fund mobilized through saving deposits. In addition to these activities, the banks are admitted to provide housing credits and also to provide credits to depositors.

(2) Rural banks

There are 5,832 banks consisting of 3,574 village banks, 2,079 paddy banks, 169 petty traders banks, and 1 employee bank, each having one cash office. Majority of these banks are located in Java, and Bali. They handle time and saving deposits and, based on deposited funds, providing medium- and long-term credits to villagers and small retailers at very small amount.

(3) Pawn shops

There are 474 state pawn services. Their finance is limited to Rp.100,000 in maximum and the term of three to six months.

(4) Development finance companies

The development finance companies are engaged in making investment or providing long-term investment credits to industrial projects, and also undertake consulting services for medium- and small-scale enterprises, credit guarantee, and arrangements for organizing joint-ventures. There are three development finance companies as enumerated below.

1) P.T. Indonesia Development Finance Company (IDFC or UPPINDO)

A joint-venture company established by BI (75%) and the Development Finance Corporation of the Netherlands, a state-owned corporation in the Netherlands (25%).

2) P.T. Private Development Finance Company of Indonesia (PDFCI)

A joint-venture company established by BI (22.1%), the International Finance Corporation and Japan Security Credit Bank.

3) P.T. Bahana

A Company owned by the Government (80%) and BI (20%).

Their investment activities are modest, because of a limited number of viable projects and time-consuming for materialization.

(5) Investment finance companies

There are nine investment finance companies, including 5 joint-venture companies established by Indonesian state commercial banks and foreign banks, and one joint-venture company established by BI and a foreign bank. They are mainly engaged in short-term capital investment such as deeling, guarantee issuance and/or underwriting of trade bills and promissory notes, as well as the transaction of deposit certificates.

(6) Credit insurance companies

There are two credit insurance companies, i.e., P.T. Askrindo and Perusahaan Umum Pengembangen Koperasi (PKK)[1/]. P.T. Askrindo was established by the Government and BI in 1971 for the purpose of providing banks with credit insurance and guarantee, as well as export insurance[1/]. It aims at promoting the credit facilities for small-scale enterprises which were enforced in the First Five-Year Development Plan. It was primarily engaged in the credit insurance added with credit guarantee, and currently handles re-insurance of nonlife insurance, as well as marine insurance. PKK is an institution providing insurance for banks' credits provided to cooperatives.

Note: 1/ Asuransi Expor Indonesia (ASEI) was newly established in November 30, 1985 who has succeeded export insurance business operated by P.T. Askrindo until that time extending the business for banks and exporters. The report above was submitted before the establishment of ASEI.

6.1.7 Capital Market

(1) Interbank call market

In 1974, the interbank call market was opened for 140 banks registered as the member in the Jakarta clearing house. The market functions to transact promissory notes and deposit certificates with in 7 business days call. At present, several financing institutions other than the banks participate in the market. There is no open market for bills and BI's deposit certificates, nor repurchase market for bills.

(2) Long-term capital market

1) Securities market

The securities market was established in 1952. However, it was not active because of extreme inflation and little interest of the public. Hence the market was effectively closed in 1958. The Government currently promoted stock exchange aiming at creating investment opportunities for Indonesian investors and stimulating the public interest for investment. Thus the stock exchange was reactivated in 1977. On the other hand, the Government set up a national unit trust-P.T. Danareska. It is engaged in underwriting new issues and issuing back-to-back certificates and mutual fund certificates to the public. However, a limited number of companies is listed in the stock exchange and the market activity is modest.

2) Bond market

The issuance of bonds was authorized in 1978. However, the first bonds were issued by three public enterprises in 1983, which were 5-years bond of 15.5% coupon rate. The market is still in a trial stage.

6.2 Growth and Structural Change of the Financial Sector

6.2.1 Overview of the Banking Activities

The banking system, as stated earlier, has a dominant share in the financial system of the country. The short-term credits from the banking system currently showed a rapid growth. The outstanding of the short-term credits provided by the banking system amounted to Rp.18,891 billions at the end of 1984, which was about 2.9 times of that as of the end of 1979. In real terms it grew at 8.4% per annum[1/] which was considerably higher than the GDP growth of 6.1% per annum (Table A-6.1).

Majority of the bank lending is short-term credit. It increased with a conspicuous growth, and accounted for about 66% of the total outstanding of credits provided by the banking system at the end of March, 1984 (Rp.16,135 billions)[2/]. On the other hand, the growth of investment credit was modest. Hence its share in the total outstanding of credits decreased from 49% at the end of March, 1980 to 34% at the end of March, 1984.

In 1979, the mining sector accounted for 65% of credit from the banking system, followed by 25% for the manufacturing sector. Since then, the investment credit for the mining sector decreased, while the credit for the manufacturing sector conspicuously increased so as to reverse its position to the share of the mining sector. As of the end of March, 1984, distribution of the credit was 43.8% for the mining sector, 18% for the service sector, 11.9% for the agriculture sector, 11.6% for the mining sector, 5.9% for the trade sector, and 8% for other sectors (Table A-6.2).

The banking system is traditionally based on short-term lending. If borrowers require long-term credits, the short-term credits are customarily revolved to make long-term funds available for the borrowers. Hence, it is deemed that the lended amounts of short-term credit should have included those utilized for long-term demands.

Notes: 1/ Calculated by using GDP deflator (constant 1973 prices)

2/ Excluding inter-bank loans, credit to the government, credit to non-residents, special liquidity credit, and foreign exchange portion of foreign aid.

Table A-6.3 shows the proportion of credit provided for the public enterprises and the private sector, and their proportion to the domestic investment. The credit for the private sector showed a rapid growth. As is shown in the table, the private sector accounted for about 68% of the outstanding of credit from the banking system at the end of 1983, in which about 70% was short-term credit and the remaining 30% was medium- and long-term investment credit. It is estimated that the fixed capital formation of the private sector accounts for about 12% of the national consumption in that year, amounting to Rp.8.5 trillions in nominal terms. In comparison with this figure, it is estimated that the investment credit from the banking system accounts for nearly 40% of the fixed capital formation made in the private sector in 1983. Since the manufacturing sector holds a great share in the investment credit, the portion of investment credit for the fixed capital formation of the sector may be higher than the above. Nevertheless there is an implication that the investment credit from the banking system accounts for a relatively small proportion to the private investment.

6.2.2 Deposits of the Banking System and the Resources for the Bank Credits

(1) Overview of deposits of the banking system

Table A-6.4 shows the growth of deposits in the banking system in Indonesia. Total deposits of the banking system including deposits in BI increased by 2.8 times from Rp.5,880 billions at the end of 1979 to Rp.16,571 billions at the end of 1984. In real terms it grew at 12.5% p.a., far over the GDP growth (6.1% p.a.).

It was substantially contributed by the government deposits. The government deposit remarkably increased up to 1981, accounting for about 58% of the total deposits in the banking system at the end of 1981. Since then, the deposits from the private sector showed a substantial growth, and it reached 56% of the total deposits in the banking system at the end of 1983. The substantial increase in the government deposit raised from the revenue of oil sector (including LNG) which increased up to 1981, and it was the major source for the BI's liquidity credit provided to the banking system. Since 1982, however, the increase in the government deposit with BI tended to level off reflecting stagnation in the oil revenue. Under this circumstance, it is likely that the source for liquidity credit would become stringent to meet increasing credit demands. Hence, in June, 1983, the Government enacted a financial sector reform to make substantial reform of the financial structure.

(2) Deposit shares and deposit-loan ratios of the Deposit Money Banks

Table A-6.5 shows the deposit share and deposit-loan ratios of the respective banking group. The deposit share of the state banks tended in a decline in recent years. It decreased from 75% at the end of March, 1982 to 67% at the end of March, 1984. On the other hand, the share of private national banks increased from 13% to 20%. The deposit-loan ratio of the state banks decreased from 86.2% at the end of March, 1982 to 64.8% at the end of March, 1983. It was 74.5% at the end of March, 1984. The deposit-loan ratio of the state banks is low. This fact manifests their management characteristics greatly depending upon the liquidity credit. The deposit-loan ratios of the private national banks were around 100% except for 1983 when the economic environments were deteriorated. The deposit-loan ratios of the regional development banks were 125% in 1982, 97% in 1983, and 117% in 1984.

6.2.3 Credit and Interest Rates Policy

(1) Liquidity credit system

The most important instruments of credit policy in Indonesia are the credits conducted by BI. They were introduces as a means of chanelling surplus government funds into the economy while providing additional credit to priority borrowers. The credits comprises two components, namely:

(a) BI's direct credits to public enterprises and government organizations, and

(b) BI's indirect credits through the banking system, so-called "liquidity credit".

The category (a), as shown in Table A-6.1, accounted for about 34% of the total outstanding of credit of the banking system including the BI's direct credit at the end of 1979, but it decreased to only 4.6% at the end of 1984. This was due to the Central Bank's sound monetary management policy for reducing direct credit. The collected funds were partially transferred to the "liquidity credit".

On the other hand, the category (b) grew at 44% p.a. in nominal terms, and its outstanding increased to Rp.6,938 billions at the end of 1984 which was 6.2 times compared with that at the end of 1979. It

accounted for 38.5% of the total outstanding of credit from the banking system excluding the BI's direct credit. Thus, BI has become an important source of funds to the Deposit Money Banks.

The BI's indirect credit enabled the banking system particulary the state banks to provide a substantial volume of lending to the private sector. Table A-6.6 shows the bank lending to the private sector and the composition of liquidity credit involved. The BI's liquidity credit accounts for about 31% of total lending to the private sector, in which about 46% is for the investment credit. Thus BI has been a major contributor to the process of financial intermediation, particularly in respect of the provision of term financing for the private sector.

(2) Financial policy prior to the 1983 financial sector reform

The financial policy in Indonesia, as stated has been developed mainly through the liquidity credit system. The Government designated priority activities which should be eligible for the special credit facilities. For the designated activities the state banks provided working capital, export/import and investment credits at preferential interest rates, a proportion of which was refinanced by BI at low interest rates.

The liquidity credits effective before the 1983 financial sector reform were short-term credits for 6 designated fields covering 19 subsectors, and medium- and long-term credits consisting of general investment credit program (KIB) and permanent working capital and investment credit program for small enterprises (KIK/KMKP). KIB was divided into 4 categories set in terms of credit ceiling. Although proportion of BI's refinance and discount interest rates vary depending upon the category, the BI's refinance was made at the interest rate of 3 - 4% and with the coverage of 70 - 75% of the lending amount. On the other hand, BI regulated the lending interest rates and ceiling of the state banks for these credit facilities. The lending rate charged by the state banks was 12.5% point in average (Table A-6.7).

Commercial loans were lended mainly by the private national banks. As the lending rate of the private national banks was not regulated, their lending rate was 26% point in average. BI also regulated the deposit interest rate of the state banks. It was 9% per annum until the financial sector reform. The private national banks paid deposit rates at 19 - 20% point, because the private banks were not subject to the deposit rate regulations. Large discrepancies emerged between the returns available to depositors with state banks and private banks.

However, since public enterprises and official government bodies were generally obliged to maintain their accounts with the state banks, the latter was able to pay lower rates without losing their deposits to the private banks. Nevertheless, the state banks should be dependent upon BI's liquidity credit for lending source.

(3) Outline of the financial sector reform enacted in June, 1983

The Government enacted the financial sector reform in June, 1983, aiming at national financial stabilization and strengthenning of mobilization in the domesitc financial resources. In this context the substance of the reform was to transform the financial system from that entirely controlled by the Government such as the BI's liquidity credit, the constrained lendings and the regulated interest rates both of credit and deposit, toward the financial system based on market mechanism. Outline of the reform is summarized below.

1) Reorganization of special credit programs

The special credit programs were reorganized and reduced to a minimum extent that can fullfil the objectives of the Fourth Five-Year Development Plan, and the onlend rates of the programs were set with a simplified rate structure. The reorganized programs are summarized in Table A-6.8.

Given priority in the reorganized programs was the financial assistance for (a) the protection of the economically fragile strata, (b) the fostering of small-scale industries, (c) the promotion of export industries, (d) groupnization of the small-scale manufacturers, (e) the fostering of small farm-holders and the development of farm land by farmers, (f) education and vocational trainings, and (g) housing. The reorganization abolished the short-term general credit previously made and Category II to IV of KIB which were credit for medium- and large-scale enterprises, while setting new programs such as (a) short-term working capital credit up to Rp.75 million which is equivalent to the former KIB-Category I, (b) Keppres 29/1984 which is short-term credit of working capital required for procurement by government organizations, and (c) export credit. The reorganization also adopted a simplified onlend rate structure. A 12% point was applied to 17 programs; except for the short-term working capital credit up to Rp.75 million and Keppres 29/1984 set at a 15% point, export credit set at a 9% point, and housing and education credit set at a 5 to 9% point.

2) Deregulation of interest rates and deposit rates

The lending rates and terms for the general credits provided by the state banks, except for the special credit programs, were deregulated. The deregulation was applied also to the deposit rates paid by the state banks, except for 24-month time deposit for which the deposit rate must be higher than 12% point. At the same time BI stopped to subsidize the deposit rate paid by the state banks for 24-month time deposit.

3) Deregulation of credit ceiling

The ceiling of credits set for the banks was abolished.

4) Other measures

In order to protect any confusion raised from the above reform and also to prepare open market operation, BI enacted such systems as regulating the banks' reserves, establishing discount window, issuing BI's deposit certificates, and rediscounting private papers (refer to Section 6.1.3).

(4) Movements after the financial sector reform

Table A-6.5 shows the marginal deposit-loan ratio in March, 1984 against the deposit-loan ratio in March, 1983 by the respective banking group. It is 134.1% for the state banks, 110.7% for the private national banks, and 250% for the regional development banks. There is an implication that the mobilization of domestic funds has become effective after the reform, although it is too early to assess the effect of the reform.

Table A-6.9 shows an analysis of the composition of deposits with demand deposit and time deposit. It indicates that the proportion of time deposit has increased except for the regional development banks. Especially, the time deposit in the state banks has substantially increased, and this implies that the funding cost of the state banks has rised accordingly.

The time deposit rates paid by the state banks rised to a level of the rates paid by the private national banks, because of deregulation of the deposit rates applied to the state banks. In addition, increases in the proportion of time deposit in the state banks and the reduction of BI's liquidity credit provided to the banks caused a rise of funding costs for the state banks (Table A-6.10).

Table A-6.11 shows the deposits of the banking system by the period of maturity. Before the reform, the amount of 24-month time deposit accounted for 62.7% of total deposits, but the time deposit in the maturity shorter than 12 months accounted for a majority as of the end of March, 1984. The rate applied for 24-month time deposit is, however, almost the same for 12-month time deposit. Hence the banks have to manage with unstabilized and high cost funds which may adversely affect the management. Credits of the banking system, particularly short-term credits, currently tended in a steady growth as given in Tables A-6.1 and A-6.5.

In the long time view, it is likely that the financial sector reform enacted in June, 1983 will stimulate the effective operation of the banking system. However, the abolishment of BI's refinance for KIB-Category II to IV and short-term general credits provided by the state banks increased the funding cost of the state banks, and further, because of deregulation of the interest rates, the interest rates charged to non-priority borrowers rised swiftly.

Creditable large-scale enterprises would be possible to borrow low cost loans from external sources, while it is difficult for medium- and small-scale enterprises to get such funds. On the other hand, as previously mentioned, BI's special credit program remains for small-scale enterprises but the low interest loan from Rp.75 million up to Rp.150 million had been abolished. Therefore, the medium-scale enterprises are rather difficult to obtain low interest loans.

6.3 Institutional Finance System for Small- and Medium-Scale Industries

6.3.1 Definition of Small- and Medium-Scale Industries

There are different definitions used for the small- and medium-scale industries. One is the definition of Central Statistic Bureau set in terms of the number of persons engaged (households with under 4 perons, small-scale with 5 - 19, medium-scale with 20 - 99, and large-scale with over 100). The second one is the definition used by the Ministry of Industry for small-scale industries, defining in terms of assets, i.e., (1) total investment on machinery and equipment maximum Rp.70 millions, and (2) investment amount per worker maximum Rp.625,000. And thirdly BI also sets the definition of small-scale industries with two conditions, i.e., (1) the assets maximum Rp.100 millions, exclusive of land and building, (2) 50% and above of the equity capital held by Indonesian indigenous entrepreneur(s), and majority of directors consisting of Indonesian indigenous people. Otherwise, 75% and above of the equity capital should be held by Indonesian indigenous entrepreneur(s).

BI's definition is applied to the special credit programs for the small-scale enterprises. Hence, for those programs, eligible enterprises are subject to that definition, that is, those satisfying the indigenousness conditions and having the assets excluding land and building maximum Rp.100 millions in the case of the manufacturing and construction sectors and maximum Rp.40 millions in the case of other sectors. However, it seems to be practically difficult to define the scale of enterprises in terms of assets, since there may be difficulties in assessing the value of assets in a strict manner and, furthermore, the value reported by enterprises might not necessarily be correct. Likely, the number of persons engaged does not always represent the scale of enterprises, because it may vary depending upon variation of industries and also mode of business even in an industry. Referring to such argument, for the financial statistics, the scale of borrowers is often classified with each lending amount of loans, because the lending amount can be deemed to represent creditability of enterprises which is relative to the scale.

The BI's definition has no criteria applicable for classifying the small-scale enterprises into subdivision of the scale. Hence, the enterprises classified as a small scale under that definition include household workshops. Nevertheless, for the sake of study, the borrowers of KIK/KMKP are deemed as the small-scale enterprises, and the borrowers of the former KIB-Category I - IV or the borrowers of working capital/investment credit less than Rp.75 millions under the present

program (hereinafter called the "New Kelayakan") are deemed as the medium-scale enterprises.

6.3.2 Special Credit Programs for Industrial Development

In Indonesia, the institutional finance broadly consists of two components. One is the BI's direct credit and the other is indirect credit provided through the banking system by the Government and/or BI. The direct credit once increased to a substantial amount, but it currently become decreased according to the altered Government policy.

There are three types of the indirect credits. These are (a) the credit based on the BI's liquidity credit, (b) the credit based on the Government fund which is provided directly to the handling banks, and (c) the credit based on the Government fund which is provided to the handling banks via BI. Among the special credit programs enumerated in Table A-6.8, (1) KCK, (2) Mini Credit of KUPEDES and (14-a) Public Housing Program referred to in the table are based on the Government fund. These programs were executed for the purpose of social welfare or social aid rather than industrial development.

Besides these programs, there are a number of two-step loan programs for industrial development which have been set on the basis of soft-term loan provided under foreign aid. Table A-6.13 shows the representative ones of those two-step loan programs. There are some other loan programs which are not listed in the table, such as of fund financed by KfW in West Germany for BAPINDO. Table A-6.14 shows the current record of the outstanding of investment credit by economic sectors.

For the foregoing two-step loans, there are two types of arrangements. One is to set up a two-step loan program at the top of the Government or BI. In this case, the Government or BI is the borrower of aid loan, and the lending to end borrowers is handled by the banks designated by the Government or BI. For operation of the program, the Government or BI bears foreign exchange risk, coordinates any conflict with the existing credit programs or systems, and determines priority fields eligible for the program. Another arrangement is the direct borrowing of aid loan by a designated handling bank. In this case, the designated bank will make a loan agreement with the aid financier under the Government's guarantee and, based on the thus raised fund, it lends program loan to eligible borrowers.

It is the Government policy that whereas the private banks as well as the state banks may be designated as the handling banks for the former type

of arrangement, for the latter type of arrangement the designated bank is selected from among the state banks. The characteristics of these loan programs are featured with a package assistance combining the provision of term loans and technical assistance.

Among a variety of existing credit programs, KIK/KMKP, New Kelayakan and Keppres are subject to small- and medium-scale enterprises, in which KIK/KMKP have been executed since long time before.

6.3.3 KIK/KMKP

(1) Outline of the program

In the First Five-Year Plan, as an instrument for promoting private investment for industrial development, the Government set up a medium- and long-term investment credit system with the terms and conditions of (a) 5-years term, (b) interest rate at 12% p.a., (c) loan coverage not more than 75% of project cost, and (d) provision of adequate securities. However, most of small enterprises were unable to satisfy the prescribed requirements for borrowing. Hence, in December, 1973, the Government set up a special credit system designed for small-scale enterprises which consists of an investment credit component named "Kredit Investasi Kecil (KIK)" and a permanent working capital credit component named "Kredit Modal Kerja Permanen (KMKP)".

KIK/KMKP are based on World Bank loan (25%) and BI's own fund provided in the form of liquidity credit (55%). The World Bank loan is provided under its Small Enterprise Development Project (SEDP) which consists of the loan component and technical assistance component that is to provide trainings for loan officers of the handling banks and technical assistance to component projects. More specifically, the technical assistance includes the primary trainings for the officers in charge of the BI's branch offices and of the branch offices of the handling banks which are conducted at BI's training centers (LPPI) and the training facilities of the handling banks, and on-the-job trainings conducted for them at the Project Management Units (PMU) located in the BI's principal office and main branch offices and also at the Regional Project Management Units (RPMU) located in 13 regional offices. The objectives of these trainings are to upgrade and enhance the practical capability of loan officers and other officers in charge and to make them provide appropriate guidance to small enterprises for their project formulation and preparation.

The authority to make loan approvals for KIK/KMKP application is delegated to the handling banks, under which the branch managers of the handling banks have authority to make approvals for almost all of the application. For this end, the handling banks are obligated to set up a special window for KIK/KMKP and also to assign officers in charge who are trained at the RPMU.

BI annually allocates loanable funds of liquidity credit for KIK/KMKP to each branch office of the handling banks. As the SEDP is incorporated into the BI's liquidity credit provided for KIK/KMKP, the World Bank entrusts BI the authority to manage the SEDP loan utilized for KIK/KMKP, provided that BI shall submit the Bank annual reports summarizing the performance of KIK/KMKP, including the number of applications, approvals and rejects, the amount of loan commitment and disbursement, and the outstandings of loans. The Bank's monitoring mission visits BI and the handling banks every three months to check and monitor the progress. The terms and conditions of KIK/KMKP are enumerated in Table A-6.8.

(2) Rules for the selection of handling banks

Besides the six state banks appointed as the handling banks, BI appoints additional handling banks from among the private national banks and the regional development banks. For this end BI periodically evaluates the soundness of those banks to classify them into four ranks of (a) "Sound", (b) "Fairly Sound", (c) "Not Fully Sound" and (d) "Not Sound", and appoints the banks ranked as (a) and (b) to be the additional handling banks. BI also allocates loanable funds of liquidity credit to the additional handling banks by taking their assets into account.

(3) Fund flow

Like as the other credit programs, the BI's liquidity credit for KIK/KMKP is provided in the manner of rediscounting the loans lent by the handling banks. The proportion of BI's rediscount accounts for 80% of the loans (BI's own fund; 55%, and the World Bank fund, 25%). The remaining 20% is provided by the handling banks with their own fund.

(4) Claim to P.T. Askrindo on insurance payment, and foreclosure

The banks are allowed to make claim to P.T. Askrindo on insurance payment at the time of 3 months after the due date of borrower's repayment, because the banks are obligated to pay efforts for

collecting the debts during that period. The claim on the insurance payment is used to be done within the period of subsequent one year.

Usually, the handling banks hold security. The disposition of the security is executed in accordance with a judgement made by the National Credit Control Committee (Panitya Ursan Piutang Negara-PUPN), and the distribution of recovered money is made according to the priority of the registered right for the security. The distribution between the handling bank and the insurance company is complied with the mutual proportion of their credits.

(5) Application, loan appraisal, reporting, etc.

1) Application form

For each of KIK/KMKP, the applicant shall submit an application filled with the amount, purpose and duration of loan, togethers with the following documents:

a) Project description
b) Copy of business licenses/certificates
c) Copy of the certificate of registration
d) Financial statements, including balance sheet and incom statement
e) Letter of guarantee

2) Loan appraisal

The loan appraisal consists of the following two components.

a) Items for application

Applicant, type of buiness, business licenses, record of debts (bank applied, other banks, non-bank financiers), items for this application, project outline, financing plan, security, etc.

b) Detailed items for appraisal

Creditability analysis, evaluation of management, buiness, and sales, and financial analysis.

3) Confirmation of the use of loan

a) It is required for the applicant to submit the evidence of uses for the loan over Rp.500,000, and to make a transferred payment for the loan over Rp.1,500,000.

b) The banks maintain a check list for the loan release.

4) Report to BI

The handling banks are required to submit BI monthly reports summarizing the number of applications, approvals and rejects which are classified into 10 sectors.

(6) Present situation of operation

At the end of April, 1985, the outstanding number of the credit climbed to 165,521 for KIK, 444,319 for KMKP, and 609,840 in total, and the outstanding amount was Rp.381,269 millions for KIK, Rp.899,019 millions for KMKP, and Rp.1,270,288 millions in total. In comparison with the outstandings of credit at the end of December, 1979, KIK was 3.8 times, KMKP was 5.8 times, and total amount was 5.0 times (Table A-6.15).

The following are the status of utilization of these credits.

1) Status of utilization by regions

For KIK and KMKP, Java holds 50% and the outer island holds the remaining 50% (Table A-6.16).

2) Status of utilization by sectors

For KIK/KMKP, the trade sector accounts for a high share; about 30-40% for KIK and about 70% for KMKP, while the utilization in the manufacturing sector is relatively low; 12-13% for KIK, and 11% for KMKP (Table A-6.17).

3) Share of amount handled by each handling bank

The BRI, a state commercial bank holds a share of about 50%. The six state banks' share dominated at 86.5% at the end of December, 1983, but their share declined annually, while the shares of regional development banks' and private commercial banks gradually grew (Table A-6.18).

The above analysis indicates that these programs were substantially utilized in the local regions and for the regional life of consumption rather than for the industry. It implies that they are supporting small types of buiness for daily life.

(7) Overdue loans and bad debts

BI's classification of loan collectibility with which BI requires periodic reports from the Banks is of four grades: "Sound", "Not Smooth", "Doubtful", and "Bad Debt". In general, "Sound" represents a regular repayment, "Not Smooth" represents 1 to 6 months delay but having good prospect of rcollection, "Doubtful" 6 months to 1 year delay and having poor prospect for collection, and "Bad Debt" no possibility for collection. These criteria for assessment are considerably subjective. Table A-6.19 shows the status of delayed repayments at the end of April, 1985 and Table A-6.20 shows the 4 categories of the debt repayment status tabulated on KIK, KMKP, KIB, and BIMAS/INMAS. The rate of overdue loans under "Sound" against total loan amount is very high at 28.6% for KIK and 23.2% for KMKP. That of "Bad Debt" stands at 6.4% for KIK and 3.9% for KMKP. The share of KIK/KMKP in outstandings of non-collected credits subrogated by P.T.Askrindo climbed to 92%, and it caused big deficit of Rp.44.9 billions of the company for the fiscal year 1983. The number of overdue cases under "Sound" accounted for 24% of the outstandings of credits for KIK, and 25.4% for KMKP. Management work in connection with the delay settlement seems to cause substantial burden. However, in the reality, the overdue portfolio management does not work satisfactory, and, due to this fact, the status of delay grows more serious.

6.3.4 KIB

This system was established in 1974 in order to facilitate the promotion of domestic investment by private sector. The system has been amended several times and eventually has been abolished at the time of the financial sector reform in June, 1983. Outline of KIB thus abolished is summarized below.

OUTLINE OF KIB SYSTEM

Kinds	Category-I	Category-II	Category-III	Category-IV
Maximum loan amount (Rp. millions)	up to 75	75 - 200	200 - 500	500 - 1,500 (BAPINDO; 2,500)
Purpose	Equipment	Equipment	Equipment	Equipment
Handling banks	6 state banks			
Interest rate	10.5%	12.0%	13.5%	13.5%
BI refinance interest rate	3%	3%	4%	4%
Min. self finance by borrower	20%	25%	30%	35%
Security requirement	Completed facilities plus collateral at 50% of loan amount			
P.T. Askrindo's insurance	Handling banks may request for insurance/ guarantee, but subject to Askrindo's acceptance			

Although there is no statistics showing KIB's performance of loan in hand, it is supposed to be equivalent to the outstanding of investment credit for the manufacturing sector as shown in Table A-6.14. In comparison of these figures with the outstanding of KIK, the growing rate and shares of the both systems are as follows.

	1981	1982	1983	1984
KIK	84.6(9.6)	45.8(9.4)	22.9(10.4)	2.3(11.4)
Invest. credit	39.0(33.2)	37.5(28.8)	121.0(35.8)	54.7(37.0)

Note: Figures in parenthese represents the shares for the manufacturing sector.

The growth of KIK in the manufacturing sector is slowing down, while KIB marks a steady growth. The shares of the manufacturing sector in the total outstanding are 10% for KIK and over 30% for KIB. The status

of delayed repayment for KIB marks similar number to KIK/KMKP for the grades up to "Doubtful", but the last efforts for collections are expected to bring very good results, although the settlement may require a little time. In the case of KIB, because of the limited number of loan lending, a precise administration system may be applied.

6.4 Outlook of P.T.Askrindo (The National Credit Insurance Company)

6.4.1 Background and Profile of Business

It is a credit insurance/guarantee and export insurance company established by the Government and BI in 1971. Although the reinsurance of nonlife insurances and the marine insurance were added to its business, the main business is the credit insurance accompanied with the credit guarantee. By the classification of its business, it deals with 2 types of credit insurance, "the automatic insurance" and "the insurance case by case". By the former type of insurance, the bank may cover insurance automatically after granting the loan to a borrower, while the latter type is subject to the acceptance of the insurance company. Thus, the latter type of insurance is evidently in the area of the credit insurance with the right of selection for acceptance that is "the credit guarantee", while the former is a credit insurance without liberty of choice for the insurer.

The credit insurance business of the company by its classification is summarized below.

1) Loan scheme released for Automatic Credit Insurance

   5 items; KIK/KMKP, KMK, KEPRES and KEB with credit ceiling of Rp.2 millions (Common Exploitation Credit).

2) Loan scheme released for Selective Credit Insurance

   Loan schemes other than the above 1) and KEB exceeding the credit ceiling of Rp.2 millions. The old KIB (incl. Kelayakan) is of this cetagory.

   The insurance fee is to be paid at one time at the rate of 1-5% of the loan amount.

6.4.2 Operation Status

Table A-6.21 and Table A-6.22 shows the record of the insurance/guarantee provided by the company.

The amount of guarantee provided by the company drastically declined in 1983 by 29.5% compared with the previous year; decrease of 44.9% for KIK, decrease of 23.8% for KMKP and decrease of 25.6% for KEB. It is also observed sharp decreases in all economic sectors; -49.2% in agriculture, -47.9% in manufacturing, and -21.1% in trade.

In 1984 a slight increase of 5.4% was observed, but in comparison with the record in 1982, it is still lower by 25.4%. Especially, the decrease is remarkable for the agriculture sector; the sector in 1984 continued to record in minus pace of -40% compared with 1983.

As shown in Tables A-6.14 and A-6.18, the outstandings of KIK/KMKP showed a remarkable decrease in the local regions, particularly the KIK of the state banks having overwhelming share in its total credits largely decreased. Thus the loan number of KIK is decreasing since 1981, whereas the loan number of KMKP tends in a slight increase. It implies that small enterprises have been discouraged for investment, although requiring working capital, because of current depression in domestic markets. It seems to be hardly expected that the insurance will substantially increase, since the increase of KIK/KMKP lending is unlikely.

6.4.3 Subrogation of Credits

Tables A-6.23 and A-6.24 shows the record of the outstandings of subrogated credits in 1982 through 1984 and claims on credit insurance in 1982 and 1983. It is noted that there is no record of the subrogated credits or the claims on credit insurance for KIB. As is apparent from the figures shown in Table A-6.23, the outstandings of subrogated credit for KIK/KMKP accounted for 92.2% of total at the end of 1984.

Although there is no data for making an accurate analysis of insurance risk, a brief analysis of the risk is attempted in the following manner:

(a) Estimate of the outstandings of insurance amount:

It is estimated at 75% (insurance coverage) of the outstanding of credit for KIK/KMKP recorded at the end of respective year.

(b) Average of (a) in the previous year and (a) in the subject year.

(c) Estimate of the claims on insurance related to KIK/KMKP:

It is estimated by means of multiplying (i) the claims on insurance (shown in Table A-6.24) with (ii) the share % of KIK/KMKM in the total outstanding subrogation (from Table A-6.23).

(d) Insurance risk rate estimated by means of (c) divided by (b)

Thus estimated rates for 1982 and 1983 are as follows:

$$\text{Risk rate for 1982 : } \frac{20,086 \times 78.6\%}{(988,000 + 1,196,00) \times 1/2} = 1.4\%$$

$$\text{Risk rate for 1983 : } \frac{58,784 \times 86.4\%}{(1,196,000 + 1,251,000) \times 1/2} = 4.2\%$$

There is no data showing the claims on insurance for the 1984 fiscal year, since the financial audit is not made yet for that year. Nevertheless, in view of the fact that the outstandings of subrogation substantially increased at the end of 1984 fiscal year[1/] while the outstandings of insurance acceptance amount did not increase, it is surmised that the risk for 1984 may be greater than 1983.

The ratios of the outstandings of subrogation against the outstandings of insurance amount[2/] is 2.3% for 1982, 4.0% for 1983, and 8.5% for 1984[3/]. It implies the tendency that portfolio of KIK/KMKP is sharply getting worse.

6.4.4 Financial Position

Table A-6.25 shows the insurance premium charged by P.T. Askrindo. The insurance premium to be charged is paid at one time for full insured period. The premium rate for KIK/KMKP is 3% for the period up to 5 years, and 5% for the period beyond 5 years.

Notes: 1/ Increases compared to the previous year are Rp.17,951 millions in 1983 and Rp.42,215 millions in 1984.

2/ Average of the end of 1983 and 1984 is Rp.1,239 billions

3/ Each year represents the end of fiscal year.

Table A-6.24 shows the income statement of the company in the fiscal years of 1982 and 1983. In view of the income generated from the credit insurance in 1982, the revenue of premium and the claims are nearly balanced1/. Hence, with the earnings from assets, the income position in that year resulted in a profit after allocation to technical reserves. In 1983, howerver, the claims substantially increased and exceeded the revenue of premium2/, resulting in a loss of Rp.48,989 millions for the credit insurance. The export insurance and nonlife insurance also resulted in a loss. The loss in 1983 was attributed to stagnation in the lending of KIK/KMKP and other credits which were subject to the insurance, as well as sharp increases in insurance risk as discussed earlier. In view of the portfolio of KIK/KMKP getting worse and also of the decrease of KIK/KMKP lending, it is surmised that the financial position in 1984 may be worse as compared to 1983. The recovery of subrogation, as shown in Table A-6.23, remains in about 10% for the three years of 1982 - 1984.

Notes: 1/ Premium; Rp.20,886.8 millions, Claims; Rp.20,086.2 millions

2/ Premium; Rp.15,159.6 millions, Claims; Rp.58,784.8 millions

6.5 The State Banks and Problems in Management of KIK/KMKP

6.5.1 Introduction

As examined thus far, the six state banks (five state commercial banks and one state development bank) hold a leading position in the financing activities of Indonesian banking. It is these six banks that manage the institutional credits to the small-scale industries (KIK/KMKP). This section outlines each of the six banks and examines the problems faced by them in management of KIK/KMKP.

6.5.2 Bank Negra Indonesia 1946 (BNI)

(1) Outline of BNI

As Table A-6.26 shows, BNI ranks first in the amount of both total assets and deposite, and second to BRI both in the number of personnel and the loans outstading. In its lending operation, the loan outstandings at the end of 1984 reached the amount of Rp.3,849.2 million (which is 20.5% of loan outstandings of the whole banking institutions). BNI is operating with 241 branches (including 4 overseas branches and 42 cash offices).

(2) Lending operations and KIK/KMKP

Looking at the lending operations of BNI, its domestic loan outstandings quoted in rupiah amounted to Rp.2,497.9 billion of the total loan outstandings of Rp.3,048 billion at the end of 1983. The domestic loans devided by sectors and by terms are shown on Table A-6.27.

Most of BNI domestic loans goes to the industrial sector (40.3%) and to the commercial sector (32.2%), and half of the industrial sector loans are long-term credits. The long-term credits in total account for 48.2%, rather high proportion, of the domestic loans.

As shown in the Table A-6.28, the BNI's share of small-scale credits, KIK/KMKP, is small during the years of 1983 and 1984 (5.4% and 4.5% respectively of the total loans outstanding). However it ranks next to BRI which has an overwhelmingly high share of KIK/KMKP. Within the economic sector, the industrial sector and the commercial sector, of which retailing is the main component, take up over 80% (As of December 1983: industrial sector 28.1%, commercial sector 55.8%. At end 1984: industrial sector 26.1%, commercial sector 57.6%).