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Sri Lanka:

**Potential for Attracting
Foreign Direct Investment
in the Machine Tool Industry**

**Analysis of Interviews Carried out at the
7th European Machine Tools Exhibition (EMO)
with World-Wide Participation in Milan, Italy
from 14 to 22 October 1987**

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November 1987

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1. Background

The European Machine Tool Exhibition (EMO) with worldwide participation takes place in a two year cycle in the cities of Hannover (Federal Republic of Germany), Milan (Italy) and Paris (France). The 7th EMO was held in Milan from 14 to 22 October 1987 with the participation of approximately 1.650 exhibitors from a total of 37 countries. It is natural that the host country of the exhibition has the major share in numbers of exhibitors, in the present case Italy with a share of approximately 45 per cent followed by the Federal Republic of Germany with approximately 17 per cent, Switzerland with approximately 9 per cent, and France and Spain with approximately 5 per cent each. The participation of exhibitors from developing countries has been growing steadily in the past events. The 7th EMO counted with a total of approximately 50 exhibitors from developing countries such as Brasil (2), Republic of Korea (10), People's Republic of China (14), Singapore (1), Turkey (2) and Taiwan, Province of China (21).

The exhibition can be characterized, in comparison with previous exhibitions in Paris (1983) and Hannover (1985) where a series of pilot and technologically sophisticated solutions were introduced, as presenting market-oriented products consisting of machinery hardware and engineering software for a world wide market that is diversified in terms of technology, company size and management requirements. Whereas previous development of the international machine tool market concentrated on the introduction of standardized numerically controlled machine tools, present development is oriented towards personalized (i.e. client-orientated) and flexible technological solutions at acceptable cost for each customer. This has led to the fact that in some cases total labour cost in production of hardware and creation of appropriate engineering software for

specific applications of machine tool systems rose to 60 per cent of total production costs. This means that the share of labour cost in the production cost of advanced technology machine tool systems has approximately doubled in less than a decade owing to the increasing importance of engineering software solutions in the machine tool sector.

This development has concentrated so far on machinery for utilization in production operations, in previous years in the field of large scale production and assembly operations (e.g. automobile industry, electrical motors production) and presently entering into the wide area of small batch production of a large number of engineering products, parts and components. One of the consequences of this development is the growing market segmentation between production machine tools and general purpose machine tools for workshop operations (i.e. single lot production as found commonly in maintenance and repair operations) or for training purposes in vocational training centres. This market segmentation also laid the base for an increasing participation of developing countries in the world machine tool business, especially general purpose machinery, even though statistically their market share is still minimal. Notwithstanding the more recent efforts and the success of the developing countries in entering into the area of numerically controlled machine tools, at the beginning mainly for their internal markets, but lately also for export markets, their major international growth potential continues to be in the foreseeable future in the area of general purpose machinery for workshop and training purposes. In this area these countries have considerable comparative cost advantages over producers from industrialized countries owing to low labour costs and "standardized" markets not requiring a steady feed-back from clients' requirements as in the case of modern flexible machine tool production systems. The difficulty of access to proprietary know-how, especially

for modern and technologically advanced machinery, and of market access for this kind of product also play an important role limiting the prospects of developing countries in increasing their exports of this category of machinery. The interviews with exhibitors from developing countries confirmed this tendency as their major success at the fair can be seen in the establishment or extension of dealership arrangements with companies from industrialized countries in the category of general purpose machine tools.

These basic considerations were confirmed during field work at the 7th EMO in Milan and were taken into account in the selection of enterprises interviewed for the determination of their interest of entering a machine tool production operation in Sri Lanka.

2. Résumé on interviews

During the 7th EMO a total of 68 exhibitors were interviewed (see table 1) with concentration on exhibitors from Federal Republic of Germany, Italy, and Japan (44 per cent of all interviews). The companies to be interviewed were selected empirically taking into account their market importance, possible readiness for engagements in production operations abroad, company size, and category of machinery. The interviews were not planned to represent a statistical cross section of the exhibitors by country or by category of machinery, if so, one potential joint venture partner most probably would not have been included in the interview sample (small scale company, category of machinery with relatively little share in total machine tool market). The interviews with exhibitors from developing countries were carried out to analyze their experiences in entering into the machine tool market still being dominated by producers from industrialized countries.

The interviews carried out resulted in covering approximately two categories of machinery per company (table 2). In average this figure is highest for Japanese exhibitors (2.6 per interview) due to the fact that most exhibitors from this country belong to the group of large-scale producers. The figure is lowest for exhibitors from Switzerland (1.5), Spain (1.6) and Italy (1.7) reflecting in a certain way the high degree of specialization of producers from these countries and the strong participation of small sized manufacturers in the machine tool industry of these countries.

Table 1: Number of companies interviewed by countries

Country	Number of companies interviewed	Number of exhibiting companies
Federal Republic of Germany	10	288
France	6	78
Great Britain	6	35
Italy	10	739
Japan	10	47
Korea	3	10
Spain	5	76
Switzerland	6	147
USA	5	29
Other developing countries	3	40
Other industrialized countries	4	(approx. 161)
Total	68	(approx. 1.650)

Table 2: Number of interviews by category of machinery

Category of machinery	Number of producers interviewed
Lathes	23
Milling machines	14
Drilling machines	10
Grinding, lapping and polishing machines	10
Machining centres	21
Presses, rolling and shearing machines	9
Punching machines	6
Bending machines	4
Electrical discharge machines	3
Laser cutting machines	6
Robots and FMS	7
Others	5
Accessories and components	6
Total	124

Table 3 reflects the number of interviews by size of company. Almost half of the interviews (47 per cent) was carried out with enterprises having less than 200 employees or almost two thirds with less than 500 employees. The reasons for this composition of breakdown are twofold:

- first, the structure of the European and North American machine tool industry is dominated by the great number of medium and small sized enterprises. Among the total of Japanese exhibitors interviewed, there is only one enterprise with less than 500 employees. Apparently smaller Japanese enterprises were more reluctant to bear the high costs of exhibiting in Italy than bigger ones, most certainly also due to the fact that larger Japanese machine tool producers are more active in and more dependent on foreign markets than smaller ones

- in the course of interviewing indications rose that smaller sized companies might be more interested in a production operation in a country with conditions like Sri Lanka, a topic that will be treated in more detail in the following chapter; therefore a greater number of smaller enterprises than actually planned were visited.

The number of small enterprises from Italy is the highest of all nationalities (60 per cent of enterprises interviewed). This can be explained by the fact that the Milan EMO fair is considered by Italian enterprises as "their" fair, besides the fact that in this country small and medium sized companies traditionally have a high share in the composition of the machine tool industry.

Table 3: Number of interviews by size of company

Number of employees	Number of companies interviewed
less than 50	10
50 - 99	8
100 - 199	14
200 - 499	11
500 - 999	12
1000 and more	13
Total	68

In general terms it can be stated that the interest demonstrated by the exhibitors on the subject matter of the interviews has been extremely high. Only two enterprises (i.e. 3 per cent) of the ones contacted showed no interest in the enquiry. These companies have not been included in the above tables.

All interview partners asked for confidential treatment of the information supplied. For this reason the report presents the analysis of the interview results in a form not allowing to combine specific cases, experiences or business strategies with the corresponding informant.

3. Analysis of the interview results

I. Engagement in foreign countries

The degree of direct engagements in foreign countries largely depends on the size of the company. In general terms it can be said that the larger the company the stronger are its foreign financial engagements. The main reasons for this fact are financial strength and manpower availability which both normally are scarcer in small sized enterprises than in big ones.

i) Exports

Export markets play a predominant role, especially for western European machine tool manufacturers where export shares partly are in the order of 80 and 90 per cent of total sales. Export shares of small European producers, particularly Italian and French ones, are sometimes only in the 25 to 45 per cent range of total sales. The importance of exports is (with one exception) much less for manufacturers from the USA, partly due to the fact that American enterprises start up production abroad once the market has developed satisfactorily to justify opening up a new production facility. The picture for Japanese manufacturers is more diversified: there are companies with export shares as high as in the case of European medium and large scale producers but also export shares in the 20 to 30 per cent range. This is, according to the interview partners, due to various reasons: firstly the large size of the domestic Japanese market, secondly the policy of some companies to invest abroad (mainly through purchase of existing companies), particularly in the USA and Europe, and thirdly the (still) strong position of competitors from Europe and the USA as well as the "newcomers" Republic of Korea and

Taiwan, Province of China, especially as relates to general purpose machine tools.

The far largest export markets are the industrialized countries absorbing around 80 to 90 per cent of all exports according to information given by the exhibitors interviewed. A certain importance as importing markets used to have in the past the major Latin American countries such as Argentina, Brazil and Mexico but due to their international financial difficulties these export markets have practically "dried out" as one interview partner put it. New emerging export markets are seen in Republic of China and Republic of Korea. India, Pakistan and ASEAN countries also were attributed a certain importance for the future but to a lesser degree than the first two Asian countries mentioned. African countries were only mentioned by French manufacturers as gaining importance in the future. Most European interview partners also mentioned the European centrally planned countries as potentially growing export markets.

Approximately half of the enterprises interviewed have had exports to Sri Lanka but only three companies on a continuous basis. The companies manufacturing special machine tools coincided in the statement that at present the Sri Lanka market is too small to allow for a steady business in their categories of machines. As far as the market of Sri Lanka was known to the exhibitors it was classified as a market mainly for general purpose machine tools where companies from industrialized countries are progressively losing their comparative production cost advantages to producers from newly emerging countries such as Republic of Korea and Taiwan, Province of China.

ii) Foreign subsidiaries

While approximately one third of the exhibitors interviewed have own sales subsidiaries in important export markets, the major portion of the companies work through local import houses and sales agents. Three of the enterprises interviewed mentioned that their business relations with their agents in Sri Lanka were excellent.

All sales subsidiaries (with the exception of one in Singapore) are located in industrialized countries. The main reasons given for own sales subsidiaries were requirement of close business relations with customers, production systems analysis of clients needed for tailor - made technical concepts and, based on this, hardware and software configuration according to customer needs. Some of the manufacturers export only "carcass" machinery, i.e. basic machine frames, the selection of tooling and equipment with accessories being done in the country itself. This is especially the case for exports to the USA due to differences in production systems.

Out of the 68 exhibitors interviewed 18 companies had a total of 31 production facilities abroad, either as joint ventures or wholly owned. 25 production facilities were located in industrialized countries and only 6 in developing countries (4 in Brazil, 1 in India, and 1 in Taiwan, Province of China). Besides the special relations with client industries which were the driving forces for opening up sales subsidiaries (including engineering, maintenance and in some cases equipment of machines with tools and accessories) there were three additional major reasons for investment in production facilities abroad: first, trade policy reasons (fear of export restrictions, especially to the USA), secondly, access to technology (especially in the

case of former Japanese and Korean investments in Europe) and thirdly complementation of own production program.

It is noteworthy that foreign investment is at present rather characterized by purchasing existing companies than by opening up of new production facilities. One of the reasons given by the interview partners is the increasing share of "intangibles" in the sales cost of products, i.e. cost of market access, brand names, special customer relations of sales personnel etc, which the investor intends to reduce through the purchase of known establishments.

Among the criteria for establishing a foreign production facility the size of the local market ranked first followed by existing industrial infrastructure (mainly subcontracting capacity and communications) and availability of qualified technical personnel in engineering and production. Labour costs only have a marginal importance for decision making as far as highly specialized machine tools are concerned, yet they are considered of being more important in the case of general purpose machine tools.

In one case a foreign direct investment in production facilities in a developing country (Brazil) had been given up owing to difficulties in obtaining and transferring foreign currencies and to high production costs which did not allow to be competitive on export markets.

iii) Foreign licencing

Production know-how transfer in form of licences is a relatively common form of foreign engagement, particularly for participating in newly emerging markets. A total of 16 companies, i.e. roughly one fourth of the exhibitors interviewed, have granted a total of 27 licences of which three fourth went to developing countries: 7 to Indian, 6 to Chi-

nese, two each to Brazilian and Korean and one each to Argentinian, Burmese and Taiwanese business partners. Only in three cases a purchasing relation between recipient and donour of licence developed at a later stage for parts, components or complete machinery.

Even though licencing was quoted by the majority of the donours of licences as quite a suitable means of business extension to markets with special conditions (e.g. import restrictions or currency transfer restrictions) there was a small number of companies (8) which showed no interest in following such an approach. Their reasoning concentrated on the high cost of manpower training, absorption of highly qualified own personnel for the training creating capacity problems in other areas (e.g. technological development or production), problems of currency transfer and the risk of damage to the own brand name.

iv) Foreign production cooperation

The machine tool industry is a basic example of interindustrial integration and specialization in engineering and production, expressed in forms of company cooperation such as subcontracting and product complementation. Both forms of cooperation are also widely applied by the machine tool producers interviewed. Especially the European manufacturers have a network of supply and delivery contracts, purchasing and selling parts, components, software and sometimes complete machine tools to complement the own or the business partner's production program and sales program. Subcontracting and complementation represent in many cases 50 per cent or more of total production costs. One American company relied completely on outdoor machining of parts and components and concentrated on the assembly of the machine tools. Japanese companies interviewed were less engaged in subcontracting (approximately 20 to 30 per cent

of total production costs), this, however might be a special feature of the enterprises present at the fair, i.e. large scale manufacturers who generally incline more towards inhouse production unless technology or comparative cost disadvantages do not require otherwise.

While national subcontracting is still the most important form of business cooperation among all manufacturers, the European producers of machine tools have a wide range of international subcontracting, especially among French, German, and Swiss companies. Here subcontracting includes high precision and technologically advanced parts, components, and accessories while the purchasing company concentrates efforts in development and production of core items of its products. In comparison the international subcontracting of Japanese and American (2 cases) companies follows more the pattern of "cost advantage" subcontracting, i.e. purchase of standard components and machinery mainly from Republic of Korea or Taiwan, Province of China because of production cost advantages due to cheap labour in these countries. There were indications during the interviews that this policy might be given up with increasing specialization of the Japanese and American companies and that in future the subcontractor might relocate the production to Japan or the USA and manufacture the items in automated facilities or, in the case of subcontracting of complete machines, allow the former supplier the continuation of production and marketing under his own brand name..

The difference in the nature of subcontracting between European and Japanese interview partners is in a way indicative for the criteria applied by the subcontractors: in Europe prevails subcontracting of high performance and quality products with less importance given to the price whereas in Asia the main criteria apparently is low price for standard quality products. Some European producers had

previously experimented with "price" - subcontracting from India, Singapore and Brazil but this approach has been given up due to delivery timing problems, foreign exchange procedures or quality reasons. In one case, a European manufacturer used a bolt which, against the subcontracting agreement with an Asian supplier, was not hardened. The breaking of this non-hardened bolt in a machine component has caused machine failures and repair obligations of the world wide sold machines at the clients' premises at a cost to the machine tool manufacturer multifold of the price difference between a domestic subcontractor and the one from the Asian developing country.

II. Trends in the international setting of the machine tool industry

i) Technological development

In discussing trends of technology distinction should be made between general purpose ("traditional") machine tools and modern production machine tools. General purpose machine tools had received less attention in the past years as regards its market potential and area of application. The major part of the machine tool producers concentrated their product development and marketing efforts on the newly emerging automated technologies, the new machine configurations (e.g. machining centres) and engineering software development all leading to high productivity increases in specific production operations. These efforts led to the development of rather standardized CNCMT (Computer Numerically Controlled Machine Tools), a development of which Japan was the leading nation.

The interview partners coincided in that, as regards present efforts in development of production machine tools, the trend goes more and more towards tailor-made solutions

of a client's production problems, both in hardware and software configurations. Main emphasis is at present placed on non-machining operations in the production process as they represent the most time consuming items limiting productivity increases and causing high production through-put times and being responsible for relatively high working capital requirements. These efforts have as a consequence a continuous increase in engineering and software costs in the production and installation (including test runs) of computerized machining systems. In most cases this technological development has caused a steep increase in the labour cost component in the production cost which rose in specific cases to approximately 60 per cent of total machining system production cost (10 per cent labour cost in machining, 15 per cent in assembly, and 35 per cent in tailor-made software development according to the client's specific needs).

It is estimated that this trend in technology will to a certain extent influence the market potential for standardized numerically controlled machine tools and will lead to a more detailed cost comparison between these machines, tailor - made machining centres and general purpose machinery. It is expected that in the future operation combinations between computerized machining and manual machining on the same machine tool will increase in importance. Single or small lot production would be carried out manually and computerized machining operations would take over in case of larger lot sizes or in cases of repetitive production (e.g. weekly cycle), being the determining factor for the selection of type of operation the machine - related break - even point. This type of machine tool utilization will increase the market potential of those general purpose machine tools designed appropriately for both types of operations, manual and computerized, to the debit of those machines only designed for manual operation. This

category of general purpose machine tool will most be used in workshop type production, e.g. machining of spare parts, and for training purposes in vocational training centres.

A basic requirement not yet completely fulfilled by many producers from developing countries according to some exhibitors is quality of the machine tool and good operation performance which sometimes outweigh sales price advantages in customer decisions. Companies in industrialized countries still producing general purpose machine tools consider their quality and performance advantages as their main marketing asset.

ii) Market development

All exhibitors interviewed coincided in that the industrialized country will also in the near future represent the main international demand forces for machine tools of all categories. In first place was mentioned the USA owing to the fact that transfer of basic technological development into new machine concepts in this country lately has not kept pace with the transfers realized in Japan and European industrialized countries. In second place was named the Federal Republic of Germany which was quoted by some exhibitors of presenting market access difficulties for importers and newcomers due to relatively well established customer-client relations. Similar market access barriers were seen by European exhibitors regarding Japan, named in third place together with other European countries such as France, Great Britain and Switzerland as major international machine tool market.

Among the developing countries, Republic of China was named first in importance for international market development followed by Republic of Korea. On third rank followed India and ASEAN countries. The market development prospects of

Latin American countries (above all Brazil, Argentina and Mexico) were connected with the solution of their external debt problem and their capacity to revitalize their internal forces of economic development and a stronger participation in international exchange of industrial products. Similar uncertainty was expressed regarding the centrally planned European countries which generally were considered of having a high market potential but at the same time the constraints of business development were expressed. Other countries were mentioned by the interview partners as being of no central importance for the international development of the machine tools industry.

iii) Trends in foreign investment

As regards the interest shown by the exhibitors interviewed in foreign investment, distinction has to be made between large scale companies and small sized companies as well as between manufacturers of special machine tools and general purpose machine tools. Medium sized companies take a somewhat intermediary position, they incline towards the large scale enterprises as regards special machinery and towards small scale manufacturers as regards general purpose machinery.

In respect of large and medium sized companies from industrialized countries engaged in the production of special machine tools, the determinant factor in decision making on foreign direct investment is market size of local (USA and Japan) or regional (Europe) markets. Investments are undertaken and, according to the interview results, will be undertaken in the future to gain access to new markets or to maintain established positions in protected markets, in particular to be able to strengthen close relations with existing or potential clients.

This behavioural pattern is more important for highly advanced technologies with a considerable engineering and software component than for general purpose machinery which requires less or hardly any special engineering customer-supplier relations. Here the traditional marketing channels, e.g. import houses and independent sales agents, continue to be more commonly utilized. This most probably will also be the case in the future.

In some cases, e.g. machine tools for the automobile industry, the machine tools manufacturers saw themselves forced to follow their important customers when these established production facilities in foreign countries with limitations of machine tool imports (for example Brazil). The profitability of such investments, however, are at present quite questioned by the investors themselves as the return on investment did not meet previous expectations and as the productivity increases in these production facilities were less than expected so that exports at break-even cost or with a profit margin can hardly be achieved. In these cases apparently world - wide strategic considerations were the driving forces for the foreign investment decision of the companies.

As regards small and medium scale producers of general purpose machine tools there exists more interest in foreign direct investment in developing countries than among large scale companies but strong preference is to countries with a sizeable domestic market or with established market access to neighbouring countries (e.g. ASEAN countries). In the case of this group of enterprises additional factors in decision making play an important role, namely low labour cost (of highly skilled labour) and existence of a supply network for raw materials and parts and components to be subcontracted. Apparently these companies are more affected by competitors from developing countries with low produc-

tion costs which at present hardly can be met in industrialized countries through productivity increases and cost reductions. A bottleneck, especially among small scale producers, is seen by the companies themselves in the limited financial and human resources available on company level for a foreign direct investment. To assure the success of such a venture the interview partners considered it to be essential to delegate highly qualified personnel on all levels of production and management which also is needed in the company's main premises.

Large producers who also manufacture general purpose machine tools give more importance to their other line of production, i.e. special machine tools, for which reason their business policy is dominated by the promotion of latter production line. At the same time their business strategies are, as mentioned above, towards the major international markets where only a few developing countries are considered to be of importance. Small and medium scale producers of special machine tools concentrate their activities in general on market segments relevant to their products and technological innovation and also showed little inclination to diversify their production locations. Their foreign engagements might include sales offices of their own in main export markets but many of them mainly work through agents in foreign countries.

iv) Trends in foreign licencing

Approximately 60 per cent of the exhibitors interviewed have given production licences to partners in other countries, mainly developing countries. The experiences of 40 per cent of those licensors have been negative reason for which they would not consider to enter again a licencing agreement, 60 per cent showed interest in continuing this type of business activity. The granting of licenses concen-

trated on countries with reglementary schemes on foreign investments, e.g. India, Republic of China and Republic of Kora. Some interview partners mentioned the relatively high cost involved in licencing agreements which arise mainly from manpower training requirements which are difficult to determine in scope and cost at the time of signature of an agreement and which gave reasons to difficulties among the partners in several occasions.

Despite the negative experiences of some companies in specific developing countries (which caused statements during the interviews like "In principle interested in licence agreements, but not in countries like... because of experience of company..." indicating that there is a relatively strong flow of information within the machine tools industry), licencing agreements apparently are the kind of foreign engagements in developing countries being most favoured by the interview partners for the near future. Here once again large sized companies favoured clearly countries with sizeable domestic markets. They also showed relatively little interest in "purchasing back"-operations, i.e. supply of components and parts or complete machine tools from their licencees. Among small scale machine tool producers there exists in general more readiness to enter licencing engagements with countries having a limited domestic market such as Sri Lanka and entering into "purchasing back"-arrangements.

v) Determinating factors for foreign engagement decicions

As already mentioned above, the overall determinating factor for foreign engagement decisions is the importance of the local market in the target country for the present or future (according to the judgment of the company) international machine tool market. Whether direct foreign investment (in sales organizations or production facilities)

or licencing agreements are intended by the manufacturers depends to a great extent on the foreign investment policy of the respective country and the type of technology involved: in industrialized countries foreign direct investment is preferred by the companies in high technology-areas to protect proprietary technical know-how, and in emerging developing countries, generally having stricter regulations on foreign investment, licencing agreements are predominant over foreign direct investment in production facilities. The technologies involved in these agreements do, however, in general not represent most recent achievements in know-how development but can, in the majority of cases, be considered as of being macro-economically appropriate for the composition of production factors in the country of the licensee.

In second place of importance for decision making the interview partners mentioned the existence of a sound industrial infrastructure. The requirements of machine tool manufacturers go in this context beyond the normal request of existence of good physical (industrial land, energy supply, transportation and communication), political (incentives, foreign exchange regulations and general economic policy) and organizational (administrative procedures) structures. The complexity of their product requires, in addition, the existence of an appropriate local supply network for raw materials and of industrial capacity for subcontracting parts and components (e.g. castings, machined parts, electric motors) as well as the supply of these production or assembly inputs at internationally competitive prices.

As regards the labour force the interviews resulted in that some manufacturers require highly skilled labour with good productivity at costs below newly emerging developing countries already engaged in machine tool production while for

others it would be sufficient to have a labour force with good basic technical skills. The latter apparently put more emphasis on their own in-company training programs during start-up of production or might be manufacturing machines of a lesser degree of technological complexity.

Some interview partners openly questioned whether all conditions required for entering into the manufacture of machine tools could be met by Sri Lanka. Major concern was mentioned related to the size of the domestic market and the reduced access to other markets in the region such as ASEAN countries and India and Pakistan as well as the existence of an appropriate industrial supply network and a good business environment.

4. The Prospects for Sri Lanka

1. Sri Lanka in the Asian Context

The report has underlined the gravitation of the world's industrial economy towards Asia and the particular weight which primarily Japan, and to a lesser degree Republic of Korea and Taiwan, Province of China, have rapidly gained in the MT market. In this maelstrom the smaller Asian countries outside of the Pacific, of which Sri Lanka is the principal case, are in serious danger of marginalisation. Indeed it might be argued that Sri Lanka could come to be regarded as an economy possessing more the development problems characteristic of Africa rather than Asia i.e. export earnings heavily dependent on less than a handful of primary commodities whose prices completely fail to keep pace with those of the standard bundle of imports (a secular deterioration in the terms of trade), significant distance from major consumption areas in the world economy, an industrial sector small in relative and absolute terms suffering severe structural weaknesses and with highly circumscribed room for manoeuvre, and chronic international and public indebtedness rendering the country ever more vulnerable to conditions on macroeconomic (and thus sectoral) policy imposed by the international lending agencies.

That view would, in present circumstances, be too gloomy in several respects. Sri Lanka's contemporary history is notable for the largely successful attempt to create the core elements of a social welfare system in a poor country. It is that approach which has given the high levels of literacy of the population, the levels of nutrition and provision of basic health services which distinguish Sri Lanka from many other parts of the Third World, and the emphasis on public works. Through its geographical location the country is still involved with Pacific Basin nations to a much greater extent than any of the sub-Saharan African countries. And Sri Lanka has, for the past decade, followed a policy of encouraging FDI in manufacturing with a pronounced bias towards export; in so doing it moved before most of the African countries but later than the Asian NICs (though there only the city States of Hong Kong and Singapore placed extensive reliance on collaboration arrangements for their exports). Unlike the sub-Saharan African countries, however, Sri Lanka stands isolated in terms of relations with some of the major economic groupings. Although the country is party to the Lomé Convention and a member of the Commonwealth, these are arrangements which yield relatively little trade and aid benefits. The country is apart from any strength through numbers which could be derived from participation in regional groupings, however loose (SADCC now handling that task for 9 states in sub-Saharan Africa and Asean for 6 states of Sri Lanka's own region), is outside of these groups which receive special attention from international lending agencies, and does not fall within the 'preferred area' of any of the major donor countries. Sri Lanka is thus to an important extent on the fringe of the map for many aspects of decision making: whatever is accomplished will be through its own efforts and not with the force of other countries to buttress its actions.

4

To provide a general frame of reference, Table 25 summarises some macroeconomic indicators for the 3 largest Asean members, China, India and Sri Lanka. On a per capita income basis Sri Lanka is at about half the level of Thailand and some 25% below Indonesia; although reliable comparisons are not easy to establish, the distribution of income is probably much more equal in Sri Lanka than in the Asean states. The column for industry's share throws

into sharp relief Sri Lanka's limits as a market; on a par with India in relative terms but a few percentage points below the rest means that the absolute size of industry is well below that in any of the other Asian states listed. Unlike say Hong Kong and Singapore, tiny countries but with heavy concentration on industry and intricate networks of financial and communications services as backup, or Malaysia, a country of comparable size of population yet (notwithstanding the depressed prices of its main commodity exports of petroleum, rubber and tin) with the potential to develop considerable industry based on natural resource and agricultural commodity processing, Sri Lanka's industry has few systemic or natural advantages to build on. There is, in short, a fundamental problem of integrating industrial activities with the rest of the economy. During the past decade the thrust of policy has not been towards building linkages among branches or across sectors but rather to encouraging a type of industry which could at least bolster employment and the foreign exchange position. The final column of Table 25 expresses the percentage variation in gross export receipts over the quinquennium to end 1985 and shows the increase for Sri Lanka to have been second only to China. Given the relative stagnation of earnings from traditional commodity exports, much of the rise is due to manufacturing trade and the government continues to look for ways to augment and diversify that commerce - hence the interest in MT (among other branches).

While Table 25 illustrates how Sri Lanka compares to some other Asian nations macroeconomically, to locate it in the Asian context requires some further exploration of the investment situation. It is simplest to begin with Japanese investment since this is the country located in the region, the world MT leader and now showing the highest marginal propensity for FDI. Table 26^S describes the country composition of its investments in Asia during fiscal year 1985 (i.e. to 31 March 1986). Ten countries are listed explicitly and to them more than 98% of all FDI to the region is committed; Sri Lanka is not mentioned and its part of the category 'other' could only have been minute since the whole of the Indian subcontinent plus various other countries also figure in that group. Moreover, the general figures here do not tell the whole story. Some of the stronger commentaries argue that Asia has been left aside by the boom in FDI from Japan. Thus one recent assessment commented that "except for significant increases in investment in Singapore, South Korea, Taiwan and to a lesser extent India, the Japanese are leaving Asia high and dry"¹ and "As Japan moves into the information revolution, it has also lessened the need for South East Asia's raw materials its survival once depended upon."² The figures for the past couple of years vary sharply from the pattern of the late 1970s and early 1980s, especially for the Asean countries which are probably Sri Lanka's most serious competitors. From 1977-1983 the annual average growth rate of Japanese FDI in manufacturing was 18.7% globally but a superior 20.6% in Asean (corresponding world and Asean statistics for 1976-1983 were for USA 6.6% and 13.3%, for FRG 12.2% and 12.8%). So Sri Lanka is barely on the map even where its neighbours (economically speaking) are somewhat losing their place.

A more detailed picture in relation to FDI can be gleaned from some other recent research. Looking once more at the Asean countries (less Singapore and Brunei) Japanese FDI is far more concentrated on manufacturing than is investment from USA: 1983 data show the share of manufacturing in the US total to range from around 4.5% for Indonesia and Thailand to some 35% for Philippines, whereas the corresponding span for Japan runs from 27.5% in Indonesia to 75% for Thailand. Within manufacturing Japan put close to one-third of the total into metals and metal products against just one-seventh

not confirmed through interviews!

out
 for USA. On areas of interest to Sri Lanka, therefore, Japanese behaviour is of considerable significance. [A failure to make an impression on Japan would thus mean that investment in the MT and metalworking areas would have to be sought in bits and pieces from firms located in countries that are either not at the core of the branch or are losing their position in the core group. Since, moreover, the labour intensity of Japanese investments in machinery industries is high relative to those made by other countries (1983 figures put employment per US\$1 mn. of Japanese assets in the machinery sector in Asia at 59 people while the corresponding figure for USA is about 15% lower), the employment effect as well as the foreign exchange effect is significant. Finally, the absence of FDI by US companies in Sri Lanka implies that nothing can be expected from capital spending by subsidiaries.]

The report has suggested that the Asean countries may be Sri Lanka's closest competitors in the region, in the sense that they too are actively seeking foreign collaboration and do not (with the exception of Singapore) yet have sufficiently strong domestic industries of their own. As a prelude to exploring possibilities in Sri Lanka, Table 627 brings together some characteristics of the MT industry in 5 Asean countries (excluding Brunei). No satisfactory estimates of the overall value of output could be obtained but other aspects of branch structure and the approach of governments to MT could be ascertained; the main findings can be summarised as follows. First, the number of producing firms is small, around 10 to 15 - the higher number for Malaysia includes quite a few metalworking and woodworking enterprises whose elimination would certainly reduce that country's total to the same range as elsewhere. If this number, unweighted for size of employment or value of output, is compared with numbers in other countries, then the Asean average is not much more than 10% of the industry size in, say, Japan or Republic of Korea. Second, there is an absence of leading firms i.e. enterprises which have a powerful investment and production base. Thus in Indonesia commentary in 1986 on the plans to enhance the branch stated "The government has authorised 11 companies to expand and develop their machine tool activities. Until now firms have only been small and have not been able to compete with imports."² There does not, furthermore, appear to be evidence of a State sector firm of significant size operating in any of the countries. Third, and closely related to the preceding point, all Asean countries recognise a dearth of investment in MT notwithstanding the importance assigned to it in national planning. As described in the last section of Table 627, the inherent risks of MT production tend to be accentuated in the developing country context: whereas events of the present decade have been as an earthquake in several OECD countries, bringing down many firms and forcing others to be rebuilt on totally different structural bases, in Asean they have acted as a brake on getting the industry off the ground.

Reports from specialised industry sources emphasise both the continued wish of countries to enhance production and their recognition that FDI offers the most promising route for achieving the aim. Thus a 1985 analysis stated "Although a country that can now produce 1550 machine tools a year, Indonesia's newest 5 year plan calls for production of 21,000+ metalworking machines per year by 1989...Present facilities could manage 3,600 units per year by then, and the rest will have to come from new facilities from joint ventures and foreign investment. Indonesian technology officials have announced they would prefer to get the capital and knowhow from the US machine tool industry."² Moreover, in early 1986 the import duty on MT was raised by some 15% with the purpose of encouraging greater domestic output; thus far, however, there is scant evidence that FDI has actually occurred. In the

case of Thailand there was an undisguised 1986 initiative by the Board of Investment to encourage US metalworking and machinery firms to locate plants in the country. Thus: "Thailand has moved into a better position to compete for US manufacturing operations in the wake of rising labour costs elsewhere in Asia, including Hong Kong, Malaysia, Taiwan and South Korea. It has a sizeable pool of engineers and technicians and its assembly line workers make less than US\$4 per day. Going wage rates for skilled workers range up to US\$6 per day, while typical salaries for technicians and engineers are US\$150-250 per month and US\$300-500 per month respectively. Benefit packages usually come to about 50% of wages and salaries. Standard government incentive packages include investment guarantees, up to 8 years of corporate income tax and business tax exemption, duty free import of machinery, equipment and basic raw materials and components."² In the Thai case also the impacts of this drive to encourage FDI have yet to be realised. Obviously there are 3 kinds of time lag in this process viz. the information lag from Government to potential investor, the approval lag for acceptance by the Board of Investment of any proposed FDI, and the gestation lag for turning an accepted proposal into an actual production operation. Together these lags are quite sufficient to account for the absence of actual start-ups till now. The passage of time could well lead to a marked reduction of the information lag and possibly some cutback of the approval lag. Yet the gestation lag is always likely to be present, especially in an industry as volatile as MT: market conditions can alter between the date a proposal is put together and the time the investment is ready to begin.

Returning to Table 6 the fourth point to underline, and one of considerable importance, concerns the type of product and production technology prevailing in Asean. Singapore stands apart from the other 4 nations with a profile resembling the advanced OECD countries i.e. emphasis on metal cutting using equipment of recent vintage and certainly with some export orientation. But the 4 largest Asean countries are in a quite different context. Although they have roughly the same number of firms as Singapore, what these firms actually do is by no means comparable. To begin with their concentration of activity is towards metal forming, using machinery of no more than an intermediate kind and often obtained second-hand. The average age of machinery is therefore high relative to the stock found in more advanced production locations (this statement can be made with some confidence due to the introduction of new technologies) and the equipment is being used to produce for specific orders rather than large batches. Now it is true that MT demand anywhere has a substantial job order component but a stronger sector where firms have more flexible production equipment can usually manage (except in phases of very limited demand) to keep low rates of machine downtime and reasonably high and stable levels of capacity utilisation. These indices are definitely unfavourable for the Asean countries and must lead eventually to higher product prices and/or lower company profits than would prevail in a situation where the sector was stronger. The reliance on imported raw materials accentuates the problems not so much in the familiar sense of the risk that foreign exchange will be unavailable (though this might be a difficulty on occasion, especially in Philippines and Indonesia) but because of the disjuncture between material quality and equipment vintage. There is currently a contradiction between the declared aims of augmenting MT quality and the tools at the disposal of the industry to achieve that objective. In Asean the sector is thus awaiting its own definition - how to combine the simpler, lower grade requirements for many branches of local output with the undoubtedly essential introduction of progressively more advanced technologies to support the modern industries. Each of the 4 countries (leaving aside

Singapore) will have a different response due to the varied industry mixes they possess and as of now there is no sign of any elements of a common approach.

The Asean example is highlighted to show how difficult the task is for Sri Lanka, which is in a weaker position than any of the 5 countries. The next sub-section moves to the Sri Lanka situation on its own.

II. Manufacturing and Foreign Direct Investment in Sri Lanka

In the past decade manufacturing activity in Sri Lanka has been aimed to a considerable extent at obtaining foreign exchange. The route chosen to achieve this has been the encouragement of FDI and that, in turn, has been channelled through 2 organisations, the Greater Colombo Economic Commission (GCEC) and the Foreign Investment Advisory Committee (FIAC). The former deals with export oriented FDI as such in the Sri Lankan Investment Promotion Zone (IPZ) while FIAC handles all other external investments. In ownership terms the formal difference is that while FIAC transactions are of a JV nature where at least half the equity capital is registered in the name of a Sri Lankan physical or legal person, the GCEC operations can be wholly foreign owned. In practice a certain number of exceptions have been made for FIAC arrangements, principally for some construction development, large capital intensive operations and projects providing substantial export potential. The importance attached to the export thrust can be judged by the fact that the GCEC, administratively headed by a Director General, is immediately responsible to the President of Sri Lanka. FIAC, as the title says, is an advisory institution with the Committee itself chaired by the Deputy Secretary to the Treasury and including secretaries to other ministries as well as others, not least the head of GCEC. Back-up support to FIAC comes through the International Economic Cooperation Division (IECD) of the Ministry of Finance and Planning and it is responsible for what amount to information brokerage activities in relation to collaborations in JV agreements. The institutional location of both FDI bodies mirrors most sharply their preoccupation with financial matters, whether in foreign exchange or otherwise. This point is of some consequence when dealing with MT.

To put the foreign linked projects in the whole industrial context, Tables B and C describe the role of GCEC and FIAC firms as industrial employers and industrial exporters respectively. Their combined employment share as of end 1985 was about 28% with close to three-fifths of that in GCEC, and their combined export share much higher, approaching 45% at end 1985 of which over one-third came from FIAC approved activities. Industrial exports as a whole rose by greater than three and one-half times from the end 1970s to the mid 1980s - the increase in the GCEC/FIAC combined share was almost sixfold and in absolute terms the GCEC/FIAC rise accounted for 60% of the whole increase in industrial exports. Domestically tied industry thus continues to occupy the predominant place in the overall context: in output terms the locally oriented factories contribute about two-thirds to MVA while public sector plants, which have little in the way of foreign JV, contribute a little over one-half (if the State Petroleum Corporation is taken away then the contribution is roughly one-quarter). These comments are for industry as a whole, of which manufacturing is just over one-half. Hence the shares of GCEC and FIAC would rise substantially were they computed on a manufacturing basis: the issue in the metalworking and MT activities will be to see what part of them are and could be handled by FDI ventures.

To go further into the existing pattern of FDI means examining the nature of projects actually in operation under the jurisdiction of the 2 authorities; Table 29 gives the GCEC data and Table 30 that for FIAC. Under both authorities the number of operation projects is substantially less than those approved; the tables leave aside the information on approvals and deal strictly with projects actually working. GCEC statistics do not give a cash value of investment to compare with the Rs.3.7 bn. for FIAC projects but one source gives the cumulative figure for 1979-1984 as roughly Rs.2.7 bn. If the annual average contained in that figure had been maintained through 1985 and 1986 then the cumulative value of investments in GCEC as of beginning 1987 would have been approximately Rs.3.8 bn. This implies a larger average size (measured by capital invested) of project for GCEC and in general a substantially larger foreign investment in absolute figures for the average project in GCEC as opposed to FIAC. In the latter average project size is just under Rs.30 mn. and the foreign share just over 30%, meaning that FDI per project was probably around Rs.10 mn. For GCEC a figure of at least Rs.20 mn. of FDI per project seems a fair reckoning. The GCEC numbers show JVs with local partners account for just over half the cases and that each of the half a dozen leading investor countries, that together signify half the cases, also have around one half of their projects as JV. Although explicit export figures for GCEC are not given it is known that a very high proportion of output is in fact sent abroad - but Table 31 reveals that the export ratios for FIAC projects are also extremely high.

Of major interest for this report is the degree to which projects even loosely related to MT have been implemented under the approval of GCEC or FIAC. Table 31 gives figures for the broad category of basic metals and engineering (of which, it will be recalled, MT is but a small part) and shows that all FIAC authorised investments there came to around 4% of the FIAC total, that just over 3% of the direct employment generated was in this broad category, and that none of the output was exported. GCEC investments, as Table 29 indicates, were mainly in textiles and garments: information obtained in an earlier study by UNIDO covering the 1979-1984 period shows zero FDI in basic metals and only Rs.90 mn. in fabricated metal products, machinery and transport equipment which once more means around 3% of the total. Overall, therefore, in projects coming under the aegis of the FDI authorities the '3% rule' seems to prevail as far as basic and fabricated metal products are concerned i.e. the sector accounts for that proportion of manufacturing investment and employment whatever type of FDI regime is followed. Moreover, data on value added for fabricated metal products and non-electrical machinery covering the whole of manufacturing i.e. whether or not foreign investment is part of the capital base, suggest that their joint contribution is no more than 3%. It bears repetition that MT proper is only a small part of this. Within a manufacturing economy where capital goods are a relatively minor share of total output and in any case are on the decline, MT certainly do not figure other than on the periphery.

The preceding comments are put into sharp perspective by Table 32 which provides a few performance indicators for the years 1977 and 1984 in the branch of fabricated metals. MVA and employment shares fell from around 5.5% to the 3% level and there were no exports to speak of throughout the period. Though dependence on foreign raw materials fell somewhat it remained high (as for the Asean countries discussed in the preceding sub-section). The only clear improvement was in regard to capacity utilisation though even there the change may be partly attributable to the elimination of a few firms. Aggregate output of MT, though impossible to determine accurately, can only be

tiny. For, to use 1982 figures where full comparability can be obtained, the situation was as follows. MVA was around US\$750 mn. of which fabricated metal products did not account for above US\$30 mn. If the ratio of value added to gross output was even as low as one-fifth, then the latter aggregate would have been around US\$150 mn. of which MT was only a tiny part.

Table ¹² 25 gives the data for imports of metalcutting MT and shows that in 1982, a quite low year for trade, gross imports were close to US\$2.8 mn. Combining this with the gross output approximation just described shows that the contribution of local MT production to apparent consumption might have been as much as three-quarters (if MT accounted for the high proportion of 5% of gross output of fabricated metal products) or as low as zero, if in fact MT production strictly defined is non-existent. Survey data by ESCAP suggest the latter is closer to the truth i.e. that what actually takes place is metal working of a fairly traditional type. On this basis the current situation is one where domestic production, heavily reliant on imported raw materials, meets part of the demand for what is probably a mixed bundle of fabricated metal products and there is an annual import of MT anywhere from \$2-6 mn. Given foreign exchange shortages the import figure is probably a low estimate of real demand in the economy but even so it would seem that local MT requirements are currently quite small. This is explained both by the limited total size of the industrial sector and its composition which is towards branches relatively light in the use of MT. Sri Lanka not only lacks the production base for MT, it also lacks the demand. In a more developed industrial economy there is a synergy between MT production and the structure of industrial output but in Sri Lanka that situation does not exist nor is it likely to in any time-horizon relevant for present purposes.

So it is that the government is considering MT essentially as one possible vehicle towards expanding and diversifying its foreign exchange earnings from cheap labour based manufacturing. Production is not seen in the perspective of domestic requirements (though there could be minor spinoffs) nor does there seem to be any intention of a progressive absorption of technology with a view to establishing independent locally controlled operations. Instead the hope is to derive net foreign exchange receipts in return for supplying cheap labour. What does this mean in practice?

III. Experience and Prospects in Metal Working and Machine Tools

As an approximate guide to what is happening in the broad area of metal fabrication with FDI involved, the listings of firms operating under GCEC and FIAC authority have been examined to single out those having some involvement in this area. From the GCEC list, valid as of end January 1987, only 3 companies with even a loose connection to the area of interest to this report could be identified. They were: Mono Pumps, a wholly owned UK firm producing industrial and irrigation pumps (this enterprise had ceased operation by end April 1987); Alloy Fabricators, a tripartite JV of UK, Norwegian and Sri Lankan interests, making piping systems; and Precision Moulds and Tools Ltd., a JV of FRG and Sri Lankan interests manufacturing moulds and tools. From the FIAC list, valid as of end June 1986, there were again only 3 companies with some relation to the subject matter of this report. They were: Eastern Auto Parts (Pte) Ltd., a JV with Denmark aimed at renovation of automotive components; Lanka Askok Leyland Ltd., a JV with India in the area of assembly and progressive manufacture of motor vehicles; and Swedlanka Engineering (Pvt) Ltd., a JV with Sweden for the manufacture and designing of moulds, dies and special machines. To obtain a feel for the situation contact was made by

correspondence and 'telephone interviews' with some of these firms; the following paragraphs give a rough sketch of the situation in 2 of them, Mono Pumps and Swedlanka Engineering.

Mono Pumps functioned for 6 years under GCEC authority manufacturing industrial and irrigation pumps for export, primarily though not exclusively to other Asian countries. The UK based company, which also has operations in Australia and some other countries outside of Asia and the Pacific, was originally seeking a cheap labour base mostly for assembly operations though with some simpler engineering operations as well. Initially the company's preferred location had been the Philippines but that was rejected for reasons of suspected political instability (this was in 1980); Singapore and Hong Kong were also considered with their plus points being their engineering capacities but the firm felt that geographical location was not quite adequate and that Sri Lanka could provide adequate quality at higher profit to the company. Mono Pumps emphasises that labour costs were not a particularly big item in total output charges (they were much smaller than materials costs) but they were the only cost component that could be pared down through relocation. Production was set up with already used equipment relatively demanding of less skilled labour. It was pointed out that the absence of local infrastructure for maintenance precluded the installation of best practice machinery and that, though the 6 years activity did demonstrate that Sri Lankan engineers could handle the equipment installed very well, the country would not come into the realm of possibilities if sophisticated equipment was to be utilised. In such a case the preferred locations in Asia would be Singapore and Hong Kong. Moreover, the company pointed out that absence of a sufficiently elaborate local engineering network rendered local subcontracting extremely difficult. During the 6 years life of the investment in Sri Lanka local sourcing of castings was eventually achieved (originally they were imported from Taiwan, Province of China) but, had the factory been set up in Singapore, Republic of Korea or Taiwan, Province of China, it seems that a high degree of local subcontracting would have occurred from the start. In its operations the firm employed some 40 to 50 people and stressed that their on the job learning and real productivity were fully satisfactory.

Why has Mono Pumps closed down? The crucial reason has been the introduction of a high degree of automation into the production process which has made it economically beneficial to relocate output to UK. New machines, functioning around the clock 6 days a week and which necessitate only 8 semi-skilled operators, make it more economical to produce in Manchester and export from there. The fact that Manchester is at the centre of a region with a rich engineering tradition that continues to be closely involved with machine building is also a factor of significance - the company stresses that if any problems arise with the equipment then "someone down the road" will be able to help solve them. Were it not for the fresh technology of production Mono Pumps would still be in Sri Lanka and the company emphasises that if some intermediate level activities with export of production were to present themselves it would be very willing to return since its experiences were good. Production has ceased simply because cheap labour is no longer a strong enough asset in the business.

Swedlanka is a case of great significance, indeed unique since it is the only firm explicitly engaged in part of the metal working field. The agreement to establish the company was finalised in April 1985 and production started in July 1985 to make tools and dies for plastic rubber and metal manufacturing industry. The capital composition of the company is unusual and

of considerable interest as a pointer to possible accords in the future. Participation of Swedish groups involves both Swedfund itself, with 24% of the stock and Conrit AB, with 25%. Initially the Sri Lankan involvement came from 2 Tamil entrepreneurs but they withdrew towards the end of 1986 and now the domestic shareholding is 41% for Phoenix Ltd., a private company, and 10% for the National Development Bank. Thus there are 2 public sector financing agencies, together holding just over one-third of the investment capital, and 2 private firms. Total share capital is Rs.4 mn. out of a total investment of Rs.9 mn., part of the funding coming through loans raised in Sri Lanka. The genesis of the project reflects both the public/private combination in Sweden and the difficulties experienced in the European MT industry. For Conrit, a relatively small firm, was experiencing increasing problems in competing from its Swedish base and was faced not only with the need to reduce unit costs but also the necessity to expand its market. Swedfund was instrumental in seeking out the Sri Lanka possibility and has financed the critical training component for Sri Lankan toolmakers in Sweden. This has permitted the current combination of low labour costs and qualified staff (employment is now in the 25-30 range) without which the operation would not be viable.

As of 31 March 1987 the company completed its first full year of operation with a turnover of Rs.5.2 mn. which, after allowance for all charges, was not much below the break-even point. The company assesses that its output is high quality and is exporting a considerable proportion to Western European markets including Sweden itself, FRG and Switzerland - the initial export requirement was one-quarter of output but this may well be exceeded. It appears that freight costs are not significant and thus do not present any obstacle as far as exporting is concerned. Marketing is clearly a vital activity since Conrit is not a sufficiently big company in Sweden to hold any captive market of its own. But Swedlanka has 2 advantages: first, though Conrit may not be large at home it does possess all the local knowledge to ensure that a quality low cost item can break into the Swedish market; and second, the Managing Director of Swedlanka is a person who already had detailed information on and many contacts in the other European countries and was therefore able to move the product much more quickly than would normally be the case. Thus far, it will be noticed, Swedlanka is not selling elsewhere in Asia nor is it by any means a standard subcontracting activity - it is beginning to take a life of its own.

How does Swedlanka fare in a somewhat broader perspective? The company thus far is well pleased with operations in Sri Lanka but has emphasised various issues of a system nature which are germane to investment decisions that other firms could consider. To begin with, the absence of infrastructure complicates the management problems. There is serious underdevelopment of the small industry network which renders subcontracting a difficult job. Now the company argues that these matters are ones of a long term nature and that to carry out a transformation of the industrial economy in this way requires a basic stability of approach which cannot be achieved even in the space of a decade. In contrast to Singapore, Republic of Korea and Taiwan, Province of China where the same focus has been maintained now for at least 25 years, and where the linkages of public and private sector, large businesses and small, are so intense as to allow virtually immediate use of local subcontracting (save for very sophisticated items), Sri Lanka has, over the longer time horizon, had some major shifts of perspective. The message appears to be that what is lacking is the integration of a series of emphases which, in themselves, are fully acceptable and indeed represent the pivots of an economy and society able to progress under existing conditions of the international

system. Put briefly the cornerstones so far laid are the establishment of basic education and health schemes which provide the essentials for human resources to develop, the use of public investment to set up the physical infrastructure and some agricultural and industrial activities which offer a context for business, and an orientation towards export in manufacturing without which the country cannot easily tackle its twin obstacles of foreign exchange scarcity (Sri Lanka has no power over the international markets for its major commodity exports) and limited domestic market. These elements need to be blended together instead of being treated as antithetical e.g. the supposition that somehow an export orientation in manufacturing is incompatible with an important presence of public sector firms in those industries where private capital is not readily forthcoming. In effect the view from the foreign investor side is saying that the more the public/private, large/small industrial sectors in Sri Lanka work together, the more not only domestic investment will be stimulated but the more encouragement foreign investors will also have. Even now there is a view of the groups as antagonistic, adversarial which prevents any coherent strategy from fully unfolding.

Swedlanka, as other companies, notes the major shifts in production cost structures and levels now sweeping through the industrial sectors of the OECD countries and particularly pronounced in the MT and engineering branches where the combination of the electronic with the mechanical has totally altered the nature of processes (allowing a felicitous mix of batch and custom-made production) and drastically changed the skill requirements for staff. Production in Sri Lanka is highly vulnerable to these developments and that creates real tensions around investment decisions. Swedlanka lays strong emphasis on the time required to build marketing channels and establish long term customers: even if original investment costs can be recouped relatively quickly, medium to long term profitability is a function both of continuing cost efficiency and quality maintenance (variables which depend, among other things, on whether significant technological changes are occurring) and the ability to retain a marketing grip. The problem is that Sri Lanka has a cheap labour edge but that is constantly liable to erosion (or even a sudden landslide) due to technological changes. Consequently the single edge of labour cost is not enough: what is required is at least a second asset, preferably of a system kind, which can provide some cushion against technological improvements (at least within a range). It is the long term building of that asset which has to be the focus not only of policy, seen as a succession of manoeuvres, but of strategy. This is not the same as economic planning as it has been conventionally understood and widely castigated. It is a social cum economic process of integration which recognises that domestic entrepreneurship devoted to long term profit making through industrial production (as opposed to financial speculation and trading) is essential to improving not only the wealth of the economy but also its resilience in the face of external shifts. That entrepreneurship will only flourish if public sector support is available and if the public sector is committed to creating a well defined type of economic structure. The common feature of the economically successful Asian countries has been precisely the sharpness and insistence of that definition.

The case sketches express perhaps more graphically than any figures the high risk option which Sri Lanka is pursuing (and which in the short term it may have little alternative but to follow). Yet to put Sri Lanka's investment costs in perspective a quick glance at the numbers is useful. Table 34 brings together, for the latest year for which a sizeable sample of countries on a

comparable basis could be obtained, data on hourly wages and labour costs in the export zones. The numbers tell their own story: Sri Lanka is by far the cheapest location with costs of half to one-third those prevailing in Philippines, Thailand and India. The table shows vividly how (and recall these are 1983 data) Hong Kong, Singapore and Republic of Korea have become, in the Asian context, high labour cost locations and have therefore been driven to seeking other advantages to sustain their export thrust. On any assessment, and especially when the discipline, skill and literacy levels of the Sri Lankan labour force are kept in mind, the country is unquestionably the cheap cost site.

Since the latter half of 1985 there has been a major realignment of exchange rates, especially in the \$/Yen parity. This has altered investment costs in different countries according to the behaviour of their currencies; the results likely for the 2 year period to end 1987 are given in Table 35. The only countries, as compared with Sri Lanka, which are becoming cheaper for investors both in \$ and Yen are Indonesia and Philippines with the numbers for Malaysia not much different. At one level this confirms the view expressed earlier in this report that it is the Asean countries which are Sri Lanka's competitors: they have the lowest labour costs (fragmentary information for Indonesia suggests that could it have been included in Table 34, its rates would have been closest to those for Sri Lanka) and their exchange rates are just as likely to devalue as Sri Lanka's with their export earnings reliance on a few commodities and political unrest contributing to a lack of confidence in the economy.² But taken from a different angle, the information of Table 35 suggests some other conclusions as well. First, nothing much is to be gained by any further attempts at competitive devaluations, cuts in wage rates or efforts to improve incentives for foreign investors. Not only are they likely to backfire, in that neighbouring countries will probably modify policies to neutralise the shifts, but they would seriously call into question the net benefits to Sri Lanka of the export oriented manufacturing thrust. Due to the absence of data this report has been unable to present net export earnings estimates but they are certainly not that substantial due to the import content of export directed manufacturing production. Any further policies allowing part of the benefits to be taken away would leave the country with little to show for its efforts. Second, the obvious course for Sri Lanka is to try and combine some of the low cost advantages with those of a sophisticated supporting service sector, as indeed exists in Hong Kong, Singapore and elsewhere in Pacific Asia. That means encouraging investment of a different kind such that, for example, efforts in MT could obtain local assistance from computer software specialists. Third, Sri Lanka will, if it wants to remain on the export path, have to go beyond the cheap labour issue to try and capitalise other assets e.g. location. Certainly efforts of that kind are not helped by the present political unrest in the country.

Currently Sri Lanka is looking at half a dozen areas where FDI might be encouraged. A couple of them are ones where a certain amount of investment has taken place viz. gems and jewellery, and consumer electronics, while the MT area with special emphasis on dies and mould making is another. Now independently of the manifold difficulties already identified with encouraging MT investment because of the state of the industry, there are some weaknesses in Sri Lanka's own administrative structure. None of the agencies connected with FDI is in a position to evaluate market potentials or indeed to assess carefully the real profitability of investments. Up till now the accent has been on quick approval of projects, especially by GCEC, and this approach may not have generated either an adequate return on the infrastructure expenses

laid out by the government when establishing the IPZ or necessarily picked the most suitable projects from foreign exchange considerations. Despite its endeavours through distributing information and so on the administration has not taken a sufficiently active stance with regard to attracting the kinds of FDI Sri Lanka is looking for. The material provided in this report demonstrates the complexity of the MT industry and the need to pinpoint particular niches where some opportunities might exist. That can hardly be done without sending experienced staff overseas to check for themselves what the possibilities really are: if the phrase 'priority sector' is to have an active rather than passive connotation then operational steps to do something in that sector must be taken. So far these steps have not been forthcoming. Moreover the relative success of the Swedlanka venture hints at the possibility of generating projects of a triangular kind, where foreign capital comes not only from industry but also financing institutions, whether public or private sector. That kind of possibility too is best stimulated through active field search by Sri Lankan staff, which could easily include public and private sector people.

IV . Summary Remarks

different This concluding chapter has underlined still more the message of the earlier ones viz. that the MT industry is nowadays almost totally taken up with an internecine struggle among the leading OECD countries in which even the Asian NICs are largely on the periphery. Although to date there is little evidence of substantial FDI as a response to the competitive tensions it is very possible that FDI and other forms of collaboration will become prominent in the near future (meaning the next year or so). But the signs point strongly to an OECD focussed investment with involvement of developing countries quite marginal. The information on Asia in this chapter shows that Japan has, relatively speaking, paid much less attention during the past 2 or 3 years to the continent and that Sri Lanka in particular is more or less off the investment map. Other OECD nations are also less interested in pursuing cheap labour locations and hardly at all in MT activities.

Within the Sri Lankan economy the role of capital goods in industry has been declining and the FDI in manufacturing that has expanded so much in the past few years shows a mere handful of firms loosely related to engineering and metalworking. Examination of what are probably the 2 most instructive cases reveals a close concordance of opinion about the advantages and disadvantages the country possesses. The labour force is excellent, learns quickly and is unquestionably cheap in relation to its productivity: if production depended on that alone then Sri Lanka would be top of the list. But today engineering/metalworking firms are looking for other perhaps more important things. Sri Lanka badly lacks infrastructure and a network of small industries suitable for subcontracting - only intermediate technology activities, at most, could be located there. If Sri Lanka hopes to be a possible location for this type of investment in the future then a qualitative leap must be made through system investments. Assets other than cheap labour and cheap currency have to be created. The country takes too lax a view of the marketing issue: much time and money goes into market building and neither Sri Lankan partners nor the authorities handling FDI seem to have given enough attention to the point. When local manufacturing does not have a high proportion of intra-firm trade and export markets, particularly in more specialist items such as MT, have to be created, this weakness is significant. These structures are brought into strong relief by the evidently high risk of technological changes which cut the ground from under the feet of

cheap labour and prompt companies which have invested to relocate as well as deterring other would-be investors.

Attempts to obtain FDI in MT and similar activities will thus require a more active and imaginative series of actions in the short run, aimed at individual investors, plus a conscious move towards system building in the medium to long run. Export oriented manufacturing predicated on cheap labour cannot be a development path to be followed for always but only a step towards upgrading human and material resources so that domestically initiated and operated activities can keep pace with changes externally. The absence of this perspective in Sri Lanka severely complicates the short-run task of finding projects yet even so more should be done. Field staff are required with substantial sectoral expertise. The contacts they make should reach beyond individual firms to public financing agencies in the OECD countries and the commercial banks. Given the very slim chances of obtaining FDI by large MT companies the efforts may have to be devoted to smaller producing countries and/or smaller firms (which could of course generate enterprises big in the Sri Lankan context). Investment authorities in Sri Lanka will have to scrutinise carefully the bases on which any possible MT investments might be made. All known attempts to develop MT production have been just that i.e. part of a comprehensive attempt to develop local industry. Sri Lanka does not want MT output for that purpose, however, although certainly some FDI based production would serve the local firms. Instead MT is wanted as a foreign exchange earner. Yet the message that seems to come from foreign firms is that their effectiveness as foreign exchange earners may well be enhanced if they can make better use of local support facilities. In trying to promote FDI in this sector Sri Lanka might therefore be compelled to widen its scope of assessment.

The report has shown that, from several points of view, the Asean countries are the ones closest to Sri Lanka in this area. In the past there were times when a closer association with these countries was proposed: but even were that to occur in the future, Asean does not have any sectoral policy which could stimulate production in this area. So from a regional perspective there does not appear to be much advantage to Sri Lanka seeking any association. Elsewhere internationally, as the report has stressed, Sri Lanka is not closely linked to any arrangements which could encourage production in MT. Probably the best that can be done is to strengthen ties with some of the smaller OECD producers and try to work up from there. All in all the prospects are slim indeed - whatever can be acquired in the way of FDI in MT will be through Sri Lanka's own efforts and very much against the current.

- 1/ South, "The Rising Sun: Cutting Out Asia", February 1987, p.58.
- 2/ idem.
- 3/ Nachrichten fuer Aussenhandel, "Branchenbild: Die Werkzeugmaschinenindustrie in Indonesien", 3 February 1986, p.sc2.
- 4/ American Metal Market, "Indonesia: Toolmakers Wanted", 14 January 1985, p.15.
- 5/ Iron Age - Metal Producing Management, "Thailand asks US Firms to Locate There", 17 January 1986, p.16.
- 6/ It is claimed that so far the internal strife has not affected foreign investment behaviour. However international air communications have been reduced (at least for passenger traffic) and the persistence of problems will certainly reduce investment incentives in Sri Lanka as compared with other countries.

Table 25: Macroeconomic Indicators for Selected Asian Countries, 1985

Country	Per Capita GDP 1985 (US\$)	Industry Share GDP 1985 (%)	Export Change 5 years to 1985 (%)
Thailand	752	29.1	+10.3
Philippines	648	31.4	-20.3
Indonesia	498	29.4	-16.3
Sri Lanka	372	26.3	+21.7
China	255	49.5	+50.7
India	243	26.3	+16.4

Source: Business Asia, 9 February 1987

Table 5: Japan: Foreign Direct Investment in Developing Asia, 1985^{a/}

Country	Amount (\$ mn.) ^{b/}	Change on Previous Year (%)
Indonesia	408	+9
Singapore	339	+51
Rep. of Korea	134	+25
Hong Kong	131	-68
Taiwan, Province of China	114	+75
China	100	-12
Malaysia	79	-44
Philippines	61	+33
Thailand	48	-60
Brunei	1	-80
Others	20	-5
Total	1435	-12

Source: The Economist, 25 October 1986, drawing on MITI data.

Notes:

- a/ Fiscal year, i.e. 1 April 1985 to 31 March 1986. Figures refer to all sectors.
- b/ Converted at current exchange rates: the aggregate fall from 1984 to 1985 measured in dollar terms would therefore be greater measured in yen due to the rising value of the yen against the dollar in the latter half of fiscal 1985 (i.e. subsequent to the G5 accord of September 1985).

**Table 6: Some characteristics of the Machine Tool Industry
in Asean Countries, 1985**

Number of Producers:

Indonesia:	13
Thailand:	13
Singapore:	10-15
Philippines:	5-10
Malaysia	47 (metalworking and wood working).

Nature of Product:

Metal Forming rather than Metal Cutting (except for Singapore)
Intermediate level (except for Singapore), including reconditioning and rebuilding of imported machines (particularly in Philippines)

Nature of Production Method:

Old machines (except for Singapore), frequently more than 10 years
Job order rather than continuous production
Heavy reliance on imported raw materials, particularly special steel alloys

Investment and Ownership:

Lack of investors (domestic and foreign) despite high priority given to
Machine Tools in all countries investment plans. Risks seen as volatile demand, advanced and changing technology, and weak support industries.

Current ownership is mainly national

Source: Derived from material collected by Technonet, Singapore, published in UNIDO, The Machine Tool Industry in the Asean Region: Options and Strategies, Main Issues at Regional Level, May 1986.

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Table 26: Sri Lanka: GCEC and FIAC Firms as Industrial Employers, 1985

Total Industrial Employment	206,172
GCEC Employment	31,835
FIAC Employment	25,874
GCEC + FIAC as % of total	28.0

Source: Upananda Vidanapathirana, "Internationalisation of Production and Third World Industrialisation: Relevant Policy Issues for Sri Lanka", mimeo, December 1986.

**Table 27: Sri Lanka: Performance of GCEC and FIAC Firms
as Industrial Exporters, 1979-1985**

Item	1979	1985
Total Industrial Exports (Rs. Mn.)	3,700	13,584
GCEC Exports (Rs. Mn.)	152	3,802
FIAC Exports (Rs. Mn.)	126	2,225
GCEC + FIAC as % of Total Industrial Exports	7.5	44.4

Source: Upananda Vidanapathirana, "Internationalisation of Production and Third World Industrialisation: Relevant Policy Issues for Sri Lanka", mimeo, December 1986.

Table 30: Sri Lanka: Features of Investment Projects Implemented under CCEC as of 31 January 1987

Registered cases of investment:	101
Number of joint ventures with Sri Lankan participation:	54
Number of wholly Sri Lankan projects:	10
Leading foreign investors measured by number of projects:	
Hong Kong	15 (including 10 JVs with Sri Lankan participation)
UK	9 (7)
Japan	7 (3)
USA	7 (3)
FRG	7 (2)
Singapore	6 (3)
Leading branches:	
Garments	26
Jewellery and lapidary	10

Source: From data supplied by GCEC

Notes: The total excludes Mono Pumps (UK) which closed down operations in early 1987. Some joint ventures with Sri Lankan participation involve more than one foreign partner; there are some joint ventures just among foreign firms.

Table 10. Sri Lanka: FIAC Approved projects in Manufacturing 1977-1986, Actually in operation^a, end June 1986

Sector	Number of Projects	Actual Investment (Rs. mn.)	Foreign Share (%)	Average Export ^b Requirement (%)	Actual Employment
Manufacturing of which: ^c	130	3,712	31.1	87.6	25,444
Textiles and Garments	42	1,225	27.9	90.0	16,177
Food and Beverages	10	383	90.0	79.0	1,068
Wood and Paper	5	40	20.0	66.7	196
Chemicals, Plastics and Rubber	28	692	21.2	83.0	3,142
Basic Metal and Engineering	12	145	33.1	n.a.	790
Others	33				

Sources: Calculated from data supplied by FIAC.

Notes:

- a/** Projects actually operating are substantially less than those approved; for manufacturing as a whole the approved figure is 229.
- b/** The figures in this column are unweighted averages (in the absence of firm level production and export data) and are calculated assuming that where FIAC provides no information on export requirements the proportion is unknown (as opposed to zero). If in fact those figures are zero, then figures in this column should be reduced. In that case the numbers would read: manufacturing, 62.0; textiles and garments, 85.7; food and beverages, 31.6; wood and paper, 40.0; chemicals, plastics and rubber, 50.4; basic metal and engineering, zero.
- c/** The branch classification is necessarily somewhat imprecise.

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**Table 22: Sri Lanka: Performance Indicators for
 Fabricated Metal Products, 1977-1984**

Item	1977	1984
Share of manufacturing value added (%)	5.3 ^{a/}	3.2 ^{b/}
Share of manufacturing employment (%)	5.6 ^{a/}	3.0 ^{b/}
Capacity utilisation (%) ^{c/}	54	84
Foreign to total raw material supply (%)	78.9	70.0
Share of manufacturing exports	negligible	negligible

Sources: UNIDO, Handbook of Industrial Statistics, 1986, and UNIDO' Sri Lanka Industrial Review, February 1986.

Notes:

a/ 1973-1975 average

b/ 1982-1984 average

c/ Includes machinery and transport equipment

d/ Includes machinery and transport equipment; estimate based on public sector firms

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**Table 37. Sri Lanka: Foreign Trade in Metal Cutting Machine Tools,
1979-1983 (US\$ '000)**

	1979	1980	1981	1982	1983
Imports	3325	6729	2775	2779	3111
Exports	112	56	281	48	198

Source: International Trade Statistics Yearbook, United Nations, New York 1985.

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 table 18: Average hourly wages and average hourly labour costs
 in Export Processing Zones and World Market factories in
 Selected Developing Countries, 1983 (\$US)

Country	Average Hourly Wages	Average Hourly Labour Costs
Sri Lanka	0.11 - 0.15	0.15 - 0.25
Philippines	0.25 - 0.70	0.30 - 0.90
Thailand	0.35 - 0.50	0.40 - 0.60
India	0.40 - 0.75	0.50 - 0.80
Taiwan, Province of China	0.40 - 1.25	0.50 - 1.50
Malaysia	0.50 - 0.70	0.65 - 0.90
Singapore	0.60 - 1.25	0.90 - 1.80
Rep. of Korea	0.60 - 1.20	0.75 - 1.50
Hong Kong	0.90 - 1.65	1.12 - 2.10
Brazil	0.40 - 0.90	0.50 - 1.20
Mexico	0.65 - 0.90	
Colombia	0.75 - 1.00	0.90 - 1.25

Source: Folker Frobel, Jurgen Heinrichs and Otto Kreye, Umbruch in der Weltwirtschaft, Rororo 1986, p.470.

Notes: Labour costs differ from wages through including social payments.

Table 28: Projected change in investment costs as measured in Dollars and Yen in Selected Asian Countries, end 1985 to end 1987

Country	Change in Yen (%)	Change in Dollars (%)
Rep. of Korea	-12.1	+17.5
Taiwan, Province of China	-5.8	+26.0
India	-26.4	-1.7
Indonesia	-43.5	-24.5
Philippines	-31.6	-8.5
Thailand	-18.7	+8.7
Malaysia	-29.6	-5.9
Sri Lanka	-30.2	-6.8

Source: Business Asia, 16 March 1987.

Notes: Percentages calculated comparing actual end 1985 rates with projected end 1987 rates; the basis for the projection is not explained. It is not clear whether full allowance has been made for possible shifts in costs other than exchange rates e.g. alterations in government policies towards foreign investment.

5. Recommendations regarding investments in machine tool production

I. Target investors

The interviews carried out at the 7th EMO Machine Tool Exhibition in Milan allow conclusions on the composition of the target group for a potential investment in Sri Lanka. All large scale exhibitors from industrialized countries showed hardly any interest in considering Sri Lanka as an investment option. The Japanese exhibitors quite clearly indicated that their foreign engagements (licencing agreements or direct foreign investment) will continue to concentrate on the People's Republic of China, Republic of Korea and Taiwan, Province of China and that no plans exist at present to further diversity on a broad scale. Additional future target countries might be among the ASEAN member states or India. Sri Lanka received little (if none) attention. However, the picture might be different among smaller sized Japanese manufacturers (less than 500 employees) but there was no exhibitor present at the Milan fair of this group of companies.

Among the manufacturers from other industrialized countries the large companies also showed little or no interest in Sri Lanka as a target country. Among medium and small sized manufacturers distinction has to be made between producers of special machine tools and of general purpose machine tools. The former, active in highly specialized market segments in industrialized countries, showed no interest in an engagement in Sri Lanka as regards their present production line. High degree of sophistication of their product, the requirement of highly skilled labour with many years of experience, relatively high degree of subcontracting of precision parts and components and scarcity of personnel to deal with a foreign facility rule out in their opinion to

enter a production engagement in Sri Lanka or any other developing country. Their labour cost in machining, assembly and software development is relatively high. But according to the interview partners the work involved is of such a degree of specialization that quality requirements can not be met through off shore work without an unproportionally high cost for labour training. The software developed or to be developed is tailor-made to customer requirements and needs a continuous feedback with the corresponding client so that relocation potential for software development is, if at all existing, minimal.

The only potential target group identified during interviews for foreign direct investment in Sri Lanka are small and medium producers of general purpose machine tools from western European countries. Out of this group, two companies showed a general interest in direct foreign investment and six said that a licensing agreement might be of interest to them. However, these statements have to be treated as indicative only, by experience it can be said that the negotiation process will be time consuming and difficult. One of the companies, a producer of general purpose lathes with or without computer numerically control units, already has long established business relations with an importer in Sri Lanka who also has built up maintenance facilities for the imported machinery.

In both cases of interest in an investment opportunity in Sri Lanka high labour cost in Europe and the international price competition played a major role in their argumentation. At the same time the interview partners considered that the setting of machine tool production will undergo changes in the medium future: countries like Republic of China, Republic of Korea and Taiwan, Province of China, will shift more and more, yet at different degrees towards technologically more advanced machinery, their labour cost

(probably with the exception of Republic of China) will increase and raise their production costs and might give room for other producers in the low price range of good quality general purpose machine tools as used in workshops and in vocational training centres. Both companies would be interested in marketing the machine tools machine tools produced in Sri Lanka on the international market including Europe.

There were other interview partners which in the long term did not rule out the possibility of Sri Lanka to enter into the international setting of machine tool production but would at present not make a statement on their own potential interest. In summary it can be said that all companies, i.e. those with a positive answer towards a production or licencing engagement in Sri Lanka and those leaving it open for the time being, conditioned their interest on the existence of an appropriate industrial infrastructure and an acceptable business environment, both considered crucial for financial success or failure of their possible venture. Those interview partners with a negative answer (60 per cent of all interviews) were of the opinion that in the foreseeable future Sri Lanka would hardly or not be able to fulfill these requirements.

There has also been some interest by European manufacturers in subcontracting parts and components. Their further pursuit of this business possibility was conditioned, however, on the existence and examples of international subcontracting from Sri Lanka in the machine industry area.

II. Key preconditions

In the following, the general key preconditions as they resulted out of the interviews are summarized. It is emphasized that in specific cases a potential investor might have additional pre-investment requirements which hardly can be foreseen at present and which would have to be dealt with in due course.

Sales market

The domestic market of Sri Lanka is generally too small for establishing a manufacturing facility. In the machine tool industry it is uncommon to base an investment decision only on cheap but well qualified labour. It is therefore recommended that Sri Lanka explores the possibility of mutual trade agreements on machine tools with Asian countries, mainly Pakistan, India and the ASEAN member states. Such agreements are essential to strengthen the interest of the identified potential business partners and to attract additional ones.

Pilot investment conditions

If Sri Lanka decides to enter into the production of machine tools, a "special package" of investment incentives will most certainly be required for the pilot investors. The incentives to be offered must clearly reduce the investment risk of both the international and local business partner. They could include e.g. special conditions for utilization of industrial land and premises, contributions to manpower training costs and special payment terms or credit lines for locally subcontracted parts and components as well as export financing to new markets (e.g. Asian countries). Besides incentives recommended to be offered to the foreign pilot investors, a financial, technological and

staff training support program is recommended for potential local subcontractors.

Business environment

A machine tool manufacturing in Sri Lanka will require the existence of an appropriate business environment of which in the Asian region Singapore is an example. The requirements in this context refer to unbureaucratic and rapid procedures in Government offices, public enterprises, banks, and business (subcontracting) partners, international telecommunications and ship transport, availability of production inputs (raw materials, uninterrupted power supply), and support to the subcontracting network.

Subcontracting network

The most crucial area for machine tool manufacturing in Sri Lanka is probably the establishment of a reliable subcontracting network of both private and public industrial enterprises. Nominally a great part of the capacity of supply industries is already existing (e.g. foundry and machining capacity), but it is generally doubted that the existing facilities can meet the quality standards required in machine tool manufacturing. All subcontractors would need for example a tight quality control system. It can be expected by experience that at the beginning production rejects will be high and the question has to be raised who would have to pay for these rejects (for many of the small-scale potential local subcontractors these costs will out-pass their financial capacity). It is recommended that this question is treated in the framework of the pilot investment conditions mentioned above. It should be kept in mind that the establishment of an efficient high-quality local subcontracting industry would also be of benefit for

attracting other machinery producers or international subcontractors.

It is recommended that as the next follow-up step a detailed analysis of the existing subcontracting potential and interest of local entrepreneurs in entering into the subcontracting business be undertaken as well as an analysis of subsequent upgrading requirements and programs through international assistance, especially in quality assurance, be undertaken.

Technical training

As far as can be judged at present there is ample availability of labour of good and basic technical skills and training. Machine tool production and assembly, however, requires very high skills and in some cases many years of professional experience (there are for example key operations in machining and assembly which in Europe is entrusted to personnel with at least 10 years experience in precision work). It is recommended that technical upgrading programs be conceived jointly with the investors including their factory personnel and employees from potential subcontractors. It is assumed that at least small-scale local subcontractors will require financial support to participate in such programs, probably to be carried out through international assistance in combination with the program recommended in relation with subcontracting.

III. Plan of action

As has been pointed out on several occasions throughout the report the possibilities for Sri Lanka to enter the machine tool industry are relatively remote and only exist if the Government is decided to undertake the required commitment and introduce appropriate policy measures. Unless there

will exist a package of far-reaching incentives to attract pilot investors which would indicate to them financial advantages to undertake a, in their eyes, risky and relatively uncommon investment in a small market-sized country with little experience in the machinery industry, it is quite doubtful that Sri Lanka will succeed in the venture. On the other hand, if Sri Lanka manages to successfully attract foreign investors and get established a few machine tool manufacturing units and also manages to develop a network of subcontracting industry of international quality standard the operation might be a breakthrough for enlarging the country's metal working and machinery production sector and make it attractive for foreign investors and international subcontracting in this field of industrial activity. A key requirement is to create a result-oriented strategy which will require a massive allocation of physical, human, organizational, and financial resources.

The Government's decision on the subject matter should be coupled with an analysis of costs of resource allocation and the potential benefits. Special attention should be given to arrive at preferential mutual trade agreements with Asian countries on machine tools and possibly later on other machinery. Without the potential to enlarge the small domestic market to a regional one the prospects for Sri Lanka as a future location of machine tool manufacturing are negatively affected in the view of investors. On the positive side, the machine tool industry is internationally characterized by the relatively high value added per employee and would in the medium term allow for job opportunities of highly qualified personnel, especially engineers and technicians. Strategically it can be considered, even though its share in manufacturing value added of the metal-working and machinery industrial sub-sectors is generally relatively low, as a key industry for the promotion and development of this sub-sector. However, it should be kept

in mind that machine tool manufacturing is one of the most complex areas in this sub-sector requiring in any developing country combined and coordinated efforts of public and private entities and the establishment of a reliable and sophisticated supporting service sector.