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METALWORKING INDUSTRIES IN SRI LANKA:

THE PROSPECTS FOR FOREIGN COLLABORATION*

Prepared by the
Regional and Country Studies Branch
Industrial Policy and Perspectives Division

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PREFACE

This report has been prepared as part of UNIDO's economic research programme covering analyses and information of relevance to industrial policy-making in developing countries. In this programme, the Regional and Country Studies Branch is monitoring pertinent developments at the national and regional levels, in particular concerning industrial policies and programmes, emerging technological trends, demand changes in important markets, sub-sector issues and company strategies.

The purpose of this study report is to provide analytical support to the endeavours of the International Economic Co-operation Division of Sri Lanka's Ministry of Finance and Planning to diversify the country's industrial branches on which exports depend and which so far have been the main receivers of foreign direct investment. Specifically, UNIDO was requested to examine the possibilities for establishment of joint ventures in the machine tool and metalworking branches.

The work undertaken by UNIDO has included essentially four inter-related activities: (i) a detailed examination of international developments in the machine tool branch;[1/] (ii) a survey of the current status of metalworking activities in Sri Lanka; (iii) a series of interviews with international machine tool companies participating in the Seventh European Machine Tool Exhibition in Milan, Italy in October 1987; and (iv) extensive utilization of earlier studies prepared by UNIDO and other organizations on related subjects both in Sri Lanka itself and in other developing countries.

The present report consolidates the results of this work and formulates a programme of action for Sri Lanka's metalworking industries with a view to increase the attractiveness of this industrial sector for foreign investors. The report was prepared by staff of the Regional and Country Studies Branch in co-operation with Mr. Peter O'Brien and Mr. Karl Heinz Plätzer as UNIDO consultants and the Sri Lanka Business Development Centre.

1/ Cf. UNIDO, Recent Developments in the Machine Tool Industry: The Prospects for Foreign Direct Investment with Particular Reference to Asian Developing Countries, PPD.53, 16 September 1987.

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LIST OF ABBREVIATIONS

ASEAN	Association of South-East Asian Nations
CAD	Computer-aided design
CISIR	Ceylon Institute of Scientific and Industrial Research
CNC	Computer numerically controlled
ESCAP	Economic and Social Commission for Asia and the Pacific
FIAC	Foreign Investment Advisory Commission
GCEC	Greater Colombo Economic Commission
GDP	Gross domestic product
GNP	Gross national product
IDB	Industrial Development Board
ISIC	International standard industrial classification
NC	Numerically controlled
MFP	Ministry of Finance and Planning
MRID	Ministry of Rural Industrial Development
MISA	Ministry of Industries and Scientific Affairs
MTS	Ministry of Trade and Shipping
MVA	Manufacturing value added
NERD	National Engineering Research and Development Centre
R&D	Research and development
Rs	Rupees
SLBDC	Sri Lanka Business Development Centre
UNIDO	United Nations Industrial Development Organization

I. CONTEXT OF THE STUDY

Before entering into the details of metalworking and machine tool production in Sri Lanka, it is essential to summarize the internal and external constraints within which policy actions will have to be taken. To begin with the capacity to generate foreign exchange, some simple yet fundamental observations can be made. In the past, Sri Lanka has obtained foreign exchange almost entirely through four sources viz., primary commodity exports, tourism, remittances by migrant labour, and exports of labour-intensive manufactures. Given the rapid deterioration in external economic conditions from the early to middle 1980s onwards, these sources have shown to be increasingly vulnerable. The sharp falls in primary commodity prices, the severe reduction in the market for Sri Lankan migrant labour due to the collapse in oil prices and its effects on the labour demand from the Middle East, and the relatively stagnant incomes in the industrialized countries and, thus, more limited growth in foreign tourism have all contributed towards constraining the prospects for increasing foreign exchange earnings. The fourth component, i.e., labour-intensive export manufacturing is also faced with uncertain prospects partly for the same reasons and partly for others. It appears that future growth of foreign investment based on international sub-contracting for Sri Lanka has rather limited horizons. In the traditional branches, of which textiles and clothing is the principal example, those firms which wished to do so have already had ample opportunity to establish operations in the country. Therefore, this type of investment is unlikely to expand very much; in the future it may even be under pressure for some reduction. The reasons are not so much rising costs in Sri Lanka itself; on the contrary wage rates for various kinds of labour have remained very low in relative terms and the Government has been generous in the fiscal and other concessions it has offered. Rather, these branches are susceptible to a certain degree of relocation back towards their original base in developed countries due to technological advances; moreover, the growing sophistication at the demand end of the market makes it more interesting for producers to locate most of the production activities in their home bases. Faced with these conditions, the Sri Lankan Government has begun to look for other branches which could provide additional foreign exchange through export-oriented manufacturing - it is for this reason that metalworking and machine tool industries have come to the fore.

Any attempt aiming at diversifying the prevailing branch structure of foreign investment to include more sophisticated lines of production, such as metalworking and machinery, is faced with difficult preconditions. Sri Lanka's geographical position, its low income level and small domestic market as well as recent developments in the international investment system all militate against easy change.

- During the present decade the source of dynamism in the international economic system has switched firmly to Asia and in particular to four parts of the continent. Japan has now become the primary international creditor and is extremely well placed in advanced industrial branches of which machine tool and metalworking are outstanding examples. The Asian newly industrialized countries have already begun to break into developed country markets, especially North America and Australasia, in reasonably advanced types of machine tool products and are areas of

major interest to potential foreign investors. The ASEAN countries are well prepared to launch the third wave of Asian manufactured exports and surveys of foreign investors show that these countries, both individually and as a group, figure highly on the list of preferred locations. Finally, India, although it seems to attract less attention in the financial and business press, nevertheless remains an extremely important industrial market and one in which the size and sophistication of domestic production has to remain a source of interest to foreign suppliers.

- Against these major locations Sri Lanka does not appear to be the 'natural choice' for potential foreign investors interested in developing operations in complex and rapidly advancing branches such as metalworking in general and machine tools in particular. The country's still limited domestic market size compels it to rely heavily on exports while the low degree of internal integration in its industrial sector creates the need to import a substantial proportion of the required raw materials and intermediate inputs. However, the fairly limited extent of domestic demand contributes towards raising the costs of such imports and thereby imposing greater pressures on productive efficiency within Sri Lanka itself. The country, as things now stand, is in the initial phase of seeking to establish itself as a more demanding investment location and to obtain the types of collaboration which would yield higher returns to the economy. The fact is that, in its concentration on cheap labour activities, Sri Lanka has only been competing to a partial extent with other Asian countries. Certainly the Philippines and Indonesia are normally analyzed in the same breath as Sri Lanka when it comes to comparisons of wage rates and government incentive packages, yet some of Sri Lanka's competition really comes from other continents, e.g., Malta and Cyprus as Mediteranean Island suppliers to transnational corporations located in European common market countries, North African States supplying to Europe, and to a lesser extent Central American countries insofar as sales to North America may be involved. In short, Sri Lanka is somehow on the margin in the dynamic region of the world economy to which it geographically belongs and is thus faced with the difficult policy predicament of deciding whether it should try to go it alone, and if so along which route, or whether it should try first to establish some formal links with other Asian countries and then try to attract foreign investment in the producer good branches which are the concern of this report.

The purpose of the preceeding remarks has been to highlight a point which is all too easy to lose sight of in present circumstances where international discussion focuses so much on export-promotion. It is that the results of promoting export-oriented foreign investment are only to a limited degree within the control area of the Sri Lankan Government. The present period is one in which numerous developing countries are offering attractive incentive packages to external enterprises and yet, with the notable exception of Japan, most industrialized countries are not expanding their foreign direct investment in manufacturing to any appreciable extent. This is partly because so much investment has occured over the past quarter century, and therefore most companies are already established in those manufacturing locations which interest them, and partly because the fierce technologically-driven competition within the industrialized countries is itself absorbing almost all the investment capital which is available. The enormous investments taking place in telecommunications and informatics are in essence a logical

supplement in terms of international infrastructure to developments which took place a couple of decades ago in terms of international transport. The container revolution in shipping along with the rapid introduction of larger and faster cargo-aircraft both contributed to reductions in unit cost of international movement of goods - current developments are providing their complement in relation to services. It follows that whereas a few years ago it was important for developing countries to have adequate port facilities with which to respond to physical transport requirements, at the end of the 1980s it is equally essential for developing countries participating in more sophisticated manufacturing operations to develop adequate service infrastructure facilities.

It emerges from the above that Sri Lanka is faced with fierce competition if it wishes to expand its involvement in advanced areas of foreign investment. For the Government to pursue this path is not merely a question of developing substantial incentive packages but also means a tough analysis of the further preconditions to be met in order to make the attraction of more sophisticated investment a successful approach.

II. THE PRESENT STATUS OF METALWORKING INDUSTRIES IN SRI LANKA

1. Introduction

In any meaningful sense of the term the machine tool branch proper is currently non-existent in Sri Lanka. Instead such production as does take place is entirely in the broader area of metalworking, defined as fabricated metal products in ISIC categories 3811-3814 and non-electrical machinery in ISIC categories 3822-3824 and 3829. These categories amounted to approximately 3.5-4.0 per cent of industrial production in Sri Lanka in 1986 and that percentage had varied hardly at all during the preceding five years. Roughly 30 per cent of the items produced were relevant to the food processing branch and another 30 per cent to textiles. The latter fact emphasizes an obvious yet significant point viz., demand for metalworking products is a derived demand and is therefore dependent on the state of economic activity in the economy as a whole and in particular on the evolution of investment in fixed capital. The primary areas of demand for metalworking items in Sri Lanka are as follows: agricultural machines and implements, especially equipment for processing tea and rubber, and water pumps for use in irrigation; textile machinery spares, building materials; transport equipment needs including spares; and, on the consumer goods side, domestic appliances. Almost all production in Sri Lanka goes to the domestic market and sales, amounting to roughly Rs 2 billion per year, account for about 22 per cent of domestic needs with the remainder being imported.

To provide more detailed information on the range, characteristics and constraints of metalworking production in Sri Lanka a survey of 52 firms was undertaken during the first half of 1987.[1/] According to data provided by the Industrial Development Board (IDB) there were approximately 870 enterprises registered as metalworking producers in Sri Lanka in 1986 with many smaller firms left unregistered (the informal part of the branch). The 52 firms included in the survey, (with data relating to the position as of 31 December 1986) tended to be the larger enterprises with fixed capital investment exceeding Rs 1 million: 9.6 per cent of the firms in question had total investment (i.e., land, buildings, working capital and plant and machinery) in excess of Rs 100 million, and average investment in plant and machinery per employee came to approximately Rs 69,000. It follows that the conclusions that can be drawn from the survey are important in at least three major respects. First, these larger enterprises are almost certainly the ones with which both government departments and potential foreign investors will have the most contact; to the extent that joint venture possibilities and other forms of collaboration can be worked out with existing enterprises, the ones surveyed are the most probable candidates. Hence, their views of the status of production and the prospects for foreign co-operation can be taken as a meaningful indicator of the overall situation. Second, the degree of sophistication in both products and processes is almost certainly highest in the enterprises examined - what can be done with their assistance and involvement effectively represents the frontier of possibilities in Sri Lanka in the short- to medium-term. Third, it may be that the problems of tiny enterprises are appreciably different from those described in the survey. To the extent this is the case, support for development of the sector might have to include measures hardly discussed by the enterprises surveyed.

1/ Cf. the Annex to this report for a complete list of firms included in the survey.

Before analyzing in detail the findings of the survey and their policy implications, a few caveats have to be put on record. First, the sample itself, like all samples, had its limitations. Only one joint venture was included and thus there was virtually no possibility to obtain practically-based assessments of joint venture operations in the country. Second, there was poor acceptance of interviews subsequent to distribution of the questionnaire. It seems that companies felt that several reports on the metalworking branch had been initiated in recent years but that the producers themselves had not benefitted from such surveys. As a consequence they were reticent to provide data for yet another assessment. This of course means that the chances of effectively cross-checking answers and of going deeper into the reasons for some of the assessments and evaluations were limited. The net result of these caveats is simply that the survey, while providing useful indicators for policy on several matters, does not provide a sufficiently strong basis for tackling all of the main areas which both government departments and foreign investors are likely to be interested in. Subsequent and highly specific enquiries would therefore have to be undertaken before any final policy designs were made.

The survey data offers information on a variety of subjects and the most convenient way to summarize these results is to use a series of standard headings; this is done in the following paragraphs.

2. Product mix

Pulling together the responses from all 52 enterprises surveyed, a variety of 39 items were identified as being part of the regular product mix of the firms. Listing these 39 products and putting against them the firms actually producing yields 118 entries, i.e., on the average each firm produces about 3 products (the largest number produced by any single enterprise was 6). The comparison of products and firms shows a fair degree of grouping. Thus agricultural machinery and spares for agricultural machinery were items each of which was made by 10 enterprises of which 8 make both sorts of product; in the same vein the listing shows that the three firms which manufacture barbed wire were also the three which manufacture wire nails, nuts and bolts. It appears that the degree of specialization is not too high and that, as will be seen later, much of this production takes place on a 'one-off' basis which is hardly conducive to obtaining low cost of production. Indeed the firms indicated that organized production lines are hardly ever used and that output consists essentially of discrete responses to demands from diverse sources. In the same connection there was little evidence to indicate that any of the companies producing metalworking items form part of larger trading or manufacturing groups in Sri Lanka; were they to do so, the resultant vertical integration could well assist stability in the flow of orders.

A categorization of the 39 items shows that 24 of them relate to ISIC 382 and that more than 80 per cent of the company entries for production pertain to the same category. Hence the metalworking sector in Sri Lanka is oriented towards non-electrical machinery rather than fabricated metal products and produces a range of items on the basis of relatively little specialization and either "one off" or small batch production. These findings suggest both considerable scope for production improvement and yet the serious obstacles to it. Certainly, companies are not in this position by accident, by choice, or by protection through government commercial policy. The reason for the current structure is the nature of the domestic market and the emphasis it puts on what we might call relatively non-automated flexibility in output where the resultant high costs are borne by local consumers.

3. Machines and manufacturing processes

The survey sought to ascertain the kinds and number of machines installed in the companies and the processes carried out using this equipment. The main features to emerge were the following:

- Lathes were by far the most common pieces of machinery installed with a total of 367 and only 5 firms possessing no lathes whatsoever.

- Although their total number was much smaller, drilling machines were also available in all but seven of the companies.

- Close to 40 per cent of the sample had no welding facilities and very few companies had machinery for boring or bending of metals.

- Though not all companies provided information on the average age of equipment, of those which did 18 firms claimed their machine stock was at least 20 years old (the largest company in Sri Lanka said the average age of its machinery was about 40 years) and only 10 companies had machinery whose average age was no more than 5 years. Though no specific information was given, it seems highly probable that even when a firm buys machinery it is purchasing reconditioned second-hand equipment and it seems doubtful that a significant number of machines in metalworking industries in Sri Lanka are ever purchased brand new. Obviously no firm is operating with machines which are at all close to the technological vintages, now commonly found not only in developed countries but in several of the more industrialized developing countries.

- No company in Sri Lanka is utilizing machinery of the numerically controlled (NC) or computer numerically controlled (CNC) type.

- Data on capacity utilization was only discerned in rough-and-ready fashion through questions to entrepreneurs regarding what they considered the level of machine use to be. On this basis seven companies claimed operations at full capacity while 20 firms said they operated at 50 per cent or less. It was not possible, on the basis of information collected in the survey, to obtain any correlations between capacity utilization and matters such as company size and age of equipment.

This sketch of the machine stock and its use gives an inroad into the question of manufacturing processes and their frequency. The survey examined a variety of ten different processes ranging from standard activities such as metal casting and milling through to more sophisticated operations involving heat treatment. A matrix relating the 52 firms to these 10 activities yielded 194 entries, i.e., an average close to four activities per firm, with the widest spread of activities for any one enterprise being seven. Machining and sheet metal working were the most frequent operations whereas, at the other end of the scale, heat treatment was only carried out by two companies and recourse to supplementary data to the survey shows that steel casting can only be carried out in two companies in Sri Lanka (both of them in the public sector). Casting as an activity is in fact still quite traditional in that few synthetic binders are employed, few chemical additives are made to slagging materials, and wooden patterns are used for individual job orders. This data emphasizes the limitations of the metalworking branch as it now exists and the desirability of substantial upgrading if higher quality products of a type suitable for export are to be manufactured. Yet the upgrading would itself imply appreciable changes in the machinery stock and is thus a matter not only of improved technical training and quality control but also of additional investment in fixed capital.

4. Manpower issues

Total employment in the firms surveyed as of end-1986 reached 6,965 persons with approximately 15 per cent of them in managerial functions. The distribution of employment by firms revealed 48 per cent of all companies to have less than 15 employees and 73 per cent of firms to have less than 100 employees; only 15 per cent of the companies had above 200 staff. A more detailed examination of the figures on an individual firm basis, however, shows that just one firm (Walker and Sons) had 1,800 employees and that this firm and the Steel Corporation of Sri Lanka together accounted for 43 per cent of all employment. If these two entities were removed, then average employment for the branch (as measured by the sample) would be around 75. Within the individual categories skilled fitters and skilled machinists are the two groups most regularly employed while, on the managerial side, various companies revealed a pattern in which just a few individuals were required to perform a wide range of functions. The firms in that situation are those which do not participate in organized training programmes. Certainly these findings are fully consistent with the typical situation of a developing country where company size in a given branch is not too large, where specialization in production is not marked, and where the financial structure of the enterprises is still fairly biased towards family concerns, sole proprietorships and partnerships (i.e., where reliance on external sources of risk capital is marginal).

The turn-over of labour appears to be reasonably high with fairly skilled staff changing jobs at anywhere from two to five years, i.e., a turn-over rate averaging around 30 per cent. More recently the difficulties facing the companies have tended to accelerate this rate and, more disturbingly, the changes seemed to have focused more on the more skilled staff. The impression is that the overall composition of the current work force is rather less skilled than before. This point is of considerable importance because the survey also shows a heavy reliance on practical experience in the labour force. Many skilled technicians are unable to read technical drawings and instead rely on their undoubted abilities to copy existing samples and to utilize their own know-how to improve the quality of production. While this kind of experience is a key asset, it nevertheless would be an improvement if some formal training could also be given, particularly when possible collaboration with foreign producers is involved. Moreover, the combination of a slow drain of highly experienced technicians along with the threat to Sri Lankan production which would come if more sophisticated products were to be imported, mean that the formal training component has to be given more attention. Since this kind of technical improvement cannot be carried out efficiently within individual firms, there is a clear case for either joint facilities to be provided by the companies themselves and or for government support in providing technical training.

The questionnaire did obtain data on wage rates in metalworking industries. Highly skilled workers are, at present exchange rates, receiving some US$50-100 per month with rates for senior managers going from US$330 - 500 per month and pay to unskilled workers being in the range of US$27-40 per month. Earlier estimates relating to 1983 showed that wage rates in these categories in Sri Lanka were, on the average, only about half of those prevailing in say Malaysia and a mere 2 per cent of comparable rates in USA: since then the relative rates of inflation along with exchange rates changes have certainly not weakened the position of Sri Lanka. In other words, in terms of sheer cash payments it is comprehensively a much cheaper location

than any other to which it might legitimately be compared. Moreover, there are no grounds for believing that the labour productivity in Sri Lanka is sufficiently below that in other countries so as to outweigh the labour cost differential. In short, Sri Lanka has no reason whatsoever to be worried that foreign investment fails to occur because of any rising tendencies in real labour costs. Rather, as further material in this report will demonstrate, the problems are elsewhere, i.e., foreign investors are, within a certain range, no longer influenced by the wage rate differentials and are much more concerned with the infrastructure situation and the local supply network in alternative locations.

5. Raw material supply

The survey shows that not only is close to 4/5 of metalworking consumption in Sri Lanka met by imported items but that local content of domestic output is very low. Although foundries make significant use of scrap (mainly steel) obtained from prior local production, most other raw materials and intermediate inputs are imported. The problem of imports is not only one of availability but also of cost since the structure of the branch along with its size in the country and certain policies pursued by the Government combine to increase charges, particularly for smaller companies. The problem partly stems from the relatively small quantities needed by most companies which leads them to purchase their supplies from bulk importers rather than directly. This implies the payment of significant mark-ups which add to the cost already payable due to Sri Lanka's relative distance from raw materials sources. Moreover, the infrequency of purchase means that companies may well be subject to significant lags in delivery which of course adds to their costs and contributes to competitive difficulties. Further, the fact of purchasing through intermediaries is a negative cost factor in Sri Lanka due to the existence of a busines turn-over tax which is imposed in cascading fashion in the various stages at which a product is transacted. In short, a company is not only paying higher charges for raw materials due to Sri Lanka's own situation and the business mark-ups charged by intermediaries, but it is also losing through additional tax payments. A simple example of this was found by the survey in relation to foundry coke, which is 50 per cent more expensive when obtained through this indirect route. The larger companies can to some extent minimize the excess costs because of their possibilities of buying more frequently and on a larger scale whereas the smaller firms are at a disadvantage in all respects.

6. Company structure

More than 55 per cent of the firms surveyed were over 21 years old whereas only 9.6 per cent had been established in the five years previous to the questionnaire. The metalworking sector in Sri Lanka is therefore primarily a product of the 1960s with a relatively small proportion of its members (about one quarter) having been formed in the decade from the mid-1970s to the mid-1980s and only a few firms established in the post-liberalization period.[1/] Some of the more important companies are

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1/ By its nature the sample survey was not in a position to provide information on companies which may have been forced to close down in recent years but indirect information suggests that such firms may have existed.

relatively long established, are in the public sector and appear to sell considerable proportions of their output to government departments with which they are associated. The longevity of firms suggests that their sales contacts should be well established with, by now, a quite pronounced degree of linkage between specific supply firms and specific purchasers. Although neither the survey nor other materials were able to yield clear information on company profit rates or the real state of competition within the branch, the persistence of firms suggests that they are still able to obtain sufficient returns through selling to traditional customers. Nevertheless, the branch is definitely fragmented and there seems to be but limited scope for individual firms to reduce their excess capacity through capturing the markets normally handled by other suppliers.

A critical issue refers to the financial structure of companies. Leaving aside the public sector firms, there is a heavy reliance on a mixture of own capital plus bank loans. The majority of firms have to rely on bank loans for their working capital requirements and although World Bank funding to the financial sector allows a small subsidy component in interest rates, it appears that many if not most companies are now at the point where these charges along with their other costs have put them in a most vulnerable financial situation. There is a strong suspicion that several companies are now fully geared (i.e., the debt to original invested capital ratios are at ceiling levels or even beyond) and that the utilization of assets as measured by, for example the ratio of annual sales to fixed assets is far to low. Hence companies are faced with heavy overhead charges and insufficiently active use of capital with which to meet those costs. The existence of such a situation in countries where capital markets are active and the financial and business structure is relatively densely populated would undoubtedly lead to a wave of company mergers and/or take-overs. In Sri Lanka, however, a more likely consequence of what seems to be the present state of affairs is the collapse of several companies. Whether or not this is a desirable outcome of course depends on how the branch is viewed; on the assumption that the Government is interested in improving the state of the metalworking sector, this likely increase in concentration should be further examined.

7. External contacts of metalworking firms

In general, it emerges from the survey that companies make relatively little use of outside institutions as sources of either general information or specific consultancy. Purchases of equipment are heavily dependent on information provided by machinery suppliers or, still more frequently, by agents in Sri Lanka whose technical and commercial knowledge is not necessarily a good guide for purchasing decisions at the company level. Very few firms have undertaken external visits in recent years, whether those visits be concerned with equipment purchase or investigation of markets. Consequently companies are inward-looking in more than the traditional sense of that term, i.e., their horizons are pretty fully taken up with what is going on inside the country rather than with external changes which could either improve their situation or be a threat to it. The limited external perspective goes further than the foreign information question: the survey did discover that very limited use is made of government facilities whether they refer to formal training of technicians or to product development. The companies may perceive a need for upgrading of management, of employees and of products yet they are not willing to make the contacts outside which would

allow this upgrading to take place. It is tempting to conclude that the firms themselves must change their horizons and that this alone will solve the present situation. This deduction, however, might not be a full description of the situation since, as will be seen later, there are real problems of business confidence in metalworking industries connected with the perception of entrepreneurs about the government's attitude towards the further development of the metalworking sector (cf. section II.9).

This perception is largely shaped by the government's liberal import policy. It was noted earlier that not only are all machine tools imported but that close to 80 per cent of metalworking products are also purchased from abroad with the main sources being Republic of Korea, India, China and Taiwan Province of China. In other words, the import penetration is not primarily due to developed countries but comes from Sri Lanka's own Asian competitors. These countries have a production range which is far superior to Sri Lanka's in metalworking goods, have quality levels which are apparently superior and are obviously price competitive. For metalworking producer goods, 1986 data show substantial imports of agricultural equipment such as seeders, planters and transplanters which are all machines produced to some extent within the country itself. Although it could be (sufficient details to permit a strong statement are not available) that the kinds of equipment mentioned here are beyond Sri Lanka's current capabilities, the fact that significant imports of centrifugal pumps also take place does raise questions about the competitive capabilities of local firms. Traditionally pump production is a key branch of metalworking output even when that output is on a relatively small scale. Further examination of the import list shows that, in 1986, more than $2 million were spent on sewing machines. If these items were primarily intended for industrial use and that use was linked to export-oriented clothing production, then again it might be the case that quality levels in Sri Lanka are as yet insufficient to meet the demand of export-oriented manufacturers.[1/]

8. Institutional matters

There are at least four different Ministries with responsibilities related to metalworking issues. These are Ministry of Industries and Scientific Affairs (MISA), Ministry of Rural Industrial Development (MRID), Ministry of Finance and Planning (MFP) and Ministry of Trade and Shipping (MTS). Each of these Ministries in its turn has institutions relevant to the branch. Thus with MISA are connected the Ceylon Institute of Scientific and Industrial Research (CISIR) and the National Engineering Research and Development Centre (NERD); with MRID comes the IDB; with MFP come SLBDC and the Foreign Investment Advisory Committee (FIAC); and with MTS comes the Export Development Board. However, these institutions seem to be partially competing among themselves yet at the same time not covering several

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1/ This issue requires further analysis in terms of a more detailed specification of imported items and in terms of investigating the potential influence of export subsidies that may be provided in exporting countries abroad.

of the areas relevant to metalworking.[1/] In practice their current operations are focused on export questions, on small scale enterprises and on limited aspects of research. Yet even the comments given in earlier sections of this chapter are enough to show that metalworking is faced with broader problems of reorganization and industrial management. The present institutional set-up is not geared to providing this type of support and the problem is accentuated by the strong feeling within the companies that the Government is not really committed to supporting metalworking activities in Sri Lanka. Consequently, the institutional limitations cannot be overcome unless there is some improved dialogue between the firms and the Government and both are ready to take risks and make commitments to improve the branch.

9. Government policies

The thrust of manufacturing efforts in Sri Lanka over the past few years has been strongly towards export-oriented operations in which the Government has provided a range of incentives. Those incentives have been primarily in terms of facilitating inflow and outflow of foreign exchange for investing firms from abroad, in improving the grant of permits and licenses where necessary to cover both investment and trade operations, and in providing adequate physical infrastructure for companies to carry out their operations. This has been done within a context where companies have been able to import their requirements quite liberally and in which the import of final products has also been permitted under fairly easy conditions. For a producer good activity such as metalworking these conditions certainly do not facilitate domestic production and are not compensated by adequate foreign investment.

Indeed, the present position is one in which investment in the branch as a whole appears to be very low. Local companies have little incentive to invest because to do so would mean purchase of machine tools in conditions where imports of metalworking products are freely allowed and represent severe competition. Moreover, the relatively high costs of loan capital along with the absence of any specific direction and support from the Government act as further disincentives to local producers.

As regards the domestic metalworking sector, the Government's offering favourable conditions for foreign investment may eventually be counterproductive. On one hand, for the little investment that is actually attracted the incentives offered are presumably unnecessarily high, meaning that the Government foregoes revenue which it could otherwise have received. On the other hand, domestic investment is constrained by the threat of competition - even if that competition is not forthcoming. Thus local output declines in relative terms (i.e., compared with expenditure on imports) and may even decline in absolute terms if companies are sufficiently concerned about the combination of imports and foreign investment threats.

1/ It has been claimed that "while a significant part of local industrial ventures, owing to their resource constraints, have to rely on the public sector R&D laboratories ... in practice the utilization of the resources of these organizations by the industrialists has been far below their capacities." (Nanayakkara, W.S./Rodrigo, P.C., Structural Change and Technological Transformation of the Third World. Progress Achieved and Problems Faced: The Case of Sri Lanka, p. 112). This was confirmed by the survey carried out by the Sri Lanka Business Development Centre (SLBDC): Heat treatment facilities, though urgently needed, are heavily underutilized at the IDB.

It is this setting which is a basic reason for insufficeint confidence between the Government and the industry. Unless very clear initiatives are taken to alter this there may be a further deterioration in the situation. This implies that the current attempt to improve metalworking production through a focus on joint venture activities is a double-edged one. It could easily happen that firms become disillusioned with the possibility of still greater foreign penetration and conclude that there is little point in collaborating under those circumstances. If this were to be the case the outcome would have two unfavourable features. First, investment by local firms would fail to increase and second such joint ventures as were started up would probably be with new companies which lacked any experience in metalworking. Under these conditions the country would be failing to make good use of those assets which it currently possesses and might well be moving into types of production in which the local partners in the end provided little more than distribution and general management inputs but without any solid build-up of the branch. The mere statement of this possibility is enough to reinforce the concerns expressed earlier about trying to build up a producer good activity in conditions where the local market is relatively small, the degree of sophistication of the current industrial structure is still limited, and foreign firms do not see the country as a key part of prospective operations.

In order to put these findings at the level of enterprises within Sri Lanka into a more adequate context it is necessary to look at the current situation in international markets; that is the purpose of the next chapter.

III. INTERNATIONAL TRENDS IN METALWORKING AND MACHINE TOOL INDUSTRIES

Metalworking and machine tool activities have been subject to major changes since the mid-1970s;[1/] those changes can be characterized in the following way:

- In the early 1970s in the industrialized countries, 80 per cent of engineering output was batch production with little opportunity to realize economies of scale; each part was subject to anywhere from 5 to 30 operations with lengthy gaps between them, average component manufacturing cycle time was around 100 days, and the ratio of processing time to total cycle time[2/] was rarely above 1 per cent.

- Advances in computing, along with the introduction of NC and CNC machine tools, have permitted major changes in this structure through minimizing downtime and queuing between operations, through arranging components into families which CNC machines can process as if they are uniform items, through the optimization of parts routing, and through computer-aided design (CAD) which not only greatly improves the design process itself but allows design to govern the sequencing of manufacturing operations.

- These new orientations have led to a growing market segmentation between production machine tools and general purpose machine tools; this segmentation has permitted the rapid growth of exports from Asian newly industrializing countries which have concentrated on general purpose machine tools since these do not require a constant information feed-back from clients.

- The industrialized countries are currently strongly oriented towards the manufacture of production machine tools which provide personalized flexible technical solutions to client problems, solutions which in the most advanced cases cover whole flexible manufacturing systems. This orientation has now pushed total labour costs to around 60 per cent of total costs with a significant proportion being made up of the incorporated software. Indeed the labour share in costs of advanced machine tool systems has more than doubled in relative terms within the past decade.

The changes outlined above have greatly increased the techological gap between the majority of developing countries and the developed countries and indeed made that gap so significant that genuine questions about the relevance of technology transfer now have to be asked. Technology transfer is most effective when there is sufficient communication between the partners so as to put them on the same wavelength but yet where the gap between them is sufficiently great as to make the transactions worthwhile; under present circumstances there is a serious danger that the first of these conditions can no longer be fully met.

1/ For a more detailed review of these changes cf. UNIDO, Recent Developments in the Machine Tool Industry, op. cit.

2/ Total cycle time is defined as the period from the raw material entering the plant to the finished product leaving it.

All in all, it appears that foreign investment in more advanced areas of manufacturing cannot be looked at through the same perspective as has traditionally been done in industrial branches using rather simple technologies. Most developing countries still appear to believe there is a strong interest on the part of developed country producers to relocate their activities elsewhere in order to reduce labour costs. That presumption, however, is true only to a limited extent, in a fairly small number of branches, and for countries which meet the demanding conditions these investors envisage. The work carried out by UNIDO at the 7th European Machine Tool Exhibition (Milan, October 1987) permits to further substantiate recent trends in the international machine tool system. The major findings are summarized below:

- 1,650 firms participated in the Exhibition and of these 50 were from developing countries with 21 alone from Taiwan Province of China, 14 from China, and 10 from Republic of Korea. In other words, developing country participation was almost entirely dominated by a very small number of Asian countries.

- Detailed interviews were conducted with 68 companies of which 10 each came from Japan, FRG and Italy and 6 each came from Switzerland, UK and France; these companies produce a range of 124 machine tools, with 23 firms being lathe producers, 21 manufacturing machining centers, and 14 making milling machines. The companies vary greatly in size with 13 of them having more than 1,000 employees each and 10 having less than 50 employees each.1/

- The foreign interests of these firms were already fairly extensive. Thus 18 of them had wholly owned or joint venture production facilities - of the 31 such plants, only 6 were in developing countries. Mostly these facilities had been obtained through purchase of existing enterprises and this was mainly because of the increasing share of intangibles, such as brand names and special customer relations, in the sales costs of products. The firms argued that the factors which most encourage foreign investment are the size of the local market, local input supply possibilities, the availability of a communications and services infrastructure, and availability of qualified technical personnel. Labour costs are of but marginal significance in relation to production machine tools and only of somewhat greater significance in relation to general purpose machine tools.

- One-third of the companies had sales subsidiaries in key export markets yet all but one of these were located in developed countries.

- 16 of the companies had granted a total of 27 licenses for machine tool production of which half had gone to India and China; in general, however, there was a cautious approach towards licensing.

- Regarding export markets the companies considered that, while the highly industrialized countries would continue to absorb most of foreign sales, Republic of Korea, Taiwan, Province of China, and to a lesser extent India and the ASEAN countries represented potentially promising markets.

1/ Specific information on the firms having expressed interest in foreign investment and/or licensing in Sri Lanka is provided in a separate documentation, along with the present report.

Approximately one-half of the firms interviewed had exported to Sri Lanka but only three of them had done so on a continuous basis. The firms characterized Sri Lanka as a location where general purpose machine tools were the only kinds of products which could be sold but where enterprises from developed countries had already lost out to competition from Republic of Korea and Taiwan, Province of China.

- The companies strongly emphasized the role of national and international subcontracting in machine tool production. They noted that subcontracting could easily account for around 50 per cent of total production costs and that there were important international differences in styles of subcontracting; within Europe it mostly takes the form of precision components supplied from abroad, while Japanese and US foreign subcontracting concentrates more on standardized items where labour cost advantages do play some role. Some cases were cited of European firms which had tried subcontracting in Brazil and India but had given up because of difficulties over delivery dates, foreign exchange procedures, and quality control.

- Examination of foreign investment issues has to distinguish between large and medium-sized enterprises as well as between the two types of machine tools referred to above. Essentially the investment policy of large firms is dominated by their dealings in production machine tools and only a handful of developing countries enter into this circuit; this is mainly through producers who decide to follow key customers abroad when those firms establish in developing countries. For medium- and small-scale enterprises general purpose machine tools are more significant and there is some interest in foreign investment with a preference for developing countries where the domestic market is large or where there are prospects for access to neighbouring countries (ASEAN would be a case in point). The problem for smaller firms is the limited financial and human resources available with which to handle investments.

- Several firms explicitly raised doubts about the possibility for Sri Lanka to enter into any significant foreign connection of this type. Their reasons referred to the limited size of the local market, the limited access to other markets of the region, the lack of an appropriate industrial supply network with which to meet needs for intermediate products, and doubts about the local business environment.

- According to these observations the companies felt that Sri Lanka would have to provide a series of basic pre-conditions if it were to have any prospects at all of appearing on the likely map of foreign investment locations. Those pre-conditions would have to include mutual trade arrangements whereby production in Sri Lanka could serve as a platform for exports to other countries in the area; major investments in establishment of a subcontracting network within the country where tight quality control conditions could be set up; a special incentive package which would support the efforts of pilot investors in the machine tool field; and a provision of technical training facilities paid for to a large extent from local resources.

The interviews focused on machine tool activities and as such reinforce the earlier observations regarding the limited prospects, and not only the non-existent current position, of related activities in Sri Lanka. There is little doubt that in the frame of rapid technological advance, close relations between producers and clients, fierce competition among major producers, and

the relatively limited market size of Sri Lanka itself, it would be extremely difficult to attract any investment of much consequence in the machine tool area proper. Moreover, the above comments make it clear that investments in the broader field of metalworking activities must also be looked at rather carefully. How does the country fare in relation to its Asian competitors in this area?

To provide a general frame of reference, Table 1 summarizes 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 almost 30% 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 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.

Table 1: Macroeconomic Indicators for Selected Asian Countries, 1985

Country	Per Capita GNP 1985 (US$)	Industry Share GDP 1985 (%)
Thailand	800	30
Philippines	580	32
Indonesia	530	36
Sri Lanka	380	26
China	310	47
India	270	27

Source: World Bank, World Development Report 1987.

While Table 1 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 a country located in the region, the world leader in the machine tool field and now showing the highest marginal propensity for foreign direct investment. Table 2 describes the country composition of its investments in Asia during fiscal year 1986 (i.e. to 31 March 1987). Eight countries are listed explicitly and to them more than 95% of all foreign direct investment 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

Table 2: Japan: Foreign Direct Investment in Developing Asia, 1986[a/]

Country	Amount ($ mn.)	Change on Previous Year (%)
Indonesia	794	+9
Singapore	518	+51
Rep. of Korea	590	+25
Hong Kong	288	-68
Taiwain, Province of China	272	+75
Malaysia	74	-44
Philippines	66	+33
Thailand	182	-60
Total	2,784	-12

Source: The Economist, 23 January 1988, drawing on MITI data.

a/ Fiscal year, i.e. 1 April 1986 to 31 March 1987. Figures refer to all sectors.

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 foreign investment 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 foreign investment 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%).[3/] 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 foreign investment can be gleaned from some other recent research. Looking once more at the ASEAN countries (less Singapore and Brunei) Japanese investment is far more concentrated on manufacturing than is investment from USA:[4/] 1983 data show the share of

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1/ South, "The Rising Sun: Cutting Out Asia", February 1987, p.58.

2/ Ibid.

3/ Cf. Economist Intelligence Unit, ASEAN in the Age of the Pacific, London 1988 (forthcoming).

4/ Ibid.

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 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 machine tool 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),[1/] the employment effect as well as the foreign exchange effect is significant. Finally, the absence of investment by US companies in Sri Lanka implies that nothing can be expected from capital spending by subsidiaries.

This 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 3 brings together some characteristics of the machine tool 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 vis-à-vis the machine tool branch 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 the 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 the Government has authorised 11 companies to expand and develop their machine tool activities within the so-called Simple Machine Tool Manufacturing Scheme aimed at enhancing the branch to be able to compete with imports of some basic machine tools.[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 machine tool notwithstanding the importance assigned to it in national planning. As described in the last section of Table 3, the inherent risks of machine tool production tend to be accentuated in the developing country context: whereas events of the present decade have been as an earthquake in several developed 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 foreign

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1/ Cf. Economist Intelligence Unit, op.cit.

2/ Cf. UNIDO, The Machine Tool Industry in the ASEAN Region: Options and Strategies. Analysis by Country, UNIDO/IS.634/Add.1, 27 May 1986.

Table 3: 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: The Machine Tool Industry in the Asean Region: Options and Strategies, Main Issues at Regional Level, UNIDO/IS.634, 27 May 1986.

investment offers the most promising route for achieving this 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."[1/] Moreover, in early 1986 the import duty on machine tools was raised by some 15% with the purpose of encouraging greater domestic output; thus far, however, there is scant evidence that foreign investment 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

1/ American Metal Market, "Indonesia: Toolmakers Wanted", 14 January 1985, p.16.

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."[1/] In the Thai case also the impact of this drive to encourage investment from abroad has yet to be realised. Obviously there are three 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 investment, 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 machine tools: market conditions can alter between the date a proposal is put together and the time the investment is ready to begin.

Returning to Table 3 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 four nations with a profile resembling the developed countries i.e. emphasis on metal cutting equipment of recent vintage and certainly with some export orientation. But the four 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 machine tool 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 the usually high quality of imported raw materials and intermediates and the relatively old equipment vintage. There is currently a contradiction between the declared aims of augmenting machine tool 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

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1/ Iron Age - Metal Producing Management, "Thailand asks US Firms to Locate There", 17 January 1986, p.16.

industries. Each of the four 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 five countries. The next chapter moves to the Sri Lanka situation on its own.

IV. MANUFACTURING AND FOREIGN DIRECT INVESTMENT IN SRI LANKA

1. The general situation

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 foreign direct investment and that, in turn, has been channelled through two organisations, the Greater Colombo Economic Commission (GCEC) and FIAC. The former deals with export oriented investment as such, predominantly in the Sri Lankan Investment Promotion Zone while FIAC handles all other external investments. In ownership terms the formal difference is that while FIAC transactions are of a joint venture 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 also 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 of the Ministry of Finance and Planning and it is responsible for information brokerage activities in relation to collaborations in joint venture agreements.

To put the foreign linked projects in the whole industrial context, Table 4 describes the role of GCEC and FIAC firms as industrial employers and industrial exporters, respectively. In 1986, their combined share in the country's total industrial employment was above 30% while their combined export share was much higher, surpassing for the first time 50% of the country's total exports. As regards value added, domestically tied industries continue to occupy the predominant place in the overall context: locally oriented factories contribute about two-thirds to total manufacturing value added (MVA) with public sector plants (having little in the way of foreign joint ventures) contributing a little over one-half (if the State Petroleum Corporation is taken away then the contribution is roughly one-quarter).

To go further into the existing pattern of foreign direct investment means examining the nature of projects actually in operation under the jurisdiction of the two authorities; Table 5 gives the GCEC data and Table 6 that for FIAC. Under both authorities the number of operational 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 foreign investment per project was probably around

Table 4. Share of FIAC Firms and GCEC Firms in Sri Lanka's Industrial Employment and Industrial Exports, 1986

(1) Total industrial employment	216,480
(2) FIAC industrial employment	25,444[a/]
(3) GCEC industrial employment	41,121
(2) + (3) as % of (1)	30.7
(4) Total industrial exports[b/]	15,877
(5) FIAC industrial exports[b/]	2,954
(6) GCEC industrial exports[b/]	5,187
(5) + (6) as % of (4)	51.3

Source: Central Bank of Sri Lanka, Review of the Economy 1986; Vidanapathirana, V. Internationalization of Production and Third World Industrialization: Relevant Policy Issues for Sri Lanka (mimeo), December 1986.

a/ As of 30 June 1986.
b/ In Rs million.

Table 5: Sri Lanka: Features of Investment Projects Implemented under GCEC 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 Joint ventures 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.

Rs.10 mn. For GCEC a figure of at least Rs.20 mn. of foreign investment per project seems a fair reckoning. The GCEC numbers show joint ventures 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 joint ventures. Although explicit export figures for GCEC enterprises are not given it is known that a very high proportion of output is in fact sent abroad - but Table 6 reveals that the export ratios for FIAC projects are also very high.

Table 6: 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.

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.

Of major interest for this report is the degree to which projects even loosely related to machine tools have been implemented under the approval of GCEC or FIAC. Table 6 gives figures for the broad category of basic metals and engineering (of which, it will be recalled, machine tools is but a small part) and shows that FIAC authorised investments in this category came to around 4% of the FIAC total, that just over 3% of the direct employment generated was in this broad category, and that only a small share of output was exported. GCEC investments, as Table 5 indicates, were mainly in textiles

and garments: information obtained in an earlier study by UNIDO[1/] covering the 1979-1984 period shows zero investment in basic metals and only Rs.90 mn. in fabricated metal products, machinery and transport equipment which once more is tantamount to around 3% of the total. 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 machine tools 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, machine tools certainly do not figure other than on the periphery.

The preceding comments are put into sharp perspective by Table 7 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 this change may be partly attributable to the elimination of a few firms. Aggregate output of machine tools, 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 machine tools were only a tiny part.

Table 7: 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, Industrial Development Review Series: Sri Lanka, February 1986.

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

1/ UNIDO, Industrial Development Review Series: Sri Lanka, Report IS.613, February 1986.

Table 8 gives the data for imports of metalcutting machine tools 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 production to apparent consumption might have been as much as three-quarters (if machine tools accounted for the high proportion of 5% of gross output of fabricated metal products) or as low as zero, if in fact machine tool 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 machine tools 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 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 machine tools. Hence, Sri Lanka currently not only lacks the production base for machine tools, it also lacks the domestic demand. In a more developed industrial economy there is a synergy between machine tool production and the structure of industrial output whereas in Sri Lanka that situation does not exist nor is it likely to in any time-horizon relevant for present purposes.

Table 8: 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.

In view of the situation just described, the Government is considering the metalworking and machine tool branches 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.

2. Case study evidence in the metalworking sector

As an approximate guide to what is happening in the broad area of metalworking with foreign investment 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 ceased operation by end April 1987); Alloy Fabricators, a tripartite joint venture of UK, Norwegian and Sri Lankan interests, making piping systems; and

Precision Moulds and Tools Ltd., a joint venture 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 joint venture with Denmark aimed at renovation of automotive components; Lanka Askok Leyland Ltd., a joint venture with India in the area of assembly and progressive manufacture of motor vehicles; and Swedlanka Engineering (Pvt) Ltd., a joint venture with Sweden for the manufacture and design of moulds, dies and special machines. To obtain a feel for their specific investment situation contact was made with two of these firms; the following paragraphs give a rough sketch of these two cases: 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 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, have made 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 metalworking 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 industries. 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, 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 two 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 machine tool 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 two 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, shortcomings in the industrial infrastructure complicate the management problems. There is serious underdevelopment of the small industry network which renders subcontracting a difficult job. 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, adversorial 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 developed countries and particularly pronounced in the machine tool and engineering branches where the combination of electronic with mechanical elements 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 which 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 manouevres, 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.

3. Overall policy implications

The case sketches presented above express perhaps more clearly 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 9 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 (even when using 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 labour cost site.

Table 9: 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[a/]
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 Fröbel, Jürgen Heinrichs and Otto Kreye, Umbruch in der Weltwirtschaft, Rororo 1986, p.470.

a/ Labour costs differ from wages through including social payments.

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 only countries, as compared with Sri Lanka, which are becoming relatively cheaper for investors both in $ and Yen are Indonesia and Philippines with the numbers for Malaysia not much different. This confirms the view expressed earlier in this report that it is the ASEAN countries which are Sri Lanka's competitors: some of them have low labour costs (fragmentary information for Indonesia suggests that could it have been included in Table 9, 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.[1/] But taken from a different angle, the exchange rate information 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 in view of the high import content of export-oriented 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 to go beyond the 'cheap labour strategy' by combining its low cost advantages with those of a sophisticated supporting service sector, as indeed exists in Singapore and elsewhere in Pacific Asia. That means encouraging investment of a different kind such that, for example, efforts in machine tools could obtain local assistance from computer software specialists.

Currently Sri Lanka is looking at a number of areas where foreign investment might be encouraged. A couple of them are ones where a certain amount of investment has already taken place viz. gems and jewellery, and consumer electronics, while the machine tool area with special emphasis on dies and mould making is another. Now independently of the manifold difficulties already identified with encouraging machine tool 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 foreign investment is in a position to evaluate market potentials or indeed to assess carefully the real profitability of investments. Up till now the accent has rather been on quick approval of projects and this approach may not have generated either an adequate return on the infrastructure expenses laid out by the Government when establishing the Investment Promotion Zone or necessarily picked the most suitable projects under 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 kind of foreign direct investment Sri Lanka is looking for. The material provided in this report demonstrates the complexity of the metalworking and machine tool industries 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. 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.

Within the Sri Lankan economy the role of capital goods in industry has been declining and the foreign investment in manufacturing that has expanded so much in the past few years shows a mere handful of firms loosely related to

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1/ 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 may negatively affect Sri Lanka's position as compared with other countries.

engineering and metalworking. Examination of what are probably the two 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 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 foreign investment seem to have given enough attention to the point.

Attempts to obtain foreign investment in machine tools 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 and commercial banks in the developed countries. Given the very slim chances of obtaining foreign investment by large machine tools companies the efforts may have to be devoted to smaller producing countries and/or smaller firms (which could of course generate big enterprises in the Sri Lankan context). Investment authorities in Sri Lanka will have to scrutinise carefully the bases on which any possible machine tool investments might be made. So far all known attempts to develop machine tool production have been part of a comprehensive attempt to develop local industry. Sri Lanka does not want machine tool output for that purpose, however, although certainly some foreign investment based production could also serve the local firms. Instead machine tool production 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 foreign investment in this sector Sri Lanka might therefore be compelled to widen its scope of assessment.

V. ATTRACTION OF FOREIGN INVESTMENT IN METALWORKING INDUSTRIES: TOWARDS A PROGRAMME OF ACTION FOR SRI LANKA

In the past decade, Sri Lanka has witnessed a dynamic development of its economy in general, and its industry in particular. Growth rates have on average been higher than they were in previous decades, unemployment rates have been reduced and non-traditional manufactures added to the country's major export products. However, both industrial exports and foreign direct investment have remained largely concentrated on the textiles and clothing branch and are facing an increasingly difficult situation due to adverse trade policy measures adopted in developed countries on the one hand and technological innovations with far-reaching consequences for the international division of labour on the other hand. In other words, the benefits of an export-oriented strategy predominantly based on simple labour-intensive manufactures may be petering out soon.

It is in this sense that Sri Lanka is at a crossroads and that the Government is contemplating a potential new direction to be given to the country's future industrial development, as outlined e.g. in the Public Investment Plan 1986-1990.[1/] The backward integration of manufacturing into selected fields of capital goods production such as certain types of machinery presents itself as a logical step after a range of consumer goods industries have been created in the past. At the same time, the Government is aware of the fact that foreign collaboration will be crucial to ascertain access both to advanced technology and to external markets; hence the new emphasis on attracting foreign investment in metalworking industries. However, if this approach is to be successful, Sri Lanka will have to meet a number of essential preconditions as outlined in more detail below.

On the whole, chapter V provides a consolidation of the report's main findings and their translation into concrete policy recommendations which the Sri Lankan Government may wish to consider with a view to strengthen the country's metalworking sector and thereby increase its attractiveness for potential foreign investors.

1. Advantages and disadvantages of Sri Lanka's position

The foundation of any policy proposal and subsequent technical assistance work must be a thorough understanding of the position in which Sri Lanka finds

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1/ "Reliance on labour intensive activities such as garments is a typical characteristic of early stages of industrial development in countries at low income levels. The industrial sector is apt to face difficulties due to factors like quota restrictions imposed by importing countries and the low value added nature of garment and petroleum products unless measures are taken to diversify the industrial structure. Successful industrialization also requires access to modern technological innovations and kow-how so as to raise the productivity of this sector. In view of these considerations, efforts have been made to diversify the industrial sector by developing more capital and skill-intensive projects". (Ministry of Finance and Planning, Public Investment 1986-1990, Colombo, May 1986, pp. 96 ff.)

itself with relation to the metalworking and machine tool branches. An attempt to catagorize and analyze the country's strengths and weaknesses in this regard has to start out from the recognition that, to a considerable extent, the strengths and weaknesses derive from the same sources. For example, the fact that Sri Lanka has built up an excellent international image as a production location for cheap labour-based manufacturing obviously assists the country in trying to attract further manufacturing investment. Yet, the emphasis on cheap labour in the past could well act as a deterrent to investments in branches where considerations other than labour cost are predominant. This relative nature of advantages and disadvantages has to be kept in mind in the following discussion.

(a) Advantages

i) Commitment to promotion of foreign direct investment

Ever since the present administration came to power in the late 1970s, Sri Lanka has consistently followed a policy of encouraging foreign direct investment in manufacturing industries. In so doing, the Government has built a solid reputation for Sri Lanka as a favourable production location and interviews, commentaries in the business press, and analyses published by international organizations all confirm that foreign investors fully appreciate the efforts Sri Lanka has made. In specific terms the Government has established and continued to strengthen an extensive package of incentives to support the investment thrust and the record of almost a decade shows that there have been very few, if any, difficulties in relations with foreign enterprises. The details of the promotional policy have, furthermore, made explicit allowances for alternative kinds of arrangements ranging from fully foreign-owned companies in export processing zones through to various kinds of joint ventures in which local capital has retained majority control. The statistical information presented earlier in this report shows that the proportions of manufacturing output and employment which have been generated under the aegis of these promotional arrangements have continued to increase and that, as of today, a very sizeable share of total activity in the manufacturing sector is directly associated with such arrangements. A further element of this policy has been the fielding of investment promotion missions to main investing countries, designed to take up contacts with entrepreneurs in those countries. Once again, all the available evidence indicates that the image created by these missions is favourable. In summary, therefore, Sri Lanka has acquired a valuable asset with regard to foreign collaboration arrangements. This asset has taken time to create and it is now time to capitalize on it to the maximum extent.

ii) Low labour cost location

Sri Lanka combines three highly favourable features with regard to labour costs, labour supply and productivity. Empirical evidence conclusively demonstrates both that it is the country in Asia with the lowest real wage rates and that those rates tend to increase more slowly in Sri Lanka than in its Asian competitors. Furthermore, the country has an experienced labour force which is in abundant supply; this means that a rapid expansion of manufacturing

activity which requires significant use of such labour would not run into supply shortages. Finally, the labour force is diciplined and relatively skilled: hence not only are money wage rates low, but the productivity of labour is fully competitive with that in comparable countries. Thus, Sri Lanka is exceptionally well placed to develop further its manufacturing activities insofar as they depend on intensive use of a low cost semi-skilled labour force.

iii) Infrastructural support

Upon initiation of its promotional policies Sri Lanka devoted considerable attention to improvements of external transport facilities. Both seaport and airport communications were secured and the physical requirements were established to deal with contemporary forms of commodity transport, e.g., container shipping. These facilities have, as far as can be judged, been adequately maintained and thus remain fully acceptable and consistent with the needs of external trade. Internal transport facilities, primarily road transport, have also been developed to an adequate degree. The fact that in geographical terms the bulk of export-oriented manufacturing is located within fairly restricted parts of the country means that these transport routes are relatively little affected by internal difficulties of a political kind. Finally, and of considerable relevance to possible investments in more advanced manufacturing branches, the country has made fairly good progress in setting up and operating external communication services. International direct dialing is available in the main urban areas and fairly good telex and fax facilities have also been set up. Thus, companies which have to retain close and very frequent contact with external suppliers and purchasers are fairly well served by existing facilities.

iv) Relations with donor agencies

In comparative terms, Sri Lanka has fared well with regard to external financial and technical support received from bilateral and multilateral agencies. Though the country does not belong to any regional grouping of consequence in economic terms, its external linkages are good. In the judgement of this report, this factor may well be a major asset in prospective attempts to encourage metalworking and machine tool foreign collaboration in Sri Lanka. The reason is not only that financial assistance should be reasonably easy to acquire, but much more that aid relations and the promotion of foreign direct investment are becoming more and more closely related. The attitudes of many bilateral and multilateral donor agencies seem to be increasingly influenced by the general economic policy a country pursues with relation to foreign trade and investment. Sri Lanka is well placed in this regard and should be able to utilize its status in order to establish special channels of support for the more difficult industrial ventures now being contemplated.

In securing the required financial support recourse can also be made to financial intermediaries in the region, particularly development banks. These institutions, perhaps operating with the World Bank on the one hand and domestic credit institutions in Sri Lanka on the

other, can assist channelling funds to smaller enterprises in the metalworking area. There are also advantages in associating this type of financing to the industrial promotion efforts since the bilateral donors may well be more likely to offer support if intermediary financing is also available.

(b) Disadvantages

Prior to an elaboration of disadvantages an important analytic point has to be stressed. What is perceived by domestic companies as a disadvantage may well be seen by foreign firms as an advantage, and vice versa. Furthermore, the assessment of disadvantages is not confined to the perspectives of companies alone: what firms of all kinds may see as a hindrance to investment may in reality be a policy measure by the Government designed to ensure that Sri Lanka captures a larger share of the benefits generated by an investment.

i) Absence of a targeted industrial policy

The current administration has pursued a policy of generalized promotion of manufacturing activities aimed at maximizing gross earnings of foreign exchange. This policy has explicitly discarded any notion of industrial planning or even of the selection of target areas for investment. For this reason, government institutions have not sought to acquire branch-specific information and have preferred to leave the details of decision-making and the operation of branches to the companies involved. This approach is both fully understandable and has much to recommend it. It is understandable in the sense that the country's earlier experience with industrial planning left something to be desired and in the additional sense that foreign investors at least claim that planning approaches make them fearful of excessive government intervention. The approach is also a positive one in that it has allowed investors to seek for themselves those areas where existing resource supplies and infrastructure offer the best opportunities for production.

However, as manufacturing industry enters more into the producer good area, the absence of a targeted industrial policy tends to become, at least in some respects, a disadvantage for entrepreneurs rather than an advantage. Given that demand for capital goods is a derived demand, and therefore closely associated with overall performance of the economy, and that many capital goods are supplied either to other branches themselves producing capital goods or to heavy consumer durable industries, the interlinkages of the production system and of production with demand are much more complex than for simple consumer items. In these circumstances companies look for a clear orientation from the Government as to the likely evolution of markets for their products.

It is unfortunate that in Sri Lanka's economic history an approach of targeting industrial branches has been associated with rigid bureaucratic controls rather than with promotional endeavours. At present, it appears essential that the administration embrace the idea of a promotional approach to industrial targeting and that, within this perspective, it set out clear guidelines for the expected development of metalworking and machine tool activities. Both existing local enterprises and would-be foreign investors stand to gain from such action on the government's part. The former would benefit in that their current uncertainties about

the degree of government commitment were allayed and foreign entrepreneurs would receive a clear signal that the Government was attempting to move its outward-looking manufacturing approach into new and more complex branches.

As things now appear, the promotional approach to metalworking and machine tools is also confounded by conflicts within the administration. In short, it is not clear that all interested groups and institutions are in fact in favour of this type of change and it seems quite likely that the lack of business confidence is in part a response to private perceptions of conflicts among public policy-making groups. These contradictions have real practical effects. Thus, although empirical information is not easy to come by, it does seem quite possible that local firms now actually receive negative effective protection from commercial policies. Moreover, the institutional infrastructure reveals serious lacunae. Both the Ministry of Industries and Scientific Affairs and the Ministry of Finance and Planning, are not currently organized in such a way as to promote careful project evaluation or detailed branch level documentation. The need is for specific actions yet the policies are conceived and implemented in general fashion. Establishment of a more active industrial policy thus calls for a systematic resolution of the present shortcomings.

ii) Limited prospects for capital goods production

The branches considered in this report are a key component of engineering industries and they form the bulk of capital goods production. Accordingly, the real issue at stake is to determine how far Sri Lanka can efficiently proceed along the route of capital goods manufacture. The limited domestic market alone imposes rather narrow constraints and would seem to permit basically the production of certain machinery items linked to agriculture, agro-processing and construction equipment.

The extent to which production can be deepened and diversified to include more sophisticated machinery and particularly machine tools depends primarily on two factors, viz. domestic availability of the required industrial infrastructure (raw materials, skilled labour, industry-related services) and the size of the market, including foreign demand. The progress that Sri Lanka may be able to make thus depends on easing these constraints in a efficient manner, specifically through negotiating foreign collaboration arrangements to secure access to export markets.

The tensions that can arise in developing such transactions stem from the control which foreign companies exert over the materials, the technologies, and the markets. It is well known that as long as collaboration does not pose a threat to the position of companies providing the resources then they may be ready to enter the arrangements. If, however, exports from Sri Lanka are perceived as a threat, then the collaboration will be more restricted in nature. It is no doubt partly for this reason that, as noted earlier in the report, machine tool companies emphasize the value to them of Sri Lanka concluding mutual trade arrangements with other Asian countries. Were this to be the case, the companies would both have an assurance that exports would not be rebounding to their own markets and would be able to

use Sri Lanka as a regional base from which to enter other larger Asian markets. It is clear that considerations of this nature go beyond a straight enterprise to enterprise transaction and involve also government initiatives to negotiate favourable terms for access to export markets.

In any event, the experience of all countries which have pursued the route of developing capital goods manufacture, whether within closed domestic markets or with an export-orientation, shows that time horizons are generally fairly long and that the whole process is replete with risk. The Government must make its own commitment to assume a share of those risks fully apparent to all producers; this is, in the real sense, what is needed if business confidence is to be consolidated.

iii) The nature of competition for foreign direct investment in the metalworking field

Thus far Sri Lanks's drive to attract foreign direct investment in manufacturing has operated entirely within those branches where the principal attractions have been cheap labour and an excellent incentive package, and where its main competitors have been other relatively low income countries ready to offer similar conditions. A move towards the metalworking field is, in the judgement of this report, a shift into a quite different type of market. The firms, as has been conclusively shown in reports cited earlier in this document, are not seeking cheap labour, but rather a close proximity to clients and the existence of fairly sophisticated local supply network and industrial services infra-structure. The countries which come into consideration as recipients for this type of investment are not those with which Sri Lanka has mainly been in competition during the past few years. Instead, the key locations tend to be the newly industrializing countries in Asia along with the largest of the developing countries, e.g., India and Brazil. Sri Lanka on its own cannot create the full range of attractions which such markets offer and hence is in this regard at a disadvantage in competition with them. In designing a realistic policy approach towards foreign investment in metalworking industries, this comparative disadvantage needs to be recognized. It can only be reduced in the long run and, above all, cannot be compensated for by providing even more generous fiscal or financial investment incentives.

2. Actions towards strengthening metalworking industries within Sri Lanka

(a) Support for domestic enterprises

i) Building confidence between the government and the private sector

From the preceeding observations it emerges that the primary requirement is for the Government to set out a medium to long-term commitment towards encouragement of metalworking activities in Sri Lanka. That commitment must make clear the role that domestic enterprises, operating on their own or in collaboration with foreign firms, have to play in the restructuring of the branch. If local firms can be convinced that the Government is prepared to put effort into helping them to improve their efficiency and extend their

prospective market range (both geographically and product-wise) then the specific steps which are needed can be taken.[1/]

The analysis of this report and the detailed findings presented in studies cited in this document suggest some initiatives can be undertaken. First, a joint government/private sector group could be formed with the task of assessing demand prospects within Sri Lanka and making a prospective evaluation of how local companies could meet this demand. Second, a raw materials supply organization could be considered. As a first phase a feasibility study could be undertaken with the objective of assessing the benefits such an institution could generate and the logistic requirements which would exist.

ii) In-depth surveys of the current state of metalworking industries

The work undertaken within the present programme of UNIDO assistance has already gone a considerable distance towards identifying in detail the needs in this area. However, some issues which are crucial in a full restructuring programme require further detailed field work. These issues are:

- financial structure of enterprises;
- age and efficiency of capital stock in metalworking;
- nature of relations between metalworking firms and their Sri Lankan clients.

This work should be initiated, if necessary with foreign support, at the earliest stage possible. Without it any targeting within a promotional context would be facing a difficult situation.

iii) Improving the industrial support services infrastructure

It has been emphasized throughout this report that metalworking activities in general, and machine tool production in particular, put relatively high demands on supporting industrial services. The corresponding requirements relate to (a) 'classic' areas such as testing, quality control, design etc, but also (b) increasingly to the important field of computer software incorporated in new production technologies.

As far as industrial services under (a) are concerned there are a number of public sector institutions (IDB, NERD, CISIR) active in

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1/ The merits of joint Government/private sector action were also stressed in a recent UNIDO study on the metalworking sector in Cyprus, another island country with a limited domestic maket. With a predominance of imported goods, little specialization, severe financial problems and declining export markets the situation in Cyprus bears some similarities to the Sri Lankan case. Among the key recommendations of this study was a strategy focussing on niche markets. The firms in the sector were seen to require close cooperation with each other to establish common facilities such as a CAD center and joint marketing efforts. It was further suggested that the Government should strongly support related private sector initiatives (cf. Cyprus Industrial Strategy - Report of the UNDP/UNIDO Mission, June 1987).

this field yet with heavily underutilized facilities. The reasons for this underutilization would need to be established first before steps can be considered to either upgrade their services or create new specialized organizations. This is in line with the March 1987 Industrial Policy Statement which foresees government action "to promote a closer relationship between R&D institutions and industry" and to establish "technology support centres, focussing initially on the needs of small scale, metal-making and engineering industries."[1/]

The increasing importance of CNC elements in modern machinery production raises the question of computer literacy of at least a certain portion of the industrial workforce and hence the question of corresponding training requirements. A national computer policy is currently being shaped by newly established bodies such as the National Computer Policy Committee (COMPOL) and the Computer and Information Technology Council (CINTEC), set up to advise the Government in formulating, coordinating and implementing policy. In their first recommendations the improvement of computer-related skills, inter alia in industry, was singled out as a priority training area.[2/]

iv) Government policies towards metalworking industries

While much stress has been placed on a long-term perspective for the branch, there are some areas where the Government could, fairly quickly, modify current policies. The first is in relation to tax and tariff policies where, as noted above, existing regulations appear to penalize the branch rather than support it.

The second concerns the direct purchasing of metalworking products by the public sector institutions themselves. These policies so far have not been set out explicitly but in practice the larger, publicly owned metalworking firms have been the recipients of most contracts. It is worth reconsidering the extent to which a wider spread of such orders could encourage the development of other firms.

The third area relates to the enhancement of subcontracting relationships which are a key element in creating more specialization within a network of industrial supplies (e.g. of parts and components). There are indications that the Subcontracting Exchange established 1980 under IDB suffers from serious shortcomings and so far has not been able to establish closer linkages between large and small industrial enterprises.

(b) External Promotion

i) Sri Lanka's image

The principal issue here is to build on the valuable asset which the country already has in its foreign collaboration arrangements in

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1/ Government of Sri Lanka, Ministry of Finance and Planning, Industrial Policy Statement, Colombo, March 1987.

2/ Cf. Munasinghe, M. et al., Microcomputers for Development. Issues and Policy, Colombo, June 1985, p. 15.

order to attract the more complex industrial branches considered in this report. The Government is thus faced with the subtle problem of indicating that its present policies continue in normal fashion yet at the same time showing its interest in spreading into new areas where investment promotion necessarily must include wider considerations. To do this could mean extended efforts through investment promotion offices in selected developed countries and through the sending of special missions to target areas. By the same token, donor agencies should gradually be given the message that Sri Lanka is trying to extend its industrial range without sacrificing its accumulated advantages.

ii) Targeting of collaborating countries and enterprises

The empirical enquiries on which the present report is based suggest that Sri Lanka might obtain the best results in promotional terms by focusing on just a few countries and firms which, for various reasons, could well be ready to extend their collaboration in metalworking activities. Put briefly, the most promising partners appear to be smaller, sophisticated firms and countries (clear examples would be Sweden and Switzerland). They are probably the units which have a strong interest in developing business in Asia, partly because they are somewhat excluded from preferential arrangements in their home area and partly because, by nature, they have a very marked external orientation. These companies are also reasonably small-scale and dedicated towards high production efficiency aimed at closely defined market segments. Moreover, the experience they have in conducting collaboration arrangements where a strong emphasis is put on upgrading is substantial and would certainly point towards a successful outcome of any activities in Sri Lanka. The smaller firm bias fits well with the joint venture objective of the Sri Lankan Government and the close ties between firms from those countries and donor agencies ready to provide some risk capital is likewise a key point in their favour.[1/]

The findings of this report further emphasize that the targeting will almost certainly have to be towards production of general purpose machine tools. The reasons are (a) that production is technologically less demanding and less geared towards individual clients than in the case of production machine tools, (b) that demand in Sri Lanka itself and in several other Asian countries concentrates heavily on such items, and (c) that the smaller machine tool suppliers in developed countries are better equipped for joint ventures involving these products. The product mix for metalworking in general is less clearcut though the emphasis would presumably have to be towards machinery and implements to be used in agro-processing and construction activities.

Independently of the detailed points which would have to be worked out in collaboration of this type, there is probably one major advantage to be derived from early targeting of prospective foreign partners: negotiations with them would almost certainly reveal

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1/ The case of Swedlanka (see section IV.2. of this report) has demonstrated the importance of tripartite arrangements involving also development finance institutions.

exactly what steps Sri Lanka would have to take and what are likely to be the major obstacles to collaboration. In either case a firm government commitment to expansion of the branch appears to be the sine qua non of any effective development.

3. UNIDO's further technical assistance activities

In the course of work undertaken under this study project, UNIDO has been able to identify a number of international machine tool companies which have indicated their general readiness to cooperate with Sri Lanka through either forign investment or licensing.[1/] However, throughout this report it has been stressed that a link needs to be established between specific investment promotion activities on the one hand and the broader dimension of a conducive overall industrial development strategy on the other hand. In shaping this strategy, the genuine position and long-term prospects of metalworking industries in the Sri Lankan economy need to be defined in the first place.

While decisions about the country's appropriate industrial strategy in general, and the degree of industrial targeting in particular, would have to be taken by the Sri Lankan Government, there are three areas in which UNIDO is well placed to provide short-term assistance to the country. These three areas are the promotion of foreign investment, the provision of technical assistance at the enterprise level and the establishment of required common facilities for the whole metalworking sector.

Under the first heading, UNIDO's work could comprise three interrelated activities. First, support to the government and private sector in Sri Lanka in carrying out the detailed survey work suggested in section 1.b.ii of this chapter. Second, assistance to the Government and potential foreign partners in making contacts and developing a framework for collaboration; in this sense UNIDO can act both as catalyst and broker. Third, support for detailed elaboration of new investment projects and assistance in appropriate financial and technical arrangements for them.

The third function in fact acts as a bridge towards the second main area of UNIDO's assistance, i.e., technical inputs at the project or enterprise level. In this regard the organization can help Sri Lankan authorities and foreign partners to undertake prefeasibility and feasibility studies, evaluation and monitoring of progress in initiating projects, and provision of qualified technical staff to assist in the early stages of operation and monitoring. Furthermore, technical inputs can be drawn on to help in restructuring and/or rehabilitating those enterprises already in existence which are well placed to benefit from any future collaboration.

Finally, UNIDO has great experience in the establishment of common industrial service facilities, such as in design, quality control, maintenance etc. To ascertain the need for any such facilities it is suggested to start with an in-depth analysis of already existing facilities which, as stated earlier in this report, appear to be heavily underutilized.

1/ Information on these firms is provided to FIAC in a separate documentation.

ANNEX

Sri Lankan companies included in the survey of metalworking/machinery industries

1. Abaya Die and Mould Manufactory
   20, Talawatugoda Road,
   Pitakotte,
   Kotte.

2. Agro Technica Ltd.
   400, Deans Road,
   Colombo 10.

3. All Cast,
   35, Dharmashrama Mawatha,
   Off Borupana Road,
   Ratmalana.

4. Alcobronz,
   14, Kotahena Street,
   Kotahena.

   Factory Address
   Alcobronz,
   Elizabeth Perera Mawatha,
   Kadawatte.

5. Alpex Engineering Co. Ltd.
   176, Lake Road,
   Maharagama.

6. Alpha Industries Ltd.
   Mattegoda
   Kottawa.

7. Appropriate Technology Ressearch and Development Centre,
   Industrial Development Board,
   Pannala.

8. Associated Electrical Corp.
   140, Vauxhall Street,
   Colombo 02.

9. Brown and Co. Ltd.
   481, T.B. Jayah Mawatha,
   Colombo 11.

10. Browns Group of Industries Ltd.
    33, Katukurunduwatta Road,
    Ratmalana.

11. Contracts and Supplies Co. Ltd.
675, Denister De Silva Mawatha,
Colombo 09.

12. Ceylon Stoves and Enamelling Works,
Kirillawala,
Kadawatha.

13. Dias and Dias,
690, Negombo Road
Mabola,
Wattala.

14. Dias Mechanical Engineering,
96/1, Sri Wickrama Mawatha,
Wattala.

15. Dias Brothers Engineering,
29/5, Hekitta Lane,
Wattala.

16. Edna Industries
Mawanella.

17. Gamini Engineering Works,
Ambatale,
Angoda.

18. General Metals Ltd.,
241, Sri Sangarajah Mawatha,
Colombo 10.

Factory Address
General Metals Ltd.,
Dalugama,
Kelaniya.

19. Glacio Ltd.
High Level Road,
Navinna,
Maharagama.

20. Government Factory,
Kolonnawa.

21. Industrial Development Board,
615, Galle Road,
Katubedde,
Moratuwa.

22. Industrial Development Board,
Common Services Centre,
Matara.

23. Industrial Development Board,
Common Services Centre,
Anuradhapura.

24. Jayantha Karmika Ayathanaya,
D.D. Dayaratne,
98, Kajantota Road,
Malabe.

25. P.P.P. Jinadasa,
Regal Bldg.,
Parsons Road,
Colombo 01.

26. Jinasena Ltd.,
4, Hunupitiya Road,
Colombo 02.

27. Kamburugamuwa Industries,
2, Batuta Mawatha,
Matara.

28. Latsha Industries,
Latsha Wire Converters,
9/4, Old Airport Road,
Ratmalana.

29. Mascons Ltd.,
175, Sri Sumanatissa Mawatha,
Colombo 12.

30. Metalix Engineering,
41/18, Epitamulla Road,
Kotte.

31. Metro Industries,
Negombo Road,
Kochchikade.

32. Premier Engineer,
Morgan Street,
Colombo.

33. Rice Milling Machines Fabrico,
Pamburana Road,
Matara.

34. St. Anthony's Group of Industrial Ltd.,
752/1, Baseline Road,
Colombo 09.

35. Samson Engineeris, Kandy Road,
Mahara.

36. Samuel Sons and Co. Ltd.,
64, Messenger Street,
Colombo 12.

37. Saram Auto Engineers,
7A Mankuliya Road
Negombo.

38. Sathosa Engineering Services Ltd.,
(CEATO)
Suwarapola,
Piliyandala.

39. Singer Industries Ltd.
435, Galle Road,
Ratmalana.

40. Solex Engineering Enterprise
208, De Saram Place,
Colombo 10.

41. Somasiri Huller Manufactory,
18, Parakrama Avenue,
Kohuwala,
Nugegoda.

42. Sriman Agro Industries,
Negombo.

43. Star Engineering Industries,
Mr. N. Wickremasinghe,
Divulapitiya Road,
Minuwangoda.

44. State Hardware Corporation,
Cast Iron Foundry,
Enderamulla.

45. State Hardware Corporation,
Yakkala.

46. Steel Corporation,
Oruwala,
Athurugiriya.

47. Swed Lanka Engineering (Pvt.) Ltd.,
Ranmuthugala Estate,
Kadawatha.

48. Tools and Agricultural Machineries Ltd.,
P.O. Box 1940,
53, Vidyalankara Bldg.,
3rd. Floor,2
First Division,
Colombo 10.

49. Usha Industries Ltd.,
68, Attidiya Road,
Ratmalana.

50. N. Vaitilingam Co. Ltd.,
70, Bloemendhal Road,
Colombo 13.

51. Walker and Sons Limited,
4346, G. Srimath Ramanathan
Mawatha.

52. Upali Wimaladharma and Co.,
9/2, Old Airport Road,
Ratmalana,
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