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THE MANUFACTURING SECTOR IN ZIMBABWE*

Prepared by the

Regional and Country Studies Branch

Studies and Research Division

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PREFACE

Within the framework of UNIDO's programme of industrial studies, the Regional and Country Studies Branch carries out analyses of industrial structure and structural change at the international and national level. These have the objective of providing policy-oriented advice to governments on action necessary to accommodate such change and to foster the sector's contribution to overall economic development.

This study was carried out for the Government of Zimbabwe as a United Nations Development Programme project, with UNIDO as the executing agency. The report was previously issued in three volumes.^{1/}

The report formed the basis of a workshop organized by the Government in Juliasdale, Zimbabwe, 4-6 December 1985. The meeting was opened by the Deputy Prime Minister of Zimbabwe, Hon. S. Muzenda, and chaired by the Permanent Secretary of the Ministry of Industry and Technology, Cde. S. Geza. Participants represented government departments, parastatal organizations, the private sector (Confederation of Zimbabwe Industries), the University of Zimbabwe, UNDP and UNIDO.

The report is in three parts. The first one, Part I, contains a summary of the main findings and recommendations. Part II contains the full text of the study, describing in detail the analysis of the manufacturing sector in Zimbabwe and the conclusions that were drawn from it. Part III contains statistical annexes. The preparation of the study included data-gathering in Zimbabwe and the writing of the final report at UNIDO Headquarters in Vienna.

^{1/} UNIDO DP/ID/SER.A/631 + Add. 1 and 2. 12 September 1985.

The study was carried out by Eng. E.D.D. Cochrane, Chairman, NEI-Cochrane (Pvt.) Ltd., Zimbabwe, Dr. Daniel Ndlela, Economics Department, University of Zimbabwe and Mr. Roger Riddell of the Overseas Development Institute, London, United Kingdom, as UNIDO consultants, together with the Regional and Country Studies Branch of UNIDO.

A list of government bodies and other institutions contacted during the course of this study appears at the end of the present Volume. The study team would like to express their thanks to all of these, and to thank the manufacturing firms who completed a questionnaire at short notice in the face of what they must have seen as more immediate tasks.

Particular gratitude has to be expressed to the officials of the Ministry of Industry and Technology, and of the Confederation of Zimbabwe Industries, and especially to Mr. Shumba and Mrs. Watt of the Ministry, and Mr. Simon Gray of CZI. The CSO provided the team with unpublished data which was of considerable assistance in the preparation of parts of this study. In conclusion the team would like to thank Mr. A. Ambatchew, Resident Representative of UNDP, and Mr. K. Stigen, UNDP/UNIDO, for their help and encouragement in carrying out this study.

BACKGROUND AND SCOPE OF THE STUDY

The purpose of the study was to assess the present condition of the manufacturing sector and the problems that are faced arising both from internal difficulties and the changing world situation, and in addition to provide recommendations on adjustment measures in such a way that the sector can contribute to overall development and to regional co-operation strategies.

The need for such a study was recognized in Zimbabwe through the setting up by the Ministry of Industry and Technology of a Steering Committee, composed of representatives from the Ministry itself, the Industrial Development Corporation, the Central Statistical Office, the Confederation of Zimbabwean Industries and the University of Zimbabwe, as well as representatives from UNDP and UNIDC, Harare.

The scope of the study was intended to be very wide. The objective was to form a comprehensive view of all aspects of the manufacturing sector, its role, its operation, and its difficulties, at a sectoral and sub-sectoral level. The topics to be covered included exports, imports, technology, investment, linkages within the sector and other parts of the economy, and the institutional and policy framework in which the manufacturing activity operates. The intention was to derive a picture of the current state of the sector with a view towards providing recommendations as to short, medium and long-term measures that could be adopted to enable manufacturing to best grow and contribute to overall development.

In response, the present study contains chapters on the place of the manufacturing sector in the economy, its structure, size and ownership, its sub-sectoral organization, its linkages, its role in the world economy, its capacity utilization and maintenance, its technology, and prospects in the areas of exports, import substitution, regional co-operation, and investment. A review is also made of government policy and the institutional arrangements at present existing and in which the manufacturing sector operates. Detailed chapters on each of these headings are found in Part II of this report.

The main source of information has been existing studies, statistics, findings, and analysis. The team's main task was to draw upon this material in order to answer the questions posed by the present study. The questionnaire was intended as a supplementary measure to derive information on particular questions in the areas of linkages, technology and capacity utilization on which basic data was felt to be needed. A number of firms was selected to receive the questionnaire, based upon a detailed sub-sectoral analysis with the intention of reflecting the distribution of manufacturing value added throughout the 33 sub-sectors and also to focus upon both small and large firms in order to determine size-related aspects of the questions. Some 200 firms were sent a copy of the questionnaire and a total of 82 replies were received in time to be incorporated in the analysis. The responding firms represented about 38.9 per cent of manufacturing gross output in 1982. In view of the rather limited response obtained, the questionnaire results have not been separately analysed in the present report. However, because they contain in some cases new and valuable information, they are used, as appropriate, in the discussion of particular issues even though they must necessarily be regarded as supplementary material and indicative in character. The questionnaire form is reproduced in Part III.

The Census of Production compiled annually by the CSO has been a major statistical resource in the execution of the present study and, while recommendations are made for improvements in this area, it is nevertheless proper to recognize the considerable advantage that Zimbabwe enjoys due to the presence of such a detailed collection of data on the activities of the manufacturing sector. As is noted in the chapter on linkages in Part II of this report, the unpublished data also obtained from the CSO in this connection was of considerable assistance, as in several other areas also. The linkage data was transferred to UNIDO's computer facilities in Vienna, together with the questionnaire results, where it was analysed to provide an input for the preparation of this report. The report itself was written by the team in Vienna on the completion of the data-gathering work in Zimbabwe.

INSTITUTIONS WITH WHICH MEETINGS WERE HELD

Name of Institution

1. Ministry of Industry and Technology
2. Ministry of Agriculture
3. Ministry of Mines
4. Ministry of Trade and Commerce
5. Ministry of Labour, Manpower Planning and Social Welfare
6. Ministry of Finance, Economic Planning and Development
7. Barclays Bank
8. BCCZ
9. Central African Textile Manufacturers Association
10. Central Statistical Office (CSO)
11. Cold Storage Commission (CSC)
12. Commercial Farmers Union
13. Cotton Marketing Board
14. Dairy Marketing Board (DMB)
15. Electricity Supply Commission
16. Engineering Employers Association
17. Industrial Development Corporation
18. National Railways of Zimbabwe
19. Post and Telecommunications Commission (PTC)
20. Reserve Bank of Zimbabwe
21. SEDCO
22. Standard Chartered Bank
23. SVECO
24. Zimbank
25. Zimbabwe Development Bank
26. Zimbabwe Institute of Development Studies
27. Zimbabwe Tobacco Association

In addition, a total of 25 manufacturing firms were individually visited

P A R T I

OVERVIEW OF THE MANUFACTURING SECTOR

Zimbabwe's manufacturing sector is exceptional in its size and diversity, especially in comparison to many other countries in Africa. Its aggregate features can be summarized as follows:

- The sector contributes 24 per cent of GDP. This is three times the average for sub-Saharan Africa.
- Growth in recent years has been usually negative: from 1980-84 it averaged 0.4 per cent per annum, in spite of a good performance (9.8 per cent) in 1980-81. The sector is nevertheless resilient: its output has not fluctuated as much as the rest of the economy.
- Manufacturing value added (MVA) per capita is three times the average for Africa as a whole.
- It contributes greatly to export earnings, between 34 and 52 per cent, depending on the classifications used.
- But it is also a heavy user of imports, using about 45 per cent of all commodities imported.
- It is therefore a net user of foreign exchange.
- It is also a major user of energy, having 22 per cent of total consumption, and between 48 and 50 per cent of total electricity consumption.
- The sector is a key source of government revenue, providing 28 per cent of the total in the fiscal year 1981-82.
- It provides 16 per cent of total formal employment, in second place to agriculture at 26 per cent.
- The average wage in manufacturing is higher than the national average, because fewer manufacturing employees are in the lowest wage bracket and more in the highest, compared to the overall pattern of earnings in the economy.

Organization of the sector

Zimbabwe's manufacturing has a tendency towards monopolization of product manufacturing: although the sector produces over 6,000 different products, 50 per cent of these are produced by only one firm and 80 per cent by one, two or three firms. A further skewed distribution is seen in the dominance of large firms. In 1982, 7.8 per cent of the firms produced 41 per cent of output. Furthermore there is a tendency towards a greater concentration of production among large firms in recent years.

A similar concentration can be seen in the geographical distribution of manufacturing. The Harare region, for instance, contains 46 per cent of manufacturing employment and only 11 per cent of the population. Adding Bulawayo and KweKwe/Redcliff accounts for 79 per cent of the total manufacturing employment. Recent years have seen a slight increase in this concentration.

The above characteristics have a number of implications. The tendency towards dominance of large firms and monopolization of product manufacture increases the vulnerability of the sector, even if there are benefits in terms of allocation of national resources. Furthermore, the weakness of small firms, a tendency for the total number of firms to decline, and the geographical concentration of production in the main urban centres, all make more difficult the task of integration of the rural areas, the employment of the rural population and the expansion of the domestic market.

One factor which may well have influenced the above characteristics is the degree of foreign ownership. This is estimated to be around 48 per cent for manufacturing as a whole. But, at the branch level, there are considerable variations, with over 50 per cent foreign ownership in Drink and Tobacco, Paper, Printing and Publishing, Chemical Products, Non-metallic Mineral Products, Metal and Metal Products and Others.

Characteristics at the branch level

By many criteria, the most important sector in Zimbabwe's manufacturing is the Metals and Metal Products sector, which includes non-ferrous metal and iron and steel basic industries, metal products, machinery and equipment including electrical, radio and communication equipment. This is a diverse and extensive group, which contains 30 per cent of all manufacturing firms, produces 23 per cent of total manufacturing net output, accounts for 53 per cent of all manufacturing exports and 24 per cent of all jobs in manufacturing, and, finally, has 32 per cent of all the capital stock in manufacturing. This sector's dominance is further indicated by its extensive linkages. Metal and Metal Products is the sector with most backward and forward linkage with other manufacturing sectors. Also, its close relationship with the mining sector in particular gives it a key role in the economy as a whole.

In terms of net output, numbers employed and value of capital employed, Foodstuffs is the second most important sector (16 per cent of total net output). As an exporter however it is in third place to Textiles, which includes significant cotton lint sales and has 9 per cent of total output. Closely allied through linkages is the Clothing and Footwear sector, with similar levels of employment and the same share of net output, but a much higher number of individual firms and a much smaller contributor to exports.

But manufacturing contains several other significant branches, notably Chemicals and Drinks and Tobacco, which are respectively in third and fourth place in net output terms (13 per cent and 11 per cent of the total). The other sectors are Paper, Printing and Publishing (7 per cent), Non-metallic Mineral Products (5 per cent), Wood and Furniture (4 per cent), Transport Equipment (3 per cent) and Other Manufactured Products (2 per cent).

Estimates of the degree of linkage suggest that these sectors, and the more detailed sub-sectoral activities of which they are composed, form a very elaborate and diverse system. Thus at the level of 33 sub-sectors, it is estimated that about 70 per cent of all possible linkages within manufacturing are in fact taking place: the sub-sectors are supplying one another with a wide variety of manufactured products for use in further production.

Manufacturing has important links with other parts of the economy also, especially with agriculture. A very high share of commercial agricultural inputs comes from manufacturing, about 66 per cent of intermediate inputs (though some of these are imports). In the reverse direction agriculture supplies cotton, cattle, maize and other products to Textiles and Foodstuffs. Agricultural inputs are about 16.5 per cent of total manufacturing gross output, which is equivalent to about 25 per cent of all intermediate inputs to the sector as a whole. The figures indicate that 59 per cent of agricultural output goes to manufacturing for further processing.

With respect to mining, the linkages are also important. They appear to be lower than the links with agriculture, but statistical reasons may account for this, since it is difficult to separate manufacturing from mineral processing carried out on mining sites. Linkages with individual sub-sectors of manufacturing are higher, especially with non-ferrous metals and iron and

steel basic industries. Mining uses a variety of manufactured products in its own production, which may be as high as 47 per cent of its output. In turn, mining supplies 17.5 per cent of its output to manufacturing.

The combination of the sectoral activity within manufacturing is, overall, not very far from that of developed countries, and is closest to the group of high income developing countries, even though Zimbabwe itself belongs to the low income group. But such a comparison refers only to the proportions of sectoral output: the actual levels are low, and Zimbabwe has not increased its share of world manufacturing output since 1973.

The sectors were ranked above in terms of their net output, in order to show which are most important. But other indicators give a very different picture. Although Metals and Metal Products is the largest sector, it is the Chemicals sector which has the largest net output per employee, the greatest capital per employee, and the largest output per unit. Drink and Tobacco has the second largest output per employee, and the largest output per employee, but the smallest share of output being exported.

Looking at intermediate inputs, it can be seen that half of all material input purchases are made by just two sectors, Foodstuffs and Metals. But Foodstuffs acquires almost all its raw materials locally, while Metals imports over 40 per cent. Chemicals imports even more of its raw materials, over 50 per cent, but the highest figure is for Transport Equipment, with 60 per cent of its raw materials being imported.

Industrial resources

The statistics given so far can convey only a surface impression of manufacturing in Zimbabwe. They cannot of themselves show the elaborate structure of activity, of skills, processes and products, which constitutes the sector at present. The origins of this system lie in the combination of import substitution and export promotion policies adopted in the past. Import substitution in Zimbabwe has always contained elements of export orientation, with many products being delivered either to the regional market or overseas. Import substitution has passed the "shallow" stages of replacing formerly imported consumer goods, and the manufacturing sector produces and exports capital equipment and intermediate goods and it designs, modifies and implements production processes.

Indications of the strength of these capabilities may be seen in such areas as the design and construction of equipment for grain milling, stock feed conditioning and packaging. Zimbabwe produces agricultural machinery such as tillage, spraying, reaping and curing equipment, conveyors, dust removal chambers, rotary drying kilns and humidification chambers. For food and drink processing, low temperature cryogenic vessels and stainless steel storage and colling vessels are all made locally. The metal products and machinery and equipment firms number around 300, designing and producing a range of goods from irrigation equipment to holloware. Transport equipment producers, as well as assembly work, manufacture such items as locally designed buses and railway rolling stock.

Human skills development has also taken place in Zimbabwe, and the country possess considerable resources in the form of entrepreneurs and engineers. It has apprenticeship schemes that are operating well and a body of skilled labour. Good support services, transport and communciations also exist.

In summary, Zimbabwe's manufacturing sector represents a considerable asset to the country, not just in terms of manufacturing value added, but in employment, foreign exchange earnings, technology, the exploitation of natural resources, and the provision of key linkages to help the formation of an independent and self-sustaining economy. In fact, one calculation indicates that, if there were no manufacturing sector in Zimbabwe, an extra \$2 billion of foreign exchange would be needed annually.

ISSUES FOR THE FUTURE

1. The role of Government

The basic statement of national policy for manufacturing is set out in the Transitional National Development Plan 1982/83-1984/85. The objectives defined include the expansion of the sector and its linkages; the enhancement of its competitiveness; the promotion of labour intensive technologies; further import substitution; training and upgrading of staff; de-centralization; increased local participation, ownership, and control; and energy efficiency.

Analysis of the Plan indicates many policy areas that were identified for action to meet these objectives. These include: the formulation of a comprehensive industrial strategy; an assessment of the export potential of the sector; the identification and encouragement of dynamic comparative advantage industries; the increased skills supply and remuneration; more state participation; assistance to small and medium-scale activities especially outside the main centres; a review of the foreign exchange, taxation, licensing and incentive systems; the creation of a climate of consultation and co-operation with private industry; incentives for investment; and the encouragement of technologies using local inputs.

Those measures were intended to assist manufacturing in growing at a rate of 11 per cent per annum over the period 1982/83-1984/85. Many uncontrollable factors were obviously mainly responsible for the lack of success, including drought, disrupted external communications, depressed world trade and a difficult international monetary and financial situation. However, analysis of the implementation of the policy measures outlined above suggests that, as yet, only moderate progress has taken place. Full implementation could hardly have counter-balanced external negative forces, but scope remains in all the given policy areas for further efforts. Progress achieved can be summarized as limited overall, being greatest in the areas of assessment of export potential and review of foreign exchange taxation and incentive systems, and least in the area of improved efficiency.

General government policy, and measures in other sectors, inevitably affect manufacturing also. This is particularly so in Zimbabwe, as in other countries where the sector is large and has many linkages with other parts of the economy. Such measures include those taken in areas such as wages, labour regulations, price control, taxation, investment trade and macroeconomic policy generally. Action has been taken in all these areas in recent years, but the immediate effects on manufacturing are usually negative, including wage, labour and price controls, foreign exchange controls, monetary policy and reduced government expenditure in construction. Positive effects have resulted from trade agreements, such as the Preferential Trade Area (PTA), the export incentive scheme, the Manufacturing Rehabilitation Import Programme, the Export Revolving Fund, Commodity Import Programme aid, the establishment of the Small Enterprise Development Corporation (SEDCO) and the Zimbabwe Development Bank (ZDB), and increased expenditure in health and education.

This is a brief qualitative summary of effects: measures are looked at from the point of view of their effects on manufacturing, not for their wider implications (which of course will have further and possibly different effects in the longer term). But it shows that the manufacturing sector operates in a context of a wide number of implicit as well as explicit policy measures. This context is further determined by a complex system of controls on the setting up and operation of a business, safety levels, pollution controls, labour regulations, foreign travel and the like.

The consequence of such a policy environment is that the efficiency of industry is bound up with that of the public authorities: the degree to which decisions are taken quickly and in full realization of their effects on manufacturing will directly determine the progress of the sector. From this point of view it is important to note that many decisions are taken at the level of government without the explicit involvement of the Ministry of Industry and Technology even though they may directly affect the sector. It should be noted also that short-term decisions, for instance with respect to foreign exchange or to the scheduling of parastatal investment, can have long-term effects on the sector, and that the result of all the policies and controls within which manufacturing operates is that the sector's progress is being determined without an explicit analysis or explicit objective.

Analysis of policy and its application at present, including the operations of the Ministry, suggests that considerable scope exists for improvement in this field. The findings can be summarized as: a minor role at present of the Ministry of Industry and Technology, a lack of an overall plan, a short-term orientation, a lack of qualified staff, a dominance of foreign exchange questions, in some cases a multiplicity of Ministries involved in decisions, a lack of monitoring of projects, a lack of promotion of local industry in parastatal investment, a consequent uncertainty among industrialists as a result of all the above, a need for co-ordination between the SEDCO, IDC and ZDB, too restrictive a criterion of immediate foreign exchange gains for new investment, and a passive approach by many of the committees involved in decision making.

Improvements in the above processes of decision making will certainly benefit the sector, but they have to be carried out with a view of what directions are appropriate for manufacturing in Zimbabwe in the years to come. The present study attempts to contribute to the formation of such a view, by considering not only the manufacturing system as it at present operates but also the emerging challenges for future years. These are now examined under the headings of investment, import substitution, exports, regional co-operation, technology and structural change. However, all these topics are inter-related.

Investment

Zimbabwe appears to have severe problems in this area. There has been considerable under-investment. By this is meant that, even taking a modest growth target for manufacturing of 5 per cent per annum, the sector has been replacing equipment and adding new capacity at a woefully inadequate rate. Moreover, these inadequate levels have persisted since 1975. To maintain a 5 per cent growth, it is estimated that up to perhaps \$330 million at 1982 prices is needed for investment, yet the highest figure in recent years has been \$231 million in 1981, with considerably lower figures, \$169 million and \$131 million, in 1982 and 1983.

It should be noted that the estimation of investment requirements assumes proportional growth among the branches of manufacturing. Capital stock is at present concentrated in Foodstuffs, Chemicals and Metals, which together have

60 per cent of accumulated investment in land and buildings, plant and equipment, and vehicles. Thus, if structural change is to occur, the figures for needed investment will be higher: if some sectors have to expand at higher rates than the average, than their existing capacity will be saturated sooner. Again, structural change may also entail shifts to new product lines within existing branches, rendering existing equipment obsolete sooner. For these reasons, under-investment seems indeed an obstacle to future progress.

The reasons for this appear to be:

- Foreign exchange shortages: as long as some essential proportion of equipment needs to be imported, it will constrain the planned investment by a domestic manufacturer.
- Uncertainty about economic conditions and the direction of Government policy.
- With respect to direct foreign investment (DFI), a general downturn internationally due to world economic conditions.
- Again with respect to DFI: an unfavourable press image of Zimbabwe, together with the fact that the country has not signed particular investment agreements or guarantees.

The response to these difficulties has to be a combination of measures covering both foreign exchange and domestic resources. Foreign exchange requirements for investment of the order discussed above may amount to \$118 million annually. This can be met through aid (where growth prospects are, however, limited) foreign borrowing (where balance of payments constraints are already severe) or DFI (where prospects are, as noted, also limited and where Zimbabwe is from some points of view geographically disadvantaged and in competition with many other developing countries). As to domestic resources for investment these seem less of a constraint, and it is the essential foreign exchange component that appears to be the critical barrier.

Action could therefore include the following:

- Renegotiation of existing loans to longer periods. This would ease the foreign exchange constraint (and ease the excessive increases in electricity costs resulting from existing foreign borrowing in this area).
- Consideration of ways to improve the investment "climate", including a review of how existing policies help or hinder progress to the desired level.

- Examination of newer forms of DFI, including joint ventures.
- Better use of existing capacity: the evidence is that there is considerable under-utilization. In some cases new investment could be postponed if machine-use time could be increased. This point is examined further below.

However, an essential first step is the assessment of investment needs in the context of overall strategy for the sector. The present practice is that investment proposals are put to the Projects Committee which decides on approval or rejection in the light of established criteria. But this is too passive an approach: the sector needs detailed objectives and a desired set of priorities towards which investment is to be directed.

Capacity utilization and maintenance

The survey carried out for this study indicates not only that manufacturing is operating at less than full capacity (in fact around 69 per cent) but also that there is considerable variation in the definitions of "capacity" used. Some firms work one shift a day, some two, and some three. The results suggest that 63 per cent of the firms surveyed have machines lying idle at least one third of the available time. This means that there is some scope for increased production without concomitant increases in investment and therefore that not only must the obstacles to increased capacity utilization be addressed but that new thinking is needed at the factory level to establish better use of existing facilities.

Of major importance in this area is preventive maintenance. The capital goods (i.e. the machinery and equipment) in Zimbabwe manufacturing are a national asset, and if insufficient care of machines and equipment is taken this leads to machines highly exposed to breakdown risk, causing both underutilization of productive capacity and very often a foreign exchange loss. A crude estimate is that perhaps \$30-\$50 million in damage to machinery and property alone takes place annually. Inadequate attention to preventive maintenance, loss prevention systems and management by objectives is a significant obstacle to improved capacity utilization and manufacturing growth.

The issue of maintenance of equipment does not figure very largely in discussion of industrialization policy. Zimbabwe manufacturers, to judge from the survey conducted, do not see it as a major obstacle to increased capacity utilization: they rank it in sixth place, after domestic and external supply and demand factors, and central or local government decision making. However, poor maintenance, losses, and accidents involve many hidden costs, and experience suggests that the real picture with regard to these questions in Zimbabwe manufacturing is a bleak one. It ought therefore to receive urgent attention.

Import constraints on capacity utilization can also, through linkages, have wider negative effects throughout the manufacturing sector. This has been noted in the effects of tin-plate shortages in the canning of food, the lack of suitable paper for the expansion of the printing and publishing industry, and the potentially very widespread effects of rubber shortages on the production of tyres for the domestic market. Finally there exists the problem of insufficient capacity in a number of areas at the sub-sectoral level: it has been noted in particular in the grain milling, sugar refining, and cotton ginning activities.

Import substitution

Industrialization in Zimbabwe has always followed a course, though not exclusively, of import substitution. This course was intensified by the conditions of the UDI period, and it has led to a considerable national productive capacity in many areas of manufacturing. As has been noted, many elements of this capacity have catered also for the regional and external markets. Analysis suggests that:

- Considerable possibilities remain for further import substitution. These cover a wide range of products, especially in the Chemicals, Non-Metallic Minerals, Metals and Transport Equipment sectors, and are listed in the Detailed Recommendations below.
- Both new and existing capacity can in many cases cater further for the regional market and other exports. This means that improved efficiency, quality and costs can accelerate the process by which substitution is linked to export promotion.
- The existing capacity, if used more fully through increased production could produce further savings on imports. Major investment programmes have to make as much use as possible of local manufacturing capacity.

- The existing capacity is in some cases highly dependent on the investment scheduling of parastatal bodies. Given this vulnerability, the decision by a parastatal not to invest in new equipment can mean that the manufacturer of it has no further market and will not survive.
- The present system of foreign exchange allocations certainly induces a search for local sources of supply, and thus creates pressure for continued import substitution in intermediate goods. However additional incentives towards new substitution should be considered, since manufacturing still imports an estimated 25 per cent of its raw materials.
- Import substitution of capital goods is a particularly important area from the point of view of longer term needs and opportunities, and longer term technological and structural change. Zimbabwe already has a good basis for progress, and the manufacturing sector both national and regional can be enhanced by an increased product range, especially in heavy engineering.

Exports

Although almost 30 per cent of firms carry out some exporting, and exports take place from all 33 sub-sectors, nevertheless manufacturing exports are mostly confined to a handful of large firms and to one or two subsectors. For most firms, exports form a small part of total output.

Manufactured exports are also very volatile, showing sharp fluctuations in recent years, sharper than changes in manufacturing production. They are dominated by steel, ferro-alloys and cotton lint. The main producing sectors involved are Metals and Metal products, Textiles, and Foodstuffs. The main markets for manufactured exports at present are EEC, 36 per cent; the Republic of South Africa, 17 per cent; the Far East and Australia, 10.1 per cent; the USA, 7 per cent, and other SADCC countries, 7.2 per cent. If we include Metals in these figures then the EEC takes 30.5 per cent of all manufactured exports, South Africa, 22 per cent; the Far East and Australia, 11.2 per cent; the USA, 10.4 per cent and SADDC, 12.8 per cent.

Important issues in the question of manufacturing exports include the following:

- Zimbabwe is disadvantaged as an exporter, especially as far as the overseas market is concerned, through the high costs of sending goods by rail to the ports in South Africa and Mozambique and the equally high costs of importing raw materials. The present disruptions to rail transport in Mozambique make this even worse.

- The credit terms which exporters offer can be a handicap to expansion. While an extended credit scheme (operated by an arrangement with the World Bank) would cover larger capital goods exports (of \$0.5 million upwards), and 180 day credits are covered by the Reserve Bank, more facilities and flexibility in their application may be needed if Zimbabwe is to compete on equal terms with both developed and developing country competitors.
- The natural vulnerability of all exports to external factors seems to have led domestically-oriented manufacturers to view them as a second-best option, to be pursued more when the local market is depressed.
- On this point, the evidence suggests that these manufacturers (i.e. excluding the major areas of steel, ferro-alloys and cotton lint production) have shown the ability to move in and out of export markets in Southern Africa according as domestic demand rises and falls. However such a strategy is scarcely applicable to more competitive international markets: once abandoned, such markets are difficult to regain.
- To encourage these exporters to shift towards a more export-oriented approach additional incentives may be needed. For some of them at present, exports appear profitable only at the margin, when they have underutilized capacity.
- This further implies that measures to expand exports cannot be separated from the question of improvements in quality and competitiveness, and new investment to re-vamp existing plant will be required.
- Some specific overseas export expansion opportunities exist in textiles, clothing, tobacco products, and metal products (listed in the Detailed Recommendations, numbers 34-36).
- Regional export possibilities exist in the Chemicals, Non-Metallic Mineral Products, and Metal Products sectors, and especially in the areas of capital goods and transport equipment (see the recommendations on regional co-operation, numbers 47-54).

Regional co-operation

Zimbabwe is a member of two important co-operative groupings in the region, the Southern Africa Development Co-ordination Conference (SADCC) and the Preferential Trade Area (PTA). SADCC's orientation is more towards harmonization of development plans, and PTA's towards trade expansion through tariff reductions and payments arrangements, but the two organizations cannot be fully distinguished in this way. Major considerations for Zimbabwe are the following:

- As noted above, considerable possibilities exist for exports to the region: it is an enormous potential market (the PTA, which is larger than SADCC, covers a population of 168 million in 1983), and

Zimbabwe with its strong and diverse manufacturing sector is well placed to take advantage of this. This is so also because of Zimbabwe's geographical location, its familiarity with the market and the appropriateness of its products for regional needs.

- In a regional co-operation strategy, Zimbabwe has scope in those areas in which it is already well endowed with natural resources, experience and skills, and these would include engineering products, transport equipment and agricultural equipment.
- A further possibility is for Zimbabwe to move into expanded and developed production in areas such as chemicals, including fertilizers, glass, rubber, pharmaceuticals, and plastics. These products are not necessarily particularly simple in processes nor are they necessarily based on natural resources, but the region can be expected to have increased demand for them in the course of development.
- With respect to the PTA region, the tariff reductions that have so far taken place on capital goods and transport equipment are not of great help to Zimbabwe: since many member countries were not producers of these goods the tariffs were low to start with, and the reduction does not of itself give sufficient competitive edge to Zimbabwe against non-member suppliers.
- Regional co-operation implies that Zimbabwe will have to consider the expansion of imports from the region. The clearing house facility of the PTA, for instance, allows for payment in local currencies, but only to the extent that trade is balanced. Both Zimbabwe and the other member countries are still heavily dependent on imports from outside the region, and a co-ordinated approach, switching to intra-regional sources of supply, will have to be adopted if Zimbabwe's exports to the region are to continue to grow within the present framework.
- More generally, Zimbabwe will have to restructure its manufacturing and move towards new lines of production, according as industrial development takes place in other countries of the region. This is the inevitable consequence of the co-operation established and the objectives for which it is taking place. The size and capabilities of Zimbabwe's manufacturing sector means, however, that the basis for change is there, and it can make a substantial contribution to the development of the region as a whole.

Technology

The range and speed of technological change in the world economy is increasing, and Zimbabwe has to take account both of the causes and effects of this change. At present, something over 50 per cent of Zimbabwe's manufactured exports go to developed countries overseas, and this indicates that change in these countries is already of direct relevance to Zimbabwe.

However it will be even more relevant in the future, both because of any desired expansion in these exports and more importantly because Zimbabwe will be facing a world economy increasingly altered by technological change.

At present there is a so-called "global race" in technology. New fields of development such as biotechnology and microelectronics are the focus of strong government and private industry efforts in both developed and several of the more advanced developing countries. Major programmes of research, development and application are underway. They include both government and private industry programmes, even in countries where government action of this kind is not traditional. This is because it is recognized that the implications of the new technologies are so important, and the research effort to maintain competitiveness is so large, that only concerted national or indeed regional action can meet the challenge.

Why are these technologies so important? The following are some major points:

- Firstly, it should be recognized that technological change can make some materials obsolete (e.g. fibre optics replacing copper wire).
- It devalues old skills and creates new ones (e.g. computer aided design replacing the traditional draughtman).
- Microelectronics has encouraged the growth of a whole range of computing communication and control techniques which are broadly known as "informatics". Informatics allows for manufacturing to be carried out in a way which saves wastage, improves quality and allows rapid alteration in product design (e.g. in textiles and clothing).
- Informatics, through robotization etc., saves labour inputs. This means that countries whose comparative advantages derive from low labour costs can see these advantages disappear.
- Biotechnology will have equally significant, if perhaps longer-term effects in agriculture, mining, food-processing and other fields.

How does Zimbabwe stand in relation to these changes? In general, the impact has not yet been felt. Some manufacturers are aware of the new techniques, especially in automation and other areas. But the sector is characterized by equipment that is outdated, even if adequate for present purposes. This conclusion is suggested both by the low levels of annual investment already referred to, and the fact that the survey sample showed

only 30 per cent of manufacturers with adequate plant for the overseas market. In addition, the amount of research and development (R&D) being carried out is negligible.

Against this it should be added that Zimbabwe is in a good position, by reason of the experience and skills existing, to more rapidly absorb the new technologies. Furthermore, the level of experience internationally has now made it possible to achieve improved technological forecasting and assessment, since the main lines of development have now been more clearly established. This may make it somewhat easier to avoid expensive mistakes. (One small developing country went into the production of Light Emitting Diodes (LEDs) only to see them replaced internationally by Liquid Crystal Diodes (LCDs). The factory has now closed down).

Some implications for policy are as follows:

- Technological assessment has to become a regular activity at the level of Government, as part of the process of determining the technological "mix" of manufacturing in the future.
- By reason of its engineering skills, the country is well placed to adopt a policy of "unpackaging" of technology, in which the concepts and the component process elements can be absorbed and mastered. This criterion should be followed in the area of import controls with respect both to components and capital goods.
- Research and development for manufacturing at the national level has to be established. Unlike mining and agriculture, the sector lacks a central body to carry out research to improve processes and develop industry in new directions.

Structural change

This subject is closely related to the previous one. Technology is the driving force behind much of the structural change underway in world industry, although changes in consumer demand patterns, environmental considerations, and natural resource levels also play their part. As long as Zimbabwe intends to play its part in the international division of labour, it will have to take account of such change, to adapt its production structure, to develop new opportunities and to relinquish old patterns of production. Thus, in conclusion, the following points should be considered:

- Structural change is not only a question of technology. It has very practical implications in terms of investment, employment and skills. Precisely because the implications are so great, structural change is resisted by some countries. As a result of perfectly understandable social pressures, countries do not like to run down old or outmoded industries, or allow imports from countries who are better able to do this particular job.
- However, the pressures for change continue, and so does resistance to them. The world trading system is becoming more restrictive, and new efforts are needed for its liberalization.
- This means that any country faces both internal and external obstacles to changing its structure in line with its dynamic comparative advantage. It is especially difficult for a developing country such as Zimbabwe which has an existing industrial base and limited resources to bring about the needed changes.
- Finally, the national purpose of industrialization must be kept in mind. It is to contribute to the overall development of the national and improve the living standards of its people. The international economic system has enormous implications for manufacturing in Zimbabwe, but rural development and the extension of industrial progress to the broad masses of the population must be an underlying concern of policy. This study has not considered these questions, but the analysis of what is a major national resource, the modern sector, may nevertheless indicate more clearly one instrument available for these ends.

DETAILED RECOMMENDATIONS

The following are some of the major recommendations that have been arrived at in the study. Where possible, reference to the main text in Volume II are provided, and further information can be found there. Some recommendations, however, have been reached at the concluding stages of the study, and are a consequence of the general view formed by the study team of the manufacturing sector, how it operates, and how it could better do so.

<u>Capacity utilization and maintenance</u>	<u>Page</u>
1. A national industrial machinery maintenance policy should be developed, to include a communications programme to increase awareness of the problems. Consideration of an incentive scheme is also needed.	211
2. The skilled labour situation for preventive maintenance should be examined, and programmes for the training of new people to undertake work in this important field should be developed.	209, 211
3. The Projects Committee should assess the maintenance plans of proposed new investment and approval by the Committee should be contingent upon the presentation of an acceptable plan of maintenance.	211
4. Greater use of existing capacity should also be furthered by the examination of the impact of labour legislation, both existing and pending, on the willingness of manufacturers to expand production when demand rises.	194

Technology

5. The development of a technological policy should be initiated based upon that which improves the quality and competitiveness of the manufacturing sector.	218
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6. Since this, in turn, depends upon the orientation of sub-sectors towards the domestic and export markets, the market mix should be one determinant of the technological course to be pursued in that sub-sector. 292, 314, 320

7. A basic element of technological strategy should be the "unpackaging" of new technologies to be imported, with the objective of encouraging their diffusion and their mastery within the manufacturing sector. This means the separation and selective importation of the constituent parts of the technology (skills, processes, components). 172, 230, 320

8. With respect to human skills, it should be recognized that some by their nature will always be needed from outside the country, such as designers for industrial products for particular markets. More flexibility in recruiting these skills should occur. -

9. The Ministry of Industry and Technology should be involved, by supporting suitable applications, in the approval process for the recruitment of expatriate staff. -

10. The Government, in view of its powers and the scale of its resources, should be a broker in the generation of industrial research and development. 230

11. An institute for industrial research and development should be established, initially at a small level, with a structure that allows it to grow in accordance with revealed demand for its services. 231

12. This institute should ensure co-operation within industry in industrial research, by carrying out projects funded on the basis of joint applications by different firms. 232

13. This institute should have as a further guiding principle the development of linkages between its work and practical aspects of manufacturing, and it should also avoid excessive administrative staff and concentrate upon acquiring the right substantive staff. 232
14. The training of engineers and technicians should be a matter of particular concern, especially through an examination of skill shortage in new technologies, the unemployment of qualified persons, and other employment difficulties. 230
15. The Government and private sector should jointly examine establishing peripheral technologies services in local engineering firms, to use as much as possible existing and often dispersed skills. -
16. Foreign engineering services should be contracted only when local capacity is not available, and this should be done only with the explicit involvement of local technology services. 226

Import substitution

17. Import substitution continues to hold attractive opportunities for Zimbabwe, and these should continue to be identified and exploited, with an increasing concentration also upon those which both substitute for imports and also allow, with further capacity, for an export potential. The following recommendations (18 to 33) list some detailed possibilities in this field. 234
18. Some future fertilizer needs can be met by the development of a coal-ammonia plant. 256-257
19. The production and use of methanol, as an alternative fuel extender, should be followed. 245-249
20. Woven plastic grain bags should be produced to avoid the import of jute bags. 252-253

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21. A chemical pulp plant would significantly reduce paper imports and also allow for the expansion of the publishing and printing industries.	253-255
22. Sheet and plate glass manufacture should be established.	261
23. The manufacture of explosives, an important mining input, should be investigated.	256
24. Increased support is needed for the textile industry, particularly to achieve the expanded manufacture of better quality finished clothing.	97, 300
25. The electrification of the railways is a significant opportunity for Zimbabwe manufacturing and its full participation in this and all major para-statal investment should be carefully planned and promoted.	118, 262
26. The range of capital equipment manufactured in Zimbabwe should be increased, especially in heavy engineering.	-
27. Hydrated lime manufacture should be undertaken.	258
28. The manufacture of basic refractories should be undertaken with careful analysis of their use by industry.	260-261
29. A variety of other products deserve further investigation for import substitution possibilities, such as grain milling equipment, high speed bottle filling and washing machinery, increased recovery of oil and tallow, and increased production of maize oil to obtain self-sufficiency in cooking oil.	247-251
30. Urgent attention should be given to the present insufficient capacity in cotton ginning, which is a linkage between agriculture and manufacturing which has potential for expansion and could have positive effects on the export performance.	92, 300

31. Local content in sub-sector 31, Transport Equipment, could be improved by a reduction in the proliferation of different types and models of transport equipment, especially in the areas of tractors, and passenger vehicles from that at present existing. There appear to be significant prospects in the repair and maintenance of aeroplanes, which would increase export earnings and enhance the technological advancement of the sector. 122, 123, 237-238, 302
32. It is vital to ensure that import substitution capacity, painfully built up, is not allowed to disappear, or, if so, it should done with full knowledge of the fact. For instance some manufacture of railway trucks now undertaken is dependent on parastatal purchase of the product, and the decision to reduce investment in the railways even if only over the short-term could cause such a company to disappear. 303
33. There should be incentives to import saving, as there are, for companies, in export promotion. The manufacturer who reduces his foreign exchange requirement, other things being equal, contributes to the balance of payments as much as the exporter does. -

Exports

34. Careful control of the quality of the products offered should be undertaken in all barter trade arrangements. -
35. Exporting could be made more attractive, and exporters encouraged, by a mechanism which give, to those undertaking it, some degree of direct access to foreign exchange. 290-292
36. As a longer term measure to encourage the success of exports, the most important need is investment in order to produce more cheaply and participate more fully in the international division of labour. 292

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37. Urgent attention needs to be given to the rail transport situation, and, international support needs to be sought for its resolution.	293-295
38. Co-operation already established between Government and industry in trade fairs representation of Zimbabwe exporters should be continued and indeed expanded. With respect to specific export product opportunities, these are covered in the following recommendations (39 to 46).	301
39. Textiles and clothing exports can be improved by better quality and design.	301
40. Cigarettes and cigars can be exported to certain developed markets in accordance with local tastes.	300
41. There is potential for the increased exports of tropical fruits and juices.	91, 300
42. Pharmaceuticals, with an expansion of existing capacity, can also be exported.	301, 314
43. Both higher quality paper, and books and other printed matter can be exported if the measures followed under recommendation 21 above are followed.	301-302
44. Transport equipment particularly for the Southern Africa region is a significant export opportunity.	237, 302, 314-315
45. The export, especially to the EEC region, of high quality hollow-ware, made from copper, should be pursued.	304
46. Improved co-ordination between the Ministry of Industry and Technology and the Ministry of Mines is needed to enhance linkages and thus export performance.	302

<u>Regional co-operation</u>	<u>Page</u>
47. In general, Southern Africa should be a particular focus of exports, and the SADCC region offers great scope.	207-321
48. For this purpose, the compilation of data bases on the products demanded and produced by SADCC and PTA states, together with continuous updating of this information, would be of great assistance.	319
49. The strongest firms, particularly those with significant capacity in product technology and design should be fully integrated into the regional export drive.	313
50. For regional exports, Zimbabwe should develop its production of fertilizer products, glass products, rubber, pharmaceutical, and plastics.	314
51. Monitoring of export and trade credits available to exporters should be kept under review, and policy directed towards improving upon the terms and conditions available, to increase competitiveness with respect to developed countries and the Republic of South Africa.	317
52. One example of the means by which Zimbabwe could contribute to regional co-operation would be investigation of the import of sulphuric acid from Nitrogen Chemicals of Zambia in place of imports from overseas sources.	318
53. The imports of tallow from Botswana should also be investigated.	313
54. In general, Zimbabwe's strategies for SADCC and PTA have to recognize that the other member countries will pursue their own industrialization, and structural adjustment will be needed to allow Zimbabwe to move into new lines of manufacturing in a complementary fashion.	319-320

<u>Investment</u>	<u>Page</u>
55. The allocation of funds for investment should be directed towards both ensuring that present levels of utilization are maximised and that training is undertaken, and secondly towards new investment.	324
56. The special initial allowance for investment should be made a permanent feature of the policy infrastructure.	-
57. The foreign exchange allocations for investment should have far higher priority. A detailed examination of the costs and benefits of Zimbabwe's not signing particular investment agreements should be undertaken.	330, 331, 346-348
58. The uncertainties among industrialists which hamper investment, such as delays in price decision, labour regulations, electricity costs, foreign exchange allocations, and the role of the State, should be recognized and steps taken either to reduce them or to analyse their detrimental effects.	330-332
59. Consideration should be given to freezing electricity prices and the re-negotiation of the loans that have caused recent increases.	348-349
60. A detailed picture of investment requirements in the future should be built up by, among other things, asking the manufacturers themselves what their intentions are.	337
61. A mechanism should be established to co-ordinate investment plans of SEDCO, IDC, and ZDB. All these bodies at present have cash limits defining their areas of responsibilities, but their sectoral priorities must be co-ordinated.	197-198
62. Increased utilization of existing capacity will save costs on new investment and the costs and benefits should be analysed in a vigorous manner.	349-350

63. In general, State investment in manufacturing would achieve wider benefits if targetted to new areas of activity than by taking over existing firms. 351-353

Operations of the Ministry of Industry and Technology

64. The Ministry should integrate into its day-to-day operations the large amount of existing data on Zimbabwe manufacturing, and use it for decision making . -
65. Since particularly in connection with the mining industry and with external trade, there is a lack of clarity in the statistical picture of manufacturing, a full view of these relations should be taken into account in assessing strategy for the manufacturing sector. Inaccuracies in statistical data will otherwise bias the strategies adopted. 50-51
66. Existing data can be improved by the inclusion of two questions, one on the breakdown between imported and domestic inputs used by manufacturers, and the other on investment intentions for the future, in the questionnaire that is sent every year to all manufacturers as part of the Census of Production. 40, 337
67. The speed of processing of this data should be increased and it should be available, in an interactive computer system, to allow Ministry officials responsible for particular sectors themselves to know what are the numbers involved. -
68. The Ministry officials responsible for particular branches of manufacturing should, by accessing this data and by continuous liaison with producer groups, have an up-to-date picture of the effects of all Government decision on operations. -

69. A special liaison group should be formed by the Ministry and the parastatal bodies to ensure that investment decisions taken by the latter are made in a full awareness of the effects these would have on local industry and also of the way in which the local content of major investments can be improved.
70. Mechanisms must be established to allow full knowledge and participation of the Ministry of Industry and Technology in decisions taken by other Ministries which have a direct effect upon the condition and progress of manufacturing, and these include activities in the areas of price determination, investment decisions, manpower policy, immigration, etc. 195
71. The Ministry's strategic role should be expanded by development of a national plan for industry, and the reduction of excessive concentration on short-run matters and immediate foreign exchange questions. 195-196
72. The speed of decision making both within the Ministry, and also in questions involving more than one Ministry, has to be greatly increased, and this will be furthered by the consultation mechanisms suggested in recommendation 68 above. 195
73. The Ministry must move to a more active, rather than a passive role. Instead of waiting for requests to be submitted, and either approved or rejected, the Ministry itself should be determining the strategy for the future, and encouraging State or private industry to follow it. 198
74. There should be improved monitoring of the local content of aid projects, in order to increase this whenever possible. 197
75. An increase in qualified staff in the Ministry, to act as sectoral specialists, and to monitor industrial progress on a continuous basis is urgently needed. 196

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76. Staff resources should also be dedicated to monitoring and assessing structural change and technological progress at an international level.	171
77. Existing international organizations which act as a store of such information should be utilized as much as possible, and regional co-operation developed.	171

General policy

78. The importance of the manufacturing sector needs to be more fully recognized, because it is a complex which supports the whole economy and because its diversity gives flexibility to cope with changing social and economic conditions, both internal and external.	-
79. There must be a clear recognition of the numerous ways in which Government policy affects industry. These effects arise both from the diversity of industry and its linkages and also from the wide variety of Ministries and State bodies whose actions affect the manufacturing sector.	-

P A R T I I

Chapter One

THE PLACE OF THE MANUFACTURING SECTOR IN THE NATIONAL ECONOMY

Introduction

A principal purpose of this study is to provide a perspective of the manufacturing sector in order to guide future policy initiatives for its growth, expansion and structural change. Emphasis will therefore be placed primarily on current rather than historical data, since there are a number of historical summaries available which trace the evolution of the sector down to the present day.^{1/} This Chapter provides an analysis of the place of manufacturing in relation to the current national economy, largely based on statistical data. As will be highlighted, manufacturing industry plays a crucial role in the national economy and is the leading sector from the point of view of a number of key indicators, being the single most important contributor to national value added, a major exporter, one of the largest employees of labour and a critical source of Government revenue through direct and indirect tax receipts.

Manufacturing and national production

In terms of value added, the manufacturing sector is the single most important sector of the national economy. In the five year period, 1980-1984, manufacturing has contributed on average 24.2 per cent to gross domestic product (GDP), over ten percentage points higher than the next most important sector, agriculture, which has averaged 14.2 per cent of GDP over the same period. Considering only those sectors which contribute to material production, that is excluding the service sectors, manufacturing has on average been responsible for 32 per cent of total material production over the same five-year period.^{2/} The relative performance of manufacturing in relation to overall production is shown in Table 1.1.

**Table 1.1: Manufacturing and national production,
million dollars, constant at 1980 prices
(Gross domestic product at factor cost)**

Year	Manufacturing (1)	Gross domestic product (2)	Percent (1/2) (3)	Material production (4)	Percent (1/4) (5)
1980	802	3,206	25.0	2,544	31.5
1981	881	3,679	23.9	2,908	30.3
1982	877	3,610	24.3	2,759	31.8
1983	852	3,467	24.5	2,580	33.0
1984	811	3,511	23.1	2,573	31.5
Average 1980-1984	845	3,495	24.2	2,677	31.6

Source: Monthly Digest of Statistics (MDOS), December 1984, Central Statistical Office, (CSO), Harare, Table 8.2 and unpublished estimates provided by the CSO.

As is now well known, the Zimbabwe economy has been characterized by rapid expansion, severe contraction and, more recently, a modest upturn in the Independence period to the end of 1984. The manufacturing sector has exhibited fluctuations in real output during the period, moving in general with the broad trends in the economy as a whole. In the period 1980-84, there has been an annual average growth of 0.4 per cent in manufacturing and an annual average growth of 0.8 per cent in the material production sectors. In contrast with the economy-wide performance, the manufacturing sector has been characterised by less volatile fluctuations - its highest annual real growth rate in 1980-81 being less than the national average increase and its deepest annual contraction in the material production sectors between 1982 and 1983, being less severe than the national average contraction in the material production sectors between 1982 and 1983. Although the manufacturing sector, against the national trend, contracted between 1983 and 1984, quarterly data of the volume index of the sector records an upturn in the final quarter of 1984. Recent growth rate indicators are shown in Table 1.2.

**Table 1.2: Growth rates of the manufacturing sector and national economy,
1980-1984, fixed (1980) prices**

Sector	Real annual growth rates				Annual average
	1980-81	1981-82	1982-83	1983-84	
Manufacturing	9.8	-0.5	-2.8	-4.8	0.4
Material production sectors	14.3	-5.1	-6.5	0.5	0.8
Overall GDP	14.7	-1.9	-4.0	1.3	2.5

Source: As Table 1.1 above.

Employment, wages, productivity and vacancies

Although manufacturing makes the largest contribution to overall production, it is second in place - to agriculture - as a source of employment (excluding self-employment). In the five year period, 1980-1984, employment in the manufacturing sector has averaged 170,6000 a year, contributing 16.1 per cent to total formal sector employment; in contrast agricultural employment has averaged 284,920 a year, contributing 27.6 per cent to total formal sector employment - the two sectors combined employing 44 per cent of all formal sector employees and manufacturing and agriculture accounting for 23.9 per cent and 32.5 per cent respectively of employment in the material production sub-sectors. However, the relative importance of manufacturing as a source of employment needs to be emphasized. In the three year period, 1972-1974, agricultural employment averaged 354,833 a year, 36 per cent of total formal sector employment and two-and-a-half times the 140,500 figure for manufacturing. Ten years later, in the period 1982-84, agricultural employment had dropped to 267,767 a year (a fall of 24 per cent), contributing only 26 per cent to total formal employment and only one-and-a-half times the 173,500 figure for manufacturing. Recent trends are shown in Table 1.3.

Table 1.3: Employment in manufacturing, agriculture and the national economy
(thousands)

Year	Agriculture	Percentage total	Manufacturing	Percentage Total	Total formal sector employment
1972-74	354.8	36.0	140.5	14.0	996.8
1980	327.0	32.4	159.4	15.8	1,009.9
1981	294.3	28.4	173.2	16.7	1,037.7
1982	274.3	26.2	180.5	17.3	1,045.9
1983	263.5	25.4	173.4	16.8	1,033.9
1984 ^{a/}	265.5	25.7	166.7	16.1	1,034.0

Source: Monthly Digest of Statistics, December 1984, CSO, Table 6.1 and unpublished data provided by the CSO.

a/ Figures for June, other years being annual averages.

The 1981 National manpower Survey (NMS) gives a further breakdown of particular features of employment which illustrate characteristics of the manufacturing sector vis-a-vis the economy as a whole. The first feature to highlight is the skills structure. According to NMS figures, employment in manufacturing constituted 20 per cent of all employment. However the manufacturing sector only accounted for 9 per cent of all professionals employed in the economy, less than the overall average, whereas it accounted for 26 per cent of all skilled and 19 per cent of all semi-skilled employees.

Table 1.4: Skills breakdown, manufacturing sector and the national economy 1981

Skill	Manufacturing sector	Percentage	Total economy
Professional	6,241	9.3	66,826
Skilled	23,091	21.8	105,745
Semi-skilled	45,041	25.6	176,001
Unskilled	97,397	19.0	513,442
Total	171,770	19.9	862,014

Source: National Manpower Survey 1981, Vol.I, Ministry of Manpower Planning and Development, p.48 Table 2.2

This skewed distribution of skills breakdown of the manufacturing sector is confirmed by the 1982 wage distribution analysis of formal sector employees conducted by the CSO. Although using a different data-base it shows that relative to the national average, lower paid employees in the manufacturing sector receive higher incomes while the manufacturing sector pays higher wages to a proportionately larger group of employees than the national average. The figures are recorded in Table 1.5.

Table 1.5: Wage distribution of employees, September 1982

Monthly Cash Income ^{a/}	Total employees in manufacturing (1)	Total in employment ^{b/} (2)	Percentage (1/2) (3)
Under \$100	2,890	115,770	2.5
\$100 and under \$150	85,800	268,940	31.9
\$150 and under \$250	45,480	161,910	28.1
\$250 and under \$500	18,150	95,150	19.1
\$500 and under \$750	5,680	34,510	16.5
\$750 and under \$1,000	3,500	18,380	19.0
\$1,000 and over	7,690	25,350	30.3
Non-respondents	14,700	60,190	24.4
Total	183,890	780,300	23.6

Source: Wage Distribution of Employees in Agriculture (June 1982) and Other Industries (September 1982), CSO, July 1983, (mimeo).

a/ Including all regular allowances paid in cash but excluding all income in kind.

b/ The totals exclude employees in the agricultural sector.

This less than normal wage income distribution pattern for the manufacturing sector - revealing fewer than average employees paid less than \$100 a month and proportionately more paid in excess of \$1,000 a month in 1982 - helps to explain why the manufacturing sector's total wage bill is higher than the economy-wide average and also why the average wage per employee is higher than the average for the whole economy. As Table 1.6 shows, manufacturing accounted for 22 per cent of all employees earning between 1980 and 1983, although only contributing 17 per cent to overall employment; average earnings per employee amounted to \$3,335 a year in the manufacturing sector, compared with \$2,506 a year for all employees in the economy and \$2,418 a year for those employed in the material production sectors.

Table 1.6: Earnings in manufacturing and in the national economy

Year	Earnings \$ million			Earnings per employee \$		
	Manufacturing (1)	All sectors (2)	Percentage (1/2) (3)	Manufacturing (4)	Material production sector (5)	All sectors (6)
1980	401.8	1,881.0	16.8	2,521	1,680	1,862
1981	539.9	2,394.6	18.5	3,117	2,259	2,308
1982	651.4	2,917.2	22.3	3,609	2,700	2,789
1983	709.7	3,169.2	22.4	4,093	3,033	3,067
Average 1980-83	575.7	2,590.5	22.2	3,335	2,418	2,506

Source: Monthly Digest of Statistics, December 1984, CSO, Table 6.1

As well as earnings per employee another important indicator for economic analysis is labour productivity. One measure of labour productivity is the value added per employee. Here again, the manufacturing sector performs better than the average for the economy as a whole and than the average for the material production sector as a whole. However on a sub-sectoral score, manufacturing comes in fourth place after Finance and Insurance, Distribution and Electricity and Water. Average value added per employee for the years 1980-84 at 1980 prices is recorded in Table 1.7

The National Manpower Survey also analysed the level of vacancies in the economy in 1981. The results showed that there was a proportionately lower level of vacancies in the manufacturing sector compared with the sector's contribution to overall GDP, including vacancies for those jobs defined as "difficult to fill". Given the secular decline in production levels from 1981 to end of 1984, skills shortages will have been less of a constraint on the sector in recent years than they are likely to be during the current phase of expansion.

Table 1.7: Value added per employee in dollars, 1980-84 at 1980 prices

Sector	Value added in \$, per employee					Average 1980-84
	1980	1981	1982	1983	1984	
Agriculture ^{a/}	1,413	2,011	1,797	1,677	1,879	1,420
Mining	4,305	3,973	4,458	4,693	5,344	4,555
Manufacturing	5,031	5,087	4,859	4,913	4,865	4,951
Electricity/water	10,448	10,606	9,692	9,855	9,859	10,092
Construction	2,062	2,102	1,898	1,805	1,940	1,961
Finance/insurance/real estate	16,160	18,551	19,315	16,076	15,478	17,116
Distribution/hotels	6,046	6,627	5,325	4,578	4,307	5,377
Transport/communications	4,627	4,929	4,722	4,496	4,268	4,608
Public administration	4,078	4,050	4,079	4,072	4,129	4,082
Education	4,033	3,993	3,955	3,964	3,957	3,980
Health	4,803	4,785	4,815	4,789	4,798	4,798
Domestic services	602	603	602	601	602	602
Other services	3,995	3,932	3,946	3,945	3,945	3,952
Total all sectors	3,174	3,545	3,452	3,455	3,396	3,404

Source: Monthly Digest of Statistics, December 1984, Tables 8.2 and 6.1 and unpublished estimates provided by CSO.

a/ The figures for agriculture are inflated because the value added figures include the communal land as well as the commercial sector component. (This also contributes to the fluctuations recorded from year to year.) The effect of this distortion is to raise slightly the total labour productivity for the economy as a whole, and hence to underestimate the difference between manufacturing and the rest of the economy.

A final area of potential concern is the stability of the present skilled and professional labour force. If non-Zimbabwean citizenship is a critical factor in people's mobility and in particular in the likelihood of possible emigration, then the manufacturing sector is in a disadvantageous position relative to its contribution to gross domestic product. The NMS recorded that of all non-Zimbabwean and dual citizens classed as professionals, 22 per cent were employed in manufacturing, and of those classified as skill workers, 27 per cent were employed in the manufacturing sector. Tables 1.8 and 1.9 record these figures in more detail.

Table 1.8: Vacancy rates in manufacturing and the national economy, 1981

Sector	Vacancies		Number of vacancies	Posts available	Vacancy rate (%)
	Easy to fill	Difficult to fill			
Manufacturing	1,384	1,438	2,822	77,195	3.5
Whole economy	7,687	7,317	15,004	313,395	4.8
Manufacturing/ whole economy (per cent)	18.0	19.7	18.8	24.6	-

Source: National Manpower Survey, 1981, Vol. III, Ministry of Manpower Planning and Development, Tables 12.3 and 12.10.

Table 1.9: Citizenship of skilled personnel in the manufacturing sector and the national economy, 1981

	Citizenship					
	Professionals			Skilled workers		
	Zimbabwe	Dual	Non-Zimbabwe	Zimbabwe	Dual	Non-Zimbabwe
Manufacturing	3,970	387	1,884	18,678	762	3,651
Whole economy	26,602	2,212	8,084	71,053	2,599	13,857
Manufacturing/ whole economy (%)	15	17	23	26	29	26

Source: National Manpower Survey, 1981, Vol. III, Ministry of Manpower Planning and Development, Tables 10.2.3 and 10.2.15.

Export earnings

Another critically important contribution that the manufacturing sector makes to the national economy is that of earning foreign exchange through exporting the products it manufactures. In analysing this contribution, however, one is faced with definitional problems - precisely which products are to be classified as manufactured products and which as products originating from other parts of the economy? Two general methods will be used here. The first is to consider as manufactured exports only those goods

exported which are produced by undertakings defined under the Central Statistical Office's Census of Production as manufacturing units. This means that any processing or refining or products from the mining sector that takes place on a mining site is excluded from manufacturing and hence from manufactured exports if the final products are exported. It also means that cotton lint production and export is defined under manufacturing. The second method is to use the United Nations' International Standard Industrial Classification of all Economic Activities which defines manufacturing to include the processing, refining and smelting of mineral products to produce metals or metal derivatives.^{3/} In the latter case, the exports of refined metals and by-products are included under manufactured exports. However under either method gold exports would be excluded, following recognized international and Zimbabwean convention.

A final methodological issue concerns the derivation of total export figures because one wants to see also what is the contribution of manufacturing to total commodity foreign exchange earnings. In this case, items such as the export value of migrants' effects should be excluded from the total export figures, since they have not necessarily contributed to value added. Again, there are arguments for including gold and re-exports in the total figure, against which the manufacturing contribution is to be measured. Both sets of figures will be analysed here.

Table 1.10 shows the major contribution that the manufacturing sector makes to the national economy as an exporter. Taking the least favourable combined definitions (excluding metal products from manufactured exports and taking all exports together) the manufacturing sector contributed 34 per cent of export earnings between 1980 and 1983. Taking the most favourable definitions (including metal products as manufactured exports and analysing these as a proportion of commodity exports only), then the manufacturing sector contributed 52 per cent of export earnings between 1980 and 1983. Using these different definitions, the lowest share of manufactured exports (recorded in 1982) was 29 per cent, the highest (recorded in 1980) was 59 per cent. Figures for the first eleven months of 1984 show that manufactured exports have expanded significantly; excluding metals the increase over the year 1983 was 35 per cent at current prices, including metals by 24 per cent. The 1984 figures also indicate that compared to its contribution at Independence, the manufacturing sector is currently playing an even more

Table 1.10: The manufacturing sector's share of total export earnings
(thousand dollars)

Year	Manufactured ^{1/} exports less metals (1)	Manufactured ^{2/} exports including metals (2)	Total exports ^{3/} earnings (3)	Total commodity ^{4/} exports, less gold sales (4)	As % of total exports (1/3) (5)	As % of total commodity (1/4) (6)	As % of total exports (2/3) (7)	As % of total commodity (2/4) (8)
1980	355,612	446,315	909,200	750,561	39.1	47.4	49.1	59.5
1981	325,695	405,569	971,700	834,265	33.5	39.0	41.7	48.6
1982	277,216	354,711	968,400	756,297	28.6	36.7	36.6	46.9
1983	395,019	503,207	1,150,200	975,559	34.3	40.5	43.7	51.6
1984 ^{a/}	536,882	624,729	1,142,636	978,478	47.0	54.7	54.9	63.8
Average 1980-1983	338,386	427,451	999,875	829,171	33.8	40.8	42.8	51.6

Source: Monthly Digest of Statistics, December 1984, tables 10.1-10.5 and unpublished material supplied by CSO.

Notes: 1/ Derived from MDOS, Table 10.5, excluding coal and coke and the following metal export headings: Precious metal waste, ores and concentrates of silver and platinum, copper metal, nickel metal, tin metal.

2/ As for 1/ but including the named metal headings and also excluding coal and coke.

3/ MDOS, Table 10.1, heading 'Total Exports'.

4/ As for 3/ less gold sales, re-exports and migrants effects from Table 10.5.

a/ Data for January to November only.

significant role as a foreign exchange earner, accounting for 47 per cent of all exports and including metals for 64 per cent of all commodity exports excluding gold sales.

Table 1.11 records the volatility of both the national and manufacturing exports over the past five years by comparing the different aggregate export data from Table 1.10 as index numbers at fixed 1980 prices. The table shows that, since Independence, manufacturing exports have until 1984 declined in value, whereas overall national exports increased following an initial fall and then appear to have fallen back quite substantially. However the 1984 figures are not complete as they only refer to the first eleven months of the year.

Table 1.11: Index of manufactured and national exports at fixed prices (1980 = 100)

Year	Manufactured exports less metals	Manufactured exports including metals	Total exports	Total commodity exports less gold sales
1978	104	107	102	113
1979	110	112	104	109
1980	100	100	100	100
1981	83	82	97	91
1982	73	74	99	94
1983	92	93	104	107
1984 ^{a/}	103	95	85	89

Source: Table 1.10 and Monthly Digest of Statistics, December 1984, Table 10.2.

a/ January to November only.

As well as earning foreign exchange through its exports, the manufacturing sector is a major user of foreign exchange as imports are required both to maintain and expand production. The sector utilizes foreign exchange because it imports many raw materials, plant and equipment and spares, and fuel energy supplies, all of which may be of a type or quantity not available locally. It is clearly important for planning purposes to know how much of total national imports the manufacturing sector absorbs even though the figure obtained will not necessarily be a good indicator of future

demands for foreign exchange especially when, as now and in the foreseeable future, balance of payments pressures lead to lower levels of foreign exchange being allocated than are required by the sector.

There is, regrettably, no accurate data recording the proportion of total imports absorbed by the manufacturing sector. This arises for a number of reasons. Foreign exchange allocations distributed through the Ministry of Trade and Commerce do not give an accurate indication of imports absorbed by the manufacturing sector, in part because the divisions overlap different parts of the economy, in part because manufacturers receive a significant and unknown proportion of their foreign exchange requirement via merchants, and in part also because most public sector and parastatal industrial enterprises are not included under any of the industrial allocation divisions. Indeed the sub-division 'Industrial Imports' of foreign exchange allocations distributed by the Ministry of Trade and Commerce probably accounts for less than 50 per cent of the total foreign exchange used by the manufacturing sector. Additionally, the Ministry of Trade and Commerce allocation system does not include barter trade which directly benefits manufacturers by providing intermediate and capital goods imports. And finally, foreign exchange allocations distributed through the Ministry of Trade and Commerce never accounted for the distribution of all commodity imports and today, with the rise in aid funding through commodity import programmes, the Ministry probably distributes foreign exchange for less than 85 per cent of all commodity imports. As for the detailed trade statistics, these are equally no accurate guide because they do not indicate destination of imports into the different industrial sub-sectors nor whether imports are for final consumption, or whether they are intermediate imports or capital goods imports.

Although there exists no agreed consensus on the accurate utilisation of foreign exchange by industrial sub-sector, for the purposes of the present study, some very approximate estimates of the import usage of the manufacturing sector have been made, on the assumption that the main imports used by the sector are for raw materials, spare parts, replacement and new capital and for fuel and energy imports. The figures suggest that the manufacturing sector used about 45 per cent of all commodity imports between 1980 and 1982, making it by far the largest single sector absorber of commodity imports. The annual estimates are shown in Table 1.12.

Table 1.12: Crude estimates of total imports used by the manufacturing sector, 1980 - 1982 (million dollars)

Year	Raw materials	Capital, replacement and new	Energy	Total manufacturing sector imports	Total imports	Manufacturing as percentage of total
1980	288	56	27	372	809.4	46
1981	363	74	31	468	1,017.7	46
1982	394	61	26	481	1,081.8	44
Average 1980-82	348	64	28	440	969.6	45

Source: Monthly Digest of Statistics, December 1984, Tables 10.1, 14.2; P.O'Keefe and B. Munslow, (Eds), Energy and Development in Southern Africa SADCC Country Studies Part II, Beijer Institute, Stockholm, 1984, p.179, R.C. Riddell and D.F. Nsiyaludzu, 'Turnover, Inputs and Input Costs in the Manufacturing Sector, 1980-1982', CZI, Harare, April 1982 (mimeo), R.C. Riddell and D.F. Nsiyaludzu, 'Investment in the Manufacturing Sector: Projections to 1985 and Foreign Exchange requirements', results of Questionnaire Survey carried out for the present study and The Census of Production 1982/83, CSO, 1985.

Methodological

Note: Raw material inputs estimated at about 23 per cent of total material inputs after making allowances for the import surcharge and converting import figures to fob. Energy based on 1980 Energy Consumption by sub-sector and imports (fob) for each item and on the assumption that all coal and coke imports are used by the manufacturing sector. Capital import figures based on Census of Production net investment figures, converted to fob and making allowances for the import surcharge on the assumption (CZI Survey figures) that 78 per cent of plant and equipment capital investment is imported content. Additionally, no allowances are made here for changes in stocks. To the extent that imports are acquired for stocks and not used directly in manufacturing then the import figures will tend to over-estimate import dependence of the sector in a given year. In the years 1980 to 1982 the annual increase in stocks was \$62 million, \$93 million and \$35 million respectively.

Comparing these (crude) estimates with the more accurate figures for the exports of manufactured products of the sector (using column 1 of Table 1.10) would indicate that the manufacturing sector was a net user of national foreign exchange of \$16 million in 1980, \$142 million in 1981 and some \$205 million in 1982. However extreme caution needs to be exercised in interpreting these figures. One reason is because of the crude nature of the calculation of import absorption of the sector. (It does not, for instance, include all indirect imports, through manufacturing's use of other sectors which themselves are importers). But more importantly, there are different ways of considering the overall foreign exchange costs and benefits of the manufacturing sector. For example, it is far from irrelevant to ask what would be the foreign exchange costs of not having a manufacturing sector at all. If one assumes that the \$3,049 million of goods produced by the sector in 1982 are essential to the country and using the Jansen Study's index of competitiveness (The Domestic Resources Costs ratio (DRC), of 1.27), then the foreign exchange costs of importing these goods would have been \$2,400 million less the estimated import content of producing the goods of \$440 million (Table 1.12) giving a foreign exchange saving of the manufacturing sector of \$1,960 million.^{4/} To this needs to be added the foreign exchange earning of manufactured exports of \$277 million (Table 1.10 column 1), giving an overall foreign exchange 'gain' of the sector to the national economy of \$2,237 million. These precise figures clearly do not have much practical applicability; they are presented here to indicate the very different ways one can examine whether the manufacturing sector is in foreign exchange terms - and therefore ignoring all other benefits - an asset or liability to the national economy.

Finally, some sample information from the survey carried out for the present study should be added. The questionnaire (reproduced in Volume III) attempted to gather more detailed information on those points, if only in an illustrative manner. A total of 73 firms provided a breakdown between local and imported inputs. It was seen that the domestic content of manufacturing inputs was 76 per cent, with imports at 24 percent. The value of imports in the sample was \$180.2 million. The figures refer to raw material, fuel and energy inputs, with all fuel and energy purchases being treated as local purchase.

Table 1.13: Total fuel consumption, manufacturing sector and the national economy, 1980

Sector	Coal 10 ³ tons	Petrol 10 ³ barrels	Diesel 10 ³ barrels	Power	Electricity ^{a/} 10 ⁶ Kwh	Percentage of total energy
				paraffin 10 ³ barrels		
Manufacturing	1,257	84.6	341.1	5.0	3,517.7	22.06
Total economy	2,538	1,591.7	2,213.4	6.0	6,942.5	100.00
Percentage share by manufacturing	49.5	5.3	15.4	83.3	50.7	22.06
Percentage of total energy used by manufacturing	15.6	0.2	0.9	-	5.4	22.06

Source: P.O'Keefe and B. Munslow, (Eds), Energy and Development in Southern Africa, SADC Country Studies, Part II, Beijer Institute, Stockholm, 1984, p.179.

a/ Includes commerce.

The channel for receipt of imported raw materials was predominantly Industrial Import Control and the Export Revolving Fund, which covered 64.4 per cent of a total of \$103.8 million of imports for which these details were given. Commercial Import Control accounted for a further 20.2 per cent, with commodity aid programme being 7.0 per cent of the total, non-currency transactions 0.1 per cent and "other" being 8.1 per cent.

Table 1.14: Manufacturing^{a/} and national electricity consumption, 1980-1984
(10⁶ Kwh)

Year	Manufacturing	Total national consumption	Manufacturing's share of total
1980	3,517.7	6,942.5	50.7
1981	3,516.1	7,137.4	49.3
1982	3,558.0	7,316.9	48.6
1983	3,293.9	6,970.2	47.2
1984 ^{b/}	1,702.5	3,452.9	49.3

Source: Monthly Digest of Statistics, December 1984, Table 14.2.

a/ Includes transport and construction

b/ January - June.

Manufacturing and national energy use

Of the different types of energy sources utilized in Zimbabwe, the manufacturing sector in 1980 was responsible for 50 per cent of coal consumption, 5 per cent of petrol consumption, 15 per cent of diesel consumption, 83 per cent of power paraffin consumption and 51 per cent of electricity consumption. In aggregate, the sector used just over 22 per cent of total energy consumption. Details are shown in Table 1.13.

Since 1980, manufacturing's share of total electrical consumption has been fairly stable but, falling to a low of 48.6 per cent of total national consumption in 1982, the year that the volume index of manufacturing fell from its post-Independence peak. Table 1.14 records changes since 1980.

Manufacturing and Government revenue

Manufacturing industry makes a further contribution to the national economy by providing a source of Government revenue through taxation receipts. A number of items can be identified comparatively easily - more detailed analyses are being conducted by the Commission of Inquiry into taxation - which include both direct and indirect taxes. Taking, first, direct taxes there are three sources that can be identified: company taxes paid by undertakings defined as companies that are engaged in manufacturing activities; the taxes paid by manufacturing undertakings run as unincorporated enterprises, and finally the income tax paid by employees who are employed by enterprises (corporated and unincorporated) engaged in manufacturing. There are, too, three sources of indirect taxation revenue originating from the manufacturing sector. These are: sales tax paid on the purchases made by employees paid by the sector derived from their disposable income; excise duty paid on the purchases made by employees paid by the sector derived from their disposable income and, finally, customs duties paid on products imported by the sector to be used in the manufacturing process. Calculating the contributions made to the fiscus for each of these items for the financial year 1981-82 shows that the sector contributed \$296 million to Government revenue, which was 28 per cent of the total Government revenue which derived from income tax and taxes on goods and services. Table 1.15 gives details of this source of revenue.

Table 1.15: Contribution of the manufacturing sector to total income tax and taxes on goods and services, 1981-1982
(thousand dollars)

Type of tax	Manufacturing sector contribution	Total Government revenue	Manufacturing's contribution to total
Company tax	118,291	297,004	39.8
Income tax of self-employed	392	39,118	1.0
Income tax of employees	40,894	175,511	23.3
Total income tax	159,577	511,633	31.2
Sales tax ^{a/}	51,096	280,749	18.2
Excise duties ^{b/}	23,678	130,102	18.2
Custom duties ^{c/}	61,655	140,125	44.0
Total taxes on goods and services	137,357 ^{d/}	556,077 ^{d/}	24.7
Totals	296,006	1,067,710	27.8

Source: Monthly Digest of Statistics, December 1984, CSO, Tables 6.2, 8.3 and 18.3; Income Tax Statistics Fiscal Year 1981-1982, Table 4 and 6, Table 12, above and Wage Distribution of Employees in Agriculture (June 1982) and Other Industries (September 1982), CSO, July 1983, (mimeo).

a/ Assuming 82 per cent of gross income is spent on consumption as indicated in CSO expenditure surveys. The figure of 18.2 per cent is the proportion of total disposable income of employees of manufacturing to total private consumption of the economy.

b/ Assuming sales expenditure for excisable products is similar to overall national consumption.

c/ Assuming customs duties paid are proportional to manufacturing's share of total commodity imports - certainly an underestimate.

d/ Includes the relatively small items of betting and other items for which the same distribution is made as in a/ and b/ above.

Notes and references to Chapter 1

- 1/ See, for example, UNCTAD, Zimbabwe Towards A New Order, Geneva, 1980; C. Stoneman (ed.), Zimbabwe's Inheritance, Macmillan, London, 1981; D.J. Jansen et al, Zimbabwe: Government Policy and The Manufacturing Sector, California, 1983 and Industrial and Process Engineering Consultants (Great Britain) in association with Sir Alexander Gibb and partners, The Development of Manufacturing Industry within the Federation of Rhodesia and Nyasaland, July 1960, London, 1960.
- 2/ The use of the term 'material production' is the same as that used in the Transitional National Development Plan and therefore includes the following sub-sectors: Agriculture, Mining, Manufacturing, Electricity and Water, Construction, Distribution, Restaurants and Hotels, and Transport and Communications.
- 3/ "Manufacturing is defined as the mechanical or chemical transformation of inorganic or organic substances into new products whether the work is performed by power-driven machines or by hand, whether it is done in a factory or in the worker's home, and whether the products are sold at wholesale or retail". And manufacturing within the sub-category non-ferrous metal basic industries: "The manufacture of primary non-ferrous metal products, consisting of all processes from smelting, alloying and refining, rolling and drawing and founding and casting ...". International Standard Classification of All Economic Activities, Department of Economic and Social Affairs, Statistical Office of the United Nations, New York, 1968, Statistical Papers Series M, No.4, Rev.2. The definitional problem is further examined in the next chapter.
- 4/ See Jansen (1983), Volume I, p.49.

Chapter Two

STRUCTURE, SIZE AND OWNERSHIP WITHIN THE MANUFACTURING SECTOR

Introduction

The preceeding Chapter took the manufacturing sector as an homogeneous whole and compared its performance and characteristics with different aspects of the national economy. This Chapter begins to unpiece the sector into various constituent parts, assembling the available data in a variety of ways to highlight different features of the sector that are important to policy-makers and to the construction of a unified and consistent strategy for the future. Time-wise there are two methods of assembling data: statically - analysing the data at a particular point of time - and dynamically - analysing the data over a longer time frame be it a number of years or even decades. This Chapter presents largely a static analysis, using data for 1982, this being the latest year for which complete statistics are available. The next Chapter, which examines each sub-sector in turn, will incorporate more dynamic features into its analysis. However, as will become clear below, even a static presentation can point to policy implications which can be placed within a dynamic framework.

Problems of definition and accuracy of published statistics

We have travelled thus far without asking a central question: what is manufacturing and how is it defined? Certainly problems have already been encountered; in the previous chapter anomalies in distinguishing between mining and manufacturing were highlighted, and they were found to have profound effects in assessing the contribution of the manufacturing sector to national foreign exchange earnings.

What, then, is manufacturing? We can begin answering this question by reproducing the definition used by the United Nations:

"Manufacturing is defined as the mechanical transformation of inorganic or organic substances into new products whether the work is performed by power-driven machines or by hand, whether it is done in a factory or in the worker's home, and whether the products are sold at wholesale or retail.

The assembly of the component parts of manufactured products is considered manufacturing except in cases where the activity is appropriately classified in group 5000 (Construction). The assembly on the site of prefabricated, integral parts into bridges, water tanks, storage and warehouse facilities, railroad and elevated rights-of-way, lift and escalator, plumbing, sprinkler, lighting and electrical wiring, etc. systems of buildings, and all kinds of structures, is classified as construction. The assembly and installation of machinery and equipment in mining, manufacturing, commercial and other establishments, when carried on as a specialized activity, is classified in the same group of manufacturing as the manufacture of the item installed. Establishments specialising in the installation of major household appliances, such as stoves and ranges, refrigerators, washing machines, dryers, are classified in the appropriate group of major group 951 (Repair services). The assembly and installation of machinery and equipment which is performed as a service incidental to the sale of the goods by an establishment primarily engaged in manufacturing, wholesale trade or retail trade, is classified with its principal activity.

Establishments specialising in the repair of industrial, commercial, office and similar machinery and equipment are, in general, classified in the same group of Manufacturing as establishments primarily engaged in manufacturing the goods. Units the principal activity of which is the repair of household appliances, equipment and furnishings, motor cars and other consumer goods are, as a general rule, classified in the appropriate group of major group 951 (Repair services) in accordance with the kind of goods which are repaired. Repair services which are usually furnished by establishments primarily engaged in custom manufacturing, are covered in the group of this major division in which the custom manufacturing is classified. The substantial alteration, renovation or reconstruction of any type of goods is considered to be manufacturing, and not repair.

The manufacture of specialized components and parts of, and accessories and attachments to, machinery and equipment is, as a general rule classified in the same group as the manufacture of the machinery and equipment for which the parts and accessories are intended.

However, the making of specialized components and accessories by moulding or extruding plastic materials is included in group 3560 (Manufacture of plastic materials, n.e.c.). The manufacture of unspecialised components and parts of machinery and equipment, e.g. engines, pistons, electric motors, electrical assemblies, valves, gears, roller bearings, is classified in the appropriate group of Manufacturing without regard to the machinery and equipment in which these items may be included."^{1/}

The definition explains that major aspects of assembly and repair work are classified as manufacturing, and this widens the groups of activities that a superficial common-sense understanding of manufacturing might consider relevant. Now let us reflect upon the application of this definition to Zimbabwe. It means that a carpenter working from his home in Gutu to make furniture for neighbouring villages is involved in manufacturing. So is a panel-beating co-operative in Pioneer Street, and so are brewers of beer and Kachasu in the remote corners of Masvingo, and cake-bakers in Mount Pleasant's affluent homes who sell their wares on a Saturday morning in the local shopping centre to earn money for the Shirley Cripps Children Home, and the Renco Goldmine extracting gold by chemical process at the mine-site.

We now jump from the real world to the world of Zimbabwe national statistics and data collection and in so doing we narrow down the meaning of manufacturing activities considerably. All manufacturing carried out in the home is excluded from official definitions of manufacturing, and so, too, are illegal activities such as beer-brewing in municipal areas and makers of Kachasu throughout the country. Our carpenter in Gutu would be excluded, and so would his neighbours who make bricks from ant-hills, brushes from trees and bright covers cloth utilising beads to protect food in the villages. Indeed the only people or groups who are required to submit returns to the Central Statistical Office and who are classified as manufacturers are registered companies - and to be accepted as a registered company requires initial capital outlay of \$30,000. The implication of this discussion should be apparent: official statistics of manufacturing seriously underestimate and by definition explicitly ignore specific areas of manufacturing and are particularly inadequate when it comes to small-scale, informal and part-time manufacturing. A recent sample study of informal activities found 194 firms

engaged in some 16 types of manufacturing activities in just four urban and three rural areas of the country. Compare this data with the official statistics which record only 46 units with an annual turnover of less than \$20,000 engaged in manufacturing in 1982. The official statistics explicitly exclude establishments with a gross output of under \$2,000.^{2/} Clearly then policy recommendations for small-scale manufacturing should not be based on the official statistics available.

That is but one problem. Let us return to another, namely the mining/manufacturing separation and reproduce part of the definition of manufacturing used in official Zimbabwean statistics. It states that "Establishments operating on a mining site as refiners/smelters of non-ferrous or precious metals areexcluded."^{3/} On the other hand, excluded from the definition of mining are "mines and quarries operated by manufacturers as a source of their raw materials, such as limestone mines operated by cement manufacturers. These form part of the manufacturing sector."^{4/} The question this raises for policy-making is the effects this alteration to the definitions of mining and manufacturing are likely to have on proposals for an industrial strategy. One aspect is the effect on statistics gathered. If, for example, the gross output of nickel, copper and tin (defined by the United Nations but not in Zimbabwe as manufacturing output) is transferred to manufacturing it would add \$88.2 million to total manufacturing gross output in 1982, increasing it by 2.9 per cent, and increasing the gross output of the metals sub-sector by 13.8 per cent. Isolating the exports of these products, their inclusion in manufacturing would not only raise manufactured exports by 32 per cent in 1982 (as already mentioned above) but also shift the export/gross output ratio of the metals sub-sector from 23 per cent to 31 per cent, indicating a far higher export orientation of the sub-sector than the official (and, as is admitted, inaccurate) statistics show. For policy-making there is a range of issues raised. Current official figures under-estimate the degree of sophistication of the country's manufacturing sector by giving a higher weighting to light industry than actually exists. They also under-estimate the degree of external orientation of the sector and probably over-estimate the import-dependence of the sector because metal processing and refining are largely based on the country's natural resources base. Additionally, the inclusion of part of metal processing into the mining sector and part in the manufacturing sector highlights a disjuncture in policy-

making: a Government initiative commenced by the Ministry of Mines would in crucial aspects need to be consistent with and incorporated into policy initiatives and strategies of the Ministry of Industry and Technology.

A similar definitional problem with parallel implications arises in relation to the distinction in official statistics between manufacturing and agriculture. The Census of Industrial Production also excludes from manufacturing statistics "certain manufacturing activities undertaken on sugar, citrus and tea estates and saw-milling activities on estates and farms where separate manufacturing establishments could not be adequately identified."

Serious though all these problems are, a far greater one for policy purposes concerns the way that the official statistics classify industries within industrial sub-sectors. In CSO Statistics, 33 sub-categories of industry are identified which are then gathered into 11 broad sub-divisions. These are listed in the notes to Table 19. A difficulty can arise in the way in which manufacturing establishments are defined. According to the official classification these are "the smallest business unit at the accounting entity level i.e. the smallest unit for which all the required information is available including details of stocks, indirect costs and fixed assets used."^{5/} The chief problem occurs when a company is engaged in manufacturing products across industrial sub-divisions when either these are manufactured at the same establishments or when the accounting practices of the firm are inadequate to distinguish between the financial aggregates of establishments that may be producing products classified in different industrial sub-divisions. In these instances, the procedure adopted is to classify the establishment (or establishments) under the industrial classification relevant to 50 per cent or more of its total output. This means that the total data provided for the establishment concerned includes output, inputs, services used, wages and salaries etc. - not only for the dominant product manufactured but for all minor products that if produced by another establishment would be aggregated under a different industrial classification. Let us take an example to illustrate the problem. In year 1, Nthingi (Pvt) Ltd makes \$1 million worth of furniture using \$700,000 worth of local inputs, \$100,000 worth of imported inputs and pays \$200,000 in wages for 100 workers. In year 3, Nthingi (Pvt) Ltd branches out into the clothing

business and begins to manufacture high-fashion men's suits. In year 3 it makes \$5 million worth of furniture and \$2 million worth of men's suits. According to official statistics and assuming that the financial system cannot distinguish sufficiently between the different processes, the gross output of Nthingi (Pvt) Ltd of \$7 million would be classified as furniture output. The total employment of, say, 170 people, would be classified as employees in the furniture sub-sector even though, say, 70 were employed in making suits. Additionally the inputs used to make furniture and suits would be classified as furniture inputs even if - as could occur - the cost of purchasing suiting material could be higher than the cost of purchasing wood and the imported content of the suiting material would be far higher than the imported content of the inputs to manufacture the furniture.

This method of classification has particular difficulties for Zimbabwe's manufacturing sector which is characterised by a relatively small number of industrial establishments making a relatively large contribution to the sector's production. In 1982, for example, just 150 manufacturing units were responsible for 53 per cent of the net output of the sector. Now to the extent that large manufacturing establishments produce goods across industrial sub-sectors then the aggregate data of these establishments will bias the sub-sectoral data recorded - inflating the figures for those sectors in which firms are dominant producers and deflating the actual contribution to industry of those products that are classified elsewhere. If, as occurs, large firms with output levels in excess of \$50 million are engaged in different sub-sectors, for example Lever Brothers and Olivine producing both soaps and edible oils, then if the individual contributions of each product are not separately identified by the firms then the minor product's contribution will be ignored in its own industrial classification and transferred to another sub-sector.

We are able, to a limited extent, to provide an indication of part of the degree of inaccuracy in incorrect sub-sectoral classification of output by analysing unpublished 1981 output data provided to the consultants by the CSO. For each sub-sector, data was provided not only in terms of total output but also by the sub-type of product whose output was classified for that sub-sector. The data given for sub-sector 3 (under the 33 sub-sectoral classification) is reproduced in Table 2.1. It shows that \$203 million is

officially recorded for the output of grain-mill products and the manufacture of prepared animal feeds. However it can readily be seen that the final four entries, accounting for \$12.7 million of output are incorrectly classified: malt and malt extract should be classified under Drink and Tobacco and the remainder under Chemical products. Although the data is not available, it should now also be apparent that the labour component, wage bill, and input figures provided for this sub-sector will also be inaccurately allocated to subsector 3.

Table 2.1: Outputs of subsector 3 - Grain mill products and animal feeds

<u>Output in \$</u>	<u>Name of product</u>
12,737,633	Vegetable oils, margarine
8,331,536	Grain mill products, n.e.s.
55,647,559	Animal feeds and fish meal
55,506,624	Flour
57,552,225	Maize meal
19,597	Bakery products, n.e.s.
19,293	Molasses and bagasse
605,950	Food products, n.e.s.
4,847,499	Malt and malt extract etc.
5,303,949	Soap, detergents, cleaners
1,806,799	Toiletries and cosmetics
702,372	Chemical products, n.e.s.
203,081,036	Total output

Of course it is also possible that products which should be included in sub-sector 3 are classified elsewhere. The question then arises as to whether the errors balance each other out. To test this possibility the data for the output for the whole of the manufacturing sector provided in the 1981 unpublished CSO output data was analysed, but on the basis of the eleven sector (Production Index) classification. It is reproduced in Table 2.2. The analysis indicates that in the output data for that year (column 3) some \$119 million of gross output was incorrectly classified, amounting to just over 4 per cent of total gross output. Column 7 of Table 2.2 answers the question as to whether the errors balance each other out. It shows particularly serious errors for five of the eleven sectors with the most extreme ones occurring for sectors 7 and 9. The correct gross output figures for sector 7 are \$27.5

million higher than the official published statistics indicate, an error of some 7 per cent while the correct gross output figures for sector 9 are \$21.9 million lower than the official published statistics indicate, an error of some 3.5 per cent. Of interest, too, is that the errors for sector 1 almost balance out. And as columns 2 and 6 show there is a significant change in the contribution made to total gross output of different sectors, particularly sectors 7 and 9.

Another range of errors in the published statistics arises if firms that manufacture products are not included in the data for the manufacturing sector. During the course of data analysis for the current study, it was discovered that a number of firms which do manufacture, and which are certainly formal sector operations, are for some reason not classified as industrial producers. Out of 70 firms which gave us permission to look into their production returns to CSO, five were classified by CSO as non-producers, yet these firms are certainly manufacturers. These include Tinto Industries, the leading manufacturer of agricultural implements with a turnover well in excess of \$6 million, and Sullivan Engineering. Regrettably it is not possible to ascertain the degree of error in the published statistics resulting from this particular error. However the fact that it has been discovered points to the need to embark upon a systematic and comprehensive check to establish that at least all formal sector undertakings engaged in manufacturing are included in the official statistics.

The likely inaccuracies in the published data for manufacturing have serious implications for drawing up an industrial strategy based upon these statistics, if this strategy is overly dependent upon an accurate sectoral classification. For example, to the extent that interlinkages both between different manufacturing sectors and between sectors and other sectors of the economy are incorrectly specified, projections of future inter-linkages and their effects on production levels, employment generation and input requirements will be inaccurate. Or, if a strategy based on maximum employment generation is proposed based on CIP statistics of sectoral labour-intensity then, again, the possibility of distortions in the data base would need to be recognised.

Table 2.2: Perceived error in official gross output data by manufacturing sector, 1981 CSO input/output source
(thousand dollars)

Sector	Officially recorded gross output (1)	Percentage (2)	Value of output incorrectly attributed to sub-sector (3)	Value of output that should be recorded for respective sector (4)	Corrected value of gross output (1)-(3)+(4) (5)	Percentage (6)	Difference in output figures (5)-(1) (7)	Percentage of variation by sector (7)/(1) (8)
1	615,336	21.8	28,350	26,200	613,186	21.8	-2,150	-0.3
2	168,786	6.0	4,098	5,072	169,760	6.0	+974	+0.6
3	348,597	12.4	7,575	2,055	343,077	12.2	-5,520	-1.6
4	196,637	7.0	763	2,893	198,767	7.0	+2,130	+1.1
5	110,469	3.9	1,831	735	109,373	3.9	-1,096	-1.0
6	154,993	5.5	2,286	2,071	154,778	5.5	-215	-0.1
7	378,099	13.4	29,620	57,143	405,622	14.4	+27,523	+7.3
8	88,144	3.1	1,796	1,070	87,418	3.1	-726	-0.8
9	629,390	22.3	34,361	12,457	607,486	21.5	-21,904	-3.5
10	87,883	3.1	5,957	8,432	90,358	3.2	+2,475	+2.8
11	39,721	1.5	2,271	780	38,230	1.4	-2,191	-5.5
Total	2,818,055	100.0	118,908	118,908	2,818,055	100.0	0	-

Source: CSO 1981 Input/output Data, unpublished and supplied by the CSO.

To the extent that industrial re-structuring does occur and especially to the extent that establishments diversify into production across the sub-divisions of industry then official published statistics are likely to give an even more distorted view of structural changes. Indeed it can be seen that the statistics have a bias against recording critical aspects of structural change and product diversification across sub-groups. That is unless or until the magical 50 per cent figure is reached and then the official figures will over-exaggerate structural changes. Recognition of this factor is made in the Census of Industrial Production which admits the errors implicit in the methodology used and points to a change in procedure adopted in 1976.

"Over time the main activities of some establishments change from one activity to another, necessitating a change to the industrial classification of those establishments. These changes, some of which are inter-sectional, cannot be reflected in a statistical time series.

Up to 1976, the procedures followed in such instances was to adjust the back series of the two relevant industries so as to include the entire activities of the establishment concerned only in the industry to which it was re-classified. This incorrectly implied that the establishment belonged to its most recent industry group for the whole of the time series.

To overcome this distortion this practice has been dropped and, with effect from 1977, when an establishment is re-classified because of a change in activity, it is moved to its new industry group without inter-industry adjustments to the figures for earlier years."^{6/}

There are two concluding observations from this general discussion of definitional problems and the accuracy of published statistics that need to be made. Firstly, the remainder of this chapter and many of the conclusions drawn in subsequent chapters are based on published data and statistics, most from the Census of Industrial Production. To the extent that these statistics are themselves unreliable, biased or distorted then the conclusions made will necessarily be affected. It is to be hoped that the discussion in this section will not be forgotten when reading the rest of the report, but rather, constantly borne in mind.

Secondly, as Zimbabwe becomes more concerned with planning and devising an industrial strategy based on statistical analysis, so the need becomes ever more urgent to perfect the database and to address the key weaknesses that exist in the present Census of Industrial Production. For if the assumptions are wrong then it is more than likely that the conclusions and strategies proposed will be inaccurately specified. With these large caveats, we can now move on and analyse what the published statistics tell us about the structure, size and ownership patterns within the manufacturing sector.

Size and structure of manufacturing units

Zimbabwe's manufacturing sector exhibits a number of characteristics which suggest that it is far removed from the world of perfect competition. Two in particular need emphasising. One is the monopolisation of product manufacture and the other is the dominance of a small number of large firms contributing to overall output of the sector.

According to the Government publication Products of Zimbabwean Industries 1982, the manufacturing sector in 1982 produced a total of just over 6,000 separately identified products from abattoir equipment to zip-fasteners. Analysing these products by number of manufacturers who produce them shows that 50 percent are manufactured by only one firm and that 80 percent are made by one, two or three firms. So if one stretched economic theory beyond its limits and suggested that four producers constituted perfect competition, the data reveals that competitive production is only applicable to 20 percent of the products produced. Only some 50 products out of 6,000 are manufactured by 20 or more firms and even then quality differences may differentiate products further.

Moving from product manufacture to contribution to output, similar distortions are apparent. According to the 1982/83 Census of Industrial Production, there were 1,344 separate manufacturing units in the country. However, only 105 (7.8 percent) were responsible for 41 percent of total (net) output, each employing over 750 employees. At the other end of the scale, 703 units (52 percent) produced 8 percent of total (net) output, each employing 50 employees or less.

What is also revealing is the trend towards a greater concentration of production among a few large firms over the past five years. Whereas between 1977 and 1982 total employment in manufacturing rose by 25 percent, total employment in firms with more than 750 employees rose by 105 percent, from 26 percent of all manufacturing employment in 1977 to 43 percent in 1982. At the small-firm end of the scale, the total number of employees in firms engaging less than 50 people fell by 4 percent from 1977 to 1982. Overall, the number of units fell from 1,355 to 1,344 from 1977 to 1982 (a 1 percent drop) while the volume index of production increased by 34 percent. Table 2.3 shows the trends in size and relative contribution to output between 1977 and 1982.

Table 2.3: Trends in the size and contribution of manufacturing units by numbers of employees for 1977 and 1982

Item	Numbers employed					Total
	up to 50	51 to 500	101 to 500	501 to 750	over 750	
Number of units, 1977	759	194	260	91	51	1,355
Number of units 1982	703	205	288	43	105	1,344
Percentage change 1977 to 1982	-7	+6	+11	-53	+106	-1
Numbers employed 1977	14,319	12,877	45,870	30,829	37,356	141,233
Percent of total 1977	10	9	32	22	26	100
Numbers employed 1982	13,733	13,997	55,315	16,718	76,460	176,223
Percent of total 1982	8	8	31	9	43	100
Percentage change 1977 to 1982	-4	+9	+21	-46	+105	+25
Share of net output 1977	9	8	31	15	36	100
Share of net output 1982	8	8	31	12	41	100

Source: The Census of Production 1977/82, The Census of Production 1982/83, CSO, Harare, Table 8.

A final distinct characteristic of industrial concentration concerns the geographical location of manufacturing. Harare, although accounting for only 11 percent of the country's population (including Chitungwiza), is responsible for 50 percent of manufacturing output and about 46 percent of manufacturing employment. Bulawayo accounts for 23 percent of manufacturing output and 28 percent of manufacturing employment and the KweKwe/Redcliff industrial complex contributes 7 percent to manufacturing output and 5 percent to overall manufacturing employment. Together these three centres contribute 82 percent of total manufacturing output and account for 79 percent of manufacturing employment. In the five year period 1977-1982 there has been a slight increase in industrial concentration in these three areas, although with a fall in the KweKwe/Redcliff share. Table 2.4 provides the details on industrial concentration and recent trends.

Major characteristics of manufacturing industry by sectoral grouping

Official statistics for the manufacturing sector are collected according to 54 sub-categories, aggregating 76 categories classified by the United Nations listings. So as to conceal the financial statistics of particular firms, data is published by the Central Statistical Office in its Census of Industrial Production publication only in a more aggregated form according to 33 sectors. These figures are further aggregated into 11 industrial sectoral divisions for publication in the Monthly Digest of Statistics in which is also published an index of the volume of industrial production according to the 11 sector classification. The breakdown of manufacturing according to the 11 and 33 classification is recorded in Note 2 of Table 2.5 below.

Tables 2.5, 2.6 and 2.7 provide an initial analysis of major characteristics of the manufacturing sector using the 11 sector classification for the year 1982, the most recent year for which complete statistics are available. As the figures are reproduced for only one year they are not intended to be used to deduce particular dynamic characteristics of the sector. The intention is rather to highlight some intra-sectoral differences and, using various sets of data, to comment on the relative importance of the different sectors.

Table 2.4: Geographical concentration of manufacturing industry, 1977 and 1982

Location	1977				1982				Change	Change
	Gross ^{a/} output	Per cent	Numbers employed	Per cent	Gross ^{a/} output	Per cent	Numbers employed	Per cent	in output %	in employment %
Harare	655,228	47.8	63,920	45.3	1,667,983	51.6	80,849	45.9	155	26
Bulawayo	299,184	21.8	40,711	28.8	748,198	23.1	50,078	28.4	150	23
Masvingo	18,444	1.3	1,147	0.8	32,501	1.0	1,247	0.7	76	9
Kadoma ^{a/}	45,789	3.3	3,735	2.6	71,268	2.2	4,355	2.5	56	17
Gweru	60,377	4.4	6,770	4.8	129,330	4.0	8,550	4.9	114	26
Redcliff/KweKwe	129,169	9.4	8,320	5.9	229,447	7.1	8,844	5.0	78	6
Mutare	43,539	3.2	4,962	3.5	99,861	3.1	7,882	4.5	129	59
Other	117,817	8.6	11,668	8.3	256,456	7.9	14,399	8.2	118	23
Total	1,369,547	100.0	141,233	100.0	3,235,044	100.0	176,204	100.0	136	25

Source: Census of Industrial Production 1982/83, CSO, Table 10.

a/ Figures in thousands of current dollars.

b/ Figures for Kadoma not strictly comparable because of change in geographical reporting by a major company.

Tables 2.5 and 2.6 should be read together for the latter provides the percentage distribution of the latest available data put together in the former table. They show the over-riding importance of the Metals and Metal Products sector, sector 9, in overall manufacturing - and it should be re-iterated that these official figures exclude the contribution of metal processing and refining. Sector 9 has the largest number of units of each sector, is responsible for the largest contribution to net and gross output, is by far the largest earner of foreign exchange through exporting, employs most labour and has the highest value of capital employed of all the different sectors. In terms of contribution to output, numbers employed and value of capital employed, sector 1, Foodstuffs, is the second most important sector although as an exporter it falls into third place to sector 3, Textiles, whose export performance is boosted by cotton lint sales ginned by the Cotton Marketing Board. Sectors 1, 2, 3 and 7 are of interest because their share of both gross and net output is proportionately far higher than the number of units in the sectors would suggest. This probably means that a small number of large firms make a dominant contribution to production in these sectors. Sectors 2, 6 and 8 - Drink and Tobacco, Paper, Publishing and Printing and Non-Metallic Minerals - make a low overall contribution to the export earnings of manufacturing. Sectors 3, 4 and 5 - Textiles, Clothing and Footwear and Paper, Publishing and Printing - employ relatively more labour than their proportionate share of either gross or net output. This would suggest that these sectors are relatively labour-intensive, a factor confirmed by their lower share of total capital stock. On the other hand, sectors 2 and 7 - Drink and Tobacco and Chemical and Petroleum Products have shares of net output higher than their shares of total labour, suggesting greater relative capital intensity, again confirmed by their shares of total capital stock.

Table 2.5: Some key characteristics of manufacturing industry by broad sector, 1982
(thousand dollars)

Sector ^{2/}	Number of units (1)	Gross output (2)	Net output (3)	Exports ^{3/} (4)	Number of employees (5)	Capital ^{1/} stock (6)
1	152	788,273	198,320	20,435	26,334	573,100
2	53	229,831	136,367	2,481	13,206	341,200
3	67	302,415	107,311	57,861	20,789	362,900
4	148	211,259	111,256	10,774	21,879	119,900
5	98	93,964	49,098	9,060	12,914	83,600
6	114	163,489	84,131	2,445	9,445	189,300
7	126	395,246	159,131	15,096	12,945	507,400
8	58	94,361	56,749	1,717	7,818	243,200
9	408	639,137	290,963	147,295	42,237	1,218,900
10	46	93,836	36,486	3,507	5,245	86,000
11	94	37,195	18,880	6,545	3,411	30,800
Totals	1,364	3,049,006	1,248,692	277,216	176,223	3,756,300

Source: The Census of Production 1982/83, CSO, various tables for columns (2), (3) and (5), Monthly Digest of Statistics for December 1984, Table 10.5 for column (1), The Census of Production 1962, 1963, 1966/67 and 1982/83 and private communication from CSO for column (6).

Notes: (to Table 2.5)

1/ Calculated by bringing capital stock for 1962 and net capital expenditure each year from 1963 to 1982 to 1982 prices using separate deflators for land and buildings, plant and equipment and vehicles from 1982 to 1969 and the gdp deflator for 1962 to 1969 provided by CSO and calculated from published national accounts data.

2/ The sectoral classification is that used by the CSO namely:

1. Foodstuffs including slaughtering and processing of meat; canning and preserving fruit and vegetables; grain mill products and animal feeds; bakery products; chocolate and sugar confectionary; dairy and other food products.
2. Drink and Tobacco including beer wine and spirits; soft drinks and carbonated waters; tobacco products including post-auction grading and packing.
3. Textiles including ginning including spinning, weaving, finishing textiles and carpets; knitted products, rope and cordage; and other textile products.

Notes: (to Table 2.5 continued)

4. Clothing and Footwear including wearing apparel and footwear.
5. Wood and Furniture including sawmilling and wooden products; furniture and wooden fixtures.
6. per, Printing and Publishing including pulp, paper, paperboard and products; printing publishing and allied industries.
7. Chemical and Petroleum Products including fertilizers, insecticides and pesticides; paints, varnishes and filling materials; soaps, detergents, toilet preparations and pharmaceuticals; matches, inks, candles, glues and polishes; basic chemical products and gases; rubber products; plastic products.
8. Non-Metallic Mineral Products including structural clay products and bricks; glass, cement and other associated and non-metallic mineral products.
9. Metals and Metal Products including non-ferrous metal and iron and steel basic industries including smelting and refining but excluding these products when manufactured at mine-sites; metal products, machinery and equipment including electrical; radio and all communication equipment.
10. Transport Equipment including motor vehicles and reconditioning; and other vehicles.
11. Other Manufactured Products including leather products and substitutes; pens; watches; jewellery; toys; photographic and optical instruments.

3/ Exports here exclude the manufacture, processing and refining of metals and alloys if carried out on mine-sites.

Table 2.6: Some key characteristics of manufacturing industry by broad subsector, 1982 (percentages)

Sector	Percentage number of units	Percentage of gross output	Percentage of net output	Percentage of exports	Percentage of employees	Percentage of capital stock
1	11.1	25.9	15.9	7.4	14.9	15.3
2	3.9	7.5	10.9	0.9	7.5	9.1
3	4.9	9.9	8.6	20.9	11.8	9.7
4	10.9	6.9	8.9	3.9	12.4	3.2
5	7.2	3.1	3.9	3.3	7.3	2.2
6	8.4	5.4	6.7	0.9	5.4	5.0
7	9.2	13.0	12.7	5.4	7.3	13.5
8	4.3	3.1	4.5	0.6	4.4	6.5
9	29.9	21.0	23.3	53.1	24.0	32.4
10	3.4	3.1	2.9	1.3	3.0	2.3
11	6.9	1.2	1.5	2.4	1.9	0.8
Totals	100.0	100.0	100.0	100.0	100.0	100.0

Source: Table 2.5 above.

Table 2.7 confirms some of these relationships and reveals others in the overall intra-sectoral comparisons. Striking is the absence of the dominance of sector 9, Metals and Metal Products. Only in terms of exports as a proportion of output is it the leading sector, although sector 3, Textiles, is not far behind. Sector 9 is seventh in order of gross output per unit, sixth in terms of gross output per employee and second to sector 7, Chemicals and Petroleum Products, in terms of capital per employee. Relatively high scores for net output as a percentage of gross output indicate a relatively low level of value added in the production process - the highest scores being recorded for sectors 2 and 8 - Drink and Tobacco and Non-metallic Minerals; these two sectors also score among the highest in terms of capital per employee although sector 2 is far more productive in terms of net output per employee.^{1/} On the other hand, relatively low scores for net output as a percentage of gross output are recorded for sectors 1,3 and 10 - Foodstuffs, Textiles and

Transport Equipment - indicating a relatively high contribution of value added in these sectors; for sectors 3 and 10 this was achieved with relatively less capital per employee and for sector 3 with additionally a relatively low score for net output per employee. Sectors 2, 6 and 10 - Drink and Tobacco, Paper, Printing and Publishing and Transport Equipment - have extremely low ratios of exports to gross output, so they not only contribute little to overall manufactured exports but also export a negligible amount of what they produce - of considerable interest for sector 2 given the overwhelming importance of non-manufactured tobacco exports for national foreign exchange earning. The relative figures also show far greater variation between sub-sectors by capital per employee and output per employee. The differences in capital per employee is seven times between \$5,480 per employee for sector 4, Clothing and Footwear and \$39,197 per employee for sector 7, Chemicals and Petroleum Products, but only 2.4 times between \$5,085 and \$12,293 for net output per employee again for these same two sub-sectors. Finally, a high score recorded in the last column of Table 2.7 indicates a relative ability to achieve higher value added with lower amounts of capital inputs. The best scores here are for sectors 4, 5 and 11 - Clothing and Footwear, Wood and Furniture and Others - but these are also just those sectors recording low values for net output per employee.

Table 2.7: Some key variables of the manufacturing sector, derived from Table 2.5 above, for 1982

Sector	Gross output per unit \$ '000	Gross output per employee \$	Capital per employee \$	Net output per employee \$	Exports as % of gross output	Net output as % of output	Net output as % of capital
1	5,186	29,934	21,763	7,531	2.6	25.2	35
2	4,336	17,404	25,837	10,326	1.1	59.3	40
3	4,514	14,547	17,456	5,162	19.1	35.5	30
4	1,427	9,656	5,480	5,085	5.1	52.7	93
5	959	7,276	6,474	3,802	9.6	52.3	59
6	1,434	17,310	20,042	8,907	1.5	51.5	44
7	3,137	30,533	39,197	12,293	3.8	40.3	31
8	1,627	12,070	31,108	7,259	1.8	60.1	23
9	1,567	15,132	28,859	6,889	23.0	45.5	24
10	2,040	17,891	16,397	6,956	3.7	38.9	42
11	396	10,904	9,030	5,535	17.6	50.8	61
Total	2,235	17,302	21,316	7,086	9.1	41.0	33

Source: Table 2.5 above.

Major characteristics of inputs into manufacturing by sector

Further insight into the relative importance of different industrial sectors can be obtained by analysing the costs of various inputs used in the production of manufactured goods. Tables 2.8, 2.9 and 2.10 provide some of these basic indicators for the year 1982, enabling one to comment upon static comparisons.

Basic inputs are divided into three broad categories in official statistics: material purchases, which include raw material purchases and energy purchases such as electricity, water and fuel; wage and salary payments; and finally payments for services utilized and necessary for production to take place, including plant hire, basic charges, insurance payments etc. Tables 2.8 and 2.9 show that half of all material purchases by manufacturing industry are absorbed by just two sectors, 1 and 9 - Foodstuffs and Metals and Metal Products, with columns (5) and (6) indicating the split between energy and fuel purchases and raw material purchases: sector 1 absorbing over one third of all raw material purchases and sector 9 nearly half of all fuel and energy inputs. Sectors 4, 5, 6, 10 and 11 - Clothing, Footwear, Wood and Furniture, Paper, Printing and Publishing, Transport Equipment and Others - use minimal amounts of manufacturing's total purchases of fuel and energy indicating that expansion of these sectors would be most beneficial in terms of energy-saving strategies. They were also, with sectors 2 and 8, the lowest absorbers in terms of cost of raw materials. Indeed four sectors, 1, 3, 7, and 9 - Foodstuffs, Textiles, Chemical and Metals - accounted for over 75 per cent of all raw material and energy purchases. Sectors 1, 7 and 9 - Foodstuffs, Chemicals and Metals, also paid the largest wage and salary bills, accounting between them for over 52 per cent of all such payments. However, sector 1, Foodstuffs, paid a far greater share of manufacturing's bill for material purchases than for wages and salaries whereas for sector 9, Metals and Metal Products, the reverse was true.

Table 2.10 arranges the data from Table 2.8 in a different way to draw out other points of comparison. Columns (1)-(4) of Table 2.10 show the respective shares of different types of inputs to total inputs for achieving the output for each sector. For sectors 1, 3, 7 and 10 - Foodstuffs, Textiles, Chemicals and Transport Equipment - material purchases are in excess

Table 2.8: Key inputs into manufacturing production, 1982
(thousand dollars)

Sector	Total ^{1/} material purchases and changes in stocks (1)	Wages and salaries paid (2)	Payments ^{2/} for services (3)	Total input costs (4)	Cost of ^{3/} energy inputs (5)	Raw ^{3/} material purchases (6)
	(1)+(2)+(3)					
1	589,950	90,848	43,422	724,220	13,723	589,789
2	93,462	51,369	37,428	182,259	6,268	89,058
3	195,101	51,821	18,525	265,447	6,145	191,122
4	100,003	58,961	20,127	179,091	1,309	99,792
5	44,866	28,109	14,934	87,909	2,753	40,440
6	79,357	46,817	19,190	145,364	4,323	73,434
7	236,114	68,158	38,433	342,705	15,255	224,707
8	37,592	24,611	6,599	68,802	8,023	32,788
9	348,189	169,267	54,825	572,281	53,526	286,560
10	57,347	20,379	5,533	83,259	1,015	54,147
11	18,307	9,966	4,339	32,612	512	18,085
Total	1,800,288	620,306	263,355	2,683,949	112,852	1,699,992

Source: Census of Production 1982/83, CSO, Tables 2, 4 and 5.

Notes to Table 2.8:

- 1/ This column is for total purchases of inputs, electricity, water, fuel and payments paid for work given out but excluding goods for resale. As the figure given makes allowances for changes in stocks it represents the physical input costs required to manufacture products in the year.
- 2/ The services are the aggregate of the following, where applicable: maintenance of building and plant, rent, hire of plant, advertising, insurance and workmen's compensation, charges made to head office abroad, rates, royalties, bad debts and 'other services', a large proportion of which are bank charges.
- 3/ Energy costs include electricity, water, coal, coke and petroleum fuels. These costs together with material purchases do include purchases that add to stocks as well as those used for direct manufacture.

of 68 per cent of total input costs, indicating that for them expanding production will require relatively more fuel and raw material inputs than for other sectors. On the other hand, for sectors 4, 5, 6, 8 and 11 - Clothing and Footwear, Wood and Furniture, Paper, Printing and Publishing, Non-Metallic Minerals and Others - wage and salary expenditures are in excess of 30 per cent, indicating that for them expanding production is likely to require relatively more labour than for other sectors - on the assumption, of course, that methods of production remain unchanged. For sectors 2 and 6 - Drink and Tobacco and Paper, Printing and Publishing - service payments were high relative to other sectors.

Column (5) of Table 2.10 records that about 6.3 per cent of material purchases is accounted for by fuel and energy purchases for the manufacturing sector as a whole.^{8/} For sectors 8 and 9, Non-Metallic Minerals and Metals and Metal Products, fuel and energy purchases are relatively large, indicating greater national energy requirements if these sectors were to be expanded more rapidly than others. On the other hand, the fuel and energy components of material purchases of sectors 3, 4, 10 and 11 - Textiles, Clothing and Footwear, Transport Equipment and Others - were relatively low as a proportion of total material purchases.

Column (6) of Table 2.10 is included to provide an initial comparison of the import requirements for material purchases for different sectors. To the extent that the figures are correct (and they are based on a sample survey) they indicate the wide variety of import dependence for material inputs of the different sectors, ranging from a low of 2.4 per cent for Foodstuffs to a high of 60 per cent for Transport Equipment. These comparative figures indicate that if sectoral expansion were to be determined by using minimal amounts of foreign exchange for material purchases then sectors 1, 5, 8 and 11 - Foodstuffs, Wood and Furniture, Non-Metallic Minerals and Others - should be favoured at the relative expense of sectors 7, 9 and 10 - Chemicals, Metals and Transport Equipment.

The time has come to make some concluding observations concerning the data contained in Tables 2.5 and 2.10. The purpose of assembling the data in the manner provided was to enable some comments to be made on a relative basis of the contribution of different sectors to important input and output variables. One critical conclusion to be drawn is the complexity of the

inter-relationship between the different sectors. Holding everything else fixed and concentrating on just one variable be it gross or net output, labour costs, export earnings, foreign exchange saving, capital used per labour input or energy usage then different sectors can be rated as important/non-important all on a relative scale. This highlights the need to consider the variety of costs and benefits of adopting different scenarios for the future of manufacturing as a whole. And this itself is only one element to be focused upon in devising a comprehensive industrial strategy for the future.

Table 2.9: Key inputs into manufacturing production, 1982
(percentages)

Sector	Percentage of total material purchases and changes in stocks (1)	Percentage of wages and salaries paid (2)	Percentage of payments for services (3)	Percentage total input costs (4)	Percentage of energy input costs (5)	Percentage of raw material (6)
1	32.8	14.6	16.5	27.0	12.2	34.7
2	5.2	8.3	14.2	6.8	5.6	5.2
3	10.8	8.4	7.0	9.9	5.4	11.2
4	5.6	9.5	7.6	6.7	1.2	5.9
5	2.5	4.5	5.7	3.3	2.4	2.4
6	4.4	7.5	7.3	5.4	3.8	4.3
7	13.1	11.0	14.6	12.8	13.5	13.2
8	2.1	4.0	2.5	2.6	7.1	1.9
9	19.3	27.3	20.8	21.3	47.4	16.9
10	3.2	3.3	2.1	3.0	0.9	3.2
11	1.0	1.6	1.7	1.2	0.5	1.1
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Table 2.8 above.

Table 2.10: Manufacturing inputs characteristics by sector, 1982
(percentages)

Sector	Material purchases as percentage of total inputs (1)	Wages and salaries as percentage of total inputs (2)	Service payments as percentage of total inputs (3)	Totals (4)	Energy ^{1/} inputs as percentage of material purchases (5)	Imported ^{2/} inputs as percentage of raw material purchases (6)
1	81.5	12.5	6.0	100.0	2.3	2.4
2	51.3	28.2	20.5	100.0	6.7	24.0
3	73.5	19.5	7.0	100.0	3.1	23.0
4	55.8	32.9	11.3	100.0	1.3	39.0
5	51.0	32.0	17.0	100.0	6.1	14.0
6	54.6	32.2	13.2	100.0	5.4	24.0
7	68.9	19.9	11.2	100.0	6.5	52.0
8	54.6	35.8	9.6	100.0	21.3	16.0
9	60.8	29.6	9.6	100.0	15.4	41.0
10	68.9	24.5	6.6	100.0	1.8	60.0
11	56.1	30.6	13.3	100.0	2.8	3
Total	67.0	23.1	9.9	100.0	6.3	25.3

Source: Table 2.8 above and R.C. Riddell and D.F. Nsiyaludzu, "Turnover, Inputs and Input Costs in the Manufacturing Sector, 1980-82", CZI, Harare (mimeo), April 1983.

Notes:

- 1/ As this is derived from dividing column (5) by column (1) of Table 2.8 it does not take account of changes in stocks.
- 2/ Very approximate figures with data for sector 11 assumed to be the sectoral average.

The ownership and structure of the manufacturing sector

No comprehensive analysis of the total capital stock existing in Zimbabwe has been carried out and in addition there exists no comprehensive breakdown of capital stock by public and private sector or by foreign or local origin, either for the economy as a whole or for manufacturing in particular. What data does exist is partial, crude and based on a variety of guesses. Much of the substantial work on the ownership pattern and origin of Zimbabwe's capital stock has been done by Stoneman who together with Clarke has made lists of foreign and local companies involved in the Zimbabwe economy by broad sector, which are readily available for reference.^{9/}

As an introduction to this section three sets of figures specifically related to the manufacturing sector will be highlighted to provide an initial comparison with the data that the present consultants have been able to gather.

The first set of figures refer to the year 1963 and is based on a survey of companies carried out by the Central Statistical Office. They refer to private undertakings only and reveal that for the manufacturing sector in 1963, 72 per cent of gross profits accrued to foreign companies and 28 per cent to domestic companies. Additionally, of the gross fixed capital formation for that year, of private companies in the manufacturing sector, 69 per cent was made by foreign and 31 per cent by domestic companies.^{10/} More recently, in June 1984, Stoneman estimated that of total capital of \$2.4 billion in the manufacturing sector in 1982, 70 per cent was owned by foreign concerns while 30 per cent was domestically owned.^{11/} Finally, recent estimates by a consultant for 1983 judged the \$2.6 billion total capital in the manufacturing sector in 1983, 4 per cent was public and 96 per cent private, with 38 per cent of the total being domestic and 58 per cent foreign.

Two sets of data have been assembled for the present study which attempt to throw light on the ownership pattern of manufacturing industry. The first set refers to levels of turnover and not capital stock but the figures obtained are in one respect identical to the last set of figures quoted in the preceding paragraph. National accounts data from the CSO for 1981 indicate for the manufacturing sector the breakdown of total turnover by five sub-categories: unincorporated enterprise, private companies, parastatals and local authorities. For 1981, the origin of turnover for each of these

sub-categories was given as follows: unincorporated enterprise, 1 per cent; private companies, 88 percent; Central Government, 0.5 percent; local authorities, 0.5 percent and para-statals, 10 percent. Using this data and taking into account the main acquisitions either by Central Government or the Industrial Development Corporation to early 1985 the figures provided by the CSO have been re-worked and the results are reproduced in Table 2.11. They show that for the manufacturing sector as a whole turnover by type of undertaking is as follows: unincorporated enterprise, 1 percent; private companies, 84.5 per cent; Central Government and/or IDC-controlled (more than 50 per cent), 4 per cent; local authorities, 0.5 per cent and parastatals, 10 per cent. The figures show considering manufacturing in detail, Central Government or parastatal have an influence in three major sectors. These are: Foodstuffs, where the Cold Storage Commission and the Dairy Marketing Board together contributed 25 per cent to total turnover; Textiles, where the Cotton Marketing Board contributed 38 per cent to total turnover and the Metals and Metal Products sector where control of ZISCO, Lancashire Steel, and F. Issels together contributed some 17 per cent to total output of the sector. In all other sectors, private companies controlled in excess of 90 per cent of total turnover. The only significant contribution by local authorities was in sector 2, Drink and Tobacco, being municipal beer production. The 8 per cent Central Government/IDC contribution in sector 10, Transport equipment, reflects the influence of Willowvale, 100 per cent owned by the IDC.

The figures in Table 2.11, while indicating the private/public share in total manufacturing sector turnover, do not provide a breakdown into foreign and local control of capital. This particular gap is filled by data summarised in Table 2.12. The figures reproduced in Table 2.12 require some explanation as to their origin especially because they indicate a far lower level of foreign control of the manufacturing sector than most other estimates previously published.

As is well known, the Preferential Trade Area (FTA) agreement to which Zimbabwe is a signatory stipulates that certain preferential tariffs shall only be applicable to companies that in due time have a certain specified domestic ownership and management share. To ascertain the degree of local

**Table 2.11: Turnover of the manufacturing sector by private
and public undertakings
(million dollars)**

Sector	Unincorporated enterprise	% of total	Private companies	% of total	Central Government/ IDC controlled	% of total	Parastatals directly manufacturing	% of total	Local authorities	% of total	Total turnover
1	4.6	1	457.0	74	-	-	153.7	25	-	-	615.3
2	1.6	1	154.8	92	-	-	-	-	12.4	7	168.8
3	0.2	-	217.9	62	-	-	130.5	38	-	-	348.6
4	2.2	1	192.6	98	1.8	1	-	-	-	-	196.6
5	1.9	1	108.6	99	-	-	-	-	-	-	110.5
6	1.1	1	151.3	97	2.6	2	-	-	-	-	155.0
7	11.4	3	366.7	97	-	-	-	-	-	-	378.1
8	0.3	1	87.8	99	-	-	-	-	-	-	88.1
9	4.7	1	516.6	82	108.1	17	-	-	-	-	629.1
10	1.3	1	120.7	97	1.5	2	-	-	-	-	92.9
11	0.6	1	40.4	99	-	-	-	-	-	-	41.0
Total	29.9	1	2,383.8	84.5	114.0	4	284.2	10	12.4	0.5	2,824.3

Source: Unpublished information from CSO, UNIDO questionnaire results and Industrial Development Corporation of Zimbabwe Ltd., Annual Reports and Accounts for the year ended 30th June 1984.

Methodological Note:

The basic data, including total turnover figures are for 1981. However the distribution of turnover has been updated to the ownership pattern pertaining in 1985. Turnover under the column heading 'Central Government and IDC-controlled' includes the following: ZISCO, Lancashire Steel, Delswa, Willowvale, F. Issels and Government printing and Stationery. However, it does not include Central Film Laboratories and National Furniture Industries for which 1981 turnover figures was not available.

ownership and management two surveys have been carried out recently, one by the Department of Customs and Excise, the other by the Confederation of Zimbabwe Industries (CZI) requesting companies to state what percentage of their capital is domestically or foreign owned and the foreign/local breakdown of their management structure. Returns have been analysed by the Economics Department of the CZI which, together with the known ownership pattern of parastatals involved in manufacturing and those that the IDC has a share in, led to usable data from some 290 firms or undertakings.^{12/} Using the turnover figures for each undertaking this sample represented 57 per cent of the total turnover of the manufacturing sector. The next step was to separate out foreign from local firms. This was done by using the following definitions: if a firm recorded its share of foreign ownership to be between 51 per cent and 100 per cent then its total turnover was deemed to be foreign; if a firm recorded its foreign ownership to be between 0 per cent and 50 per cent then its total turnover was deemed to be domestic. Next it was assumed that there was a one-to-one relationship between capital stock for 1982 and the turnover figures calculated and split into the defined foreign and domestic categories. Finally the sample figures were assumed to be proportional to the prevailing foreign to domestic share by each sector of manufacturing, so sectoral data for total capital by ownership was derived.

The figures based on these calculations and assumptions are reproduced in Table 2.12. They can, of course, be called into question in terms both of the assumptions made and the accuracy of the sample in relation to the whole manufacturing sector. Three immediate comments are pertinent here. The first is that as the PTA agreement favours local ownership, there is a possibility that returns by individual companies may have over-stated the domestic ownership proportions as in certain cases there would be economic gains arising from recording domestic ownership at the margin. Secondly, local ownership could imply ownership by a holding company in Zimbabwe whose assets are in practice foreign-owned. Both these factors would provide a bias in the figures towards domestic ownership. On the other hand, and thirdly, the company returns were heavily biased towards the larger companies. These would have a greater incentive to give an accurate indication of their ownership structure because of the relative ease with which the authorities could cross-check the data provided. Additionally it is widely assumed that smaller companies have a proportionately higher share of local ownership to foreign

ownership than do larger companies. This factor would tend to bias the data and the assumptions made in the extrapolations in favour of over-exaggerating the share of foreign ownership. Clearly then the degree of accuracy of the data remains unknown: it is thus presented with the caveats that it deserves.

To the extent that the data does reflect the true position it shows that for the manufacturing sector as a whole, 48 per cent of the capital is foreign-owned and 52 per cent is domestically-owned. If the data is accurate it indicates that most previous estimates of the ownership pattern of the sector have seriously over-estimated the foreign control of the country's manufacturing industry. The data also indicates a high degree of local ownership of the Textiles sector and overall domestic control of sectors 1, 4 and 10 - Foodstuffs, Clothing and Footwear and Transport Equipment. Four sectors have high degrees of foreign ownership, namely Drink and Tobacco, Paper, Printing and Publishing, Chemical Products and Others. And finally looking at the sampling proportions in column (6) of Table 2.12, the figures for sectors 1, 6, 7, 8, 9, 10 and 11 would appear to have a good chance for being representative, and these sectors do account for over 75 per cent of all the capital invested in the manufacturing sector. In short, there would appear to be good grounds for suggesting that the data presented in Table 2.12 should not be viewed as wildly inaccurate and that they may be a good guide to the present ownership breakdown.

So far in this discussion no mention have been made of the Jansen study's estimate of foreign and local ownership. It is now time to compare the figures reproduced in Table 2.12 with those estimated in the Jansen study, being data for 1980. Jansen estimated that 50 per cent of the equity of the manufacturing sector was foreign-owned, using a sample based on 65 per cent of the total gross output of manufacturing for the year 1980. Given that the figures shown in Table 2.12 were for 1984/85 ownership structures and that the overall foreign ownership share was calculated to be 48 per cent it would appear that the two sets of figures are very similar, the fact that they were based on different sample populations reinforcing their likely accuracy.

Table 2.12: Capital assets of manufacturing by sector according to local and foreign ownership, 1982
(million dollars)

Sector	Capital held by local owners (1)	Local per cent of total (2)	Capital held by foreign owners (3)	Foreign per cent of total (4)	Total capital of manufacturing sector (5)	Based on sample of % turnover for the whole sector (6)
1	345.6	60.6	224.7	39.4	573.1	65.6
2	133.4	39.1	207.8	60.9	341.2	23.6
3	274.3	75.6	88.6	24.4	362.9	47.0
4	99.1	82.7	20.8	17.3	119.9	16.1
5	52.7	63.0	30.9	37.0	83.6	22.4
6	73.3	38.7	116.0	61.3	189.3	68.1
7	189.3	37.3	318.1	62.7	507.4	70.1
8	111.6	45.9	131.6	54.1	243.2	72.2
9	582.6	47.8	636.3	52.2	1,218.9	54.8
10	44.9	52.2	41.1	47.8	86.0	96.6
11	7.9	25.7	22.9	74.3	30.8	75.6
Total	1,949.8	51.9	1,806.5	48.1	3,756.3	56.6

Source: Confederation of Zimbabwe Industries 1985 Survey in conjunction with 1984 survey carried out by the Department of Customs and Excise; UNIDO questionnaire results and Cotton Marketing Board Reports and Accounts for the year ended 29th February 1984.

Methodological Note:

Companies were asked the percentage ownership (foreign or local) of their undertakings. This ownership share was calculated as a proportion of turnover to give a weighted average per sector and then converted to capital assets on the assumption that there was a 1 to 1 relationship between turnover and assets by sector. If a company recorded ownership between 51 per cent and 100 per cent foreign then all the turnover was assumed to be foreign controlled, if between 0 to 50 per cent local then, again, all turnover was assumed to be local. Public companies statutory corporations and those over 51 per cent owned by the Industrial Development Corporation were assumed to be locally-owned companies.

When, however, data at the level of individual sectors of manufacturing is compared then striking differences as well as similarities are revealed. Almost identical figures for foreign ownership shares occur for only two sectors: Drink and Tobacco (2) and Metals and Metal Products (9). Wide differences between the two sets of figures - over 20 per cent - occur for the following sectors: Foodstuffs (1), Clothing and Footwear (4); Wood and Furniture (5) and Transport Equipment (10). What is also revealing is that wide differences occurred even when the sample size represented over 70 per cent of total gross output. This occurred in the case of Foodstuffs, Chemicals, Non-Metallic Minerals and transport Equipment. These wide sectoral differences would tend to suggest that the near-similar figures obtained for the ownership pattern of the manufacturing sector as a whole is more a matter of luck than statistical rigour. The respective data are reproduced in Table 2.13. Given the tentativeness of the assumptions upon which the figures in Table 2.12 are based, the variation with the Jansen figures and the different methodologies used, it would appear that more substantial analysis than could be conducted in the time available for the present study should be carried out if there is a need to ascertain with more accuracy the foreign/domestic ownership structure of the manufacturing sector.

Table 2.13: Foreign/domestic ownership pattern of the manufacturing sector: UNIDO and Jansen data compared

Sub-sector	UNIDO study results 1981/84		Jansen study results 1980	
	percentage of foreign ownership	percentage of total turnover based on	percentage of foreign ownership	percentage of total turnover based on
1	39.4	65.6	8	70
2	60.9	23.6	61	67
3	24.4	47.0	30	70
4	17.3	16.1	62	44
5	37.0	22.4	85	46
6	61.3	68.1	49	61
7	62.7	70.1	74	77
8	54.1	72.2	65	77
9	52.2	54.8	53	63
10	47.8	96.6	84	45
11	74.3	75.6	n.a.	0
Total	48.1	56.6	50	65

Source: Table 2.12 above and Jansen, D., et al, Zimbabwe: Government Policy and the Manufacturing Sector, Larkspur California, 1983, Vol. I, p.30 and Vol. II, p.84.

n.a. - not available.

Notes and references to Chapter 2

- 1/ International Standard Industrial Classification of All Economic Activities, Department of Economic and Social Affairs, Statistical Office of the United Nations, Statistical Papers Series M, No.4, Rev.2, UN, New York 1968, p.28.
- 2/ Census of Production, 1982/83, CSO, Harare, 1985, p.1
- 3/ Census of Production, 1982/83, CSO Harare, 1985, p.2.
- 4/ Census of Production, 1982/83, CSO Harare, 1985, p.2.
- 5/ Census of Production, 1982/83, CSO Harare, 1985, p.1.
- 6/ Census of Production, 1982/83, CSO Harare, 1985, p.2.
- 7/ Net output as given in the Census of Industrial Production is the difference between gross output and total purchases and changes in stocks. However, to approximate value added, services purchased should also be subtracted.
- 8/ The figures given in the Census of Industrial production under 'Materials' and 'Fuel' include those items purchased that could be added to stocks. Thus the figures do not necessarily imply that these are the values of these products that are necessarily used in production for the year that they are purchased.
- 9/ See especially, C.F. Stoneman, 'Foreign Capital and the Prospects for Zimbabwe', World Development, Vol. 4, No. 1, January 1976, pp.25-58 and 'Foreign Capital in Zimbabwe', Working Paper prepared for UNCTAD, Zimbabwe Towards A New Order, UNCTAD/MFD/7, GE.80-50262, Geneva, 1980 and D.G. Clarke, Foreign Companies and International Investment in Zimbabwe, CIIR, London, 1980.
- 10/ Figures derived from Stoneman (1976), p.46.
- 11/ Personal communication, June 1984.
- 12/ Acknowledgement and thanks are due to Mr. S. Gray of CZI for assistance in processing the raw data from which these figures are derived.

Chapter Three

A SUBSECTORAL ANALYSIS OF ZIMBABWE'S MANUFACTURING SECTOR

Introduction

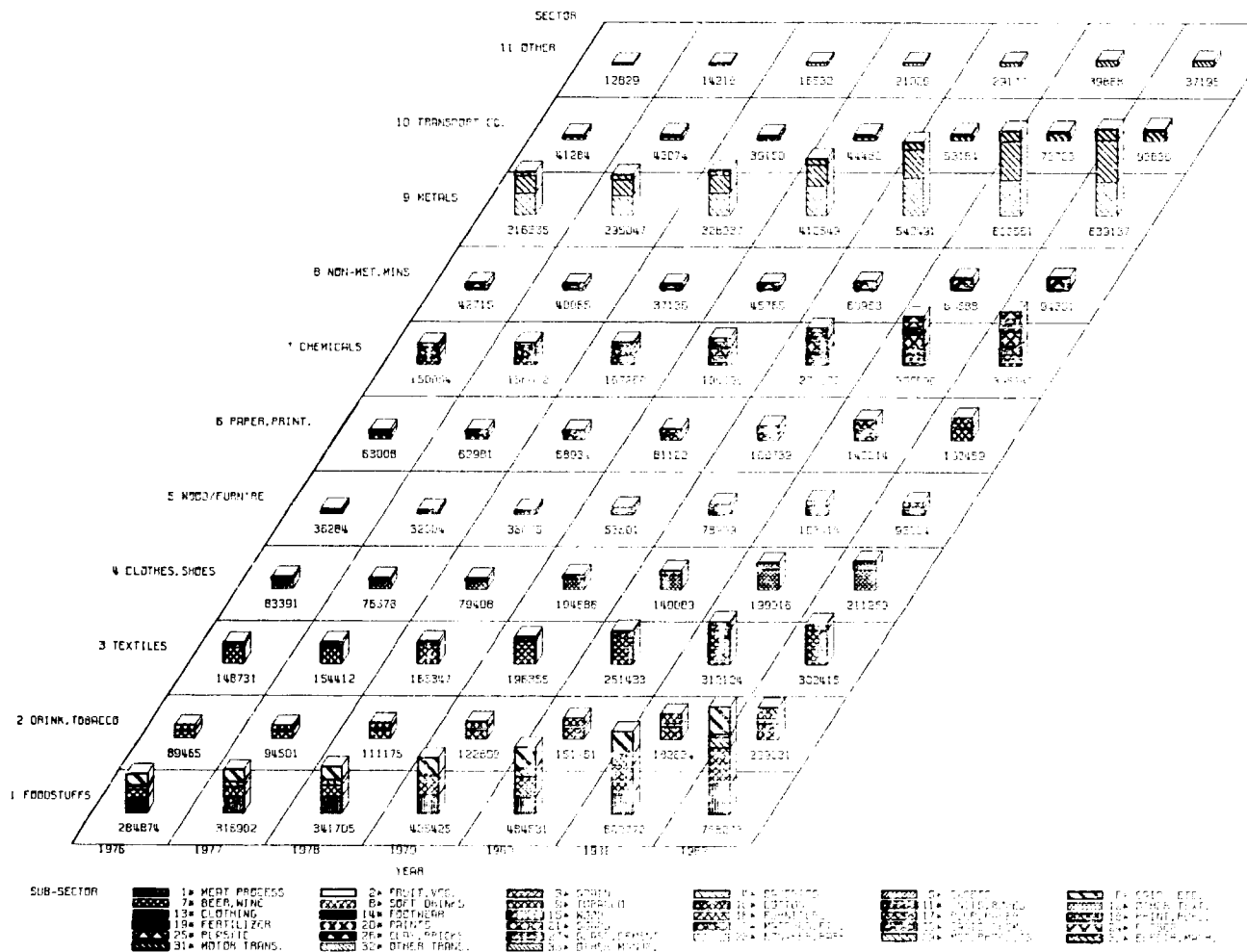
The analyses carried out in the previous chapters are based on the classification of the Quarterly Digest of Statistics. The eleven manufacturing sectors are foodstuffs, drink and tobacco, textile including cotton ginning, clothing and footwear, wood and furniture, paper and printing and publishing, chemical and petroleum products, non-metallic mineral products, metals and metal products, transport equipment, and other manufacturing groups. For the purposes of the present chapter, the analysis is further broken down into the 33 subsectors or branches used in the Census of Production. The detailed breakdown of the subsectors will, however, be carried out within the framework of the eleven sectors in the Quarterly Digest. This has the advantage of linking the higher levels of aggregation carried out in Chapter 2 with the subsectoral breakdown employed in the present chapter.

The methodology used in this chapter is that of utilising as much as possible The Census of Production Data from 1967 to 1982 as the basic source of published statistics. However other statistical information, the inputs and outputs of the subsectors for the 1981-82 period and in some cases including the post 1982 period, will be utilised together with the general knowledge available about the different subsectors.

It should be noted that the Census of Production data is in current prices, i.e. those of the year to which the data refers. The data to convert the 33 subsector production figures to constant prices is not available, since the index of manufacturing in the Quarterly Digest of Statistics covers only the less detailed classification of eleven sectors. (It is based on a sample of firms who are polled every month as to their production in physical terms). Accordingly, the discussion of growth rates in this chapter refers to growth rates in current prices, which are of course higher than constant price growth rates and their interpretation is best carried out in relative terms and with respect to shares of total activity.

SUB-SECTORAL SHARES OF SECTORAL GROSS OUTPUT

BLOCK CHART OF SUMS



VALUES IN THOUSANDS OF CURRENT DOLLARS

By far the most important subsectors in terms of gross output shares are the subsectors 29, machinery and equipment other than electrical except vehicles, and 28, non-ferrous metal and iron and steel basic industries.

These two subsectors scored first in terms of output ranking 9 times and 6 times respectively over a sixteen year period. Only in 1969 did subsector 10, cotton ginning, spinning and weaving products, come first in output shares. This last is the third most important subsector, also in terms of output shares. Other subsectors that follow immediately in this list of ranking are slaughterings and meat products (1), dairy products and other food products (6), wearing apparel (13), grains and stock-feeds (3), fertilizers, insecticides and pesticides (19) and beer, wines and spirits (7).

SECTOR 1: FOODSTUFFS AND STOCKFEEDS

Production operations under foodstuffs and stockfeeds are divided into six subsectors thus:

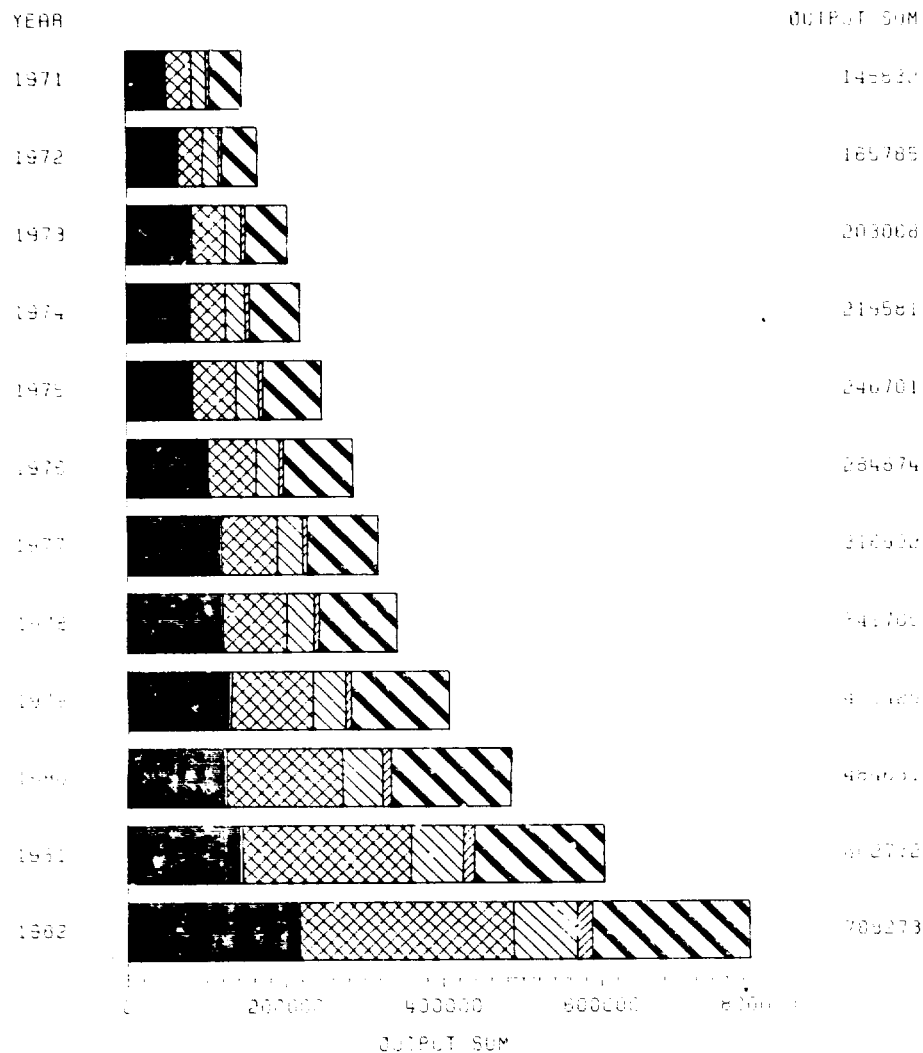
- slaughterings and processing of meat; (1)
- canning and preserving, fruit and vegetables; (2)
- grain mill products and animal feeds; (3)
- bakery products; (4)
- chocolate and sugar confectionary; (5) and
- dairy and other food products. (6)

In 1982 the group's gross output was nearly 26 per cent of total manufacturing gross output, 7.8 per cent of total net output. Against the slow growth rate trend in the manufacturing sector as a whole during the post 1974 period, this group's growth rates were 17.6 per cent and 20 per cent for gross output and value added respectively per annum during the 1974-1982 period. This clearly indicated that the local demand for food products exhibits a steady upward growth path which over-rides the counter-cyclical forces that lead to contraction in other leading manufacturing subsectors. One basic characteristic of the group is its heavy reliance on inputs from the domestic agricultural sector. The growth of the sector is therefore influenced by growth of real incomes in the domestic economy and the strength of export markets, assuming in the latter case that production technologies both in the agricultural sector and in the processing and manufacturing industries keep abreast of developments elsewhere.

SUB-SECTORAL SHARES OF SECTORAL GROSS OUTPUT

SECTOR=1 FOODSTUFFS

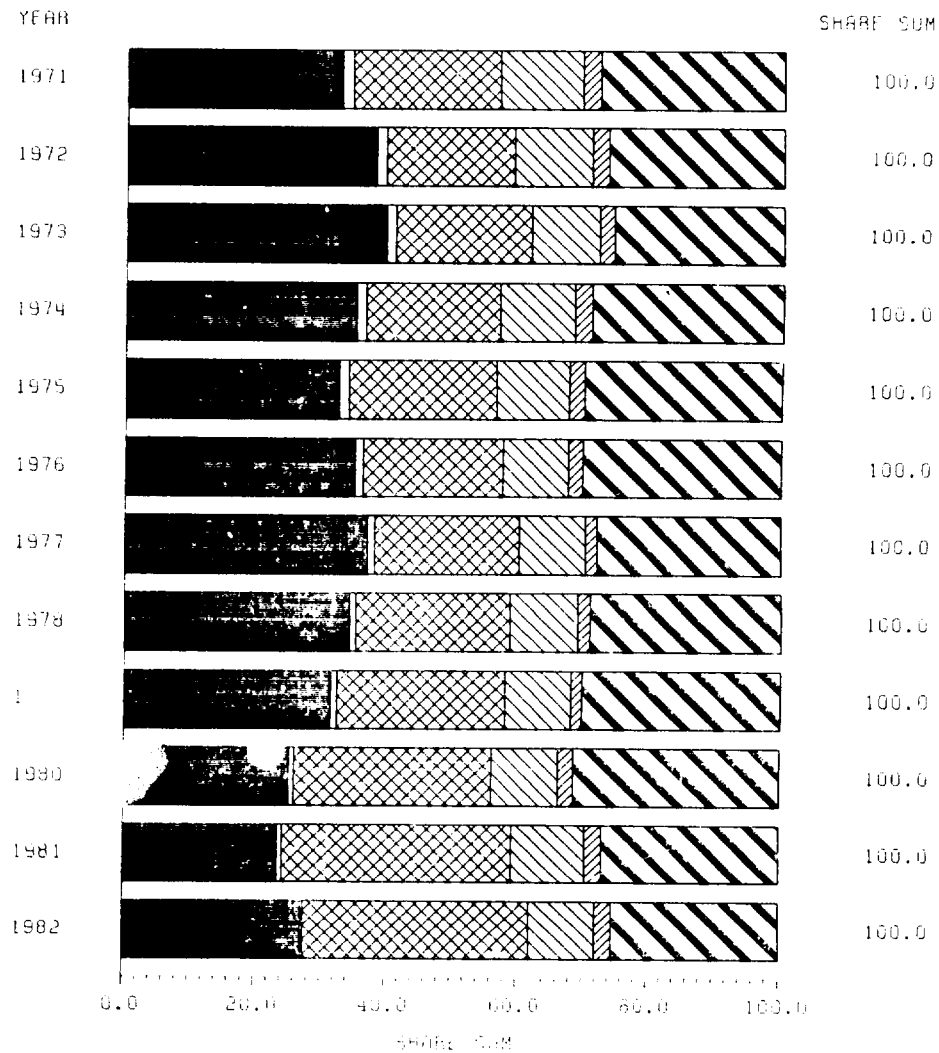
SECTOR=1 FOODSTUFFS



SUB-SECTOR

1. MEAT PRODUCTS	2. FRUIT, VEG.
3. GRAIN	4. BAKERY ETC.
5. SWEETS	6. DAIRY ETC.

VALUES IN THOUSANDS OF CURRENT DOLLARS



SUB-SECTOR

1. MEAT PRODUCTS	2. FRUIT, VEG.
3. GRAIN	4. BAKERY ETC.
5. SWEETS	6. DAIRY ETC.

SHARES EXPRESSED IN PERCENT IN CURRENT PRICE

1. Slaughtering and processing of meat

In 1982 firms engaged in slaughtering and processing of meat products accounted for 27 per cent of gross output of the total sector of foodstuffs and stockfeeds manufacture, and employed 5,844 persons, which was 22 per cent of total employment of foodstuffs manufacturing. The principal products of the subsector are beef and pork. Poultry meat, lamb and mutton are the other products. The subsector has experienced steady growth rates per year in gross output, at 15 per cent between 1967 and 1982, 16 per cent between 1967 and 1974 and 14.5 per cent between 1974 and 1982. During the same period, the subsector's value added had average growth rates of 22 per cent, 24 per cent and 20 per cent respectively per annum. The annual average growth of total wages and salaries of the sub-sector was 20.5 per cent during the 1974-1982 period.

In 1982 the slaughtering and meat products subsector had 23 operating firms. The Cold Storage Commission (CSC), a government parastatal body, is by far the largest operator in the slaughtering of beef. In 1983 it accounted for 86 per cent of all cattle slaughtering and 25 per cent of all frozen, fresh and chilled meat in the domestic market.^{1/} The CSC is also responsible for all beef exports.

On the domestic market the CSC maintains close links with other meat processing firms, especially those processing canned meat, the principal ones being Super Cannery and Lemcc Ltd. It also maintains close links with the leather processing firms by providing leather for footwear, clothing and furniture. These subsidiary components of the Commission's output currently amount to some \$15 million per annum.^{2/}

Another form of linkage with the slaughtering and meat processing subsector is seen in the total payments for services rendered by other firms to this subsector. These payments rose from about \$600,000 in 1967 to \$2.2 million in 1974 and thereafter to over \$8 million in 1982. It is, for example, CSC's policy that major overhauls, renovations and refurbishments are contracted out to specialist companies in Zimbabwe, for the overhaul of such items as the large refrigeration compressors, boilers, and similar equipment. This service is, however, decreasing its effectiveness as contractors progressively lose their experienced staff due to the migration of skills,

even though the meat industry will have to increase the scope of its maintenance facilities in order to alleviate shortages. In economic terms, it would be inefficient for individual parastatals to build their own maintenance systems, as this would involve further investments in vertically integrated units which would be underutilised most of the time.

There is virtually no import dependence in the inputs requirements of the meat industry. All major raw materials: cattle, pigs, poultry etc. are from the domestic farming sector. The local market has been contracting in the past few years. Unpublished data from the Agricultural Marketing Authority (AMA) shows that domestic consumption levels have dropped from 148,385 in 1982 to 141,493 tonnes and 135,097 tonnes in 1983 and 1984 respectively.

2. Canning and preserving, fruit and vegetables

This subsector had a sluggish growth rate of only 2 per cent per year in output in the period between 1967 and 1982. From 1974 to 1982 negative annual growth rates were characteristic of the branch: output (-4 per cent), value added (-1.4 per cent), wages (-13. per cent), and labour (-15.6 per cent). Employment fell from a record level of 1,083 in 1976 to 294 in 1982 representing a loss of 73 per cent.

The main output of the subsector is the canning of fruits, vegetables and jams, representing 99 percent of the branch's output. The other commodity is fish - dried or frozen. Whilst the subsector is dependent on local raw material input for the manufacture of the consumable output, metal containers (tins and cans) make up 29 per cent of the subsector's total material inputs. Other packaging and containers make up nearly 12 per cent of total material inputs.

The sector's production has been very sensitive in recent years both to the drought, which has decreased the off-take of product input, and to cuts in foreign exchange allocations, which have affected the production of tin cans used for canning. If, as we believe, there is a large potential export market for certain canned food products from Zimbabwe, then there is clearly a need to plan more effectively the inter-linkages between the canning industry, that part of the agricultural sector supplying the food input and the tin can manufacturers whose import content of production is still so high.

3. Grain mill products and animal feeds

This subsector's main products are maize meal (28 per cent of the subsector's total output), animal feeds and fish meal (27 per cent), and wheat flour (also 27 per cent). The other grain products are barley, grain sorghum, mhunga and rapoko. The highest average growth rates in the subsector were registered during the period 1974-1982 when output grew at 25 per cent, value added at 24 per cent, wages at 29 per cent and labour at 6.5 per cent per annum. The divergence between the high output growth rate and low labour input growth rate in more recent years (even though the former is in current prices) does suggest that the subsector is becoming more and more capital intensive.

White maize, central to Zimbabwe's grain milling industry is the staple food of the majority of the population. White, yellow and some other varieties of maize are used as stockfeeds, for cooking oil, beer and starch manufacture. Wheat is used predominantly for the manufacture of baking flour, with the unused portion providing an important component as livestock feed. Stockfeeds are also manufactured from a variety of cash crop roughage such as cotton lint seed and sugar molasses.

During the 16 years between 1967 and 1982 grain mill products and stockfeeds have held the sixth place in six years in the order of ranking of the output shares of all the 11 products groups taken together and were in fourth place in 1981 and second place for the first time in 1982.

The factory output share of grain products, especially maize seems to rise in times of bad harvests. This may be explained by the depletion of grain stocks in the hands of the rural population during a prolonged drought. Thus, the effects of the 1981/82 drought led to a rise in the demand for factory processed maize meal from the latter part of 1981 and this was most probably sustained up to the end of the drought.

In 1982 the subsector had 18 operating firms and considerably increased capacity has been installed in the post 1982 period. While an estimated 52 per cent of the flour milling capacity is at present being used, maize milling capacity is stretched to the limit. Capacity is being expanded in the maize milling area in order to meet increasing demand. The maize mill products and

other products except wheat are totally dependent on local raw material inputs. Wheat production, on the other hand, is estimated to have been some 200,000 tonnes lower than domestic demand in 1983/84.^{3/}

4. Bakery products

The principal products in this subsector are bread (83 per cent of subsector's output) and other bakery products. In 1982 there were 57 operating units in the subsector. The gross output of the sector has increased six times between 1967 and 1982 with average growth rate of 13 per cent per annum. The subsector experienced higher growth rates in the period between 1974 and 1982: an annual average of 15.5 per cent in output, 16.5 per cent in value added and 15.5 per cent in wages, but only 2 per cent in labour input. This wide differential in trends in wages and number employed might initially lead one to believe that there have been dramatic labour productivity gains. However, discussion with industrialists (not only those in the bakery industry) suggest that variations in overtime would have been a major contributory element in explaining the apparent increases in labour productivity.

There is great potential of growth in the bakery industry, especially for bread provided that wheat is made available either from the local farmers or through imports. Clearly, from a foreign exchange saving perspective preference should be for expanding local wheat production; however, as discussed elsewhere in this report, there would appear to be scope for substituting alternative flows for a certain proportion of wheat flour, especially sorghum.

5. Chocolate and sugar confectionery

The principal input of this subsector is refined sugar, which is produced locally. Confectionery represent the next group of products in output terms which uses sugar as a major input into their manufacturers. The output figures in this subsector rose from about \$6 million in 1974 to \$19 million in 1982. In annual growth rate terms gross output was 15.7 per cent, value added 19 per cent and wages 15.4 per cent. The subsector's average annual growth rate of labour was at 9 per cent per annum during the period from 1967 to 1974, but fell to 0.5 per cent during the period from 1974 to 1982.

There are opportunities for expansion in this sector for both the local and external markets if foreign exchange is made available for imported inputs, for example the gum-resin for chewing gum. Sweets, the main product of the subsector (49 per cent) and other sugar confectionery products, earned \$289,000 in foreign exchange in 1983.^{4/}

6. Dairy and other food products

The heading of this subsector is rather misleading in the sense that it fails to explicitly name sugar refining which is the second major output of the subsector. In 1982 out of a total branch output of slightly over \$175 million, the major products were: processed milk (26 per cent); refined sugar (25 per cent); vegetable oils and margarine (10 per cent); other food products (8.8 per cent); animal feeds and fish meal (6.6 per cent); and many other lesser products including chemical products, dried or frozen fish, coffee and chicory, sweets, cheese, ice cream and dairy products. Some soap, detergents and cleansers appear to be also produced by firms classified under this subsector (8.8 per cent of output). All the latter, so called "lesser" products in terms of output value have a value of between one million and six million dollars. This is, therefore, the most diversified subsector in the foodstuffs and stockfeeds group, although it is placed third in terms of total output coming after grains and animal feeds, and slaughtering and meat products.

The subsector's average annual gross rate of output was 13.7 per cent during the period 1967-1982, 11.7 per cent in 1967-1974, and 15.4 per cent in 1974-1982. Growth rates in value added and wages were highest during the period 1974-1982, which were 19.6 per cent and 18 per cent respectively.

Dairy products are produced by the Dairy Marketing Board (DMB), and other firms in this subsector use the output of the DMB as inputs into their own production. Milk deliveries to the DMB have grown from 95 million kg to 178 million kg during the period 1968-1983.^{5/} The key to the management of the products of this branch is most probably how government deals with price incentives. The success of the dairy industry in recent years can largely be attributed to the effect of an incentive pricing policy towards producers.

Thus, from July 1979 up to November 1984 there were six increase in milk producer prices, altogether amounting to 19 cents per kg. According to an unpublished AMA report the weighted average producer price of milk rose from 30.16 cents/kg in 1983/84 to an estimated 32.85 cents/kg in 1984/85. In addition, there is the milk quality premium which is 7.5 per cent of the basic producer price. On the consumer price front the price rose by about 20 per cent from September 1983. Largely because of the recent fall in real incomes, there has been a noticeable consumer resistance to the recent rise in milk price increases. A combined strategy for the exports of the dairy products in excess of the local market intake provides some scope for expansion although the industry will be critically dependent upon local sales for the foreseeable future. On the other hand, local demand for refined sugar and sugar products remains high and will continue to increase. The major constraint is the inadequate capacity. The sugar refining activity is mainly for the domestic market. Refined sugar is being exported mainly to Botswana but most of Zimbabwe's sugar is exported as raw sugar. The main inputs of the subsector are raw sugar and milk, which gives an advantage in further expansion due to their domestic origin.

SECTOR 2: DRINK AND TOBACCO

Three subsectors come under this group:

Beer, Wine and spirits (7)

Soft drinks and carbonated waters (8)

Tobacco products (9).

In 1982 gross output of the sector totalled \$230 million or 7.5 per cent of total manufacturing gross output, and employment was 7 per cent of the total of manufacturing employment.

In the period 1974-1982 the group's average growth rates of gross output and employment were 16 per cent and 2 per cent per annum respectively. Other studies have attributed this strong growth in recent years primarily to the rise in disposable incomes since Independence.^{6/}

7. Beer, wine and spirits

The principal products of the subsector (7) are opaque beer, clear beer and potable spirits. Out of a total of \$88.8 million of output in 1981 opaque beer was 53 per cent of total production of the branch's output, and clear beer occupied

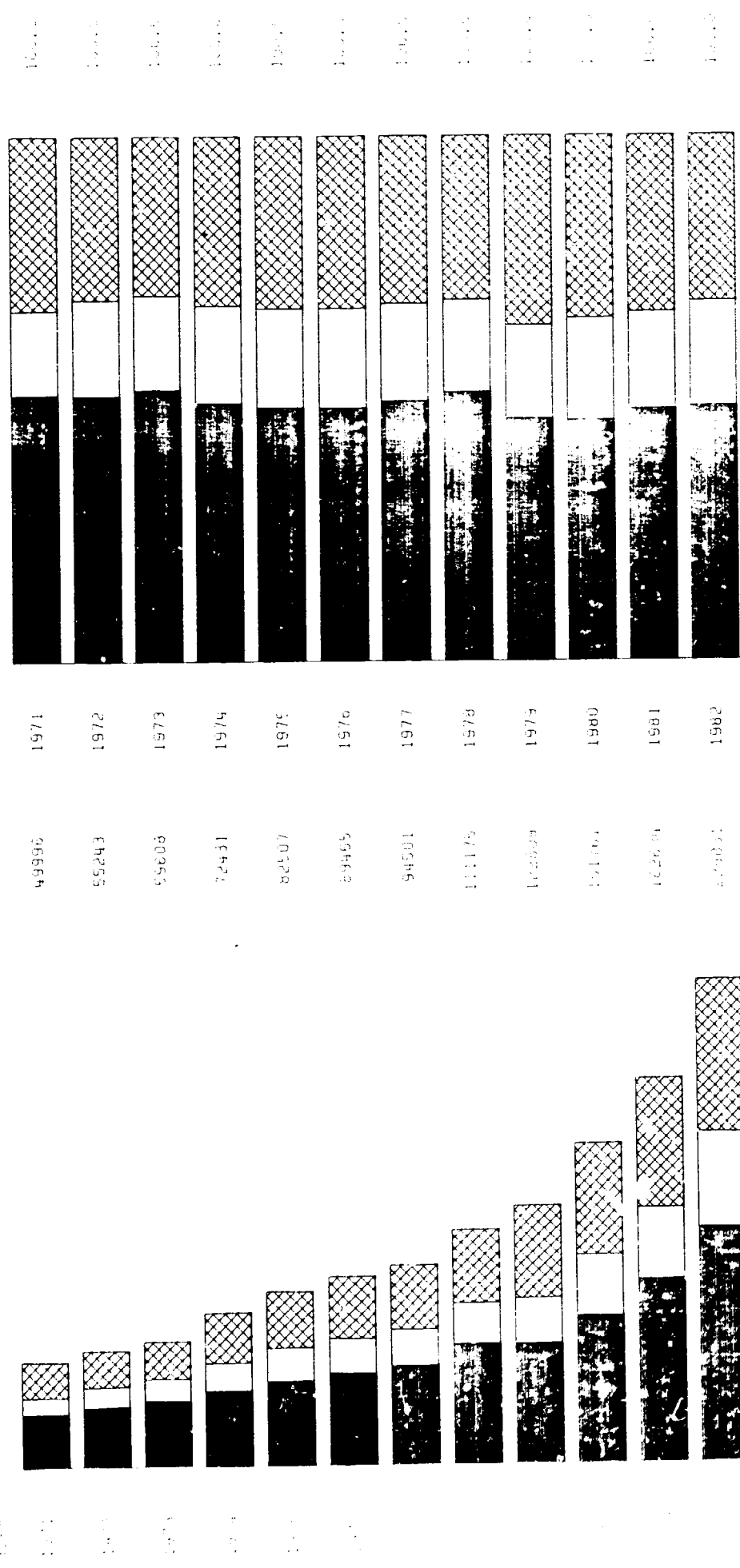
SUB-SECTORAL SHARES OF SECTORAL GROSS OUTPUT SUB-SECTORAL SHARES OF SECTORAL GROSS OUTPUT

SECTOR-2: DRINK, TOBACCO

UNIT: %

OUTPUT SUM

YEAR



0.0 200 400 600 800 1000

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a distant second place at 22 per cent of the total, with potable spirits at 10 per cent. Other products of the subsector include non-potable spirits, wine, malt and malt extract. According to the national statistics the category other products erroneously includes basic industrial chemicals.

In the period 1974 - 1982 the subsector has experienced fairly steady growth in gross output of about 15 per cent per annum, and wage growth of around 17 per cent per annum.

Zimbabwe's beer, wine and spirits are principally dependent on local grown agricultural inputs, which makes the subsector less vulnerable to foreign exchange cuts. Contrary to neglecting opaque beer since it is considered nontradable as was done in the Jansen Study, we consider it an important product in terms of employment generation, value added, tax revenues and providing a low alcoholic content beer for the people. Grains, particularly maize, provide about 39 per cent of total inputs used in the subsector.

The sugar mill distillery in the Lowveld produce 75 per cent of the country's alcohol requirements. From the fermentation of molasses, cane spirit is produced which, besides its use as industrial spirit, is the base of gin, vodka and brandy. Also wine and all types of beer are produced from local agricultural products in which Zimbabwe is quite efficient. A growing export trade of wine is picking up to the neighbouring countries within the SADCC and the PTA. Manufacturers of beer must obtain government approval before they can raise their output prices. Delays in approving prices has a disincentive effect and, therefore, adversely affect additional investment in productive capacity (for details see Chapter 6 and 12).

8. Soft drinks and carbonated waters

Soft drinks and carbonated waters (8) accounted for 20 per cent of the total gross output of the drink and tobacco group in 1982 (17 per cent of total net output). During the same year there were 14 firms engaged in production in the subsector.

In the period 1974-1982 the annual average growth rates were 16.5 per cent for gross output, around 17 per cent for value added, 17.8 per cent for wages and 3.6 per cent for employment. This compares with average annual growth rates of 14 per cent (gross output), and 8.6 per cent (employment) during the period 1967 to 1974 indicating that the subsector has experienced higher growth in the more recent years.

The subsector largely depends on imported inputs, especially concentrates. Thus, due to cuts in foreign exchange allocations, companies have been working well below their full capacities. The most important local input used in production is refined sugar. Export prospects are unlikely to be good due to lack of capacity to satisfy domestic demand, the high bulk and low value properties of the product, and the fact that all adjacent countries have their own bottling plants. The Jansen Study observes that companies under this subsector "also face restriction on exports due to agreements with multinational companies with whom they have licensing agreements, e.g., Coca Cola."^{7/} There is, however, one important area in soft drink manufacturing where export potential could be developed, and that is soft drinks based on domestically produced citrus. Exports of mazoe orange has started, although in small quantities, to neighbouring countries. There are prospects for exporting mazoe orange drinks as the domestic supply of citrus is most likely to be assured.

9. Tobacco products

In 1982 tobacco product manufacturers accounted for 32 per cent of the total gross output of drinks and tobacco (38 per cent of total net output). The subsector employed 5,705 people, or 43 per cent of the total. There were only 12 firms operating in the subsector in 1982. From a low activity level during the early UDI period the subsector's average annual growth rates during the period 1974-1982 were 15 per cent for gross output, 18 per cent for value added and 15 per cent for wages. However, during the same period the average annual growth rate of employment of the subsector was only around 1.5 per cent. This downward trend in labour absorption has continued. For example, during the 1980-1982 period the subsector's gross output had an average annual growth of 17.5 per cent per annum (20.8 per cent for net output), but employment grew at an average of -3.4 per cent per annum.^{8/}

SECTOR 3: TEXTILES INCLUDING COTTON GINNING

This group includes cotton ginning and textile manufacturers, knitted product, rope and cordage, and other textile products including (wrongly) wearing apparel. In 1982 gross total output totalled about \$448 million (around \$179 million net), or 14.7 per cent of the gross output of manufacturing (14 per cent of total net output). The average number employed totalled 37,319 or 21.2 per cent of employment in the manufacturing sector.

10. Cotton ginning and other textiles

This subsector comprises cotton ginning, weaving, finishing textiles and carpets and other textile products; i.e., firms "making up" from textile materials. The Cotton Marketing Board (CMB), dominates or has a near monopoly of cotton ginning. Together, in 1982 these components had a gross output of \$264 million, or 8.7 per cent of total manufacturing (around 7 per cent of total net output of manufacturing), and a total employment of 16,479 or 9 per cent of total manufacturing employment.

The most immediate problem facing cotton production is that ginning capacity is increasingly inadequate for the expanding seed cotton crop produced in Zimbabwe. E.g., a surplus of more than 10,000 tonnes of seed cotton could not be ginned in time in the 1984 season, and such delays are detrimental to the quality of the product.^{9/} About 80 per cent of cotton lint produced in Zimbabwe is exported, while textile manufacturers absorb 20 per cent for both the local and export markets. The Jansen Study recommends that while Zimbabwe has a clear comparative advantage in cotton ginning, it does not appear to have a comparative advantage in the manufacturing of textiles. It will be argued below that in fact, Zimbabwe does have a comparative advantage in the manufacture of textiles as well.

11. Knitted products, rope and cordage, and other textile products

12. Other textile products

These two subsectors can be treated together because their output is very similar. Firms in subsector 11 manufacture knitwear (76 per cent of total output), yarns and thread (trimmings) and various other types of knitted

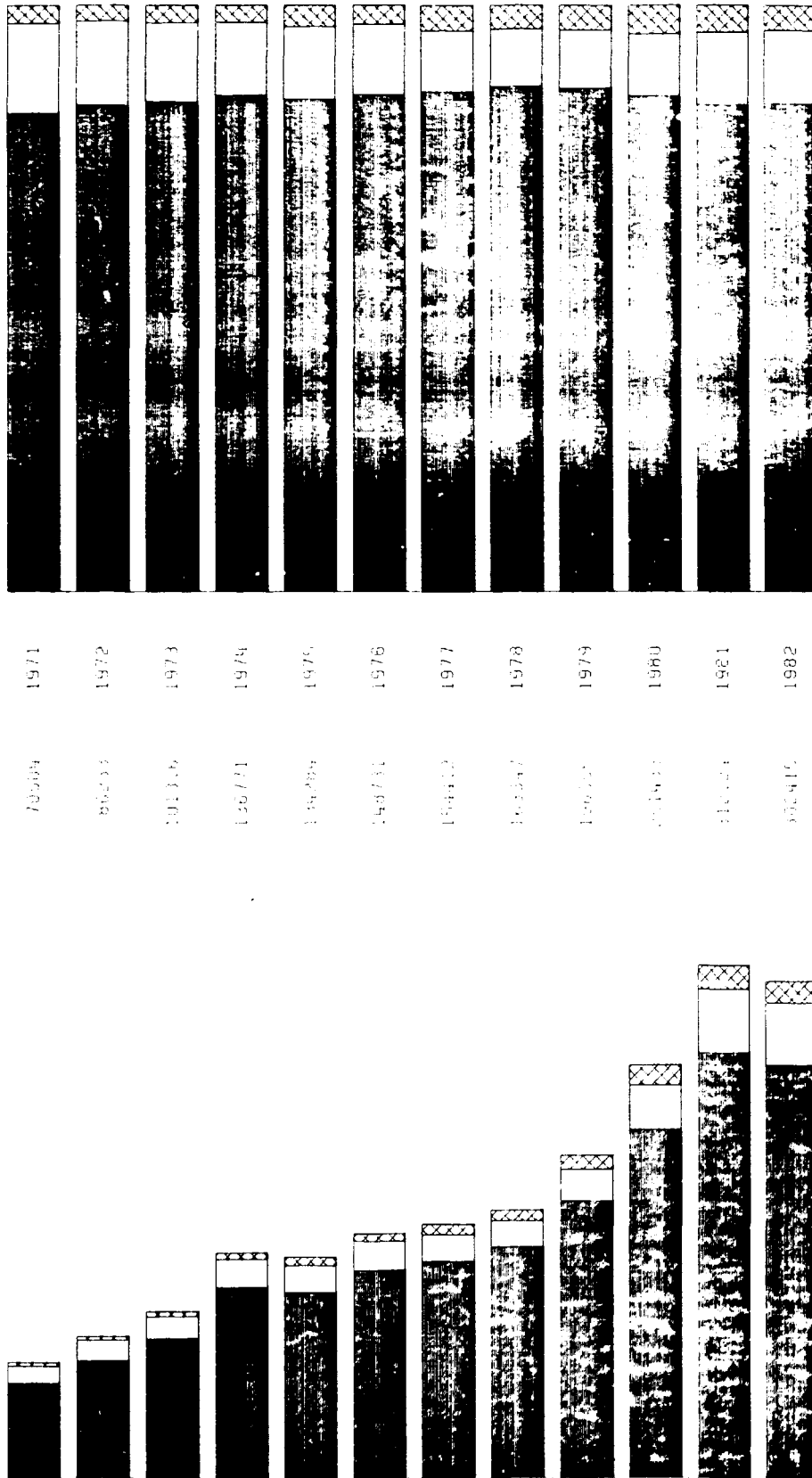
SUB-SECTORAL SHARES OF SECTORAL GROSS OUTPUT SUB-SECTORAL SHARES OF SECTORAL GROSS OUTPUT

SECTOR-5: TEXTILES

Quantities

Year

Year



1971 output is taken as 100% and the current year's output is expressed as a percentage of 1971 output. The current year's output is expressed as a percentage of 1971 output.

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Current Year

Current Year

12. Cotton Textiles 13. Synthetic Textiles 14. Woollen Textiles 15. Other Textiles

12. Cotton Textiles 13. Synthetic Textiles 14. Woollen Textiles 15. Other Textiles

products, industrial plastic products, canvas, etc. Subsector 12 produces knitwear (61 per cent), ladies wear (16 per cent), carpets and floor rugs (6.9 per cent), mens wear, etc. In 1982 the two subsectors had 26 firms with a gross output of \$51.4 million, representing 1.7 per cent of total manufacturing sector's gross output.

As shown in Table 3.1 below, Zimbabwe's textile subsector is mainly dependent on local raw material inputs. In 1984 local inputs totalled \$65.4 million, or 69.4 per cent of total inputs, while imported inputs made up the remaining 30.6 per cent. An important raw material input that can be reduced over time, depending on changing tastes, is the fibres and yarn. It has been suggested elsewhere that cotton textile manufacturing based on locally produced lint is more efficient than manufacture of polyester fabric based on imported polymers.^{10/}

Table 3.1: Raw material inputs of textile manufacturers
(Excluding ginning and "other products" for 1984)

<u>Raw Material</u>	<u>Local</u> <u>(\$ million)</u>	<u>Imported</u> <u>(\$ million)</u>	<u>Total</u> <u>(\$ million)</u>
Lint	26.0	-	26.0
Fibre/yarn	22.6 ^{a/}	12.6	35.2
Packing	2.0	-	2.0
Fabric	7.0 ^{b/}	-	7.0
Chemicals	2.0	10.0	12.0
Spares	1.0	5.3	6.3
Sundries	3.0	1.0	4.0
Goods for Resale	1.8	-	1.8
Totals	65.4	28.9	94.3

Source: Estimates from Central African Textile Manufacturers' Association (CATMA)

Notes: a/ This figure probably has a large element of double counting.

b/ Believed to contain a large amount of beneficiated Zimbabwe yarn, spun in Botswana and re-exported back to Zimbabwe.

Table 3.2: Turnover of textile products (excluding cotton ginning)
(\$'000)

Product	1980/81	1981/82	1982/83	1983/84
Fabric	84,224	96,830	87,000	87,000
Knitted & Hosiery	22,285	28,748	28,000	29,000
Yarn	21,544	26,730	23,000	30,000
Household Goods & Other Products ^{a/}	47,671	59,056	55,500	61,000
Increase in Stocks	1,371	9,061	8,330	1,285
Totals	177,095	220,425	201,830	208,285
Payments for Services	107,536	124,177	121,748	131,965
Value Added	69,509	96,248	80,082	76,320
Capital Expenditure	26,138	43,579	25,292	7,509
Numbers Employed ^{b/}	16,181	18,026	18,144	16,599

Source: CATMA Financial Statement Estimates

Notes: a/ Household goods are blankets, carpets, sheets and towels. Other products are cordage, tapes, sacks and includes finishing of textiles.

b/ In 1982/83 and 1983/84 the figures include a large element of temporary workers, possible as high as 20 per cent at times.

As shown in Table 3.2 production of textiles slightly picked up from a figure of \$201.8 million in 1982/83 to \$208.3 million, i.e., by 3 per cent in 1983/84. This figure certainly decreased in constant prices given a higher rate of inflation during the period. But this was just the start of export expansion in the subsector. Export earnings increased from \$7.9 million in 1982 to \$14.6 million in 1983 (84 per cent) and then reached a record level of just over \$24 million in the first nine months of 1984 (cf Table 3.3). The breakdown of products exported show an impressive variety. Government policies cannot afford to neglect any of these product groups, though promotion of the most efficient ones is important to improve the quality and reputation of Zimbabwean products.

Table 3.3: Textile exports for the period 1981-1984
(\$'000)

Product	TOTAL ANNUAL			Jan.-Sept. 1984
	1981	1982	1983	
Yarns				
Knitting	51	75	-	78
100% Rayon	1,074	923	265	6
100% Cotton	356	52	208	512
Others, mainly cotton blends	2,464	1,636	2,347	8,714
Group Total	3,945	2,686	2,820	9,310
Fabrics				
100% Cotton (including printed)	111	63	3,397	5,580
Cotton Canvas	550	54	216	327
Other, under 50 per cent cotton	2,122	1,435	1,666	511
Group Total	2,783	1,552	5,279	6,418
Other Products				
Blankets	143	28	62	52
Towels/napkins	1,141	400	736	2,083
Sheets	2,335	1,854	3,941	4,291
Other Textile Mfg.	648	702	755	1,519
Knitted clothing	591	357	601	146
Carpets	341	95	207	145
Sacking	35	69	23	3
Twine, Rope and cord	237	170	166	149
Group Total	5,471	3,685	6,491	8,388
Total	12,199	7,923	14,590	24,116

Source: CATMA Figures

SECTOR 4: CLOTHING AND FOOTWEAR

There are two subsectors under this group, viz: wearing apparel and footwear. In 1982 there were 148 firms accounting for 7 per cent of the total manufacturing sector's gross output, while numbers employed were 12.4 per cent of total employment. Like Textiles this group has a high local content in the inputs used in production.

13. Clothing

The subsector had 113 operating firms in 1982, whose production accounted for 69 per cent of the total production of clothing and footwear. Clothing or wearing apparel firms seem to vary among themselves in terms of export performance. Some of the firms in this group are exporting their production not only to South Africa and some PTA countries, but also to the more sophisticated and competitive European markets.

According to a Commonwealth Secretariat study, Zimbabwe has the best opportunities for clothing and grey cloth exports. The best items in these categories are jeans, shirts and T-shirts. The major products in this subsector are menswear (42 per cent), ladies wear (38 per cent), protective clothing (10 per cent), and other wearing apparel (9 per cent).

But Zimbabwean textile mills will have to improve their quality of the product, and delivery of materials if clothing firms are to maintain competitiveness. Some companies have complained about the lack of consistency in the quality of the product that is being delivered, which make it inadequate for preparing good quality clothes for the export markets. The local market is served with the same fabrics and similar styling as the export market which is important for maintaining the scale of production. However, the need for up-to-date design to meet changing tastes and fashions in more volatile export markets in developed countries means that this is not altogether an advantage.

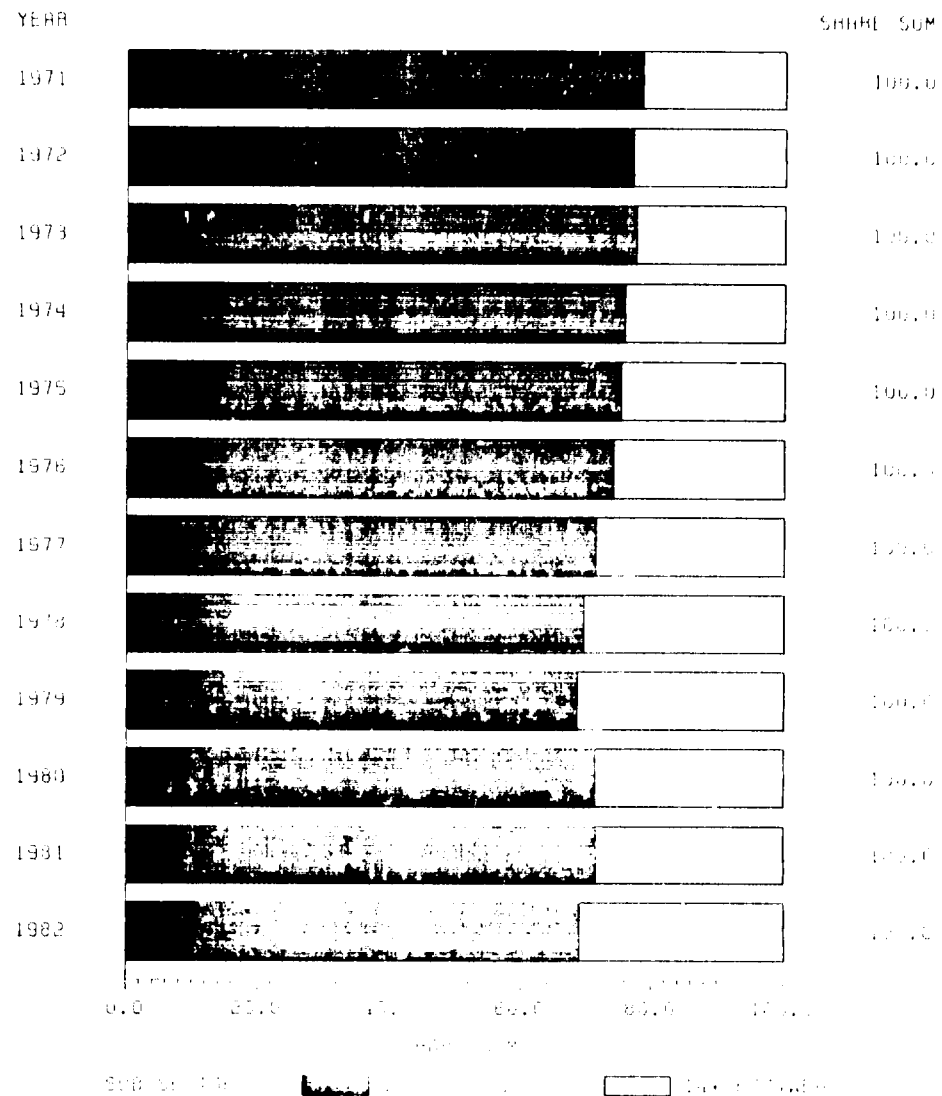
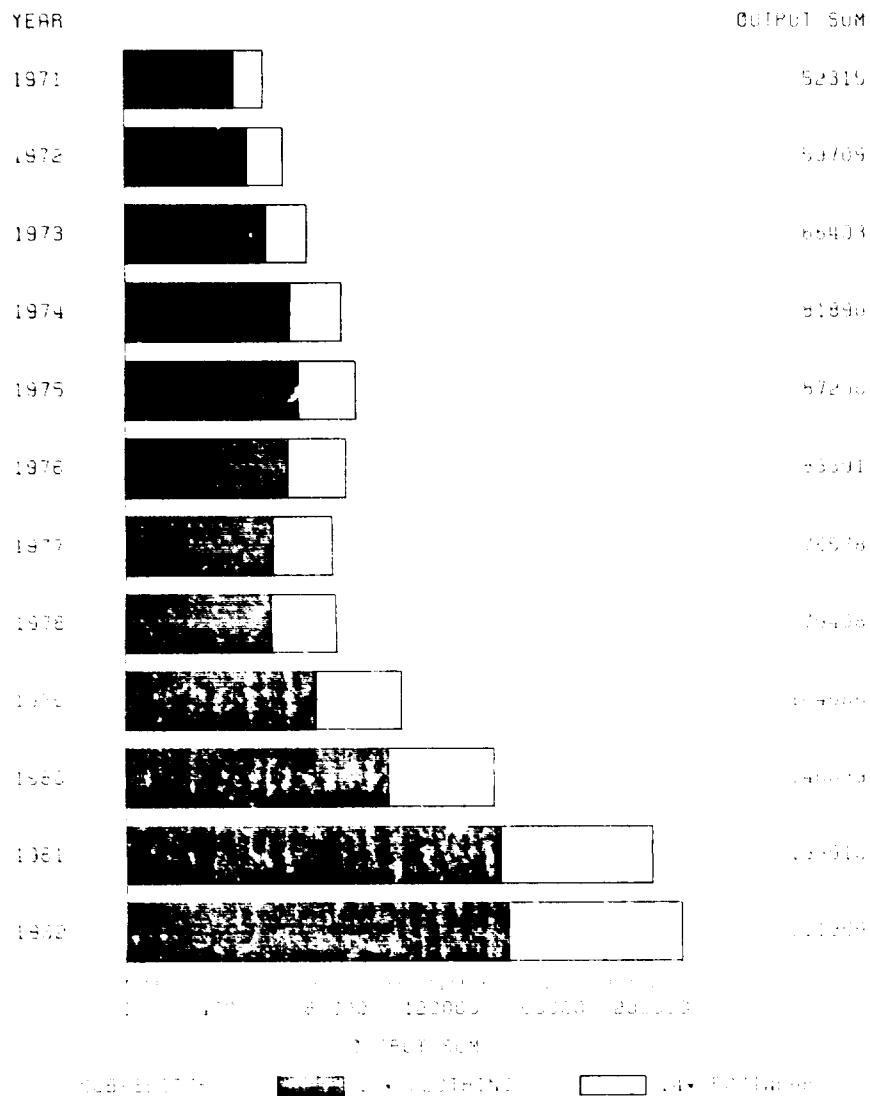
14. Footwear

In 1972 footwear accounted for 31 per cent of the total output of clothing and footwear. There were only 15 firms in operation in 1982. Zimbabwean firms in footwear are amongst the most efficient producers in the country. The Jansen

SUB-SECTORAL SHARES OF SECTORAL GROSS OUTPUT SUB-SECTORAL SHARES OF SECTORAL GROSS OUTPUT

SECTOR-4 CLOTHES, SHOES

SECTOR-4 CLOTHES, SHOES



Study confirms that Zimbabwe has a clear comparative advantage in footwear manufacture. The subsector's average annual growth rate in the 1974 - 1982 period was 16.1 per cent while its value added reached a 20 per cent growth rate per annum during the same period. The group is labour intensive, with an average gross output of \$12,000 per employee from 1980 to 1982. Footwear is the only commodity produced by the firms in this group.

SECTOR 5: WOOD AND FURNITURE

In 1982 there were altogether 98 firms in this group with gross output of around \$94 million or 3 per cent of total manufacturing (3.4 per cent of total net output). The group employed 7.3 per cent of manufacturing sector's total employment. The 1982/83 annual production for rough sawn timber totalled \$16.5 million and the value of exports during the same year was \$700,000.^{11/} Other timber products that are exported include paper, furniture, wood-based panels and treated round poles of all sizes.

15. Sawmilling and wooden products, except furniture

Because of the reduction in local demand due to the depressed building industry and particularly to a drastic reduction in low-cost housing output, production in this subsector (15) has been in a deep slump. Thus, whilst the 1974-82 average annual growth rate for gross output was around 13 per cent and 14.3 per cent for value added, gross output fell by 6.7 per cent between 1981 and 1982 and employment by 36 per cent during the same period.

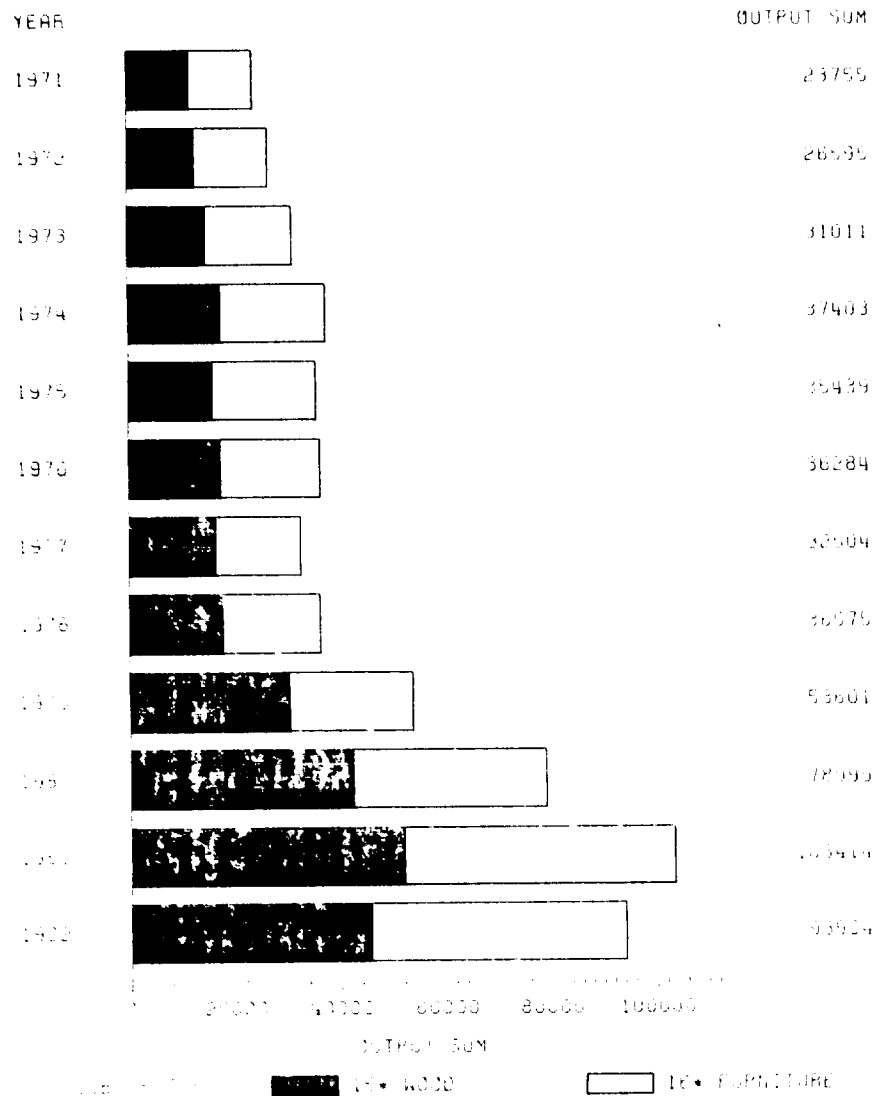
The subsector is quite labour intensive, with a gross output per employee of around \$5000 in 1980 and \$7000 in 1982. The subsector laid off 2,342 workers between 1981 and 1982.

Its main products are wood products for buildings (40 per cent), rough sawn wood (25 per cent) joinery and prefabs (14 per cent) and wooden containers, crates and pallets (11 per cent).

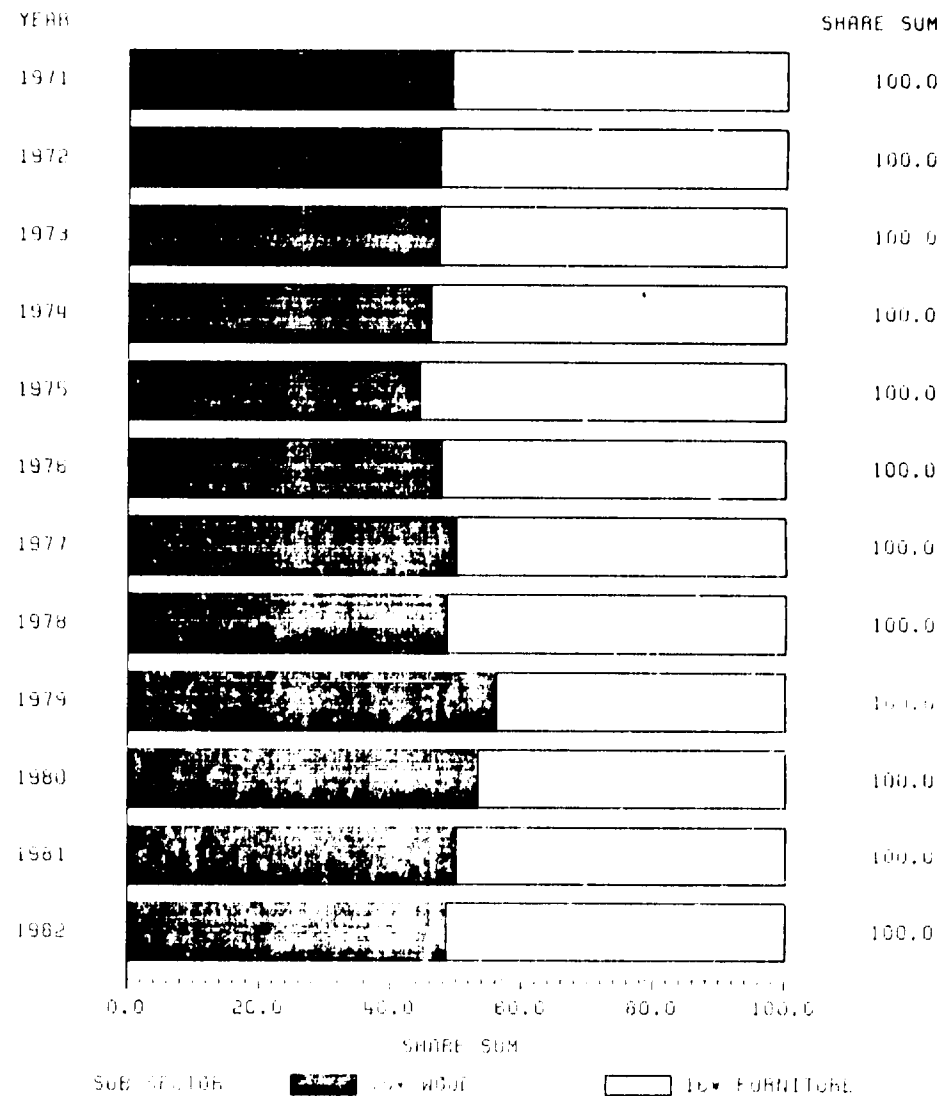
SUB-SECTORAL SHARES OF SECTORAL GROSS OUTPUT SUB-SECTORAL SHARES OF SECTORAL GROSS OUTPUT

SECTOR=5 WOOD/FURN'URE

SECTOR=5 WOOD/FURN'URE



VALUES IN THOUSANDS OF CURRENT DOLLARS



SHARES BASED ON VALUES IN CURRENT PRICES

16. Furniture, and furniture fixtures except primarily of metal

Furniture products had a steady annual average growth rate of 17 per cent for gross output, 15.5 per cent for value added and 16.5 for wages in the 1967 - 1974 period. But in recent years growth rates have fallen to 11.5 per cent for gross output, to 8 per cent for value added and 11.7 per cent for wages. Its main local inputs are rough and sawn timber, and textile fabrics. Industrial rubber products, varnishes, lacquers and paint and chemical products are imported.

In the domestic market falling real wages have adversely affected furniture sales. This has presumably affected demand patterns with a swing towards lower quality products purchased by middle and lower income population groups.

SECTOR 6: PAPER AND PAPER PRODUCTS

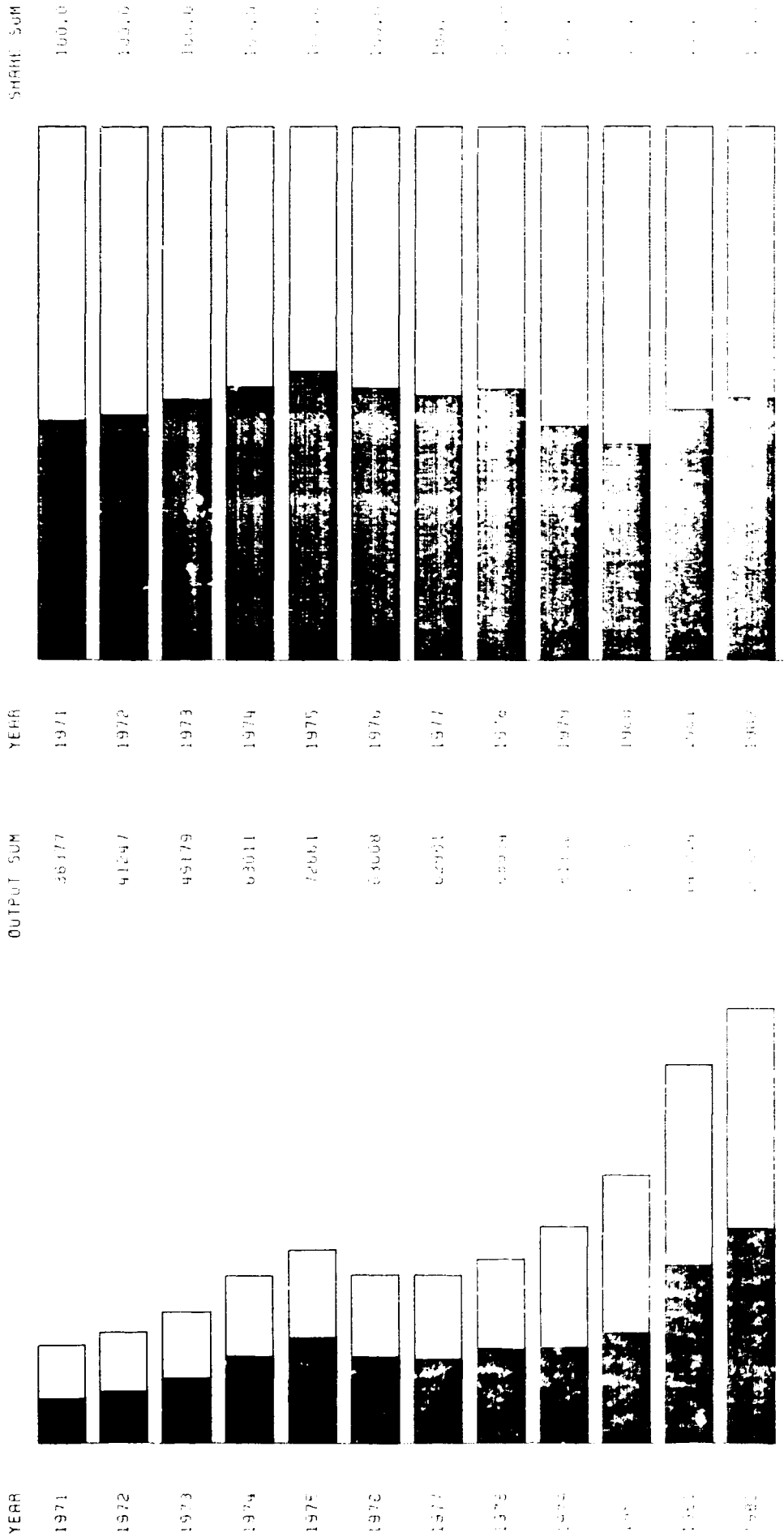
The group's products includes paper, paper products and stationery, printing and publishing. In 1982 there were 114 operating firms with gross output of \$163.5 million or 5.4 per cent of the total manufacturing sector (6.7 per cent of net output). In 1982 the group's total employment was 9,445 representing 5 per cent of total employment. The average annual growth rate of employment of the group was around 5 per cent over the period 1974-1982.

17. Pulp, Paper, Paperboard and Their Products

Zimbabwe primarily produces newsprint and kraft paper, as there is no chemical pulp plant to produce fine paper on a regular basis. In 1982 Zimbabwe's imports of plain and composite paper totalled \$5.6 million. This importation, however, does not fully satisfy the wide range of requirements of the country, including the production of text books to meet expanded enrollments in schools. There is, therefore, need for a chemical pulp plant for the production of fine quality paper. Zimbabwe pulp is well suited for the production of fine paper, though pulp is also imported from Swaziland.

The SADCC pulp and paper demand study estimated that in 1983 Zimbabwe had a shortfall of 15,500 TPA of paper and paperboard which had to be met by imports. The 9 SADCC countries had an estimated shortfall of 88,900 TPA.

SUB-SECTORAL SHARES OF SECTORAL GROSS OUTPUT SUB-SECTORAL SHARES OF SECTORAL GROSS OUTPUT
 SECTOR=6 PAPER,PRINT. SECTOR=6 PAPER,PRINT.



Legend:
 [White Box]
 [Black Box]
 [Grey Box]

Zimbabwe has been considering a small chemical pulp plant designed to meet its domestic requirements. There is at present sufficient and adequate pulp in Zimbabwe for the production of chemical pulp. If such plant could expand beyond the national feedstock capacity, there is an adequate supply of raw materials from Swaziland. Zimbabwe has increased its gross output from around \$47.7 million in 1980 to \$80.5 million in 1982 (61.7 per cent) and since demand is still not satisfied more expansion will benefit from both the local and the potential regional export markets.

The output of the subsector includes pulp, paper and paperboard (43 per cent), paper containers and cartons (40 per cent) and other paper products (14 per cent).

18. Printing, publishing and allied industries

Firms in this subsector manufacture stationery products and are also involved in printing activities and packing materials. The major outputs are printed products (59 per cent), publishing (36 per cent) and paper containers and cartons (4 per cent). The major input of these firms is paper and paper products. The subsector experienced high growth rates in recent years. In the 1979-1982 period average annual growth rates for gross output, net output and employment levels were 22 per cent, 24 per cent and 4.7 per cent respectively. Exciting prospects can be realised in this subsector with the development of a domestic pulpchemical plant (see Chapter 9, Import Substitution).

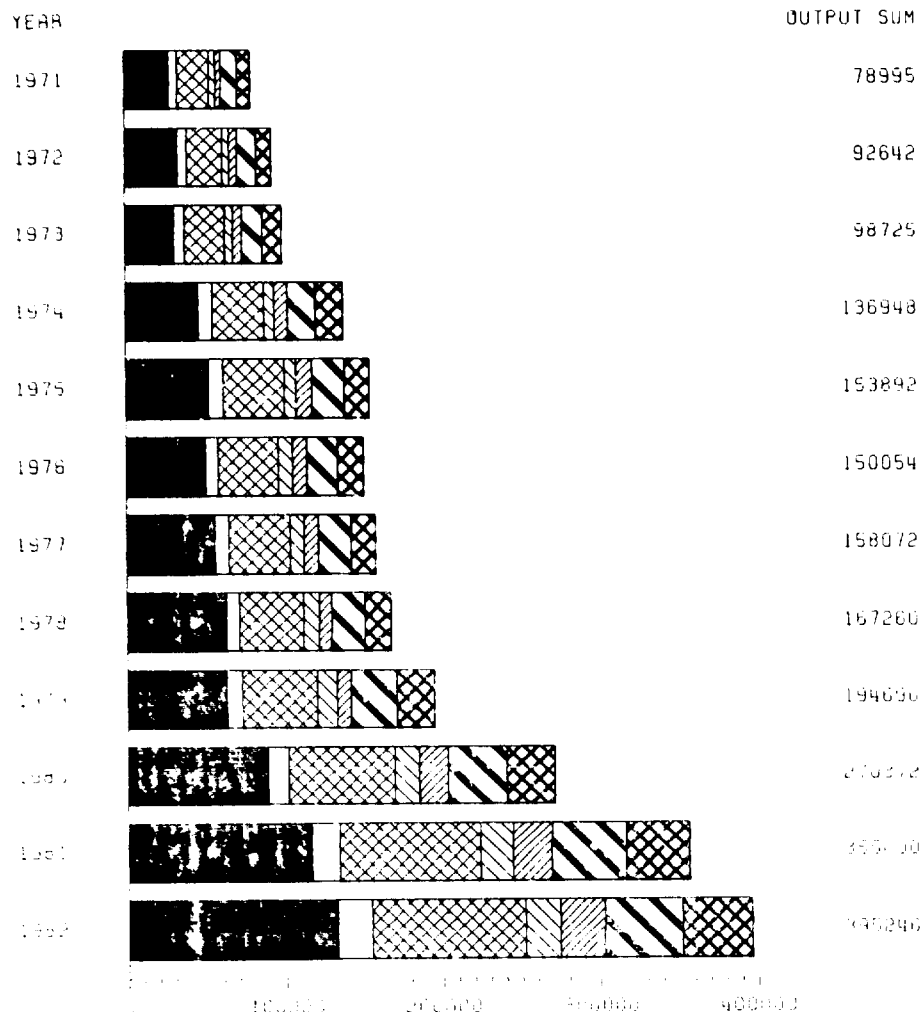
SECTOR 7: CHEMICAL AND PETROLEUM PRODUCTS

In 1982 the chemical products group accounted for 13 per cent of manufacturing gross output (12.6 per cent of net output) and 7 per cent of employment. The chemical sector produces a wide variety of chemicals all categorised according to their major end uses, viz: fertilizers, pesticides and insecticides, plastics, elastomers (synthetic rubbers), synthetic fibres and heavy chemicals, e.g. detergent, alkylate, ethylene glycol, etc. Each of these categories is a specialised industry represented under the various subsectors of the group:

SUB-SECTORAL SHARES OF SECTORAL GROSS OUTPUT SUB-SECTORAL SHARES OF SECTORAL GROSS OUTPUT

SECTOR=7 CHEMICALS

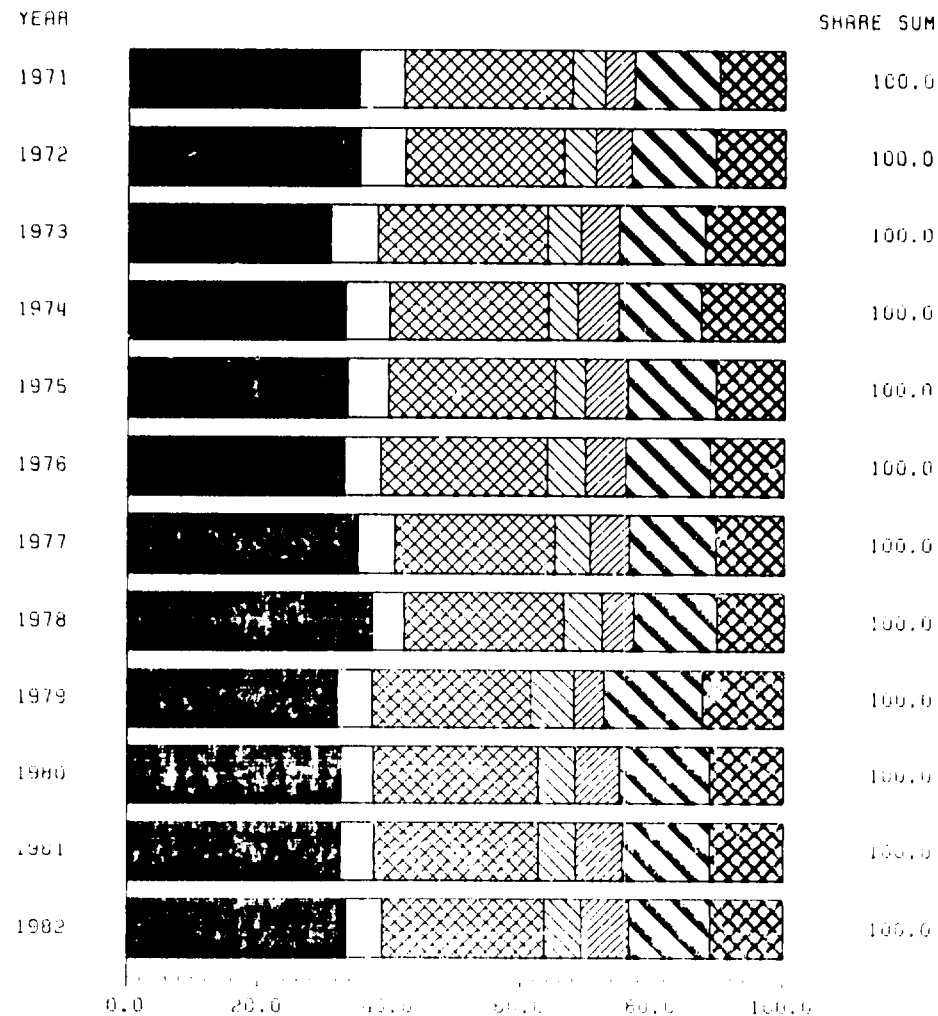
SECTOR=7 CHEMICALS



OUTPUT SUM



VALUES IN THOUSANDS OF CURRENT DOLLARS



SUB-SECTOR



SHARES BASED ON VALUES IN CURRENT PRICES

Fertilizers, insecticides and pesticides, (19)
Paints, varnishes and filling materials, (20)
Soaps, detergents, toilet preparations and pharmaceuticals, (21)
Matches, inks, candles, glues, polishes and other chemical products, (22)
Basic industrial chemicals, chemical products and gases, (23) and
Plastic Products. (24)

19. Fertilizers, insecticides and pesticides

In 1982 gross output of the subsector totalled \$131.9 million which represented 33 per cent of the chemical group's total gross output (18 per cent of net output). The subsector grew at high rates during the period 1967 - 1974 when its output average growth rate was 18.6 per cent per annum and value added was 20.2 per cent. The rates slowed down in the 1974-1982 period to 14.2 per cent and 9.4 per cent respectively. This subsector has a high concentration of production with only 4 firms in production in 1982. By value, fertilizers were 89 per cent of output in 1981.

Zimbabwe uses all the three categories of fertilizers, namely: nitrogenous, phosphatics and potash. Nitrogenous fertilizers and phosphatics are produced locally. Ammonium nitrate (AN) is produced from ammonia and nitric acid by Sable Chemical Industries. The feedstock ammonia used in the production of nitric acid and AN is also produced by Sable Chemicals via electrolytically derived hydrogen using about 20 per cent of national electric usage as the raw material.^{12/} A shortfall in the local production of ammonia is met by an importation of anhydrous ammonia which has averaged over 30,000 tonnes in the period 1980-1983.^{13/}

Imported ammonia has enabled Sable to increase AN production to more than 200,00 tonnes per year (average 215,000 for 1981-1983). Besides the proposals to install more capacity for production of nitric acid and AN in order to meet increased demand for AN, Zimbabwe should be also looking at the gasification of coal which will induce forward a number of varied technological processes besides ammonia production (See Chapter 9, Import Substitution).

The other locally produced fertilizer is the phosphatic fertilizer produced from phosphate rock (from Dorowa), pyrites (also locally produced) and imported sulphur. The shortfall in the local production of phosphate rock and sulphuric acid is imported, the latter amounting to approximately 25,000 tonnes per year. Imports of fertilizers are cheaper through Beira and Maputo via Chicualacuala than via South African ports. For example, the Beira route is 46 per cent cheaper than Maputo via Chicualacuala and the latter is 22 per cent cheaper than Maputo via the Transvaal border.^{14/} But there is still the possibility of importing sulphuric acid from Zambia which might turn out to be cheaper and have the spin-off of promoting intra-SADCC trade which Zimbabwe needs desperately as an outlet for her manufactured products.

Only two firms, Zimbabwe Fertilizer Company (ZFC) and Windmill share the production and marketing of compounds in Zimbabwe. For their production these firms import urea and sulphate of ammonia and other lesser inputs. Since 1982, as in the case of all other imports, fertilizer imports are affected by the surtax rate of 20 per cent. A long-term plan for the production of fertilizer in Zimbabwe should be looking into all possibilities for replacing the electrolysis route of producing ammonia which already is excessively expensive for Zimbabwe's users of fertilizers.

In the 1984-1985 season Zimbabwe's pesticides consumption in the form of crop chemicals, herbicides, insecticides, fungicides, seed dressings, soil fumigants and other pesticides totalled about 9,400 solids (T) and liquids (KL).^{15/} In addition DDT, Fenitrothion and some Endosulfur required for health control programmes, totalled about 400 tonnes per annum. Four firms, Shell Chemicals (Zimbabwe) Ltd., Agricura Pvt Ltd., Windmill Pvt. Ltd., and ZFC Ltd. formulate and manufacture various types of crop chemicals. Copper oxychloride technical pesticide used by tobacco, tea and coffee is also manufactured in Zimbabwe by Cecon Enterprises which has a capacity of 750 TPA. The only major pesticides not produced in the country is Ethylene Dibromide and Methyl Bromide.

A recent SADCC study has proposed the manufacture of Malathion as a substitute for DDT within the SADCC region. SADCC is estimated to require about 810 tonnes of Malathion which is expected to grow to about 1,430 tonnes by 1990. For details on product range and plant capacity see the Commonwealth study.^{16/}

20. Paints, varnishes and filling materials

This is the smallest subsector in the chemical industry group with a gross output total of \$22 million in 1982 representing only 5.6 per cent. The 1974 - 1982 average growth rate was 11.7 per cent per annum for output and 17.8 per cent for value added. During the same period the subsector experienced a negative average growth rate of -2.7 per cent for employment. The subsector is quite capital intensive, with a gross output of \$37,948 per employee in 1982, compared to \$17,301 for the manufacturing sector as a whole.

There were only 6 firms in the subsector in 1982. Because of lack of building activity demand for paints is adversely affected. The manufacture of paints is also based on imported components, but the local value added had maintained a steady high growth of 18 per cent per year during the long period from 1967 to 1982.

21. Soaps, detergents, total preparation and pharmaceuticals

Out of a total output of \$97 million in 1982, the subsector's (21) major commodity outputs were:

- | | | |
|-------|-------------------------------|-----------------|
| (i) | soap, detergents, cleaners | (35 per cent) |
| (ii) | vegetable oils, margarine | (20 per cent) |
| (iii) | medicinal and pharmaceuticals | (19.8 per cent) |
| (iv) | toiletries and cosmetics | (19.5 per cent) |

About 24 per cent of the output of this subsector seem to be misplaced. These include fruit and vegetables and jams, cheese, stockfeeds, watches and clothes. Notwithstanding this in 1982 the gross output of the subsector represented 24.5 per cent of the chemicals group. During the same year there were 30 firms in the subsector.

The manufacture of soaps, detergents and toilet preparation has not been affected by the slump to the same degree as other subsectors. The subsector is a hub of foreign firms with quite advanced products in terms of technology processes used. Local and export demand have been increasing in recent years.

The pharmaceutical industry produces for domestic and export markets. It is generally assumed that exports to the neighbouring countries will continue to expand as these products are essential items. The Zimbabwean industry, therefore, needs to make provision for meeting this demand and for maintaining product quality and diversification as the export market requires. There is an important role for the state through its interest in CAPS Ltd.

22. Matches, inks, candles, glues, polishes and other chemical products

This is among the small subsectors (22), second only to the paints groups but it has experienced quite high growth rates in recent years. Between 1974 and 1982 the average growth rates per year were 17 per cent for output, 16.5 per cent for value added and 18 per cent for wages, and 5.6 per cent for labour. The 1979-1982 growth rate figures are even more impressive: 21 per cent for gross output and 22 per cent for net output. Matches are in fact 11 per cent of output, the largest item being chemical products not elsewhere specified (69 per cent).

In spite of the drought and the general downturn in the economy, demand for these products has not fallen. Matches have been exported to Zaire in the past, but there few prospects for exports to the region.

23. Basic industrial chemicals, petroleum products and gases

During the 1967-1974 period the subsector's (23) gross output and value added had yearly averaged growth rates of 24.6 per cent and 29 per cent. In the 1974-1982 period these rates slowed down to 16 per cent and 7 per cent respectively.

The products under this subsector include manufacture of basic industrial chemicals, except fertilizers (e.g., sulphuric acid, phosphoric acid and aluminium sulphate), petroleum refineries such as lubricating oils and manufacture of coal and petroleum products. Manufacture of benzol from Hwange and Zisco, gases such as oxygen from Sable and other gases including liquid gases represented around 23 per cent of the subsector's output in 1981.

The subsector has scope for further development, particularly in the area of gases: oxygen, nitrogen and carbon dioxide (see Chapter 9).

24. Rubber products

The subsector's (24) gross output grew from \$17.2 million (\$8.4 million net) in 1974 to \$49.16 million (25.1 million net) in 1982, representing an average annual growth rate of 14 per cent. During the same period average annual growth rates of value added and wages were 12 per cent and 17 per cent respectively. In 1982 net output of the subsector represented 16.7 per cent of the chemicals group and 17.6 per cent of the group's total employment.

In 1982 there were 23 firms in the subsector. The main products are tyres and retreads, which in 1981 represented 66 per cent of total production of the subsector. Other products include industrial rubber products, tubes, gaskets, conveyor belts, hoses and tiles.

The subsector's main material inputs, rubber (40 per cent in 1982), synthetic resins and man-made fibres (12 per cent), chemical products (11 per cent) are almost all exclusively imported products which give the subsector a high import dependence. But the demand of the rubber products and the subsector's interlinkages with the rest of the economy makes it absolutely imperative that the manufacture of rubber products, especially tyres, be increased. Tyres are being exported to the SADCC and PTA region. The efficiency of production is critically dependent upon volumes, and these in turn depend on receiving adequate foreign exchange allocations. A recent feature of the application of the export revolving fund has been to increase production for export orders at the expense of local demand. While this trend has beneficial features as it leads to immediate increased net foreign exchange earnings, the negative features of satisfying export orders at the expense of meeting local demand need to be highlighted. Because of the critical need for tyres through all sectors, shortages have profound ripple effects across the national economy. The effects are not only to reduce the efficiency of local producers but also, indirectly, to place obstacles in the way for other exporters who need tyres as an intermediate input. Indeed it is not hard to envisage a case where maximising tyre exports at the expense of local demand could be leading to lower overall export earnings because of the shortfall produced on the local market.

25. Plastic products

In 1967 - 1974 the subsector had high and steady average growth rates of 24 per cent for gross output and 28 per cent for value added per annum. The plastic industry is well diversified. Its main products are plastic containers (46 per cent of total output of the subsector), various types of plastic products, asphalt, bitumen and tar. According to statistics textile fabrics, pulp, paper and paperboard are included under this subsector.

Synthetic resins, which make up 62 per cent of the subsector's inputs are imported. Industrial plastic products used as inputs in the subsector are mainly based on imported inputs. PVC compounding is undertaken by Tregers which is the supplier of PVC products in both the local and export markets.

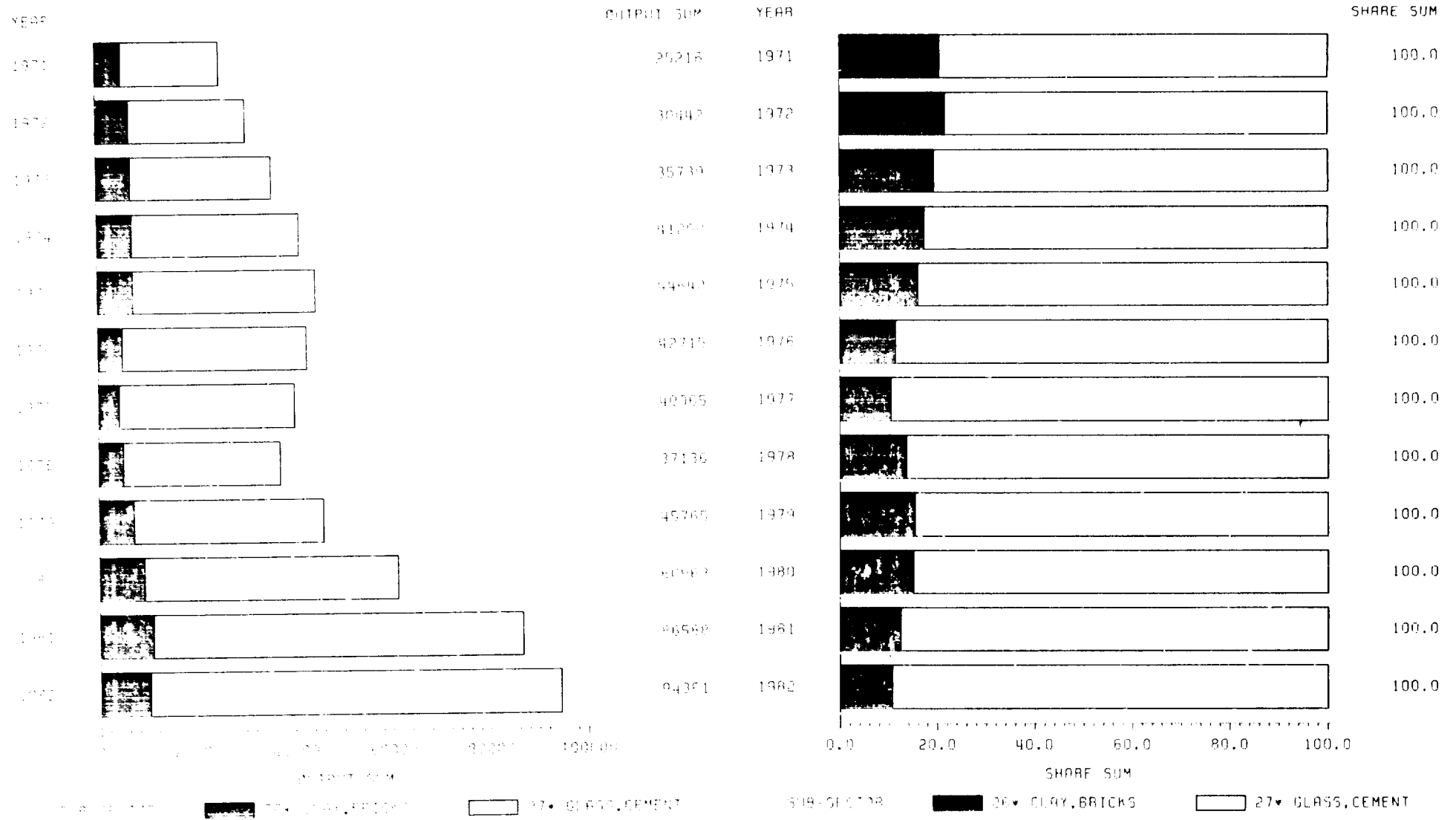
Increasing of the local content would be possible if vinyl chlorides were manufactured locally. The matter of a minimum economic plant capacity is at present inhibiting progress in this area, but efforts should not be spared in looking for a small output facility for the production of vinyl chlorides. Plastic products are more likely to substitute for many other products in the packaging and container industries, and provide exports to the neighbouring countries. Care should, however be taken that the expansion of plastic products is not done at the expense of other packaging products, e.g. paper products.

SECTOR 8: NON-METALLIC MINERAL PRODUCTS

In 1982 this group's gross output totalled \$94.4 million or 3 per cent of total manufacturing gross output (net output was 4.5 per cent of total), and employment was 7,818 persons representing 4.4 per cent of total employment. Also in 1982 there were 58 operating firms in the group. The main products of the group include cement and cement products, clay products, bricks, asbestos, concrete products, glass and glass products, pottery and ceramics.

The non-metallic mineral products group is basically a resource-based subsector in the sense that it relies largely on locally mined and processed inputs for its production. The major inputs are metal products, cement, asbestos, clay and sand, paper containers and cartons, and glass.

SUB-SECTORAL SHARES OF SECTORAL GROSS OUTPUT SUB-SECTORAL SHARES OF SECTORAL GROSS OUTPUT
 SECTOR=8 NON-MET.MINS SECTOR=8 NON-MET.MINS



VALUES IN THOUSANDS OF CURRENT DOLLARS

SHARES BASED ON VALUES IN CURRENT PRICES

26. Structural clay products including bricks

Firms in this subsector account for only 10 per cent of total gross output for the non-metallic minerals group, and 24 per cent of the group's employment. In the 1974 - 1982 period this subsector had low growth as shown by annual average growth rates of 4 per cent for output and 3 per cent for value added. The annual average growth rate of employment fell substantially by -7 per cent per annum during the same period. There was a short-term upturn in the products of the subsector following independence, but since the building industry slackened, the demand for the subsector's products has again fallen.

The subsector is labour intensive, with an average gross output of only \$5,000 per employee in 1982. Increasing of employment can, therefore, be enhanced by rapid expansion of structural clay products and bricks production.

27. Glass, cement products and other non-metallic mineral products

Both the gross and net output of this subsector account for around 89 per cent of the Non-metallic minerals group. The five major products of the sector are: cement (30 per cent of the subsector's total output), asbestos excluding tiles (24 per cent), concrete products (15 per cent), glass containers (10 per cent) and glass panes and sheets (6 per cent). During the period 1967-1974 the subsector maintained high and steady average growth rates of 19 per cent for gross output and 18 per cent for value added per annum. The annual average growth rates of gross and net output during the 1979-82 period were 30 per cent and 32 per cent respectively, which was higher than the average annual growth rates of manufacturing of 21.9 per cent and 28.8 per cent respectively. Zimbabwe has at present installed capacity of 1,080,000 tonnes per annum and only produced about 50 per cent of this capacity in 1980/81.^{17/} The main determinant of cement production in Zimbabwe has been the local building industry and the growth of other sectors, e.g., irrigation and transport. Exports, mainly to Botswana and Malawi averaged 8 per cent of total sales during the 1973-1981 period.^{18/}

SECTOR 9: METALS AND METAL PRODUCTS

This is the largest subsector in Zimbabwe's manufacturing sector, measured in terms of gross output, net output, number of firms and employment. In 1982 the group had 408 firms, accounting for 29 per cent of the total number of firms in the manufacturing sector, 21 per cent of total gross output, 23 per cent of total net output and 24 per cent of total employment. The metals and metal products group is the most diversified in terms of the range of commodities produced and different end-users of the products in the economy. The interlinkages between this group and all other sectors in the economy are probably the most developed and yet the subsector still has the greatest potential for further development of linkages. The group's products are used as intermediate goods, machinery and equipment by the manufacturing sector itself, the agricultural sector, mining, construction, transport, energy and telecommunications.

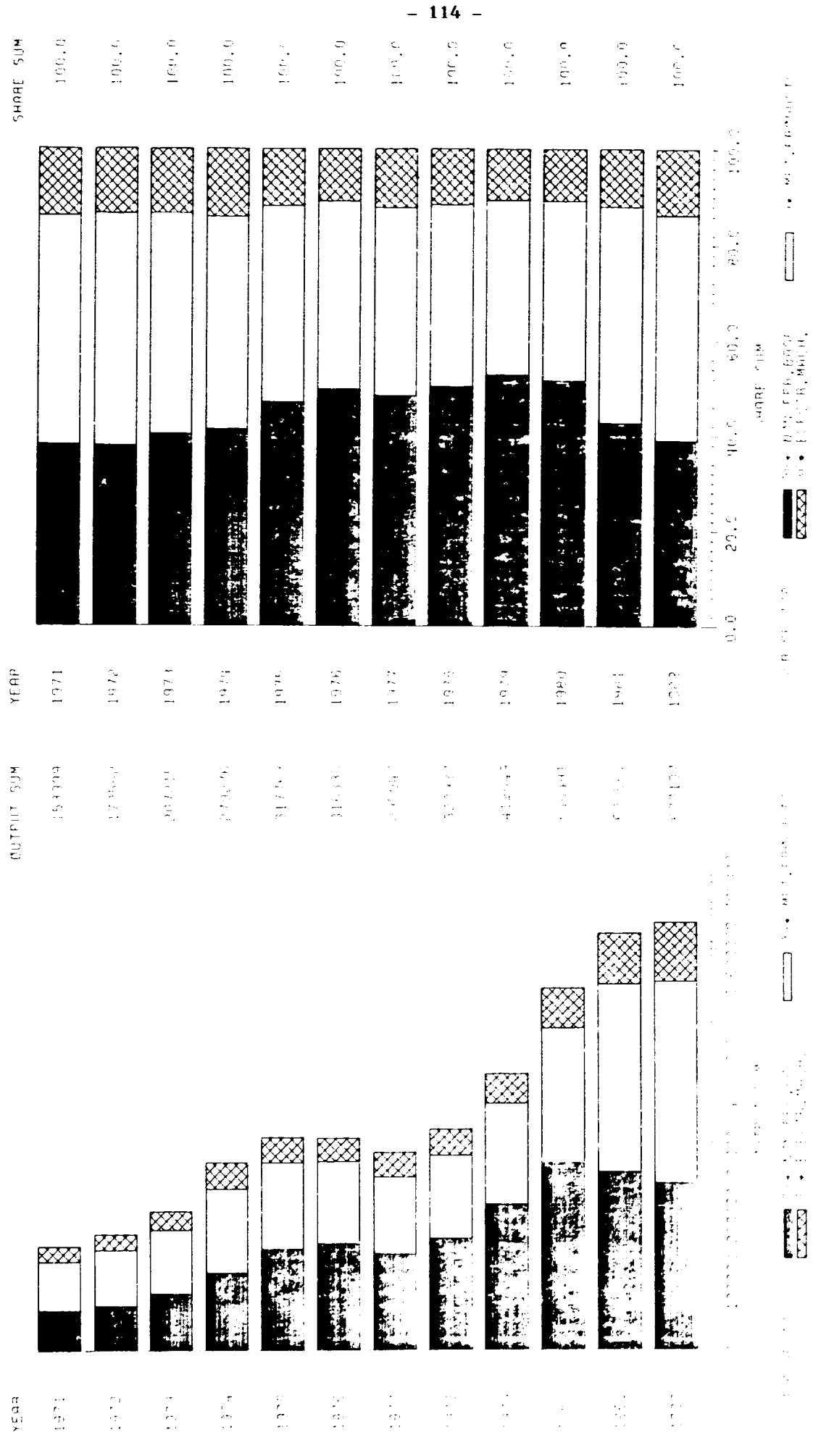
Gross and net output grew steadily at an average of 20 per cent and 21 per cent per annum respectively from 1967 to 1974. These high growth rates are attributed to sanctions and the import substitution that developed in order to supply both consumer and intermediate goods during this period.

28. Non-ferrous metal and iron and steel basic industries including smelting (Iron and Steel Only)

This is the second largest subsector in the metals and metal products group. In 1982 its gross output was \$248.5 million representing 39 per cent of the group's total, 31 per cent of total net output and 37 per cent of total employment. During the 1967-1982 period average annual growth rates were 23.8 per cent for gross output, 13.5 per cent for value added and 17.8 per cent for wages. In the 1974-1982 period growth slowed significantly to 10 per cent per year for output, 3 per cent per year for value added and 14.9 per cent for wages per annum. Between 1980 and 1982 gross output and net output registered negative average annual growth rates of -5.5 per cent and -17 per cent respectively.

In 1982 over 90 per cent of the products of the subsector were accounted for by the following five products: iron and steel basic industry products (35.5 per cent of the branch's output), ferro alloys (34.6 per cent), finished industrial metal products (11 per cent), wire, including galvanized, excluding

SUB-SECTORAL SHARES OF SECTORAL GROSS OUTPUT SUB-SECTORAL SHARES OF SECTORAL GROSS OUTPUT
SECTOR=9 METALS SECTOR=9 METALS



copper (6 per cent), and non-ferrous metal basic products 6 per cent. During the 1979-1983 period ZISCO's total operating costs, expressed in dollars per tonne of liquid steel, went up by 49 per cent and financial charges by 13.6 per cent. ZISCO's main export products, blooms and billets, average export price per tonne fell by -17.6 per cent during this period.^{19/} Thus, though the average export sales price per tonne was finally positive (17 per cent), ZISCO has not benefited as it is not a main exporter of medium and light mills which fetch good prices in the market.

This subsector has a high local content as most of its inputs are locally sourced. Out of a massive input bill of \$164.5 million in 1982, well over 70 per cent was made up of local inputs. The main locally sourced inputs were iron and steel basic industry (30.9 per cent), iron ore (15 per cent), chrome (11 per cent), non-ferrous metal basic products (7.2 per cent), and bricks (6.5 per cent). The major imported inputs which are likely to have a significant proportion of foreign content is what is termed metal products, machinery and spares which amounted to 10 per cent of total inputs in 1982.

Because this subsector is heavily dependent on the world market, the fall in the world prices of steel and metallic minerals contributed to its poor performance. A greater proportion of ZISCO products (about 80 per cent) and much more for non-ferrous products is for export, which means that efficiency of production is of major importance both in mining and processing of inputs, mainstream production processes, and transporting of the products.

In spite of these current problems of the iron and steel industry, the authors of the present study do not agree with the proposition put forward by the Jansen study^{20/} that because firms in this subsector were found to be inefficient in terms of the DRC measurement, the country would save foreign exchange, even in the short-run, by closing them down. In fact, the statement that "Zimbabwe produces a fairly limited selection of steel products, and much of the steel used in the country, all plate steel and sheet metal is imported" is incorrect and misleading. Although at present CSO data on inputs does not differentiate between local sourced and imported inputs, plate and sheet metal should come under "metal products" which even when lumped together with machinery and spares still amount to 10 per cent of both subsectors 28 and 29 taken individually. As seen in the chapters on Linkages (Chapter 4), Technology (Chapter 8) and Import Substitution, (Chapter 9) subsectors 28 and 29 form the basis and feedstock for development of the manufacturing sector.

Because of the error of statistics in 1982 \$25.3 million, representing 8.7 per cent of the subsector's output consisted of misclassified items including such a wide range of products as plastics, insecticides, paper products, textiles, opaque beer and maize grain (see Chapter 2 for a detailed discussion on the incorrectness of the statistics).

29. Metal products, machinery and equipment other than electrical except vehicles

This is the largest subsector in the metals and metal products group with gross output in 1982 of \$302.1 million representing 47 per cent of the group's total output, and with 54 per cent of total net output, 48 per cent of wages and salaries and 51 per cent of employment. The subsector's growth was consistently high during the 1967-1974 period: 22.6 per cent per year for gross output, 22.8 per cent per year for value added, 20.8 per cent for wages and 14 per cent for employment per annum. During the 1974-1982 period annual average growth rates fell to 11.6 per cent for gross output, 12.6 per cent for value added, 13 per cent for wages and 0.3 per cent for employment per annum. The subsector still had positive growth rates between 1980 and 1982 of 22 per cent and 21 per cent for gross and net output respectively, although it is likely that these will have drastically fallen in the post 1982 period.

There were 300 firms in this subsector in 1982 representing 74 per cent of the group's total. Firm activity in this subsector includes the heavy engineering firms involved in design and production of machinery equipment and spares for other industries. There is also a great deal of general jobbing and maintenance activity. Whilst many of these firms were originally stimulated by the mining sector the slowing down of that sector in recent years has meant that firms have had to change either their product range or move toward product designs rather than wait to build plant and equipment according to customers specification. R & D activity would aid in this restructuring particularly for many heavy engineering firms which have large overheads (see Chapter 8 on Technology).

Firms in the light metal fabrication and agricultural implementation came out less affected by the slump than those specialised in heavy mining equipment. Light metal fabrication includes the manufacture of sheet metal

products, metal containers for food and other products, holloware and other light metal products. Both the domestic and export markets for these products are still expanding.

Agricultural implements production includes a wide variety of products including tractor-drawn implements for the large-scale commercial farming sector, irrigation equipment, agricultural boilers for tobacco farmers, coffee processing machines, tobacco curing equipment and implements for the small-scale peasant sector. Zimbabwean firms have built up a reputation of original design in the production of agricultural implements and equipment that is suitable to local agricultural conditions. Firms in this group have been exporting to neighbouring countries. Most of the steel used in the production of agricultural implements is locally produced. Imported sheet steels are used for the manufacture of specialised parts of implements but this represent a small proportion of the implements both by mass and value.

30. Electrical machinery and equipment and communications equipment

Out of a total output of \$75.5 million produced in this subsector in 1982, 23 per cent consisted of radios, stereos, televisions, etc., 21 per cent electric cable and wire, 17 per cent industrial electrical equipment, 14 per cent batteries, 11.5 per cent electrical machinery, and 7 per cent electrical domestic appliances, with the rest consisting of other household and industrial electrical goods including geysers, cookers and stoves, communications equipment, copper metal and copper sheeting. In the 1974-1982 period the subsector's growth rates were 10.6 per cent for gross output, 15 per cent for value added, 14 per cent for wages and salaries and 0.6 per cent for employment per annum. Between 1980 and 1982 the subsector had average annual growth rates of 23 per cent and 28 per cent for gross and net output respectively.

Because a large proportion of the value of total inputs used by the subsector are imported materials the subsector has been negatively affected by foreign exchange cuts. The production of radios, stereos etc., has been fairly stable but production would increase if allocations were increased. Production of electric cables and wire, the next largest commodity group in the subsector, purchases about 95 per cent of its raw materials from local manufacturers even though part of this output itself contains imported components.

Table 3.4 below shows the number of companies largely from the metal products group, which supply the PTC with its needed inputs for the 1984/85 period. The majority of the inputs are from local manufacturers. Such a supply or order chart for a large parastatal indicates the degree of its integration with local manufacturers. The strategy for the expansion and procurement policy of parastatals or public utilities is critical for the development of local manufacturing. The drawing of plans for the projects of each public utility needs to be done in the light of existing technological capabilities, either to advance these in terms of pointing to new directions for sources of inputs or destination of outputs for either local use or for exports or both.

It is, therefore, absolutely necessary that an input procurement policy of parastatals, public corporations and ministries like Defence, Construction be established. On the basis of the existing supplies, more capacities would then be built in response to the "state of the art" in product designs and specifications, or in accordance with the specifications of the users. This list need not be inflexible as it will change depending on the availability of new products, substitutes, or lack of earlier known products or processes.

Such a scheme would if implemented through regular and reliable information flows enable the Ministry of Industry and Technology to anticipate new needs, to identify and alert potential local suppliers, especially those with underutilized capacity, and, equally importantly, to reduce the imports of externally originating equipment. These points are taken up again in later chapters, especially Chapter 6, Government Policies and Objectives, and in Vol. I of this study. The information exchange process would also assist the monitoring of trends in equipment installation and the degree to which labour intensity and employment generation were being considered.

Discussions with the management of the PTC brought forward new products which are distinct possibilities for local manufacture or assembly, namely: telephone instruments, underground telephone cables, copper covered steel wire, radio-telephone systems, power equipment and air-conditioning, public call boxes, PABXs and teleprinters. These are obviously new areas for import substitution that can be taken up on an item by item basis. One view is that given the existing excess capacities in the current operating firms, new

product lines should always be built into the scale of the present operations. Two recent examples of increasing local manufacture have been (i) the manufacture of radio sets for the Ministry of Defense by an additional unit in an existing local company; and (ii) production of PABXs and telephone sets by WRS with the financial assistance from Yugoslav sources.

SECTOR 10: TRANSPORT EQUIPMENT

Firms in this group manufacture vehicle bodies, trailers for motor vehicles and trucks, motor spare parts and components, rolling stock, boats, bicycles, etc. In 1982 the group's output both gross and net and employment were each 3 per cent of total manufacturing. Two subsectors come under this group, viz:

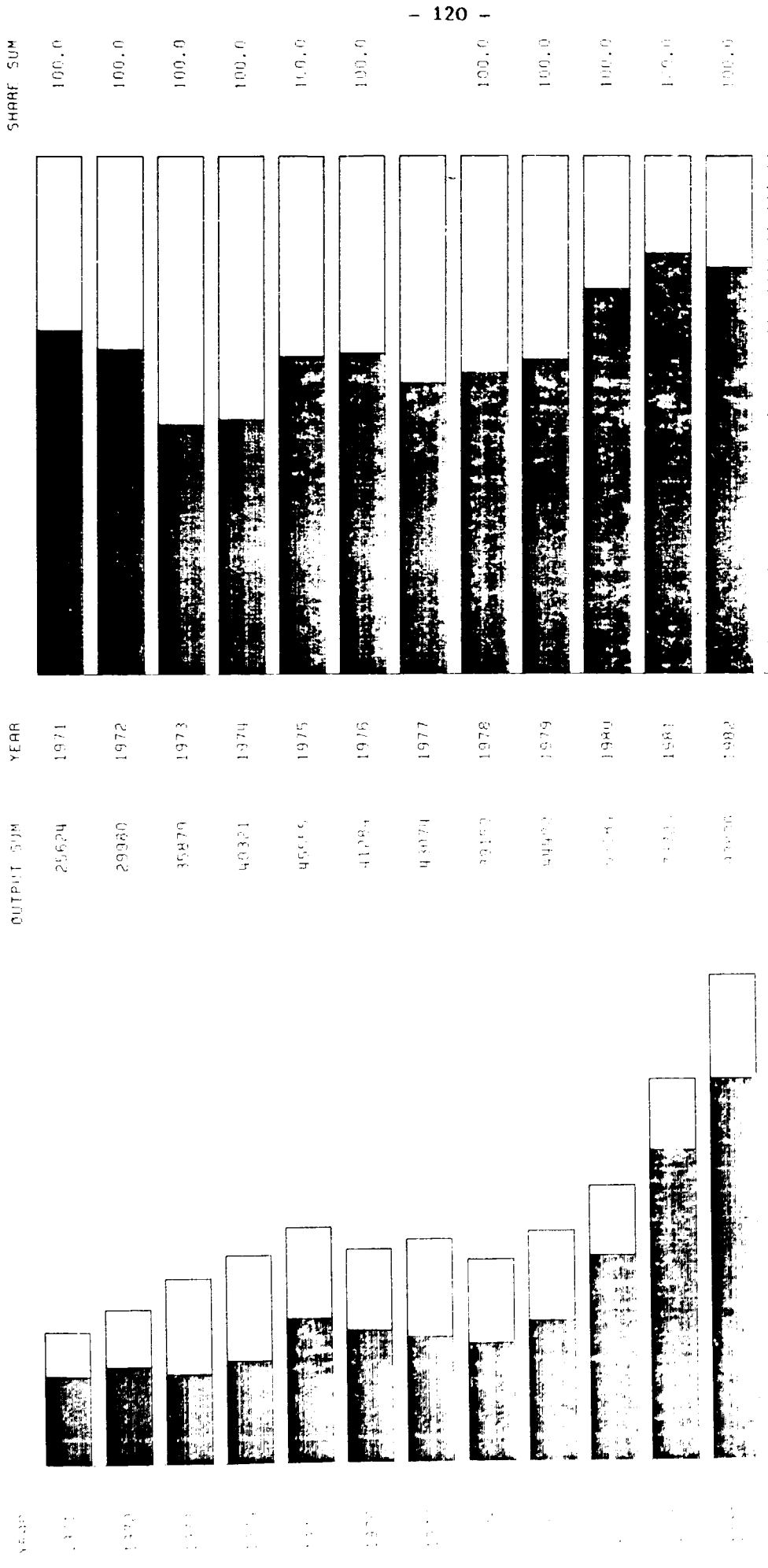
- Motor vehicles including reconditioning; (31)
- Other vehicles and equipment including repairs (32).

31. Motor vehicles including reconditioning

In 1982 this subsector had 32 firms representing 70 per cent of firms in the Transport Equipment group, and accounted for 78 per cent of both total gross output and employment. During the 1967-1974 period the subsector grew rapidly at 20.5 per cent per year for gross output, 40 per cent for value added, 13.7 per cent for wages and 12 per cent for labour per annum. High growth rates were maintained, though at a slightly reduced rate in the 1974-1982 period. In the 1980 - 1982 period the subsector maintained annual average growth rates of 36 per cent and 30 per cent for gross and net output respectively.

In 1981 the subsector's major commodity outputs were motor vehicle bodies (62 per cent), trailers for trucks and other vehicles (15 per cent), motor spares and accessories (10 per cent), metal products, machinery and spares (6 per cent), and assembled motor vehicles (5.5 per cent) and caravans (2 per cent). The main activity of the subsector is motor vehicle bodies, which has a high local content.

SUB-SECTORAL SHARES OF SECTORAL GROSS OUTPUT SUB--SECTORAL SHARES OF SECTORAL GROSS OUTPUT
 SECTORAL TRANSPORT EQ. SECTORAL TRANSPORT EQ.



Source: Bureau of Economic Analysis, Department of Commerce

Table 3.4: Local companies supplying the PTC orders 1984/85

Commodity Group	Number of Suppliers	Products Supplied by Local Manufacturers	Number of Cases and Products supplied by local agents of External Suppliers
Cable Network	26	Tube asbestos, paroline, copper wire, wire, bars & iron, N/S plates, cover slabs, hook clamps, shelves, angle iron, fuse base, PVC pipe, polythene tubing, steel rivet, iron sheeting, angle iron, telex tesin.	(1) modules
Overhead Line Network	14	G.I. wire, wooden poles, rods stay, straps congnier collars, O/S line materials, straps, clips, bolts and washers, arms.	NIL
Subscriber Apparatus	14	Tape, poles, instal. E PABX (services only) Kaylite box, batts E. PABX' Switch, Spares, To. D.P. Box.	(3) Mains Cable, sprague connectors, Elys UH PABX.
Telegraph Apparatus	1		(1) Teleprinter spare parts.
Switching Plant	56	Hard board, pos. battery & neg. battery, thinners, paint, iron rods, flat bar, angle, flat, bars, Iron, (MCB) Trinopen, cable rugs, trunking, copper sheet, bison board, inverter, batteries, line film, plastic chair, design plates, rust remover, designation plates, nuts and bolts.	(14) lighting equipment, heat shrink, bison boards, wire cable, resistors, systoflex, uniselector, power cable, MK6 components.
Transmission Plant	40	Brass strip, warning plate, chargers, power Consultants (services) PVC trunking, earthen-wire and CCT brackets, timber meranti?	(10) Stand-by gensets, power cable, sprs, Un. PABX, Earthenwira, steel conduit, electrical material, fuses GEC 35 PVC cable, stand-by Gen. Plant.
Masts	11	Pipes, radio towers, radio masts, earthing masts, masts 2 CHZ, masts TR col, steel rope.	NIL
Testing Equipment	3	Pulse echo locator, discs, Watt meter	NIL
Drawing Office Equip.	4		(4) 254 Printer, MP 400 Pr' ters
Engineering College	3		(3) Acetate sheet, power spares, electric typewriter.
Factory Plant	10	dish, shafting bar, conduit steel	(7) Tools, valve, concrete mixer, generators, multimeter, Photocopier.
Contract Work	48	Screw & clips, brackets, des. strips, PCBs, Comm. Radios, Road Fair Range, Antenna Erect, Transformer, Repair Fridge, Blasting, Designation Plates, maintenance E. PABX, Fibre glass, crane hire, Air compressors, Teneval 7397, Airplant, PCB thru Hole, Program Modification, Consultancy Services, Gold Plate PCBs, Programme ISC	

Source: Data supplied by PTC Management

Notes: The column on the number of suppliers can list any firm one or more times depending on the number of times a particular firm is supplying different products under different commodity groups.

The most expensive inputs going into the subsector are motor spares, accessories including completely knocked down (CKD) kits, which were 38 per cent of the subsector's total inputs in 1982. For local content to be further increased, continuous policy assessment should be maintained to assess those elements of this input component for every model that is manufactured or assembled locally in order to improve on the local content. What is probably of greater importance, however, is to consider reducing the range of models assembled so as to be able to standardise on spare parts, maintenance equipment and skills. There can be no doubt that the present wide proliferation of the number of tractor and private fleet vehicle models militates seriously against increasing local content.

Other major inputs used in the subsector, e.g., iron and steel products (19 per cent) and industrial rubber products (9 per cent) will in turn increase their local content as they improve their scale of operations in response to increases in the demand for their products.

32. Other vehicles and equipment including repairs

This subsector comprises manufacture of railroad equipment, motorcycles and bicycles, aircraft and other transport equipment. Whilst the subsector's growth rate was more or less on a par with that of other sectors in the 1967-1974 period, it was one of the worst hit by intensification of war and sanctions in the post 1974 period. The 1974-1982 annual growth rates were as follows: -0.2 per cent for gross output, 0.3 per cent for value added, -0.4 per cent for wages and -8 per cent for labour. It is obvious that the growth rates picked up once more in the 1980-82 following the rehabilitation of the national railways and the electrification programme. Gross output and net output had average annual growth rates of 21.6 per cent and 9.6 per cent respectively in the 1980-82 period.

In 1982 the major outputs of the subsector were boats (25 per cent), rolling stock (24.5 per cent), bicycles (18 per cent) metal products, machinery and spares (14 per cent) and trailers for trucks, etc. (13 per cent). There is great scope for growth in this sector if the railways programme of electrification is allowed to proceed as soon as possible, and if the exports of rolling stock are sustained in the PTA and to other African countries outside of the PTA area. Another area of potential growth for

Zimbabwe is the repair and overhauling of aircraft and equipment. This activity is an area of potential growth for Zimbabwe both for the maintenance of the local military and civilian fleet and for the repair and overhauling of foreign engines. At present there is repair of British, Australian, and SADCC/PTA aircraft equipment by Field Aircraft Services in Harare.

SECTOR 11: OTHER

33. Other manufacturing industries

This subsector is composed of three parts:

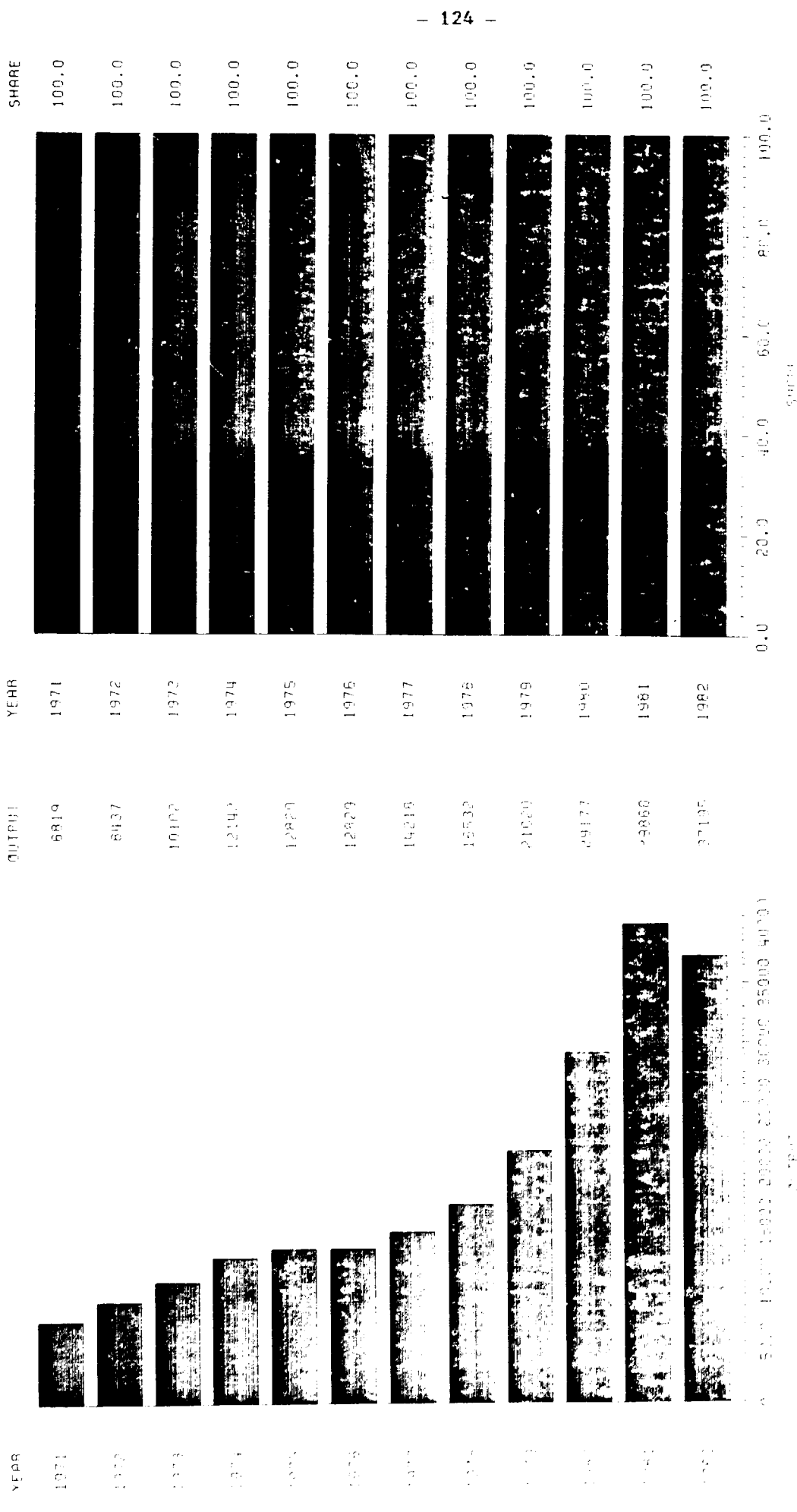
- (i) manufacture of leather and products of leather except footwear and wearing apparel;
- (ii) manufacture of professional and scientific, and measuring and controlling equipment and of photographic and optical goods; and
- (iii) other manufacturing industries.

Out of a total of the subsector's output of \$39.7 million in 1982, its major components include the following: a category defined as other not elsewhere specified (33 per cent), hides and skins (20 per cent), jewellery and engraving (12 per cent), curios (9 per cent), brushware (7.6 per cent), leather and synthetic bags (5.7 per cent), scientific/professional equipment (5.3 per cent) and other lesser commodities in terms of their output value.

This subsector is very heterogeneous and aggregate information as to its inputs is not very helpful, because these would in most cases be specific to particular activities within this subsector. Again, the largest single product of this subsector (other, commodity code 2990) is not defined at all, even though it was valued at \$13 million in 1981.

One does not know what types of inputs go into the production of the category other, a point that must be clarified if planning information is to be as precise as possible. Hides and skins is an industry with a potential for the export markets, although higher value added would accrue if both shoes, travel goods, baggage, etc., were manufactured from these hides and skins.

SUB-SECTORAL SHARES OF SECTORAL GROSS OUTPUT SUB--SECTORAL SHARES OF SECTORAL GROSS OUTPUT



SHARES BASED ON VALUE IN CURRENT PRICES

Notes and references to Chapter 3

- 1/ Commercial Agriculture in Zimbabwe 1984/85, published by Modern Farming Publications Trust, Harare, p. 27
- 2/ The figure was obtained in the process of an interview with management of the CSC.
- 3/ Patricia Henson and Richard Winkfield, "Grain" in Commercial Agriculture in Zimbabwe 1984/85, p. 55
- 4/ Trade figures provided by CSO.
- 5/ Douglas Pascoe, "Dairy" in Commercial Agriculture in Zimbabwe 1984;85, Ibid, p. 29
- 6/ Jansen, Doris J. Zimbabwe Government Policy and The Manufacturing Sector, Vol 1. p. 71
- 7/ Ibid p. 74
- 8/ This picture is totally different from the one painted by the president of Zimbabwe Tobacco Association (ZTA) when he remarked "Of every 100 workers in Zimbabwe 12 are employed in the tobacco industry," in Zimbabwe Tobacco Today, Vol. 8 No. 22, February, 1985, p. 8. The manufacturing activity of tobacco is certainly a cause for worry, though, of course, the ZTA does not represent tobacco manufacturers.
- 9/ Parker, C. "Cotton", in Commercial Agriculture in Zimbabwe, 1984/85, op. cit p. 71
- 10/ Jansen, Ibid. p. 79
- 11/ Philip Hayter, "Timber" in Commercial Agriculture in Zimbabwe 1984/85, op. cit. p. 95
- 12/ Report of the Commission of Inquiry Into the Agricultural Industry, Zimbabwe, (1982), p. 141
- 13/ SADCC Industrial Project Study Annesc 1. 1-10
- 14/ The Nitrogen Chemicals of Zimbabwe (NCZ) has recently reported to have extended its sulphuric acid production with a surplus of 5,000 tonnes per annum.
- 15/ SADCC: Development of Pesticides and Insecticides Manufacturing Activity, March 1985, Commonwealth Secretariat CFTC/IDU
- 16/ Ibid.
- 17/ Zimconsult: "The Cement Industry Sectors in the Countries of the SADCC" September 1982.
- 18/ Ibid
- 19/ ZISCO - Rehabilitation Study Schedule 3-2, Schedule 3-5 and p. 111/41 of 94.
- 20/ Jansen, op. cit. p. 109

Chapter Four

LINKAGES

Types of linkage

Only in the most under-developed economies do sectors exist, and sometimes grow, in isolation from one another. It is part of the development process that not only does the country concerned have a wider range of activity, with representation of some kind in more and more of the possible economic sectors, but also that these activities support one another by supplying goods and service to one another for use in the production process.

The extent to which such exchanges take place between the domestic sectors determines the degree to which the different activities of the economy form an interdependent complex. The production structure is more stable, both because its dependence on export markets and import supplies can be lessened, and also because the development of an increasing range of such linkages means that there are more market choices for individual producers in the economy.

This kind of linkage, which can be called intermediate linkage, where a domestic sector supplies or receives goods and services from another, is the most immediate one. The domestic nature of it is the most important for the economy as a whole. For instance, agriculture in a primitive stage does not use fertilizers, pesticides, or other inputs from the manufacturing sector. Development of agriculture can take place by importing these products, but if, instead, they are supplied by a domestic manufacturer (i) there is the strong likelihood of a foreign exchange saving (ii) there are increases in domestic value added and employment (iii) there is a step towards an interdependent and self-sustaining system of economic activity.

There are also less immediate linkages, but nonetheless important ones. The manufacturing sector, receiving a stimulus from agriculture, will in turn demand more inputs from other parts of the economy, and so on. These are the so-called indirect effects. Again, the increased employment will cause additional consumption and the operational surplus may go to new investment. These can be described as induced effects.

These kinds of linkages are well-known. They are restated here because the present study has as part of its terms of references the consideration of the role of the manufacturing sector in Zimbabwe as a whole. The objective is to assess not just the performance, its present condition and the future possible directions of the manufacturing sector, but also to examine how it fits into the rest of the economy, how much each sector depends on the other and, most importantly, how such links can be encouraged and strengthened in the future.

The questions for Zimbabwe are complex but correspondingly interesting. In African terms, Zimbabwe is of course unique in the size and diversity of the manufacturing sector. But it is also unique in the strength of two other sectors; agriculture and mining, which are both important foreign exchange earners and important sources of employment. This means that in the present analysis we have to consider both the highly complicated structure of transactions within the manufacturing sector itself, where the 33 sub-sectors are exchanging a very wide variety of products, and also the links between manufacturing and the other important parts of the economy.

In discussing linkages, one should ideally make several distinctions and classifications, apart from those already made between direct, indirect, and induced linkages. An important distinction is that between backward and forward linkages. A backward linkage looks at a sector from the point of view of what it needs from other sectors to carry out its production activity. Thus agriculture in the use of chemicals has a backward linkage to manufacturing. Similarly, if it produces goods that are used in the food processing sector, it has a forward linkage to the manufacturing sector.

Another important distinction is between actual and potential linkages. The need for one product in the production of another may be met through imports, but the fact of an existing demand may encourage the initiation of domestic production of that commodity to meet the demand. Thus a potential backward linkage can become an actual one if the conditions are right. Similarly the existing production of some commodity may encourage the start of new activities that make use of that commodity for new purposes. And thus a potential forward linkage can become an actual one, again in the right conditions. It seems reasonable, however, to say that potential backward

linkages are more likely to become actual than are potential forward ones. This is because the existence of a demand for a product seems more likely to induce domestic production: for a potential forward linkage to become actual means that the availability of a domestic product induces a new activity and makes use of it. In cases of critical shortages of foreign exchange this may indeed be a necessary condition for the new activity to begin, but it is not usually a sufficient condition.

A further distinction should be made in the area of investment. We referred above to intermediate linkages, where one sector uses the other's output as an input to its own production process. But investment activities also involve linkages. A decision in agriculture to buy machinery means an increased demand for manufacturing, if the equipment is made locally. A decision to construct new storage facilities is a boost directly to the construction sector, but this in turn will need building materials which are produced by the manufacturing sector. Investment linkages can be as important as intermediate ones. But, because they don't arise from a continuous process, they are usually treated separately, and cannot be seen, for instance, in a normal input-output table.

Links with agriculture

The standard national accounting division of GDP into six sectors (Agriculture, Mining, Manufacturing, Utilities, Construction and Services) place Zimbabwe's agriculture as the third largest sector, after services and manufacturing. Agriculture's share of GDP, however, has been declining. In constant prices it fell from 24.7 percent of GDP in 1963 to 19.2 percent in 1981. In the same period, manufacturing rose from 17.4 percent to 23.9 percent. It is notable that the adjustment in sectoral shares of GDP has been preponderantly between these two sectors: the other sectors have undergone much small changes.

Even the aggregate figures, however, indicate a clear linkage between the two. If agriculture has lost importance to manufacturing, the two have nevertheless exhibited very similar cyclical behaviour, rising and falling largely together over a long period. The importance of agriculture to Zimbabwe's manufacturing is obvious in several senses. Firstly, the sector,

as a major employer (about 25 percent of the workforce) and a major exporter, is critical to the health of the economy as a whole and thus to all the sectors. Secondly, the major agricultural products such as beef, tobacco, grain, and cotton all act as inputs to important manufacturing bodies such as the Cold Storage Commission, the Dairy Marketing Board and the Cotton Marketing Board. Thirdly, the high concentration of commercial farming in the total means a significant demand for manufactured products. Fourthly, the high potential of other (non-commercial) agricultural activity for modernization and higher factor productivity means that a new and larger market for manufactured products exists both in supplying inputs to agricultural development and also to cater for increased consumption in rural development as a whole. In the following sections an attempt is made to quantify some of these linkages and assess the present and future relationship between the two sectors.

Manufacturing inputs into agriculture

Table 4.1 shows the major manufactured inputs into the agriculture sector (excluding communal lands and small scale market gardening). It gives a surface impression of the needs of the sector in its production activities. The second part of the table shows the proportion that each manufactured product forms of the total. Two points should be made at the outset. The first is that these figures are assumed to include imports, and therefore may over-estimate the linkage between agriculture and domestic manufacturing. This would be true, for example, for grain bags - a potential import substitute which is discussed in Chapter 9: Import Substitution. The second is that "agriculture" is an aggregation. Some of the activities included, such as fisheries are relatively small and do not affect the overall findings very much. But very different and important activities such as animal production (which uses stockfeeds) and crop production (which uses fertilizers) are here combined to give an overall picture.

It can be seen that in the classification adopted here, the largest single input is fertilizer, whose value was equivalent to 14 percent of agricultural output in 1983, having approached 15 percent in 1982. The next largest manufacturing input is stock feed, which is between 7.5 and 10.5 percent of total input, and, like fertilizer, highly dependent on general

levels of activity and the output proportions of the major products. Following these, the maintenance of vehicles, including small tools (and presumably spare parts) amount to something over 5 percent, with petroleum products somewhat less. Smaller manufactured inputs to agriculture include insecticides and fungicides (3.2 to 3.4 percent) grain bags and other packing, and disinfectants and detergents. As column 1 and 2 of Table 4.1 show, however, even these small percentages of total inputs still represent substantial amounts of money. Insecticides and fungicides, for instance, amounted to nearly \$27 million in 1983.

Overall, total manufacturing inputs into agriculture were \$299 million in 1982 and, even though total output of agriculture rose hardly at all in 1983, were even higher at \$328 million. This represented a share of 36 percent of total output in 1982 and 39 percent in 1983. The share of intermediate inputs (i.e. ignoring wages, profits, etc.) was more stable, at 66 percent in 1982 and 67 percent in 1983. All these shares are very high, and they point to the crucial importance of manufactured inputs for the agriculture sector.

Imports by the agriculture sector

But how much of the manufacturing inputs to agriculture are in fact produced in Zimbabwe, and how strongly, therefore, does agriculture depend on domestic manufacturing? Table 4.1, column 5 gives some estimates of import requirements for the 1984-85 season, obtained from CFU sources. The figures are not, of course, directly comparable because they relate to an estimated and different level of output, and they represent what the sector would like to import, rather than what it actually did in the years 1982 and 1983. However, they give some indications of the import dependency of the sector.

Fertilizers are a major import item, even if imports are only a relatively small part of the total used. Imports of fertilizers (manufactured and natural) amounted to \$16 million in 1982. If to that total the amount of anhydrous ammonium imported is added (\$9.3 million) then imports amount to 20.5 percent of total use. An important domestic linkage is thus accompanied by a significant import leakage. Measures in connection with the expansion of fertilizer production to strengthen domestic linkages are discussed elsewhere. (See Chapter 9: Import Substitution).

Insecticides, fungicides etc., are also important imports. Their import value in 1982 was \$15.3 million. While not all necessarily go to agriculture, it can be seen from the CFU estimate in column 5 of Table 4.1 that the foreign exchange requirements in the field are extensive. Only one plant, making copperoxychloride, produces pesticides in Zimbabwe, exporting 20 percent of its output in 1983. A malathion plant for Zimbabwe such as is recommended in the SADCC report on pesticides could make an important contribution to improved domestic and intra-regional linkages in this field.^{1/} It could also have important public health and environmental benefits by reducing the need to use DDT-based chemicals.

Table 4.1: Manufactured inputs into commercial agriculture

	<u>Thousands of Dollars</u>		<u>Share of Total</u>		<u>Est. Imports</u> (5)
	1982	1983	in per cent		
	(1)	(2)	1982	1983	
			(3)	(4)	
Fertilizer	124,000	116,785	14.8	13.9	20,000
Insecticide, Fungicide	28,476	26,819	3.4	3.2	27,000
Grain Bags	8,478	3,543	1.0	0.4	10,000
Other Packing	2,431	3,543	0.3	0.4	
Stock Feed	63,352	88,470	7.5	10.5	
Disinfectant & Detergents	349	289	0.0	0.0	
Petroleum Products	28,566 ^{a/}	41,389	3.4	4.9	62,500
Maintenance (Vehicle and and small tools)	43,675	47,442	5.2	5.6	24,150
Total Manufacturing Inputs	299,327	328,319	35.6	39.0	143,650
Total Intermediate Inputs	452,446	493,018	53.9	58.6	
Total Output ^{b/}	840,000	841,000	100.0	100.0	
Manufacturing inputs as a proportion of total intermediate inputs			66.2	66.6	

Source: [Cols. (1) to (4)] Derived from Zimbabwe, Production Account of Agriculture, Forestry and Fishing, 1975 - 1983, Agriculture Statistics, Central Statistical Office
[Col. (5)] Derived from J. Laurie "Viability Conference: Follow-Up" C.F.U. 22.11.1984

Notes: a/ Estimated from 1983 Share of Fuel Power and Water

b/ Net of Own Account Capital Formation

The import of grain bags is variable, dependent on, of course, the level of crops and also the availability of used bags on the domestic market. The bags are made of jute and imported from Bangladesh, and their cost is not only in terms of foreign exchange, but is also dependent on the price of jute. The recent shortages of jute can be expected to increase the \$10 million estimate in column 5. This is another area where the use of a substitute product could strengthen the manufacturing sector, increase the reliability of supplies of essential agricultural input, and make a significant foreign exchange saving.

The largest item, however, on the import bill of agriculture, is of petroleum products, which amounted to \$41 million in 1983. The CFU estimates that, in general, agriculture takes about 25 percent of total fuel imports. It is on that basis that imports of \$62.5 million are projected for the 1984-85 season. This is clearly the major foreign exchange leakage of agriculture, amounting to no less than 43.5 percent of all imports that the sector makes. It is not amenable, either, to import substitution measures of a simple kind, but is a part of Zimbabwe's overall energy problem. Further development of alcohol production cannot reduce the import requirements very much, because agriculture uses mostly diesel, which cannot be extended by alcohol, without significant and very costly changes to the present tractor fleet.

A final group of imports is roughly equivalent to vehicle maintenance and miscellaneous needs of the sector. This input varied between \$43.7 million and \$47.4 million in 1982 and 1983, and the estimated imports for the current season are about \$24 million. Of this group, the largest single item is tyres, domestically produced, but having a high import content, since the rubber has to be imported. Possibilities for substitution in this area appear therefore very limited, at least in the short term, since Zimbabwe does not at present engage in commercial rubber production. With respect to spares and maintenance material in general, there is a potential conflict between the need to maintain the efficiency and competitiveness of the sector and the foreign exchange costs of importing new machinery, especially tractors. The maintenance costs of new equipment may be lower, and it may also be more fuel-efficient. But it nevertheless represents both a foreign exchange loss and a lessened stimulus to the domestic manufacturing sector, which certainly has the capacity to produce many spares and replacement parts. For the future, CFU estimates are of about 1000 tractors that this sector would like

to be imported in the current season, and FAO estimates of a growth in net investment in tractors and machines of between 6 and 12 percent per annum in real terms until the year 2000.^{2/} This latter figure represents an increase in the number of tractors in use from an estimated 1900 in 1975 to either 30,000 or 60,000 in the year 2000, depending on whether a moderate or high growth scenario is assumed.^{3/}

The distinction made above between intermediate and investment linkage should be borne in mind, but, on the general question of investment linkage, it is worth noting that there is a reasonably stable relationship observed between materials used for own account capital formation in agriculture and total output. This means that works carried out by the agricultural sector (presumably in both building maintenance and land improvement) use a certain amount of materials, and this amount can be said to have a value of roughly 3 percent of total agricultural output. This, if added to the 39 percent figure observed in 1983 would give a total of about 42 percent of agricultural inputs arising from the manufacturing sector.

On a more general level, the question of potential linkages becomes very important in connection with the communal lands. The figures given above have referred to use of manufactured inputs by commercial agriculture. The communal lands in general make use of manufactured inputs to a very limited degree. If they were to use fertilizers, pesticides, machinery and equipment on the same scale as in the commercial areas, this would, apart from increasing agricultural production, also directly increase domestic manufacturing production by perhaps \$115 million annually. This is an extreme assumption since it is based on patterns of production and labour utilization in the commercial areas which it is not necessarily intended to transfer to the communal lands, but it gives some indication of the potential for expanding linkages between the two sectors over a long period.

Agricultural inputs into manufacturing

Table 4.2 shows the major agricultural commodities absorbed by the manufacturing sector. The data refers to 1981/82, the latest year for which data was available, and in the tables the agricultural commodity, its receiving subsector of manufacturing and the value of the transactions are

shown. The total for each commodity is also given. Due to the particular method by which the CSO assigns a manufacturing firm to one of the 33 subsectors, it can happen that certain of the destinations of agricultural products appear out of place. Thus a small quantity of cattle is shown as going to subsector 29, metal products, machinery and equipment. The value is however, less than \$2,000, and otherwise over \$91 million dollars worth goes as expected to manufacturing subsector 1, slaughtering and processing of meat.

The major missing item is tobacco which is not reported in these absorption statistics. This is in accordance to a large extent with the treatment of tobacco in the Census of Production (see p. 4, para 22. 1982/83 Census) and will be further discussed below.

The first item in this table, hides and skins, is shown as going roughly equally to sectors 14 and 33, the second of which includes leather goods other than footwear and clothing (231). But this in fact understates the industrial use, since these are hides and skins coming directly from agriculture, rather than abattoirs, which are part of the manufacturing sector (subsector 1). Total production of the latter's hides and skins (which have a separate commodity code, 2017) was \$7,596,117 in 1981.

Coffee and tea both go to subsector 6, where a major tea blending and packing company and two companies making dried coffee powder are found. Purchases by manufacturing amounted to 19.2 percent of the 1981 output of coffee and 22.7 percent of black tea. Possibilities for expanding this share would be constrained by (a) the size of the domestic market and (b) the preference in many export markets for roasts, blends and packs from traditional importers familiar with national tastes.

Table 4.3 gives an overview of output of major agricultural commodities in comparison to manufacturing purchases of them. As noted already, the manufacturing statistics in column 2 derive from the 1981/82 Census of Production which in general covers the period March 1981 to March 1982. The agricultural production figures, on the other hand, appear to cover the calendar year 1981. Thus to balance supply against demand is difficult, apart from the question of valuations used and what extra charges such as taxes and transportation are included. This may explain the anomalies in Table 4.3 for

Table 4.2: Agricultural commodities inputs to manufacturing
(in dollars, 1981)

COMM-8		
NAME	INPUT	SECTOR
HIDES AND SKINS	2682710	14* FOOTWEAR(234)
HIDES AND SKINS	2633651	33* OTHER MANUFACTURING(231,290,291)
COMM-10		
NAME	INPUT	SECTOR
COFFEE BEANS	1652768	06* DAIRY AND OTHER N.E.C.(202,204,207,209)
COMM-11		
NAME	INPUT	SECTOR
TEA, BLACK DRIED	2036819	06* DAIRY AND OTHER N.E.C.(202,204,207,209)
COMM-12		
NAME	INPUT	SECTOR
LUCCERNE	156166	01* SLAUGHTERING, PROCESSING OF MEAT(201)
COMM-13		
NAME	INPUT	SECTOR
COTTON RAW	96318889	10* COTTON (INCL. TEXTILES, CARPETS)(223,225)
COMM-14		
NAME	INPUT	SECTOR
CITRUS FRUIT	13703	01* SLAUGHTERING, PROCESSING OF MEAT(201)
CITRUS FRUIT	226463	04* BAKERY PRODUCTS(206)
CITRUS FRUIT	481293	06* DAIRY AND OTHER N.E.C.(202,204,207,209)
CITRUS FRUIT	773642	08* SOFT DRINKS AND CARBONATED WATERS(214)
COMM-15		
NAME	INPUT	SECTOR
FRUIT, OTHER	1121576	02* CANNING, PRESERVING, FRUIT, VEGETABLES(203)
FRUIT, OTHER	16641	04* BAKERY PRODUCTS(206)
FRUIT, OTHER	36298	05* CHOCOLATE AND SUGAR CONFECTIONERY(208)
FRUIT, OTHER	134393	06* DAIRY AND OTHER N.E.C.(202,204,207,209)
FRUIT, OTHER	398883	07* BEER, WINE AND SPIRITS(211,212,213)
FRUIT, OTHER	91632	21* SOAPS, DETERGENTS, TOILETRIES, PHARM.(247)
FRUIT, OTHER	41831	22* MATCHES, INKS, GLUES, AND CHEM. N.E.C.(248)
COMM-16		
NAME	INPUT	SECTOR
VEGETABLES FRESH	35759	01* SLAUGHTERING, PROCESSING OF MEAT(201)
VEGETABLES FRESH	193308	02* CANNING, PRESERVING, FRUIT, VEGETABLES(203)
VEGETABLES FRESH	20048	03* GRAIN MILL PRODUCTS, ANIMAL FEEDS(205)
VEGETABLES FRESH	557	04* BAKERY PRODUCTS(206)
VEGETABLES FRESH	1808965	06* DAIRY AND OTHER N.E.C.(202,204,207,209)
VEGETABLES FRESH	50370	21* SOAPS, DETERGENTS, TOILETRIES, PHARM.(247)
VEGETABLES FRESH	41831	22* MATCHES, INKS, GLUES, AND CHEM. N.E.C.(248)
COMM-17		
NAME	INPUT	SECTOR
MAIZE GRAIN	37553	02* CANNING, PRESERVING, FRUIT, VEGETABLES(203)
MAIZE GRAIN	67674306	03* GRAIN MILL PRODUCTS, ANIMAL FEEDS(205)
MAIZE GRAIN	938178	06* DAIRY AND OTHER N.E.C.(202,204,207,209)
MAIZE GRAIN	11748922	07* BEER, WINE AND SPIRITS(211,212,213)
COMM-18		
NAME	INPUT	SECTOR
WHEAT GRAIN	39001786	03* GRAIN MILL PRODUCTS, ANIMAL FEEDS(205)
WHEAT GRAIN	1030	04* BAKERY PRODUCTS(206)
COMM-19		
NAME	INPUT	SECTOR
GRAIN OTHER	14602	01* SLAUGHTERING, PROCESSING OF MEAT(201)
GRAIN OTHER	19159401	03* GRAIN MILL PRODUCTS, ANIMAL FEEDS(205)
GRAIN OTHER	8349692	07* BEER, WINE AND SPIRITS(211,212,213)
GRAIN OTHER	8118473	21* SOAPS, DETERGENTS, TOILETRIES, PHARM.(247)
COMM-20		
NAME	INPUT	SECTOR
EGGS	28276	04* CHOCOLATE AND SUGAR CONFECTIONERY(208)
COMM-21		
NAME	INPUT	SECTOR
MILK	916	04* BAKERY PRODUCTS(206)
MILK	31534301	06* DAIRY AND OTHER N.E.C.(202,204,207,209)
COMM-22		
NAME	INPUT	SECTOR
CATTLE	91418817	01* SLAUGHTERING, PROCESSING OF MEAT(201)
CATTLE	1920	29* METAL PRODUCTS, MACHINERY(268)

Table 4.2: Agricultural commodities inputs to manufacturing
(in dollars, 1981)

Continued

----- COMM=31 -----		
NAME	INPUT	SECTOR
PIGS	12983839	01* SLAUGHTERING, PROCESSING OF MEAT(201)
----- COMM=32 -----		
NAME	INPUT	SECTOR
POULTRY LIVE	7337171	01* SLAUGHTERING, PROCESSING OF MEAT(201)
----- COMM=33 -----		
NAME	INPUT	SECTOR
OTHER LIVESTOCK	18634	01* SLAUGHTERING, PROCESSING OF MEAT(201)
OTHER LIVESTOCK	5372	33* OTHER MANUFACTURING(231,290,291)
----- COMM=42 -----		
NAME	INPUT	SECTOR
SUGAR RAW	32414171	06* DAIRY AND OTHER N.E.C.(202,204,207,209)
----- COMM=50 -----		
NAME	INPUT	SECTOR
TIMBER	5434443	15* SAWMILLING, WOOD EXCL. FURNITURE(236)
TIMBER	1190432	16* FURNITURE, FIXTURES, EXCL. METAL(238)
----- COMM=60 -----		
NAME	INPUT	SECTOR
FISH	9674	02* CANNING, PRESERVING, FRUIT, VEGETABLES(203)
FISH	345532	06* DAIRY AND OTHER N.E.C.(202,204,207,209)

items such as cotton and grain (other), where the ratio between manufacturing purchases and national output is greater than 1. Imports cannot in general explain these anomalies, since these are very low for cotton and not much higher for other grain.

Returning to Table 4.2, the destination of agricultural commodities therein can be clearly seen to follow a reasonable pattern of behaviour with food products going to the food processing sectors, hides and skins to the leather sector, timber to wood and furniture and cotton to the cotton textile sector. But some items need further comment. Fruit (other) to beer, wine and spirits (commodity 15 to subsector 17) is probably grapes for wine, and vegetables to dairy and other n.e.c. (commodity 16 to subsector 6) is probably potatoes for crisp manufacture.

As noted in Chapter 3, maize is an enormously important crop. Although Table 4.3 suggest that manufacturing absorbs only 36 percent of Zimbabwe's output, it is, the third largest agricultural input to manufacturing, after cotton and cattle. Additionally the absorption ratio would have risen substantially in the 1982-83 drought years as production dropped by some 60 per cent over 1981 volumes. Maize is used in the production of oil (from the kernel), husk animal feed (from the husk) and roller meal (from the remainder). A large amount (\$8.3 million in 1981) is used in the production of opaque beer.

Although tobacco is not included in the list of commodities in Tables 4.2 and 4.3, it is a major input to the manufacturing sector and its post-auction grading and packing is an important activity in subsector 9, which, however, also includes the domestic production of cigarettes, etc. The value of the tobacco other than that going to Zimbabwean cigarette factories, however, i.e., the tobacco that is graded and packed after auction, is not treated in the CSO census of production as a material input to the sector nor does it appear in the gross output of the sector. However the grading and packing activities mentioned contribute to manufacturing value added and together with cigarette factories gives employment to 3 percent of the manufacturing labour force. It is fair to say, also, that the tobacco industry depends for its successful exports on the skills and techniques embodied in subsector 9 and that this activity represent a key linkage between agriculture and manufacturing in Zimbabwe.

Table 4.3: Major agricultural products: value of outputs
and manufacturing use 1981 (\$'000)

	(1)	(2)	(3)
	Output	Purchased By Manufacturing	Share of Output Going to Manufacturing
Coffee	8,620	1,653	0.192
Tea	8,977	2,037	0.227
Cotton	50,797	96,319	1.836
Citrus	2,298	1,495	0.651
Fruit (Other)	4,183	1,841	0.440
Vegetables Fresh	10,424	2,151	0.206
Maize Grain	222,068	80,399	0.362
Wheat Grain	31,911	39,003	1.222
Grain (Other)	8,650	35,642	4.120
Eggs	6,918	28	0.004
Milk	32,510	31,535	0.970
Cattle	89,685	91,421	1.019
Pigs	8,910	12,984	1.457
Poultry Live	14,983 ^{a/}	7,337	0.490
Other Livestock	1,115	24	0.022
Sugar Raw	73,598	32,414	0.440
Timber	7,852	6,625	0.844
Fish	1,340	355	0.265

Source: Col (1) Production Account of Agriculture, Forestry and Fishing 1975-1983 Central Statistical Office.

Col (2) Data on inputs from the 1981/82 Census of Production.

a/ Productive and breeding stock excluded

The overall linkage between the two sectors has been summarized above in terms of the inputs from manufacturing to agriculture, where it was shown that they represented about 42 percent of total inputs. The reverse linkage can be calculated as follows: the value of commercial agriculture production in 1981 was \$759 million, and the total recorded agricultural purchases by manufacturing amounted to about \$449 million, implying that 59 percent of agricultural production went to manufacturing. This estimate should be corrected for imports, but the import of agricultural raw materials in Zimbabwe for the commodities considered is low (except for timber) and would not change this figure very much, even assuming that they all went to the manufacturing sector.^{6/}

The same figures of purchases, \$449 million, can be used again to assess how important agricultural inputs are to the manufacturing sector. In 1981 manufacturing output was \$2.722 billion (excluding sales of goods not produced on the premises). Agricultural inputs thus represented 16.5 percent of total inputs, and 25.3 percent of total intermediate inputs (including services). The interdependence of the two sectors is clear. If anything, agriculture needs manufacturing more than vice versa, but this could be said only at a superficial level, since both generate income and foreign exchange, and, through the different forms that linkage takes, both contribute to a balanced and expanding economy.

Links between mining and manufacturing

The mining sector in Zimbabwe is small in terms of the share of GDP. It was 7.2 percent of GDP in 1973 and fell and rose to reach its highest share of 8.9 percent in 1979 and 1980. Since then, however, its share of GDP has fallen, and in 1982 it amounted to only 5.4 percent of GDP. By comparison, manufacturing in that year was 24.5 percent of GDP and agriculture 15 percent.

But these statistics understate the importance of the mining sector to the economy as a whole and to the manufacturing sector in particular. Firstly, the sector is an important earner of foreign exchange through direct exports of such items as asbestos, lithium ore, copper slimes, other metallic ores and concentrates and coal and coke. These items alone had an export value of \$81 million in 1982 and around \$85 million in 1983. Secondly, the

sector provides raw materials to manufacturing for further processing, and manufactured exports of ferro-alloys, ingots and billets, iron and steel bars, rod and sections, copper, nickel and tin metal alone amounted to \$194 million in 1982, and \$281 million in 1983. Thirdly, the mining sector has played and continued to play an important role as a user of machines and equipment made in Zimbabwe by the manufacturing sector. Considering its contribution to GDP, the mining sector spends, proportionately, far more than the manufacturing sector on machinery and equipment. Fourthly, by its stimulation of research and development, technological diffusion and the building up of skills, it contributes to the longer-term development of the economy in general and manufacturing in particular.

The prospects for this sector, in its existing form, however, are dependent on forces outside the country's control. Zimbabwe's mineral exports are in no case unique, except perhaps for the long-fibre asbestos produced and the quality of its ferro-chrome. The world market price for minerals is established through a reconciliation of world supply and demand. The success of the mining industry is dependent not only on the efficiency of domestic production but on world markets and the exchange rate between the Zimbabwe currency and the currencies of the major purchasers. Thus the amount of stimulus that the sector can give to manufacturing is contingent upon a multiplicity of external factors.

Mining: inputs to the manufacturing sector

The mining commodities used by the manufacturing sectors in 1981 are shown in Table 4.4. A total of 13 commodities are distinguished in the classification followed. The most notable absence from the list are the major metals copper, nickel and tin which are not reported as being used by the manufacturing sector. This is because, as already noted, all mineral processing that takes place at the mine is regarded as being part of mining activity, though it should properly be treated as manufacturing. The difficulty of separating statistically the different activities means that much of the refining and other processing of the extracted ores is hidden in the mining statistics. Such a position may also explain anomalies in the reported statistics, such as that copper (concentrates) (code 1141) are reported as used in manufacturing but not as produced anywhere and copper (refined) (code 1140) is not reported as being produced at all.

Nevertheless the figures of Table 4.4 give important indications of the degree to which the mining sectors outputs are used in manufacturing. The largest flow by far is of iron ore, which amounts to no less than 33 percent of all mining commodities used. Furthermore, it goes entirely to manufacturing subsector 28 (non-ferrous, iron, steel [basic]), amounting to 19 percent of the intermediate inputs to that sector in 1981. The second largest element in the list is chrome, which amounted to 23.8 percent of all mining commodities used. The destination was again sector 28. Indeed, sector 28 is an important absorber of many other mining commodities. It is the largest single absorber of limestone for lime, the third largest absorber of other stone, clay and sand, and the largest absorber of other mining not elsewhere specified. This last group includes a wide range of minerals, including antimony, arsenic, barytes, corderite, corundum, feldspar, flourspar and manganese. Overall, sector 28 takes over 68 percent of all minerals going to the manufacturing sector with a total value of about \$53 million. This amounts to 40 percent of its total purchases of goods and services.

The third largest mineral input to manufacturing is phosphates, which amount to 12.2 percent of the total. These are absorbed by the fertilizer industry, whose use of phosphates in the reporting period were in fact significantly above production. Asbestos has the next largest share of mining inputs, at 7.4 percent. Long-fibre asbestos is a comparatively rare commodity and as noted is an important export commodity. Manufacturing's use of it is limited to about 6 percent of total production, and this is for the traditional purposes of insulation and insulating brick manufacture, etc. The extent to which such a linkage can continue (and indeed to which the export performance can be maintained) is, of course, contingent on the way in which the health hazards of this material in both its extraction and usage are assessed.

Limestone for lime is used by five sectors, the largest, as noted, being subsector 28, which takes 75 percent of total manufacturing use. Other stone, clay and sand, however, act as an input to no fewer than 14 of the 33 manufacturing subsectors, with subsector 27 (glass, cement, etc.) being by far the largest purchaser, taking no less than 64 percent of total manufacturing purchases.

Table 4.4: Mining inputs into the manufacturing sector

NAME	VALUE	SECTOR	TITLE
COKE, COAL PRODS., CLINKER	837532	23	BASIC CHEMICALS, PETROLEUM PRODS. (243, 250, 251)

COMM-1130			
NAME	VALUE	SECTOR	TITLE
CHROME	18394522	28	NON-FERROUS, IRON, STEEL (BASIC) (262, 264)

COMM-1160			
NAME	VALUE	SECTOR	TITLE
GOLD AND SILVER	202690	29	METAL PRODUCTS, MACHINERY (268)
GOLD AND SILVER	51955	33	OTHER MANUFACTURING (231, 290, 291)
	254645		

COMM-1170			
NAME	VALUE	SECTOR	TITLE
IRON ORE	25524548	28	NON-FERROUS, IRON, STEEL (BASIC) (262, 264)

COMM-1302			
NAME	VALUE	SECTOR	TITLE
LIMESTONE FOR LIME	41699	19	FERTILIZER, INSECTICIDES (244)
LIMESTONE FOR LIME	251649	24	RUBBER PRODUCTS (253)
LIMESTONE FOR LIME	649964	27	GLASS, CEMENT ETC. (256, 257, 259, 260)
LIMESTONE FOR LIME	4072862	28	NON-FERROUS, IRON, STEEL (BASIC) (262, 264)
LIMESTONE FOR LIME	420970	29	METAL PRODUCTS, MACHINERY (268)
	5437144		

COMM-1303			
NAME	VALUE	SECTOR	TITLE
SILICA SAND	195986	19	FERTILIZER, INSECTICIDES (244)
SILICA SAND	327975	27	GLASS, CEMENT ETC. (256, 257, 259, 260)
	523961		

COMM-1305			
NAME	VALUE	SECTOR	TITLE
OTHER STONE, CLAY AND SAND	70069	7	BEER, WINE AND SPIRITS (211, 212, 213)
OTHER STONE, CLAY AND SAND	2134	15	SAWMILLING, WOOD EXCL. FURNITURE (236)
OTHER STONE, CLAY AND SAND	27155	19	FERTILIZER, INSECTICIDES (244)
OTHER STONE, CLAY AND SAND	1954	20	PAINTS, VARNISHES, FILLERS (246)
OTHER STONE, CLAY AND SAND	69480	22	MATCHES, INKS, GLUES, AND CHEM. N.E.C. (248)
OTHER STONE, CLAY AND SAND	20985	24	RUBBER PRODUCTS (253)
OTHER STONE, CLAY AND SAND	551203	26	STRUCTURAL CLAY PRODS. INCL. BRICKS (258)
OTHER STONE, CLAY AND SAND	2518055	27	GLASS, CEMENT ETC. (256, 257, 259, 260)
OTHER STONE, CLAY AND SAND	477913	28	NON-FERROUS, IRON, STEEL (BASIC) (262, 264)
OTHER STONE, CLAY AND SAND	121739	29	METAL PRODUCTS, MACHINERY (268)
OTHER STONE, CLAY AND SAND	11516	30	ELECTRICAL MACHINERY/EQUIPMENT (278, 279)
OTHER STONE, CLAY AND SAND	1818	31	MOTOR VEHICLES (283)
OTHER STONE, CLAY AND SAND	27187	32	OTHER VEHICLES ETC. (282, 284, 285, 286)
OTHER STONE, CLAY AND SAND	4668	33	OTHER MANUFACTURING (231, 290, 291)
	3905876		

COMM-1460			
NAME	VALUE	SECTOR	TITLE
PHOSPHATES	9426752	19	FERTILIZER, INSECTICIDES (244)

COMM-1630			
NAME	VALUE	SECTOR	TITLE
ASBESTOS	16894	12	OTHER TEXTILE PRODUCTS (226)
ASBESTOS	6198	24	RUBBER PRODUCTS (253)
ASBESTOS	5707961	27	GLASS, CEMENT ETC. (256, 257, 259, 260)
	5731053		

COMM-1790			
NAME	VALUE	SECTOR	TITLE
OTHER MINING N.E.S.	400519	27	GLASS, CEMENT ETC. (256, 257, 259, 260)
OTHER MINING N.E.S.	4528047	28	NON-FERROUS, IRON, STEEL (BASIC) (262, 264)
OTHER MINING N.E.S.	19034	30	ELECTRICAL MACHINERY/EQUIPMENT (278, 279)
OTHER MINING N.E.S.	169318	33	OTHER MANUFACTURING (231, 290, 291)
	5116918		

COMM-1792			
NAME	VALUE	SECTOR	TITLE
PRECIOUS STONES	924443	29	METAL PRODUCTS, MACHINERY (268)
PRECIOUS STONES	150408	33	OTHER MANUFACTURING (231, 290, 291)
	1074851		

COMM-1796			
NAME	VALUE	SECTOR	TITLE
IRON PYRITES	1159239	19	FERTILIZER, INSECTICIDES (244)

COMM-1797			
NAME	VALUE	SECTOR	TITLE
BALXITES AND ALUMINIUM	227956	19	FERTILIZER, INSECTICIDES (244)
	77414997		

With regard to coke and coal products, the amount reported in Table 4.4 is only that used as raw material. But, of course, coke and coal is an important energy source for much of Zimbabwe's manufacturing sector. The total purchases were \$31.5 million and coal in 1981.

Total mining production in 1981 was valued at \$441 million, and the amount going to manufacturing in Zimbabwe (including coal for energy) was \$106.9 million. This represents a share of 24.2 percent. The forward linkage is thus rather low compared to agriculture. The \$77.4 million of minerals, in turn, represented only 2.8 percent of total manufacturing output, or 6.0 percent of manufacturing's total intermediate inputs (including services). The backward linkage of manufacturing to mining is thus also low. However, as was seen, the dependence of some individual branches of manufacturing is much higher, such as for subsector 28 and, further, all the 33 subsectors use coal and coke. It should also be recalled that the production and the further processing of certain key metals, in particular copper, nickel and tin appear to be excluded from the more detailed statistics being discussed here, and their inclusion would certainly increase the figure of 2.8 percent of manufacturing output being inputs from mining, as well as the share of mining output, now estimated at 17.5 percent, going to manufacturing. The contrast between the two figures would probably remain, but it should not however be taken as representing an unequal interdependence. Manufacturing is an important market for mining output, but mining products represent a small but essential input for manufacturing activity.

Manufacturing inputs into mining

The manufacturing inputs into mining are very heterogeneous, but certain commodities stand out as being of particular importance. Most notable is the commodity group 2680, Metal Products, Machinery and Spares, which is overall the largest input from manufacturing to mining. This commodity group is the major output of manufacturing subsector 29, which was discussed further in Chapter 3 of this report, and exemplifies the strength and diversity of the relations between the two sectors and the important contribution made by manufacturing in its tools and equipment in supporting mining activity. In fact the value of this item is no less than 33 percent of all manufacturing inputs into mining.

This group has a value of \$68.2 million, and the next largest group is commodity 2620, Iron and Steel Basic Industry, whose value in inputs to mining was \$27.7 million in 1981, and which is the largest single output of manufacturing sector 29. The third largest commodity input is of explosives and cartridges, of which mining used \$18.5 million.^{7/} Given the significant import levels of these items, there is consideration of import substitution possibilities under this heading in Chapter 9 of this report.

Next to this comes Acids as a major input, amounting to \$16.4 million, with the bulk, however, being used in copper and nickel mining (\$11.3 million), and gold mining (\$5.0 million). All mining sectors use a number of items whose total value is rather smaller, such as Textile Bags and Sacks (\$1.7 million), Paper Containers (\$2.8 million), Industrial Rubber Products (\$8.5 million), Containers - plastic (\$9.7 million), Cement (\$7.5 million), Electrical Equipment - Industrial (\$8.8 million) and Motor Spares, etc. (\$5.1 million). In addition there are some other items not used by all mining sectors, such as toiletries and cosmetics (\$4.6 million) reported as going into other mining, but which must be a mis-classification, wood (\$3.5 million) used in four mining sectors presumably for pit props or other construction, and bricks (not concrete) amounting to \$2.6 million dollars in value, which latter may be either refractories or for own account construction. The full set of inputs, for each of the six mining sectors, is given in Table 4.5.

In total, the reported purchases of manufactured products by the mining industry amounted to \$209 million in 1981. This represents 47 percent of the gross output of the mining industry, according to the 1981 Census of Production. This may be an overestimate, because in the Census, Table 4.4, the mining sectors total purchases of materials appears as only half this figure, at \$105 million. This discrepancy is difficult to understand. It arises mainly in the Copper and Nickel, the Asbestos, and the Other Mining sectors, where the difference in estimates are respectively \$43 million, \$21 million and \$19 million. The special nature of the mining industry in Zimbabwe, consisting of mining firms who carry out processing activities and manufacturing firms who carry out mining activities, and the need to allocate these firms in one sector or another may be giving rise to some of the discrepancies, or alternatively, the commodity use data used here may be erroneous. However, even taking the lower figure, the use of manufactured inputs by the mining sector represents 3.9 percent of manufacturing's output and 7.4 percent if one takes the higher figure.

Table 4.5: Manufacturing inputs into the mining sectors

SECTOR-35* CHROME MINING			SECTOR-36* COPPER AND NICKEL MINING		
COMM	NAME	VALUE	COMM	NAME	VALUE
2262	TEXTILE BAGS AND SACKS	339	2262	TEXTILE BAGS AND SACKS	1213158
2364	WOOD, ROUGH/SAWN	211380	2293	PROTECTIVE CLOTHING	31408
2401	PAPER CONTAINERS AND CARTONS	5567	2364	WOOD, ROUGH/SAWN	2102917
2430	BASIC INDUSTRIAL CHEMICALS N.E.S.	156903	2401	PAPER CONTAINERS AND CARTONS	1650798
2481	EXPLOSIVES AND CARTRIDGES *	2806983	2430	BASIC INDUSTRIAL CHEMICALS N.E.S.	5339045
2532	INDUSTRIAL RUBBER PRODUCTS	246598	2431	ACIDS	11262742
2551	CONTAINERS - PLASTIC	43102	2481	EXPLOSIVES AND CARTRIDGES *	3090000
2591	CEMENT	128566	2532	INDUSTRIAL RUBBER PRODUCTS	3350881
2620	IRON AND STEEL BASIC INDUSTRY	1748632	2551	CONTAINERS - PLASTIC	273992
2621	GRANULATED SLAG AND SLAG CLINKER	13752	2581	BRICKS (NOT CONCRETE)	1335573
2640	NON-FERROUS METAL BASIC PRODUCTS	82500	2591	CEMENT	1367542
2680	METAL PRODUCTS, MACHINERY AND SPARE	1367833	2620	IRON AND STEEL BASIC INDUSTRY	13086014
2792	ELECTR. EQUIP. - INDUSTRIAL	224392	2640	NON-FERROUS METAL BASIC PRODUCTS	6161414
2830	MOTOR SPARES ETC.N.E.S.INCL.C.K.D.	48241	2680	METAL PRODUCTS, MACHINERY AND SPARE	18335854
		7094788	2792	ELECTR. EQUIP. - INDUSTRIAL	2581752
			2630	MOTOR SPARES ETC.N.E.S.INCL.C.K.D.	1364439
					72547520
SECTOR-37* GOLD MINING			SECTOR-38* STONE QUARRYING		
COMM	NAME	VALUE	COMM	NAME	VALUE
2262	TEXTILE BAGS AND SACKS	203745	2262	TEXTILE BAGS AND SACKS	167265
2293	PROTECTIVE CLOTHING	133580	2293	PROTECTIVE CLOTHING	2494
2364	WOOD, ROUGH/SAWN	669218	2401	PAPER CONTAINERS AND CARTONS	89007
2401	PAPER CONTAINERS AND CARTONS	206989	2431	ACIDS	23061
2420	PRINTED PRODUCTS, N.E.S.	7514	2481	EXPLOSIVES AND CARTRIDGES *	724385
2430	BASIC INDUSTRIAL CHEMICALS N.E.S.	65342	2532	INDUSTRIAL RUBBER PRODUCTS	259752
2431	ACIDS	4967149	2551	CONTAINERS - PLASTIC	422646
2432	GASES AND LIQUID GASES	1283	2591	CEMENT	772125
2471	MEDICINAL AND PHARMACEUTICAL	26092	2620	IRON AND STEEL BASIC INDUSTRY	82626
2481	EXPLOSIVES AND CARTRIDGES *	4125573	2680	METAL PRODUCTS, MACHINERY AND SPARE	3349353
2532	INDUSTRIAL RUBBER PRODUCTS	738390	2792	ELECTR. EQUIP. - INDUSTRIAL	17670
2551	CONTAINERS - PLASTIC	375473	2830	MOTOR SPARES ETC.N.E.S.INCL.C.K.D.	302691
2581	BRICKS (NOT CONCRETE)	532282			6223075
2590	LIME AND PLASTER	5518			
2591	CEMENT	877355			
2620	IRON AND STEEL BASIC INDUSTRY	4336865			
2627	FINISHED INDUSTRIAL METAL PRODUCTS	99423			
2640	NON-FERROUS METAL BASIC PRODUCTS	965068			
2680	METAL PRODUCTS, MACHINERY AND SPARE	7460348			
2792	ELECTR. EQUIP. - INDUSTRIAL	2234059			
2796	ELECTRIC CABLE/WIRE	5558			
2830	MOTOR SPARES ETC.N.E.S.INCL.C.K.D.	447142			
2894	BRUSHWARE	123650			
		28607616			
SECTOR-39* ASBESTOS MINING			SECTOR-40* OTHER MINING		
COMM	NAME	VALUE	COMM	NAME	VALUE
2262	TEXTILE BAGS AND SACKS	3066	2262	TEXTILE BAGS AND SACKS	161408
2401	PAPER CONTAINERS AND CARTONS	68841	2293	PROTECTIVE CLOTHING	867171
2430	BASIC INDUSTRIAL CHEMICALS N.E.S.	232975	2364	WOOD, ROUGH/SAWN	574969
2481	EXPLOSIVES AND CARTRIDGES *	7792035	2401	PAPER CONTAINERS AND CARTONS	818391
2532	INDUSTRIAL RUBBER PRODUCTS	1994437	2430	BASIC INDUSTRIAL CHEMICALS N.E.S.	3913596
2551	CONTAINERS - PLASTIC	7009976	2431	ACIDS	180895
2581	BRICKS (NOT CONCRETE)	141070	2470	SOAP, DETERGENTS, CLEANERS	334533
2591	CEMENT	3507468	2471	MEDICINAL AND PHARMACEUTICAL	1082049
2620	IRON AND STEEL BASIC INDUSTRY	5837096	2472	TOILETRIES AND COSMETICS	4618911
2640	NON-FERROUS METAL BASIC PRODUCTS	171903	2532	INDUSTRIAL RUBBER PRODUCTS	1931548
2680	METAL PRODUCTS, MACHINERY AND SPARE	16197869	2533	TYRES, RETREADS	316051
2792	ELECTR. EQUIP. - INDUSTRIAL	2357696	2551	CONTAINERS - PLASTIC	1553111
2830	MOTOR SPARES ETC.N.E.S.INCL.C.K.D.	1040653	2581	BRICKS (NOT CONCRETE)	608779
		46355185	2591	CEMENT	888180
			2620	IRON AND STEEL BASIC INDUSTRY	2609045
			2640	NON-FERROUS METAL BASIC PRODUCTS	1650511
			2680	METAL PRODUCTS, MACHINERY AND SPARE	21527897
			2790	ELECTR. MACH. ETC., N.E.S.	1173090
			2792	ELECTR. EQUIP. - INDUSTRIAL	1361588
			2793	BATTERIES	76158
			2796	ELECTRIC CABLE/WIRE	274258
			2830	MOTOR SPARES ETC.N.E.S.INCL.C.K.D.	1859452
			2831	MOTOR VEHICLES - ASSEMBLED	9836
			2901	SCIENT./PROF. EQUIPMENT	114484
					48505926
					209334119

Manufacturing and the construction sector

Construction is an activity which contributed \$150 million to GDP at factor cost in 1982 (current price). Its share of GDP is small. Measured in constant (1980) prices, the share fell steadily from 5.4 percent of GDP in 1973 to 2.7 percent in 1980 and it stayed at that value until 1982. Being a labour intensive industry, however, its share of total employment is a good deal higher, at 4.9 percent in 1982. Perhaps more than most other activities, construction includes a good deal of informal works, and the real importance of the sector to the economy is probably understated by the above figures. In any case, the sector's material inputs come predominately from manufacturing (the major exceptions being sand, stone, gravel, etc., which are mining products). The major contributing sectors of manufacturing and the commodities include the following, although these commodities are produced in smaller amounts by other subsectors:

<u>Subsector</u>	<u>commodity for construction</u>
27	: cement, concrete, asbestos products, bricks, glass panes and sheets,
26	: bricks,
23,22,25:	asphalt, bitumen and tar,
20	: varnishes, lacquers, fillers, paints,
25	: industrial plastic products,
15	: wood, rough/sawn, wood products for buildings, and joinery, prefabs,
28	: basic iron and steel materials, angles, sections, etc.
29	: metal products, machinery and spares,
31	: Motor spares,
30	: electric cable and wire.

Reference was made above to the informal sector in terms of construction activity. It is known, however, that construction also forms links with the informal manufacturing sector, which in this case appears to be largely urban-based and to be providing inputs to construction up to items such as metal window-frames.

The value of the commodities above purchased by the construction industry are not available in detail for the present study, although they are collected by the CSO for the Census of Production and in principle could be presented in the same detail as the inputs to the manufacturing sector. The total of all materials purchased by construction, however, is known from the Census. In

1981 it amounted to \$138.4 million. This would, as usual, exclude electricity, water and fuel, but it would include mining products such as some bitumen and tar produced by mining establishments and also items such as sand, stone and gravel. It would also include any raw lumber purchased, which is an agricultural output. However, it appears unlikely, judging from the output use, and export statistics covering mining and manufacturing, that these particular items could amount to more than about \$2 million. Even if this figure is wrong by a factor of ten, it still leaves the construction sector taking inputs from manufacturing whose value is greater than the lower (Census) estimate given above for mining use of manufactures. Considering the lower value of construction output compared to mining, this means that manufacturing inputs to construction are proportionately much more important, with a share of gross output equal to 32.9 percent in 1981, and the same in 1982.

Linkages in the other direction, that is, from construction to manufacturing, are of two kinds. The first is the intermediate linkage, where the construction sector carries out repair and maintenance work on buildings and civil engineering for the manufacturing sector. The second is the investment linkage; part of the manufacturing sector's investment is in the form of buildings, and new investment of this kind is, in general, carried out by the construction sector. The value of the first was \$5.0 million in 1981 and \$4.9 million in 1982, having risen fairly sharply since 1981. The second (investment) linkage, however, is much larger, with manufacturing spending \$59.2 million in 1981 and \$48.1 million in 1982. These figures, however, include the cost of land and may also include the purchases of existing buildings purchased.

Linkages with other sectors

Agriculture, Mining and Construction have been dealt with thus far, and the remaining section of the chapter deals with links within the Manufacturing sector itself. Together, these four sectors cover 48 percent of GDP in 1982 at current prices. The remainder of GDP has percentage shares as follows: Electricity and Water (1.7), Finance and Insurance (5.1), Real Estate (1.1), Distribution, Hotels and Restaurants (14.7), Transport and Communications (8),

Public Administration (8), Education (7), Health (2.4), Domestic Services (1.9), and Other Services (6.1). The linkages of manufacturing with these is now briefly examined, although in general it is not possible to have detailed information and even the gross output figures, to assess the relative importance of manufacturing inputs, are unavailable.

Electricity is a subject examined elsewhere in this report. Chapter 2 contains a summary of manufacturing use. Similarly, in transport and communications, some account is given under various headings elsewhere: Chapter 10 describes manufacturing's use of the railways, and Chapter 3 describes manufacturing and communications. Chapter 9 discusses, inter alia the role of import substitution in manufacturing with respect to energy and transport. The large items of Finance and Insurance and Public Administration would in general use office supplies from manufacturing. The main manufactured items going into Distribution, Hotels and Restaurants would be processed food and drink, since to be at manufactures resold by shops are intermediate inputs would be a form of double counting. Education and Health would have their own special inputs, of educational materials and health products, as well as a wide variety of smaller items.

As to manufacturing inputs from all these other sectors, the aggregate payments in 1981 and 1982 were as follows: Rent \$16.5 million and \$20.9 million, Hire of Plant \$8.1 and \$5.6 million, Advertising \$14.2 million, and \$17.7 million Insurance and Workmen's Compensation \$13.6 and \$17.2 million, Head Office charges \$3.4 and \$5.6 million, Rates \$3.1 and \$6.7 million, Royalties \$6.1 and \$7.1 million and other services \$116.0 and \$138.4 million.

Rent can be seen as an input from Ownership of Dwellings. The other items vary in the national accounting sector to which they should be attributed, with some, such are Workmen's Compensation being a form of taxation. But the largest item on the list is Other Services which is far greater than all the others put together. From the census questionnaire form it appears that this item includes such things as postal charges, travelling expenses, professional fees, bank charges and computer service fees, but not transport services. Clearly the classification used is not very helpful for

analytical purpose and a disaggregation would be useful. The lumping together in the published data of Workmen's Compensation insurance and silicosis levy with insurance premiums is also a drawback (though these are separate questions in the actual census form).

However, adding together the different payments for services above, and excluding Head Office Charges and Royalties (which amounts to import of services) the total values in 1981 and 1982 respectively were \$171.5 and \$212.1 million. These amounted to 6.3 percent and 7.0 percent of manufacturing gross output in these years. However, an unknown amount of service imports is hidden in the "Other Services" total and the degree of domestic linkage is certainly lower than these shares would imply.

Links within the manufacturing sector

The data available for this study included the commodity output of each industry and the commodity inputs to each industry. This data amounted to a matrices of output (industry by commodity) and input (commodity by industry), the so called "make" and "absorption" matrixes. The data has been used especially in the sections on agriculture and mining in this chapter. But the volume of information would not allow a similar treatment of the manufacturing sector, whose 33 sectors have a complex system of relationships involving the production and use of approaching 250 different commodities.

Accordingly the attempt has been made to construct an approximate input-output table for the manufacturing sector, showing the connections, in terms of transfers of commodities, between each of the 33 sectors. The assumptions made and the table itself, together with coefficients derived from it, are given in Part III of this report, since, even with the simplifications adopted, the data is too extensive to be given here. (A table covering 33 sectors and the totals, contains 1,156 entries).

Two problems at once arise in using the input and output data together to produce a table of linkages between sectors. The first is that the input data contains imports (to an unknown amount) and the output data does not. The second problem is that of prices. The output data is in terms of receipts by producers, i.e. producers prices, the input data in terms of expenditure by the using sector, i.e. purchasers prices. No simple correction can be made of the

latter, but to deal with the former problem; that of imports, the intermediate use of a commodity, if it exceeded recorded domestic production, was scaled down so that total use equalled total domestic production. This is a rough method but the objective is to avoid over stating the domestic links between sectors, and, while overstatement still exists, sufficient correction may have been done to give some broad indications of the way in which Zimbabwe's manufacturing sub-sectors are interrelated and depend upon one another for their productive activities.

Table 4.6 presents an aggregated domestic input-output table for the manufacturing sector in eleven sectors. It summarizes the 33-sector table in Part III. The eleven sectors are the same as those used in Chapter 1, "The Place of the Manufacturing Sector in the National Economy". Each row represents the producing sector. Each column represents the using sector. Thus the entry under row 3 column 4 means that the Textiles sector delivered \$72.8 million worth of goods to the Clothing and Footwear sector, and so on.

As can be seen, the diagonal elements, the intersection of row 1 with column 1, etc. are in general very large. These elements represent the so-called intra-industry transactions: the transfer of commodities produced within the branch from one activity to another. Thus the large value for element 1,1 in fact represents such items as, for instance, a transfer from the slaughtering to the processing of meat: carcasses are an output of slaughtering and an input to the further processing. Both types of activity are in sector 1 and therefore the value is simultaneously an output and an input. Sector 1 in fact includes six food-processing sectors (subsectors 1 to 6 in the 33-sector classification). They have in fact a complex set of inter-relations, which can be seen in more detail in the larger table in Part III. All these are summarized in the simple figure in element 1,1 of Table 4.6. It should again be emphasized that this table covers only manufactured commodities (2000-2999) and manufacturing sectors. All other transactions are excluded. So the agricultural inputs into sector 1, such as grain, cattle etc. do not appear in the table.

To see the linkages more clearly, Tables 4.7 and 4.8 give the values of Table 4.6 in terms of their percentage shares of the column and the row total respectively. Thus in Table 4.7, the first column now gives the share that of the eleven manufacturing sectors has of the total manufacturing inputs i'

sector 1. In general, the table gives a way of seeing the degree to which each sector depends on the other manufacturing sectors, or, more precisely, the relative importance of each manufacturing sector to the others. At an 11-sector level, there is some value for linkage i. almost all elements of the table, but, by considering only those sufficiently large, the number of important links can be seen more clearly.^{8/} Apart from sector 4, Clothing and Footwear, the diagonal element is always very important. Thus for sector 1, Foodstuffs, the most important manufactured inputs come from itself, from Chemical and Petroleum Products, and from Metals and Metal Products. In general, sectors appear to be dependent on three or four other sectors, although sector 4, Clothing and Footwear, has an overwhelming dependence on sector 3, Textiles, and sector 9, Metals and Metal Products, is dominated by transactions within the sector, and thus mainly dependent on itself for its manufactured inputs.

What is particularly striking is the dependence of almost all sectors on sector 9, Metals and Metal Products. Even for sector 4, Clothing and Footwear, the Metals sector provides 4.2 per cent of manufactured inputs, and for other sectors the shares are much higher, between 10 and 20 per cent for Foodstuffs, Drink and Tobacco, Textiles, Wood and Furniture, Paper and Printing, and Chemicals. For Non-Metallic Minerals the Metals share of manufactured inputs is 57.3 per cent, for Transport Equipment 48.5 per cent and for other Manufacturing 51.4 per cent. Of the eleven sectors, Metal and Metal Products is the only one to have so many important links. Indeed, the last column of Table 4.7 shows that it provides no less than 31.0 per cent of all manufacturing inputs into manufacturing, by far the largest figure.

This column also shows that the next most important sectors, from the point of view of providing inputs to the manufacturing sector as a whole, are Textiles (18.9 per cent); Foodstuffs (14.7 per cent); Chemical and Petroleum Products (14.0 per cent); and Paper and Printing and Publishing (9.4 per cent). But one has to look at the full table to see the spread of this dependency. Textiles is an important input into three sectors, textiles itself; Clothing; and Wood and Furniture. Foodstuffs is also important for three sectors, Foodstuffs, Drink and Tobacco, and Chemicals. Chemicals however is important for six: Foodstuffs, Wood and Furniture; Paper, Printing and Publishing; Chemicals itself; Transport Equipment; and Other Manufacturing. Finally Paper and Printing and Publishing is an important manufacturing input to Drink and Tobacco, to itself, to Chemical and Petroleum Products and to Non-Metallic Mineral Products.

Table 4.6: Flows within manufacturing

ROWNAME	COLNAME						COLNAME						ALL
	01 FOODSTUFFS(- INCLUDING STOCKFEEDS)	02 DRINK AND TOBACCO	03 TEXTILES INCLUDING GINNING	04 CLOTHING AND FOOTWEAR	05 WOOD AND FURNITURE	06 PAPER AND PRINTING AND PUBLISHING	07 CHEMICAL AND PETROLEUM PRODUCTS	08 NON- METALLIC MINERAL PRODUCTS	09 METALS AND METAL PRODUCTS	10 TRANSPORT EQUIPMENT	11 OTHER MANUFACTUR- ING		
	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW		
	SUM	SUM	SUM	SUM	SUM	SUM	SUM	SUM	SUM	SUM	SUM	SUM	
01 FOODSTUFFS(INCLUDING STOCKFEEDS)	81735128	17400234	99485	288474	259172	594087	9083883	9403	280543	28088	1977140	111355784	
02 DRINK AND TOBACCO	118942	18518081	127858	15064		24695	728824	7410	77343	1909	15713	17831820	
03 TEXTILES INCLUDING GINNING	4388973	91510	88873532	72792249	3528314	217781	1500837	133082	861199	79756	748849	142990881	
04 CLOTHING AND FOOTWEAR	431705	242828	183885	278509	69560	141652	85382	44485	1300891	12690	34281	2823379	
05 WOOD AND FURNITURE	76748	2184520	46854	50481	10373019	318879	224738	91844	1350539	324778	583338	18805318	
06 PAPER AND PRINTING AND PUBLISHING	12139108	5400818	2979803	3618025	384488	31725934	7918997	3476836	2851831	84129	820540	71397889	
07 CHEMICAL AND PETROLEUM PRODUCTS	18145870	2243834	3315804	7650388	5755070	5444462	46327356	704144	11137211	3075853	2487824	108287885	
08 NON-METALLIC MINERAL PRODUCTS	1869747	4597079	42	1088423	1574631	18384	1843240	9853062	8981892	1849116	83238	31838831	
09 METALS AND METAL PRODUCTS	17430229	8522420	7894077	4080385	5208058	4823958	13958179	21019388	131852522	12932163	9838081	235014416	
10 TRANSPORT EQUIPMENT	441898	541173	269389	158815	282075	123756	648928	1239203	1191729	8229882	228265	13353590	
11 OTHER MANUFACTURING	83443	9539	285705	8142793	198188	159356	170516	102888	428890	33404	2781840	18398921	
ALL	138839588	85749615	73835734	96142548	27828731	43292895	82486889	38681223	180113991	28851326	18154685	758377473	

Table 4.7: Input shares within manufacturing

ROWNAME	COLNAME						COLNAME						ALL
	01 FOODSTUFFS(- INCLUDING STOCKFEEDS)	02 DRINK AND TOBACCO	03 TEXTILES INCLUDING GINNING	04 CLOTHING AND FOOTWEAR	05 WOOD AND FURNITURE	06 PAPER AND PRINTING AND PUBLISHING	07 CHEMICAL AND PETROLEUM PRODUCTS	08 NON- METALLIC MINERAL PRODUCTS	09 METALS AND METAL PRODUCTS	10 TRANSPORT EQUIPMENT	11 OTHER MANUFACTURI- NG		
	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW			
	% OF INPUT	% OF INPUT	% OF INPUT	% OF INPUT	% OF INPUT	% OF INPUT	% OF INPUT	% OF INPUT	% OF INPUT	% OF INPUT	% OF INPUT		
01 FOODSTUFFS(INCLUDING STOCKFEEDS)	59.8	31.2	0.1	0.3	0.9	1.4	11.0	0.0	0.2	0.1	8.2	14.7	
02 DRINK AND TOBACCO	0.1	29.8	0.2	0.0		0.1	0.9	0.0	0.0	0.0	0.1	2.3	
03 TEXTILES INCLUDING GINNING	3.2	0.2	79.7	75.7	12.8	0.6	1.8	0.4	0.4	0.3	3.9	18.9	
04 CLOTHING AND FOOTWEAR	0.3	0.4	0.2	0.3	0.3	0.3	0.1	0.1	0.8	0.0	0.2	0.4	
05 WOOD AND FURNITURE	0.1	3.9	0.1	0.1	37.8	0.7	0.3	0.3	0.8	1.2	2.9	2.1	
06 PAPER AND PRINTING AND PUBLISHING	8.9	9.7	4.0	3.8	1.4	73.3	9.6	9.5	1.8	0.3	4.3	8.4	
07 CHEMICAL AND PETROLEUM PRODUCTS	13.3	7.0	4.5	8.0	20.8	12.6	56.2	1.9	7.0	11.6	12.9	14.9	
08 NON-METALLIC MINERAL PRODUCTS	1.2	8.2	0.0	1.1	6.7	0.0	2.2	28.9	6.6	8.9	0.4	4.2	
09 METALS AND METAL PRODUCTS	12.8	11.7	10.4	4.2	18.8	10.4	16.9	57.3	82.3	48.5	51.4	31.0	
10 TRANSPORT EQUIPMENT	0.3	1.0	0.4	0.2	1.0	0.3	0.8	3.4	0.7	30.9	1.2	1.8	
11 OTHER MANUFACTURING	0.1	0.0	0.4	6.4	0.7	0.4	0.2	0.3	0.3	0.1	14.5	1.4	
ALL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	

Table 4.8: Output patterns within manufacturing

ROWNAME	COLNAME						COLNAME						ALL
	01 FOODSTUFFS(- INCLUDING STOCKFEEDS)	02 DRINK AND TOBACCO	03 TEXTILES INCLUDING GINNING	04 CLOTHING AND FOOTWEAR	05 WOOD AND FURNITURE	06 PAPER AND PRINTING AND PUBLISHING	07 CHEMICAL AND PETROLEUM PRODUCTS	08 NON- METALLIC MINERAL PRODUCTS	09 METALS AND METAL PRODUCTS	10 TRANSPORT EQUIPMENT	11 OTHER MANUFACTURI- NG		
	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW			
	% OF OUTPUT	% OF OUTPUT	% OF OUTPUT	% OF OUTPUT	% OF OUTPUT	% OF OUTPUT	% OF OUTPUT	% OF OUTPUT	% OF OUTPUT	% OF OUTPUT	% OF OUTPUT		
01 FOODSTUFFS(INCLUDING STOCKFEEDS)	73.4	15.6	0.1	0.3	0.2	0.5	8.2	0.0	0.3	0.0	1.4	100.0	
02 DRINK AND TOBACCO	0.7	93.7	0.7	0.1		0.1	4.1	0.0	0.4	0.0	0.1	100.0	
03 TEXTILES INCLUDING GINNING	3.1	0.1	41.2	59.9	2.5	0.2	1.0	0.1	0.5	0.1	0.5	100.0	
04 CLOTHING AND FOOTWEAR	15.3	8.6	6.5	9.8	2.5	5.0	3.0	1.6	48.1	0.4	1.2	100.0	
05 WOOD AND FURNITURE	0.5	14.0	0.3	0.3	88.5	2.0	1.4	0.6	8.7	2.1	3.8	100.0	
06 PAPER AND PRINTING AND PUBLISHING	17.0	7.8	4.2	5.1	0.5	44.4	11.1	4.9	4.0	0.1	1.1	100.0	
07 CHEMICAL AND PETROLEUM PRODUCTS	17.1	2.1	3.1	7.2	5.4	5.1	43.8	0.7	10.5	2.9	2.3	100.0	
08 NON-METALLIC MINERAL PRODUCTS	5.3	14.6	0.0	3.4	5.0	0.1	5.6	31.2	28.5	5.9	0.3	100.0	
09 METALS AND METAL PRODUCTS	7.4	2.8	3.3	1.7	2.2	1.9	5.9	8.8	56.1	5.5	4.2	100.0	
10 TRANSPORT EQUIPMENT	3.3	4.1	2.0	1.2	2.1	0.8	4.9	9.3	8.9	81.8	1.7	100.0	
11 OTHER MANUFACTURING	0.8	0.1	2.7	59.1	1.9	1.5	1.6	1.0	4.1	0.3	28.8	100.0	
ALL	18.0	7.4	9.7	12.7	3.6	5.7	10.9	4.8	21.1	3.5	2.5	100.0	

Table 4.8 gives a different view of linkage. The rows of Table 4.6 have been divided by the row totals. Thus the percentages, the elements, refer to the share of output going to that particular sector, e.g. the element in row 10, column 2 means that 14.0 per cent of the output of Wood and Furniture used by manufacturing went to the Drink and Tobacco sector. Just as in reading Table 7 it is important to remember that the column totals (100 per cent) mean the totals of manufactured inputs only, so in Table 4.8 it should be recalled that the row totals (100 per cent) mean the totals of output which is used by manufacturing, not of output per se. The figures thus give indications of the relative importance, within the manufacturing market, of each sector as a user of the product in question. But several sectors, such as, for instance, Drink and Tobacco, produce mainly for consumers, not for the other manufacturing sectors. Thus the total amount used by other manufacturing sectors can be very small in relation to the total output.

Table 4.8 shows that no one sector has more than three corresponding sectors as important markets, and, for most sectors, they themselves constitute the biggest manufacturing market. Looking at the final row of the table, however, which is a weighted average of the shares for each sector, it can be seen that five sectors represent relatively important manufacturing markets for manufacturing output, these being Metals and Metal Products (21.1 per cent), Foodstuffs (18.0 per cent), Clothing and Footwear (12.7 per cent), Chemical and Petroleum Products (10.9 per cent) and Textiles including Ginning (9.7 per cent). Metal and Metal Products is thus also the most important from the point of view of suppliers because it absorbs the largest share of manufactures used in manufacturing as a whole. It represents important markets for Clothing and Footwear, of whose products it absorbs over 46 per cent of those sold to manufacturing. Similarly, it takes 10.5 per cent of Chemicals sales to manufacturing, 28.5 per cent of Non-Metallic Mineral Products, and 56.1 per cent of its own sales to manufacturing.

This has been only a brief survey of the information contained in Tables 4.6 to 4.8 and the more detailed tables given in Part III are capable of being interpreted in many different analyses to yield fuller insights into all the inter-dependencies that exist within Zimbabwe's manufacturing sector. But perhaps enough has been said here to indicate that the different branches form a web of relationships among themselves, which create their own dependencies

and their own opportunities and potentials. The diversity of commodities and activities within the manufacturing sector constitutes an elaborate system, in which each part offers both suppliers and markets for the others. If one sector stands out as being central to the complex it is Metals and Metal Products, but, throughout all possible combinations of sectors, linkages predominate. In the 33 sector table of intersectoral relations in Part III, of the 1,089 possible linkages, about 76 per cent actually exist. While this statistic is of course dependent on the classification used and also the degree to which it has been correctly read in practice, the figure is nevertheless a high one and shows that the diverse branches of manufacturing are dependent on one another to an important extent.

It is worth emphasizing also that even though the absolute value of a linkage, measured in money terms, may be small, it can nevertheless be an essential one. Many instances can be given of manufacturing processes that need only small quantities of a particular input but cannot do without it. This kind of linkage, as well as those more important in value terms, either as markets for manufacturing output or as major inputs to production processes, all point to the conclusion that the viability of any one sub-sector of manufacturing is dependent on that of others, and that decisions taken at a sub-sectoral level have to recognize the repercussions throughout the manufacturing sector, and, more generally, through the economy as a whole.

Notes and references to Chapter 4

- 1/ SADCC "Development of Pesticides and Insecticides Manufacturing Activity", Commonwealth Secretariat, March 1985.
- 2/ FAO "Agriculture 2000" Zimbabwe Country printout December 1982.
- 3/ Tractors are a complex issue because the proliferation of different types in Zimbabwe makes import substitution of spares difficult. Also, because the amount of power needed varies, the production of tractors themselves in Zimbabwe, as a further step in import substitution, would not be easy. But regional co-operation may offer some scope: see note 8 to Chapter 11.
- 4/ Based on the proportions between communal and commercial land usage given in the Transitional National Development Plan Vol. 1, p.67, Table 11.3.
- 5/ A special anomaly appears in Table 2 in values for commodity 15 (fruit, other) and commodity 16 (vegetables fresh) which are shown as going in identical quantities (\$41,831 worth) to sector 22 (matches, pulp, glue and chemicals not elsewhere classified). This probably represents an arbitrary subdivision of an original value for the two commodities combined, but whether this division was carried out by the reporter or the CSO is not known.
- 6/ Ideally a correction should be made for hides and skins also, which are produced partly by agriculture and partly by manufacturing.
- 7/ This includes an estimate for the use by the Copper and Nickel Mining sector, where the original source data was clearly wrong. The estimate was made by considering the amount of output produced by the sector, the yield and the volume of blasting implied, and the requirements for such a volume. The figure obtained was \$3.09 million.
- 8/ The criterion adopted is to take values greater than 9.1 per cent, since this is the "average value" of each element (100/11).

Chapter Five

THE WORLD ECONOMY AND STRUCTURAL CHANGE

Zimbabwe's manufacturing in an international context

In earlier chapters, especially Chapter 1, an analysis has been made of the overall position of the manufacturing sector with respect to Zimbabwe's economy as a whole. To begin this present chapter, we look at some indicators which show the comparative position in Zimbabwe's manufacturing, with particular respect to other African countries and other developing countries in general.

As has been elsewhere noted, the share of manufacturing in GDP in Zimbabwe is very high by African standards and indeed, many developed countries have no higher share. Another measure of manufacturing development, frequently used by UNIDO, is manufacturing value added per capita, thus measuring manufacturing output of the country in proportion to its population. By this standard, Zimbabwe performs very well. Its manufacturing value added per capita was US \$145 in 1981.^{1/} This contrast with the figure of US \$46 for Africa, i.e. approximately 3 times the African average. In comparison with all developing countries it is almost 50 per cent higher, since the average for this group is only US \$101. The relative advantage of Zimbabwean manufacturing is thus clearly seen, since the GDP per capita figures are US \$543, US \$433, and US \$533 for Zimbabwe, Africa, and developing countries respectively. Thus, Zimbabwe's manufacturing value added per capita is proportionately much higher than that of all developing countries than is its GDP per capita, though this again is slightly higher than for developing countries as a whole and about 25 per cent higher than the African average. Although the statistics are rather old, reflecting the time necessary to collect and construct fully comparable data for international statistics for all countries, nevertheless they indicate the striking strength of Zimbabwe's manufacturing. This is also shown by the growth rates achieved by manufacturing value added in Zimbabwe, which from 1963 to 1981 grew at an average of 7.5 per cent, while that for Africa grew at an average of 6.5 per cent per annum, and that for all developing countries grew at 7.2 per cent per annum. The higher growth rates achieved by Zimbabwe are, however, attributable to, in particular, the period 1963-1973, where an average growth

of 10.9 per cent per annum was achieved, far higher than either in Africa or in developing countries as a whole. The later period 1973-1981 showed much lower growth rate in Zimbabwe than in other groups (2.8 per cent per annum as against 5.9 per cent per annum for Africa and for all developing countries).

However, this performance needs to be set against the picture of the present concentration of industrial activity in the developed world. Thus in 1981 the Low Income countries achieved only 2.51 per cent of world manufacturing value added, and Zimbabwe's share of world MVA was 0.5 per cent. Indeed, this share has not been increased from 1973.

The structure of manufacturing in Zimbabwe can also be compared internationally by looking at the shares of different branches in total manufacturing, and constructing a measure which summarizes these shares, it is possible to see how Zimbabwe's manufacturing structure compares with those of others. It should be emphasized that such a measure, reflects, however, only the proportions between the different branches of manufacturing and not the absolute values. An index showed that in 1973 Zimbabwe, in comparison to developed market economies had a score of 79 out of 100 (which fell to 76 in 1980) which indicates that the structure of Zimbabwean manufacturing was not very far from that of developed countries, even though, of course, the absolute values produced were far lower. With respect to developing countries, and dividing these into three groups: lower income, middle income, and high income, the structure of Zimbabwean manufacturing approaches most closely that of the high income developing countries (with a score of 82), even though Zimbabwe itself belongs to the low income group of countries.^{2/}

Issues emerging from recent industrial developments in developed countries

The developed market economy countries, as a group, have seen their share of world manufacturing fall from 73 per cent in 1970 to an estimated 62.3 per cent in 1983. The growth of MVA per capita in this region was an average of 4.5 per cent per annum in the years 1963 to 1973, but in the decade 1973-1984, it averaged only 0.9 per cent per annum. Its share of world trade in manufactures has fallen from 85.0 per cent in 1970 to an estimated 80.3 per cent in 1983. Recent years have seen recession, inflation and unemployment in many of these countries, reflecting deep difficulties at a structural level in the manufacturing sector in particular.

The centrally planned economies of Europe have seen a very much higher pattern of growth in manufacturing. MVA per capita grew at an average of 8.6 per cent per annum over the period 1963-1973. However this fell to an average of 4.2 per cent per annum in the period 1973-1984, which was still higher than developing countries or developed market economies as a whole. Overall, the centrally planned economies have increased their share of world manufacturing value added from 18.3 per cent to 24.9 per cent between 1970 and 1984. At the branch level, significant increases in world share have been seen in metal products, transport equipment, pottery china and earthenware and non-electrical machinery. This group of countries has very large shares of world textiles, footwear, industrial chemicals, miscellaneous products of petroleum and coal, pottery china and earthenware, glass, other non-metallic mineral products, and metal products, machinery and transport equipment. However, the group's influence on world trade in manufactures is not as great, at an estimated 8.8 per cent of world exports in 1983. In fact its share has fallen steadily as that of developing countries has risen.^{3/}

It is the developed market economy countries who most dominate industrial production and trade and with whom Zimbabwe's manufacturing has at present the closest links. Developments in the industrial structure of these countries are of particular concern because they are having and will continue to have an important influence on world industry in general, thus contributing to a context in which all countries operate. The United States, while not having an explicit national policy for industry in the sense of a directed or preferred structure, has through a number of measures in such areas as trade policy, government spending and legislative action, had important government impact on industrial structure. With respect to the EEC, explicit difficulties exist in the areas of steel, textiles, and of aircraft production, among others. The responses to the first has been, as in so many other cases in developed market economies, in the form of restraints in trade and orderly marketing agreements. The issue in steel is the same as that in aircraft: whether government sectoral policy amounts to unfair competition. Similar considerations apply with respect to Japan although the products at issue (electronics, cars, etc.) are different and the level of technology is newer and higher. More generally the increasing orientation of U.S. economic policy towards a Pacific Basin strategy, as well as the huge potential market in China, can lead to further complications with Japan in the industrial sphere.

The EEC has developed a community policy in limited areas such as steel and aspects of high technology. But the continuing diverse national aspirations of its members represent strong obstacles to a more coherent strategy. Furthermore the basic competitive principles of the Treaty of Rome and their legislative application militate against the development of large community-wide enterprises. The high tariff walls of the EEC have encouraged foreign investment from Japan and the U.S., with many national firms engaged in joint ventures with outsiders rather than with other EEC firms. The technology issues underlying these developments have accelerated concern in EEC countries as to their diminishing competitiveness and the degree of independence available to them.

Japan's problems are those of success. Its exports to other OECD countries are regarded as a main challenge to United States and European industry and its heavy and, most importantly, fully co-ordinated concentration on high- technology has raised even more fears for the future. But it faces growing conflict with the NICs of its own region (e.g. in steel with the Republic of Korea), concern over its trade surplus with ASEAN and, perhaps, an inadequate level of domestic invention to continue to fuel the innovation (the successful, efficient and elegant application and marketing of invention) at which it excels. Given its sources of invention, the industrial economies of Europe and North America, it might, by a too-successful dominance, manage to extinguish many of the sources of its own success.

The growing importance of technology in the conflicts summarized above reflects its role in modern industry. It underlies Japan's co-ordination between government and producers, and it is at the heart of the EEC's and national governments' concern both with declining industries and the need for technology policies. Nowhere are the industrial conflicts and varying responses in OECD countries seen so sharply as in the area of informatics policy. Many European government and now the EEC, with its ESPRIT programme, are implementing schemes of R&D and application in an attempt to match both existing United States dominance and expected Japanese challenges.^{4/}

In a sense, these European policies (and there are attempts at some co-ordination in the United States also) are reactions only: the most they aim for is resistance or at best equality. And they are based on perceived

lags and losses. In fact only severe observed weaknesses could have induced such policies in the EEC, given its special characteristics as a grouping of different, still powerful states. The questions therefore arises as to whether such programmes are not already too late. And if so, how much more inadequate may be the new programmes now being formed by some developing countries?

In general the fierce competition between OECD countries in high-technology industries makes it less likely that developing countries can find niches and opportunities in the field without efforts far greater than those being made at the moment. The aims and programmes of developed country governments have to be seen in conjunction with the unstated plans now being implemented by the private enterprises in many of these countries. The accelerating pace of technological change and the rapidly accumulating levels of investment required at each stage are increasingly difficult to catch up with. The decreasing length of product cycles gives more and more value to technological information, necessitating more secrecy and higher royalties, and thus further inhibiting technological diffusion.^{5/}

Trends in direct foreign investment

Two schools of thought exist on the present situation with respect to direct foreign investment. The first says that the immediate prospects are bad for direct investment in developing countries from developed, because of the uncertain condition of the world economy which creates doubts as to demand for goods in the future, the precarious financial position of many developing countries which threatens in some cases their political stability and thirdly the attractive high interest rates available in some developed countries, offering a possibly more secure financial return than a new manufacturing enterprise. Arguments against this view include the following: the developing countries represent a largely untapped market for manufactured products and growth prospects are therefore good, in contrast to developed countries where there has even been talk of a saturation of demand. Again the most promising investment opportunities in developed countries are in frontier technologies where the investment costs are great and the risks perhaps even greater, as can be seen in, for instance, the possibly temporary saturation in semi-conductor markets that occurred last year and the still unreceived

benefits in areas such as genetic engineering. It might also be pointed out that high interest rates in developed countries are a result of, in many cases, specific government policies towards reducing inflation and that longer term prospects for interest rates remaining high are therefore uncertain.

It should be noted that the arguments against a future increase in direct foreign investment are largely short-term ones, and the arguments in favour of it are largely long-term. However, it is a fact that the actual levels of direct foreign investment are currently depressed. In general, it is not emerging as a factor, particularly in the African context, such as to relieve financial strain on the economies and on the industrial sector in particular. Indeed, it has been estimated that in 1983 both direct foreign investment and portfolio investment in Africa was less in total than in 1978.^{6/} While it is felt that the arguments that direct foreign investment will increase in the future are persuasive, it should be borne in mind that to assess the extent to which it will flow to any one developing country is very difficult because it depends upon two sets of factors. One of these is, it is generally agreed, the "climate" or "environment" for direct foreign investment provided by the country, rather than any specific incentives that may be introduced by the country to induce direct foreign investment. Factors determining the "climate" include, for instance, the general health of the economy, its social and political stability, the evidence available of its attitude to private investment, etc. It is these factors, rather than the specific package of measures introduced, which determine whether the country is considered at all as a possible site for direct foreign investment.

"It cannot be stated too strongly that, to attract foreign investment, the host country's overall economic policies are of crucial importance and that special incentives play only a subsidiary role."^{7/}

Secondly, it should be remembered that a developing country, in seeking direct foreign investment, is doing so in competition not only with other developing countries in its own and other regions, but with developed countries also (over 77 per cent of direct foreign investment from the Federal Republic of Germany, for instance, is located in other developed countries.) Indeed, competition among developing countries for direct foreign investment has been such in recent years as to have induced an excessive series of incentives upon offer as a result of which it is difficult to see what benefits direct foreign investment could in fact bring.

In deciding upon a strategy for direct foreign investment, all the traditional considerations have also to be borne in mind. These include the well-known arguments against direct foreign investment that it by means of transfer pricing, may bring insufficient benefits to the host economy, that it may merely exploit what advantages are offered by the host country and disappear when these are exhausted, that it may involve a low level of technology (such as assembly work) which adds little to the development to the manufacturing sector, and that, even if it involves high-technology, no provision may be made for its diffusion and integration into the manufacturing sector of the country as a whole.

Apart from these considerations, it should be noted that some of the incentives chosen by developing countries in the past to attract investment have been irrelevant to the investor and have entailed losses to the host country. This is particularly the case of tax incentives. In a country such as the United States of America, which operates a tax credit system of investment abroad, any tax is paid by a U.S. company on its operation abroad is credited against its liability to tax in the United States. Therefore, ignoring for the present the question of differential rates of taxation, it can be seen that if a developing country offers a tax concessions, this merely represents a loss to government revenue and provides no benefits to the investing company, since they will then have to pay more tax in the United States.

Any consideration of direct foreign investment, as far as Zimbabwe is concerned, must however consider also the potential benefits: the possible improvement in the balance of payments both in the current and the capital account, the increase in employment, the opportunities for technological advances, the acquisition of skills and marketing ability, and the like. It must also consider whether newer forms of foreign participation now in many cases accompanying or substituting for the traditional forms of direct foreign investment may not be more advantageous in particular circumstances to meet Zimbabwe's overall manufacturing strategy. These include management contracts, licensing agreements, production sharing, supply contracts, technical support, and training assistance. Different forms of these, adapted to suit the particular requirements of the adopted strategy, may prove more flexible and advantageous. Certainly, to adopt a simply traditional approach

of encouragement of direct foreign investment, by offering the usual incentives appears inappropriate; the short term prospects of direct foreign investment are not good, there is widespread competition from other developing countries for it, and finally Zimbabwe by reason of its geographical location, expensive electricity and transport costs and relatively high labour costs, does not appear well placed to attract direct foreign investment of the conventional form, particularly if it is directed towards exports rather than the internal or regional market.

There are nevertheless arguments in favour of new efforts. Zimbabwe needs increased investment to the manufacturing sector, as is shown in Chapter 12. There is certainly scope within Zimbabwe itself for mobilization of increased domestic resources to this end. However, the foreign exchange costs of new investment cannot be met in this way. The present foreign debt of Zimbabwe arising in manufacturing is relatively small, amounting to only 3 per cent of the total foreign debt of the country. Foreign borrowing for expansion of the manufacturing sector is thus a possibility but this of itself will not necessarily bring technological improvement, nor will it guarantee access to markets, in the way that a joint venture with a foreign company might. It is therefore suggested that some allowance of joint venture agreements between Zimbabwean companies, the Government, and foreign companies, in the proportions found suitable by Government, be considered as the main way which direct foreign investment is to be encouraged. Having said this, attention has to be given to the overall investment climate which as has been said is the primary determining factor in whether a decision is made by the foreign investor to invest at all. Secondly, the policy should be directed towards specific sectors identified as being those where foreign technology and marketing ability are needed and which can contribute to the overall development of the manufacturing sector. The criteria of technology unpackaging, of the degree to which the new investment exploits and expands linkages, of employment generation, and of net retained foreign exchange earnings of the project should be the principle determining factors. With respect to the sectoral choice for development by these means, clearly an overriding consideration must be the significant industrial capacity already built up in Zimbabwe. Based upon natural resources, the sectors of food processing, clothing and textile, non-ferrous metals and iron and steel, are clearly of major importance. They represent a considerable accumulation of

skills, of processes, and of support for many other activities both within and outside the manufacturing sector. Equally other sectors, such as non-metallic minerals, chemicals, pharmaceuticals, and printing, paper, publishing and transport equipment represent areas where there is considerable scope for further development, especially in view of regional aspects and prospects. But the first group of sectors are those in which particular stresses and strains may be based upon future expansion in view of existing trends in international industrial restructuring, and some of these problems are now considered in the next section.

Difficulties in structural change at the international level

Just as trade is an engine of growth, so it is very often in the arena of international trade that the difficulties of structural change appear. The increasing stresses and strains to which the international trading system are being subjected and the widespread tendency towards retreat from the GATT principles have their origins partly in macroeconomic policy pursued by individual governments, partly in changes in consumer patterns, partly in the limitations of natural resources, but fundamentally at the level of shifts in comparative advantage between countries at a sectoral level, and the technological progress which has given rise to these shifts. As noted above, the conflicts between countries with respect to particular sectors now cover a broad spectrum, including iron and steel, consumer electronics, and agricultural products. With respect to developing countries prospects for manufactured exports, the most notable manifestation of this current has been the Multi-Fibre Arrangement. This is an agreement between developed countries and developing countries, due to expire in its present form in 1986. The agreement limits the physical quantities of exports which the developing country can make of textiles and clothing to developed countries, through the form of agreement on a quota. This is an oversimplified statement of the system: the calculation of the quota and the means by which it is revised are complex. In addition there are special provisions for developing countries which produce both raw materials for textiles and the textiles themselves. However, the importance of the agreement is that it is the direct consequence of the penetration of exports of textiles and clothing from developing countries in the markets of the developed countries which was accompanied by

a long decline in similar industries in the developed countries, resulting in many cases in significant losses of jobs. Whether in fact, and there is certain evidence against this, the two phenomena were in any way related is irrelevant: for the justification of the Multi-Fibre Arrangement is the need for developed countries to adjust their economies, and in particular the textile and clothing industries, in an atmosphere of controlled penetration of imports from developing countries. While the Multi-Fibre Arrangement has been condemned in the strongest terms by, for instance, a panel of experts under GATT auspices, because it violates all the principles of international free trade and also is directly harmful to developing countries,^{8/} nevertheless there are few signs that some such arrangement will not be continued when the present agreement expires. With respect to the EEC in particular, the accession to the Community of a low cost textile and clothing producer such as Portugal, will hardly favour a liberalization, even though the industry there has its own structural difficulties.

It should be stressed that Zimbabwe was hardly one of the countries whose exports performance brought about the Multi-Fibre Arrangement: it was the significant success of the Far Eastern producers, in particular, which induced it. As an ACP country, Zimbabwe's textiles and clothing exports come under Lomé III with respect to the EEC market, and access here is unrestricted. Nevertheless, Zimbabwe as all other developing countries, now operates against the background of the MFA, even if Zimbabwe is for the immediate future incapable of producing anything in the way of disruption on existing markets in the clothing and textiles fields.

A further result of the conditions which gave rise to the MFA has been the growing investment in developed countries in new technologies to enhance their capabilities in the textile and clothing fields. These technologies are electronics-based, and include numerical control, flexible manufacturing systems and robotics. While the impact of the last named in the textile field are unlikely to be seen for some years to come, it is a good deal more certain that textile and clothing manufacturers in developed countries are gearing themselves up to a position in which they will be confident of recovering some of the ground lost in the past. The reasons for this are clear. A clothing or textile manufacturing system which minimizes labour inputs reduces the cost of production, and furthermore such a system can be changed very quickly to produce new products and designs to meet new tastes and to reflect changes

the relative prices of raw materials (e.g. natural versus synthetic fibres). If these developments threaten the advantages of those developing countries who have low cost labour, they will certainly even more affect those whose costs are higher.

In general, however, immediate obstacles to be faced by developing countries in their textile and clothing exports are in the area of protection rather than the lost competitiveness induced by technological change. Other implicit forms of protection are found in the support given by countries, both developed and developing, to particular industries. High international competitive pressures have grown. These include, in particular, iron and steel, where world-wide over capacity and stagnant productivity growth have led to tensions in international trade and to a series of measures by Governments to assist the restructuring of the industry in certain countries and, in some cases, at the regional level (the EEC). Iron and steel, in a broad sense is seen as a strategic industry, and it is also a major source of employment, being especially concentrated in some areas of developed countries for very long periods. As a result there are strong social and community pressures on the governments in these countries to afford the industry a measure of protection against what is seen as unfair foreign competition and, if necessary, to subsidize it in its traditional role of employment provision.

5. Technological change

In the discussion of the textile industries above, an indication was given of the way in which technological changes affecting the competitive advantage of developing countries, at present having low labour costs, through the increasing introduction of microelectronics-based technologies which allow for lower skills, lower labour, and less wastage in use of raw materials, together with the flexibility to adapt to changing market conditions. This progress is not limited by any means to the textile industry, rather it can be expected gradually to affect all sectors of manufacturing, as well as other parts of the economy. Microelectronics is at the core of a whole sequence of techniques, such as computing, telecommunications, factory automation, etc. which will transform the production structure throughout the world economy in the years to come. The frontier fields of automation, robotization, computer

integrated manufacturing, expert systems and knowledge-based systems are at present the focus of widespread efforts in developed countries and in a selected number of developing countries.^{9/}

Perhaps the best known example of such a programme is the Japanese Government's Fifth Generation Computer Project, which is intended not only to increase the speed of computers but also to develop them qualitatively to a new stage of machine intelligence, in which computers will make judgements based upon accumulated knowledge. It is in response to this, and to the increased penetration by Japan of international markets in microelectronics and computers (they are not as yet as significant in tele-communications and in software), that has prompted the EEC to launch its ESPRIT programme, and also the formation of collaborative efforts in the United States computer industry. The new EUREKA project combines EEC and other West European countries in a new collaboration for major technological research and development. But these represent only a small part of the activity underway at both government level and in the transnational corporations in order to master and apply these technologies. For instance, both Japan and the EEC have also each developed and applied application programmes in the clothing industry in particular.^{10/} Considerable effort is now being directed in developing countries to undertake similar programmes of co-ordination, with Brazil, Mexico, Argentina, India and the Republic of Korea being particularly noteworthy examples of the way in which government action can bring together different groups in such development and focus on a key strategic sector.

If microelectronics will change the way in which products are manufactured, there are other technological advances that will change the nature of the products themselves. It has been noted in the study of non-ferrous metals how the changes of technology are affecting the demand for certain types of metals, with, for instance, glass fibre used in fibre optics reducing the demand for copper which was the traditional raw material for cables. Again the demand for tin has been affected by technological development that tends to use less tin in the production of tin plate and less lead in the production of batteries. The demand for the latter has also been reduced by the substitution of plastics for lead in cable sheeting and other metals and plastics in piping. On the other hand, other developments have

lead to an increased demand for lead in electronics, auto-corrosion applications and as radio-active shielding, and aluminium is finding new applications in computers, communication equipment and instrumentation. Environmental and public health questions have negatively affected the demand for lead, and also, of particular interest to Zimbabwe, the demand for asbestos.^{11/}

Another major area of technological development, that of genetic engineering, can be expected also to affect the patterns and geographical location of agricultural production in the future, as well as having important impacts in such fields as chemicals and pharmaceuticals. Increased mastery of the techniques of genetic engineering can, in the future, be expected to lead to the production in other parts of the world, of commodities whose production at present appears best suited to particular climatic conditions in one country or a group of countries. The prospects for the production, for instance, of tropical fruits in temperate zones of the world is an obvious example of the possible consequences of such research. While the prospect is a longer term one, and the specific development would obviously affect more severely developing countries heavily dependent on such unique tropical products, the implications remain for Zimbabwe as for every other country.

"Though the first benefits from the new techniques will affect human and veterinary medicine, many feel the more important applications will be in the areas of energy, mining and agriculture For example, in energy new strains of microorganisms will more efficiently convert earth's most abundant resource, biomass, into primary energy substances such as biogas and alcohols. In mining, hardy strains will leach out large quantities of copper and uranium from now discarded mine tailings and from low quality areas. In agriculture, genetic engineering will be used within 10 years to improve crop strains and within 20 years it is likely plants will be fixing their own nitrogen (converting atmospheric nitrogen into easily assimilated plant nutrients), thereby lessening the need for artificial fertilizer."^{12/}

Technological development continues and is accelerating, and this creates new problems and new opportunities. The problems arise for an economy, and especially a manufacturing sector, which is inflexible and unresponsive to the signals given by the international economic environment or for an economy based upon industries doomed to decay, for whose replacement no provisions has

been made. This is not a case per se against measures of protection traditionally accorded the manufacturing sector in developing countries, many of which are applied in Zimbabwe, such as import controls, price controls, and constraints upon the operation of transnational corporations. All these measures have their place. The question only is, what are they intended to protect? Their object should be to nurture and sustain a manufacturing system. This system naturally contains production processes, capital equipment, an experienced labour force, and managerial and marketing skills. But if it is to survive in the future, it will also have to contain powers of innovation, the ability to acquire or develop technology and to apply it, and most importantly the ability to detect trends in technology and trends in structural change, to determine the appropriate response, to mobilize the resources necessary for it, and to adjust and modify the strategy in the light of constantly changing conditions. In the long and now steep path of technological and structural change, there are no resting places, and the ability of the manufacturing sector to change itself in the light of new developments is the most important capacity for it to attain. It is this capacity, above all others, which industrial policy will have to safeguard. Irrespective of the development paths chosen by Zimbabwe, the country, will as long as it intends to proceed through exchange of goods and services with the rest of the world economy, have to take account of the changes therein.

Regional co-operation, which is regarded as of particular importance for Zimbabwe in the future, cannot replace or remove the need for such assessment and flexible response. Regional co-operation schemes are based on partnerships with a number of other countries, and it cannot be assumed, even if Zimbabwe chooses to follow a path that ignores technological development in the world outside, that other countries of the region will also do so. It should also be noted that on the assumption of a new form of government emerging in South Africa, many of the constraints upon the fuller and wider activity on the part of the South African manufacturing sector will be removed. In such a context, the need for Zimbabwe manufacturing to increase its international competitiveness is all the more important.

Practical steps to foster and maintain this kind of flexibility of the manufacturing sector include the following:

- a) The Ministry of Industry and Technology could dedicate staff resources specifically to monitoring and assessing structural change and technological progress at an international level, synthesizing now widespread information to assess its importance for Zimbabwe in the future. A reasonable time horizon should be adopted in which it can be expected that results will be analysed, conclusions drawn and, through consultation between Government and the manufacturing sector, measures adopted which would determine a suitable response. A close liaison would be necessary with the proposed institute for research and development (discussed in Chapter 8). Of its nature, the latter would carry out research and development upon request from manufacturing: it should however do so within the context abroad for strategic guidelines laid down by the Ministry as to suitable sectors for particular concentration;

- b) Existing international organizations which act as a store of such information should be utilized by Zimbabwe to the maximum extent possible. These include UNIDO as well as other organizations such UNCTAD, UNCTC, together with a large number of bodies concerned with structural change and technological assessment analysis, mostly but no means all in developed countries. Regional co-operation can be also furthered through networks for information exchange among groups of developing countries. Because of the fact that SADCC is, at a fundamental level, an information exchange system, this could be a good body for some efforts in this direction: however it should be recognized that the major developments in this field are taking place in other parts of the world, both in the developed countries and in parts of Asia and Latin America. For this reason the use of international organizations will be of great benefit. UNIDO is already establishing in co-operation with the Economic Commission for Latin America and the Caribbean (ECLAC) an industrial restructuring information system, known as IRIS. At the detailed technology level a Latin American Microelectronics Network (REMLAC) is being created and an International Centre for Genetic Engineering and Biotechnology has been established under UNIDO auspices;

- c) The question of enhancing the flexibility of the manufacturing sector itself to meet these changes and challenges is a complex one. The manufacturing sector in Zimbabwe has shown itself in many difficult situations to be resourceful in resolving difficulties. The most important task for Government is to enhance the awareness of difficulties not necessarily immediate but which will inevitably soon appear. For this reason, the Government should enter into an explicit and continuing dialogue with manufacturers on how it believes developments in the world economy call for increased efforts on the part of Zimbabwe's manufacturing sector. It should back-up its point of view by specific encouragement of the areas in which it believes Zimbabwe's future lies. In particular it should foster the diffusion of certain technologies, such as micro-electronics, perhaps through selective import relaxations on key components of this technology. Following a policy of technology unpackaging, the importation of those electronics circuits which Zimbabwe will not be in a position to make itself for years to come should be positively encouraged. This would both allow Zimbabwe manufacturers access in principle to such technologies and also foster a manufacturing activity and technology application in new areas, in the use of components for computer manufacturing and the development of software for both process and business applications.

Notes and references to Chapter 5

- 1/ These and the following figures are in constant (1975) United States dollars, supplied by the Statistics and Survey Unit, UNIDO.
- 2/ UNIDO "Handbook of Industrial Statistics 1984", United Nations, New York, 1985 Sales No. E/F/84.II.B.8, Table 3.
- 3/ UNIDO "A Statistical Review of the World Industrial Situation 1984", UNIDO/IS.506, March 1985.
- 4/ "Survey of Government Policies in Informatics", UNIDO/IS.526, 4 April 1985.
- 5/ "World Industrial Restructuring and Redeployment", UNIDO/ID/B/339, 2 April 1985.
- 6/ "Summary Report on Industry and External Debt in Africa," UNIDO/IS.536, 20 June 1985.
- 7/ "Investing in Developing Countries", OECD, Paris 1983, p.14.
- 8/ "Trade Policies for Better Future", GATT, March 1985.
- 9/ R.C. Riddell, Automation, Productivity and Employment: Reflections for Zimbabwe. Talk given at USA CIMB-Zimbabwe YMCA Executive Summit, Harare, 3 March 1983.
- 10/ K. Hoffman, "Clothing, Chips and Competitive Advantage: The Impact of Microelectronics on Trade and Production in the Garment Industry", World Development Vol.13 No.3, March 1985.
- 11/ "The Development and Restructuring of the Non-Ferrous Metals Industries", UNIDO/ID/WG.436/1.
- 12/ "The Promise of Biotechnology and Genetic Engineering for Africa", UNIDO/IS.513.

Chapter Six
GOVERNMENT POLICIES AND OBJECTIVES

Introduction

The Government's broad objectives for the manufacturing sector are set out in Volume I of the Transitional National Development Plan 1982/83 - 1984/85. While it is now widely recognized in Government that the quantitative targets for economic growth published in the Plan have been proved unachievable, the Government has equally stressed that the general objectives and perspective of the Plan are still central to its thinking.

Before highlighting these objectives, attention needs to be drawn to three assumptions that appear to underlie the discussion of manufacturing industry in the Transitional National Development Plan.

The first is the recognition of the pivotal place of the manufacturing sector in the national economy both now and in the future. The Plan states that "as the leading sector of the economy, its growth will contribute substantially to the attainment of the planned real economic rate of growth" (section 4.40). This relationship between the manufacturing sector and the national economy is two-way: the pattern and changing structure of the national economy will have a direct bearing on the present and future course of the manufacturing sector while the direction and changing structure of the manufacturing sector will itself affect the outlook and prospects for the national economy. The most obvious implication of this inter-relationship is that one cannot successfully implement a strategy for industrial development in isolation for the rest of the economy. Hence to the extent that the decisions of different agencies, departments or ministries of Government have an effect on the pattern and development of key sectors of the economy then these different organs of Government have a role to play in achieving the objectives outlined for the manufacturing sector.

The second assumption is a recognition not only that the manufacturing sector should expand but that interventionist policies should be introduced, implemented or continued to encourage expansion. The implication is that a complete laissez-faire attitude to the sector is rejected, although there would appear to be scope for market forces, competitiveness and private enterprise, even if these are sometimes over-ridden.

The third assumption is the recognition that some of the aims and objectives for both the national economy and for the manufacturing sector are likely to conflict with each other especially in the short and medium-term. For example the Plan states explicitly that "the twin objectives of growth and equity is difficult and may in some cases be impossible particularly in the short term" (section 4.7). Given limited resources it is simply not possible for all sub-sectors within manufacturing to expand, to rapidly increase exports of manufactured products and to meet all aspects of domestic demand, to maximize employment growth and international competitiveness, to prevent price increases and encourage rapid investment when costs are increasing - to pinpoint a number of potentially conflicting objectives. The implication here is that in the real world an industrial strategy will need to highlight the potential contradictions and indicate the priorities, in this way leading to the achievement of the most critical objectives, bearing in mind that if too short a time frame is adopted then the achievement of long-term objectives could be seriously impaired if not rendered impossible.

Broad objectives for the sector

The objectives for the manufacturing sector that are outlined in the Plan are to be seen within those laid out for the national economy. These include: rapid economic growth, attaining and maintaining full employment, achieving greater equity by reducing wide disparities in income, wealth and economic opportunities, reconstructing and revitalising those parts of the economy which suffered dislocation or neglect because of the war and sanctions and, finally, socio-economic transformation especially towards more socialised forms of production and distribution. The Plan outlines "the fundamental and ultimate goal" as "the development of a democratic egalitarian and socialist society, set in a dynamic framework of a developing economy" (section 3.17). To achieve this goal changes are to be introduced, including "participation in and ownership of a significant proportion of the economy by nationals and the State. This will imply, on the one hand, the collective participation by Zimbabweans in the ownership and management of key private enterprises and, on the other, control by the State of some activities and enterprises considered to be of interest for the economic and political security of the nation" and the "re-orientation of the production system so as to generate the goods and services needed for national development as well as for popular consumption" (section 3.24).

Before listing specific objectives for the manufacturing sector, the Plan describes five "issues" that are "relevant for the future growth and development of manufacturing" (section 13.2). These are:

1. the formation and implementation of an industrial strategy for the sector;
2. the heavy dependence of manufacturing on imported inputs;
3. the sector is operating under a skilled manpower constraint that seems to be worsening;
4. industries are highly concentrated in the two main centres of Harare and Bulawayo;
5. the sector is under considerable foreign ownership control.

The stated objectives for the manufacturing sector given in the Plan are as follows:

- (i) to expand the sector to enable it to meet the growing and changing patterns of demand and to actively encourage and promote greater backward and forward linkages within manufacturing and with other sectors like mining and agriculture. Particular attention will also be given to the establishment of small and medium-scale industries in rural areas;
- (ii) to enhance the competitiveness of the sector's products on world markets and thus significantly strengthen its export earning capacity and prepare it for the eventual removal or reduction of the significant protection from world competition afforded by quantitative import restrictions and their substitution with tariffs;
- (iii) to encourage and promote the adoption of labour-intensive technologies consistent with the country's factor endowment and thus enhance its capacity to generate a larger number of jobs than is currently the case;
- (iv) where desirable and economically efficient, to encourage further import substitution in areas such as energy, fertilizer production, heavy industrial machinery, light machine tools, and electronics;
- (v) to encourage and promote the training and upgrading of staff at all levels, including managerial, technical and skilled positions;
- (vi) to encourage decentralization of industries;
- (vii) to encourage more local participation, ownership and control of industries by Zimbabweans; and

- (viii) to encourage efficient use and conservation of energy and provide necessary assistance to the sector to adjust and adapt to high energy costs.

In summary, these eight objectives could be stated as follows: growth and expansion, export expansion, job creation, further import substitution, skills training, decentralization, less foreign ownership and control and more efficient energy utilization.

The strategy for implementation

To achieve this range of objectives, the Plan lays out a variety of specific policies for execution. Pride of place is given during the plan period (to mid-1985) to the formulation and articulation of a "comprehensive industrial strategy" with elements applicable in the short-term. Implicit mention is made to address the question of the "need, capacity and potential of the manufacturing sector to become more export-oriented than it is now" (section 13.8).

Besides these two policies others explicitly highlighted are the following:

3. to identify and provide special encouragement to existing and new industries that have a dynamic comparative advantage (section 13.8);
4. encourage more labour-intensive industries and ensure that they grow faster than the average real growth of the sector (section 13.9);
5. encourage relatively more labour-intensive technologies in the sector (section 13.9);
6. ensure established industries are efficient and that their expansion is not limited by the size of the domestic market (section 13.10);
7. provide an increased supply of domestic skilled manpower and ensure the remuneration of all manpower, and particularly skilled manpower, is consistent with the domestic labour market conditions (section 13.11);
8. promote co-ordinated and accelerated State participation in the economy through the Zimbabwe Development Corporation, especially through a re-vamped and re-oriented Industrial Development Corporation (section 13.12);
9. assist small and medium-scale enterprise engaged in processing and manufacturing activities, especially outside Harare and Bulawayo (section 13.13);
10. review the criteria for foreign exchange allocation, export incentives, export promotion institutions and mechanisms, tax incentives, industrial licensing policy and advisory services (section 13.14);

11. create a climate conducive to meaningful consultation, co-operation and, where appropriate, co-determination on matters of mutual interest with private sector industrialists (section 13.15);
12. provide fiscal and other measures to stimulate investment (section 4.40);
13. give preference to technologies using local inputs as opposed to those dependent upon imports.

Evaluation of policy measures outlined in the Plan

As is well known the statistical targets for growth, investment, employment and exports enunciated in the Plan for both the national economy and for the manufacturing sector have in aggregate not been met. A variety of explanations have been put forward to explain this low level of achievement among which have been the years of drought, the disappointing performance of the international economy and the persistently high value of the United States dollar. In this section of our Report we are not primarily concerned with the quantitative objectives but rather with the policy instruments that the Plan outlined for assisting the achievement of the stated objectives. While it is certainly possible that there could be a causal link from failure to achieve quantitative targets to the inability or inappropriateness of initiating new policies, it is more likely that the causal link would go the opposite way: failure to achieve policy initiatives is a contributory factor for lower than projected quantitative targets being achieved. In this case there would seem to be merit in evaluating the success rate of initiating policies to meet broad quantitative objectives even if these targets were not met. Hence this section attempts to examine the implementation of policies proposed in the Plan for achieving the objectives for the manufacturing sector while readily acknowledging that particular circumstances, many external, contributed to the failure to achieve the quantitative targets that were drawn up.

We shall thus examine the 13 specific policies outlined for execution during the plan period to assist in achieving the objectives for the manufacturing sector. The purpose is to assess how far these policy proposals have been implemented successfully by May 1985. It needs to be stressed that there is an element of subjective judgement in the conclusions drawn on the success or failure to implement certain specific proposed policy initiatives: for this reason comments on these assessments made are given in brief for each

proposed initiative. Two additional preliminary comments should also be made. The first is that although in certain instances policies have not been implemented, plans are underway to execute them in the future; in these cases the evaluation needs to be seen as for what it is, namely, a static rather than a dynamic assessment. The second is that there may well be good reasons why certain policies have not been implemented. The purpose of this (static) evaluation is not to go into causes of failure, where these have occurred, nor to assess the relative merits of attempting to introduce particular policies.

The results of the evaluation of the success in implementing policy measures outlined in the Plan are summarized in Table 6.1 below. They indicate in general a low level of policy implementation. Out of 13 policies specified in the Plan only two have been carried out and neither of these have been fully implemented. On the other hand, there would appear to be only one policy proposal that seems to have been ignored entirely. However, on a score of 0 for nil implementation and a score of 10 for completely successful implementation, the achievement rate is low, only a little over 30 per cent.

A striking result is the lack of dominance of the Ministry responsible for the manufacturing sector, the Ministry of Industry and Technology, in the execution of the proposed policies to achieve the objectives outlined in the Plan for the sector as a whole. The Ministry of Industry and Technology would appear to be the responsible agency for only 7 out of the 13 proposed policy initiatives and to have exclusive responsibility for only two of the initiatives. This points to the fact, highlighted in more detail below, that a strategy for the manufacturing sector if it is to be effectively implemented needs the active support and encouragement of other agencies of Government under the present structure of responsibilities within the different organs of the State.

Table 6.1: Assessment of policy measures outlined in the Transitional Development Plan for the manufacturing sector

Number	Policy proposals	Achievement		Executing agency/ agencies	Comments
		Yes/No	Score 0-10		
1.	Formulation of a comprehensive industrial strategy	No	2	Cabinet, Economic Planning, Industry and Technology	An attempt was made in the study "Government Policy and the Manufacturing Sector" which did not fulfill expectations. The present pilot project could be seen as an input into developing a comprehensive industrial strategy.
2.	The strategy to address the need, and capacity potential of the sector to become more export-oriented	Yes	7	Cabinet, Treasury, Reserve Bank	Although no rigorous analysis of the capacity and potential of the sector to expand exports has been carried out, a range of policies have been put in place and have successfully increased the exports of the sector. However, the sustaining of the rate of export expansion remains in doubt.
3.	Identify and encourage dynamic comparative advantage industries	No	1	Industry and Technology	The study referred to in (1) above analysed static comparative advantage and thus provided a poor guide to future industrial strategy.
4.	Encourage more labour-intensive industries and ensure they grow faster than the average growth rate of the sector	No	3	Cabinet, Treasury, Industry and Technology, SEDCO ZDB	No new initiatives since publication of the Plan have been published. However, it is known that the Industrial Projects Committee of the Ministry of Industry and Technology does use the labour-intensive criterion in accepting/rejecting new projects while SEDCS does also consider this criterion in evaluating projects. ZDB has only just started operations.
5.	Encourage more labour-intensive technologies	No	1	Cabinet, Treasury, Industry and Technology, SEDCO, ZDB	No new initiatives, fiscal or otherwise, and no evidence to current or prospective industrialists of policy implementation.

Table 6.1: Assessment of policy measures outlined in the Transitional Development Plan for the manufacturing sector
(continued)

Number	Policy proposals	Achievement		Executing agency/ agencies	Comments
		Yes/No	Score 0-10		
6.	Ensure current industries are efficient and expansion not limited by the domestic market	No	0	Industry and Technology	No new initiatives, no agreed definition of efficiency, no evidence of expansion determined by the export market. The present Foreign Exchange allocation system does not specifically encourage efficiency or competitiveness, and it is not mentioned in the guidelines.
7.	Provide increased supply of domestic skilled manpower, ensure adequate remuneration especially of skilled workers	No	5	Labour, Social Services and Manpower Development	No doubt that major initiatives are underway to improve skilled manpower supply; however, reliance on expatriate labour is still critical and likely to increase as economy expands. The wage freeze and ceiling on wage increases for those earning \$20,000 a year and more is ensuring a far less than adequate remuneration of skilled and semi-skilled workers. Raising the wage freeze ceiling to \$36,000 in July will have gone some way to alleviating this particular constraint.
8.	Promote co-ordinated and accelerated state participation in the economy through ZDB and re-vamped IDC	No	4	Cabinet, ZDB, IDC, Industry, and Technology	State participation in the economy has definitely occurred. However, it is slowing down, it is generally unco-ordinated. The ZDB has just begun operating while the IDC, although re-vamped, is hindered from co-ordinated planned involvement through having to respond to unco-ordinated directives for specific involvement largely in industries experiencing difficulties and problems of viability.
9.	Assist small and medium-scale enterprises in processing and manufacturing activities especially outside Harare and Bulawayo	No	4	Cabinet, Treasury, SEDCO, ZDB Technology	SEDCO and the ZDB have become operational but to date they have not yet implemented this policy. SEDCO is dominated by commercial rather than manufacturing projects, few, if any, in processing. ZDB has not yet accepted any project. While a score of 4 is appropriate as of May 1985, policies have been initiated to lead to the successful implementation of this measure in the near future.

Table 6.1: Assessment of policy measures outlined in the Transitional Development Plan for the manufacturing sector
(continued)

Number	Policy proposals	Achievement		Executing agency/ agencies	Comments
		Yes/No	Score 0-10		
10.	Review the criterion for foreign exchange allocation, export incentives, export promotion institutions and mechanisms, tax incentives, industrial licensing policy and advisory services	Yes	7	Cabinet, Treasury, Trade and Commerce, SEDCO	Much has been achieved here. A foreign exchange study has been carried out, export incentives have been assessed and new incentives introduced, export promotion activities in Trade and Commerce have been re-vamped, advisory services are a constituent part of SEDCO's activities. however, tax incentive reviews await the findings of the Tax Commission and industrial licensing policies do not appear to have been reviewed.
11.	Create a climate conducive to meaningful consultation and co-operation with the private sector and, where appropriate, co-determination	No	4	Cabinet, Planning, Industry and Technology	Advice of and information for the private sector has certainly been sought. however, no formal structures exist except in relation to pre-budget presentations; information flows tend to be one way way and no example of co-determination exists, except perhaps the present study.
12.	Provide fiscal and other measures to encourage investment	No	2	Cabinet, Treasury	Foreign investment guidelines have been published. However, these fall far short of the encouragement investors are seeking while fiscal measures, except for the re-introduction of the special initial allowance for investment, have deterred rather than encouraged investment.
13.	Give preference to technologies using local inputs as opposed to those dependent on imports	No	3	Industry and Technology	The traditional system still operates unchanged; no systematic evaluation of local technologies vis-a-vis imported ones has taken place although some partial studies have been carried out, especially by UNIDO. However, no action on the recommendations has occurred.

Notes: SEDCO - Small Enterprise Development Corporation
ZDB - Zimbabwe Development Bank
ZDC - Zimbabwe Development Corporation

Outline of major policies executed which affect the manufacturing sector

We now move away from the objectives for the manufacturing sector as given in the Plan and the policies proposed to assist in the implementation of those objectives, and we consider some of the major policies that different parts of Government have introduced or perpetuated in the last few years which have either a direct or indirect bearing upon the performance of the manufacturing sector. A selection of 30 different policy initiatives has been chosen for discussion. As will readily be seen, the list of measures taken that do have an influence (often considerable) on the sector is long and the ramifications of some of the policies likely to have been profound. If these policy measures are in any way representative of all policies initiated or continued that have a bearing on the performance of the manufacturing sector, they illustrate a number of important conclusions for policy execution for the sector:

- a) the Ministry of Industry and Technology has a relatively minor role in relation to critical policy decisions taken that affect the performance and direction of change of the manufacturing sector;
- b) the Cabinet and Treasury play a major and critical role in deciding policies that have profound effects on the manufacturing sector;
- c) because of the relatively minor role that the Ministry of Industry and Technology plays in critical policy decision-making affecting the sector it is also likely that there is little in-depth analysis of the effects of policy changes either on the performance of the sector or on the potential conflicts resulting from implementing policies on the broad objectives Government has for the sector.

In reading the comments made about the different policies implemented or continued and listed in the Table below, it needs to be stressed that the comments are in no way meant to conclude that the policy measures have in themselves been either "good" or "bad". A number of decisions, such as the cuts in foreign exchange allocations were made for the simple and obvious reason that there was no foreign exchange available to allocate to manufacturers to the extent necessary to maintain or expand demand. The comments made in the Table are thus only concerning the effects of policies on the manufacturing sector, not on the broader desirability of introducing the policies.

Table 6.2: A selection of recent policies affecting the manufacturing sector

Number	Policy decisions	Decision-making and/or executing agency of Government	Effect of policy on the manufacturing sector	Comments, especially in relation to Government's objectives for the sector
1.	Introduction of and increase in minimum wages	Cabinet; Treasury; Labour, Social Services and Manpower	Positive	Policy gave an added boost to domestic demand for products produced by the sector that over-rode the marginal cost increase for the sector.
2.	Wage freeze	Cabinet; Treasury; Labour, Social Services and Manpower Development	Negative	Curtailed domestic demand and lowered production levels. Negative effects on skills retention. Overall conflict with growth and expansion of the manufacturing sector.
3.	Special permission required to dismiss labour	Labour, Social Services and Manpower Development	Negative	Led to companies carrying excess labour to requirements; negative effect on profit levels, investment, future labour hiring and probably on labour-intensive production methods. Overall conflict with growth and expansion of output, and only short-term positive impact on employment levels.
4.	Special permission to hire foreign labour and only for short-term contracts	Labour, Social Services and Manpower Development	Negative	Delays in granting permission to hire necessary skilled foreign labour has had a negative effect on production levels. Likely to get worse as the economy expands again.
5.	Price freeze	Cabinet; Treasury Trade and Commerce	Negative	Freezing prices when costs have been rising had the effect of lowering profits, this outcome almost certainly outweighing demand buoyancy effects.

Table 6.2: A selection of recent policies affecting the manufacturing sector
(continued)

Number	Policy decisions	Decision-making and/or executing agency of Government	Effect of policy on the manufacturing sector	Comments, especially in relation to Government's objectives for the sector
6.	New price control regulations	Cabinet; Trade and Commerce	Negative	The major effect of the new price control regulations on the sector has been negative because of the long delays in granting price increases. This has lowered profit margins and directly affected internal funds for re-investment.
7.	Publication of Foreign Investment Guidelines	Treasury; Cabinet	Neutral to Negative	Because the Guidelines have provided little substantially new to potential investors, because a specific code for foreign investors has not been produced and as the Government has not signed the OPIC agreement the new guidelines have not been a positive boost to investors and have probably decreased interest in Zimbabwe as a field for investment.
8.	Increase in electricity charges	Cabinet; Energy; and ZESCO	Negative	Dramatic increases in electricity charges have had a significant effect on cost increases with ripple effects on the domestic economy; they have lessened the competitiveness of key manufactured exports especially ferrochrome and steel.
9.	Short payback period for capital purchases for electrical capacity expansion	Cabinet; Energy; ZESCO	Negative	Foreign loans contracted over the short period for expansion of Wankie power station with rise in the US dollar have increased debt servicing costs contributing to cuts in foreign exchange allocations including those for the manufacturing sector.

Table 6.2: A selection of recent policies affecting the manufacturing sector
(continued)

Number	Policy decisions	Decision-making and/or executing agency of Government	Effect of policy on the manufacturing sector	Comments, especially in relation to Government's objectives for the sector
10.	Export incentive scheme	Cabinet; Treasury; Reserve Bank	Positive	The re-introduction of the export incentive scheme and raising the level to 9 per cent has had a major positive effect on expanding the exports of the manufacturing sector.
11.	Manufacturing Rehabilitation Import Programme with World Bank funds	Treasury; Trade and Commerce	Positive	The US \$65 million facility for the manufacturing sector enabled the sector to expand production and replace equipment in the early stages where the monies led to increases over and above normal allocations. Subsequently, the effects were probably not sustained.
12.	World Bank export promotion/ revolving fund loan	Treasury; Reserve Bank; IIC; Trade and Commerce	Positive	The provision of foreign exchange for raw materials and spares needed for exports together with the extension of the credit terms usually applied by the Reserve Bank has been a major factor in boosting the exports of the sector.
13.	Raising excise duties for drinks and tobacco and switch from sales tax	Treasury; Cabinet	Negative	This increase has made a significant negative impact on sales and hence on production levels for sub-sectors directly affected.

Table 6.2: A selection of recent policies affecting the manufacturing sector
(continued)

Number	Policy decisions	Decision-making and/or executing agency of Government	Effect of policy on the manufacturing sector	Comments, especially in relation to Government's objectives for the sector
14.	Raising consumer prices for dairy and beef products	Treasury; Cabinet; OMB; CSC	Negative	Increased prices have led to substantial falls in sales, affecting negatively the dairy industry and beef processing. Transfers to the export market have not been large enough to counter the effects.
15.	Changes in sales tax	Treasury; Cabinet	Negative	The 1984 falls in sales tax have partially offset the drop in domestic demand for manufactured products caused by previous increases.
16.	Import surcharge of 20 per cent	Treasury; Cabinet	Negative	This surcharge has the direct effect of raising costs of capital and imported inputs into the manufacturing sector; given the shortage of foreign exchange the effect is likely to have made little to no positive impact in regard to encouraging labour-intensive technologies.
17.	Establishing ZDB	Cabinet; Treasury;	Positive	Positive potential impact on the manufacturing sector especially by providing an additional window for access to foreign exchange and professional project appraisal.
18.	Establishing SEDCO	Cabinet; Treasury; Trade and Commerce	Positive	Positive yet probably only marginal impact on promoting small-scale industry because of its dominant interest/workload in commercial projects.
19.	Cuts in foreign exchange allocations for raw materials	Treasury; Trade and Commerce	Negative	Dramatic negative effect on output levels and ripple negative effects on employment and future investment.

Table 6.2: A selection of recent policies affecting the manufacturing sector
(continued)

Number	Policy decisions	Decision-making and/or executing agency of Government	Effect of policy on the manufacturing sector	Comments, especially in relation to Government's objectives for the sector
20.	Signing the PTA agreements	Treasury; Trade and Commerce	Positive	Initial success in expanding manufactured exports to PTA member States; continuation of export expansion largely dependent upon access of trading partners to foreign exchange.
21.	Signing CIP aid agreements	Treasury; Trade and Commerce; Industry and Technology; IIC	Positive	In as much as the CIPs have provided additional foreign exchange the short-term effects have been positive. However, the longer term costs could prove high.
22.	Expansion of health and education votes	Treasury; Health: Education; Cabinet	Positive	Expansion has led to increased demand for pharmaceuticals, text books, school buildings and uniforms which will have boosted production in supplying industries.
23.	Maintain large budget deficit	Cabinet; Treasury	Negative	While running a large budget deficit to maintain expansion of recurrent expenditure items helps some subsectors (see comment for No.22) financing this with foreign borrowing and lowering the expansion of capital spending is having a greater negative effect on manufacturing as a whole.
24.	Devaluation and sliding exchange rate	Cabinet; Treasury; Reserve Bank	Negative	As the manufacturing sector is a net user of foreign exchange and its import requirements far higher than allocations, higher import costs have a negative effect on the sector's expansion potential.

Table 6.2: A selection of recent policies affecting the manufacturing sector
(continued)

Number	Policy decisions	Decision-making and/or executing agency of Government	Effect of policy on the manufacturing sector	Comments, especially in relation to Government's objectives for the sector
25.	State purchase of interests in private manufacturing concerns	Cabinet; Treasury; Reserve Bank	Negative/ Positive	There is no doubt that steps in this direction are positive to the extent that they directly address an explicit objective of Government policy; however, purchasing shares in existing companies rather than creating new industrial capacity does nothing for other objectives like expanding output and increasing employment or raising investment. Additionally the seemingly haphazard policy in relation to types of investment has had a negative effect on potential private foreign investment.
26.	Failure to permit price increases for NRZ and air-carriers	Cabinet; Treasury	Positive	This has helped to keep costs down and so has helped maintain domestic demand and export competitiveness.
27.	Maintaining negative real interest rates	Cabinet; Treasury; Reserve Bank	Negative	The fact that negative real interest rates have had such little effect on investment levels indicates that this policy has not helped the long-term prospects for the sector. It may have helped stimulate depressed domestic consumption. Higher real interest rates should stimulate saving and prevent a crowding out of access to investment funds in future.

Table 6.2: A selection of recent policies affecting the manufacturing sector
(continued)

Number	Policy decisions	Decision-making and/or executing agency of Government	Effect of policy on the manufacturing sector	Comments, especially in relation to Government's objectives for the sector
28.	Cuts in foreign exchange for spares	Cabinet; Treasury; Trade and Commerce	Negative	Cutting allocations for spare parts has not only immediate negative effects for the sector; it also leads to great risk of machine break-down requiring even more foreign exchange for both spares and replacements in the future.
29.	Agreement to continue the trade agreement with South Africa	Cabinet; Treasury Trade and Commerce	Positive	Given the dominant position of South Africa as a trading partner the effect of continuing the agreement is positive in foreign exchange earning (exports) and saving (lower import and freight costs).
30.	Slowing down in low cost housing projects	Cabinet; Treasury	Negative	Decisively lowered demand for materials produced by the manufacturing sector.

Notes: IIC - Industrial Import Control
 SEDCO - Small Enterprise Development Corporation
 ZDB - Zimbabwe Development Bank
 ZESCO - Zimbabwe Electricity Supply Corporation

Range of policy instruments available to control, guide and alter the structure and direction of the manufacturing sector

In its broadest terms, Government's main desires and objectives for the manufacturing sector are to encourage its growth and through specific policies to guide its future direction, with a view to its generating more foreign exchange by increasing manufactured exports, or saving more foreign exchange by increasing the local content of production. One method of achieving these broad objectives, agreed by Government as important, is by control. While one way of controlling the direction of the sector is by participating directly in the ownership and/or management of different industries two observations need to be made. The first is that taking over the management and/or ownership of an industry is no guarantee that the particular industry will expand and grow. The second is that Government has at its disposal a wide array of policy instruments that have the potential to guide the sector and encourage sectoral expansion and/or contraction. Hence if the objective of having a greater direct involvement in the ownership and management of industry is to ensure its future direction and expansion then, as this section will illustrate, there are a wide range of instruments available to achieve this objective without adding the additional costs of direct purchase. If, however, Government wishes to take on board the additional cost - to assist in achieving its objective of increasing State participation in the sector - then there is still a range of choices available: to take control of existing industries, to take a significant yet less than controlling share of existing industries, or, thirdly, to concentrate State involvement in new industrial projects where increases in production and employment and possible net foreign exchange earning are a direct result of outlaying funds for State participation. This section is devoted to outlining the other (non-participation) instruments Government has at its disposal to control the present and future direction of the sector. As will become clear the instruments are practically all-embracing.

One way of looking at the controls Government has over the sector is to examine these negatively, that is to list the things that industries cannot do without Government or local authority permission. The list would include the following: setting up a business; buying or using land to establish a factory; using foreign exchange to purchase plant or equipment; reaching a required level of safety for workers in the factory; establishing pollution

control (where applicable); paying stipulated minimum wages for different grades of workers; firing workers; hiring non-nationals; conforming to industrial regulations in relation to hours worked, holidays, accident compensation, grading of employees, health facilities, refreshments for employees, non-discrimination by race in access to all on-plant facilities; obtaining foreign exchange for imported inputs, spares and plant and equipment replacement (unless obtained through a merchant with a specific import license to cover the designated tariff heading); setting the prices of the products of the factory either in relation to the factory costs formula of the Price Control regulations or for specific factory-gate prices for designated products; increasing prices of products if these are designated under the Price Control regulations; expanding the industry if there is a foreign exchange component in the expansion (nearly always); borrowing money for the banking sector if 15 per cent or more of the issued share or voting power is owned by non-residents or non-citizen dual residents; exporting any product from Zimbabwe; travelling abroad to find export markets, to increase product quality, to purchase equipment, to hire non-national labour, to seek technology or licensing agreement; purchasing other industries that have 15 per cent or more non-resident ownership or voting power; establishing an industry in a communal area and selling significant quantities of products to Government or parastatals (by tendering).

Of course, similar conditions are found in developed countries also. However, in a small economy such as Zimbabwe, where the manufacturing sector is vulnerable to outside forces also, these controls have special significance. Given the array of permissions that are needed for an industry to be established, to function, to import, to export and to expand, it is apparent that the efficiency of industry is directly affected by the efficiency with which all these different decisions are made. Delays in granting permission in any of these areas will affect the efficiency of particular industries and bottlenecks in relation to specific areas where permission is required can quickly have repercussions for the sector as a whole. Thus with the present structure of controls there can be no doubt that the efficiency of the manufacturing sector as a whole is intricately bound up with the efficiency of the civil service and the decision-making process of Government. This factor has led to the remark made by a number of managers of industries to the effect that most of their time these days is taken up with obtaining permissions from different Government departments, to the extent that not a few have claimed that they do not have enough time to run their industries.

While industrialists, present and potential, tend to view these sorts of controls negatively, controls can and do have a positive role to play in orientating industry in a certain direction and in encouraging expansion of different subsectors. Indeed it can be argued, and forcefully, that controls always result in steering the sector in a particular direction even if no explicit acknowledgement of this result is made. For example, giving foreign exchange to industrialists to replace their old and out-moded plant and equipment implies that the plant and equipment should be replaced and hence that production of the particular product has priority over introducing a new line of production or expanding a different line of products. Similarly, granting approval to a specific new project when funds are scarce implies that production of the product specified is considered more important than either products from rejected projects or - often of more importance - products that could be of higher priority but for which no projects are currently before the Projects Committee. Or again, providing foreign exchange on a half-yearly basis for new projects could result in the exclusion of major projects whose foreign exchange requirements exceed those available in a particular given period.

Price control is another area that has implications for growth projects and the future direction of industry. If the over-riding policy objective is to keep prices down by granting price increases lower than necessary to achieve a rate of return required to expand a particular industry or by delaying price increases for a long period - as frequently happens - then the longer term policy implication of such a policy is to discourage future expansion and investment of the price-controlled products vis-a-vis those products able to earn the industry concerned a higher rate of return. The long-term effect is to alter the future pattern and direction of different parts of manufacturing industry. This may well be the intention, and if so well and good, if not then the tension between short-term and long-term objectives needs to be understood and the consequences worked out and costed.

Refusal to grant permission to dismiss labour is also a policy that has different sorts of implications for different industries and for the economy as a whole. In times of recession, carrying labour excess to requirements adversely affects profit levels and also levels of corporate tax paid. Thus to refuse permission for certain sub-sectors to shed excess labour will disadvantage those sub-sectors vis-a-vis others and implicitly discourage

future expansion. If the policy is to discourage labour-shedding across the sector then the overall potential for future investment will be lowered. But there are other less direct effects of explicit labour control. Inability to shed excess labour discourages firms from taking on extra labour. This can negatively effect skills acquisition. It can discourage plants from working extra shifts in time of increased demand, and thereby increasing employment in the upturn, and it can encourage firms to purchase more capital equipment if the marginal cost of letting a machine stand idle when demand is depressed is less than the marginal costs of carrying unproductive labour.

While it is self-evident that cuts in foreign exchange for imported inputs to specific industries will lead to decreases in production and that increases in allocations will lead to an expansion in production (demand and stock levels remaining the same) the implication of reducing foreign exchange for spares and replacement machinery could be perverse in the medium to longer term. If a firm finds it difficult to obtain foreign exchange for spares then there is an incentive to expand plant and equipment over and above 'ordinary' requirements to ensure that output can be maximized. This has the effect of distorting and expanding the demand for replacement needs in the short term which could well increase the capital requirements in the future if the failure to replace worn-out parts of a machine leads to a more rapid deterioration of the life of the whole plant. In both cases, a short-run drop in foreign exchange provision could well lead to a greater overall outlay of foreign exchange over a longer period.

Each of these different examples illustrates an important series of points for the planning of the manufacturing sector. Firstly, although controls could well be introduced to deal with short-term problems, many will have long-term implications either for the sector as a whole or for different sub-sectors. Secondly, and relatedly, negative controls do have a positive impact, not only on overall growth and expansion but also on growth and expansion of different sub-sectors. Thirdly, even though no blueprint of the future growth and expansion of the sector may have been worked out, the manner in which short-term decisions are taken will have long-term implications for the future expansion of the sector. Willy-nilly, future patterns and structures are being formed even without a worked-out blueprint. And, finally, any delays in decision-making will themselves have profound effects on the pattern and growth of the sector even if these have not been built into the decision for imposing controls in different areas.

Some concluding observations

A rapid three month study on the manufacturing sector cannot hope to encompass all the different dimensions involved in policy-making for the sector. In this final section a number of more specific points are made, in part as a result of observations by the consultants and in part as a result of discussions largely with Government officials. They should be read with the understanding that a number of the observations lack in-depth analysis and may need subsequent refinement.

1. While having direct responsibility for the planning and direction of the manufacturing sector, in practice the Ministry of Industry and Technology does not appear to play the major role in policy-making and implementation. Many major decisions are made and executed by other Government agencies such as the Treasury, Ministry of Trade and Commerce, Ministry of Labour, Social Services and Manpower Development. Centralisation of much decision-making is focused on Cabinet and its various sub-committees. It is partly because of this centralisation of decision-making that delays are occurring, which are having an adverse effect on the achievement of specific objectives of the sector, and that responsibility does not filter down to the Ministry of Industry and Technology for major initiatives that directly or indirectly affect the manufacturing sector.
2. There is no worked out blueprint or strategy for the growth and expansion of the manufacturing sector. In practice decision-making has predominantly been based on a short-term horizon, good examples being price control, employment regulations and foreign exchange cuts. Nonetheless these short-term measures do have long-term implications: there is evidence and there are theoretical considerations to suggest that delays in granting price increases, restrictions in dismissing labour and cuts in foreign exchange for spares and capital replacement have been detrimental to long-term growth and expansion of the sector. The longer is the delay in agreeing a strategy for the sector's future the greater is the likelihood that present structures will be ossified so lessening the opportunity for initiating change.
3. As a result of (1) and (2) the Ministry of Industry and Technology is oriented in practice to the short run. It is to be hoped that the new planning section will provide the much-needed long term perspective on the

implications of policy change. However this will not lead to practical results until the Ministry becomes concerned with, and is called upon to analyse the effect of, all policies decided upon and often executed by other areas of Government.

4. One major constraint in the Ministry of Industry and Technology is the lack of key qualified staff. For example project approval is carried out without the services of an in-house qualified engineer. Another is the ministerial breakdown of responsibilities. For example, if planning of the sector's growth and direction of expansion is critical not only for the whole role of the Ministry but also for other sector's of the economy, then its function should be highlighted in both the divisional breakdown and in relation with other areas of Government. Given the critical nature of inter-linkages between manufacturing and particular parastatals - such as NRZ, PTC and ZESC - the time is long past when the development of these sectors and areas of the economy should be carried out without the involvement, in some way, of the Ministry of Industry and Technology.

5. As a result largely of history, the predominant concern of a large proportion of the staff of the Ministry is with the administration of foreign exchange. Not only does this leave little time over for essential areas of analysis such as overall planning, trends in demand, capacity utilization, and the effects of different policies and supply constraints on the growth and expansion of the sector, but there appears to be considerable overlap between the work of Ministry officials and the work of Industrial Import Control. Although Government recognizes the key role of manufacturing in the economy and its future importance, it is striking to observe that the Ministry of Agriculture has a provision for 16 economists to carry out analysis, projections and requirements for the sector. This contrasts with no separate and distinct economic and forecasting section identifiable within the Ministry of Industry and Technology, save within the still-emergent planning section.

6. The fact that historically industry was related to the Ministry of Trade and Commerce means that industrialists have today to liaise with Ministry of Trade and Commerce officials for various permissions and with the Ministry of Labour, Social Services and Manpower Planning for others. Not only does this mean that more time and energy by industrialists has to be devoted to liaising with a broad range of officialdom but it also means that the Ministry of

Industry and Technology's efforts to co-ordinate a systematic policy for the sector as a whole are continually dissipated and its role marginalised. For example, the Ministry's ability to plan price control measures and to monitor the long-term and short-term effects of controlling prices is reduced considerably if, as occurs today, price control matters are decided upon within the context of the Ministry of Trade and Commerce.

7. Two areas that need attention are the monitoring of the local content of aid projects and the importation of goods into the country that could be made by local industrialists. Because of the weak position of the Ministry within Government structures it appears that a number of government agencies have continued to import goods that are made locally or could be made locally.

8. The Ministry of Industry and Technology additionally has little influence in promoting local industry in public sector investment projects of both parastatals and central Government. Co-ordinating industrial growth and expansion should entail ensuring that close linkages should be maintained and furthered in giving local industry public sector contracts. There are cases where short-term considerations of budget saving threaten to wipe out industries that have traditionally supplied industrial and engineering products to the State and parastatal sector with severe medium and long-term cost and foreign exchange implications. For instance, budget cuts in National Railways of Zimbabwe have led to a decision not to invest in new trucks. A Zimbabwean manufacturer of railway trucks can thus be forced out of business.

9. The fact that industrial planning since Independence has been largely ad hoc and that decisions have by and large been based on short-run considerations has led to uncertainty about the role of private sector industrialists in the future. This has been a contributory factor in the low level of investment that has taken place. This uncertainty has been exacerbated by the statement that Government intends to seek more direct involvement in the productive aspects of manufacturing. Without a more specific outline of Government's intentions in this direction, this uncertainty is likely to persist. This comment should not be interpreted as implying a criticism of Government's objective of increasing state participation in productive manufacturing industry. Rather it is a comment on a major effect of the manner in which this policy has been carried out.

10. SEDCO, the ZDB and a re-vamped IDC all exist and all play or will play a role in appraising and approving industrial projects in the future. There is a real danger that without an overall strategy for manufacturing the decisions of these different bodies will be inconsistent, fuelling uncertainty and inefficiency and leading to de facto but unplanned expansion of industry. In addition the fact that SEDCO is responsible to the Ministry of Trade and Commerce and that its interests are dominated by commercial projects indicates a danger that it will fail to take the lead in promoting small and medium-scale industries in a manner consistent with strategies derived within the Ministry of Industry and Technology. There is, too, a danger that to the extent that Government directs the IDC to use its funds and energies in resuming ailing private sector industrial undertakings, its energies will be directed less to industrial expansion, growth and the development of new industries.

11. The criterion that new industrial projects should show foreign exchange saving or net earnings within the period of a year is likely to inhibit the long term dynamic expansion of the sector now that the easy stage of import substitution industrialization is coming to an end for many industrial sub-sectors. A short-term balance of payments profile is no longer an adequate benchmark for evaluating rejection or acceptance of industrial projects.

12. Another feature of the passive rather than active attitude to the manufacturing sector and the dominance of a short-term rather than a longer term perspective in policy-making is the responsive rather than positive attitude that is exhibited towards potential future investment. Both the industrial projects committee within the Ministry of Industry and Technology and the Foreign Investment Committee overseen within the Ministry of Finance, Economic Planning and Development are passive committees that wait and respond to initiatives placed before them by present or potential industrialists. Without a framework drawn up for the future direction and expansion of sector or sub-sectors within manufacturing, together with, where appropriate, incentives to channel investment into the desired direction, a continuation of the present system can only encourage unplanned structural change.

Chapter Seven

CAPACITY UTILISATION AND MAINTENANCE

Introduction

The question of capacity utilization is not one that can be treated in isolation. As noted, in Volume I, it was one of the unifying themes which the present study team used to bring together, under an operational heading, many of the issues to be covered as set out in the terms of reference of the study, with the other two themes followed being linkages and technology.

Broadly considered, to analyse capacity utilization means to see how and to what extent the production possibilities of manufacturing in Zimbabwe are being used. If they are not being fully used, if machines are not running as much as they could and workers are not employed as much as they could be, then capacity is underutilized. This definition, however, at once raises two difficulties. The first is, what is meant by full capacity? Is it that machines should run at 8 hours a day, five days a week, or 24 hours a day, seven days a week? The latter might be a better definition since these are the absolute physical limits to capacity utilization: however manufacturers do not necessarily think in those terms, and often define "full capacity" in lesser terms, such as the former example, or as what happens in good times, or in terms of their best season ever or in terms of local working hours, or some other concept. It is for such reasons that the more general yet precise concept of capital rather than capacity utilization has developed.^{1/}

The second difficulty is more at the level of national planning than techno-economic studies. It is that by considering only existing factories, machines, and employees, we necessarily adopt a very limited view of capacity, and it could rather be said that as long as workers, skilled and unskilled, are unemployed, and as long as available capital is not invested in productive areas, then the capacity of the country is underutilized. For the present however we will maintain the manpower definition, although it should be remembered, as specifically discussed in the preceding chapter (Chapter 6: Government Policy and Objectives) that the expansion and development of the manufacturing sector is to enhance the use of Zimbabwe's industrial capacity, actual and potential.

The questionnaire distributed to industrialists, reproduced in Part III, defined capacity utilization as::

"..... the potential theoretical level of output that could be achieved from the present machinery installed, assuming no machinery breakdown, a complete range of spare parts, available machine operatives and optimum labour and skills, access to raw materials and the ability to sell all that is manufactured."

The questionnaire also invited the industrialists (in question 16) to list the seriousness (on a scale of 0 to 10) of obstacles to achieving the full potential of plant capacity. These included both demand, supply and technological and institutional factors. They are given in Table 7.1, and, as can be seen, even this list of possible factors is a very diverse one.

The table shows the results of the questionnaire and indicates that of all obstacles to capacity utilization, the most important appears to be the shortage of imported raw materials. It should be noted, however, that manufacturers' replies were made at a specific point in time, one where foreign exchange constraints were uppermost in their minds because of successive cuts in allocations. This provides a perspective on the Export Revolving Fund, which has considerably improved the position of exporters, (who can now readily obtain the foreign exchange needed for their foreign inputs) but has not, of course, improved the position of those who produce for the domestic market. Chapter 2 has pointed out the uneven concentration on exports to be found in the manufacturing sector, and Chapter 10, Export Promotion, examines the question further. It should be noted also that lack of domestic market demand is ranked second in importance as a constraint with lack of export demand and central or local government decision making coming jointly third. (It is fair to add that the perhaps lower than expected importance given to the latter may be due to the design of the questionnaire itself, since it appeared at the end of the list on the next page of the form to be filled out by industrialists, as can be seen in Part III, Annex J). In fourth place was shortage of local raw materials. It may be noted that the factors: demand/supply, local/imported all emerge with high importance, perhaps reflecting the degree of linkage between the sectors as discussed in Chapters 3 and 4 in particular.

Table 7.1: Constraints to fully capacity utilization

	Number of times cited	Weighted average importance	Ranking ^a
1. Shortage of local raw materials	45	5.0	4
2. Shortage of imported raw materials	61	7.6	1
3. Lack of domestic market demand	51	6.4	2
4. Lack of export market demand	47	5.6	3
5. Machine breakdown	43	3.8	8
6. Lack of machine spare parts	53	4.8	5
7. Shortage of machine operatives	17	1.9	11
8. Shortage of supervisory staff	32	3.4	9
9. Shortage of machine repair personnel	32	4.0	7
10. Shortage of other skilled labour	32	3.4	9
11. Labour stoppages/go-slows	21	3.1	10
12. Cash flow difficulties	31	4.3	6
13. Central or local government decision-making	28	5.6	3
14. Other	2	5.7	-

a/ Excluding No. 14 "Other" which was mentioned only twice.

The questionnaire also yielded some general results on capacity utilization levels at the time of the survey (March 1985). From 69 firms who actually answered this particular question, the most frequent answer to the question of current level of capacity utilization was between 60 and 69 per cent, and an estimated "average" of the rate for all the responses is 69 per cent. By contrast, the "average" of the highest rate ever achieved is 81 per cent, and the results suggest that this was achieved in 1981/82 period, around mid-1981. The number of shifts worked per day was, however, that same as it is now, i.e. 1.93 shifts per day (with the length of shift then being an average 8.67 hours).

Our sample is unfortunately a small one, and too much should not be read into the results. But the issues covered in it under the heading of capacity utilization are felt to be important ones, covering as they do not only the use of machines but indirectly many areas of government and private policy and economic factors outside the sector. Thus many of the related issues are discussed in Chapter 6, Government Policies and Objectives, Chapter 8, Technology, and the chapter on Export Promotion, Regional Co-operation and Investment (Chapters 10, 11 and 12). In the last of these chapters attention is drawn to the necessity for making better use of existing capacity as a means of saving investment costs. Given that these other chapters deal with a range of issues implicit in the concept of capacity utilization, the remainder of the present chapter will concentrate on a major aspect which is believed by the team to be crucial to the better use of existing capacity, that of maintenance.

Maintenance Facilities and Skills

The correct maintenance of existing equipment and measures to foster it are singularly important issues, because the capital equipment in Zimbabwe's manufacturing sector is a national asset which has been painfully built up over the years and the correct care of it is a central means of increasing efficiency and competitiveness and saving scarce foreign exchange.

As long ago as 1958, a United Nations Technical Assistance Experts report called for urgent action to be made in regard to machine maintenance, and it remains very relevant today. The statement was as follows:

"The attention of Government and industry is drawn to the urgent need for adopting proper maintenance methods and practices and to establish proper facilities for training of maintenance personnel."^{2/}

We will be considering the matter of maintenance and its related facets under three headings: Preventive maintenance, loss prevention, and skills.

From the analysis of statistics we have of the manufacturing sector in Zimbabwe there was in 1982 an estimated resource of some \$2,300 million invested in machinery, plant and equipment with a further unknown investment in professional and technically trained people. It is an enormous and often

unrecognized resource for a developing country. The question must be asked: Do we look after this resource properly? Unfortunately, we believe we would have to accept the deserved criticism that this resource both in man and machines is not well protected or maintained, nor is this situation different in many other developing countries.

Good management means making the best use of resources available. It means inter alia eliminating waste, and waste causing agents include accidents resulting in damage to equipment, property, serious and sometimes fatal injuries to workers.

The cost of these losses to the nation are very high, probably in the order of \$30-\$50 million per annum in damage to machinery and property alone and this would not be taking into account the uninsurable losses such as hiring and training replacement staff, damaged tools and equipment and loss of production, delays and interruptions.

Preventive maintenance

Preventive maintenance is a system based on individual experience that utilises the skills of a firm's staff to check the condition of and carry out maintenance and remedial work on, machinery parts and assemblies at prearranged intervals of time. Such intervals should be set to prevent the onset of unsatisfactory running conditions and to forestall unacceptable wear, failure of accessories and frequent breakage of parts.

At the outset the question must be asked why do machines wear out? The answer to this would be a treatise in itself and the problem is recognized in an engineering science called tribology which simply means the science for understanding friction, wear and lubrication.

Friction produces wear, and lubrication diminishes the effect of friction and consequently reduces wear. If the lubrication is carefully designed, friction can almost be eliminated, resulting in a machine or component that will have an exponentially increased life. In simple terms this is what good machine design and maintenance is all about.

There are many components, machines, equipment and transport vehicles that have components or features that it is not possible to lubricate in what might be called the accepted sense. In fact friction is fundamentally important, for example, between the tyre of a road vehicle and the road and between a vehicle brake-shoe and the brake-disc. In these instances, wear takes place at a relatively high rate.

Let us now look at the maintenance scene in developing countries and Zimbabwe. Foreign exchange constraints usually first affect new capital investment; then spare parts and maintenance, with intermediate imported inputs being the last to be sacrificed. The inevitable result of such a set of priorities is that production equipment deteriorates and is not maintained or replaced. The factory can still operate for some time but its efficiency and competitiveness have been damaged to such an extent that when a recovery does take place it cannot take advantage of it.

These factors indicate that there is a urgent need to improve the quality and operational efficiency of maintenance as a national goal, and indeed, we cannot afford to do less.

There are some important points brought to light in the UNIDO document IS.481 of August 1984 titled, "System of Preventive Maintenance of Capital Goods". These are as follows:

- a) A change over from one shift to multi-shift operation of machine tools and metal forming machines results in an increase of maintenance requirement of some 30 per cent within two years.
- b) If the working life of a machine tool is extended from 5 to 10 years, this will result in an increase of 40 per cent in the maintenance required.
- c) In a normal overall routine the downtime of a machine is estimated to be between 4-7 per cent of its annual availability. If however the maintenance is largely neglected, probably until there is a major breakdown, then it is estimated the machine availability will be reduced by 20-25 per cent.

This data is sufficient in itself to justify the adoption of an efficient and comprehensive maintenance scheme and services within all sections of Zimbabwe industry and not only the manufacturing sector.

What are the main factors in preventive maintenance? They can be set out as follows:

- a) Key machines in critical production routes must receive maintenance priority. This is normally referred to as a differential maintenance policy.
- b) The concept of preventive maintenance is to avoid the unscheduled outage or breakdown of a machine.
- c) The preventive maintenance programme should be calendarized and at the same time allow a margin for breakdowns.
- d) The preventive maintenance programme must be administratively simple with records and data kept to a minimum.
- e) The maintenance facilities must be integrated into the overall administration of the firm with clear lines of responsibility to engineering management, production and financial controllers of the company.

It is ironic that in many large organizations in Zimbabwe industry great attention is directed to asset management and this largely means debtor control and the accounting for fixed and moveable assets of the firm, yet due to a poorly perceived need for highest standard of plant maintenance it is quite possible that the particular company's budgeted allowances for depreciation and maintenance, as large as they may be, are inadequate because of poor maintenance. This point is very frequently lost sight of at the management or Board meetings.

A point that must be made here, for it has a bearing on foreign currency allocation towards the purchase of the imported capital equipment, is that maintenance problems can be built into plant and machinery long before it is installed and working. By this we mean that the machinery of poor quality bought at low prices often tends to become unacceptably expensive to operate in a very short space of time.

To illustrate this feature, attached is set out in Table 7.2 a chart which illustrates the various options and cost relationships covering the three main aspects in the operation life of the machine: Plant reliability, plant maintainability, and plant economy.

In each case in the graphical relationship it can be seen that neither the cheapest nor the most expensive machine is most cost effective.

What is clearly shown in this table is the need, at an early stage of any negotiation on proposals to purchase and to install new machinery, for a number of important steps to be taken in evaluating the piece of equipment to be provided for production purposes of any kind.

Skills

A great scarcity of capital is a characteristic of most developing countries. As mentioned before, it might be expected, therefore, that capital goods in these countries would be better maintained than in industrially developed countries which have access to a relative abundance of capital equipment.

Often the developing countries' climatic conditions would emphasize the need for additional care for example in the case of high humidity or erosive dusty conditions.

Unfortunately, this supposition is not the case and to cite Hirschman:^{3/}

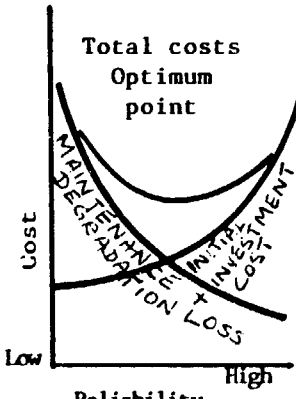
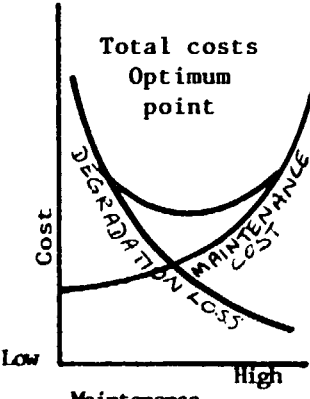
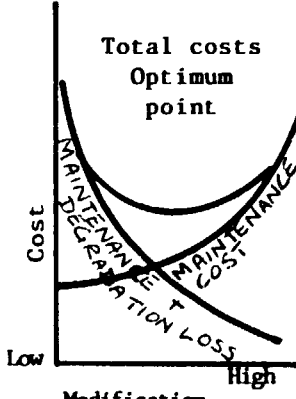
"This is perhaps one of the most characteristic failings of under developed countries and one that is spread over the whole economic landscape.

Eroding soil, stalled trucks, leaking roofs, prematurely run-down machines, unsafe bridges, clogged-up irrigation ditches - all testify to the same pervasive and paradoxical trait: the inadequate care for existing capital equipment in capital-poor countries."

At around the same time, a United Nations document remarked: "Because of inadequate maintenance, industry in many under developed countries suffers from an unduly high rate of depreciation of capital assets and a chronic waste of production capacity which even economically stronger countries could hardly afford."^{4/}

Fortunately Zimbabwe does not fit into this gloomy picture, but having said that, our objective is to increase the awareness that the present situation is far from satisfactory when it is realised that we have within Zimbabwe technical and manpower resources to do much better than is the case at present.

Table 7.2: Productive maintenance activity relationships

OBJECTIVES	At the time of equipment planning and	While equipment is in use	In case of failure analyse causes and take actions	
<p>Improve Reliability</p>	<p>Select equipment of less trouble less failure, and easy handling and having a longer life Enforce test and receiving inspection</p>	<p>Remove improper handling of the machine Routine maintenance to prevent deterioration Lubrication Cleaning Adjustment Replacement</p>	<p>Improve and modify equipment itself by reducing deterioration and lengthening life</p>	<p>Reliability Engineering</p>
<p>Improve Maintainability</p>	<p>Select equipment that can be maintained easily skilfully quickly less expensively</p>	<p>Perform preventive maintenance inspection Perform scheduled maintenance Improve work method for repair Selection of tools and materials</p>	<p>Improve and modify equipment itself to facilitate routine maintenance, inspection and repair</p>	<p>Maintainability Engineering</p>
<p>Improve Economy</p>				<p>Engineering Economy</p>
<p>METHOD FOR ACHIEVING SUCH OBJECTIVES</p>	<p>MP (Maintenance Prevention)</p>	<p>PM (Preventive Maintenance)</p>	<p>CM (Corrective Maintenance)</p>	

Productive Maintenance

"The attention of Government and industry is drawn to the urgent need for adopting proper maintenance methods and practices and to establish proper facilities for training maintenance personnel."^{5/}

The main point of this comes through very clearly; machines must be properly maintained in a pre-planned and logical manner and for this function the industry requires skilled people to carry out the work.

The grades of skills required in industry for the maintenance or refurbishment are outlined as follows:

1. Professional or graduate engineer
2. Diploma technician
3. Artisan/skilled worker

The professional/graduate engineer

Many large firms, and in some cases smaller concerns which have highly technically oriented processes or production lines, will generally perceive the need to have a qualified engineer to be responsible for the safe, correct operation of plant, with a system of planned maintenance at the core of the engineer's responsibilities.

A simple organization chart is shown in Table 7.3 to illustrate the typical arrangement of the firm in a manufacturing industry employing 400-500 people.

The mechanical or electrical engineers employed in this position would probably have 5 years of appropriate industrial experience with a good understanding of machine design, process control, safety and plant maintenance application.

The diploma/technician

It would be quite correct in many medium to small firms to employ the diploma/technician or technician as the approved responsible person in terms of the Factories and Works Act of Zimbabwe.

This person would be regarded by Government authorities as the one responsible for the safety and correct operation of plant in a designated factory.

A fore-shortened organization chart would contain the control and administrative elements with reduced staffing levels in those sections dealing with maintenance and inspection.

The mechanical or electrical technician would also require to have about 5 years of practical experience with a spread of experience similar to that of the graduate engineer.

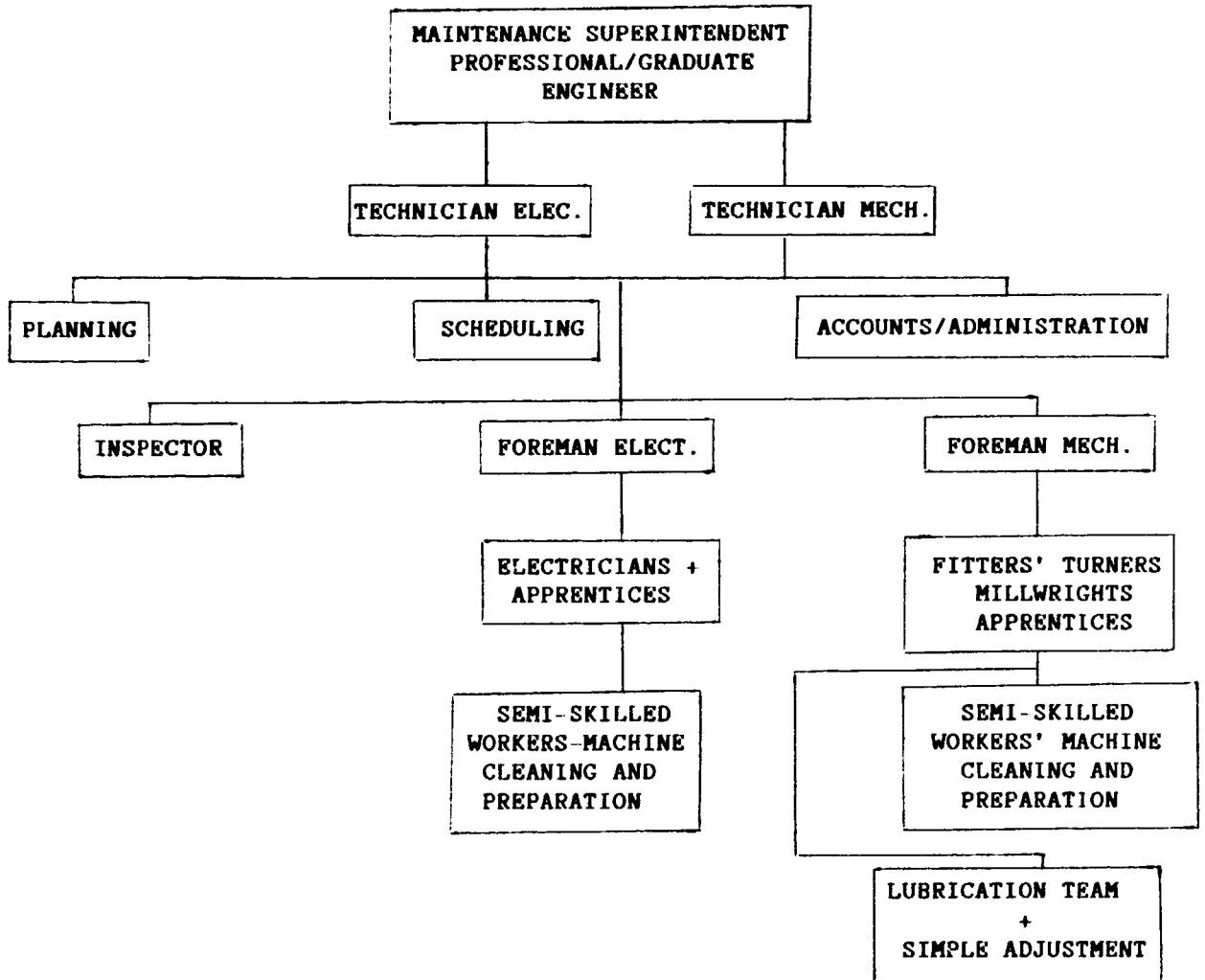
The artisan/skilled worker

Where financial constraints are the controlling factors in very small manufacturing businesses we would see the employment of the artisan/skilled worker in the role of maintenance functionary with the need to call in an electrical contractor for any specialised electrical work.

Provided the person employed in this position has adequate experience of the particular machinery involved, there is no reason why the maintenance should be any less effective in this instance than in a large factory enjoying the full technical complement.

There is an important aspect of the relationship of skills to meet these requirements in Zimbabwe and it is this: There appears to be some difficulty in placing graduates from the University of Zimbabwe and other Universities in the world who have returned to this country, as well as those who have qualified with diplomas in the technical field. It is paradoxical that, whilst there is an urgent need to properly maintain the national capital assets that are such a vital part of the manufacturing sector's fabric, and there appears to be a shortage of skills for this purpose, on the other hand the University and the Technical Colleges are turning out young people who have some difficulty in finding suitable jobs.

Table 7.3: Organization chart for planned preventive maintenance system
firm size 400-500 people employed



Small operations will reduce the professional technical scale
where appropriate as well as
the numbers of skilled and semi-skilled personnel

The problem and its resolution can be set out as follows:

1. Government responsibility:

- a) To provide a national industrial machinery maintenance policy both for the public and private sectors having ascertained and encouraged response from both these sectors in the way of proposals and plans. This could be supplemented by implementing a specific scheme of controls. Proposals to the Projects Committee of the importation of capital goods could incorporate a maintenance plan for the machinery in question. Approval of the project would depend upon the acceptability of this plan, as well as the existing criteria.
- b) To consider incentives for the private sector to financially benefit by following a preventive maintenance programme.
- c) To co-ordinate the efforts of the public and private institutions which would be involved in such a national programme.

2. Industry responsibility:

- a) For the private sector institutions to promote the application of planned maintenance through short courses, seminars, and practical workshops to encourage the philosophy of preventive maintenance.
- b) To produce a strategic plan for the introduction of preventive maintenance to industry:
 - i) manpower requirements, professions and skills
 - ii) survey on company by company basis of the existing inventory of the existing maintenance related equipment and facilities and an estimate of the cost of equipment required to bring these facilities up to an acceptable standard.
 - (iii) recommendation to the individual firms as to progressive extension of preventive maintenance/productive maintenance towards loss prevention schemes.

3. Education

To consider the existing curricula both at the university and the technical colleges and where appropriate to introduce aspects of maintenance in its overall context into the course material. In so doing, to familiarise students with the importance of this aspect of industrial activity.

We believe that the result will be:

- (a) Improved productivity and product quality with reduced product cost.
- (b) Reduced foreign exchange required for capital replacement and spares.
- (c) Improved profitability of firms in the private sector - and the improved return to the fiscus.
- (d) Improved efficiency and reduction of costs in the parastatals.
- (e) Greater employment opportunity for a wide range of technical personnel.

Loss Prevention

On the subject of loss prevention the philosophy is very closely analogous to that of modern medicine in that prevention is infinitely better than cure.

Another point that may not be very clear to begin with but hopefully will emerge with some clarity as we proceed, are the references we make to personal injury sustained at the place of work of a person employed in industry. It will be seen that the linkage between such injury or indeed fatality and damage to property through industrial accidents is a well established economic phenomenon.

Loss prevention is indubitably linked with preventive maintenance and in both instances the emphasis is on anticipating an understood set of problems and carrying out practices both preventive and remedial which ensure the avoidance of personal injury, damage to property, and unscheduled outage of the plant and equipment.

The following statement is taken from the UK Study "Success and Failure in Accident Prevention" made by the Advisory Unit of the Health and Safety Executive.

"Any simple measure of performance in terms of accident (injury) frequency rate, or accident (injury) incidence rate is not seen as being a reliable guide to the safety performance of an undertaking."

The report finds there is no clear correlation between such measurements and the work condition, the injury potential or the severity of injuries that have occurred.

A need exists for more accurate measurement so that a better assessment can be made of efforts to control reasonably foreseeable risks. It is suggested that more meaningful information would be obtained from systematic inspection and auditing of physical safeguards, systems of work, rules and procedure and training, than on data about accident (injury) experience above.

The fundamentals of successful loss prevention management are:

- planning
- organising
- leading
- controlling

The successful manager will ensure action on the part of of the various components of an enterprise in order to reach the objective of the undertaking. These can be identified as material, money, machinery, methods and men that are required to produce the goods or service which will converted into a saleable article or facility and so in turn result in the firm performing profitably.

With respect to material, in carrying out the functions of planning, organising, leading and efficiently controlling, management has to ensure that the right quantity and quality of material is available at the right price at the right time and place. If these requirements are not met, waste of one sort or another is going to take place. This in turn will affect the

profit performance of the firm. It is therefore very important to combine the fundamental components of management and production to eliminate waste as far as possible.

We will now move to what is called the "iceberg effect". The basic idea of this is that the costs arising out of an accident really only constitute a small fraction of total cost. There are many hidden costs which management often erroneously believes do not affect the profit performance.

There are two types of cost which arise after an accident takes place, and these are broadly classed as insured costs and uninsured or hidden costs.

The insured costs which are covered by Workmens Compensation are medical attention, hospitalisation, rehabilitation, and compensation. There are other insured costs which are sometimes covered by insurance companies which could provide some compensation for damage to property, fire losses, and loss of profits

The uninsured or hidden costs could take one or more of the following forms.

- (1) Make up salary: usually the accident fund will only pay basic wages or salary.
- (2) Decreased output. When the injured person returns to work, the injury may be such as to prevent him from performing efficiently, or it may involve retraining, or allocating the person to some other less demanding function.

In this regard we liken the situation to an "ice berg". As some investigators such as F. Bird consider, insured costs to uninsured costs have a ratio of 1:4, however, damage to property varies from 1:5 to as high as 1:50.^{6/}

But there is also a second "iceberg effect". This occurs despite no actual difference in production being noticed as the result of an accident having taken place. It is nevertheless obvious that if output is to remain the same it must be produced at a higher cost.

In accident studies in the USA it has been established that for every one serious, or disabling injury reported, there were 10 injuries requiring medical attention, there were 30 property damage accidents of all types and there were a further 600 incidents where no visible injury or damage took place. This is known as the 1/10/30/600 ratio.

The fact that there are 630 property damage or no-loss accidents/incidents for every 11 injuries indicates that there is a much larger basis for more effective control of the total loss due to accidents. If the number of accidents/incidents is reduced, then losses and injuries will be reduced proportionately.

In determining the real costs of an accident, account must be taken of the fixed and variable costs of production. The variable costs consist basically of raw material, labour, packing material, power and water. These costs vary in direct proportion to the number of units produced. Let us assume that the variable costs are \$1 per unit, and in consequence, if 100 units are made, the variable costs will be \$100.

In contrast the fixed costs do not vary in terms of output but are incurred whether no units are made or 500 units are produced. These costs are derived from management salary, rates, taxes and depreciation: they are all a function of time and not output. In our example we have set the fixed costs at \$300 per week.

We will see that the unit cost reduces as the number of articles produced increases - because of economies of scale. Production of 400 units will cost \$1.75 each, and production cost for 300 units/week are \$2.00 each. On the basis of a selling price of \$2.50/unit the profit is \$0.75/unit when 400 units are produced, and on a production basis of 300 units the profit is \$0.50/unit.

Let us assume that a machining tool breaks because of an overlooked fault that has appeared on the shank of the tool. This damages the machine and the fixture for holding the unit. Two things happen as a result of this damage:

- 1) Output falls from 400 to 300 units per week resulting in a reduction in profit.

- 2) Overtime may have to be worked to meet a delivery deadline and this will increase the variable costs - further depleting the profit.

In this simple example we have set out to illustrate a typical problem that is faced by management and staff in manufacturing processes throughout the world. The result is always the same, loss of profit or reduced efficiency, call it what you will.

The effect of these losses can be prevented and it starts with maintenance, planned maintenance, preventive maintenance and loss prevention or control. It is management's function to plan, organise, lead and control this program, but the entire workforce in industry must be trained and won over to this important industrial function.

In the section of the questionnaire dealing with maintenance facilities and skills a relatively encouraging picture emerged, with 60 out of 72 respondents stating that they had their own machinery and equipment necessary for plant maintenance. This equipment included a wide variety of drilling, grinding, welding and milling machines. Those who did not were usually able to specify the firms to whom they contracted out this work. Sixty-one firms said they undertook planned maintenance, 13 management by objectives, and 34 had loss prevention systems. To apply all this, 36 firms had a professional engineer, 27 a technician and 16 a skilled worker.

In spite of these figures, it is nevertheless believed that considerable scope exists in Zimbabwe for improvement of the maintenance systems, and the application of the principles set out above. As has been explained, these principles involve the introduction and application of a wide ranging philosophy which is capable of yielding significant returns to the economy.

Notes and references to Chapter 7

- 1/ G. Winston, "The Utilization of Capital in Develeoping Countries", UNIDO/IS.469, 22 May 1984.
- 2/ "Management of Industrial Enterprises", cited in Industrialization and Productivity Bulletin No.2, p.57.
- 3/ A.O. Hirschman, "The Strategy of Economic Development", Yale University Press 1958, p.141.
- 4/ "Management of Industrial Enterprises in Under-developed Countries," United Nations 1959.
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Chapter Eight

TECHNOLOGY

Technology in a developing country

Neoclassical theory argues that, for the production of any given product, there exists an infinite number of technologies, combining labour and capital equipment in varying proportions. From this it is considered that the product price, determined by market forces, would be the main criterion that would direct a firm in its choice of technological alternative.

This leads to the question of whether in fact, and especially in Zimbabwe, there is an infinite number of alternative technology routes available for the manufacture of a particular product. If so, do these alternatives use factors of production that are sufficiently large to make choice between them a clear issue? It is felt that many of the manufacturing industries in Zimbabwe are of an intermediate technology in respect of capital intensity, and lie between the technologies of developed countries and those that have come to be expected of developing countries. These technologies would be chosen in Zimbabwe for the purpose of minimising the production cost, to meet local competition, and for the purpose of exports.

Examining Zimbabwe industry from this point of view would suggest that a number of alternative technology routes in terms of capital equipment/labour ratios are available, but this number would be limited rather than infinite. In fact, in some industrial processes there are very few alternatives. By way of illustration of these problems it would be useful to consider the examples of the textile industry and that of the pulp and paper process manufacturing. Whilst alternative technologies can offer varying ratios between capital equipment and labour that exist in both of these industries, the form they take differs widely.

In the textile industry the transformation is often largely a mechanical one, but machines and labour can in principle substitute for one another. The pulp and paper making industry has, on the other hand, another set of factors that make it more limited in technology scope and that is because the process becomes one of heat input and pressure-envelope conditions. These two physical requirements are not amenable to labour transformation.

It becomes more apparent that when a process becomes increasingly rigid i.e. that there are fewer alternatives technologically speaking, then the capital equipment/labour ratio can generally only be adjusted to some extent as a trade off. Thus in the pulp and paper industry the choice would be between manually operated controls or the incorporation of the micro-processor for process monitoring and control.

In the examples used (i.e. textiles and pulp and paper), it would be incorrect to describe the main weaving and spinning plants in Zimbabwe as being biased toward labour intensive manufacturing processes. Although this route would be available to the textile industry as a technology alternative, they have not taken this course. The main reason for this is that the Zimbabwe textile industry has a very large export component. This aspect alone demands a very high and consistent standard of finish both in woven material and in manufactured clothing and garments.

But there can be important exceptions, which show the risks of generalizing. The cotton which is hand picked in Zimbabwe is some of the finest in the world, precisely because it is hand picked. New weaving mills installed in Zimbabwe, with a considerable capital expenditure, are intended for the production of textiles from this high quality raw material.

Studies in other developing countries have revealed that whilst economic factors would persuade a manufacturer to pursue a labour intensive course, this has not always taken place in practice. Upon detailed investigation it appeared that in these developing countries in which there are a number of foreign firms, these firms have a propensity to choose equipment from the home (foreign-base) source. Where this relationship is with a developed country, the equipment is often capital intensive. What this means is that there is in these instances a link between the parent and domestic firms and their countries and it is not so much a case of domestic versus imported equipment but the influence of the parent company operating from an advanced technical base.

There is also an associated follow through by local companies that do not themselves have this linkage with a foreign base. They tend to exhibit the same pattern of behaviour as do the subsidiaries of these foreign-owned firms, resulting in a tendency to purchase more capital intensive technologies.

Zimbabwe, we believe does not at the moment fall into this classification or tendency to be influenced by the capital intensity of manufacturing processes of foreign partners or owners. The reason for this was that up to the time of Independence it was extremely difficult for manufacturers, and in most cases impossible, to obtain capital equipment from any foreign related principals. This in turn tended to filter out any capital equipment purchases that could not be met locally. In the event that such capital equipment acquisition was possible, the technology embodied in this equipment had to be carefully balanced in terms of product cost to capital/labour ratio values. No doubt with the continuing stringent control on imported capital equipment this balanced perspective is likely to continue as we presently see it. This is a course that should be pursued with the right amount of understanding and flexibility in the future.

There are other factors that do effect the choice of technology. These are risks considerations set out as follows:

- a) Business and political risks
- b) Risks associated with utilization of the different factors of production
- c) The need to protect the company's competitive position

Since the business and political risks are taken into account in the pricing of the capital equipment, they should not further influence the firm's choice of technology. It has been apparent in a few instances that foreign controlled firms tend to minimise investment because of the business and political risks.

To some extent capital equipment risk is associated with the process machinery and its relative complexity, requiring special spare parts and specialist technical assistance for the maintenance of this equipment and unscheduled breakdowns. It must be acknowledged that in many developing countries the problems just described would seriously affect the judgement in terms of capital versus labour biased technology. The decision in Zimbabwe, because of the good support services in industry that presently exist would not follow this scenario rationale.

A factor that can act against a policy of labour intensive technology is the concern that a firm may have about its vulnerability to labour disputes and strikes or minimum wage legislation. This may of itself initiate more automated technologies. A further factor that may support the capital-intensive approach is the decision assessment that operator error or failure to correctly perform the manual tasks whatever it may be, is an overriding factor in terms of quality control and continued process production. Often it is the risk of human error and attendant production cost that is the motivating factor in the choice of automatic controls particularly in the example of the pulp and paper industry.

A clearer distinction can be seen to emerge between material handling and process technology. In the case of material handling this can be more readily adapted to take advantage of lower labour costs.

Finally, competitive pressure is a strong determinant in the amount of attention given to minimising the cost of production and likewise the selection of the process of manufacturing technology. Companies that are monopolistic in regard to local demand and Government parastatals are frequently charged with the lack of motivation, and often these undertakings base their technology choices on pure engineering criteria which in itself is frequently incorrectly assessed.

The case that most readily comes to mind is that of the ESC Phase II of the Hwange Power Station development, which we believe from the unquestionable advantage of hindsight, would have been better deferred to a later time, or the finance and effort directed towards another hydroelectric project.

Current electricity statistics show a decrease in consumption by the country as a whole from 5114 million kWh in 1981/82 to 4784 million kWh for 1983/84, a reduction of 6.9 percent for the period.

From an engineering science standpoint it would appear that the choice of technology is also influenced by certain physical conditions already alluded in this chapter and these are:

- a) that technology tends to become more rigid in processes of manufacture that are performed with the use of heat or the effect of a pressure envelope or a combination of the two physical effects.
- b) processes that use power/energy in terms of crushing, granulating, cutting e.g. sawmilling, metal cutting either with a fuel gas or shearing are adaptable to a wider range of labour intensive methods.

Technology resources in Zimbabwe

In the previous section we discussed the importance in economic terms of choosing the correct technology to meet local demand and competition and to extend this to suitable export markets. We will first look at the results of the questionnaire in the light of the above.

Most companies of the sample do not have an incentive system for innovation, with only 18 out of 78 having such a scheme, although another 23 have considered introducing such a scheme. As to perceived alternative technologies, only 17 out of 71 companies answering the question were aware of another method of producing their product. Of these, however, several mentioned so call "high-tech" methods, including computerized or automated production, robots and fibre optics. As to the input combinations of the new methods, energy and semi-skilled and unskilled labour would decrease and licence fees, technical and professional staff would increase. There would also be savings in machine capacity and building space. Equipment would almost always be imported.

For new products or processes, 56 firms carry out market research and 19 do not. Design of new products processes or machinery is carried out by 53 out of 72 firms. Modification of process equipment has led to increased production in 39 out of 67 cases, to increased reliability in 37 out of 64 cases and to an increased product range in 38 out of 66 cases.

However, these figures give only a very limited picture. Chapter 3 has shown the strength and variety of manufacturing activity in Zimbabwe. For more information on the present state of technology the reader should also examine Chapter 9. Although its focus is on import substitution, it nevertheless gives a detailed picture of many industrial processes at present being applied, and indicates the considerable skills and techniques that have been mastered and applied. Here we now consider in some detail the

engineering resources that are available in Zimbabwe today, and their effect on the manufacturing sector. To do this it is necessary to look at those disciplines which may not appear to have a direct linkage as well as with those that do. One aspect of this point of view is that if the peripheral engineering discipline was not available locally, it would then have to be imported like a commodity and in the same way represent an expenditure of foreign exchange.

Civil engineering

This engineering function has to do with the setting up of manufacturing plants or processes and is particularly applicable to the Cold Storage Commission's Abattoir Development Project in which approximately \$80 million will be spent on the civil engineering work associated with this project.

The scope of the civil work to be undertaken will be carried out by local consulting engineers in concert with the CSC engineers who will be jointly responsible for the overall conceptual and detailed design, preparation of tenders, the award of tenders, management of project and supervision to all aspects commissioning and also monitoring the warranty undertaking given by the project contractors.

The specialist civil engineering tasks in this particular project which are appropriate to many others also are: plant site preparations, building structures, drainage, sewage reticulation and disposal, potable water preparation and supply, roads and railway sidings.

This outline of the local civil engineering competence is a small part of the professional and technical civil engineering ability in Zimbabwe. It also covers the design of concrete steel structures, bridges and dams (Zimbabwe is a full member of the International Association for the Construction of Large Dams), radio and television service masts, municipal water and reticulation, and treatment plants including pumping stations.

Electrical engineering

This discipline would be involved in the control and power input into manufacturing industry. It would also be responsible for the design, manufacture and supply of electric motors, switchgear and control panels. It would also be involved jointly with the chemical or mechanical engineers in the process control and automation of the process.

Again on the periphery of the manufacturing sector the electrical engineer, as a contributor to the engineering industry of the country, is responsible for the design of power distribution systems either as a consultant to or employed by the Electricity Supply Commission or by the municipal electrical undertakings. These engineers are able to design and build switchgear transformers and electric motors.

A major service to the electrical distribution network is the supply of locally manufactured bare and insulated high, medium and low tension electric conductors as well as plastic insulated electric cables for industrial and domestic electric wiring.

In addition to these services the electrical engineer/technician is responsible for the operation and maintenance of a wide range of electrical equipment. In Zimbabwe, this has included everything from hydro electric and thermal-power stations to industrial process control. In addition the electrical engineer is concerned with the design, testing and manufacture of equipment, such as electric motors and transformers in the medium to low tension power range, going down to the microvolt electronic microprocessor, and communications equipment.

Mechanical engineering

This discipline usually has a priority employment position in the manufacturing sector as it is most closely related to so many of the process functions. A mechanical engineer is responsible for the design of process and manufacturing plant from the conceptual stage to final commissioning and

setting to work such equipment. Examples of this work profile would be, sugar-mills, paper and textile plants, fertilizer manufacture, industrial gas manufacture and storage. These are but a few of the areas of activity of the mechanical engineer.

These engineers would also be required to design and manufacture specialist machinery for the process sector, rock crushers, mineral screens, bulk handling conveyors, processing autoclaves (pressure chambers), process storage and reactor vessels. Other areas of responsibility would be in the operation and maintenance of thermal and hydro-electric power stations in respect of their mechanical equipment. The mechanical engineer would also be concerned with the design and operation of combustion and heat transfer equipment including large-scale air-conditioning plant for hospitals and public buildings. Transport equipment design and manufacture including road vehicles and railway rolling stock also come under the responsibility of this discipline.

Chemical and process engineering

Chemical engineering has the attribute of combining nearly all the other engineering disciplines under one hat so to speak. However, the core courses for a chemical engineering degree at a University after completion of the intermediate years are concerned with industrial chemistry and chemical engineering.

The chemical engineer would be required to design, commission and operate a wide range of process plant and in Zimbabwe the examples would be Sable Chemicals Ltd., Chemplex Ltd, and the air separation plants making oxygen and nitrogen, to cite just a few.

On many of the mines in Zimbabwe the chemical engineer would be responsible for implementing the metallurgical requirements for the extraction and concentration of minerals as well as the production of the refined metals and other mineral products.

In the manufacturing sector the chemical engineer would undertake the design and analysis of process functions, pilot plant testing, the evaluation of results, design of large-scale plant and the design of specialist equipment such as reactors, flotation cells, de-watering plants, setting tanks and process drying plant using heat or vacuum techniques.

In this same manufacturing field, the chemical engineer would be required to design the process control and monitoring equipment, ranging from simple hand controls to microprocessors.

The chemical engineer would also be involved in quality control through the management of laboratories and laboratory techniques. He would also be responsible for plant and personnel safety and in training of staff in all aspects of the manufacturing process.

Engineering expertise as a national resource

It is most important to realise that the expertise and experience set out in the foregoing paragraphs represent significant technological resources that are indigenous and available in Zimbabwe today, in the form of people who are consultants, engineers, technicians, and skilled and semi-skilled workers employed by or in the manufacturing sector. These are resources that have to be safeguarded and used like any other. It follows from this that particular attention has to be paid to questions of the employment of external consultants or experts for engineering projects. Examination will show that much could be undertaken locally by local engineers and industrial practitioners. Any move to go outside the scope of what can be done within the country must therefore receive the closest possible scrutiny.

Issues and opportunities

"The engine of growth should be technological change with international trade serving as the lubricating oil and not the fuel".

Sir Arthur Lewis

The above quotation is very applicable to the Zimbabwe situation, especially if one has the temerity to alter the word "international" and replace with the phrase "local and export".

To induce and sustain growth in the Zimbabwe economy is probably the greatest challenge that faces the country today, and in this important context the manufacturing sector has the largest capacity and the greatest flexibility for achieving this aim.

Growth is dependent on improvements in technological capabilities as well as on increases in the amount of the conventional factors of production, capital and labour. It is imperative for the mid-phase developing countries, such as Zimbabwe, which have successfully come through the early stages of industrialization and are now facing challenges of increasing import substitution, export competition and energy self-sufficiency, that they improve their grasp of technology and lay the bases for continued progress.

Often these objectives are frustrated by local costs that remain high, and the quality of the product, because of the age of the process plant or techniques, may not be acceptable in the export market. At the same time it should be recognized that technological change is not synonymous with an approach towards the most modern, capital-intensive processes. Progress can occur through improvements in efficiency in the use of existing equipment and through the adaptation of other technologies. In conclusion we can define (effective) technological change as the provision of new information and knowledge that is used effectively in industrial operations and has measureable effects on costs, product quality, level of output and sales and other ancillary operations of the manufacturing organization.

Acquisition and the cost of technology

Most developing countries are initially dependent on industrialized countries for their technological equipment, and in this regard one indicator is the volume of machinery imports the developing countries sustain. This value of machinery imports would however, have to be set against the value of locally produced local equipment. In this respect Zimbabwe is of course the best performer in Africa: its ratio of capital goods exports to imports was 0.284 in 1979.

But a further aspect of technology acquisition is the use of licenses and patents. There is not at the present time, a full and internationally recognized code of practice in terms of what criteria must be fulfilled when considering an application from a manufacturer about to enter into a license or royalty agreement with a foreign partner. However important steps have been made, notably by bodies such as UNIDO, UNCTAD, WIPO, etc.

The issue should be carefully considered in Zimbabwe so as to ensure that the local license holder is not unduly prejudiced in terms of volume output, territorial export restrictions, product range, and furthermore, so as to ensure that he has either free or at least nominal costs access to the products/process improvement information. In this respect, the model forms of agreement developed in the United Nations system should be closely examined.

The questionnaire results suggest that process/manufacturing technologies are either developed in-house or else obtained from a foreign licensor. Only in one instance did a manufacturer indicate that the technology was available from local licensors or consultants. With respect to foreign licensors, 29 firms used them and 27 did not. The United Kingdom was the most frequent source of licences (14 citations), closely followed by the Republic of South Africa (12). The next most common sources were the United States of America (5) and the Netherlands (4). It should be noted that many manufacturers use more than one developed country as a source of licences. Since the sample is so small, it is not sensible to attach great weight to average figures, but, for 13 firms who cited a percentage royalty figure, the average was 3.5 per cent, with the average duration of agreement being 5 years (although only 3 firms gave information on this point).

Policy outline

Often Government industrial policies affect the technical choices that industry makes. The policies can therefore either stimulate or reduce its ability or willingness to take the risks involved in technological change.

In terms of incentives to a manufacturer, one of the first and most effective ways is to provide tariffs and import controls that largely exclude the external or foreign competitor. However, caution must be applied in awarding high tariffs as these would tend to dilute the incentives to innovate or to adopt new technology.

In Zimbabwe tariffs can be used, as in the past, for the protection of new product lines especially against overseas suppliers dumping practices. In some instances however, alternative restrictions are preferable to the tariff protection route. In Zimbabwe, import control rather than tariff protection has allowed a situation of great flexibility in the importation of capital

goods, i.e. where the product-capital equipment/machinery is made locally usually a complete embargo is applied on any proposed importation. If however, the capital equipment cannot be produced locally, the industry importing the goods is able to do so without incurring the penalty of a high tariff charge. Notwithstanding this situation, the Ministry of Industry and Technology and the Customs and Excise Department have encouraged manufacturers to seek the correct tariff protection for their product which provides the added insurance that in the event of the import control being lifted in general or in particular, the manufacturer has the fall back to the tariff to protect his position. However, all tariff and control measures have effects outside the sector to which they are applied, and those must be carefully analyzed through consideration of the linkages and external and internal competitiveness of the other sectors.

There is also articulate support for an interventionist policy in the development of the capital goods sector of the industry as it is probable that without support, these manufacturers would be unlikely to develop their local capital goods market in an acceptable time frame.

There have been occasions in recent years when such an interventionist support policy would have immeasurably increased the Zimbabwean technological base. Here we refer to the Hwange Thermal Power Station project, of which relatively speaking, very little was manufactured locally due to, we believe, the constraints that were part of the financial aid package.

Another aspect of Government assistance can be in more selective approval of projects, such as those which that lie within the scope of the country's manufacturing and technological capability, or those which enhance productivity and product design from manufacturers.

Most importantly, there can be no blanket specification of a preferred technological development for Zimbabwe's manufacturing. Each sector has to be looked at individually, but in terms of its needs for catering for the local market and for export. In this context the links, actual and potential, with other sectors are very important.

Such an approach can yield insights into the equipment requirements, but attention to skills, to training needs, and the need for trainers also, is equally important. Only through the development of skills can the mastery, the "unpackaging" of technology be achieved.

Institutional development

In examining a policy of national technological development in the manufacturing sector, a problem that is at once encountered is the need to co-ordinate the interest and activities of the various institutions that will be involved. Only the Government has the power and command over resources to act as a broker in a national programme to improve the country's technological capabilities, but the way in which the private sector (which will certainly benefit from the programme) is involved is crucial. If the programme is regarded purely as a Government operation, the private sector may not feel that it needs to participate. If however, these private sector companies do participate in the programme, they may feel uncomfortable in having to expose private information.

The preferred institutional arrangement is one in which the private sector shares with the Government in the programme and has substantive responsibilities for the management of the programme. This would probably occur if the institution was semi-autonomous and has both Government and private sector representation on the Board of Directors and on the management team.

Research and development

Programmes that generate the know-how for technological change are critical to the continued growth of an economy. Very largely the research and development (R&D) programme in developing countries are inadequate to the task of generating and sustaining technological change. There are often marked by proliferation of organizations that give a great deal of attention to the wrong problems.

There is also a tendency in developing countries not to invest in R&D partly because knowledge that is created in a technical development sphere is difficult to secure under a patent or copyright. This does not mean that patents or copyrights are not important or that their effect is not enforceable. Often these prescriptions are most effectively applied to a few industries such as chemical and pharmaceuticals.

Much of the expertise acquired through R&D is not patentable in that simple modification by competitor will most likely avoid the risk of a patent infringement. What we are saying is that a great deal of the research and development knowledge is in the form of expertise and know-how and many companies are reluctant to embark on this route because they worry as to how this enterprise can be protected.

Even if R&D programmes are recognized and are supported by industries or Government, it must not be assumed that the flow of commercially useful ideas will be continuous and of a high standard, nor will they be adopted at a uniform rate. In fact, failures outnumber successes, but these can be tolerated because of the pay off from one success will compensate for many failures.

The use of the phrase "research and development" could be a misnomer, because most developing countries are not much concerned with achieving break-throughs in scientific knowledge but rather with engineering development in the manufacturing sectors and it is this aspect that directly affects economic growth.

An industrial research and development institute

A research institute for industry in Zimbabwe would make a major contribution to a national technology programme. We believe it should be established, to carry out practical research on subjects of direct relevance to manufacturers, in a similar way to that in which agriculture and mining are already catered for.

We cannot go into all the details here, but it is important to stress a number of points, based partly on the experience of other developing countries in research and development. The points apply both to the proposed institute and the R&D programme in general:

- a) There can be a tendency towards basic research conducted for prestige purposes, rather than looking to adapting technologies that have been developed elsewhere or assisting industries to solve their immediate problems. Linkages with industry have to be established and the exchange of ideas institutionalized.
- b) Very often the institutional administrative part of the programme can take precedence over the substance of the work that is to be done. In support of this point we would refer to the Science and Technology Symposium at the University of Zimbabwe March 1984 at which time in the discussions it was alluded to a factual imbalance in remuneration in favour of Government administrative staff as apposed to scientific and technical personnel. This problem is pervasive, and understandably affects the aspirations of prospective graduates in the sciences to go into Government employment. The proposed institute should keep administration to a minimum.
- c) In some cases, programmes are undertaken without getting together the necessary scientific and technical staff. It is certainly important that where possible these recruitments are made from the country's nationals. However the recruitment policy should be flexible enough, in the event of a shortage of national experts, to allow for special expatriate staff to serve for the duration of a specific project, with national experts still forming the core of the organization.
- d) In some countries, incentives to the private sector are often weak or non-existent. Incentives that are usually effective include tax concessions or preferential treatment of R&D expenditures, the joint financing by Government and industry of R&D programmes, the direct or matching of grants, and the supply of detailed technological information and intelligence. In many respects the strengtning of incentives is the easiest way to achieve progress in R&D. It must also be stated that unless the private sector becomes actively and effectively involved in R&D it is most unlikely that any government can support such a programme and successfully achieve its aims.
- e) The diffusion of research results should be encouraged so that any progress achieved will spread through the sector. An important way to do this is to enforce collaboration by, for instance, insisting that grants are given, or work undertaken, at the request of at least two companies, on some topic of interest to both of them. This would maximise the available national resources for R&D.
- f) In conclusion, with respect to the proposed insitute, we believe it should begin in a small way and to a certain extent earn its keep, carrying out research and growing in response to expressed demand for its services.

References to Chapter 8

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CHAPTER NINE

IMPORT SUBSTITUTION

Policies for current and continuing import substitution

The main purpose of import substitution in Zimbabwe in the initial stages was the need to reduce the amount of foreign currency needed for the importation of capital and consumer goods as well as certain raw materials. In addition to this, an important aspect of import substitution was the increased employment opportunity offered.

The effect of this policy was to increase the scope and range of local manufacture and in so doing it has indeed in fact increased the labour required by the sector. It has also allowed local techniques to be developed and opportunities have been further extended into areas in which the particular industry or firm which, when it produced products of acceptable quality and cost, were then able to consider the products for export.

Has import substitution reached the end of its effective phase for the Zimbabwe manufacturing sector?. In the light of the following consideration, the answer to this must be a clear no.

Past import substitution industrialization policy (ISI) has been most marked and vigorous at certain critical historical moments: first, with the onset of the depression in the early 1930s, second, during the course of the Second World War following the drying up of the traditional supply of hitherto imported commodities, and even more strongly during UDI. During UDI, an environment encouraging domestic production through import controls, tariff measures and foreign currency allocation, was vigorously pursued as government policy. The direct motive for adopting such a policy was to save foreign exchange.

It will be argued here however, that, Zimbabwe did not adopt an entirely inward-looking strategy with all import substituting industries geared to a protective domestic market. Many manufactures were exported into the highly competitive South African markets, and traditional exports of primary commodities were also maintained.

The shift from ISI to a form of export-oriented industrialisation (EOI), therefore, does not necessarily mean abandoning of ISI nor does it imply embarking on something entirely new. Rather the need is to initiate or strengthen a policy whereby production costs of locally manufactured commodities are kept or made low enough to compete with foreign products in the world market. Such an approach to EOI prefers not to axe the import substituting industries, but to use them as part of an interdependent and efficient complex. The population of Zimbabwe represents a market that can be used to exploit the economies of scale necessary for external competitiveness, and the skills and experience of the work force can be intensified and developed in new directions. Finally, natural resources utilization can also be maximized.

Table 9.1 shows a trend towards self-sufficiency in some selected Zimbabwean manufactured products in grains (maize, wheat rice and others), beer, wine and spirits, pulp and paper products, fertilizers/insecticides and pesticides, rubber products, plastic products and ferro-alloys and iron and steel products. What the table shows is that imports of most manufactured goods increased by a lower rate than production figures. A strong tendency towards domestic production in lieu of imports indicates that ISI was successful at least during the period under study. In 1966 domestic production of the goods in the table represented 69 percent of total supply of the respective products, and by 1982 that had risen to 86 percent.

In spite of ISI, the manufacturing sector has at present difficulties in the form of increasing imports of machinery and transport equipment, intermediate goods and raw material inputs. It is, however, quite arbitrary to take a balance sheet of exports and imports of the manufacturing sector and argue that the sector is or is not efficient. As will be demonstrated below, Zimbabwe's ISI has passed the "shallow" phase of simply replacing former imported consumer goods. The manufacturing sector has now reached a "deepening" phase of ISI in which equipment, intermediate goods, machine tools

Table 9.1 IMPORT SUBSTITUTION IN SEVEN SELECTED PRODUCTS 1966 - 1982 (\$'000)

	1966			1975			1979			1982			Percentages of Annual Average Growth Rates Over Period 1966-1982		
	(1) Prod.	(2) Imports	1 as % of Total Supply (3)	(4) Prod.	(4) Imports	3 as % of Total Supply (5)	(5) Prod.	(6) Imports	5 as % of Total Supply (7)	(7) Prod.	(8) Imports	7 as % of Total Supply (9)	Prod.	Imports	Total
Grains	20,959	7,682	73	55,869	7,095	89	104,317	5,919	94	272,195	1,202	99	17	-11	15
Beer, Wine and Spirits	15,175	498	97	39,732	878	98	56,443	1,069	98	110,978	1,343	99	13	6	13
Pulp, Paper, paperboard and their products	10,260	5580	64	39,389	11,272	78	35,602	11,448	76	80,485	17,799	82	14	8	12
Fertilizer/Insecticides/Pesticides	14,914	8,939	63	51,5812	18,009	74	62,370	17,093	78	131,945	33,634	80	15	8	13
Rubber Products	4,712	3,081	60	20,752	6,152	77	29,363	8,074	78	49,162	9,149	84	16	7	13
Plastic Products	3,222	2,471	56	16,039	8,696	65	23,939	15,536	61	43,908	18,146	71	18	13	16
Ferro Alloys/Iron and Steel Rounds, Sections Flats, Wire, etc.	22,737	8,742	72	148,963	23,891	86	217,481	28,664	88	248,536	32,532	88	16	9	15

Source: Calculated from the Census of Production 1974/75 - 1982/83, The Whitsun Foundation "Trade and Investment in Zimbabwe" Vol 1. Trade Table 3, 7, and Statement of External Trade, CSO, 1982.

and processes are being designed, modified and manufactured for use in the manufacturing sector itself, and particularly for all other sectors most of which are directly producing or servicing exports, e.g., mining, agriculture, energy and telecommunications.

In spite of economic, social and technological problems, the ISI is now effectively linking itself to EOI. It is important to realize that ISI saves foreign exchange in far greater quantities than the manufacturing sector uses. Policy should be directed towards cutting down costs of production in the economy by intensifying the use of locally available natural and human resources, and encouraging the ability of the sector to produce for exports at competitive costs of production.

Having said that import substitution is to continue, we now examine the further opportunities for this process on a sectoral basis. To do this we use the Standard International Trade Classification (SITC) and its division into commodity groups (0-9). By looking at the volume and value of imports of individual commodities it is possible to see the scope for further progress, based on the domestic capacities and experience of the manufacturing sector. However, the survey that follows has a wider scope. It indicates the technology being applied in practice in a number of important sub-sectors. Even when specific import substitution possibilities are not identified, as in some of the following sections, it is intended that the description of activity under the relevant heading will show the progress that has been made in these activities and the national resources that are thereby embodied in the sector.

0. Food and live animals

0.1. Cold storage commission of Zimbabwe

The CSC is currently embarking on a major capital development programme which is contained in the Abattoir and Cold Storage Feasibility Studies of March 1985 drawn up by Arup Economic Consultants.

The approximate overall cost of this project is some \$160 million and is to be completed by 1989. Of this amount, approximately \$100 million or 62.5 per cent will be spent locally. However, of this some \$15-\$20 million will be spent in the form of purchases of locally made capital equipment. The balance is largely made up of civil engineering work, being site preparation, which covers such items as road and rail installations, cattle pens, water and sewage reticulation, effluent treatment plant and the main abattoir buildings. The civil engineering work of course, would represent a considerable amount of activity in the construction sector of the economy which has its own linkages with the manufacturing sector (see chapter 4).

This development project by the Cold Storage Commission (CSC) is the most important capital project in the country at the present time. In terms of import substitution, the funds allocated for the plant and utilities in the abattoirs, as set out in detail in the feasibility report, are for procurement of equipment that would normally be imported. The CSC, which for some time past, has purchased these services and manufactured capital equipment from local firms, is not embarking on any plan to introduce new technology to local contractors of an untried type or concept, but is purchasing, in the main, equipment that has been well proven in the Kadoma, Marondera and Chinhoyi abattoirs. In particular we would refer to the continuous by-products equipment that was introduced in 1976. We would make the point that the supportive approach of the Cold Storage Commission to local industry and manufacturers is in marked contrast to that of the Electricity Supply Commission and the National Railways of Zimbabwe. Both these parastatals have embarked on major projects in recent years which could have been of a good deal more benefit to the country in many important respects, particularly in the manufacturing sector. Unfortunately, we believe that the pressures that were concomitant to the aid packages probably made it difficult for these government bodies and Government itself to manoeuvre within the prescription of these aid facilities. While this is a case of "water under the bridge", it must be hoped that the situation will not be repeated again.

0.2 Meat canning

Meat canning is an important component of Zimbabwe's meat exports, as well as the local market consumption of meat in a different form. There are two main meat canning concerns in Zimbabwe who manufacture canned products to international standards.

These companies both operate their canning plants on a batch type of production using batch type sterilizing retorts with a wide range of other process equipment manufactured locally to their specific requirements. Continuous sterilizers are available from foreign sources, but the batch process still serves the local industry well and probably simplifies the important aspect of quality control. To expand on this last matter, when a canned consumable product is found to be unfit for consumption, the recovery of the cans from the market that are in the same batch in terms of identification is relatively easy in a batch process. This however, is considerably more difficult in a continuous process to determine at what point the process aberration occurred and generally one has to examine the historical process recorded charts to establish the point at which the process fault occurred, and then link this to the production cycle. The batch process is therefore less rigid.

0.3 The Grain Milling Industry

This industry has a large number of specialist support industries and engineering contractors, who have developed a high degree of local technology and experience in such areas as milling plant, building design, design of grain handling and control equipment.

A local engineering company has in conjunction with one of the main roller-meal millers developed a hard cast/iron high strength roll which is performing well against the imported article.

It must be pointed out that a number of foreign equipment suppliers are often reluctant to pass-over their technology even on a licensed basis particularly if their own manufacturing facilities at base are being under-utilized.

The grain milling industry supports itself well in respect of professional, technician and skilled worker recruitment and is also a major source of training personnel in the manufacturing sector in the spheres of technicians and skilled workers.

The two main milling groups advise that a considerable portion of their equipment is old, some of it more than 40 years old. Plans are afoot to commit their companies to major plant replacement in 1985/86 and 1986/1987. A very large part of the equipment will be manufactured and constructed locally, particularly in the civil engineering and building aspects, but also in milling plant itself.

These companies will however generally look to the recognized European and North American manufacturers for the supply of new plant in specific areas where "state-of-the-art" design is appropriate to their requirements. These companies should also consider the option of local manufacture, particularly in respect of fast moving spares components.

0.4 Animal stock feeds

An important aspect of the quality beef industry in Zimbabwe, which was particularly emphasized during the recent drought, was the provision of formulated high-protein stock feeds as an important part of both the beef and dairy sections of this arm of the agricultural sector.

Several large firms in Zimbabwe supply the bulk of locally produced fibre-based animal stock feeds. They use, in the main, baggasse (sugar cane) fibre, to which must be added locally produced protein compounds. These compounds have been formulated over the years with proven weight gain to input cost ratios.

The process plants for conditioning and final preparations of the stock feeds have been locally manufactured, and are based on acquired or licensed design. The experience gained allows other similar material preparation plants to be successfully undertaken for agricultural product drying and preparation.

The same technology extends into tea and coffee production in Zimbabwe. These two agricultural products have given rise to a specialist group of firms that produce a wide range of tea and coffee preparation and packing machines, all of completely local manufacture. These industries, with their technological back-up, serve as a good bench-mark in terms of overseas

competitiveness and in terms of effective management and efficient production. If this was not the case, Zimbabwe would have long since ceased to be a significant exporter of high-grade tea, which indeed it is today.

1.0 Tobacco and beverages

1.1 Tobacco

In this product the country is a very large net exporter and in 1982 exported some \$195 million worth of tobacco. The bulk of this, of course, was flue-cured Virginia type tobacco. We must however, consider the manufacturing sector's contribution to this export, as it includes the import substitution, services and equipment that this sector provides. In the main these are:

- a) Ploughs and ground tillage equipment;
- b) Spray equipment for insecticides and pesticides which include both knock-sack manually operated spraying machines and tractor mounted powered spray equipment;
- c) Reaping equipment, which the country has specialized to a very large extent, making it a leader in this regard in the efficient utilization of a highly manually orientated reaping system. This is necessary for the individually reaped leaf ensuring a hand-picked crop, with benefits in the prices paid for such a quality product;
- d) Curing equipment. This covers a wide range of processing conditions which occur on the farm and call for the modulated curing cycle for the Virginia type tobacco leaf. The physiology and proper curing cycle of this leaf has been the substance of continuing investigation by the Tobacco Research Board of the Government of Zimbabwe. This organization is considered as one of the foremost in its field in the world.

This Research Board in addition to the fundamental research it does on plant growing, entomology etc. also serves as a base for this sector to obtain properly monitored and controlled tests on commercial equipment that is being offered to the tobacco industry in the form of drying, curing equipment and plant, all of which is manufactured locally;

- e) Conditioning and packing for export. After the tobacco has been sold by the producer, tobacco that is destined for export must be unpacked from the bale purchased by the overseas buyer. The tobacco must then be conditioned and repacked for export.

This has given rise to a number of tobacco packing plants which by virtue of the volume and quality of the product that they have to handle are very significant factors in the manufacturing industry.

The process in which they are involved is, as mentioned, the unpacking of the producer bale, followed by a very carefully controlled re-conditioning of the tobacco which requires drying and re-humidifying processes to very close tolerances. Next comes the packing into "hogs-heads" and timber boxes. The tobacco has to be packed in such a manner as to ensure that the grades and quality so purchased are separately packed and identified.

The local component-manufacture of the process plant is probably of the order of 90 per cent. It covers such items as handling conveyors, screens, dust removal chambers, rotary drying kilns and humidification chambers with steam plants providing the heating and the humidification medium. These plants are themselves locally manufactured and are operated on coal fired combustion equipment.

The imported component of such installation would be the temperature and pressure control devices and electrical switch gear. Very largely, all other aspects would be designed, fabricated, supplied, installed and commissioned from local sources.

The timber used for "hogs-heads" and boxes is constructed of local pine timber (being either P. Patula or Radiata), the bulk of which is grown in the Eastern highlands of Zimbabwe where the country's major timber industry is situated. This industry provides structural timber for purposes such as this and for newsprint manufacture.

This export of "hogs-heads" etc. represents a large indirect export for the timber industry.

1.2 Beverages

There are two distinct sections - one non-alcoholic and one alcohol-based.

1.2.1 Non-alcoholic

These beverages are normally made under an international license, although there is one trade name which goes back many years and is entirely Zimbabwean. This is "Mazoe" and it is marketed both locally and internationally under that name.

In order to comply with the hygiene and quality assurance requirements for international licensing of a product, such beverages require in the main high quality water, sugar, colouring, flavouring and aeration with carbonic acid gas - CO₂ (carbon dioxide), all of a high standard of purity.

Generally all plant associated with the production of such beverages is manufactured of stainless steel. Sterilizing is usually carried out with steam heated hot water, and the aeration is produced by CO₂ injection from bulk low temperature carbon dioxide storage vessels.

Local manufacture, in particular, relates to bottle washing machines (built under license) and of course the manufacture of the bottles themselves by the country's glass manufacturing operation in Gweru.

Stainless steel vessels are locally manufactured to equipment designs which have been established in the country for some years now. This beverage industry gave rise to the need to manufacture low temperature cryogenic vessels using low temperature structural materials and high duty vacuum insulated jackets. These vessels were locally designed and manufactured, and they comply with either British or American standards for low temperature gas storage.

This tank storage development was an important feature, because before this dry ice (CO₂ in solid form) was delivered from suppliers in Cheredzi and the Republic of South Africa in non-pressure type insulated containers, which of necessity allowed the vapourizing gas to be released to the atmosphere. This method of transportation was inefficient in cost and bulk handling aspects.

It should be mentioned that considerable quantities of carbon dioxide are produced from the Triangle Ethanol Plant as well as at the Absolute Alcohol Distillery of Hippo-Valley Estates limited.

The country is therefore, self-sufficient in this important beverage commodity. In addition to this, any development of this industry in respect of design, technology and manufacture can be provided within the manufacturing sector.

1.2.2 Alcoholic beverages

Considering alcoholic beverages in terms of volume, the most important are the beers, opaque and clear. In the case of opaque beer, this is produced by the Municipality of Bulawayo, the Municipality of Gweru and Chibuku Limited. This latter is a private sector company in the Delta Corporation Group - who have in recent years operated a management and marketing contract with the Municipality of Harare. This same company operates numerous small breweries throughout the country in addition to their main opaque brewery plant at Seki, just outside Harare

The opaque and clear beer manufacture requires as input material: maize, malt, hops, yeast, sugar and potable water, all of which except for hops are locally supplied. The imported value of hops in 1982 was \$421,000, and whilst this could be produced locally, the constraint appears to be in respect of the price that National Breweries is prepared to pay for this input, and the consideration by the farming community that the price offered for the locally produced equivalent is not attractive enough.

Returning now to the manufacture and production of the two types of beer, the process includes preparation, milling, grinding and drying followed by mixing, heating, fermentation, cooling, storage, bottling and packing for the carriage of the finished product. As with most consumable products, and particularly since both types of beer incorporate the use of yeast and sugar, most of the equipment with which it comes into contact has to be constructed of either copper or stainless steel. Other necessary services are high quality potable water, steam or hot water and refrigeration facilities.

In the event of an extension to a brewery or the construction of a new plant, the imported components would mainly be gas compression equipment (either screw or reciprocating compressors), instrument and control equipment, and electrical switch gear. The remaining equipment is designed and manufactured locally, including stainless steel storage and cooling vessels, that are as well as the steam and hot water generators, circulating water pumps, with peripheral equipment such as coal and ash handling, exhaust gas cleaning, and steam and hot water reticulation.

We believe however that the high speed bottle filling and bottle washing plant will probably have to continue to be imported. But consideration must be also given to the fact that National Bottlers Ltd. which is part of the same Delta Corporation Group have built their own bottle-washing machinery and we therefore believe that with the appropriate license and the importation of critical equipment, substantial portions of both the high-speed filling and the bottle-washing machinery could be manufactured locally.

3.0 Mineral fuels and related materials

3.1 Methanol

Various studies have been carried out in Zimbabwe to consider whether any of the current oil from coal routes are appropriate and applicable to the country's need for diesel and petroleum products or as a fuel extender.

The Industrial Development Corporation embarked on an investigation in 1977/1978 to consider a low temperature pyrolysis route which involves the low temperature carbonization of coal by heating and collecting the liquid products. This reaction must take place at temperatures below 600⁰ C to minimize the cracking of liquids into gases. The aim was to achieve approximately a 10 per cent recovery into liquid phase.

The coal used was drawn from the Lubimbi Coal Field. It was unfortunate that the decision was made to use coal samples of high ash content with the object of leaving the better coal to be sold commercially. As a result, the yields were particularly disappointing with figures of approximately 1 ton of liquid products to 25 tons of coal charged in the pilot plant. At this point the project was closed down.

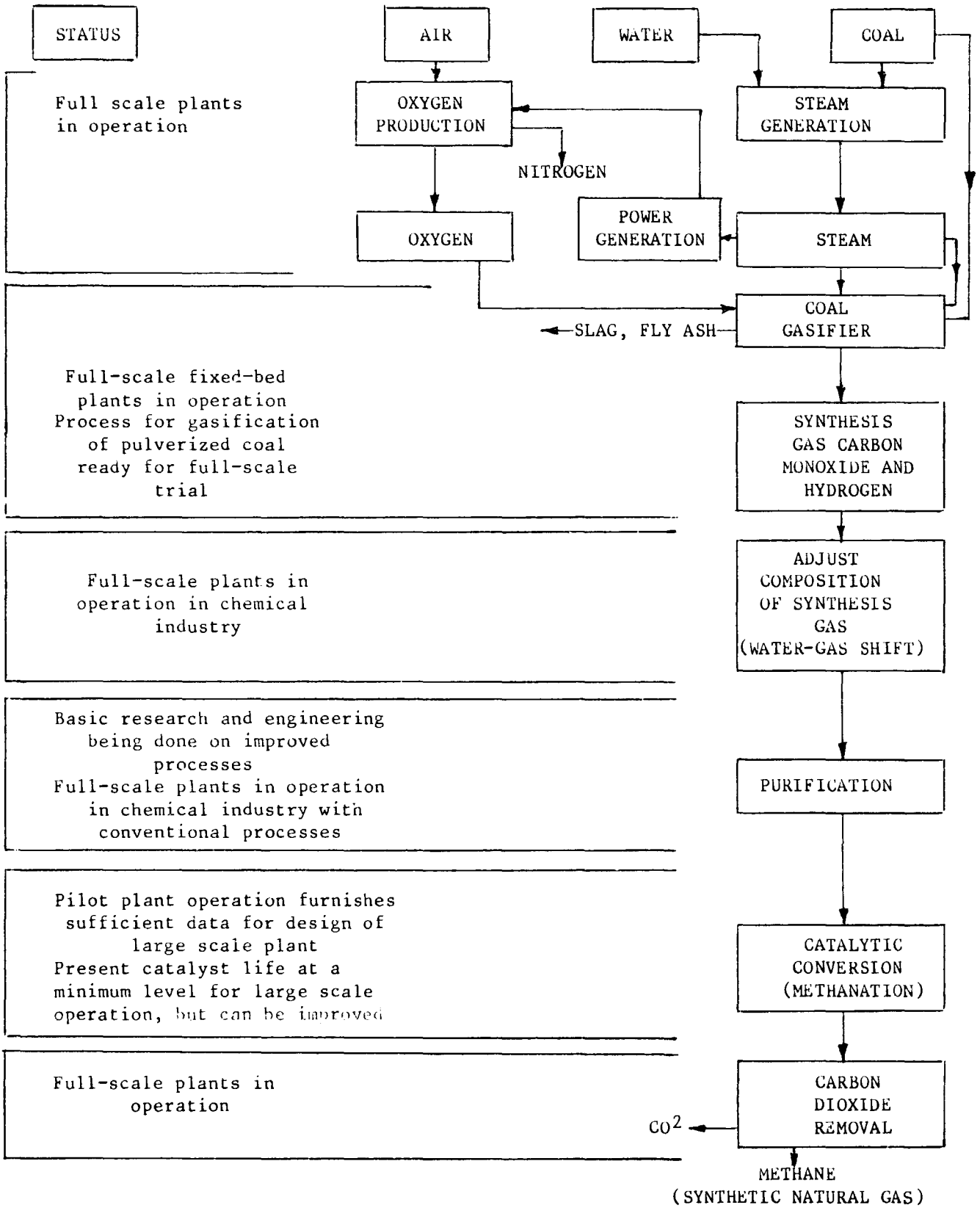
In 1980/1981 the Bulawayo Municipality's City Electrical Engineers Department invited Davey McKee of the United Kingdom to carry out a feasibility study on the reticulation of low to medium B.T.U. gas to various liquid fuel using industries in the Bulawayo municipal area. Their idea was to site a gasification plant fuelled with Wankie coal in the vicinity of the municipal power station. An enquiry was finally issued by the Bulawayo Municipality for the design, supply, installation, commissioning, and setting to work a municipal gas undertaking involving some 29 kilometres of gas mains throughout the industrial area.

When the project came forward from the Municipality to the then Ministry of Industry and Energy with a requirement at that time for some \$2-\$3 million of foreign currency, the project was not approved.

At the time that the tender bids were received, a Zimbabwe contractor based in Harare had obtained an undertaking from the British Gas Corporation (in a liaison with Humphreys and Glasgow Ltd., a firm of consulting, chemical and processing engineers in London), to allow for the installation of a British Gas Corporation's Lurgi-type fixed bed slagging gasifier. It was considered that a side stream of synthesis gas would have permitted a methanation process which would be developed in parallel with a supply of medium B.T.U. gas to the various Bulawayo industrial client.

At this point a little should be said about the British Gas Corporation's slagging gasifier. This gasifier process was commissioned approximately ten years ago and built at Westfield in Scotland for the British Gas Corporation for the purpose of gasification of U.K. coals into SNG (synthetic natural gas) to replace North Sea gas when that resource starts to run down in approximately 30-40 years time.

This research has also been funded by the American Energy authorities with very successful results on a wide range of American bituminous coals. The Lurgi gasifier from which the slagging gasifier it is derived of course the main gasification unit in the Sasol plant. This coal gasifier produces a synthesis gas, as it is called, which is made up principally of carbon monoxide at about 31-32 percent, hydrogen at approximately 53-54 per cent, methane at 13.5 per cent and the balance made up of small quantities of nitrogen, carbon dioxide and hydrogen sulphide. The hydrogen sulphide must, of course, be removed before the catalytic conversion of the SNG to methanol.



GASIFICATION METHANATION PROCESS

The principal advantages of the coal gasification/methanation process are:

- a) Adaptability to a wide variety of coals;
- b) Requires a minimum of coal pretreatment with respect to the agglomerating characteristics, and this is particularly important in respect to Wankie coals;
- c) High rates of methane production per unit volume of reactor equipment;
- d) Operation at virtually any pressure level from one atmosphere to pipeline pressure.

The disadvantages are:

- a) A high degree of sulphur removal required from the synthesis gas to prevent loss of effectiveness of the methanation (nickel) catalyst;
- b) Rapid heat removal required from the highly exothermic methanation reactions;
- c) The relatively low thermal efficiency of conversion of coal to methane. However, when one is able to supply heat in the form of coal energy at very low input costs, this while important should not obscure the overall strategic advantage of the process.

The methane or methanol (which is produced at lower reaction temperatures) would initially be considered as a motor spirit fuel extender in the same way that ethanol has been so successfully used in Zimbabwe at the present. We believe that this is a viable alternative to the proposal embodied in the Chisumbanje project report, with its combined sugar-cane and ethanol production now tending to ethanol production alone because of the world over supply of cane sugar. Our concern here is that such production of a motor spirit extender uses an important land resource with potentially great irrigation opportunities. It must therefore be carefully considered from the economic and social point of view and is bound to come under social scrutiny, particularly if there are any short falls in national food supplies or in those of other SADCC countries.

In contrast, the methanol route, initially as a fuel extender and ultimately as a possible motor spirit based on coal gasification is a pragmatic and internationally well understood process for Zimbabwe to embark upon, particularly if it can be combined with providing a fuel gas to an important industrial manufacturing sector, as in the case of the Bulawayo Municipal project.

3.2 Mineral, fuels and lubricant and related materials

3.2.1 Lubricating oils

In 1982 Zimbabwe imported some 21.48 million litres of lubricating oil in bulk at a cost of \$9,467 million. In 1983, some 15 million litres were imported at a price of \$9,272 million. The ratios indicate very clearly the increasing cost of lubricating oils, and the amount of foreign currency involved is very large.

At the present time, the Shell Company of Zimbabwe operates the only oil re-refinery in the country. One grade is marketed under brand names such as Shell, B.P., Mobil, Total, Castrol and another grade, made to the same standard, is sold under the name Nova. Nova products were in fact the original lubricating oil re-refinery in the country, which was absorbed into the relatively large Shell oil re-refinery established at the Willovale, Harare Industrial Site.

It can be postulated that if all the lubricating oil used in automotive engines, stationary engines and the railway diesel electric units was recovered, the actual amount of lubricating oil needed to make up what are known as "crankcase losses" would then be very small indeed.

Unfortunately losses occur when draining engine and gear-box crankcases. There are also instances where lubricating oil is diluted with gas oil (diesel oil) and fired in furnaces. Because of the high relative cost of lubricating oil, this latter practice is a most unfortunate one and every effort must be made for increase awareness of the strategic importance of this commodity.

In years past, there was an unfortunate marketing tactic, used by the lubricating oil suppliers and marketing organizations, of demeaning the quality of re-refined lubricating products, with in most cases very little technical grounds for doing so. In fact, it can be argued that some of the unstable aromatics in new lubricating oil are driven off beneficially, under the effects of the stress and temperatures of operating conditions in re-refining.

The process of re-refining used oil in Zimbabwe today is one which removes completely all metallic particles which may be present in the recovered oil. All moisture and dilutants, such as gas oil, are removed, and the final polishing by series filters and blending, brings the oil back to standard viscosities. The quality of the oil is monitored by the Standards Association of Central Africa and the appropriate mark is permitted for use on containers filled with this re-refined oil. It must be pointed out that certain engine builders, particularly the Caterpillar Tractor Company of the United States, generally will not validate guarantees on the operation of their engines when used with oils that are not naphtenic- based. Since lubricating oils are either naphtentic or parafinic base from the time of their original production, the use of re-refined oil is a problem. This is because in a re-refinery it is not possible to separate these two basic types of lubricant. It is therefore possible that engines carrying specific limitations to warranty in terms of lubricants used may still have to be provided with imported lubricating oils.

However, these are special cases. The general position can certainly be improved. The matter of improving the efficiency of recovery and collection of oils drained from crankcases etc. must receive further Government attention. An incentive in this direction would be to increase the price of recovered used oil.

4.0 Animal and vegetable oils and fats

4.1 Tallow (animal)

In 1982 Zimbabwe imported 15,243 tons of tallow valued at \$5.455 million. The main industrial use for tallow is in the manufacture of soap. Zimbabwe itself is a large producer of tallow from animal fat and the bulk source of this material is the Cold Storage Commission. Earlier in this chapter we referred to the capital development programme of CSC which is contained in the Abattoir and Cold Storage Feasibility Study prepared in March 1985. A great deal of this CSC development programme is associated with the export of high grade meat to EEC countries.

This meat will be required to be largely fat free. The preparation of it will give rise to additional source fat for tallow production. There is scope therefore for the level of importation of tallow, particularly for the soap

making industry, to reduce significantly over the next 3-4 years. It is important that any perceived imbalance in tallow importation against local production should be carefully considered at an early stage, in order to reduce the cost of importing this material as far as possible.

5.0 Chemicals

5.1 Plastic raw materials

One interesting feature of Zimbabwe's manufacturing sector is that concerned with the plastics industry in that it is one of the most buoyant sectors in the manufacturing economy and offers still very substantial opportunity for import substitution. At the present time there is no production of plastic resins of either the thermoplastic or the thermosetting type in Zimbabwe.

The Industrial Development Corporation, in conjunction with some of the main plastic fabricating and extruding companies in the country, have considered the matter of jointly putting up a plastic resin plant to cater for the production of polymers of chloride and ethylene bases.

So far, the minimum plant size and cost has deterred the participants from going further into this project for self-sufficiency, and we believe that this opinion, set against the background of decreasing world prices for plastic resin materials, is probably the right one. However, it is important to continue to examine the situation, since the present importation of PVC resin alone amounts to \$5-\$6 million per annum.

Far greater scope for import substitution will be provided by extending the existing facilities and range products. In particular we would like to focus attention on the grain bag requirements for the Zimbabwean maize crop. At the present moment grain bags are used for the handling and stock piling of maize outside the main depots of the Grain Marketing Boards bulk storage facilities. The grain bags in question are specified as the "imperial heavy C bag" (90 kg grain capacity) and these bags are estimated to have a circulation life of approximately 3 years, being downgraded after the first year from the maize stock piling function.

These bags are of woven jute construction and are purchased from Bangladesh through the Zimbabwe Grain Bag Pool which is managed for all parties concerned, including the Government, by the Farmers' Co-op in Harare. The number of bags to be purchased this year is between 19 and 21 million and these will cost approximately \$26 million.

The alternative is to consider the woven plastic grain bag. Project approval has been sought by two of the main plastic bag manufacturers in the country, and in particular the Highfield Bag Company of Harare wishes to install a bag making plant to produce what is called a "poly-weave"-woven plastic grain bag.

The estimated costs of the project are:

- a) plant cost approximately \$5 million;
- b) raw material costs approximately \$3 million sufficient for 12 million bags or \$6 million raw materials for 24 million bags.

The advantages that the manufacturers see, in addition to the obvious economic benefit, are in terms of higher local input of labour and industrial activity and flexibility in responding to crop size change. Most importantly, the finished product price would be considerably lower, approximately 80 cents per bag as against \$2.48 for the jute bag.

In considering what appear to be the obvious advantages it is somewhat surprising that steps have not already been taken to implement this project.

There is however, some concern expressed by the Grain Marketing Board on a number of aspects of a change from jute to plastic bags. These are as follows:

- a) safety in large stock piles - the standard plastic bag may slip out of the bag pile because of its smoothness;
- b) ultra-violet light degradation of the plastic material;
- c) poor trippage or circulation life;
- d) lack of comparative data on these and other aspects of the use of plastic bag in countries with similar crops, climates and conditions of handling.

In reply to these criticisms, the local bag manufacturers state that:

- a) the polyweave bag will provide an equally secure stock pile because of the woven thread profile;
- b) the plastic resin formulation by the resin manufacturers is U.V. inhibited and would be effective for 3-4 years at a minimum;
- c) circulation life would not be less than the jute bag that it replaces;
- d) the plastic bag is not as flammable and does not suffer from damp rot;
- e) in regard to comparative tests, RSA maize authorities are currently carrying out tests, Malawi is using the polyweave bag for grain, and the Zimbabwe Seed Maize Co-op have been using the plastic bag for about three and a half years with satisfactory results.

To conclude, it is vitally important that the GMB accelerate its testing programme on the acceptability of the woven plastic bag, as the acquisition cost of jute bags is rapidly moving to \$30 million per year, all of which is in foreign currency.

We would also cite a very much smaller but equally as important substitution opportunity, in respect of agricultural bailing twine. This product is at present imported into Zimbabwe from two sources. Sisal twine is brought in from Tanzania and polypropylene twine is obtained from the USA. The value of import licences granted for these purchases is approximately \$900,000 per year.

It is considered by one of the country's plastic extruders that, with plant modifications involving some \$100,000 in imported machinery and equipment and a raw material cost of \$300,000 per year at present value, the entire agricultural requirement for twine could be supplied locally.

5.2 Chemical pulp plant

The Canadian Company H.A. Symons International Limited have been commissioned by the Government of Zimbabwe in conjunction with the Canadian Development Agency (CIDA) to inquire into all aspects of the possible establishment of a chemical pulp plant in Zimbabwe.

At present, Zimbabwe buys a substantial quantity of chemical pulp amounting in 1982 to \$4.4 million to which must be added a substantial portion of the currency allocated to the purchase of plain or composite paper which again in 1982 amounted to \$5.6 million per annum. The production of chemical

pulp would allow a much improved quality of paper, both for commercial and book manufacture, to be produced. In particular the requirements for the Ministry of Education could then be provided for from local resources.

The figures stated above represent a heavy constraint on the printing and publishing industry, which would be a great deal more buoyant if the country was able to produce a better quality paper.

It is being assessed by H.A. Symons and the Forestry Commission, together with the two main paper manufacturers, the Hunyani Pulp and Paper Company and the Mutare Board and Paper Company, that the country's requirements of chemical pulp would be between 150 and 200 tons a day. This must be set against the overseas assessment that a minimum plant size would be between 600 to 1,000 tons a day. It is clear that the economies of scale would not be implied in Zimbabwe's case. However, a number of factors would override this large plant assessment in regard to Zimbabwe's requirements, and it is also believed that a higher price for the chemical pulp feedstock would be acceptable to the industry.

It is felt that a high priority rating should be accorded to this project by the Industrial Development Corporation. An interesting point made by H.A. Symons was that the timber being grown and produced by the Forestry Commission is of an extremely high standard and quality. One of the purposes of the visit by these Canadian consultants was to examine the local facilities for plant manufacture with the objective of reducing as far as possible the foreign exchange requirements and it is believed that the survey will show that a very substantial part of the plant could be manufactured locally.

The main items of the plant would be as follows:

- a) Plant and buildings. These would be ferro-concrete with steel-framed trusses;
- b) Stacker-Reclaimers. This equipment is used for handling the chipped wood material;
- c) Digester vessels constructed of carbon steel;
- d) Water-tube boilers designed for burning black-liquor with approximately 55-65 per cent solids (this is a very valuable fuel recovery aspect of a modern chemical pulp plant). This equipment would probably be licensed from experienced overseas manufacturers of this type of plant, such as the American company, Combustion Engineering or Babcock and Wilcox of the United Kingdom.

The bulk of the equipment would certainly be locally manufactured to approved designs. A wide range of other smaller equipment such as pumps, hoist-conveyors and timber handling plant would be designed and manufactured in Zimbabwe.

5.3 Anhydrous-ammonia

Ammonia NH_3 in simple terms provides the nitrogen component in chemical fertilizers. Approximately \$9.3 million of anhydrous-ammonia in bulk was imported into Zimbabwe in 1982, and agricultural activity has increased since then. The size of this importation makes it very important to examine what opportunities are available to make Zimbabwe self-sufficient in terms of this vitally important chemical.

There are some considerations that are worthy of serious attention: one is to improve the efficiency in the application of anhydrous-ammonia and therefore either decrease the requirement or to make the same amount go further. The second approach is to consider processes that would be economically acceptable for the production of anhydrous-ammonia from coal.

Returning to the first of these two considerations, we examine at the better utilization of anhydrous-ammonia in bulk. At present, anhydrous-ammonia is imported by Sable Chemicals Limited and used at their plant in Kwe Kwe to produce ammonium-nitrate. The plant uses atmospheric air to recover nitrogen and oxygen separately from an air separation plant. The oxygen is sold to the national steelworks, ZISCO. The ammonium-nitrate so produced in its high-grade form is an explosive of considerable energy. It must be reduced in terms of explosive sensitivity by granulating the ammonium-nitrate prill with kaolin and a binder such as heavy fuel oil. The fertilizer marketing companies were soon to realise the commercial opportunity, in that the nitrogen content is increased by carrying out one of the granulation phases with a gaseous inoculation of the granule with anhydrous-ammonia.

But there is an alternative route. However, what we are about to propose can be used only in clay soils that have the ability to retain moisture. The moisture must be present to the extent of the minimum of 8.0 per cent and is also only applicable to relatively large agricultural undertakings, because of the installation costs of equipment which may be beyond the financial resources of the smaller farm unit.

The proposal is to consider direct ammoniation of the soil by means of a special tank usually mounted on a tractor. This allows the gaseous NH_3 under its own vapour pressure to pass through a control regulator into a tube or series of tubes set behind a scarifier-type of blade, allowing the direct injection of NH_3 gas into the soil. The plough device is usually provided with a trailing form of moldboard which closes the trench cut by the scarifier. There is very little assessed waste of gas. The research indicates that the NH_3 in the presence of moist clays forms nitrates with considerable speed and, as can be expected, it is finely divided in the soil. The benefits of this process are very largely in terms of bulk transportation. But in terms of NH_3 economies can be also achieved as the process does not require the overheads attributable to granulation plant. A team from Zimbabwe under the aegis of the Industrial Development Corporation visited the Ubombo Ranches (Sugar Estates) in Swaziland and were shown evidence of the effectiveness of this direct form of ammoniation and also that the sugar-cane fertilizer bill was some 30 per cent less than for equivalent granulated compounds.

5.4 Ammonium nitrate fuel oil explosives

At present, as was seen in Chapter 2, the mining industry uses considerable quantities of explosives. There are of two main types: the nitroglycerine-based amon-gelignites or equivalents, and ammonium nitrate fuel oil (ANFO). The former is a complicated and expensive product to manufacture, and it is not felt that Zimbabwe is yet in a position to undertake the production. The latter, ANFO, could be manufactured, as described above in the discussion of ammonium nitrate production by Sable Chemicals, using a porous prill. However, a detailed investigation would have to be made as to the breakdown of current importe between amon-gelignite and ammonium nitrate types of explosive. Only then could import substitution possibilities be properly assessed.

5.5 Anhydrous-ammonia from coal

A number of studies have been carried out by the Industrial Development Corporation, Rio-Tinto Limited together with TA Holdings Limited, and others, to examine the feasibility of producing petrol, diesel and ammonia from coal, with the emphasis on motor spirit and diesel fuel oil.

It is considered that as time goes on the cost of building such a complex plant will tend to escalate beyond the reach of Zimbabwe, but first steps must be taken and hopefully these can be small ones.

In this regard, we must look at technology that has been successfully implemented in surrounding countries and in particular, to consider carefully the process that is used by the Zambian parastatal - Nitrogen Chemicals of Zambia Limited, at their nitrogen plant just south of Lusaka.

Here the Government of Zambia have installed a modern nitrogen producing plant, based on local Zambian coal. The process uses the Kopper-Totzek gasifier, which incidentally is also the main gasifier type in the South African Modderfontein Plant that produces a thousand ton per day of ammonia (making it probably the largest plant of its type in the world).

The NCZ plant incorporates a pulverized fuel grinding section which reduces the coal to "face powder" quality, approximately 80 per cent passing through a 200 mesh. Steam is produced from coal-fired boilers and oxygen is provided from an on-site air separation plant. The steam, coal and oxygen are blown into a furnace which operates at only slightly above atmospheric pressure and on a continuous basis manufactures the synthesis gas consisting of hydrogen, carbon monoxide and C H gases with very small quantities of carbon dioxide and nitrogen. The hydrogen and carbon monoxide are the chemical building blocks for anhydrous-ammonia.

The most important point here is this plant is effective on local coals and has operated successfully for some years. And a similar approach could offer Zimbabwe the same self-sufficiency in this all important nitrogen source. Zimbabwe manufacturers and contractors have had the opportunity of offering and supplying maintenance services to NCZ and it is felt that much of this plant could be made under license in Zimbabwe, with a high degree of quality assurance support given to any international financial lender who would require this assurance before embarking on any funding of this nature.

5.6 Hydrated lime

High grade hydrated lime with over 99 per cent purity is required for the two ferro-chrome alloys smelters, and also to meet the needs of the municipal water treatment plants throughout the country. At present, the importation of this product is valued at approximately \$5-\$6 million per annum.

The Industrial Development Corporation have this matter under study as a priority item at the present time. However, it is felt that this is a potentially very interesting project, and the study process should be speeded up.

It is contended in some quarters that there are no suitable limestone deposits in Zimbabwe which would allow the economic production of high grade hydrated lime. The reason for this is that most grades run at 96 to 97 per cent calcium carbonate with a balance represented in impurities, particularly silica. In the calcining process the carbon dioxide is driven off from the limestone and this represents approximately 50 per cent of the original mass. However, the deleterious material, principally the silica, which remains with the product now increases to approximately 8-10 per cent, which is unacceptable for the high grade hydrated lime requirements of the ferro-chrome smelters in particular.

In the opinion of the IDC there are a number of suitable deposits, one near Mutare and the other one being the "Early Worm" mine in the Glendale area, north of Harare. This latter site has the advantage of being close to a railway facility and the main national rail network. This particular deposit is considered to be of sufficiently high quality to allow for the production of an acceptable high grade hydrated lime. We believe that it is in a national interest to go ahead with the development of this project. We are also advised there is some ambiguity between the Ministry of Industry and Technology and the Ministry of Mines as to whose responsibility it is for the development of this study. As we see it, it is substantially an industrial undertaking and should remain with the IDC.

Manufactured goods

6.1 Steel making - ZISCO

In November 1982 the Government of Zimbabwe signed a contract with Voest-Alpine of Austria to undertake a detailed study of the national steel making complex ZISCO at Redcliff in the midlands of Zimbabwe. Funds were made available for the study by the Austrian Government through its Technical Aid Programme.

The study was completed in May 1983 and represents a comprehensive view of the problems and the opportunities that arise out of this undertaking.

The main positive features of the ZISCO Complex are:

1. The ability to use readily available raw materials i.e. coal/coke, limestone and good quality local iron ore which should allow ZISCO to produce finished and semi-finished steel products at very low cost.
2. ZISCO is a major industrial base in the country: the linkages between this sector and others represent a central component of manufacturing activity.
3. ZISCO represents a contribution in terms of import substitution of approximate \$25 million per year, and is an export foreign exchange generator of \$65 million per year in 1983 figures.

The major difficulties that face ZISCO are the financial charges that have increased since 1978 by approximately 123 per cent. Labour has increased by 88.5 per cent and raw materials by 98.25 per cent whilst the electrical energy cost has increased in the same period by 270 per cent.

The result of these large increases in costs together with railage and port dues in respect of the exported steel, is to show that in world price terms the steel landed at a port is no longer competitive and in order to continue to generate foreign exchange there is a net cash outflow at the time of the report (March 1983) of Z \$43 per ton of steel produced.

The analysis of the overall ZISCO picture is complex but it is felt that it is an important and established part of the industrial fabric of Zimbabwe and is a major national asset. It has also a significant role in regional co-operation, with its skills and experience being of definite value to other African countries. Therefore, given good financial management and improved plant efficiency and productivity, the Government would be right to continue to support the National Steel Works - ZISCO.

6.2 Basic refractories

6.2.1 Magnesite high duty refractories and other fire bricks

An extensive examination of local sources of raw magnesite and a feasible route for beneficiation was carried out for UNIDO by Vljacic and Budimir (Report No. DP/ZIM/83/006). The report was completed in March 1985. Whilst this survey is not the place to discuss the above report in detail, some important observations must be made and should be further explored:

1. The bulk sample of material taken from the Kadoma Magnesite Mine cannot be considered to be a fair aggregation of the overall ore deposit. If the ore quality were to differ substantially from the bulk sample, there will need to be a review of their beneficiation proposals and this point is fundamental.
2. The import substitution and export potential appears to be very good. There are two matters that must be confirmed at an early stage:
 - a) Verification of the market size and distribution;
 - b) The estimated cost of a plant to meet the quality standards that the potential users will demand.

We would add another point, and that is, quite apart from any assurance that the Zimbabwe manufacturer of this high duty magnesite and other refractories may be able to provide, we can be quite sure that the market will only hesitatingly receive these refractories, and only into such parts of their furnace equipment which will not represent a serious outage in the case of failure of the local refractory. Certainly these plants would not carry out a major furnace relining with the Zimbabwe refractory until the local product had some years of acceptable performance behind it up.

6.3 Glass

Zimglass Ltd. This is the country's glass/bottle manufacturing facility situated at Gweru in the midlands. This company is currently considering a joint venture with the IDC to expand the scope of the glass making facility by producing sheet and plate glass. At present Zimbabwe imports approximately \$3.5 million per year of these products. The plant needed to produce sheet and plate glass will cost approximately \$15 million, with an imported content of approximately \$3-\$5 million. It would appear to be a good import substitution project with some export potential into the PTA area.

At the present time, the glass melting furnace is partially heated with liquified petroleum gas (LPG) all of which is imported at an annual input cost of \$200,000 per year. An alternative fuel source is now considered to be available and that is provided by using a two-stage coal gasifier fuelled with coal from Wankie Colliery.

In the past the locally designed and built gasifiers were of the single stage type and would effectively operate only on coke or charcoal. The flame temperatures available from producer gas based on these fuels would be marginal for glass melting furnances.

The two stage gasifier fuelled with a non-swelling, non-agglomerating coal that can now be provided by the Wankie Colliery Company from the open-cast mine now in operation, will have a higher calorific value. It would be an approximately 40 per cent improvement over the single stage gas calorific value, and consequently it should be able to achieve a higher flame temperature.

This gas from the two-stage unit is entirely suitable for glass melting both from the point of temperature acquisition and cleanliness which is very important in this industry.

In addition to the foreign exchange saving, the cost of energy into the furnace when using coal as a substitute for the imported LPG would be significantly reduced and on its own should be a viable project for consideration.

7.0 Industrial machinery

We have in the preceding part of this chapter dealt with a number of specific import substitution areas where equipment, machines or materials can in fact be provided from within the manufacturing sector and these as we have illustrated cover food processing, beverages, tobacco, mineral dressing and processing, fuel substitution including methanol, ethanol and producer gas, chemicals such as anhydrous ammonia, hydrated lime and chemical pulp for paper making, manufactured goods and finally we turn to transport equipment.

7.1 Transport equipm

In this area the railway rolling stock which is manufactured in Zimbabwe represents a very significant and important import substitution. There are two main companies involved in this work, the one being the Zimbabwe Engineering Company (Zeco) in Bulawayo and the other Morewear Limited in Harare. Both these companies offer proven designs in the freight type rolling stock, with Zeco in particular having constructed passenger coaches.

Another major undertaking by Zeco Ltd. was the refurbishment of approximately 80 steam locomotives. This has certainly cushioned the National Railways of Zimbabwe against the massive increases in the price of diesel oil, and it has allowed breathing space until the electrification project of the railways covers a greater portion of the railway system.

On the subject of electrification, we believe, as has been said above, that a great deal more could have been manufactured in Zimbabwe. It is hoped that, as the electrification system is extended to other sections of the main line, an opportunity will be afforded to Zimbabwean contractors and manufacturers to make a greater contribution to this major national project.

Another company that has made important contribution to the railway rolling stock manufacture is Issels Ltd. who manufactured cast steel bogies and cast steel railway wheels. This facility is unique in Africa outside the RSA.

7.2 Water pumps

The level of importation of water pumps in 1982 was \$3.46 million. Since then, there have been a number of important changes in this machinery import area, in that some joint ventures have been entered into with EEC countries which have provided manufacturers in Zimbabwe with the technology transfer to enable them to produce an article fully comparable with the previously imported unit.

There may still be some cases in which the size or specialization of the pump may preclude the local manufacturers from offering a particular type of pump, for example the high pressure large volume pumps for municipal water schemes or boiler feed pumps. But it is of course quite possible that parts of these specialist pumps could be made locally, which would contribute towards increased technical understanding as well as to import substitution.

8.0 Section 8 and 9

8.1 Aircraft, airframe and engine overhaul and rebuilding

Field Aircraft Services Central Africa Ltd: the main function of this company is to provide service and repair facilities in Zimbabwe for the country's general aviation aircraft i.e. those aircraft outside the scope of Air Zimbabwe. This service facility is essential to the Airforce of Zimbabwe for the overhaul of all the engines used by its aircraft both piston type and gas turbines (jet engines), and also to the District Development Fund (DDF) fleet of aircraft.

In the specialized aircraft, airframe and engine servicing field, it is necessary for an organization such as Fields to be authorized to carry out overhauls, engine and airframe rebuilding and repairs. This authorization is issued by the various international airframe and engine manufacturers and this they would only grant after a physical audit of the firm's ability and proficiency in all respects has been carried out and has been deemed to be satisfactory.

It is therefore, with some pride that Zimbabwe can acknowledge that it has one of the foremost aircraft maintenance and repair facilities in Sub-Saharan Africa. In respect of import substitution, this firm's facilities

avoid the necessity of sending engines in particular out of the country for overhaul and repair, a feature which would be most unacceptable to the Airforce of Zimbabwe. As an exporter, this firm has built up an enviable reputation and clientele in neighbouring countries, due to their engine rebuilding ability and the standards of workmanship that they offer.

The Company receives engines of the Pratt and Whitney type (these engines are of USA origin in the power range of 1,300-1,800 horse power) from the UK, Australia and the RSA, in addition to a wide range of engines and aircraft componentry from many states in Africa.

The Company provides excellent training facilities and has a unique position in Africa in this regard.

The constraints facing the development of its export potential is the reduced foreign exchange allocation that it currently receives, which it is hoped will improve in the near future. However, a new appraisal must be made of this important facility to ensure that it can take full advantage of the aircraft servicing and rebuilding requirements of the SADCC and PTA member states.

Conclusion

In the foregoing analysis and discussion relating to the issue of import substitution provided by the manufacturing sector of Zimbabwe, we believe there is enough evidence to show that as mentioned before, this industrial activity is deepening.

This contention is supported by the statistical evidence that an even greater proportion of the country's domestic demand is being met by the manufacturing sector with a major thrust towards the import substitution of larger capital items and capital projects. Certainly, the technical resources skills and ingenuity are there. An imaginative approach to the development of linkages and the identification of opportunities for bringing together different industrial resources can continue to yield further import substitutions possibilities.

It has not been possible to cover all potentials in the survey. In particular, we have not discussed chemicals, such as acids (extensively used by mining), polyester fibre (for which a project has already been submitted to Government) and pharmaceuticals (UNIDO project for CAPS Ltd. is under way). Other interesting areas include further import substitution in transport through lowering the import content of cars and lorries, and expansion of the sugar refineries. The possibilities discussed here are a selection on which some competence to comment is felt. But it is by no means an exclusive list.

Notes and References to Chapter 9

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Chapter Ten

MANUFACTURED EXPORTS: RECENT TRENDS, CONSTRAINTS AND POTENTIAL FOR FUTURE EXPANSION

Introduction

Manufactured exports contribute between 28 percent and 64 percent of total export earnings for the country - the wide variations apparent in these figures being reflective of the different definitions used which was discussed in Chapter 1 above. On whatever definition, exports are an important aspect of the manufacturing sector; besides earning foreign exchange they provide additional jobs and Government revenues through taxation, as well as leading to product quality improvement in the domestic market. Not only are manufacturing exports important, but it is a critical policy objective of government to promote and expand exports from the sector to enhance the benefits already accruing.

The main subject areas of this chapter will include constraints on increasing export earnings, institutional instruments used to assist export expansion, and the potential for export expansion. As with other chapters, little attempt will be made to reproduce detailed factual information that is readily available elsewhere. A number of publications exist giving details about procedures for exporting, and readers are referred to two in particular: Whitsun Foundation, Trade and Investment in Zimbabwe, Volume I-Trade, Harare, 1983, and Confederation of Zimbabwe Industries, Zimbabwe Export Directory 84, Harare, 1984. In addition, information is provided in the current and back issues of the Confederation of Zimbabwe Industries' publication CZI Trade Bulletin, and periodical publications of various commercial banks and the Reserve Bank of Zimbabwe.

Before discussing the constraints inhibiting export expansion, we shall examine in more detail the place and role of the manufacturing sector as an exporter.

The manufacturing sector as an exporter

If the number of firms engaged in exporting their products was the criterion for judging the export-orientation of the manufacturing sector, then one could be forgiven for classifying the sector as "export-oriented". Over 370 separate manufacturing firms are currently engaged in exporting, nearly 30 percent of all manufacturing units officially accounted for in CSO statistics. Out of all of the 33 sub-sectors classified under manufacturing, only one, soft drinks and carbonated waters, failed to record export sales in 1982 and even this omission was remedied in 1983, when exports of \$8.8 million were recorded in official statistics.

There is, however, a crucial difference between being an exporter and exports contributing in a major way to the activities of either individual companies or sub-sectors. If one were to classify export-orientation as "exports providing the dominant orientation of the firm" then few firms would be so readily termed export-oriented. ZISCC and the two ferro-chrome producers would be termed export-oriented under this more restrictive definition as would firms engaged in parquet-flooring exporting where, for one firm at least, over 50 percent of turnover originated in export sales.

This leads us to highlight three important characteristics of exports and the manufacturing sector. Firstly, total export sales for the sector are dominated by a handful of large firms and from the contribution of one or two sub-sectors. Secondly, for the overwhelming majority of manufacturing firms exports constitute only a small proportion of the turnover. And thirdly, exports for the sector tend to have been extremely volatile in recent years, fluctuating far more than changes in output.

If one excludes metal-processed exports (which accounted for \$77.5 million of export sales in 1982 and \$108.2 million in 1983) then in 1982 and 1983 steel and ferro-alloy exports amounted to \$118.3 million and \$173.3 million respectively. These export sales accounted for 42 percent of all non-metal manufactured exports in 1982 and 43 percent in 1983. If one adds the exports of cotton lint to these exports then the contribution of these few items rises to 61 percent and 62 percent respectively of all non-metal manufactured exports. In the first eleven months of 1984, steel and ferro-alloy exports

amounted to \$189 million, 35 percent of all non-metal manufactured exports. Adding cotton lint exports raises the figure to \$291 million, 54 percent of all such exports. This dominance of a few firms is confirmed by more detailed sub-sectoral data. Columns (6) to (11) of Table 10.1, below, show the sub-sectoral contribution to total manufactured exports for the years 1981, 1982 and 1983. Two sub-sectors, Textiles and Metals and Metal Products, are responsible for some 70 percent of all manufactured exports with sub-sector 9, Metals and Metal Products being by far the most important contributor to total manufactured exports.^{1/} The next most important contributor to total manufactured exports is sub-sector 1, Foodstuffs.

Columns (1) to (6) of Table 10.1 reveal the second and third characteristics of manufactured exports mentioned above, namely the low proportion of exports to turnover and the volatility of exports. Overall, manufactured exports as a proportion of total turnover, have declined from 17.5 percent in 1978 to a low of 9.1 percent in 1982, although these proportions have risen again in 1983 and even more so in 1984. Fluctuations within different sectors of manufacturing using the 11 sector classification, have been even more dramatic: from 20 percent to 5 percent of turnover for Clothing and Footwear, from 14 percent to 3 percent for Foodstuffs and from 9 percent to 4 percent for Transport Equipment. But even being at their 'peak' levels, exports only contributed to 30 percent or most of turnover for the Textiles and Metals and Metal Products sectors. And for private sector textile firms, therefore excluding the effect of the Cotton Marketing Board, figures from the Central African Textile Manufacturers Association (CATMA) show that exports have ranged between 4 percent and 7 percent over the last three years. For the majority of manufacturing sectors, exports account for less than 10 percent of total turnover. For sectors 2, 6, 7, 8 and 10 - Beverages and Tobacco, Paper, Chemicals, Non-Metallic Minerals and Transport Equipment - exports over the period 1978-82 have tended to hover around the 5 percent of total turnover level.

Table 10.1: Manufactured exports and gross output data by manufacturing sector, 1978-1983
 (\$000's and percentages)

Sector	Manufactured Exports as percentage of gross output					Manufactured Exports by Sector (\$,000)					Jan to Nov Only		
	1978	1979	1980	1981	1982	1981	1982	1983	1984	1983	1984		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)%	(8)	(9)%	(10)	(11)%	(12)	(13)%
1	13.9	13.1	7.1	4.8	2.6	28,913	8.9	20,435	5.8	35,108	8.9	54,731	10.2
2	5.5	4.4	3.2	3.4	1.1	6,294	1.9	2,481	0.7	3,114	0.8	2,791	0.5
3	30.0	29.3	27.8	22.2	19.1	69,394	21.3	57,861	16.3	85,609	21.7	127,697	23.8
4	20.4	20.5	16.6	13.2	5.4	18,382	5.6	10,774	3.0	8,876	2.2	15,979	3.0
5	18.3	14.2	12.4	9.9	9.6	10,264	3.2	9,060	2.6	8,761	2.2	9,858	1.8
6	2.8	2.4	2.4	1.2	1.5	1,717	0.5	2,445	0.7	4,979	1.3	7,749	1.4
7	6.8	6.6	4.1	4.1	3.8	14,579	4.4	15,096	4.2	14,351	3.6	26,180	4.9
8	2.4	2.3	3.2	1.8	1.8	1,529	0.5	1,717	0.5	4,436	1.1	7,009	1.3
9	29.2	32.0	36.3	25.9	23.0	161,113	49.5	147,295	63.4	215,431	54.5	262,027	48.8
10	9.1	5.7	2.9	9.3	3.7	6,878	2.1	3,507	1.0	4,101	1.0	9,514	1.8
11	21.8	30.1	20.3	16.6	17.5	6,632	2.0	6,545	1.8	10,253	2.6	13,347	2.5
Total	17.5	17.6	16.3	12.0	9.1	325,695	100.0	277,216	100.0	395,019	100.0	536,882	100.0

Source: Monthly Digest of Statistics, December 1984, Table 10.5, Statement of External trade 1982, Table 6 Census of Production 1984/83, Table 2 and for 1984 figures supplied by CSO.

Methodological Note: The export data by SITC items given in Table 10.5 of the Monthly Digest of Statistics uses a different classification than the ISIC classification for manufacturing output data. The allocations made for the construction of this table, are given on the following pages.

<u>Industrial sector</u> <u>classification</u>	<u>SITC manufactured export commodities</u>
1. Foodstuffs	Food (0): Meat, fresh, chilled or frozen; malted barley; animal foods; refined sugar.
2. Beverages & Tobacco	Beverages and Tobacco (1): manufactured tobacco; beverages.
3. Textiles	Crude Materials Except Fuels (2): cotton lint. Manufactured Goods classified by materials (6): yarn and threads; fabrics; bed-sheets.
4. Clothing & Footwear	Miscellaneous Manufactured Articles (8 & 9): suits; jackets & trousers; dresses; blouses & skirts; other clothing; footwear.
5. Wood and furniture	Crude Materials Except Fuels (2): railway sleepers wooden; poles and posts; parquet and other lumber; Manufactured Goods classified by Materials (6): plywood and boards; Miscellaneous Manufactured Articles (8 & 9): furniture fixtures.
6. Paper, Printing & Publishing	Manufactured Goods Classified by Materials (6): Paper, paper-boards and manufactures thereof; Miscellaneous Manufactured Articles (8 & 9): Printed matter.
7. Chemical & Petroleum Products	Mineral Fuels (3): ground-nut oil; cotton-seed oil, other chemical and related products (5) wattle extract; soaps; Crude glycerine; medicinal and pharmaceutical products; insecticides, fungicides and disinfectants;

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| 7. (continued) | other; Manufactured Goods Classified by Materials (6): tyres and tubes; Miscellaneous Manufactured Articles (8 & 9): articles of plastic material. |
| 8. Non-Metallic Minerals | Manufactured Goods Classified by Materials (6): cement. |
| 9. Metals & Metal Products | Manufactured Goods Classified by Materials (6): Domestic hardware; pigiron; ferro-alloys; metal containers; ingots and billets; iron and steel bar, rod and sections; wire; railway construction material; other. Machinery, Transport, Radio/TV and Electrical Equipment (7); Non-Electrical Machinery; Insulated Electronic Cables and Wire; Radios, TVs and |
| 10. Transport Equipment | Machinery, transport, radio, TV and Electrical equipment (7): railway vehicles & equipment; other. |
| 11. Other | Manufactured Goods Classified by Materials (6): leather in the piece; Miscellaneous Manufactured Articles (8 & 9): curios, travel goods; other miscellaneous articles. |

To ascertain the accuracy of this methodology, 1982 trade data aggregated according to this MDOS categorisation was compared with the far fuller breakdown contained in the Statement of External Trade 1982. Comparing these two sets of data, apportioned by industrial sector, indicates that the above categorisation for 1982 underestimated the total of manufactured exports by \$6.28 million or 2.3 percent of the MDOS data. The most significant sectoral error is for sector 8 where the figures recorded in the table above are about 100 percent too low. There is, too a 15 percent under-recording of food sector exports. The details of those differences are recorded in Table 10.2.

Table 10.2: Discrepancies in trade data calculation

Sector	1982 Exports from the Statement of External Trade \$000 (1)	1982 Exports from MDOS data using Classification Described above \$000 (2)	Absolute Variation \$000 (3)	Percent Difference ((1)-(2))/(2) (4)
1	23,277	20,435	2,842	+13.9
2	2,481	2,481	0	0
3	59,529	57,861	1,668	+2.9
4	10,879	10,774	105	+0.9
5	8,755	9,060	305	-3.4
6	2,443	2,445	2	-0.1
7	14,668	15,096	428	-2.8
8	3,485	1,717	1,768	103.0
9	144,535	147,295	2,760	-1.9
10	2,611	3,507	896	-25.4
11	10,833	6,545	4,288	-65.5
Total	283,496	277,216	6,280	2.3

Table 10.3 provides additional evidence to indicate the greater volatility of exports than overall turnover for manufacturing industry. Columns (3) and (4) show that in fixed price terms manufactured exports excluding metals have exhibited annual fluctuations of over 10 percent a year between 1979 and 1982 (excluding the 1984 figures which are for January to November) whereas annual changes of production have only exceeded 10 percent in the exceptional 1979 to 1980 period. The Table also points to a phenomenon to be discussed in the next section - an apparent relationship, in a number of years, between increases in output in the sector and a fall in the real value of manufactured exports.

The destination of exports

We now move from a consideration of exports by sector, and the relationship between exports and turnover, to the markets for manufactured products. Table 10.4 shows the destination of Zimbabwe's manufactured exports by country or trading area for 1983 (the latest year for which data is available). A number of characteristics from the Table need to be highlighted. Columns (3) and (4) show that there are five major market areas for manufactured products including metals, and these account for 87 percent of all such manufactured exports. They are the EEC, South Africa, the SADCC Countries, the USA and the

Table 10.3: Comparative indices of manufacturing production and manufactured exports, 1978-1982, (1980=100)

Year	Volume Index of Production (1)	Percent Annual Change (2)	a/ Manufactured Export Index		a/ Manufactured Export Index	
			Excluding Metals (3)	Percent Annual Change (4)	Including Metals (5)	Percent Annual Change (6)
1978	79.2		103.8		106.8	
1979	87.2	+10	110.5	+6	111.8	+5
1980	100.0	+15	100.0	-10	100.0	-11
1981	109.4	+9	82.8	-17	82.2	-18
1982	108.7	-1	72.6	-12	74.0	+26
1983	105.8	-3	91.6	+12	92.9	+2
1984	102.1	-4	102.6 ^{b/}		95.1 ^{b/}	

Source: Monthly Digest of Statistics, December 1984, Tables 10.2, 10.5 and 13.5 and for 1984, data provided by the CSO.

a/ Exports at current prices deflated by the unit value index for all exports. Metal exports include nickel, copper, tin, precious metal waste and ore and concentrates of silver and platinum.

b/ Trade data for January to November only.

Far East and Australasia. When metals are excluded (Columns [4] and [5]) certain shifts are apparent. Overall the share of these five markets to total manufactured exports falls to 80 percent. However, the relative importance of the South African and SADCC markets grows. Together, South Africa and the SADCC countries account for 28 percent of all Zimbabwean exports in 1983, but 35 percent of all manufacturing exports, including metals, and 43 percent of all manufactured exports, excluding metals. Botswana is far and away the most important SADCC country for manufactured exports for Zimbabwe accounting for over 50 percent of all manufactured exports to SADCC Countries. However, the markets outside Africa for Zimbabwe's manufactures should also be highlighted. In 1983, some 56 percent of all manufactured exports were destined for countries outside Africa. Yet these figures themselves can be attributed in large measure to the biased influence of steel and ferro-alloy exports. CSO trade statistics reveal that of all chemical exports only 18 percent went outside Africa in 1982, falling to 5 percent in 1983. Again, only 3 percent of machinery and transport equipment went to destinations outside Africa in 1982 and 5 percent in 1983. When steel and ferro-alloy

products are excluded, South Africa and SADCC Countries are the major markets for manufactured exports, with South Africa in 1983 buying 65 percent more than all SADCC Countries combined. Furthermore, Columns (7) and (8) indicate that for South Africa and the SADCC Countries it is Zimbabwe's manufactured products that provide the major proportion of these countries' total imports from Zimbabwe. Excluding metal products, 63 percent of all exports to South Africa consisted of manufactured products. The figure was 57 percent for SADCC Countries. For all other regional groupings these proportions fall to less than 40 percent of their imports from Zimbabwe

Supplementary information on market destination of manufactured exports is available from sample surveys conducted by the CZI. A recent Survey (1985) covering 260 manufacturing exporters and 70 percent of all funds allocated to manufactured exporters via Industrial Import Control but, importantly, excluding exports from ZISCO, ferro-alloy and metal product exports, showed that 34 percent of those manufactured exports considered went to PTA Countries and 66 percent to non-PTA members, including South Africa, with 46 percent going to PTA Countries in 1984 against 54 percent for non-PTA members. Over the period 1983-84, manufactured exports so-classified to PTA members increased by 145 percent in current prices, and to non-PTA countries by 81 percent.^{2/}

An earlier CZI Survey revealed the dependence of a number of industrial sectors on South Africa for their export markets. The survey, for 1980, covered 248 exporters responsible for 93 percent of all manufactured exports for that year. It revealed that for seven sectors of manufacturing, over 50 percent of all exports went to South Africa with South Africa accounting for over 85 percent of all exports for sectors 4, 5 and 6 - Clothing and Footwear, Wood and Furniture and Others. These figures are reproduced in Table 10.5. They are, however, dated and as the preceding paragraph indicated there has, more recently, been an expansion of manufactured exports to the PTA area countries, which are at present largely dominated by SADCC members as recipients of Zimbabwe's exports. However, as the figures in Table 10.6 indicate over the three year period 1981-1983 there has been little change either in the proportion of manufactured exports going to the Southern Africa region - some 44 percent of the total - nor of the relative shares going to South Africa and SADCC States. Yet the South African market has experienced the most widespread annual fluctuations of all.

Table 10.4: Total commodity exports and manufactured exports by country or area of destination, 1983, \$000

Country/Area of Destination	Total Exports \$000	Percent of Total Exports	Total Mfg. Exports Incl. Metals	% of Total Mfg. Exports Incl. Metals	Total Mfg. Exports Less Metals	% of Total Mfg. Exports Less Metals	Mfg.	Mfg.
							Export+ Metals as % all Exports 3/1	Exports Less Metals as % all Exports 5/1
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
EEC ^{a/}	352,874	36.2	148,727	30.5	104,688	27.4	42.1	29.9
South Africa	162,387	16.6	106,703	21.9	102,478	26.8	65.7	63.1
Far East/ Australasia	98,535	10.1	54,781	11.2	36,122	9.4	55.6	36.7
North Africa/ Middle East/ Indian Sub C.	67,227	6.9	17,305	3.5	16,838	4.4	25.7	25.0
USA	67,181	6.9	50,606	10.4	24,939	6.5	75.3	37.1
Scandinavia	8,074	0.8	3,207	0.7	745	0.2	39.7	9.2
Other Europe	54,258	5.6	30,936	6.3	22,317	5.8	57.0	41.1
SADCC States ^{a/} of which	108,775	11.2	61,789	12.8	61,758	16.2	56.8	56.8
Zambia	(32,060)	(3.3)	(7,389)	(1.5)	(7,358)	(2.0)	(23.0)	(23.0)
Tanzania	(3,272)	(0.3)	(291)	(0.1)	(291)	(0.1)	(8.9)	(8.9)
Swaziland	(1,210)	(0.1)	(822)	(0.2)	(822)	(0.2)	(68.0)	(68.0)
Mozambique	(15,300)	(1.6)	(7,244)	(1.5)	(7,224)	(1.9)	(47.2)	(47.2)
Malawi	(15,125)	(1.6)	(11,917)	(2.4)	(11,916)	(3.1)	(78.7)	(78.7)
Botswana	(40,789)	(4.2)	(33,401)	(6.8)	(33,401)	(8.7)	(81.9)	(81.8)
Namibia	(1,019)	(0.1)	(745)	(0.1)	(745)	(0.2)	(73.1)	(73.1)
Other African	26,055	2.7	3,970	0.8	3,970	1.0	15.2	15.2
Other Countries	30,201	3.0	9,785	2.0	8,531	2.2	32.4	28.2
Total	975,567	100.0	487,809	100.0	382,386	100.0	50.0	39.2

Source: Monthly Digest of Statistics, December 1984, Table 10.5 and unpublished trade data supplied by CSO.

Note a/: Portugal and Spain are included in statistics for the EEC and Namibia on statistics for SADCC.

Methodological Note to Table 10.4:

Total exports (Column 1) are total exports of \$1,025,708,000 less migrants effects of \$50,141,000 giving the total of \$975,567,000. Additionally, migrant effects exports are subtracted from the regional trade data in relation to statistics on migrants by country of destination as follows: 59 per cent to South Africa, 3 per cent to USA, 22 per cent to EEC countries and 5 per cent to Far East and Australasia. The value of migrants effects to other African countries is assumed to be zero. See Zimbabwe, Monthly Migration and Tourist Statistics for October 1984, CSO Harare, Table 5.2

Total manufactured exports including metals (Column 3) are calculated as follows: they include SITC sections 4, 5, 6 and 7 plus section 8 and 9 less the estimates of migrants effects. In addition, cotton lint exports have been included at \$73.6 million by area of destination as follows: EEC, 42 per cent; other Europe, 13 per cent; Far East, 8 per cent; Malawi, 2 per cent; and South Africa, 35 per cent (derived from Cotton Marketing Board, Reports and Accounts for the Year Ended 29 February 1984, p. 12); meat fresh cooked and frozen of \$10.9 million of \$6.5 million to the EEC and \$4.5 million for Other European (largely Switzerland) see Abattoir and Cold Storage Feasibility Studies March 1985, Arup Economic Consultants, P. B. 10 and malted barley of \$3.8 million as follows: \$2.5 million to Other African, \$222,000 to Mozambique and \$765,000 to Botswana. Refined sugar exports have been allocated \$11 million to Botswana and \$1.5 million to Mozambique. The manufactured exports thus listed exclude manufactured exports valued at \$29.9 million for which country/regional destination wasn't readily available. These include: other meats, \$6.9 million; animal feeds \$0.9 million; manufactured tobacco, \$2.9 million; beverages, \$0.2 million; railway sleepers, \$1.7 million; poles, \$2.4 million and parquet and other lumber, \$2.4 million. Most of these products go to South Africa and SADCC Countries and hence these regions' manufactured imports from Zimbabwe are slightly underestimated.

Total manufactured exports excluding metals (Column 5) are derived by subtracting the following exports from Column (3): nickel, copper and tin metal, copper slimes, copper electrolytic, copper refined and copper and copper alloys. Figures in brackets (), are those for separate SADCC countries, plus Namibia - the figures add up to the total SADCC figure given for every column of the Table.

Table 10.5: Manufactured exports to South Africa, 1979 and 1980, \$000's

	Total Exports 1980 (1)	Exports to SA 1979		Exports to SA 1980		as % Total 1980 (4)/(1) (6)
		Value (2)	% (3)	Value (4)	% (5)	
A. Foodstuffs	18,343.0	5,873.4	8.2	6,844.2	7.7	37.3
B. Beverages and Tobacco	7,678.0	6,438.4	9.0	5,575.4	6.9	72.6
C. Textiles	18,371.4	9,098.5	12.8	10,654.2	11.9	57.9
D. Clothing and Footwear	16,635.3	14,688.7	20.6	15,391.0	17.2	92.5
E. Wood and Furniture	10,270.2	6,840.4	9.6	8,829.0	9.9	85.9
F. Paper, Printing, Publishing	2,164.6	1,441.2	2.0	1,219.6	1.4	56.3
G. Chemicals, Pharmaceuticals	6,895.4	1,906.8	2.7	1,809.8	2.0	26.2
H. Non-Metallic Minerals	4,088.7	163.7	0.2	620.4	0.7	15.2
J. Metals & Metal Products	113,172.2	14,398.6	20.2	23,823.8	26.7	21.0
K. Transport and Equipment	15,484.8	6,753.0	9.5	9,371.4	10.5	60.5
L. Others	5,610.1	3,561.9	5.0	5,059.4	5.7	90.2
Total	218,713.7	71,164.6	100.0	89,197.2	100.0	39.6

Source: RC Riddell "Zimbabwe's Manufactured Exports and the Ending of the Trade Agreement with South Africa", CZ1, Harare (Mimeo), December 1981.

Table 10.6: Total manufactured exports excluding metals and manufactured exports to South Africa and SADCC States 1981-1983

Destination	1981		1982		1983		Annual % Change	
	\$M	%	\$M	%	\$M	%	1981-82	1982-83
To South Africa	88.5	27	69.0	25	102.5	27	-22	+49
To SADCC States (Srn Africa)	55.4 (143.9)	17 (44)	48.7 (117.7)	18 (43)	61.8 (164.3)	16 (43)	-12 -18	+27 +39
All Areas	325.7	100	277.2	100	382.4	100	-15	+38

Source: Tables 10.1 and 10.4 above, and Statement of External Trade 1981, CSO Harare, 1982.

Methodological Note:

Figures for total trade for 1983 between Tables 10.1 and 10.3 differ; the explanation for these differences is explained in the methodological note to Table 10.1. The methodology used to obtain the trade figures for Table 10.3 by regional grouping is used again to derive the figures presented in this Table, with data for Namibia included when applicable.

Constraints on expanding exports

In the final analysis, exports are dependent upon potential importers deciding to purchase the goods being offered. This decision itself will be dependent upon the potential importer's ability to pay for the goods on offer. But assuming that this hurdle can be overcome, then exports will be dependent upon the quality of the product, the price of the product, the ability to supply the required volumes of the product demanded and delivery time from placing the order to receipt of goods, all of these compared with alternative sources of supply. And all these are conditional upon the potential importer having information about the different products on offer, the prices, volumes and delivery times as well as, usually, having a positive assessment of the reliability of the information provided and of the reliability of the providing country and/or firm.

This latter point (the reliability of the source of supply) highlights a potential constraint facing the expansion of Zimbabwe's manufactured products. Only in rare cases is the manufacture of products for export, as for the domestic market, not dependent upon foreign exchange to purchase raw

materials or spare parts required for the manufacture of products - the amount of foreign exchange itself being dependent on the particular product being made. Hence, a basic requirement for sustained export expansion is a continued guarantee of foreign exchange needed for products to be exported. Nothing could be worse in an export drive than to get into a market and then fail to deliver the goods promised, for a second chance is unlikely to be given. Additionally, foreign exchange is necessary to ensure that Zimbabwean firms are aware of potential markets and countries for their products and that potential purchasers are provided with information - through literature, trade fairs and personal visits - on Zimbabwe's products and their appropriateness for purchase. Again, the higher the priority given to expanding exports, the greater the demands will be for foreign exchange to provide these services and facilities. There is no place for half-hearted attempts to enter new export markets or to provide existing markets with new product lines for these will end in failure.

But the potential foreign exchange constraints on expanding exports need also to be seen in a dynamic as well as static framework. Potential importers of Zimbabwean manufactured goods will keep viewing the price and quality of her products against competition from other countries. Thus the more "exported" Zimbabwe becomes - that is the greater the proportion of exports to turnover - the more susceptible she becomes to having to respond to changing technological developments in other parts of the world, affecting both product quality and techniques of production. So, to the extent that production processes change in third countries, then for Zimbabwe to maintain a competitive edge, she, too, will have to adapt her own production processes. Now because of the industrialised world's almost complete monopoly on research and development it is apparent that new techniques and processes will tend to have a high import component. Thus expanding substantially into the export market will be likely to lead to two results: firstly, a likely rising demand for imported plant and equipment to maintain and expand product lines and quality; and secondly, and relatedly, a far greater need to accept structural adjustment and adaptation within the industrial sector than would be required with the present low percentage of turnover that is exported. As firms become increasingly export-oriented. the manufacturing sector will become increasingly less able to produce traditional products with old-fashioned

plant and equipment, even if that equipment is still able to cater for the local market. It will therefore have to embark on a far more rapid process of adaptation and change than has traditionally been the experience of a majority of Zimbabwean manufacturers and than government officials have been used to assessing and monitoring. At the margin there could well be a potential conflict at least in the short term between wishing to promote a rapid expansion of exports while also wishing to promote further import substitution.

Structural adjustment implications of expanding manufactured exports are likely to be more far-reaching to the extent that expansion is promoted in more open and less "captive" markets. Thus expansion into EEC and North American countries and into those of the newly industrialising countries will tend to affect present industrial structures and processes in Zimbabwe far more rapidly than if expansion occurs mainly within the southern African and particularly the SADCC and PTA States. But it needs to be stressed again that as already over 50 percent of manufactured exports go to markets outside Africa the adjustment implications are already present.

One indication of the potential adjustment requirements of attempting to expand manufactured exports has been obtained by answers to the questionnaire distributed to firms for the present study. Firms were asked about the quality of their present plant and equipment in terms of different markets, internal and external. The results are given in Table 10.7. They show that there are serious constraints of plant quality for expanding exports to both the South African and especially for the overseas market. Given the fact that three quarters of all manufactured exports went to South Africa and overseas markets in 1983, there would appear to be important constraints in terms of present plant equipment status of expanding exports substantially into these markets.

Considering, still, the various constraints within countries importing manufactured products from Zimbabwe, a range of additional different types of problems need to be highlighted. Trends in world industry, its changing structure, and the effects on world trade provide an important. Some of these trends are discussed separately in Chapter 5.

Table 10.7: Adequacy of present plant for the export market

Adequacy of Present Plant in Terms of:	Numbers with Adequate Plant	Total Sample	Percent with Adequate Plant
Zimbabwe Market	62	69	90
PTA Region Market	58	66	88
South Africa Market	36	67	54
Overseas Market	20	67	30

Source: UNIDO 1985 Questionnaire Survey Data

For the South African market, particular potential constraints revolve around lower anticipated growth rates than in the previous decade, doubts about the long term status of the trade agreement with Zimbabwe, possible resistance to low tariffs for Zimbabwe imports in expanding manufacturing sectors resulting from the substantial structural adjustment occurring within the South African economy, the wide fluctuations in the Rand/Zimbabwe dollar which inhibit planning and last, but not least, political instability which already is having repercussions for South Africa's internal economy. In the immediate future the South Africa economy is expected to grow at only 1 per cent this year compared with 4-5 per cent in 1984. So the 1984 mini-boom in manufactured exports from Zimbabwe to South Africa is unlikely to be sustained. In the longer term, the priority of the South African Ministry of Trade and Industry to promote exports among their manufacturers will doubtless, if successful, have a double negative effect on Zimbabwe. In the first place it will make exporting to South Africa that much more difficult, and in the second it will make South Africa an even more severe competitor in third markets within the Southern Africa region.^{3/}

For the SADCC and PTA areas, the agreement to promote inter-regional trade and for the PTA region especially the progressive reduction of intra-country tariffs provide a favourable context for increased trade in manufactures. However, in this section particular constraints need to be highlighted. The first is competition with South Africa. This affects Zimbabwe manufacturers

in a number of ways. Perhaps the most important, given the critical foreign exchange shortages of the other countries of the region, is the extended credit terms that South African exporters can and do offer - sometimes to the extent of offering open-ended letters of credit. It is certainly true that the extension of credit terms from 90 to 180 days for Zimbabwe exporters as part of the World Bank Export Revolving Fund loan has eased the problem of foreign exchange shortages and South African competition. However, these problems are still significant.

As for the PTA, it appears to have provided an initial short-run boost to Zimbabwe's manufactured exports. But this is unlikely to be sustained if the importing countries continue to be plagued by substantial shortages of foreign exchange to purchase products they need and want but do not have the funds to acquire. As the Reserve Bank has repeatedly stressed, the establishment and operation of the Clearing House for Payments within PTA States permits payments to be made in local currencies only to the extent that trade is balanced between member states. When, as occurs all too frequently, Zimbabwe has a trade surplus with individual PTA member states then the balance of debit outstanding has eventually to be paid in foreign currency.

There would appear to be little prospect that these constraints will ease in the remainder of the present decade.

Other South African related difficulties include the following: the existence of the South African Customs Union which inhibits expansion of exports into member states; a wide range of export subsidies including discounted transport rates for South African manufacturers exporting to other African countries and indications that some South African companies with subsidiaries in Zimbabwe are inhibiting exports of these subsidiaries both by failing to sanction capital investment programmes in Zimbabwe and by preventing subsidiaries from entering third markets which are being supplied by the South African parent. A few cases of this latter constraint have come to light. However, it is not known how widespread is the practice, and there are also example of South African parent companies not only assisting their Zimbabwean subsidiaries to enter third markets in South Africa, but also providing their South African marketing facilities to promote Zimbabwean exports of competitive products within South Africa itself. Too little

information is available to ascertain with accuracy whether the dominant South African attitude to Zimbabwean subsidiaries is support, opposition or indeed, neglect.

Exporters: competition and vulnerability

The discussion above of product quality requirements of potential importers indicates that an apparently external constraint on export expansion - whether the importer wished to purchase the product - is linked to specific internal factors - whether firms have the plant and equipment necessary to produce the product at the level of quality required. Another area of apparent external constraint also has critical internal linkage and it is the area of price and price competition among actual or potential rival suppliers.

The conventional wisdom would suggest that Zimbabwe exports or should export those products for which she has a "comparative advantage", meaning those she is able to produce at a relatively lower cost and hence sell at a relatively lower price than her competitors. However, besides price, export expansion is also constrained by whether the importing country can pay for the product and whether it wishes to buy the product, whatever its price might be. Furthermore, export strategy for a wide range of products entails first of all, getting established in the market. Very frequently this can mean exporting at a loss initially and then, when product quality and delivery are reliably established, gradually building up the price. In the real world it is frequently only over the longer term that one could anticipate exporting at a profit.

There are other aspects also, especially over the longer term. Firstly, consider those firms whose production is almost entirely dependent upon the export market. If production costs and exchange rate variations render the selling price (assuming as is usually the case that one is a price-taker) uneconomical then there are a variety of choices open to the firm: sell at a loss, produce and stockpile in the hope of a future favourable price change or shut-down. The choice taken will itself be dependent upon a variety of factors: the additional ripple effects of the shut-down on factors such as employment and social questions; the ability of the firm to finance a stock-piling exercise, and the short-term need to earn foreign exchange. Over the short term a private company with retained earnings or potential over-draft facilities will have some flexibility to maintain production when

it is either selling at a loss or stock-piling, but in the long-run it can only do so with state aid or, as occurred in the Zimbabwe mining industry recently, state backing for bank loans. For firms in the state sector, support financing would be needed at once, especially in the case of firms like ZISCO that do not have a reserve of accumulated profits. In general, it would appear that the greater is the shortage of national foreign exchange in the short-term or the greater the likelihood of the selling price rising, as in the case of Zimbabwe's gold support price scheme, or the greater the immediate social dislocation caused by closing, then the greater will be the perceived national benefit of subsidising loss-making exports or of subsidising stock-piling. The general point is that national priorities can and do influence policy at the level of the firm to maintain the export of products when losses are incurred, so over-riding the apparently irrational decision to continuing exporting.

This discussion is important because it highlights potential constraints and costs that could well arise if the manufacturing sector were to become more export-oriented by expanding the number and significance of firms who produce exclusively or predominantly for the export market. Export-oriented firms have the advantage of reaping more units of foreign exchange per unit of investment than domestically-oriented firms, but they do so at a cost of greater vulnerability. As external market conditions change, and they do so all the time, then the choice is far more likely to arise of having to close down with both social and economic costs of so doing or of the state having to provide finance to assist in adjustment to new long term market conditions, than would be the case with domestically-oriented firms supplying the far more captive local market. To the extent that the exports of export-oriented firms suffer a permanent decline, to the extent that adjustment out of these products to those that provide better export prospects does not occur quickly, and to the extent that the government is unwilling to see massive lay-offs occurring then increased export-orientation could well prove a very costly decision. Increased export-exposure to international market forces is a high risk decision to take and these risks need to be highlighted, even if the potential benefits to be reaped are also considerable.

Exports and the domestically-oriented producers

Having discussed those firms oriented primarily to the export market we now turn our attention to those firms - the vast majority of firms engaged in exporting - for whom exporting is a subsidiary activity to supplying the domestic market. While it is not being assumed that all these firms are exporting at a loss, there would appear to be reasons additional to those mentioned above which could encourage them to do so. It has already been suggested (in the comments made about the figures from Table 10.3, above) that there seems to be an inverse relationship between output expansion and export decline and between output contraction and export expansion in the period 1979-1983. Now as exports account for only a small proportion of total turnover, the expansion and contraction of output in the manufacturing sector would appear to be determined at present largely by changes in the domestic demand for manufactured products. Additionally given the monopolisation of production (over 80 percent of all products are made by three or fewer manufacturers) there is in general some ability for manufacturers to influence domestic prices, although this influence is lower in products specifically price-controlled. As the vast majority of firms in the sector have been established to service the needs of the local market, production has been historically linked to domestic sales, providing in general satisfactory profit levels in times of rising demand.

Why then should these domestically-oriented firms export at all? The answer would appear to lie in marginal costs and benefit considerations with the marginal benefits heightened especially when the domestic market is in decline. With the substantial fixed costs of plant and machinery already installed and with the additional recent constraint of restrictions in laying-off excess labour, (placing labour charges almost within the category of fixed costs), there are clear incentives for manufacturers to look for export markets when additional plant capacity exists and marginal costs are covered. This arises especially when domestic demand falls. Hence for firms (the majority) oriented primarily to the domestic market exporting would appear to be an activity pursued to utilize excess plant, and now labour, capacity. As firms are still interested in profit maximization they will tend to export when their marginal costs are covered. Hence at the margin they can afford to pitch their exports at a considerably lower price than their domestic selling price, the latter price being determined by total cost

considerations. Add to this the fact that some exporters do export at a loss in the short term to maintain a hold in markets when marginal costs exceed marginal revenue and to gain access to new markets it would seem that one has a number of important explanations for why and how those firms predominantly oriented to the domestic market are involved in exporting.

Finally, one needs to consider the effects of the export incentive scheme and the World Bank's export revolving fund. The export incentive scheme provides at present an effective post-tax 18 percent differential for exporting products rather than supplying them to the local market - a substantial difference when marginal cost considerations are to the fore. The World Bank's fund provides unlimited access to raw material imports used for exports and was introduced at a time when scarcity of supply of raw material imports for the local market was contributing decisively to low levels of production for the domestic market. The combined effects of these measures at a time of severely depressed local demand were bound to boost exports for the reasons given above. It has been a common cry of many manufacturers over the past year that they are exporting on the basis of the margin provided in the export incentive scheme, and that but for the revolving fund they would have to close down.

What is particularly striking is the manner in which the official statistics tend to confirm the theoretical relationship suggested to exist between output and export levels in the manufacturing sector. In an attempt to isolate the movements of exports of domestically-oriented manufacturing firms, the exports of cotton lint, iron and steel products and ferro-alloys have been removed from the data in Table 10.8 which records annual output levels and those of the remaining manufactured exports from 1978-1984. The figures indicate that these exports have expanded when output has contracted and contracted with rising output levels, with dramatic increases in exports occurring in 1983 and 1984 when the additional incentives were introduced. Inconsistent figures are recorded for the changes in exports from 1981 to 1982 when one would have expected exports to have expanded. However, the reverse movement can be explained by the combined effects of the removal of the export incentive, the debacle of the trade agreement with South Africa and continued output expansion in four sectors responsible for exports, namely Foodstuff, Drink and Tobacco, Chemicals and Transport Equipment.

Table 10.8: Relationship between manufacturing output and export levels in non-iron and steel, cotton lint and ferro-alloy manufacturing industries, 1978 - 1984

Year	Exports Less Iron & Steel & Cotton Lint & Ferro-alloys		Index at Fixed Prices 1980 = 100	Index of Volume of Manufacturing Production 1980 = 100	Comment
	Current Prices	Fixed 1980 Prices			
1978	131.2	199.7	139	79.2	
1979	146.0	193.4	135	87.2	End of war, economic uncertainty
1980	143.1	143.1	100	100.0	
1981	144.1	130.3	91	109.4	Export incentive removed
1982	107.1	99.8	70	108.7	Uncertainty over SA trade agreement
1983	162.9	134.3	94	105.8	Export incentive reintroduced World Bank revolving fund began late in year
1984 ^{a/}	245.9	167.1	117	102.1	

Source: Monthly Digest of Statistics, December 1984, Tables 10.2; 10.5 and 13.5 and information provided by the CSO.

a/ January to November only

Methodological Note:

Manufactured exports are calculated in the manner described in the note to Table 10.1 except that the value of following categories of exports have been deducted: Cotton lint, ferro-alloys, ingots and billets and iron and steel bar, rod and sections. Fixed price figures are calculated using the index number of the unit value of exports.

The reason for discussing at some length the likely causes lying behind the expansion and contraction of exports originating from those manufacturing firms oriented largely to the domestic market is that it provides an important perspective for viewing constraints that in the future could inhibit the further export expansion of products from these firms. Of course it needs to be stressed that the discussion has thus far been partial and one-sided: constraints and potential for export lie not only in changing internal incentive and demand patterns, but also in the external environment. However, the fact that clearly distinguishable internal changes have in practice led to such substantial changes in export values from year to year does suggest that within the Southern Africa region, where the majority of these exports go, there would appear to have been a fairly responsive market. In other words, for the prices that the exports have been offered there would appear to have been a substantial ability to sell. With more aggressive marketing, different pricing strategies and a wider availability of foreign exchange in importing markets, export levels might have been higher, but the figures indicate an ability to move in and out of markets with considerable variation in levels of trade in manufactures. In other words the argument that one cannot move out of an export market and expect to move back in again does not seem to be so important a factor within Southern Africa.

Perhaps the single most important lesson to be drawn from the above discussion is that there is a critical relationship between levels of exports and the state and potential of the domestic market for this group of manufacturing exporters, who are the vast majority, accounting at present for over 50 percent of the export revenue of the manufacturing industry. Furthermore, the relationship is more than one of technical costing inter-linkages. There is among a majority of exporters a desire to maintain the existing relationship between domestic production and exporting. Most are reluctant to increase substantially their exposure to export markets without a firm domestic base. This is not only because of present price differentials, but also because of a belief that the risks are too high: the domestic base is known and provides a reasonably captive market whereas exposing oneself to too high a profile on the export market carries very high risks and additional costs. It is for this reason that manufacturers are frequently heard to claim that exporting is simply the "icing on the cake". One major constraint in changing this attitude is that the manufacturer who is exporting obtains no additional benefit in supplying the external rather than the domestic market.

Exporting for the firm is viewed principally in accounting terms: the firm sees no gain in foreign exchange earning by exporting or by increasing exports. It is only the Treasury and the Reserve Bank who obtain the foreign exchange benefit. It is far easier and cheaper to exploit the known local market if demand is bouyant there rather than the unknown and riskier export market.

If the overall industrial strategy is to establish the conditions for a steady growth rate of the industrial sector then to encourage the further expansion of exports of these "domestically-oriented" exporters a number of considerations will have to be addressed. Firstly, the rate of expansion of the sector will have to be higher than that required simply to meet the anticipated expansion in domestic demand. Thus if the increase in domestic demand is to be at least 3.5 percent a year - to allow for the increase in population and some improvement in living standards - the annual rate of increase of the manufacturing sector would need to be higher than this rate of increase. Secondly, the investment the sector requires will need to be higher than that needed simply to account for the anticipated rise in domestic demand. It is also to be expected that the investment costs of sustaining an expanded export drive will be proportionately greater per unit of output than expanding domestic output by the same amount. This is because the quality of the product required for the export market will tend to be higher than that required for the domestic market, so calling forth a higher level of sophistication in plant and equipment. Both these points can be illustrated by means of the historical data on exports and turnover given in Table 10.1, above. The Table shows that exports as a percentage of turnover varied between 17.6 percent and 9.1 percent between 1978 and 1981. If, as the evidence tends to confirm, the higher ratio is attributable largely to a switch from the domestic to the export market, then the higher ratio - and even higher ratios still - can only be obtained in the longer term, and assuming also higher levels of capacity utilisation, with a substantial increase in investment. In short, average export to turnover figures which include high export ratios in times of domestic recession provide little guide to future export ratios with a steady expansion of domestic demand and general economic expansion. Thus there is not only no guarantee that the high level of exports achieved by the manufacturing sector (for example in 1984) will be sustained in the years to come. There is evidence to suggest that the export

contribution will decrease, and probably substantially, as domestic demand begins to rise again. Past evidence points strongly to the conclusion that the nearer a firm is working to its full capacity target the lower will be the incentive to export. Hence adopting a full capacity strategy and targetting investment expansion to this objective would tend to provide the ingredients for a major disincentive to expand exports.

Policy issues

How then does one break out of this? A number of possible solutions present themselves. One is to continue to introduce incentives so as to work on lowering the marginal costs of exporting. Export incentive free of tax, transport subsidies, free access to foreign exchange for required inputs, credit schemes, bridging finance, financial guarantees, etc. are precisely those types of incentives which will be likely to continue to reap benefits in the form of increased exports, especially in times of depressed domestic demand. In an expansive period for the domestic economy they are likely to have considerably less although still have some effect. It needs to be stressed, however, that these measures are not costless: they are usually a form of subsidy likely to be frowned upon increasingly by trade partners. Another seemingly attractive policy would appear to lie in squeezing domestic margins so as to equate or attempt to equate domestic and international prices. In this way the domestic market won't appear, or be, so attractive as the market-of-first-recourse. While such a strategy might seem enticing, it is far more likely to lead to lower investment levels and a progressive decline in both domestic and export output as rates of return fall, profits turn into losses and contraction sets in. A far more attractive option lies in providing an incentive that will enable the manufacturer to be able to distinguish clearly between gains from exporting and gains from supplying the domestic market. And one such incentive is clearly "free" foreign exchange. If a manager of a company were to receive 1 percent or 1/2 percent or 1/4 percent of the net foreign exchange he earned by exporting, to be used precisely as he wished - to buy a video, to holiday on the Kenya Coast or to give to his employees as he saw fit - then he would have concrete evidence that exporting was profitable for him and, importantly, a recognisable incentive to maintain export production even when domestic demand picked up. The exchequer would clearly gain by picking up the 99 percent or 99.5 percent of extra foreign exchange earned. While such a suggestion, or one along

similar lines but incorporating the same basic ideas, would be a major departure from present practice these is no doubt, after talking to manufacturers, that it would provide perhaps the single most important incentive that government could offer.

Most of these sorts of solutions, however, are little more than short-term palliatives that avoid rather than confront the central issue. The central issue is one of price and competitiveness. "Domestically-oriented" industries have grown up in Zimbabwe primarily to serve the needs of the local market and the main reason why they are still oriented to the domestic rather than the export market is because domestic prices are higher than the prices to be obtained from exporting. Not only are domestic prices higher but for most firms it appears that exporting is only profitable based on marginal cost pricing. The effective theoretical long term solution lies in firms obtaining a satisfactory rate of return on the export as well as on the domestic market. And this will only come about if the methods of production are changed and altered to lower overall unit costs of production. For most companies this is likely to require not only a re-vamping of present plant and equipment or the purchase of new equipment but sufficient volumes of throughput to lead to the lowering of unit cost required. But the end result would be that "domestically-oriented" companies would eventually be or at least have the potential to be export-oriented, since satisfactory rates of return would then be earned on the external as well as the internal market. For if satisfactory rates of return could be earned from exporting and if export demand were buoyant then fixed costs as well as marginal costs would be covered by export sales and little further inducements would be needed to persuade firms to export rather than supply the domestic market. To achieve such an objective would without a doubt require large amounts of foreign exchange to purchase modern plant and equipment. However, it needs to be stressed that this is the only sure way of substantially increasing the export orientation of the bulk of firms in the manufacturing sector. Finally, one also needs to emphasize that all the problems associated with locking oneself more tightly into the international division of labour will be heightened: higher risks, need for rapid and stressful structural adjustment and social dislocation. Clearly the costs would be considerable.

Export and transport costs

A final major area of constraint to expanding manufactured exports concerns the country's geographical location and the costs of transporting goods in and out of the country: exports to their final destination and imports of raw materials and plant and equipment required for the export process from their country of origin. Mention was made in the preceding paragraph about lowering unit costs of production by increasing the volume of throughput. There is little doubt that given Zimbabwe's land-locked location and its resource base there will be products that she simply has no comparative advantage to export either now or in the long term especially to regions outside Southern Africa.

The influence of transportation costs on expanding potential manufacturing exports is a vast subject and studies are underway and nearing completion on a number of the complex issues involved.^{4/} To illustrate the effects of transport costs that are susceptible to considerable change as a direct result of intervention measures we shall consider here some of the variables related to rail freight charges.

The vast majority of the exports of the manufacturing sector and imported inputs into the sector are carried by rail,^{5/} by the Mozambiquan rail system (CFM) or the South African rail system (SAR) as well as on the national network, the National Railways of Zimbabwe (NRZ). The figures presented in Tables 10.9 and 10.10 record the rail costs per tonne of carrying a selection of various manufactured exports from the point of origin in Zimbabwe to different ports via different routes. Besides indicating in broad terms the comparative disadvantage of Zimbabwe's geographical location as a source of manufactured exports destined for markets outside Africa - the costs per tonne are high no matter what port is used^{6/} - there are other important issues. Perhaps the most striking comparative figures shown in Table 10.9 are the enormous differences in tariff rates to take Zimbabwean exports to the coast by different routes. For steel there is more than a 300 percent difference, amounting to an absolute difference of \$60 a tonne between Beira (where some steel is currently being shipped) and Port Elizabeth. For ferro-chrome the differences are even greater. But for low-bulk high value products such as textile cloth, the 200 percent difference, amounting to \$15 a tonne, can be even more critical.

What is perhaps of more concern, given present constraints, is the comparative cost difference of transporting goods to Maputo either directly, via Chicualacuala or through South Africa, via Kamatipoort. Since August 1984 the direct route has been effectively closed. As the Table indicates the cost of this action to the competitiveness of Zimbabwe's exports has been very significant. It has raised the rail cost per tonne of steel exports by 116 percent, raw sugar by 56 percent, ferro-chrome by 115 percent and textile cloth by 36 percent.^{7/} In practice, however, and in spite of the rail cost differentials, much textile cloth exports are having to go via Durban, increasing the rail costs by \$14 a tonne in contrast to the Maputo via Chicualacuala route. The general points to be stressed are these: to expand manufactured exports to non-African markets involves high transport costs (and port and sea freight charges are not ever considered here) placing the country at a severe international disadvantage in any case and the disruption of the direct Mozambique routes adds significantly to these cost disadvantages. Conversely, the provision of reliable rail and port services through Mozambique to their coastal ports would remove a major constraint which is currently affecting the competitiveness of Zimbabwe's manufactured products outside Africa.

Table 10.10 provides a breakdown of the rail costs per tonne for these different products and routes split between NRZ and foreign rail charges. The figures are presented to contribute to the debate about rail subsidies and the effects of these on export performance and prospects. It is well known that currently the NRZ is operating at a loss and that in addition high-bulk products tend to be carried at a more favourable rate than low-bulk products. Thus exports are in general subsidised with high-bulk exports receiving a greater subsidy. While, clearly, a reduction in the rail subsidy or alterations in the tariff rate-to-cost of carrying different types of exports will make exports less competitive, the figures in Table 10.10 indicate the differing influences that NRZ tariff rates have on overall rail charges for different routes, and hence the relative policy control the Government has on altering CIF competitiveness through varying rail subsidy rates. As the Table indicates, Government policy would have the greatest relative effect the higher the proportion of rail traffic going directly through Mozambique and the least absolute effect the greater the proportion of goods that travel on the South African rail system.

The overall conclusion to draw from these figures is that the ability to expand manufactured exports to destinations outside Africa will be inhibited significantly by higher transport costs to the extent that South African routes will have to be used. This is not only because tariff rates per tonne are higher, but also because when South African routes are used Zimbabwe's ability to influence transport costs by applying transport subsidies is considerably lessened. If expanding manufacturing exports demands increased penetration of non-African markets, the removal of these constraints is of high priority.

To turn to the other side of the coin, Table 10.11 provides similar data on the rail transportation costs of importing products used by the manufacturing sector. While the overall trends and tariff differentials are similar to those for export traffic it is important to stress that Zimbabwe can be disadvantaged twice, or even three times, by having to use the more costly South African routes vis-a-vis the Mozambique rail links. To the extent that imports of raw materials used in the manufacture of products for export to markets outside Europe themselves came from outside Europe, then the increased rail tariffs affect the relative competitiveness of the export twice over. And to the extent that machinery and equipment also has to be imported from outside Africa then there is a threefold negative effect on competitiveness. These influences clearly heighten the transport constraint inhibiting manufactured exports beyond Africa and indicate the quite considerable susceptibility of final prices to intervention and disruption of transport routes.

The potential for increased export expansion

In this section we shall be looking more at the potential that exists in certain specified markets for Zimbabwe's manufactured exports in general and for certain types of products in particular. The points raised here are presented extremely tentatively and are not intended to replace detailed market research and surveys.

Table 10.9: Rail freight costs for selected Zimbabwean exports 1985
\$Z per tonne and index (Beira Costs = 100)

Item	Rates to Different Ports									
	Beira		Maputo via Chicualacuala		Maputo via Kamatipoort		Durban		Port Elizabeth	
	\$	Index	\$	Index	\$	Index	\$	Index	\$	Index
Steel Billets Ex-Redcliff	27.75	100	30.46	110	66.04	238	88.34	318	86.70	312
Raw Sugar Ex-Chiredgz	41.19	100	29.32	71	45.56	111	55.66	135	65.76	160
Ferro-Chrome Ex-Kwekwe	17.84	100	20.05	112	42.94	241	57.86	324	58.87	330
Furniture Ex-Bulawayo	150.60	100	151.10	100	90.11	60	102.57	68	109.67	73
Canned Fruit Ex-Mutare	4.61	100	8.07	175	9.01	195	10.98	238	11.45	248
Textile Cloth Ex-Chegutu	14.59	100	17.44	120	23.74	163	31.18	214	31.18	214
Ladies Dresses Ex-Harare	15.23	100	21.32	140	30.26	199	39.56	260	40.15	264

Source: Data provided by National Railways of Zimbabwe.

Note: South African currency converted at 0.819672. Furniture and ferro-chrome rates calculated on contracts arranged with South African Railways 1 April 1985 to 31 March 1986.

Table 10.10: Rail freight costs per tonne paid to NRZ and foreign rail companies, 1985

Percentage of total rail costs by NRZ and foreign

Item		Beira	Maputo via Chicualacuala	Maputo via Kamatipoort	Durban	Port Flizabeth
Steel Billets	NRZ	46	40	18	14	22
Ex-Redcliff	Foreign	54	60	82	86	78
Raw Sugar	NRZ	60	27	21	17	15
Ex-Chiredzi	Foreign	40	73	79	83	85
Ferro-chrome	NRZ	40	35	16	12	21
Ex-Kwekwe	Foreign	60	65	84	88	79
Furniture	NRZ	51	42	71	63	70
Ex-Bulawayo	Foreign	49	58	39	37	30
Canned Fruit	NRZ	29	53	47	39	48
Ex-Mutare	Foreign	71	47	53	61	52
Textile Cloth	NRZ	43	43	32	24	34
Ex-Chegutu	Foreign	57	57	68	76	66
Ladies Dresses	NRZ	38	47	33	25	35
Ex-Harare	Foreign	62	53	67	75	65

Source: Data provided by National Railways of Zimbabwe.

Note: South African currency converted at 0.819672. Furniture and ferro-chrome rates calculated on contracts arranged with South African Railways 1 April 1985 to 31 March 1986.

The medium to long term potential from the supply side for Zimbabwe's manufactured exports would appear best to lie in the following categories of products: those which are based on the domestic resources of the economy, those that flow from the special strengths of the sector that have been developed over time, those for which there is and is likely to continue to be an excess of production over domestic demand requirements and, relatedly, those which are based on investment decisions when the justification for the investment includes an export component.

This classification of export potential is, of course, broad in the extreme. This is in part deliberate because of the wish to emphasize that there is a variety of choices that can be made over the medium to long term in the export field, depending on the emphasis placed on different industries and sectoral expansion within the framework of an industrial strategy. Local resource-based export expansion should by no means be considered the only pattern. As the examples of Japan and Hong Kong show, rapid export expansion can occur with few physical resources advantages; it can equally occur through planning and adaptation to future changing world or regional comparative advantage. The export potential can clearly be changed substantially by investment choices made, even if these choices are guided primarily by attempts to save foreign exchange through further import substitution. For example our discussion of possible considerations of further import substitution in Chapter 9 would also lead to the initiation or expansion of exports of the following products: steel and specialised steel products from the revamping and new investments in ZISCO; beef and beef products including (indirectly) footwear from the CSC investments; stock feeds; skimmed milk; printed books; polypropylene bags; plastic twine; chrome-magnesite high-duty refractory bricks and sheet and plate glass.

Examples of export possibilities based on the non-mineral resource-base of the economy would include products within sectors 1 to 5: foodstuffs, beverages and tobacco, textiles, clothing and footwear and wood and furniture. Even analysis of present export data shows that products from all these sectors are currently being exported not only to neighbouring countries but to EEC and North American markets. Clearly the maximum gain is obtained from the increasing and more sophisticated processing of domestic resources, both because the foreign exchange gain is larger and because further processing leads to employment benefits and additionally to increased import

Table 10.11: Import rail freight costs in Z\$ for various inputs into the manufacturing sector by different ports, 1985

		Fertilizer/tonne ^{a/} to Harare			CKDS/tonne to Harare			to Mutare			Synthetic Fibre/100 kgs to Harare			to Bulawayo			Machinery per 100 kgs to Harare			to Bulawayo		
		\$	%	Index	\$	%	Index	\$	%	Index	\$	%	Index	\$	%	Index	\$	%	Index	\$	%	Index
Beira	NRZ	8.04	36	100	4.35	40	100	1.80	22	100	2.38	42	100	3.68	53	100	3.23	42	100	5.23	54	100
	Other	14.53	64	nc	6.44	60	nc	6.44	78	nc	3.26	58	nc	3.26	47	nc	4.48	58	nc	4.48	46	nc
	Total	22.57	100	100	10.79	100	100	8.24	100	100	5.64	100	100	6.94	100	100	7.71	100	100	9.71	100	100
Maputo via Chicualacuala	NRZ	15.28	46	190	7.18	48	165	8.59	53	477	3.60	48	151	3.14	45	85	5.11	49	158	4.48	46	86
	Other	17.73	54	nc	7.63	52	nc	7.63	47	nc	3.80	52	nc	3.81	55	nc	5.25	51	nc	5.25	54	nc
	Total	33.01	100	146	14.81	100	137	16.22	100	197	7.41	100	131	6.95	100	100	10.36	100	134	9.73	100	100
Maput via Kamatipoost	NRZ	15.13	37	188	7.13	39	164	8.54	43	474	3.59	24	151	3.14	22	85	5.09	36	158	4.48	34	86
	Other	25.40	63	nc	11.27	61	nc	11.27	57	nc	11.27	76	nc	11.27	78	nc	8.82	64	nc	8.82	66	nc
	Total	40.53	100	180	18.40	100	170	19.81	100	240	14.86	100	263	14.41	100	208	13.91	100	180	13.30	100	137
Durban	NRZ	15.13	32	188	7.13	30	164	8.54	34	474	3.59	18	151	3.14	16	85	5.09	28	158	4.48	26	86
	Other	32.60	68	nc	16.31	70	nc	16.31	66	nc	16.31	82	nc	16.31	84	nc	12.72	72	nc	12.72	74	nc
	Total	47.73	100	186	23.44	100	217	24.85	100	240	19.90	100	353	19.45	100	280	17.81	100	231	17.20	100	177
Port Elizabeth	NRZ	22.30	43	277	9.78	40	225	11.24	44	624	4.83	25	203	3.65	20	99	6.81	38	211	5.19	32	99
	Other	29.10	57	nc	14.41	60	nc	14.41	56	nc	14.41	75	nc	14.41	80	nc	11.24	62	nc	11.24	68	nc
	Total	51.40	100	228	24.19	100	224	25.65	100	311	19.24	100	341	18.06	100	260	18.05	100	234	16.43	100	169

Source and Notes:

See Table 10.9 above

^{a/} The index figures are Beira Costs = 100

nc - Not comparable because different rail systems are involved.

The dollar value is the cost per tonne or per 100 kgs as indicated of carrying the respective goods on the NRZ or foreign rail system. The percent value is the proportion of domestic and foreign rail costs to total rail costs for each route. Hence the total percent is 100 for each of the five routings indicated.

The index figure for the totals compares the total rail costs (per tonne or per 100 kgs) as indicated for each of the five routings as indicated with Beira as the base.

The index figure for the NRZ figures compares the NRZ rail costs (per tonnes or per 100 kgs) as indicated for each of the five routings with NRZ rail costs for Beira as the base.

substitution. The lessons are obvious but have been followed through with greater success in some areas than others. Instead of exporting live cattle, beef is exported, as are hides, though not all hides, for some are used in the manufacture of shoes which themselves are exported. However, the raw cotton through to clothing chain is not nearly so highly developed. Millions of dollars worth of cotton lint is exported which could be processed into textile products, some of which could supply the clothing industry for further exports. At present these would appear to be a major blockage within the textile link in the chain: there is insufficient capacity to take a substantially higher input of lint. There is also a serious lack of consistency in product quality of the textiles that are manufactured by at least one very important textile producer, so causing difficulties with clothing manufacturers attempting to supply the overseas market. Given the quality of Zimbabwe cotton and the rapid expansion in cotton production, there are substantial gains to be made by expanding and continuing to modernise the country's textile and clothing industry. Export gains could be considerable especially to the EEC under the favorable Lomé Convention terms. However, these gains will not be reaped unless and until the quality and product consistency from the textile industry is improved and the throughput expanded markedly.

Tobacco is another product which is largely exported in the unmanufactured state. The control of the tobacco market worldwide by large multinationals and the practice of blending leaf from different countries provide unique difficulties in achieving further processing before exporting. However, the fact that multimillion dollars worth of exports of cigarettes to South Africa have occurred indicate that there is scope for expansion, especially given the prominence tobacco companies are now giving to exporting to third world countries. Another possible export expansion line is in cigars to the EEC which would also benefit from the Lomé rules of origin agreement: Zimbabwe would have a definite price advantage and as for quality her cigars have already won prizes in the prestigious Dutch market.

Within the foodstuffs sector, Zimbabwe's geographical and climatic location provide potential comparative advantage for tropical and sub-tropical fruits, vegetables and juices especially to largely temperate markets such as the EEC, while the CSC's expertise in chilled and frozen beef could perhaps be shared to extend to game meats.

The high bulk and generally comparatively low value of wood and furniture products has by no means ruled out the prospects of further potential for expansion in the overseas markets, as the recently announced \$2 million worth of furniture exports to the UK by Springmaster illustrates. In spite of fierce competition from Scandinavia in particular there has also been some exporting of knock-down furniture to the EEC. However, radical expansion is unlikely to occur.

For most of the products which have been analysed by export marketing experts for expansion potential, a number of key issues have been highlighted. These include: the importance of exhibiting properly at a number of key trade fairs, the need for cooperation and collaboration among Zimbabwean producers to meet large orders that are beyond the scope of some smaller manufacturers, the need to package the goods in a manner likely to attract different regional markets, the need to develop personal contacts and the need to keep fully abreast with changes in fashion in the large and potentially most lucrative overseas market. For fashion goods, Zimbabwe has one potentially important asset. Provided it produces goods that sell well in the European and North American markets these lines will have an excellent chance of being in high demand in the South African market a few months later so facilitating longer production runs and reaping additional cost benefits.

Pharmaceuticals is an industry where there is a strong domestic base, considerable product diversification and company specialisation and where recent substantial export orders have been received, especially from within Africa. Given the excellent quality rating of Zimbabwean products there would appear to exist the base for further expansion especially in Africa although there is little doubt that this would require some costly investment for both further plant modernisation and further product diversification. Furthermore, pharmaceutical products, like basic foodstuffs, have the added advantage that demand stands up comparatively well when importing countries suffer from foreign exchange shortages and cuts or freezes in import levels.

The pulp, paper and printing industry has been a poor export performer both in terms of total turnover and in terms of total exports of the manufacturing sector (see Table 10.1 above). The main (minor) exception has been printed paper to Southern African schools, especially within South Africa. The main constraints on exports have been both the increasing

domestic demand and the quality of the material produced. Investment in chemical pulp to produce higher quality paper (including computer paper) would almost certainly lead to capacity in excess of local demand for many years, so creating export potential. However, increased value-added and foreign exchange would be obtained if printed material were to be exported, and there is a considerable African market for both school books and printed literature.

Exports of transport equipment have also been historically low in terms of turnover and total manufactured exports. While it would appear that there is little if any scope for exporting passenger cars at present (that is with the presently available plant and equipment) railway wagons are exported to the region, and in the light of both cost and quality, future sales can be anticipated. As regards passenger buses there is little doubt that Zimbabwe produces one of the most durable vehicles for African roads on the market, the product having been developed and adapted over many years. Although costs are frequently not competitive it would appear that there is significant scope for export expansion within Africa given the comparative advantage of product quality and technical skills available. Additionally, as the bus manufacturers themselves maintain, to increase volumes would have a significant influence on the prevailing price differentials.

Last, but most important, is the metals and metal products sector which is far and away the largest contributor to manufacturing exports in relation both to turnover and to total exports from the whole sector. Different elements need to be separated out. First are those exports based predominantly upon the mineral resources of the country. Clearly the beneficiation and processing of mineral products is of far greater advantage to the country than simple exploitation of the ore. In this field some quite remarkable advances have been made over the past fifteen to twenty years. The Ministry of Mines has a first-class record for promoting further mineral processing. The main policy issue here would appear to be the need to maintain and intensify the coordination and planning between this ministry and the Ministry of Industry and Technology so that future opportunities can be exploited and policies followed through rapidly to the implementation stage.

A second category would include iron and steel products. While these exports have been high compared to other manufactured exports they have been low in relation to plant capacity. This has partly been due to lack of consistency in

product quality, partly due to production difficulties, and partly due to depressed world markets. Additionally the foreign exchange gains that have been achieved need to be analysed against the financial aid that government has had to provide to ZISCO directly and the subsidies that have been born by the railways. With substantial capital investment there is little doubt that substantial export earnings will continue to accrue from iron and steel export sales, with the additional benefits of quality improvement and product diversification. A third category of exports within this sector encompasses those engineering industries manufacturing both heavy and light metal products. The considerable stock of skills, expertise and experience within Zimbabwe's engineering industry together with complex inter-linkages both within the engineering industry and to the iron and steel industry have created a substantial regional comparative advantage in this sphere of manufacturing which already results in considerable regional export orders, one speciality being the export of mining equipment. With a re-vamped ZISCO producing a diversified product range the already existing export potential of this downstream area of activity is likely to be considerably enhanced although prohibitively high transport costs will make major expansion outside central and southern Africa unlikely.^{8/}

Mention needs to be made here especially of the links existing in a number of key engineering firms between the ability to export and the presence of a firm and secure domestic base. For a number of firms, some in Bulawayo, over the period of the post-1981 recession the viability of their operations has been threatened by a drastic cut-back in domestic orders. In some instances the failure of para-statal purchases of their products to guarantee orders in the short term could well lead to these firms having to close down. Not only will such moves erode the potential for future exports but it will increase considerably national foreign exchange costs, because future orders can then only be met by importing what now can be manufactured locally. The point to be stressed is that short-term attempts by para-statals often at ministerial behest, to trim short term expenditure can and in some instances certainly will constrain potential exports, as well as other unfortunate consequences, because the firm may simply close down.

Other exports in the metals sector include radios and hollow-ware which are exported at present largely to South Africa. With the current poor local electronic industry, in comparison with many Far Eastern exporters, there is little potential for expansion in the export of electronic products without substantial new investment. Hollow-ware exports to both South Africa and to the PTA States are likely to increase, although not dramatically. There would appear, however, to be considerable potential for manufacturing and exporting copper-based high quality hollow-ware to the EEC countries, where demand prospects are good.

Footnotes and reference to Chapter 10

- 1/ The accuracy of this data is discussed in the methodological note to Table 10.1.
- 2/ CZI Trade Promotion Department "Study into the Level of Industrial Trade Between Zimbabwe and the PTA Countries as a Comparison to Zimbabwe's Trade with the Rest of the World," Harare, (Mimeo), November 1984. The following categories of exports were included in the survey results: animal feeds, manufactured tobacco, beverages, meats, wattle extract, soaps, crude glycerine, medicinal and pharmaceutical, insecticide and fungicide, other chemicals, leather in the piece, tyres and tubes, plywood and boards, paper and paper boards etc, yarns and threads, fabrics, bedsheets, cement, domestic hardware, gemstones, metal containers, wire, railway construction materials, non electrical machinery, insulated electric cables, radios and TVs and parts, railway vehicles and equipment, other machinery and related equipment, miscellaneous manufactured articles, furniture, travel goods, suits, dresses, other clothes, footwear.
- 3/ For accessible assessments of the prospects for the South African economy see the country reports of the Economist Intelligence Unit Ltd. and South Africa, A Financial Times Survey, May 10, 1985.
- 4/ Specific mention can be made for example of the SIDA/SWECO, Zimbabwe National Transport Study, the Coal Transportation Study prepared by the Netherlands Economic Institute.
- 5/ One needs, however to be aware that important manufactured exports are air-freighted. For example, high fashion clothing exports are most commonly air-freighted. But even favourable and subsidised air-freight rates won't necessarily give Zimbabwe a competitive edge into overseas markets as many air-freighted garments have to be repressed, adding yet another and often substantial contribution to the final selling price.
- 6/ Differential Sea-tariff rates are another important area of consideration for export competitiveness providing yet further disadvantages to Zimbabwe. A leading textile product exporter pointed out to the study team that he is currently charged \$1,500 to ship a container of his products from Durban to Southampton while Frame Textiles, the large South African textile producer and competitor, is charged \$1,000 to ship exactly the same container also from Durban to Southampton. The (South African) shipping line apparently claims that the differential price is justified not because of overt discrimination against Zimbabwe, but because the turnaround time of containers to Zimbabwe is far longer than within South Africa.
- 7/ Evidence has also come to light of the relevant South African agencies offering major rail users, like the sugar companies, special discounted rates on the Maputo via Komatipoort line if they are willing to enter into contracts to route their exports this way over a prolonged period. While this provides a marginal and perhaps even significant gain to the companies involved, it also highlights one way that Zimbabwe can be locked into an unfavourable dependent economic link arising largely from politico-military factors.

Footnotes and reference to Chapter 10
(continued)

- 8/ Though export penetration to the overseas market of these products is unlikely to occur, one must point out that companies do receive orders and export overseas. Cleminson and Plaskitt (to the USA) and Radiator and Tinning are just two examples. Mention should also be made of the ability of engineering firms to sell their services abroad and thereby earn valuable foreign exchange. For example, Field Aircraft Services' Engine Division is a recognised world leading specialist in engine rebuilds and receives engines from all Africa, Australia and the UK for rebuilding.

Chapter Eleven
REGIONAL CO-OPERATION

Regional co-operation in Africa

The Lagos Plan of Action and, with respect to manufacturing, the Industrial Development Decade for Africa (IDDA) are the fundamental political and economic statements on regional co-operation for African development. Both of them are based upon the use of the collective resources of the whole of Africa towards common development ends. Within this context, two sub-regional organizations are of special importance to Zimbabwe, are the focus of much attention, and are the main topics of this chapter. These are the Preferential Trade Area (PTA) and the Southern Africa Development Co-ordination Conference (SADCC).

Both these bodies have important implications for manufacturing. This is because they are concerned with co-operation in trade and development policy. Because of the links between the two topics and the objectives of both organizations to have more links between the member economies and between member economic policies, any consideration of manufacturing in Zimbabwe has to include consideration of these bodies.

However, this chapter has to be read as part of the study as a whole. There are special features of SADCC and PTA which will affect trade and industrial policy. But, equally, there are problems of trade and policy in Zimbabwe that are important whatever countries Zimbabwe co-operates with. The difficulties identified in capacity utilization and export performance (Chapters 7 and 10), the issues in technology (Chapter 8), investment (Chapter 12) and government policy (Chapter 6) are all relevant. The whole structure of Zimbabwe's manufacturing as described in Chapters 1 to 4 is the basic starting point for reviewing the possibilities for regional co-operation. It is hoped, therefore, that this study will itself provide information useful to policy formulation for greater co-operation within the region as well as making clearer the opportunities and the efforts needed for industrial development in general.

What follows therefore is a brief account of the organizations concerned, their objectives, their potential and the possible role for Zimbabwe in the furtherance of their ends.

PTA and SADCC

The orientations of these two organizations can be simplified, and characterized as two alternative approaches to regional integration. The first is the "trade approach". This is based on the principle of freeing of trade within the region. The second is the "planning approach" which is predicated on growing regional planning or development within the institutional framework of countries forming the co-operative regional group. It should be stressed that these categories are idealized. Trade and development planning cannot be neatly separated. Nor do PTA and SADCC fit neatly into these two categories. However the trade liberalization character of PTA is clear enough. From July 1, 1984 customs tariffs on selected goods were reduced by the following percentages for each commodity group in accordance with Article 4 of Annex I of the treaty:

1. raw materials - agricultural by 50 per cent
2. raw materials - non-agricultural by 60 per cent
3. intermediate goods by 65 per cent
4. durable consumer goods by 40 per cent
5. non-durable consumer goods by 35 per cent
6. highly competitive consumer goods by 30 per cent
7. consumer goods of particular importance to economic development by 70 per cent
8. capital goods and transport equipment by 70 per cent; and
9. luxury goods by 10 per cent.

In addition, non-tariff barriers to trade, with respect to commodities appearing on the common list, were to be progressively reduced with a view to their eventual elimination.

On the other hand, the intentions of SADCC's regional co-operation contain elements of a "planning approach". The principal strategic objectives of SADCC are transformation at the level of each member state and "the reduction of economic dependence, particularly, but not only, on the Republic of South Africa". The means are found in planning and co-ordinating of the

region's industrial co-operation programme, particularly its manufacturing sector. SADCC's decentralised institutional framework is geared to engaging national governments and administrations directly in the regional planning process.

In practice, as we have said above, neither SADCC nor PTA, or for that matter any regional integration scheme lends itself sharply to the dichotomy between trade and planning. The actual scheme may be a mixture of the two approaches. While the PTA's main objective is to facilitate a common market, it includes in its programme other related aspects of co-operation such as transport and communications, agricultural and industrial development and mobilization of financial resources for economic development of the member states. For its part SADCC initially included trade on its agenda in the Lusaka Declaration, though no definite trade programme has been agreed upon. But any agreed industrial structure would have implications for trade.

The characteristics of the region's economies will determine the role or influence of the manufacturing sector in regional co-operation. The PTA and SADCC regional integration schemes combine countries with a general lack of complementarities in their production and industrial structures. As will be shown below, this fact is revealed by the general patterns of trade of manufactured goods. Both the volume and range of products in intra-regional trade are insignificant in relation to the region's trade with the rest of the world. There also exists disparities in the level of industrialisation, a factor that militates against regional co-operation on an equal basis among the economies of the member countries.

What then is the role of Zimbabwe's manufacturing sector or its contribution to regional co-operation arrangements? In order to answer this question we will first examine data on the supply and demand structure of manufacturing goods. Because of the paucity of data we will concentrate on SADCC and use the results to approximate roughly what would be the case in the wider PTA region.

Supply and demand features of manufactured goods in SADCC

Total supply of manufactured goods is measured by the sum of domestic production of manufactured goods and imports of manufactured goods. Table 11.1 shows that the seven country-group is heavily dependent on imports for the satisfaction of their domestic consumption of manufactured products. Over US\$4,900 million, or nearly 46 per cent of domestic consumption is met by imports.^{1/} As to individual countries, Zimbabwe and Zambia have import dependence ratios of 27 and 35 per cent respectively. At the other extreme, Botswana, Lesotho and Swaziland have between 90 and 96 per cent dependence on imports for the satisfaction of their domestic consumption.

Processing industries in the other SADCC countries (i.e. apart from Zimbabwe) are at a low level, and the prospects for exporting raw materials to them are therefore limited. Thus, apart from food products, the only possibility for increasing exports to the region is to concentrate on manufactures. And indeed, 73 per cent of Zimbabwe's exports to SADCC in 1981 consisted of manufactured products.^{2/}

Table 11.1: Domestic supply and disposition of manufactures of seven SADCC states (US\$ million in current prices) for 1980

Country	Supply		Total	Disposition	
	Domestic Prod.	Imports		Domestic Cons.	Exports
Botswana	180.7	639.6	820.3	709.9	110.4
Lesotho	30.9	413.7	444.6	430.9	13.7
Malawi	363.9	417.6	781.5	692.9	88.6
Swaziland	380.5	477.6	858.1	531.3	326.8
Tanzania	874.4	973.4	1,847.8	1,731.2	116.6
Zambia	2,917.2	892.2	3,809.4	2,528.5	1,280.9
Zimbabwe	3,702.0	1,122.8	4,824.8	4,199.2	625.5
Totals	8,449.6	4,936.9	13,386.4	10,823.9	12,562.5

Source: UNIDO Data Base. Tables on supply and disposition of manufactures are based on ISIC categories.

Notes: 1. Exchange rates used here are based on UNIDO's data base are 0.776P, 0.778M, 0.812K, 0.778.E 8.195 Sh., 0.789K and 0.643Z\$ per US\$ for the respective currencies.

2. Data was not available for Mozambique and Angola for the equivalent period.

According to the UNIDO data base the structure of imports of manufactured products in SADCC reveals that metal products, machinery and equipment accounted for 42 per cent of the region's overall import bill in 1980. Ratios of imports as a proportion of domestic consumption were 37 per cent for fabricated products and over 85 per cent for non-electrical machinery and transport equipment. Altogether the seven countries imported US\$ 2,242 million of capital goods type of products (ISICs 371, 372, 381, 382, 383 and 384) representing 47 per cent of these countries' total imports of manufactured products.

In Tanzania, Zambia and Zimbabwe capital goods imports were up to between 43 and 46 per cent of total imports of manufactured goods. Though in terms of value the smaller countries like Botswana, Swaziland, Lesotho and Malawi imported less, this class of products represented important imports for these countries.

Though SADCC as a whole is still very weak in both metal fabrication and machine-building, these capacities are already there in Zimbabwe and Zambia and could represent a crucial nucleus for long-term regional development for self-reliance. The question is how does Zimbabwe's manufacturing sector respond to these opportunities of supplying this important class of products? Zimbabwe's manufactured exports to SADCC (see Table 11.2) do not seem to match the region's pattern of import demand structure, especially with regards to capital goods. In 1981 Zimbabwe's exports of capital goods represented only 11.5 per cent of her total exports of manufactured products to the region. It is known that some companies lost important contracts due to poor export credit facilities at the time, and this point will be discussed later. From a regional co-operation point of view, there is no doubt that Zimbabwe could specialise in the production and exports of capital goods, machinery and transport equipment. Capital goods were emphasized in 1984 by SADCC, with specific reference to machine tools, irrigation pumps, mining equipment, and railway wagons, rolling stock and equipment.^{3/4/}

The importance of information and marketing needs to be stressed. Zimbabwe manufacturers have to be aware of possibilities and promote their products. For instance, there is at present insufficient marketing of such products as Zimbabwean buses and trucks, which are certainly more suitable for the region's rough roads and terrain than European-built buses which are

Table 11.2: Zimbabwe's main exports to SADCC in 1981
(in million US \$)

	Angola	Botswana	Lesotho	Swaziland	Malawi	Mozambique	Tanzania	Zambia	Total
Refined Sugar		12.87							12.87
Malted Barley		0.72		0.72					1.44
Oilcake and meal								1.88	1.88
Tea		0.29							0.29
Ground Nut Oil		1.16							1.16
Yarns & Synthetic Fibres		6.36			1.59				7.95
Cement		1.74							1.74
Asbestos & Products			0.48			3.18			3.66
Coke						09.72		2.85	3.57
Toilet Soap								2.85	2.85
Metal Products		1.74				1.30		0.58	3.62
Machinery		0.58	0.43						1.01
Railway Equipment								6.94	6.94
Other	1.59	15.75	0.83	0.87	12.87	4.49	0.28	15.28	51.96 ^{1/}
Total	1.59	41.21	1.74	1.59	14.46	9.69	0.28	30.36	100.92

Source: SADCC "A Strategy for the Integration of SADCC Markets Final Report, November 1983 for the SADCC Secretariat, International Funding Services, S.C. Brussels, Annex No. 2 Table 16.

Notes: 1/ The category may contain other exports of non-manufactured products.

imported into the SADCC region. Again, a recent SADCC study^{5/} cites the case of Cecon Enterprises Pvt. Ltd., Zimbabwe, a Bulawayo based technical pesticide manufacturing plant which was working at about 50 per cent capacity because management was not aware of the demand for pesticides from tobacco, tea and coffee authorities in Tanzania and Malawi and other SADCC countries.

Almost all member countries' lists of imported manufactured products could be the subject of discussion. This should be at the level of product groups, and it should involve the firms making these products in Zimbabwe. This cannot be solely the business of the Ministry of Trade and Commerce or of Zimbabwe National Chamber of Commerce (ZNCC) branches. It is manufacturing firms who are involved in product technologies, and designs, and it is they who should be in the forefront of breaking into the markets, and the involvement of the Ministry of Industry and Technology itself is also vital.

But trade cannot go only in one direction. Zimbabwe also has to consider its imports from the other countries. In 1981 Zimbabwe's total imports from SADCC totalled US\$114.2 million against total exports of US\$138.2 million, giving Zimbabwe a regional trade surplus of 21 per cent.^{6/} The single largest item imported by Zimbabwe is electricity from Zambia, nearly US\$29 million in 1981, followed by motor spirits and synthetic fibres from Botswana (US\$11 million). Zimbabwe could and should import from SADCC more of the products it needs if and when these are available. For instance, in 1982 and 1983 Zimbabwe imported nearly \$5.5 million and \$7 million, respectively, of animal tallow for the soap industry. A good proportion of this product is imported from Botswana, and this could be increased if that country can supply the product. The same thing could be done for those products which SADCC countries manufacture and Zimbabwe imports, e.g., aviation turbine fuel from Zambia, wood pulp/sulphur from Swaziland, and textile products from Malawi and Botswana.

Historically, product complementarities are weak among SADCC countries. Only in non-electrical machinery in Botswana, ceramics in Lesotho, food and ceramics in Malawi, and wood, wood pulp and basic chemicals (i.e. fertilizer) in Swaziland, was national production above 5 per cent of the seven country group's sectoral totals of the respective products.

In Tanzania tobacco, textiles, leather and footwear are all above the 5 per cent mark. In Zambia, beverages, refined petroleum, rubber products, professional equipment and non-ferrous metals pass the 5 per cent mark. Zambia also meets this criterion for clothing, non-basic chemicals, glass, metal products, machinery and equipment though these products are dwarfed by the non-ferrous metals output in that country's economy. Zimbabwe's sectoral contribution is understated by its lack of output in petroleum refining, but no fewer than 16 branches were more than 5 per cent above the seven country-group's sectoral share. Zimbabwe's sectoral share rises more significantly in the more complex and capital intensive manufacturing processes such as chemicals, plastics, glass, metal products and capital goods. It also does well in clothing, footwear and furniture.

As mentioned above, the region is obviously characterised by the general lack of complementarities in production and industrial structure among the member countries. It can be said to have in general a horizontal production structure: there are similar ranges of products such as food, textiles, beverages, and a lack of vertical production relations among the region's branches of production. In fact, the trade pattern of these countries reveals a historically determined vertical linkage between the former colonial powers and South Africa on the one hand, and the SADCC states on the other. But the existing production patterns, especially in Zimbabwe, could break through by catering for the more capital-intensive capital goods market for the region. Technology and import substituting policies to this end should in that case be built on the more complex and capital intensive manufacturing processes.

Two options are open for Zimbabwe in a regional co-operation strategy. First, it could concentrate on those products in which it is well endowed with natural resources and skills, such as engineering products, transport equipment, and agricultural equipment. Second, Zimbabwe could specialise in products which do not rely on local raw materials or simple production techniques. For example, Zimbabwe could develop further its production of chemical products, including fertilizer products, glass products, rubber, pharmaceuticals and plastics. Products like medicinal pharmaceuticals are essential commodities and demand for them is usually assured in spite of foreign exchange cuts. This could be an area of specialisation in addition to traditional supplies like refined sugar to Botswana. But labour-intensive strategies will not do for Zimbabwe, since its labour costs are higher than in other countries of the region.

The PTA regional market

The PTA region represents a captive potential market of over 160 million people in 1983, with GDP of over US\$33,900 million, GDP per capita of over US\$8,500 and MVA of over US\$6,000 (Table 11.3). Only a few countries eligible for membership have not joined and these include Angola, Mozambique and Botswana. However, these countries belong to SADCC, and thus remain part of the overall regional co-operation scheme for Zimbabwe. Tanzania has already announced its intention to join the PTA.

The countries in the region have an average of 11.3 per cent manufacturing share in GDP which represents a low level of development of the manufacturing sector. The potential for exchange of industrial goods is, therefore, still low in these countries. But more important indicators of the size of the market to absorb manufactured goods should be the GDP and GDP per capita, and the population. The latter gives a potential market over 21 times as large as the domestic market of Zimbabwe.

The PTA's sub-regional targets also includes the development of transport and communications network, agricultural and industrial development, and the mobilization of financial resources for the economic development of member states, through such mechanisms as the proposed Eastern and Southern African Trade and Development Bank. These can be viewed as long-term prospects promoting further trade in manufacturing products.

The Eastern and Southern African Trade and Development Bank has still to come into operation, but the PTA Clearing Facility began working in February 1984. The main purpose of this facility is to provide liquidity for trade transactions among member states. The structure and management of the Clearing House is now well known to both government and the business community.^{1/}

The clearing arrangement makes it possible for a country to execute one transfer every two months for the settlement of the net position resulting from the transactions of the participant with all the others combined. In the first trading experience of the PTA only 6 out of 14 member countries actually participated, generating business of only 9 million units of account (UAPTA). This is equivalent to US\$9.5 million.^{8/} As the volume of trade has increased,

Table 11.3: PTA actual and potential members GDP, GDP/Capita manufacturing share in GDP, MVA IN 1981 and population in 1981 & 1983

Country	GDP (US\$'000)	GDP/Capita	Manufacturing Share	MVA (US\$'000)	Population (millions)	
					1981	1983
1 Angola ^{1/}	3,242	446	2.6	84	7.94	8.34
2 Botswana ^{1/}	1,173	1,405	6.7	79	0.94	1.01
3 Burundi	984	226	10.4	102	4.22	4.42
4 Ethiopia	4,800	149	10.4	500	32.75	33.68
5 Kenya	6,688	389	13.2	884	17.34	18.77
6 Lesotho	382	277	4.7	18	1.37	1.44
7 Malawi	1,649	258	15.2	251	6.23	6.62
8 Mozambique ^{1/}	2,612	242	8.8	230	12.53	13.31
9 Madagascar	2,835	315	13.2	373	8.96	9.40
10 Comoros	111	300	5.4	6	0.41	0.42
11 Mauritius	1,011	1,036	17.8	180	0.94	0.96
12 Rwanda	1,256	253	15.6	196	5.32	5.70
13 Seychelles	-	-	-	-	0.6	5.27
14 Somalia	1,884	390	8.8	165	4.87	5.27
15 Swaziland	618	1,074	24.3	150	0.57	0.61
16 Uganda	2,989	219	4.5	134	13.64	14.63
17 Tanzania ^{2/}	5,232	282	8.6	450	19.17	20.41
18 Zambia	3,429	574	19.3	661	5.83	6.24
19 Zimbabwe	6,534	851	25.6	1674	7.36	7.74
Totals	33,779	8,686	203.1	6,137	156.82	167.91

Source: UNIDO: Industry and Development Global Report 1985, and United Nations Monthly Bulletin of Statistics No. 4, April 1985.

Notes: 1/ These are not yet members of the PTA.

2/ This country has recently expressed its intention to join.

more structurally-influenced problems have begun to emerge. Due to the large variations in levels of development attained, particularly in the manufacturing sector, trade surpluses were visibly accruing in favour of the more developed countries of the integration zone. Zimbabwe was reported to have got a large share of the trade surplus with Kenya trailing behind. Most other countries had imported more than they had exported so that trade deficits has to be settled in foreign currency.

PTA, as a regional integration zone, presents both prospects and problems. Prospects exist for Zimbabwe along the same lines as were discussed in connection with SADCC countries, which is essentially a subset of the PTA. However, if Zimbabwe is to export capital goods and transport equipment to the region, credit facilities should be more attractive than those offered by its competitors. At present the Reserve Bank of Zimbabwe has extended credit terms up to 180 days from the date of dispatch. This extended credit scheme being implemented under an agreement between the World Bank and Zimbabwe, was intended to make capital goods exports more competitive. While the importance of the scheme is recognized, nevertheless the dead-line for the repatriation of payments should not be inflexible in the case of contracts where a Zimbabwean manufacturer can gain an important foothold in the regional market. Chapter 10, on exports, has stressed the importance of the initial step in breaking into new markets.

It is our view that the customs tariff reduction of capital goods and transport equipment by 70 per cent under the PTA scheme does not give an edge over Zimbabwe's competitors in this market. Because most of these countries do not make this class of products, the tariff rate they have on this item may only be between 5 per cent and 10 per cent. For Zimbabwe exports a reduction of 70 per cent of 5 per cent, for instance for the Zambian market, does not take us far, especially given the weak currency position compared to the currencies of Zimbabwe's competitors including South Africa. But Government has effected a financial package equivalent to the OECD countries' terms for exports of packages between \$0.5 million and \$4 million. The package gives up to a 3 year line of credit, at 10 per cent fixed interest, payment starting 6 months after commissioning of the plant, 15 per cent down payment with order, and the balance guaranteed by the Zimbabwe Credit Insurance Corporation Ltd (ZCIC). Thus, given this facility of export credit covering large projects, it is up to Zimbabwe's businessmen to communicate with the PTA importers and convince them of their ability to do the work.

Conclusions

Regional co-operation strategies involve difficult choices, and the above review has highlighted some of them. The first is the conflict between long-term and short-term interests, the second is between individual and collective interests, and the third is that between elements of a national strategy when regional co-operation is only one part of it. Clearly, the benefits of regional co-operation can be both immediate and also long-term, and they can be widely spread among the members. But all of these benefits cannot be achieved unless there is careful attention paid to the resolution of potential conflicts.

In many ways, the present state of Zimbabwe's manufacturing brings out the conflicts quite sharply. Zimbabwe dominates the region in terms of the size and diversity of its manufacturing sector. This has already led to difficulties in the PTA. Precisely because Zimbabwe's exports of manufactures have been so successful, their progress appears to have reached the limits of the local currency clearing possibilities. The prospects for increase in the future therefore will still largely depend on the hard currency exchange resources of the other countries. In the longer term the prospects for Zimbabwe increasing its exports of manufactures to the region are indeed very good, but they are dependent on the overall progress of the other economies.

However, there is also scope for Zimbabwe itself to assist this progress. The import of goods from other member countries, especially if these replace supplies from non-member countries, will itself allow a greater manufacturing contribution from Zimbabwe, whether these imports are raw materials or manufactures. Thus whether Zimbabwe increases imports of wood pulp from Swaziland or the products of the Nitrogen Chemical Company of Zambia, it will still assist Zimbabwe manufacturers to export to these countries. (The latter, in particular, deserves detailed examination).

Conflict with other national policies of Zimbabwe can be seen and are indeed exemplified in this study. In the present chapter the possibility of increasing tallow imports from Botswana was mentioned. But in Chapter 9, Import Substitution, we discussed the opportunities for increased tallow production in Zimbabwe itself. These difficult choices will persist, and the resolution of them has to be done in the wider context of the co-operation to

which all the member countries are committed. The benefits of enlarged markets and of increased trade based on dynamic comparative advantage are the goals of regional co-operation, and individual decisions have to be made within the broader framework.

Because of this, the need for information is critical. There is at present inadequate knowledge available about the full manufacturing capacities of all member countries (whether PTA or SADCC). Progress has been made, especially in SADCC, where a wide range of studies is under way. UNIDO in particular is completing a survey of industrial development for SADCC, and also a study of iron and steel for PTA region. These studies will soon be available and will, it is hoped, add to the information base for the regions. But a coherent collective strategy and the definition of individual roles will very much depend upon a continuous and up-to-date analysis of the changing situation.

Zimbabwe's manufacturing capacity, as well as raising immediate difficulties in PTA, has potential problems with respect to SADCC also. Because SADCC is concerned with the harmonization of development strategies, and because the other members understandably want to develop their own industrial capacities to a more advanced state, it will naturally follow that Zimbabwe will face increasing competition (as is already the case with textiles) from expanding industries in other SADCC countries. Chapter 5, The World Economy and Structural Change, made the point that structural change in world industry was something to which Zimbabwe could not avoid adjusting, unless it adopted a completely inward-looking policy and that regional co-operation offered no escape, since the other countries in the co-operation scheme would have their own links with the world economy. But this point can be developed further. Because the other member countries of SADCC will develop their manufacturing sectors Zimbabwe will in any case have to adjust its production structure, and it will have to exchange manufactures with the other countries on a changing basis.

Structural adjustment is not an easy task, even for developed countries. For a low income country such as Zimbabwe it will be more difficult. Nevertheless the need for it will certainly grow as other countries in the region develop industries which will be able to produce some manufactures more

cheaply than Zimbabwe. The task therefore is for Zimbabwe, realizing that in the future it will be importing more manufactures from other countries in the region, or exporting less of a traditional kind to them, to identify what products it can then hope to export.

The suggestions above were in the areas of more sophisticated products embodying a higher level of processing, and capital goods.^{8/} This strategy, like any other, will need careful planning and analysis. It will need an accompanying raw materials strategy and the development of science and technology along appropriate paths. Most importantly, it will need extensive co-ordination with the other member states. In this the Ministry of Industry and Technology should be a major actor, and its involvement in regional co-operation activities and decision-making greatly increased.

On this point, it should also be noted that harmonization of industrial development cannot be done in physical terms alone. At present the member countries of the regional grouping have different taxation structures, different investment allowances and different attitudes to foreign investment. Clearly these differences will persist for a long time to come. But their influence on the future pattern of industrial production in the region ought to be assessed and analysed in detail, together with the extent to which these differences distort the pattern from the point of view of efficiency.

Notes and references to Chapter 11

- 1/ Import and export data includes intra-regional as well as external trade.
- 2/ SADCC, "A Strategy for the Integration of SADCC Markets: Final Report", November 1983.
- 3/ UNIDO, "The Capital Goods Industry in Africa: A General Review and Elements for Further Analysis", Sectoral Studies Series No.14, UNIDO/IS.502, 20 December 1984.
- 4/ SADCC, "Current Status of Industrial Projects", 1984, p.14.
- 5/ SADCC' "Development of Pesticides and Insecticides Manufacturing Activity", Commonwealth Secretariat, March 1985.
- 6/ See 2/ above.
- 7/ See Reserve Bank of Zimbabwe, "Operational Procedures Manual of PTA Multilateral Facility", January 1984.
- 8/ It should be noted that products of these kinds have also been proposed for Zimbabwe to meet the wider regional needs of Eastern and Southern Africa. Projects have been suggested in the framework of IDDA for the upgrading and diversification of products from ZISCO, the manufacture of tractors, the manufacture of diesel engines for tractors, trucks, lorries and buses (this either in Zimbabwe or Kenya) and the expansion of existing capacity in phosphate fertilizers. See ECA, OAU and UNIDO, "A Programme for the Industrial Development Decade for Africa: Initial Integrated Industrial Promotion Programme at the Subregional level", UNIDO/ID/CONF.5/CRP.1, 29 June 1984.

Chapter Twelve

CAPITAL INVESTMENT IN THE MANUFACTURING SECTOR

Introduction

This Chapter examines and discusses broad aspects of investment in the manufacturing sector. Topics to be highlighted include: the importance of investment, an examination of why companies invest, a discussion of the major constraints impeding increased investment in the sector, an assessment of the investment needs of the sector, foreign exchange constraints, and capacity utilization and state investment in the manufacturing sector. The Chapter will not discuss major potential investment options, which are covered in Chapter 9 below. Additionally it will, as far as possible, avoid duplication of material already available such as the Whitsun Foundation, Trade and Investment in Zimbabwe: Volume II, Investment published in 1982.

The importance of investment

Capital investment provides the physical material resources required for the manufacture of products. Conventionally resources are subdivided into land and building, plant and equipment, vehicles and office equipment and furniture. For Zimbabwe's manufacturing sector aggregate data suggest that the value of the different components of capital utilized are approximately: land and buildings, 30 percent; plant and equipment, 61 percent; vehicles and associated implements, 6 percent; and office furniture and equipment, 3 percent. Clearly, however, the utilisation of different capital resources will vary, depending on a range of factors including the type of product manufactured and its quality requirements, the size of plant, the volume of production, the availability and cost of different types of capital, projections of demand for the product manufactured in different markets and the type of capital, especially plant and equipment, utilised by manufacturers producing similar or substitute products. To the extent that consumers of the products of industry are free to choose alternative products and to the extent that manufacturers wish to sell their goods on world or regional markets, then the choice of capital equipment will be seriously constrained and options about choice of manufacturing process and technology narrowed considerably.

Investment levels ultimately determine the maximum achievable level of output. Providing machines are working efficiently, labour is in plentiful supply, the labour force has the skills to operate the machines and is working to the best of its ability and raw materials are available, then a factory is able to produce a certain quantity of goods and no more. Once this maximum level is achieved then output can only be increased by expanding the physical capital, be it the land and buildings, the plant and equipment, the vehicles or the office equipment - whichever is providing the critical constraint.

Now all this may sound astoundingly obvious, but it needs to be restated to avoid falling into the mechanistic trap of assuming that the key to expanding output lies exclusively in encouraging new investment. In certain circumstances expanding investment could be an extremely foolish policy prescription - for example, if applied to most of sub-Saharan Africa, whose factories are working on average at less than 50 percent of capacity and when new investment would require large outlays of foreign exchange of which there are acute shortages. It would be equally foolish to invest in new plant and equipment if the required increased level of output could be obtained by repairing damaged plant and equipment already in place, if the purchase of second-hand equipment could achieve the output required at half the cost, or if the major constraint to raising output lay in inadequate and incompetent managers, workers or engineers.

One must not, however, swing too far in the other direction to believe that capital is somehow unimportant. Capital is important but it needs always to be assessed in terms of efficiency in utilisation. In terms of efficiency, both for an individual factory and for a country as a whole, there would appear to be four stages of priority. Firstly, ensure that the capital one has is being used efficiently and that it is accorded the correct care and attention for it to operate properly and for as long as possible. Secondly, ensure that parts that break down can be replaced. Thirdly, if output expansion is required see if this can be facilitated by acquiring second-hand capital equipment providing the product manufactured is adequate to the market needs and that it has a reasonably durable life. And fourthly, if new plant and equipment is required, either to replace old and now redundant capital to maintain present production levels or to expand production, then shop around to find the best suitable available at the cheapest price, paying particular attention to costs and availability of spares, and replacement costs. This

last stage has critically important national implications for the costs of carrying spares for a whole range of models of machines and vehicles can be, and often are, very high. And for each stage of assessment it is clearly essential to have trained personnel who have the expertise and information to make the correct decision.

The lessons to be drawn from priorities one and two above are similar to those being applied everywhere in health care: aim first for preventative medicine before curative medicine. It is in economic terms far more cost efficient to maintain present plant and equipment through supplying spares and replacement parts than it is to run-down the plant through lack of these items and then have to replace the whole plant. All things being equal then, the allocation of funds for investment should ensure first of all, that present levels of potential output are maximised through giving priority to spares and replacement capital and to ensuring there is adequately trained manpower to achieve these levels, and only thereafter should attention be turned to new projects provided one is fairly certain that present - and well-cared for - equipment is achieving its highest achievable output levels.

In short, the importance of capital investment lies in its necessity for achieving given levels of output and, if increased, its potential for raising output levels. And these factors are dependent upon both the amount and quality available and the efficiency with which it is used.

Why companies invest

It is widely asserted that investment levels in Zimbabwe are too low, implying usually, that with higher levels of investment, output will expand to the national benefit and that given projected demand requirements investment and output need to expand. As will become apparent in a later section of this chapter, this is a general conclusion with which we fully concur. This sectional heading 'Why Companies Invest' thus appears to contain an implicit value judgement, if we know what makes companies invest and work to remove the major impediments, than we can expect them to increase their levels of investment. Before discussing this central issue, we look at an opposite phenomenon: over-investment.

The issue of "over-investment" can be simply stated and it is this: If capital, and especially the plant and equipment component of investment, is essential to the operations of a manufacturing firm and if, through foreign exchange controls and shortages, the manufacturer cannot guarantee the supply of spares and replacements for his plant and machinery, then (provided the cost of the plant and machinery or car of telephone or computer terminal or whatever is small in relation to overall turnover) he will try to ensure that his capital stock is in excess of what his needs would be in the absence of scarce supply and current shortages. The greater the likelihood of shortages and the more severe the expected cuts in foreign exchange are, then the larger is the excess-to-normal -capital the manufacturer will wish to carry to ensure that production is not hindered by shortages. Thus shortages of foreign exchange for capital needs are likely to increase the demand for capital. This simple truth has led in recent times to an expansion of the field of the economics of stock control. The Nissan car assembly plant just outside Tokyo carries only half a day's stocks of the components it needs for plant assembly (including spares) as there are effectively no gaps in delivery time. The general point is this: shortages of plant and equipment have the perverse effect of increasing the demand for such plant and equipment. And in present-day Zimbabwe there is a twist to the story. Given the shortages in foreign exchange for capital equipment there is a tendency to purchase equipment under commodity import programmes in excess of "normal" needs which the donor country will be only too willing to supply. And it is not only in the manufacturing sector that this occurs; discussions with experts at the University indicate that farmers are attempting to acquire tractors in excess of their previous demands for tractor-power for precisely the same reasons, namely the difficulty in obtaining tractors. This is in fact often the rational response of an astute manager, be he in the public or private sector, to changing market conditions. To maintain allocations of spares and isolate them from overall cuts in foreign exchange should go part of the way to eradicating the costs of this sort of action.

But to return to the general discussion of this section, what motivates companies in the manufacturing sector to invest money in capital purchases? For ease of reference the main factors will be listed in note form.

1. The basic reason for wishing to invest is related to medium to long term profit expectations including market share assessments. These expectations and assessments will be based largely on a projected after tax rate of return on

capital invested that will be critically related to price profiles of both outputs and inputs and of all other anticipated costs. The basic reason could relate to increasing product quality or reducing input costs - the latter could be a result of increasing labour costs brought about by wage increases or difficulty in firing excess labour. Normally, a company will first assess replacement capital requirements prior to embarking on new capital investment, especially if the new capital investment is determined by assessments of capturing a market share from competitors. The ordering of capital investment decisions by priority would be: to fulfil replacement capital needs, to accommodate easily predicted increases in domestic demand, to attempt to capture a greater share of the domestic market, and lastly, to venture into or expand further in the export market. (In certain subsectors where the regional export market is not very competitive, these last two priorities would be reversed.)

2. It should be stressed that many decisions to invest, especially by an industrialist not producing a monopoly product, are directly affected by decisions of other firms in the sector. If one company has invested in new plant producing higher quality product then that will be a major incentive for other firms to follow.

3. Another area of investment-decision relates to moving into a new field of operation altogether. Here the general guidelines are that the larger is the financial outlay, the lower should be the risk and/or the higher the potential financial returns, preferably with a shorter pay-back period. In Zimbabwe not only would these sorts of decision require governmental approval but, importantly, they are unlikely to be embarked upon without fairly specific indications of government backing. Joint venture status with government would in general provide this sort of assurance for the private investor.

4. As contrasted with the desire to invest, the basic reasons for going ahead with the investment are: a) that government permissions have been obtained, and b) the company has the access to funds to finance the investment. As regards the latter issue, discussions with bankers confirm replies to CZ1 surveys that the vast majority of manufacturing

firms use internal funds to finance investment rather than using bank over-draft facilities. This is itself confirmed by the data in Table 12.1 below, which indicates the gap between commercial bank lending to the manufacturing sector and gross fixed investment.

Table 12.1: Gross capital formation and commercial bank advances to the manufacturing sector 1979 - 1982 (\$ million)

	Investment	Commercial ¹ Bank lending to Manufacturing	Difference
1979	51	75.0	-24
1980	124	67.5	56.5
1981	204	103.6	100.4
1982	168	110.2	57.8
1983	163	127.2	35.8

Source: Monthly Digest of Statistics, December 1984, Tables 8.4 and 19.3 and unpublished data supplied by the CSO.

Note: Of course, bank lending is not only provided for investment. In 1979 and 1983 especially, a proportion would have gone to assisting firms in difficulty due to the recession.

The fact that firms do tend to use internal funds for investment indicates that investment decisions are based on the present and more immediate past performance of the industry. Thus, expansion and good results are a fundamentally important criterion for investment by private sector firms to take place. As regards government permissions to invest, more will be said in the next section; suffice it to note here that far more investment requests have been submitted by private manufacturing firms in recent years than have received project approval.

There is then, a complex inter-relationship between investment and output. Companies will invest if they have the funds to do so, (i.e. if output has been buoyant in the past) and, additionally, if they believe future output levels will be high enough to achieve the rate of return deemed necessary for the investment decision to have been made. However, past

performance, if it has led to low profit levels, need not entail a binding constraint on present and future levels of investment if funds are available from outside the company (for example, from the banking sector) and if companies are willing to risk borrowing funds for investment purposes. However, if this course of action is to be followed, then the future returns from anticipated output levels would need to be far more secure than if only internal funds are available and to be used.

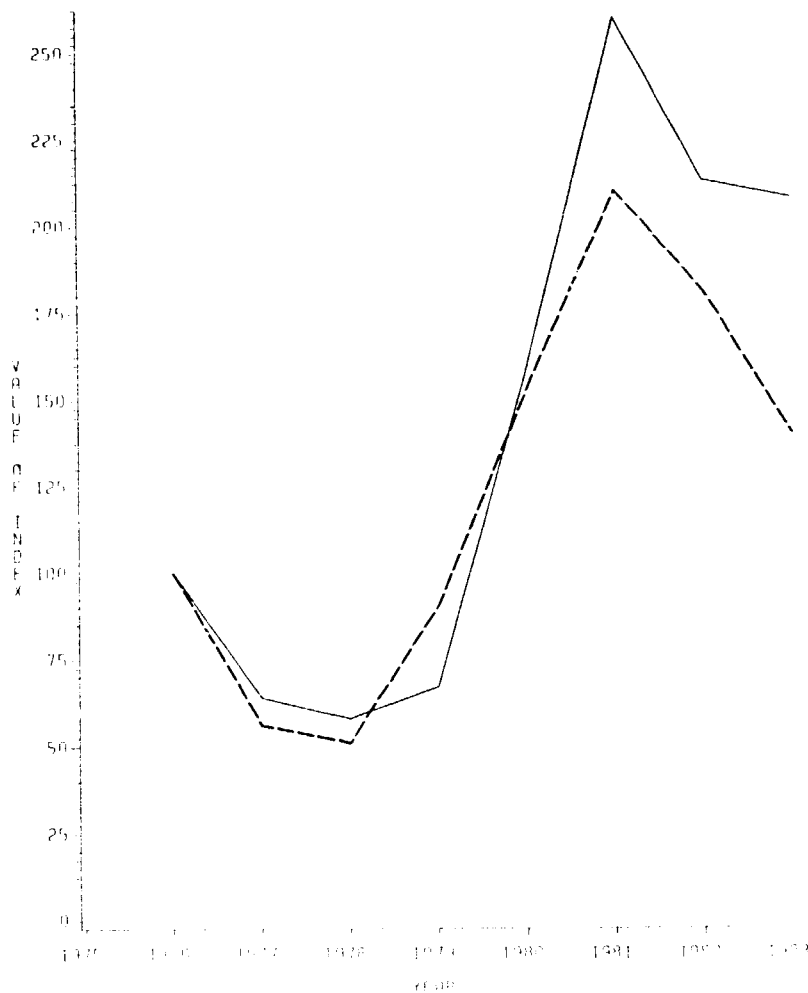
What has been impeding higher levels of investment

There would appear to have been three major factors that have impeded higher levels of investment in the manufacturing sector. These are: the contraction of the economy in general, including a fall in aggregate demand and of the manufacturing sector in particular; government policy and decision-making and foreign exchange shortages. Although they will each be discussed separately, there are close links between them.

There can be no doubt that a major influence in the level of investment in the manufacturing sector is the availability of funds for investment, especially among present manufacturers, but also among the wider investing community. When the sector was contracting in the late 1970's, profit margins were squeezed and investment levels dropped dramatically. As the sector expanded in the 1979-1980 period, investment increased and, finally, as contraction commenced again after 1981, investment levels began to fall. This relationship is shown quite clearly in the graph reproduced below which records variations in corporate profitability and manufacturing investment. It reveals the close relationship between the two indices up to 1980 and since then suggests that investment levels have held up well in terms of corporate profitability contractions.

Now the "availability of funds" component encompasses two elements: the availability of finance to purchase capital and the availability of foreign exchange to pay for that element of capital that needs to be imported. The foreign exchange shortfall can also be a critical constraint on investment levels. Additionally, shortages affecting the foreign exchange component of overall investment are likely to have a direct effect on the other part also.

GRAPH OF PRE TAX PROFITABILITY AND MANUFACTURING INVESTMENT
 INDICES 1976-100



LEGEND: INVESTMENT — INVESTMENT — PROFITABILITY
 SOURCE: MANUFACTURING INVESTMENT IN ZIMBABWE, DEC. 1989, TABLE 2.4
 AND DATA SUPPLIED BY CSO AND STANDARD CHARTERED BANK
 CORPORATE PROFITABILITY INDEX BASED ON PERFORMANCE OF 45 COMPANIES

Note: Corporate Profitability index based on the performance of 45 Zimbabwean public companies.

For example, a manufacturer is less likely to go ahead and purchase or at least develop new land by erecting a factory if he is not assured that he will be able to fill the factory with the plant and machinery that has to be imported and, because of foreign exchange shortages, cannot be purchased. Also, he is unlikely to purchase plant and equipment available locally if parts critical to production and that have to be imported are denied him. In other words, the shortage of foreign exchange will have a far wider effect on overall investment levels than the percentage foreign exchange component to that investment would suggest. For example, if the foreign exchange component of total investment in the manufacturing

sector, including plant and buildings, office equipment and furniture as well as plant and machinery, is 30 percent, then if only 10 percent of the foreign exchange required is available, overall investment could well be reduced not by 20 percent but by 40 percent or more.

Discussions with both manufacturers and with government officials indicate clearly that foreign exchange shortages have been a major constraint impeding higher levels of investment in the sector. In 1983 and 1984, the foreign exchange component of industrial projects submitted to the Industrial Projects Committee was some 70 percent of the total project value. Additionally, it appears that some four times more projects are submitted for project approval than are in practice currently approved, largely though by no means exclusively because of foreign exchange shortages.

The third major constraint listed above was termed government policy and decision-making. Clearly, failure to approve project requests is an area of constraint on rising investment levels imposed by government, although this is commonly based on wider economic pressures beyond the responsibility of the Ministry of Industry and Technology. However, it is pertinent to point out that the allocation of all foreign exchange is controlled by government. It is submitted that allocations for investment in the manufacturing sector should be a major priority, indeed, that it should receive a higher priority rating than appears to be the case at present, a point that will be expanded upon later in the present chapter.

But the issue here is a wider one and concerns the inter-relationship between the decision to invest based on profit expectations of present and potential manufacturers and government policy and practice. There is no doubt that present and future levels of investment are being adversely affected both by a lack of declared intention about the direction and ownership structure of the manufacturing sector, and also by a conflict between shorter term policy measures adopted that directly affect the sector and the long term goal of promoting investment expansion. The first aspect centres around the failure, to date, to have enunciated a detailed industrial strategy. Specific problems this throws up for investment are the following: uncertainty about which sub-sectors are to be favoured for expansion, uncertainty about the future pattern of direct state involvement in the manufacturing sector, uncertainty about critical financial aspects directly or indirectly affecting rate of

return analysis such as taxation levels, initial allowances, profit repatriation and definitions of foreign/local enterprises. These types of uncertainty particularly discourage potential investment for expansion or for establishing high-cost projects for new product development, although if replacement capital expenditure is costly these uncertainties are also likely to affect this part of the decision to invest.

For potential foreign investors these uncertainties are fuelled by others, which, whatever their objective merit, do inhibit the desire to view Zimbabwe as a fertile field for investment. These additional uncertainties include the manner in which the country is portrayed in certain influential parts of the foreign press that highlight domestic instability or give a high profile to statements by government ministers that suggest that the private sector's life in Zimbabwe is to be shortlived. Regrettably what is not important for the potential investor is whether these portrayals of Zimbabwe are correct or not. As long as he believes them to be true they will profoundly influence his views of the country. Another particular concern of potential foreign investors is the failure, as yet, of the government either to produce an investment code or, additionally, to sign the United States Overseas Private Investment Corporation (OPIC) agreement. Again, whatever the reasons given by Government for not initiating these steps, it has to be recognised that for potential investors, the signing of these agreements is viewed as a barometer of the country's acceptability for investment.

Even if these uncertainties are removed, however, one should not thereafter be overly sanguine that new private foreign investors will arrive in their droves. The international climate is far less encouraging for private investment than in the 1970's and particularly the 1960's and 1950's when most new foreign investment in Zimbabwe's manufacturing sector took place.^{1/} If new foreign investment is to come to Zimbabwe it needs to be encouraged to do so. This can best be done by identifying specific areas and projects where new foreign investment is deemed to be required, by specifying the returns to investment to be made and, finally, by identifying those foreign concerns that could be encouraged (or be persuaded) to invest in these concrete areas of activity.

The other broad area of negative government policy influence on raising investment levels concerns the conflicts between short-term policy measures and investment. As was observed in Chapter 6, even though there may be good reasons for implementing specific policies, it is important that the negative effects

resulting from some of these policy measures on investment levels should be highlighted. Investment decisions, as we have already observed, are based on medium to long-term profit expectations. Where government policies either lower expected future profits or put them in question, then these policies clearly deter investment. Some of the main uncertainties or negative influences here include the following:

- delays in granting price increases and uncertainty over the method used in arriving at specified price increases;
- lack of predictability concerning labour and wage matters including lay-offs, wage freezes, minimum wage increases, recruitment of foreigners, and the status of the Special Initial Allowance;
- uncertainty over future electricity tariffs;
- concern about future levels of normal foreign exchange allocations including those for spares and replacement parts;
- uncertainty about economic relations with South Africa;
- uncertainty concerning possible state participation or direct involvement in the industry.

Finally, it needs to be stressed that an underlying assumption of this discussion is not to suggest that these uncertainties either should be or necessarily can all be removed or eliminated. However, if investment is to be encouraged and increased, then it is essential to have analysed the main constraints that are currently inhibiting higher levels of investment from taking place and to have reached the firm conclusion that the reasons that have led to imposing policies which are constraining investment outweigh the costs of the lower investment levels that result.

Investment requirements for the manufacturing sector

The investment requirements for the manufacturing sector are dependent upon assessments of a number of variables, none of which, regrettably, are known with any precision. These include: an assessment of the assumed backlog of replacement capital needs that has built up over a number of years due to previous shortages of foreign exchange and, at various times, to depressed economic conditions which have led manufacturers to hold back on replacing capital equipment; an assessment of the 'normal' capital replacement needs of the sector and finally, an assessment of the likely expansion of capacity needed to meet expected demand for manufactured products in both domestic and export markets.

Traditionally, capital requirements are commonly assessed by analysing historical data of annual capital investment made and output achieved to derive incremental capital/output ratios which, on the assumption that they remain unchanged, are then projected forward on the basis of assumed future output. This methodology is crude at the best of times; it is particularly problematic for Zimbabwe because of the volatile nature of previous investment levels in the manufacturing sector and because it is feared that the considerable backlog in replacement capital needs is concealed in recent levels of investment. The volatility of investment in the manufacturing sector is revealed in Table 12.2 which shows annual net capital investment in fixed (1982) prices over the past 14 years, between 1970 and 1983.

For total investment, the annual figures (at constant 1982 prices) have varied nearly fivefold from a low of \$73 million in 1979 to a high of \$340 million in 1975, the variation in different categories of investment, such as land and buildings being even greater. Even when four year averages are used to attempt to smooth out annual variations, wide fluctuations are also revealed. For example, average investment over the period 1980-83 was 40 percent higher in constant prices than in the period 1976-79 and 37 percent lower than in the period 1972-75. There also appear, to be large fluctuations between changes in output in the sector and changes in net annual investment. For example, between the periods 1976-79 and 1980-83, output volume rose 30 percent, and net investment by 49 percent. However, comparing the period 1976-79 with 1972-75, output volume fell 6 percent and net investment fell by 58 percent. Finally, the figures show that investment levels at constant prices have changed by some 20 percent every year in the past five years (1979-1983) so to select any one year as a basis for future projections would appear to be extremely arbitrary, since altering the base by a year would lead to vast differences in the projections.

The figures shown in Table 12.2 are also problematic as a basis for ascertaining future investment needs because the published investment data do not provide a breakdown of investments distinguishing between new and replacement investments made. Even in the period 1976-1979 when investment levels were at their most depressed, new project investment was taking place; hence these figures would not be reflective of replacement investment undertaken, nor especially of replacement investment required given both depressed profit levels and cuts in foreign exchange allocations for replacement machinery.

**Table 12.2: Net capital investment in the manufacturing sector,
1970-1983 at constant (1982) prices
(\$ 000's)**

Year	Land & Buildings	Index 1983 =100	Plants & Equipmt	Index 1983 =100	Vehicles	Index 1983 =100	Total Net Investment	Index 1983 =100	Volume Index of Production 1983 = 100
1983	42,652	100	78,047	100	10,890	100	131,589	100	100
1982	48,078	113	96,339	123	24,100	221	168,517	128	103
1981	67,573	158	138,464	177	25,628	235	231,665	176	103
1980	48,014	112	102,065	131	20,138	185	170,217	129	106
1979	17,901	42	44,716	57	10,253	94	72,870	55	82
1978	26,830	63	49,359	63	9,276	85	85,465	65	75
1977	48,554	114	64,287	82	9,611	88	122,452	93	77
1976	61,208	144	116,207	140	12,627	116	190,042	144	81
1975	115,505	271	204,769	262	20,195	185	340,469	259	86
1974	93,938	129	196,684	252	17,462	160	308,084	234	89
1973	54,404	127	210,097	269	21,208	195	285,709	217	83
1972	38,978	91	115,413	148	16,631	153	171,022	130	77
1971	49,788	117	90,673	116	14,088	129	154,549	117	69
1970	44,383	104	69,903	89	15,179	139	129,465	98	63
Averages:									
1980-83		121		133		185		133	103
1976-79		91		88		96		89	79
1972-75		154		233		173		210	84

Source: Net Capital Investment at current prices 1970-1982: Census of Production 1982/83, Table 7 and Census of Production 1977/78, Table 7; 1983 figure for total investment supplied by CSO, the sub-divisions based on past average investment. All figures deflated using separate deflator provided by CSO for 1983-1969, rest deflated using GDP deflator. Volume Index of Production from Monthly Digest of Statistics December 1984 and various past issues.

If past investment and output performance give little information on which to project present and future investment requirements then upon what basis can these requirements be estimated? One approach could be based on the distinction between replacement and new investment. If the manufacturing sector is projected to expand beyond the maximum levels of output previously achieved and on the assumption that a given level of additional output requires a given level of additional investment, then it can also be assumed that this additional output can only be reached with new investment. The quantity of new investment required will have some relationship to the level of additional output to be achieved. However, over and above the requirements for new investment to achieve additional levels of output, investment will also be required to replace capital that is old, worn-out, or obsolete. This replacement investment is needed just to maintain output at previous levels; without replacement investment the efficiency of the capital stock will decline and so will output levels.

One way of ascertaining the replacement capital needs of the sector is to ask firms currently engaged in manufacturing what their replacement capital needs are. A sample survey carried out by CZ1 in 1982 did precisely this: asking firms what their replacement capital needs were for the years 1983, 1984 and 1985.^{2/} On the assumption that the sample results were representative of the manufacturing sector as a whole, they indicated that the replacement capital requirements were as follows:

Replacement Capital	
<u>Year</u>	<u>Requirements in \$ million (in 1982 prices)</u>
1983	112.2
1984	115.7
1985	88.1

These results and additional information provided reveal a number of important factors. Firstly, it is to be observed that, in fixed price terms, replacement investment needs drop considerably in 1985. This supports the widely-held view that there is a backlog of replacement investment requirements to be made-up. This is additionally confirmed by analysing responses to the question of why capital needed to be replaced: 61 percent because capital was worn out, 18 percent because no spare parts are available,

11 percent because present plant and equipment is too costly to operate and 7 percent because productivity levels are too low, with presently installed capital, to maintain competitiveness. Secondly, replacement capital needs appear to be high in absolute terms, amounting on average to some \$100 million a year at fixed prices according to the Survey results. This suggests that considerable investment outlays would be required simply to maintain production at historical levels.

There is, however, reason to believe that the figures given for replacement investment requirements for the sector given in the survey are too low. One reason relates to the analysis conducted for the preparation of figures presented in the Transitional National Development Plan. Volume I of the Plan states that: "in view of the current state of the economy's capital stock, it is intended that repair, maintenance, modernisation and refurbishing will absorb roughly two-thirds of total investment while new capacity will absorb the remainder" (\$5.22). Using this ratio for the projected investment figures given in the Plan for the manufacturing sector suggests that replacement investment requirements were as follows: 1982/83, \$176 million; 1983/84, \$191 million and 1984/85, \$206 million - all in 1981 prices. Actual total investment was \$205 million in 1981, \$122 million in 1982 and \$97 million in 1983, all in 1981 prices, indicating a substantial under-investment in terms of replacement capital needs and therefore an increasing backlog of replacement investment requirements.

Another way of trying to judge the replacement investment requirements of the sector is to base these requirements on capital stock figures. Using CSO estimates of capital stock in the sector for 1962, adding net capital investment from 1962 to 1982 and inflating this annual data to 1982 prices gives a crude estimate of the capital stock of the sector at 1982 prices. These estimates are reproduced in Table 12.3, giving a breakdown by broad sub-sectoral group and by type of capital employed. Although the figures reproduced may not be an accurate reflection of present levels of capital stock, because they ignore in part depreciation, and the capital stock is not necessarily adequate even for present requirements, they do provide comparative insights into the capital currently utilized by the sector. In general, they reveal that land and building and plant and equipment are far more important elements of total capital stock than vehicles; however, the proportions attributed to land and buildings and plant and equipment

respectively vary widely between sectors. Using the 11 sector classification, sectors 1, 2 and 10 especially (foodstuffs, drink and tobacco and transport equipment) have almost equal shares of each by value, but sectors 3, 7 and 9 especially (textiles, chemicals and metals and metal products) have a far higher proportion of total capital stock in the plant and equipment sub-category. The figures also show the share of total capital stock between sectors: sectors 1, 7 and 9 (foodstuffs, chemicals and metals) utilize over 60 percent of total capital and are responsible for 58 percent of investment in land and buildings and 63 percent of total investment in plant and equipment. One final word of warning about these figures (besides the ones made above) needs to be given and it is that they reveal only a static picture - giving capital stock figures for the year 1982. This necessarily leads to distortions, especially when intensive investment has taken place in recent years. For example, the figures in Table 12.3 show that the plant and equipment capital stock in the textile sector in 1982 exceeded in value that for the foodstuffs sector. A major reason for this lies in the large amounts of capital invested in the textile sector in recent years, amounting to \$76 million in 1982 prices in the three year period 1980-1982 - some 30 percent of the total capital stock for plant and equipment for that particular sector.

Calculating capital stock values is but one step in attempting to ascertain the replacement investment requirements of this stock of existing capital. One needs in addition to know the rate at which the different categories of capital stock-buildings, plant and equipment and vehicles - require to be replaced. Clearly a vehicle is likely to end its viable productive life sooner than a building while certain types of machinery will be productive for a longer period - perhaps decades longer - than other types of machinery. In Zimbabwe today there are a variety of pieces of machinery such as presses, lathes and punches that were made in the 1920s and 1930s and which the management of companies using them wouldn't part with for the world. Lemco in West Nicholson uses a machine to extrude OXO-Cubes which was made during the first world war, originally to pack gunpowder into shells, and it is still functioning. Clearly there is no accurate substitute for calculating the replacement requirements of capital, other than finding out from each manufacturer what his/her replacement requirements are, and if investment planning is to take place with any degree of sophistication then this information should be provided as a matter of priority.

Table 12.3: Capital stock estimates for the manufacturing sector,
in 1982 at 1982 prices
(\$ 000's)

Sub-Sector	Land & Buildings (1)	% of Total (2)	Plant and Equip. (3)	% of Total (4)	Vehicles (5)	% of Total (6)	Total Capital Stock (7)	% of Total (8)	Percentage Distribution by Sub-Sector		
									Land and Bldgs (9)	Plant and Equip (10)	Vehicles (11)
1	254,026	21.8	251,785	10.9	67,330	23.3	573,141	15.2	44.3	43.9	11.8
2	136,893	11.7	163,558	7.1	40,753	14.1	341,204	9.1	40.1	47.9	11.9
3	106,483	9.1	247,462	10.8	8,962	3.1	362,907	9.7	29.3	68.2	2.5
4	41,158	3.5	68,753	3.0	9,967	3.4	119,878	3.2	34.3	57.4	8.3
5	24,913	2.1	43,026	1.9	15,660	5.4	83,599	2.2	29.8	51.5	18.7
6	47,514	4.1	127,884	5.5	13,937	4.8	189,335	5.0	25.1	67.5	7.4
7	133,580	11.4	337,085	14.6	36,781	12.7	507,446	13.5	26.3	66.4	7.3
8	81,086	7.0	138,347	6.0	23,743	8.2	243,176	6.5	33.3	56.9	9.8
9	292,787	25.1	866,150	37.6	59,936	20.7	1,218,873	32.4	24.0	71.1	4.9
10	40,767	3.5	36,792	1.6	8,475	2.9	86,034	2.3	47.4	42.8	9.5
11	7,223	0.6	20,111	0.9	3,428	1.2	30,762	0.9	23.5	65.4	11.1
Total	1,166,430	100.0	2,300,953	100.0	288,972	100.0	3,756,355	100.0	31.0	61.3	7.7

Source: Census of Production 1982/83, Table 7, Census of Production 1977/78, Table 7, Census of Production 1962, Table 8, Deflator for each year 1962-1982 provided by the CSO: separate deflators for Land & Buildings, Plant & Equipment and Vehicles provided for 1969-1982, GDP deflators used for earlier years.

In the absence of such data it is possible, using capital stock figures and applying varying depreciation rates to the different sub-categories of capital investment, to estimate the annual replacement requirements of manufacturing industry. This has been attempted and the figures calculated are reproduced in Table 12.4. For Land and Buildings, a depreciation rate of 1.5 percent is used - a five percent depreciation rate for buildings is used in present day Zimbabwe; the 1.5 percent figure is taken to allow for land appreciation, but is probably a low estimate. For vehicles, capital stock values for the previous 12 years are aggregated and a 10 year straight-line average replacement rate is assumed - far longer than in the industrialised world and probably ever longer than the actual replacement rate for manufacturing industry in Zimbabwe. For plant and equipment, different replacement rates are shown - 1 percent, 3 percent and 5 percent - the chosen rates being representative rates currently used for two large industries in Zimbabwe today.^{3/}

It needs to be emphasized that the figures given in Table 12.4 will underestimate the actual replacement needs of the sector for three main reasons. Firstly, the depreciation rates selected have been deliberately pitched at a low level to avoid any possibility of exaggerating the replacement requirements. Secondly, basing future replacement needs on current capital stock figures has a built-in assumption that there is no accumulating backlog of replacement requirements. As there is in fact a serious backlog of replacement investment needs, then over the short-term (that is until the backlog has been made up) the figures given will be far too low while over the longterm the historical figures available will be biased marginally on the low side. Thirdly, and perhaps most importantly, this methodology of calculating replacement capital needs is completely unrelated to market needs. Replacement of capital could be and frequently is required not only because plant is old and worn out but because the production methods used are inappropriate. Inappropriateness itself could relate to a number of factors such as product quality, new product requirements, the desire to maintain export competitiveness when new competitors are replacing their old capital or the desire to enter export markets which would require better production techniques. Again, it needs to be repeated that there is no accurate substitute for calculating investment requirements other than by analysing the specific requirements of particular firms.

If there is one general conclusion to draw from this part of the discussion on investment requirements it must be that at present the published statistics are far from adequate for planning the replacement investment requirements of manufacturing and its constituent branches.

Replacement investment requirements are but one aspect of the overall investment needs of the manufacturing sector. Another major investment need is for the additional capital required to meet the expansion needs of the sector. One method of approach in estimating this particular type of investment requirement is to consider future output growth and compare it with the previous peak in past output. In 1984, the volume index of manufacturing production was 102.1 (1980 = 100), compared with 105.8 in 1983, 108.7 in 1982 and 109.4 in 1981, the most recent peak level of the overall volume index. Now taking 1984 as the base year and assuming that capital replacement needs have been met then one can also assume that the sector as a whole has the capacity to expand production up to the previous past peak level without having to invest in new capital. However, once that peak has been reached then new capital will be required to provide the resource base for expanding output levels. More detailed data can be obtained by examining output levels by individual sector of manufacturing and seeing when output levels as high as previous peak levels of output are reached. Table 12.5 uses this technique and examines anticipated output levels in 1990 and 1995 on the assumption of first a three percent annual growth rate in each sector and then of a five percent annual growth rate in each sector. The figures indicate that for an annual three percent increase in output, overall output in 1990 would be 11.4 percent higher than the previous peak and just over one quarter above the previous peak by 1995. With an annual increase in output of five percent, output would be a quarter above the previously recorded peak by 1990 and just over one half above it by 1995. The sectoral data show that on the assumption of a three percent annual growth rate, sectors 4, 5, 6, 8, 10 and 11 will not have reached their previous output peaks by 1990, but this group is reduced to sectors 8, 10 and 11 by 1995.

On the assumption of a five percent annual growth rate, all except sub-sector 11 will have passed their previous peaks of output by 1995 and six sub-sectors, 1, 2, 3, 6, 7 and 9 will have increased output levels by over one third above previous peaks by that date.

Table 12.4: Crude estimates of annual replacement capital requirements of the manufacturing sector at 1982 prices: varying assumptions

Sub-Sector	Land & Buildings	Vehicles	Plant & Equipment			Estimated Total Requirements with plant and equipment replacement rates		
			@ 1%	@ 3%	@ 5%	@ 1%	@ 3%	@ 5%
1	3.8	5.3	2.5	7.6	2.6	11.6	16.7	21.7
2	2.1	2.9	1.6	4.9	8.2	6.6	9.9	13.2
3	1.6	0.6	2.5	7.4	12.4	4.7	9.6	14.6
4	0.6	0.6	0.7	2.1	3.4	1.9	3.3	4.6
5	0.4	1.3	0.4	1.3	2.2	2.1	3.0	3.9
6	0.7	1.0	1.3	3.8	6.4	3.0	5.5	8.1
7	2.0	2.7	3.4	10.1	16.9	8.1	14.8	21.6
8	1.2	1.7	1.4	4.1	6.9	4.3	7.0	9.8
9	4.4	5.0	8.7	26.0	43.3	18.1	35.4	52.7
10	0.6	0.6	0.4	1.1	1.8	1.6	2.3	3.0
11	0.1	0.2	0.2	0.6	1.0	0.5	0.9	1.3
Total	17.5	21.9	23.1	69.0	115.1	62.5	108.4	154.5

Source: Table 12.3 above

Table 12.5: Volume indices of output levels by manufacturing sector, in 1990 and 1995 based on a 3 per cent and 5 per cent annual growth of output

Sub-Sector	1984 Volume Peak Level (1)	Previous Record Peak Level (2)	Projected Index Level at 3% Annual Growth Rate				Projected Index Level at 5% Annual Growth Rate				
			1990 Index Level (3)	1990 % Increase Over Previous Peak (4)		1995 % Increase Over Previous Peak (6)		1990 Index Level (7)	1990 % Increase Over Previous Peak (8)		1995 % Increase Over Previous Peak (10)
				1995 Index Level (5)	1995 % Increase Over Previous Peak (6)	1995 Index Level (9)	1995 % Increase Over Previous Peak (10)				
1	119.4	126.9	142.6	+12.0	160.4	+26.3	160.0	+26.1	194.5	+53.3	
2	86.8	100.0	103.6	+3.6	116.6	+16.6	116.3	+16.3	144.3	+41.3	
3	139.2	139.2	166.2	+19.4	187.1	+34.4	186.5	+34.0	226.6	+62.8	
4	99.9	128.4	119.2	-7.2	134.2	+4.5	133.9	+4.3	162.6	+26.7	
5	81.6	103.4	97.4	-5.8	109.5	+6.0	109.3	+5.7	132.8	+28.5	
6	93.0	112.4	110.0	-2.2	124.9	+11.1	124.6	+10.8	151.4	+34.7	
7	112.2	121.4	134.0	+10.3	150.8	+24.2	150.3	23.8	182.7	+50.5	
8	99.0	134.9	118.2	-12.3	133.1	-1.3	132.7	-1.7	161.2	+19.5	
9	89.4	104.8	106.7	1.9	120.1	+14.5	119.8	14.3	145.6	+38.9	
10	114.7	178.4	136.9	-30.3	154.1	-13.6	153.7	-13.8	186.7	+4.7	
11	50.9	100.0	60.8	-39.2	68.4	-31.6	68.2	-31.8	82.8	-17.2	
Total	102.1	109.4	121.9	+11.4	137.2	+25.4	136.8	+25.0	166.2	+51.9	

Source: CSO unpublished data for 1984 volume index and Monthly Digest of Statistics December 1984, Table 13.5 for previous peaks.

Output expansion is, of course, different from investment expansion. The critical question for policy purposes is to know the link between the two so that for different planned or projected output levels, different investment levels will be known. With this knowledge, steps can be taken and policies implemented to expand investment (if that is needed) or constraints to achieving these future investment streams can be pinpointed. The relationship between output and investment will - to repeat points made earlier in this chapter - depend upon the efficiency with which the capital in place is utilized, which itself will be dependent upon a range of factors such as labour and management skills and adequate spares, and additionally on the technological methods used in the production process. This latter point is important because, over time, technological developments tend to improve the efficiency of capital and to alter past capital/output ratios. What all this means is that the past relationship between capital and output is only useful as a guide to future relationships between the two to the extent that the efficiency level of capital utilization remains the same and to the extent that there are no technological improvements. Planners would tend to be unhappy about working with either of these assumptions: to the extent that present and past capital/output ratios were reflective of inefficient capital utilization, planners would wish to raise that level of efficiency. Especially in a world of competition and whose technological improvement leads to increasing product quality desired by consumers, planners would also wish to promote technological improvements in capital usage.

In spite of these difficulties, planners tend to use past capital/output ratios to project future levels of investment because this ratio tends to provide the best available proxy for future trends. The figures reproduced in Table 12.2 above and the discussion of them indicated forcefully that incremental capital and output ratios have been so volatile in the history of Zimbabwe's manufacturing sector as to provide no useful guide for projecting future needs. For this reason the approach adopted here in the attempt to derive some relationship, however crude, of the link between increases in output and new capital investment required is to use average capital/output ratios based on capital stock figures, using the three percent and five percent assumed growth rates for the manufacturing sector to 1995. Table 12.6 provides crude estimates of the new capital required each year at 1982 prices to sustain these respective output increases. The figures, like those for output in Table 12.5, above, are based on the additional assumption that no

new investment is recorded in a particular sub-sector until the previous output peak has been reached. Columns (3) and (5) of Table 12.6 indicate that on the basis of 10-year average capital/output ratios based on capital stock estimates, \$70 million at 1982 prices would be required each year in new investment to achieve a three percent annual growth of output and that \$173 million would be required each year in new capital investment also at 1982 prices to achieve a five percent annual growth of output. One point to note at once, even if the figures given are inaccurate, is that as future output levels are raised then proportionately more new capital appears to be required to sustain that higher output.

Combining the data in Tables 12.4 and 12.6 gives crude estimates of the total future capital requirements for the sector - both replacement and new capital based on the various assumptions already discussed.

The figures reveal that total investment needs would range from a low of \$132 million a year at 1982 prices for a projected three percent annual output increase and a low of \$236 million a year at 1982 prices for a projected five percent annual output increase to a high of \$225 million a year at 1982 prices for a projected three percent annual output increase and a high of \$328 million a year at 1982 prices for a projected five percent annual output increase. If these figures are compared with past levels of investment at 1982 prices, reproduced in Table 12.2 above they do tend to suggest, especially if a five percent annual output increase is to occur, that investment levels for each year since 1975 have been woefully inadequate with the exception of the year 1982 when the critical figure was still not quite reached.

By way of summary we can raise again the question: how accurate are the figures reproduced in Tables 12.2 to 12.6 as a basis for planning policies for investment for the sector for the future? The quick answer is that their accuracy is unknown, the implication being that for sound and accurate policy planning more accurate data should be obtained, as has been stressed above. However, in the absence of any better information, the data could act as an initial guide to investment needs. And in using them as a guide some final points bear repetition. One is that the figures derived for replacement investment almost certainly underestimate replacement investment requirements

Table 12.6: Crude estimates of annual new capital requirements at 1982 prices to sustain 3 per cent and 5 per cent annual output increases to 1995 in \$ million

Sub-Sector	Estimated Output/Capital Ratio	% Increase in Capital Stock Required to Achieve 3% Growth of Annual Output to 1995	Annual Increase in Capital Required to Achieve 3% Growth of Annual Output to 1995 at 1982 prices	% Increase in Capital Stock Required to Achieve 5% Growth of Annual Output to 1995	Annual Increase in Capital Required to Achieve 5% Annual Output Growth to 1995 at 1982 prices
	(1)	(2)	(3)	(4)	(5)
1	1.38	19.1	10.0	38.6	20.1
2	0.74	22.4	6.9	55.8	17.3
3	1.01	34.0	11.2	62.2	20.5
4	1.91	2.3	0.3	14.0	1.5
5	1.37	4.4	0.3	20.8	1.6
6	0.96	11.6	2.0	36.1	6.2
7	0.75	32.3	14.9	67.3	31.0
8	0.46	-	-	42.4	9.4
9	0.66	22.0	24.4	58.9	65.3
10	0.90	-	0	5.2	0.4
11	1.53	-	0	0	0
Total	N/A	N/A	70.0	N/A	173.3

Source: Tables 12.3 and 12.5 and Census of Production 1962, 1977/78 and 1982/83, various tables.

Methodological Note: The respective Output/Capital ratios were derived by calculating the output and capital stock figures for each sub-sector and for each year from 1973-1982 and obtaining an arithmetic average for the 10 year period. The figures in Columns (2) and (4) were obtained by dividing the respective sub-sectoral O/K ratios of Column (1) into the volume output expansion estimates in columns (6) and (10) of Table 12.5. The figures in columns (3) and (5) were derived by multiplying the figures in columns (2) and (4) by the total capital stock figures by sub-sector for column (7) of Table 12.3.

at least in the short term - that is, over the next three or four years. The second is that to the extent that the replacement investment figures underestimate requirements, they would also tend to lead to an underestimation of future capital requirements because the output/capital stock ratios are themselves derived from present levels of capital stock. Thirdly, the estimations of future capital needs are based on the assumption that output expansion is a smooth process for each sub-sector. In practice past performance suggests that when output levels have fallen below peak capacity then output increases near to the previous peak is very rapid - if demand is sustained - as the volume index figures from 1979 to 1981 indicate clearly. Fourthly, all these projections make absolutely no allowance for major new investment projects in the future. And, fifthly, no allowance is made for substantially increasing manufacturing exports which would necessitate expansion over and above past trends that have been based on lower levels of exports. When all these factors are combined, they would suggest strongly that the estimates made here are an underestimation of future investment requirements. On the other hand, the fact that the data make no allowances for technological improvements would have the effect of over-exaggerating future investment requirements. However, evidence from other countries would suggest that dramatic changes in technology are unlikely to occur rapidly in all sectors of manufacturing at the same time. Hence, the practical likelihood of this factor nullifying the other biases can be discounted.

Capacity utilization, investment and foreign exchange shortages

If there is one area of economic analysis of the Zimbabwe economy that is the subject of widespread agreement it is that the prospects for increased growth are related closely to levels of imports and that import restrictions have a substantial effect on the economy's performance. For the manufacturing sector as a whole some 30 percent of raw materials used in the production process are imported. Therefore, cuts in foreign exchange allocations, depreciation in the currency and rising international costs of these raw materials all directly affect levels of production. But the import dependence link is also critical for investment. As Volume I of the Development Plan puts it: "the growth and development of the economy require substantial imports of machines, equipment and intermediate goods not produced locally ... (including) additional requirements for rehabilitating the capital stock for maintaining and expanding production" (S7.1). Recent submissions to the

Ministry of Industry and Technology suggest that in excess of 70 percent of the value of plant and equipment needs, be they for replacement or new plant and machinery, consists of the foreign exchange requirement. Given that capital investment in the sector is the foundation upon which output is both maintained and expanded it is thus apparent that foreign exchange provided for investment is a critical determinant of the viability of the sector, even if the results of shortages in this sphere are not immediately apparent. Indeed, it was intimated above that starving the sector of foreign exchange for its investment needs at the present time could lead to higher foreign exchange costs in the future as well, of course, of holding back future increased output.

Using the crude estimates referred to in Table 1.1 of Chapter 1 which indicated that of all investment in the manufacturing sector, some 36 percent constitutes the direct foreign exchange value of the capital investment (the figure being lower than the 70 percent one in the preceding paragraph because total investment includes that for land and building which has a lower direct foreign exchange cost than for plant and equipment) then the projected future investment requirements summarized at the end of the last section would clearly entail substantial foreign exchange. These would range from a low of \$47 million to a high of \$118 million a year, depending on depreciation rates selected and output growth rates chosen. Clearly, too, with substantial major additional investments planned for the sector these figures could increase five or sixfold with ease. Thus, further import substitution (for which there are substantial opportunities as enunciated in Chapter 9) will require yet more foreign exchange for capital imports in the initial stages even though in the longer term foreign exchange saving is expected.

Now this high and increasing demand for foreign exchange resources for capital investment in the manufacturing sector is occurring at a time of national foreign exchange shortages. The current account of the balance of payments has been under considerable strain for a number of years and import allocations have been drastically cut. The 30 percent increase in normal allocations for the second half of 1985 will ease, not by any means remove, this constraint. With a debt service ratio currently in excess of 25 percent and anticipated to be in excess of 20 percent at least until 1988, these strains are likely to add to already existing pressures on allocating foreign

exchange for manufacturing investment. The question this raises is how foreign exchange resources for manufacturing investment can be maximized in the foreseeable future. Two types of answers need to be examined: one concerns the possibilities of increasing foreign exchange for manufacturing investment, and the other concerns reducing the demand for foreign exchange for investment, if possible without reducing anticipated output levels.

One method of increasing the foreign exchange available for manufacturing investment to meet the anticipated future demand requirements, beside juggling with priorities in present allocations, is to examine ways in which total allocations can be increased. One way is to hope that more aid and especially commodity aid will flow into the country. The prospects of 'free' aid increasing substantially are slight while commodity aid increases are expected to be decreased from their 1981-83 levels. In any case these are so tied as to be a poor substitute for other untied foreign exchange. One possibility that we believe should be considered extremely seriously is the rolling over of the previously accumulated short and medium term foreign loans acquired by government and the renegotiating of the pay-back period for a number of large external loans taken up by the para-statal and most notably, those monies acquired for the capital development of the Hwange Power Station. As regards the latter issue, the rapid and massive hikes in electricity tariffs experienced over the past three years have had a crippling effect on a number of key industries, many of which are either major exporters or who supply critical imports into sectors whose final products are exported. Whatever the comparative international tariffs for electricity, there is no doubt that industry in Zimbabwe has been built and developed on cheap electricity and in a number of cases her comparative advantage has arisen in part because of this factor. It is simply not possible to expect appropriate structural change and adjustment to occur in a few years as a result of increasing tariffs. Thus one of the effects of raising tariffs so rapidly to pay for the capital costs of expanding electrical supply capacity is to lower the possibility of expanding exports to earn the foreign exchange to pay for the loans entered into in such a short time. As the Main Report of the Beijer Institute energy option study succinctly states:

Since the demand for electricity is relatively price inelastic, any major increases will serve to damage the financial status of industrial establishments rather than to encouraging conservation. If the electricity building programme could be delayed, this will postpone the need for additional electricity tariff rises which might destroy the viability of many Zimbabwean industries."^{4/}

As regards postponing the electricity building programme, we are not competent to comment. However, it is our view that serious consideration should be given to freezing the crippling electricity price increases and renegotiating the external loans that are their root cause. As regards the more general point of rolling over other external loans and renegotiating the pay-back period, we believe there are substantial reasons for considering such action. Provided the extra foreign exchange made available is put into the productive sector, including investment into manufacturing, this will have the effect of strengthening the economic infrastructure, providing a more sure base for foreign investment and creating a better international climate for investment. Recent evidence indicates that constraints on expanding international liquidity have eased over the past year and hence that international banks will be more ready to renegotiate loans and, importantly, that the terms will be less harsh than could have been anticipated some months ago.^{5/} This may be too optimistic, but, with the information at our disposal we believe that these issues need to be placed on the agenda for discussion as they affect so critically the investment prospects for the manufacturing sector. Additionally, to consider such measures is consistent with proposals being made in a number of fora to accelerate the manufacturing potential in African countries^{6/}.

The second general issue raised for discussion above concerned the possibility of reducing the demand for foreign exchange for investment without reducing anticipated output levels. The focus of attention here is on capacity utilisation, which was examined in Chapter 7, particularly from the point of view of maintenance. here we wish to add a few comments on the investment question.

Chapter 7 discussed the definitional problem, and it is one that has very practical consequences. If a plant works an eight hour shift for five days a week then out of a potential 168 hours available in a week it is only operating for 40 hours or 24 percent of the potential hours available. Now, if the latter plant judges its capacity utilisation on the basis of its eight hour shift and five-day week, then it will claim it is working at full capacity. But so will a firm that normally operates its plant for 168 hours a week. Suppose, too, that the first firm uses \$1 million worth of plant and equipment that has to be imported. If demand for the products of this firm is anticipated to double over the next few years, then the firm and the country as a whole face a variety of choices. The extremes are to continue to work the same machine hours, in which case \$1 million in foreign exchange will be required to import the new equipment, or to double the machine-use time to 80 instead of 40 hours in which case the plant capacity will have been doubled without any additional foreign exchange outlay. The simple theoretical point being made is that it is possible to increase output levels without incurring costs for new investment, if the machines being used are lying idle for any period during the week, by operating the machines for a longer period. It is, of course likely that the costs of running the plant will rise with greater usage - because more spares and replacement machinery will be needed. But providing this marginal cost increase is less than the cost of installing new plant and equipment then a foreign exchange saving will have been made with an increase in output achieved.

How relevant is this theoretical discussion of capacity utilisation to the manufacturing sector in Zimbabwe today? The answer is that if the replies to our questionnaire, which covered almost over 40 percent of the sector by turnover, are reflective of the whole of the sector, then it is very relevant. Out of 68 firms who answered the respective questions, 34 firms work only one shift, 2 work one-and-a-half shifts, 7 firms work two shifts and 25 firms work three shifts. Thus, in the case of 63 percent of firms the machines they have lie idle for at least 33 percent of the week.

What these figures clearly indicate is that there is considerable scope for increasing output levels beyond either present or claimed maximum levels by extending machine-use time. Given the foreign exchange constraints inhibiting investment expansion, these results could have profound implications for raising output in the future.

State investment in the manufacturing sector

A major part of the discussion in this Chapter has concentrated on private investment. Mention of state structures has dealt with the way in which these have or have the potential to encourage or impede investment by private sector concerns. However, a general objective of government is to increase direct state participation in the economy while a specific policy objective mentioned in the Transitional National Development Plan is to "promote co-ordinated and accelerated state participation in the economy through the Zimbabwe Development Corporation, especially through a re-vamped and re-oriented Industrial Development Corporation [S 3.12]. In relation to this objective, this section discusses aspects of state participation in the manufacturing sector, particularly as they relate to investment choice. Other chapters, especially Chapter 6, Government Policies and Objectives, have specifically discussed the different ways in which the government is able to and does in fact exert wide-ranging controls on different aspects of private sector concerns in manufacturing industry.

In theory, there is a range of instruments government can utilise to increase its investment in manufacturing. For example, it can nationalise private sector concerns without compensation, it can buy into already existing operations, with a variety of options on percentage shares, it can take a share in the expanded operations of private sector companies, or it can participate in entirely new manufacturing enterprises either through joint ventures with private firms or through sole ownership of the new venture. In each of these cases the state can involve itself directly, or less directly through the ZDC, or the IDC or, again through para-statals either those more directly involved in manufacturing like the Cold Storage Commission or the Dairy Marketing Board or through promoting manufacturing elements within other para-statal operations such as exist within the Post and Telecommunications Corporation, the National Railways of Zimbabwe or, to a lesser extent, the Zimbabwe Electricity Supply Commission.

As the Government has stated its intention to promote private sector expansion in the manufacturing sector and to encourage new private foreign investment, the option of nationalising without compensation has been ruled out as the Prime Minister has frequently stated. Clearly then all other options will be determined critically by the public funds available for state

investment in the manufacturing sector. Recent trends in public finance indicate that severe financial constraints will prevent the state from allocating very large sums to direct investment in the manufacturing sector: for example the accumulated budget deficit for financial years 1981/82 to 1984/85 is expected to amount to more than \$2,000 million while the losses of the agricultural marketing board, NRZ, Air Zimbabwe and ZISCO have risen from \$49 million in 1980 to over \$280 million in 1984. The question then arises of the best method of using limited state funds for direct investment in the manufacturing sector. The Table below highlights the most likely effects of different types of state investment options, judged against important criteria and objectives that the government has set for the manufacturing sector.

A number of comments need to be made about the remarks made in the Table. They are not put in to describe what will always occur in all instances; their purpose is far more limited and it is to show the likely general direct effects of each particular form of state involvement for different important government objectives for the manufacturing sector. Scenarios could be discussed where precisely the opposite effects could occur; for example, purchasing a concern that the private sector is having difficulty running could lead to job expansion, increased exports, and product diversification. The point the Table is trying to indicate is that there is, in general, far more flexibility to achieve different objectives by the state becoming involved in new enterprises than there is in its taking over existing industries, especially those that are having problems in making ends meet. However it should be stressed that no value has been placed on the different objectives government has. Indeed, if the highest priority of all is to maintain present employment levels in the short-term, then it could be that the state should direct the finance it has for investment in manufacturing to supporting industries that would otherwise close down; but, as the Table indicates, if a wider perspective is taken then this option would tend to be the least attractive.

A final point needs to be made. Whatever form of investment the State chooses so as to increase its involvement in the manufacturing sector, there are additional benefits to be reaped by drawing up as explicitly as possible its plans and stating its intentions publicly. By doing this it will remove a large degree of uncertainty that presently exists within the private sector regarding its specific direct investment intentions. And this can only lead to a further positive incentive for sector wide investment prospects.

Table 12.7: Effects of different types of State investment in manufacturing industry

	<u>Type of Investment</u>			
	Take-over or take Shares in existing Viable private sector Manufacturing Firms	Take-over or take Shares in "lame duck" industries	Take Share in Joint venture new enterprise with private concern	Establish new entirely State-owned or para-Statal manufacturing enterprise
<u>Likely Direct Effects On: Absolute Employment Levels</u>	NIL	NIL to decrease if the industry is on the decline	Increase	Increase
Future State Financial Revenue	Increasing Revenue for State as distributed profits accrue to State and Not Private owners.	NIL to decrease if industry is on the decline.	Increase if ventures proves profitable, but less than if wholly State owned.	Increase if venture proves profitable.
Future Import Substitution	NIL	NIL	Likely Gain	Likely Gain
Export Expansion	NIL	NIL	Possible Gain	Possible Gain
Tax Revenues	NIL or decrease. If venture becomes a para-State it won't have to pay tax.	NIL to decrease if industry is on the decline	Raise, if venture proves profitable.	Raise if venture proves profitable and its form of establishment entails its liability to company tax.
Decentralization Small & Medium sized Enterprise Promotion	NIL	NIL	Possible Gain	Possible Gain
Meeting Increased Demand for Manufactured Products	NIL	NIL	Gain	Gain
Encourage Backward and Forward Linkages	NIL	NIL	Likely Positive Gain	Likely Positive Gain
Reduce Foreign Ownership of the Manufacturing Sector	YES	YES	YES	YES
Future State Financial Outlays	NIL	Increase if Industry is on the decline.	NIL	NIL
Technological Acquisition to the Country	NIL	NIL	Likely if new venture established with Foreign Curr.	NIL

Footnotes to Chapter 12

- 1/ Direct and portfolio foreign investment to the manufacturing sector in Sub-Saharan Africa amounted to US\$205 million in 1983 compared with an average of US\$325 million a year between 1978 and 1980. For a general discussion of these issues see page 5, 'Developing Country Attitudes Towards Foreign Investment', paper prepared for the Commonwealth Secretariat November 1984 (mimeo).
- 2/ R.C. Riddell and D.F. Nsiyaludzu 'Investment in the Manufacturing Sector: Projections to 1985 and Foreign Exchange Requirements', CZ1, Harare, August 1983 (mimeo).
- 3/ See, for example Arup Economic Consultants, Republic of Zimbabwe Cold Storage Commission Abattoir and Cold Storage Feasibility Studies, March 1985, Capital Development Programme, Harare and London, March 1985, p. 35 and 13-28 and Voest-Alpine, ZISCO Rehabilitation Study, 1983.
- 4/ The Beijer Institute, Policy Options for Energy and Development in Zimbabwe, Volume II, Main Report, October 1984, p. 195-6.
- 5/ See, for example, 'World Banking - A Survey' Financial Times, London, 6 May 1985.
- 6/ For example a recent UNIDO study makes the following observation:

"It is generally believed that the ability of the African countries to renegotiate international financing arrangements is low. However, there is increasing recognition that the evident inability of many African countries to service their debt in the short-run by simply cutting consumption levels enhances their scope for renegotiating the terms for debt rescheduling. This is because the responses of public and private creditors to sustained and drastic welfare loss in debtor countries ranges widely. African countries stand to gain from carefully identifying sources of industrial finance on a project-by-project basis and by adopting negotiating stances that are attuned to creditor sensitivities and priorities. Individual African countries would also stand to gain significantly by pooling negotiating resources on the debt issue as shown by the Latin American experience. Some African countries - such as Algeria where bank debt amounted to 13.5 per cent of total debt in 1982 and Nigeria which successfully renegotiated its private export debts during 1984, despite friction with the IMF - have considerable negotiating clout. A co-ordination of African national debtor strategies can pay rich dividends in terms of linking the regeneration of repayment capacities to the servicing of debt with the industrial sector."

"Industrial Development Trade and Policy Options", paper prepared by UNIDO Secretariat - Vienna, May 1985 (Mimeo).

P A R T I I I

ANNEX A

INPUT-OUTPUT TABLE FOR MANUFACTURING

FOR 33 SUB-SECTORS

FLows IN DOLLARS

THIS DATA COVERS ONLY RELATIONS WITHIN THE MANUFACTURING SECTOR. ALL OTHER TRANSACTIONS ARE EXCLUDED.

SOURCE: COMPILED FROM UNPUBLISHED DATA FROM THE 1981/1982 CENSUS OF PRODUCTION.

NOTE ON THE METHODOLOGY

The 33 sub-sector "input-output table" for manufacturing in Zimbabwe has been derived from the commodity data in annexes E and F. These two annexes, based on unpublished CSO data, show the production and use of commodities by each of the 33 sub-sectors of manufacturing. This data can be regarded as the "make" and "absorption" matrices of national accounts.

While the "make" data show what products are produced by manufacturers in Zimbabwe, the "absorption" data can be presumed to include imports also. Accordingly the total use of each commodity was scaled down to equal total output if this was smaller, and each individual use by sub-sectors was reduced in proportion to any reduction that had taken place in the total use. In a second step, each sub-sector was assumed to be supplied with a commodity by the other sub-sectors in the proportions in which the other sub-sectors produced that commodity. The values for each pairwise transfer were then summed to give the total flow between the two sub-sectors in question.

This procedure was adopted because many commodities are produced by more than one sub-sector and many commodities are used by more than one sub-sector. Thus commodity X could be produced by both sub-sectors A and B and used by sub-sectors C and D. But the statistics do not give us details on who supplies whom. It is necessary therefore to determine the proportions by considering the relative importance of A and B as producers of the commodity in question. Such a process may generate links between sub-sectors that do not in fact exist, but in the absence of more detailed information it appears a reasonable assumption. With respect to the differences in prices paid by users and received by producers, the fact that total production is the upper limit on the calculation of use, as explained above, means that the flows calculated would be nearer to producers' price values than to purchasers' prices.

SAS

	RECEIVING SECTOR					
	01* SLAUGHTERING, PROCESSING OF MEAT (201)	02* CANNING, PRESERVING, FRUIT, VEGETABLES (203)	03* GRAIN MILL PRODUCTS, ANIMAL FEEDS (205)	04* BAKERY PRODUCTS (206)	05* CHOCOLATE AND SUGAR CONFECTIONERY (208)	06* DAIRY AND OTHER N.E.C. (202, 204, 207, 209)
	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW
	SUM	SUM	SUM	SUM	SUM	SUM
PRODUCING SECTOR						
01* SLAUGHTERING, PROCESSING OF MEAT (201)	5376396	1728	2981406	823848	43330	5772001
02* CANNING, PRESERVING, FRUIT, VEGETABLES (203)	.	.	45445	41251	53168	.
03* GRAIN MILL PRODUCTS, ANIMAL FEEDS (205)	86290	18247	2171168	36782463	697172	2523754
04* BAKERY PRODUCTS (206)	.	.	.	137	6996	.
05* CHOCOLATE AND SUGAR CONFECTIONERY (208)	11173	2780	17417	38503	984862	16418
06* DAIRY AND OTHER N.E.C. (202, 204, 207, 209)	999217	543318	4955380	4581577	3675122	7690571
07* BEER, WINE AND SPIRITS (211, 212, 213)	21665	496	41850	21522	4893	25696
08* SOFT DRINKS AND CARBONATED WATERS (214)	72	.	627	.	.	121
09* TOBACCO (221, 222)	.	.	.	.	.	.
10* COTTON (INCL. TEXTILES, CARPETS) (223, 225)	54338	.	396517	.	.	3880982
11* KNITTED PRODUCTS, ROPE, CORDAGE (224)	17412	.	.	.	.	.
12* OTHER TEXTILE PRODUCTS (226)	13466	53	2772	831	134	2468
13* WEARINGS APPAREL (229)	176729	5796	53178	48468	20862	39726
14* FOOTWEAR (234)	.	.	.	.	.	86946
15* SAWMILLING, WOOD EXCL. FURNITURE (236)	595	14	710	1921	33043	38391
16* FURNITURE, FIXTURES, EXCL. METAL (238)	1593	.	.	.	.	481
17* PULP, PAPER AND PRODUCTS (239, 240)	912718	137813	1125106	1340117	963929	6324334
18* PRINTING, PUBLISHING, ETC. (242)	108210	16581	136272	171350	115878	786800
19* FERTILIZER, INSECTICIDES (244)	7138	1617	541669	791	.	57355
20* PAINTS, VARNISHES, FILLERS (246)	.	.	.	.	.	.
21* SOAPS, DETERGENTS, TOILETRIES, PHARM. (247)	257977	16250	3764865	1619116	361774	1223784
22* MATCHES, INKS, GLUES, AND CHEM. N.E.C. (248)	17402	3695	74050	28694	24173	1270935
23* BASIC CHEMICALS, PETROLEUM PRODS. (243, 250, 251)	32249	6054	106483	42851	33709	111747
24* RUBBER PRODUCTS (253)	156166	.	.	.	.	.
25* PLASTIC PRODUCTS (255)	251979	24697	2765033	374076	797211	4172330
26* STRUCTURAL CLAY PRODS. INCL. BRICKS (258)	.	.	.	.	.	.
27* GLASS, CEMENT ETC. (256, 257, 259, 260)	38308	190147	4578	1988	59716	1375009
28* NON-FERROUS, IRON, STEEL (BASIC) (262, 264)	96611	2426	110450	39285	5512	106158
29* METAL PRODUCTS, MACHINERY (268)	5089810	1058813	2937359	877404	239626	6845915
30* ELECTRICAL, MACHINERY/EQUIPMENT (278, 279)	5640	128	6742	2021	325	6003
31* MOTOR VEHICLES (283)	104289	3533	97654	60940	5838	128617
32* OTHER VEHICLES ETC. (282, 284, 285, 286)	11039	251	13196	3956	636	11749
33* OTHER MANUFACTURING (231, 290, 291)	46671	100	5231	2411	752	28779
ALL	14689144	2034538	22355158	46905522	8128159	42527069

SAS

	RECEIVING SECTOR					
	07* BEER, WINE AND SPIRITS (211, 212, 213)	08* SOFT DRINKS AND CARBONATED WATERS (214)	09* TOBACCO (221, 222)	10* COTTON (INCL. TEXTILES, CARPETS) (223, 225)	11* KNITTED PRODUCTS, ROPE, CORDAGE (224)	12* OTHER TEXTILE PRODUCTS (226)
	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW
	SUM	SUM	SUM	SUM	SUM	SUM
PRODUCING SECTOR						
01* SLAUGHTERING, PROCESSING OF MEAT (201)	121880	246	20527	96		
02* CANNING, PRESERVING, FRUIT, VEGETABLES (203)						
03* GRAIN MILL PRODUCTS, ANIMAL FEEDS (205)	7437223	29656	12617	7151	571	1175
04* BAKERY PRODUCTS (206)						
05* CHOCOLATE AND SUGAR CONFECTIONERY (208)	51618	3013	1646	1182		
06* DAIRY AND OTHER N.E.C. (202, 204, 207, 209)	3869646	5737106	115055	84668	1517	3124
07* BEER, WINE AND SPIRITS (211, 212, 213)	8125302	6468	4172	103985	10565	9890
08* SOFT DRINKS AND CARBONATED WATERS (214)	7	5547024	177748	2850	293	275
09* TOBACCO (221, 222)			2655340			
10* COTTON (INCL. TEXTILES, CARPETS) (223, 225)	3486		83856	45179807	6855004	6691467
11* KNITTED PRODUCTS, ROPE, CORDAGE (224)				93468	37059	2466
12* OTHER TEXTILE PRODUCTS (226)	925	1947	1295	12742	1349	171
13* WEARING APPAREL (229)	175814	11162	55622	164610	15175	4100
14* FOOTWEAR (234)						
15* SAWMILLING, WOOD EXCL. FURNITURE (236)	1142239	562799	418899	37422	197	580
16* FURNITURE, FIXTURES, EXC. METAL (238)			60583	8454		
17* PULP, PAPER AND PRODUCTS (239, 240)	2226700	62549	2553780	1860107	936785	122890
18* PRINTING, PUBLISHING, ETC. (242)	268532	8381	280876	6042	13451	328
19* FERTILIZER, INSECTICIDES (244)	23682	76565		338191	25074	23521
20* PAINTS, VARNISHES, FILLERS (246)	27771		9324	627		5438
21* SOAPS, DETERGENTS, TOILETRIES, PHARM. (247)	663608	123609	11988	86829	20676	12882
22* MATCHES, INKS, GLUES, AND CHEM. N.E.C. (248)	98647	9191	8161	54568	38008	14407
23* BASIC CHEMICALS, PETROLEUM PRODS (243, 250, 251)	114003	380500	3708	498895	32075	71385
24* RUBBER PRODUCTS (253)				66943	48597	18398
25* PLASTIC PRODUCTS (255)	382014	101647	209215	753420	729367	476104
26* STRUCTURAL CLAY PRODS. INCL. BRICKS (258)	63425		22904			
27* GLASS, CEMENT ETC. (256, 257, 259, 260)	1762669	2725252	22829	4		37
28* NON-FERROUS, IRON, STEEL (BASIC) (262, 264)	93619	83832	86736	235486	43701	6789
29* METAL PRODUCTS, MACHINERY (268)	1975370	1810026	2452315	5818167	756465	776805
30* ELECTRICAL MACHINERY/EQUIPMENT (278, 279)	6397	4737	9387	14378	187	416
31* MOTOR VEHICLES (283)	312684	101848	106786	204448	23043	4993
32* OTHER VEHICLES ETC. (282, 284, 285, 286)	4411	9271	6171	29545	5407	1954
33* OTHER MANUFACTURING (231, 290, 291)	2867	3774	3098	93241	158485	33999
ALL	28954372	17400604	9394639	55757326	9754715	8323693

SAS

	RECEIVING SECTOR					
	13* WEARING APPAREL (229)	14* FOOTWEAR (23-4)	15* SAWMILLING, WOOD EXCL. FURNITURE (236)	16* FURNITURE, FIXTURES, EXCL. METAL (238)	17* PULP, PAPER AND PRODUCTS (23-9, 240)	18* PRINTING, PUBLISHING, ETC. (242)
	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW
	SUM	SUM	SUM	SUM	SUM	SUM
PRODUCING SECTOR						
01* SLAUGHTERING, PROCESSING OF MEAT (201)	200					
02* CANNING, PRESERVING, FRUIT, VEGETABLES (203)						
03* GRAIN MILL PRODUCTS, ANIMAL FEEDS (205)	21062	24829	71198	13375	41898	147012
04* BAKERY PRODUCTS (206)						
05* CHOCOLATE AND SUGAR CONFECTIONERY (208)	2455					
06* DAIRY AND OTHER N.E.C. (202, 204, 207, 209)	188217	51711	146978	27821	86491	318667
07* BEER, WINE AND SPIRITS (211, 212, 213)	1653	13016			16124	7904
08* SOFT DRINKS AND CARBONATED WATERS (214)	34	361			448	219
09* TOBACCO (221, 222)						
10* COTTON (INCL. TEXTILES, CARPETS) (223, 225)	69342006	2964293	184775	3282269	3243	8187
11* KNITTED PRODUCTS, ROPE, CORDAGE (224)	83660	67719	1212	1374	127088	368
12* OTHER TEXTILE PRODUCTS (226)	2576	331994	18932	36752	75882	3013
13* WEARING APPAREL (229)	274018	2492	55431	14129	76277	65375
14* FOOTWEAR (234)						
15* SAWMILLING, WOOD EXCL. FURNITURE (236)	2038	41572	4660767	5709920	305600	2617
16* FURNITURE, FIXTURES, EXCL. METAL (238)	52	6800		2332	10461	
17* PULP, PAPER AND PRODUCTS (239, 240)	1749870	1835377	199251	145650	17047352	14358356
18* PRINTING, PUBLISHING, ETC. (242)	21493	11284	32374	7192	31139	289088
19* FERTILIZER, INSECTICIDES (244)	2883	30893			38268	18758
20* PAINTS, VARNISHES, FILLERS (246)			458663	1678453	157367	76822
21* SOAPS, DETERGENTS, TOILETRIES, PHARM. (247)	83359	101545	182944	41010	121723	488049
22* MATCHES, INKS, GLUES, AND CHEM. N.E.C. (248)	394389	514089	1501431	275751	911407	2556263
23* BASIC CHEMICALS, PETROLEUM PRODS. (243, 250, 251)	13423	50038	31125	692	67269	77069
24* RUBBER PRODUCTS (253)	20904	2196681	123906	1120247	8182	123282
25* PLASTIC PRODUCTS (255)	3654442	587722	45236	290611	603797	186196
26* STRUCTURAL CLAY PRODS. INCL. BRICKS (258)						
27* GLASS, CEMENT ETC. (256, 257, 259, 260)	334	1068089	855872	718759	1079	17284
28* NON-FERROUS, IRON, STEEL (BASIC) (262, 264)	41160	80400	138552	103385	172371	303969
29* METAL PRODUCTS, MACHINERY (268)	1312646	2639151	2904228	2046719	2433254	1573904
30* ELECTRICAL MACHINERY/EQUIPMENT (278, 279)	2227	4780	7811	4360	33059	7402
31* MOTOR VEHICLES (283)	54924	80887	170124	87232	59528	42133
32* OTHER VEHICLES ETC. (282, 284, 285, 286)	13123	10881	15425	9294	14073	8024
33* OTHER MANUFACTURING (231, 290, 291)	1075071	5067722	44789	153380	52492	108864
ALL	78358218	17784328	11851024	15775707	22495871	20796824

SAS

	RECEIVING SECTOR					
	19* FERTILIZER - INSECTICIDE- S(244)	20* PAINTS, VARN- ISHES, FILLER- S(246)	21* SOAPS, DETER- GENTS, TOILE- TRIES, PHARM- (247)	22* MATCHES, INK- S, GLUES, AND CHEM. N. E. C. - (248)	23* BASIC CHEMICALS, P- ETROLEUM PRODS. (243, - 250, 251)	24* RUBBER PRODUCTS(25- 3)
	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW
	SUM	SUM	SUM	SUM	SUM	SUM
PRODUCING SECTOR						
01* SLAUGHTERING, PROCESSING OF MEAT(201)			933757	79727	11323	
02* CANNING, PRESERVING, FRUIT, VEGETABLES(203)						
03* GRAIN MILL PRODUCTS, ANIMAL FEEDS(205)	1595	3464	2770847	72541	39530	85397
04* BAKERY PRODUCTS(206)						
05* CHOCOLATE AND SUGAR CONFECTIONERY(208)				710		
06* DAIRY AND OTHER N. E. C. (202, 204, 207, 209)	6024	8812	3831162	197594	807710	176289
07* BEER, WINE AND SPIRITS(211, 212, 213)	377321	101876	143549	33230	26442	23768
08* SOFT DRINKS AND CARBONATED WATERS(214)	10474	2828	3985	919	734	660
09* TOBACCO (22, 222)						
10* COTTON (INCL. TEXTILES, CARPETS)(223, 225)			903	911		49942
11* KNITTED PRODUCTS, ROPE, CORDAGE(224)						88689
12* OTHER TEXTILE PRODUCTS(226)	3436	30	832	175	328	48360
13* WEARING APPAREL(229)		12699	28664	4281	3752	10178
14* FOOTWEAR(234)						
15* SAWMILLING, WOOD EXCL. FURNITURE(236)	57287	13	62923	71926	243	9692
16* FURNITURE, FIXTURES, EXCL. METAL(238)						6728
17* PULP, PAPER AND PRODUCTS(239, 240)	120484	177216	4685243	766332	184714	340260
18* PRINTING, PUBLISHING, ETC. (242)	3806	21537	555523	114925	30960	69994
19* FERTILIZER, INSECTICIDES(244)	17340982	241793	340699	78567	62757	56412
20* PAINTS, VARNISHES, FILLERS(246)	393284	21170	66453	16067	528	17943
21* SOAPS, DETERGENTS, TOILETRIES, PHARM. (247)	133900	50800	12382312	195430	136916	237312
22* MATCHES, INKS, GLUES, AND CHEM. N. E. C. (248)	4877	13972	1045218	1499411	602813	1832536
23* BASIC CHEMICALS, PETROLEUM PRODS. (243, 250, 251)	1149880	309596	450241	311773	687334	109495
24* RUBBER PRODUCTS(253)	55273	4245	19157	44527	181	356232
25* PLASTIC PRODUCTS(255)	1994389	8318	1376105	410895	81371	490825
26* STRUCTURAL CLAY PRODS. INCL. BRICKS(258)						
27* GLASS, CEMENT ETC. (256, 257, 259, 260)	237083	145	1474156	112038	18462	123
28* NON-FERROUS, IRON, STEEL(BASIC) (262, 264)	392874	4667	42488	25218	502460	834222
29* METAL PRODUCTS, MACHINERY(268)	3309175	1577229	2649852	1533612	913156	1185435
30* ELECTRICAL MACHINERY/EQUIPMENT(278, 279)	131985	3013	2024	13938	11906	22936
31* MOTOR VEHICLES(283)	69448	6040	39658	34219	7301	34596
32* OTHER VEHICLES ETC. (282, 284, 285, 286)	172232	141	3969	833	1353	7661
33* OTHER MANUFACTURING(231, 290, 291)	8413	326	50141	28462	9280	48543
ALL	25974221	2569930	32959860	5648199	4141764	6144208

SAS

	RECEIVING SECTOR					
	25* PLASTIC PRODUCTS (25-5)	26* STRUCTURAL CLAY PRODS. INCL. BRICKS (258)	27* GLASS, CEMENT ETC. (256, 257, 259, 260)	28* NON-FERROUS, IRON, STEEL (BASIC) (262, 264)	29* METAL PRODUCTS, MACHINERY (268)	30* ELECTRICAL MACHINERY/EQUIPMENT (278, 279)
	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW
PRODUCING SECTOR	SUM	SUM	SUM	SUM	SUM	SUM
01* SLAUGHTERING, PROCESSING OF MEAT (201)					6098	
02* CANNING, PRESERVING, FRUIT, VEGETABLES (203)						
03* GRAIN MILL PRODUCTS, ANIMAL FEEDS (205)	18732	389	2680	38235	23904	29249
04* BAKERY PRODUCTS (206)						
05* CHOCOLATE AND SUGAR CONFECTIONERY (208)					2	
06* DAIRY AND OTHER N.E.C. (202, 204, 207, 209)	38670	802	5532	73150	49449	60455
07* BEER, WINE AND SPIRITS (211, 212, 213)	2956	1245	5964	18150	34650	2845
08* SOFT DRINKS AND CARBONATED WATERS (214)	82	35	166	769	851	79
09* TOBACCO (221, 222)						
10* COTTON (INCL. TEXTILES, CARPETS) (223, 225)	1276991				198713	31
11* KNITTED PRODUCTS, ROPE, CORDAGE (224)	29466	1379	4403	2853	113369	13967
12* OTHER TEXTILE PRODUCTS (226)	593	1688	125614	218290	111408	2569
13* WEARING APPAREL (229)	25788	657	43828	1159845	112862	27984
14* FOOTWEAR (234)						
15* SAWMILLING, WOOD EXCL. FURNITURE (236)	15926	11031	80529	244225	562084	532901
16* FURNITURE, FIXTURES, EXCL. METAL (238)		284		95	11134	100
17* PULP, PAPER AND PRODUCTS (239, 240)	780631	137070	3006802	1086792	1230906	305225
18* PRINTING, PUBLISHING, ETC. (242)	65373	14574	318190	47180	141637	39892
19* FERTILIZER, INSECTICIDES (244)	7016	2956	14155	323284	91206	6752
20* PAINTS, VARNISHES, FILLS (246)	179968	8595	155274	745382	3631936	699389
21* SOAPS, DETERGENTS, TOILETRIES, PHARM. (247)	50099	1672	18731	133824	82718	77040
22* MATCHES, INKS, GLUES, AND CHEM. N.E.C. (248)	462557	12245	66605	548803	530709	651193
23* BASIC CHEMICALS, PETROLEUM PRODS. (243, 250, 251)	17164	3951	19278	1456537	109546	52701
24* RUBBER PRODUCTS (253)	6800	117589	95676	707175	224415	193558
25* PLASTIC PRODUCTS (255)	971825	44682	142735	92490	358079	420176
26* STRUCTURAL CLAY PRODS. INCL. BRICKS (258)		1511110	872547	6163565	38887	31120
27* GLASS, CEMENT ETC. (256, 257, 259, 260)	1234	132620	7336585	2014099	501649	232372
28* NON-FERROUS, IRON, STEEL (BASIC) (262, 264)	142874	113052	1401266	28639333	49696740	6034269
29* METAL PRODUCTS, MACHINERY (268)	647045	1395179	17986108	16945013	15217370	1786019
30* ELECTRICAL MACHINERY/EQUIPMENT (278, 279)	10071	24116	99664	2039096	2688803	8805880
31* MOTOR VEHICLES (283)	265366	234433	902099	405615	547563	66495
32* OTHER VEHICLES ETC. (282, 284, 285, 286)	5899	7496	95174	82826	79184	10247
33* OTHER MANUFACTURING (231, 290, 291)	25351	34075	68493	181733	108244	138893
ALL	5048477	3813125	32868098	63388378	76103913	20221700

SAS

	RECEIVING SECTOR			ALL
	31* MOTOR VEHICLES(28-3)	32* OTHER VEHICLES ETC.(282,284,285,286)	33* OTHER MANUFACTURING(231,290,291)	
	FLOW	FLOW	FLOW	
	SUM	SUM	SUM	
PRODUCING SECTOR				
01* SLAUGHTERING, PROCESSING OF MEAT(201)			1430723	17603286
02* CANNING, PRESERVING, FRUIT, VEGETABLES(203)				139864
03* GRAIN MILL PRODUCTS, ANIMAL FEEDS(205)	6156	2950	52775	54029295
04* BAKERY PRODUCTS(206)				7133
05* CHOCOLATE AND SUGAR CONFECTIONERY(208)				1131779
06* DAIRY AND OTHER N.E.C.(202,204,207,209)	12872	6089	93642	38444437
07* BEER, WINE AND SPIRITS(211,212,213)	1057	801	15001	9224355
08* SOFT DRINKS AND CARBONATED WATERS(214)	29	22	412	5752124
09* TOBACCO (221,222)				2655340
10* COTTON (INCL. TEXTILES, CARPETS)(223,225)	923		603895	141062540
11* KNITTED PRODUCTS, ROPE, CORDAGE(224)	33087	77	79555	798649
12* OTHER TEXTILE PRODUCTS(226)	42572	3098	63400	1129692
13* WEARING APPAREL(229)	11636	954	34261	2736383
14* FOOTWEAR(234)				86946
15* SAWMILLING, WOOD EXCL. FURNITURE(236)	93443	228359	554857	15484763
16* FURNITURE, FIXTURES, EXCL. METAL(238)	2977		8479	120553
17* PULP, PAPER AND PRODUCTS(239,240)	62778	9810	756099	67593048
18* PRINTING, PUBLISHING, ETC.(242)	7906	3635	64441	3804841
19* FERTILIZER, INSECTICIDES(244)	2509	1900	36822	19794215
20* PAINTS, VARNISHES, FILLERS(246)	1416283	104193	382090	10253021
21* SOAPS, DETERGENTS, TOILETRIES, PHARM.(247)	20668	7876	223230	22934616
22* MATCHES, INKS, GLUES, AND CHEM. N.E.C.(248)	124996	62260	859811	16113266
23* BASIC CHEMICALS, PETROLEUM PRODS.(243,250,251)	5780	3720	70477	6435746
24* RUBBER PRODUCTS(253)	1257141	48240	84383	7098198
25* PLASTIC PRODUCTS(255)	17804	2482	810811	23638023
26* STRUCTURAL CLAY PRODS. INCL. BRICKS(258)	3241	15381	1688	8723868
27* GLASS, CEMENT ETC.(256,257,259,260)	1776245	54248	81548	22814763
28* NON-FERROUS, IRON, STEEL (BASIC)(262,264)	5557557	790200	1884005	97811667
29* METAL PRODUCTS, MACHINERY(268)	3436206	2793591	7741561	122664529
30* ELECTRICAL MACHINERY/EQUIPMENT(278,279)	312945	41665	212495	14538220
31* MOTOR VEHICLES(283)	8131605	65171	187249	12646158
32* OTHER VEHICLES ETC.(282,284,285,286)	18029	14757	39016	707433
33* OTHER MANUFACTURING(231,290,291)	26120	7285	2781640	10396021
ALL	22382562	4268764	19154665	758374773

ANNEX B

INPUT-OUTPUT TABLE FOR MANUFACTURING

FOR 33 SUB-SECTORS

SHARES OF INPUTS

THIS DATA COVERS ONLY RELATIONS WITHIN THE MANUFACTURING SECTOR. ALL OTHER TRANSACTIONS ARE EXCLUDED.

SOURCE: ANNEX A.

SAS

	RECEIVING SECTOR					
	19* FERTILIZER, INSECTICIDE- S(244)	20* PAINTS, VARN- ISHES, FILL- ERS(246)	21* SOAPS, DETER- GENTS, TOILE- TRIES, PHARM- (247)	22* MATCHES, INK- S, GLUES, ANJ CHEM. N.E.C. - (248)	23* BASIC CHEMICALS, P- ETROLEUM PRODS. (243, 250, 251)	24* RUBBER PRODUCTS(25- 3)
	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW
	% OF INPUT	% OF INPUT	% OF INPUT	% OF INPUT	% OF INPUT	% OF INPUT
PRODUCING SECTOR						
01* SLAUGHTERING, PROCESSING OF MEAT(201)	.	.	2.8	1.4	0.3	.
02* CANNING, PRESERVING, FRUIT, VEGETABLES(203)	.	.	.	.	.	.
03* GRAIN MILL PRODUCTS, ANIMAL FEEDS(205)	0.0	0.1	8.4	1.3	1.0	1.4
04* BAKERY PRODUCTS(206)	.	.	.	.	.	.
05* CHOCOLATE AND SUGAR CONFECTIONERY(208)	.	.	.	0.0	.	.
06* DAIRY AND OTHER N.E.C. (202, 204, 207, 209)	0.0	0.3	11.6	3.5	19.5	2.9
07* BEER, WINE AND SPIRITS(211, 212, 213)	1.5	4.0	0.4	0.6	0.6	0.4
08* SOFT DRINKS AND CARBONATED WATERS(214)	0.0	0.1	0.0	0.0	0.0	0.0
09* TOBACCO (221, 222)	.	.	.	.	.	.
10* COTTON (INCL. TEXTILES, CARPETS)(223, 225)	.	.	0.0	0.0	.	0.8
11* KNITTED PRODUCTS, ROPE, CORDAGE(224)	.	.	.	.	.	1.4
12* OTHER TEXTILE PRODUCTS(226)	0.0	0.0	0.0	0.0	0.0	0.8
13* WEARING APPAREL(229)	.	0.5	0.1	0.1	0.1	0.2
14* FOOTWEAR(234)	.	.	.	.	.	.
15* SAWMILLING, WOOD EXCL. FURNITURE(236)	0.2	0.0	0.2	1.3	0.0	0.2
16* FURNITURE, FIXTURES, EXCL. METAL(238)	.	.	.	.	.	0.1
17* PULP, PAPER AND PRODUCTS(239, 240)	0.5	6.9	14.2	13.6	4.5	5.5
18* PRINTING, PUBLISHING, ETC. (242)	0.0	0.8	1.7	2.0	0.7	1.1
19* FERTILIZER, INSECTICIDES(244)	66.8	9.4	1.0	1.4	1.5	0.9
20* PAINTS, VARNISHES, FILLERS(246)	1.5	0.8	0.2	0.3	0.0	0.3
21* SOAPS, DETERGENTS, TOILETRIES, PHARM. (247)	0.5	2.0	37.6	3.5	3.3	9
22* MATCHES, INKS, GLUES, AND CHEM. N.E.C. (248)	0.0	0.5	3.2	26.5	14.6	0.8
23* BASIC CHEMICALS, PETROLEUM PRODS. (243, 250, 251)	4.4	12.0	1.4	5.5	16	1.8
24* RUBBER PRODUCTS(253)	0.2	0.2	0.1	0.8	.	5.8
25* PLASTIC PRODUCTS(255)	7.7	0.3	4.2	7.3	2	8.0
26* STRUCTURAL CLAY PRODS. INCL. BRICKS(258)	.	.	.	.	.	.
27* GLASS, CEMENT ETC. (256, 257, 259, 260)	0.9	0.0	4.5	2.0	0	0.0
28* NON-FERROUS, IRON, STEEL(BASIC)(262, 264)	1.5	0.2	0.1	0.4	12	13.6
29* METAL PRODUCTS, MACHINERY(268)	12.7	61.4	8.0	27.2	22.0	19.3
30* ELECTRICAL MACHINERY/EQUIPMENT(278, 279)	0.5	0.1	0.0	0.2	.	0.4
31* MOTOR VEHICLES(283)	0.3	0.2	0.1	0.6	.	0.6
32* OTHER VEHICLES ETC. (282, 284, 285, 286)	0.7	0.0	0.0	0.0	0.0	0.1
33* OTHER MANUFACTURING(231, 290, 291)	0.0	0.0	0.2	0.5	0.2	0.8
ALL	100.0	100.0	100.0	100.0	0	100.0

SAS

	RECEIVING SECTOR			ALL
	31* MOTOR VEHICLES(28-3)	32* OTHER VEHICLES ETC.(282,284,285,286)	33* OTHER MANUFACTURING(231,290,291)	
	FLOW	FLOW	FLOW	
	% OF INPUT	% OF INPUT	% OF INPUT	
PRODUCING SECTOR				
01* SLAUGHTERING, PROCESSING OF MEAT(201)	.	.	7.5	2.3
02* CANNING, PRESERVING, FRUIT, VEGETABLES(203)	.	.	.	0.0
03* GRAIN MILL PRODUCTS, ANIMAL FEEDS(205)	0.0	0.1	0.3	7.1
04* BAKERY PRODUCTS(206)	.	.	.	0.0
05* CHOCOLATE AND SUGAR CONFECTIONERY(208)	.	.	.	0.1
06* DAIRY AND OTHER N.E.C.(202,204,207,209)	0.1	0.1	0.5	5.1
07* BEER, WINE AND SPIRITS(211,212,213)	0.0	0.0	0.1	1.2
08* SOFT DRINKS AND CARBONATED WATERS(214)	0.0	0.0	0.0	0.8
09* TOBACCO (221,222)	.	.	.	0.4
10* COTTON (INCL. TEXTILES, CARPETS)(223,225)	0.0	.	3.2	18.6
11* KNITTED PRODUCTS, ROPE, CORDAGE(224)	0.1	0.0	0.4	0.1
12* OTHER TEXTILE PRODUCTS(226)	0.2	0.1	0.3	0.1
13* WEARING APPAREL(229)	0.1	0.0	0.2	0.4
14* FOOTWEAR(234)	.	.	.	0.0
15* SAWMILLING, WOOD EXCL. FURNITURE(236)	0.4	5.3	2.9	2.0
16* FURNITURE, FIXTURES, EXCL. METAL(238)	0.0	.	0.0	0.0
17* PULP, PAPER AND PRODUCTS(239,240)	0.3	0.2	3.9	8.9
18* PRINTING, PUBLISHING, ETC.(242)	0.0	0.1	0.3	0.5
19* FERTILIZER, INSECTICIDES(244)	0.0	0.0	0.2	2.6
20* PAINTS, VARNISHES, FILLERS(246)	6.0	2.4	2.0	1.4
21* SOAPS, DETERGENTS, TOILETRIES, PHARM.(247)	0.1	0.2	1.2	3.0
22* MATCHES, INKS, GLUES, AND CHEM. N.E.C.(248)	0.6	1.5	4.5	2.1
23* BASIC CHEMICALS, PETROLEUM PRODS.(243,250,251)	0.0	0.1	0.4	0.8
24* RUBBER PRODUCTS(253)	5.6	1.1	0.4	0.9
25* PLASTIC PRODUCTS(255)	0.1	0.1	4.2	3.1
26* STRUCTURAL CLAY PRODS. INCL. BRICKS(258)	0.0	0.4	0.0	1.2
27* GLASS, CEMENT ETC.(256,257,259,260)	7.9	1.3	0.4	3.0
28* NON-FERROUS, IRON, STEEL (BASIC)(262,264)	24.8	18.5	5.8	12.9
29* METAL PRODUCTS, MACHINERY(268)	15.4	65.4	40.4	16.2
30* ELECTRICAL MACHINERY/EQUIPMENT(278,279)	1.4	1.0	1.1	1.9
31* MOTOR VEHICLES(283)	36.3	1.5	1.0	1.7
32* OTHER VEHICLES ETC.(282,284,285,286)	0.1	0.3	0.2	0.1
33* OTHER MANUFACTURING(231,290,291)	0.1	0.2	14.5	1.4
ALL	100.0	100.0	100.0	100.0

ANNEX C

INPUT-OUTPUT TABLE FOR MANUFACTURING

FOR 33 SUB-SECTORS

SHARES OF OUTPUTS

THIS DATA COVERS ONLY RELATIONS WITHIN THE MANUFACTURING SECTOR. ALL OTHER TRANSACTIONS ARE EXCLUDED.

SOURCE: ANNEX A.

SAS

PRODUCING SECTOR	RECEIVING SECTOR					
	01* SLAUGHTERING, PROCESSING OF MEAT (201)	02* CANNING, PRESERVING, FRUIT, VEGETABLES (203)	03* GRAIN MILL PRODUCTS, ANIMAL FEEDS (205)	04* BAKERY PRODUCTS (206)	05* CHOCOLATE AND SUGAR CONFECTIONERY (208)	06* DAIRY AND OTHER N.E.C. (202, 204, 207, 209)
	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW
	% OF OUTPUT	% OF OUTPUT	% OF OUTPUT	% OF OUTPUT	% OF OUTPUT	% OF OUTPUT
01* SLAUGHTERING, PROCESSING OF MEAT (201)	30.5	C.U.	16.9	4.7	0.2	32.8
02* CANNING, PRESERVING, FRUIT, VEGETABLES (203)	.	.	32.5	29.5	38.0	.
03* GRAIN MILL PRODUCTS, ANIMAL FEEDS (205)	1.6	0.0	4.0	68.1	1.3	4.7
04* BAKERY PRODUCTS (206)	.	.	.	1.9	98.1	.
05* CHOCOLATE AND SUGAR CONFECTIONERY (208)	1.0	0.2	1.5	3.4	87.0	1.5
06* DAIRY AND OTHER N.E.C. (202, 204, 207, 209)	2.6	1.4	12.9	11.9	9.6	20.0
07* BEER, WINE AND SPIRITS (211, 212, 213)	0.2	0.0	0.5	0.2	0.1	0.3
08* SOFT DRINKS AND CARBONATED WATERS (214)	0.0	.	0.0	.	.	0.0
09* TOBACCO (221, 222)	.	.	.	.	.	.
10* COTTON (INCL. TEXTILES, CARPETS) (223, 225)	0.0	.	0.3	.	.	2.8
11* KNITTED PRODUCTS, ROPE, CORDAGE (224)	2.2	.	.	.	.	.
12* OTHER TEXTILE PRODUCTS (226)	1.2	0.0	0.2	0.1	0.0	0.2
13* WEARING APPAREL (229)	6.5	0.2	1.9	1.8	0.8	1.5
14* FOOTWEAR (234)	.	.	.	.	.	100.0
15* SAWMILLING, WOOD EXCL. FURNITURE (236)	0.0	0.0	0.0	0.0	0.2	0.2
16* FURNITURE, FIXTURES, EXCL. METAL (238)	1.3	.	.	.	.	0.4
17* PULP, PAPER AND PRODUCTS (239, 240)	1.4	0.2	1.7	2.0	1.4	9.4
18* PRINTING, PUBLISHING, ETC. (242)	2.8	0.4	3.6	4.5	3.0	20.7
19* FERTILIZER, INSECTICIDES (244)	0.0	0.0	2.7	0.0	.	0.3
20* PAINTS, VARNISHES, FILLERS (246)	.	.	.	.	.	.
21* SOAPS, DETERGENTS, TOILETRIES, PHARM. (247)	1.1	0.1	16.4	7.1	1.6	5.3
22* MATCHES, INKS, GLUES, AND CHEM. N.E.C. (248)	0.1	0.0	0.5	0.2	0.2	7.9
23* BASIC CHEMICALS, PETROLEUM PRODS. (243, 250, 251)	0.5	0.1	1.7	0.7	0.5	1.7
24* RUBBER PRODUCTS (253)	2.2	.	.	.	.	.
25* PLASTIC PRODUCTS (255)	1.1	0.1	11.7	1.6	3.4	17.7
26* STRUCTURAL CLAY PRODS. INCL. BRICKS (259)	.	.	.	.	.	.
27* GLASS, CEMENT ETC. (256, 257, 259, 260)	0.2	0.8	0.0	0.0	0.3	6.0
28* NON-FERROUS, IRON, STEEL (BASIC) (262, 264)	0.1	0.0	0.1	0.0	0.0	0.1
29* METAL PRODUCTS, MACHINERY (268)	4.1	0.9	2.4	0.7	0.2	5.6
30* ELECTRICAL MACHINERY/EQUIPMENT (278, 279)	0.0	0.0	0.0	0.0	0.0	0.0
31* MOTOR VEHICLES (283)	0.8	0.0	0.8	0.5	0.0	1.0
32* OTHER VEHICLES ETC. (282, 284, 285, 286)	1.6	0.0	1.9	0.6	0.1	1.7
33* OTHER MANUFACTURING (231, 290, 291)	0.4	0.0	0.1	0.0	0.0	0.3
ALL	1.9	0.3	2.9	6.2	1.1	5.8

SAS

	RECEIVING SECTOR					
	07° BEER, WINE AND SPIRITS (211-212, 213)	08° SOFT DRINKS AND CARBONATED WATERS (214)	09° TOBACCO (221, 222)	10° COTTON (INCL. TEXTILES, CARPETS) (223, 225)	11° KNITTED PRODUCTS, ROPE, CORDAGE (224)	12° OTHER TEXTILE PRODUCTS (226)
	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW
	% OF OUTPUT	% OF OUTPUT	% OF OUTPUT	% OF OUTPUT	% OF OUTPUT	% OF OUTPUT
PRODUCING SECTOR						
01° SLAUGHTERING, PROCESSING OF MEAT (201)	0.7	0.0	0.1	0.0	-	-
02° CANNING, PRESERVING, FRUIT, VEGETABLES (203)	-	-	-	-	-	-
03° GRAIN MILL PRODUCTS, ANIMAL FEEDS (205)	13.8	0.1	0.0	0.0	0.0	0.0
04° BAKERY PRODUCTS (206)	-	-	-	-	-	-
05° CHOCOLATE AND SUGAR CONFECTIONERY (208)	4.6	0.3	0.1	0.1	-	-
06° DAIRY AND OTHER N.E.C. (202, 204, 207, 209)	10.1	14.9	0.3	0.2	0.0	0.0
07° BEER, WINE AND SPIRITS (211, 212, 213)	88.1	0.1	0.0	1.1	0.1	0.1
08° SOFT DRINKS AND CARBONATED WATERS (214)	0.0	96.4	3.1	0.0	0.0	0.0
09° TOBACCO (221, 222)	-	-	100.0	-	-	-
10° COTTON (INCL. TEXTILES, CARPETS) (223, 225)	0.0	-	0.1	32.0	4.9	4.7
11° KNITTED PRODUCTS, ROPE, CORDAGE (224)	-	-	-	11.7	4.6	0.3
12° OTHER TEXTILE PRODUCTS (226)	0.1	0.2	0.1	1.1	0.1	0.0
13° WEARING APPAREL (229)	6.4	0.4	2.0	6.0	0.6	0.1
14° FOOTWEAR (234)	-	-	-	-	-	-
15° SAWMILLING, WOOD EXCL. FURNITURE (236)	7.4	3.6	2.7	0.2	0.0	0.0
16° FURNITURE, FIXTURES, EXCL. METAL (238)	-	-	50.3	7.0	-	-
17° PULP, PAPER AND PRODUCTS (239, 240)	3.3	0.1	3.8	2.8	1.4	0.2
18° PRINTING, PUBLISHING, ETC. (242)	7.1	0.2	7.4	0.2	0.4	0.0
19° FERTILIZER, INSECTICIDES (244)	3.1	0.4	-	1.7	0.1	0.1
20° PAINTS, VARNISHES, FILLERS (246)	0.3	-	0.1	0.0	-	0.1
21° SOAPS, DETERGENTS, TOILETRIES, PHARM. (237)	2.9	0.5	0.1	0.4	0.1	0.1
22° MATCHES, INKS, GLUES, AND CHEM. N.E.C. (248)	0.6	0.1	0.1	0.3	0.2	0.1
23° BASIC CHEMICALS, PETROLEUM PRODS. (243, 250, 251)	1.8	5.9	0.1	7.8	0.5	1.1
24° RUBBER PRODUCTS (253)	-	-	-	0.9	0.7	0.3
25° PLASTIC PRODUCTS (255)	1.6	0.4	0.9	3.2	3.1	2.0
26° STRUCTURAL CLAY PRODS. INCL. BRICKS (258)	0.7	-	0.3	-	-	-
27° GLASS, CEMENT ETC. (256, 257, 259, 260)	7.7	11.9	0.1	0.0	-	0.0
28° NON-FERROUS, IRON, STEEL (BASIC) (262, 264)	0.1	0.1	0.1	0.2	0.0	0.0
29° METAL PRODUCTS, MACHINERY (268)	1.6	1.5	2.0	4.7	0.6	0.6
30° ELECTRICAL MACHINERY/EQUIPMENT (278, 279)	0.0	0.0	0.1	0.1	0.0	0.0
31° MOTOR VEHICLES (283)	2.5	0.8	0.8	1.6	0.2	0.0
32° OTHER VEHICLES ETC. (282, 284, 285, 286)	0.6	1.3	0.9	4.2	0.8	0.3
33° OTHER MANUFACTURING (231, 290, 291)	0.0	0.0	0.0	0.9	1.5	0.3
ALL	3.8	2.3	1.2	7.4	1.3	1.1

SAS

PRODUCING SECTOR	RECEIVING SECTOR					
	13° WEARING APPAREL (229)	14° FOOTWEAR (234)	15° SAWNILLING - WOOD EXCL. FURNITURE (236)	16° FURNITURE, FIXTURES, EXCL. METAL (238)	17° PULP, PAPER AND PRODUCTS (239, 240)	18° PRINTING, PUBLISHING, ETC. (242)
	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW
	% OF OUTPUT	% OF OUTPUT	% OF OUTPUT	% OF OUTPUT	% OF OUTPUT	% OF OUTPUT
01° SLAUGHTERING, PROCESSING OF MEAT (201)	0.0					
02° CANNING, PRESERVING, FRUIT, VEGETABLES (203)						
03° GRAIN MILL PRODUCTS, ANIMAL FEEDS (205)	0.0	0.0	0.1	0.0	0.1	0.3
04° BAKERY PRODUCTS (206)						
05° CHOCOLATE AND SUGAR CONFECTIONERY (208)	0.2					
06° DAIRY AND OTHER N.E.C. (202, 204, 207, 209)	0.5	0.1	0.4	0.1	0.2	0.8
07° BEER, WINE AND SPIRITS (211, 212, 213)	0.0	0.1			0.2	0.1
08° SOFT DRINKS AND CARBONATED WATERS (214)	0.0	0.0			0.0	0.0
09° TOBACCO (221, 222)						
10° COTTON (INCL. TEXTILES, CARPETS) (223, 225)	49.2	2.1	0.1	2.3	0.0	0.0
11° KNITTED PRODUCTS, ROPE, CORDAGE (224)	10.5	8.5	0.2	0.2	15.9	0.0
12° OTHER TEXTILE PRODUCTS (226)	0.2	29.4	1.7	3.3	6.7	0.3
13° WEARING APPAREL (229)	10.0	0.1	2.0	0.5	2.8	2.4
14° FOOTWEAR (234)						
15° SAWNILLING, WOOD EXCL. FURNITURE (236)	0.0	0.3		36.9	2.0	0.0
16° FURNITURE, FIXTURES, EXCL. METAL (238)	0.0	5.6		1.9	8.7	
17° PULP, PAPER AND PRODUCTS (239, 240)	2.6	2.7	0.3	0.2	25.2	21.2
18° PRINTING, PUBLISHING, ETC. (242)	0.6	0.3	0.9	0.2	0.8	7.6
19° FERTILIZER, INSECTICIDES (244)	0.0	0.2			0.2	0.1
20° PAINTS, VARNISHES, FILLERS (246)			4.5	16.4	1.5	0.7
21° SOAPS, DETERGENTS, TOILETRIES, PHARM. (247)	0.4	0.4	0.8	0.2	0.5	2.1
22° MATCHES, INKS, GLUES, AND CHEM. N.E.C. (248)	2.4	3.2	9.3	1.7	5.7	15.9
23° BASIC CHEMICALS, PETROLEUM PRODS. (243, 250, 251)	0.2	0.8	0.5	0.1	1.0	1.2
24° RUBBER PRODUCTS (253)	0.3	30.9	1.7	15.9	0.1	1.7
25° PLASTIC PRODUCTS (255)	15.5	2.5	0.2	1.2	2.6	0.8
26° STRUCTURAL CLAY PRDS. INCL. BRICKS (258)						
27° GLASS, CEMENT ETC. (256, 257, 259, 260)	0.0	4.7	3.8	3.2	0.0	0.1
28° NON-FERROUS, IRON, STEEL (BASIC) (262, 264)	0.0	0.1	0.1	0.1	0.2	0.3
29° METAL PRODUCTS, MACHINERY (268)	1.1	2.2	2.4	1.7	2.0	1.3
30° ELECTRICAL MACHINERY/EQUIPMENT (278, 279)	0.0	0.0	0.1	0.0	0.2	0.1
31° MOTOR VEHICLES (283)	0.4	0.6	1.3	0.7	0.5	0.3
32° OTHER VEHICLES ETC. (282, 284, 285, 286)	1.9	1.5	2.2	1.3	2.0	1.1
33° OTHER MANUFACTURING (231, 290, 291)	10.3	48.7	0.4	1.5	0.5	1.0
ALL	10.3	2.3	1.6	2.1	3.0	2.7

SAS

	RECEIVING SECTOR					
	19° FERTILIZER - INSECTICIDES (244)	20° PAINTS, VARNISHES, FILLERS (246)	21° SOAPS, DETERGENTS, TOILETRIES, PHARM. (247)	22° MATCHES, INKS, GLUES, AND CHEM. N.E.C. (248)	23° BASIC CHEMICALS, PETROLEUM PRODS. (243, 250, 251)	24° RUBBER PRODUCTS (253)
	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW
	% OF OUTPUT	% OF OUTPUT	% OF OUTPUT	% OF OUTPUT	% OF OUTPUT	% OF OUTPUT
PRODUCING SECTOR						
01° SLAUGHTERING, PROCESSING OF MEAT (201)			5.3	0.5	0.1	
02° CANNING, PRESERVING, FRUIT, VEGETABLES (203)						
03° GRAIN MILL PRODUCTS, ANIMAL FEEDS (205)	0.0	0.0	5.1	0.1	0.1	0.2
04° BAKERY PRODUCTS (206)						
05° CHOCOLATE AND SUGAR CONFECTIONERY (208)				0.1		
06° DAIRY AND OTHER N.E.C. (202, 204, 207, 209)	0.0	0.0	10.0	0.5	2.1	0.5
07° BEER, WINE AND SPIRITS (211, 212, 213)	4.1	1.1	1.6	0.4	0.3	0.3
08° SOFT DRINKS AND CARBONATED WATERS (214)	0.2	0.0	0.1	0.0	0.0	0.0
09° TOBACCO (221, 222)						
10° COTTON (INCL. TEXTILES, CARPETS) (223, 225)			0.0	0.0		0.0
11° KNITTED PRODUCTS, ROPE, CORDAGE (224)						11.1
12° OTHER TEXTILE PRODUCTS (226)	0.3	0.0	0.1	0.0	0.0	4.3
13° WEARING APPAREL (229)		0.5	1.0	0.2	0.1	0.4
14° FOOTWEAR (234)						
15° SABBILLING, WOOD EXCL. FURNITURE (236)	0.4	0.0	0.4	0.5	0.0	0.1
16° FURNITURE, FIXTURES, EXCL. METAL (238)						5.6
17° PULP, PAPER AND PRODUCTS (239, 240)	0.2	0.3	6.9	1.1	0.3	0.5
18° PRINTING, PUBLISHING, ETC. (242)	0.1	0.6	14.6	3.0	0.8	1.8
19° FERTILIZER, INSECTICIDES (244)	87.6	1.2	1.7	0.4	0.3	0.3
20° PAINTS, VARNISHES, FILLERS (246)	3.6	0.2	0.5	0.2	0.0	0.2
21° SOAPS, DETERGENTS, TOILETRIES, PHARM. (247)	0.6	0.2	54.0	0.9	7.6	1.0
22° MATCHES, INKS, GLUES, AND CHEM. N.E.C. (248)	0.0	0.1	6.5	9.3	3.7	11.4
23° BASIC CHEMICALS, PETROLEUM PRODS. (243, 250, 251)	17.9	4.8	7.0	4.8	10.7	1.7
24° RUBBER PRODUCTS (253)	0.8	0.1	0.3	0.6	0.0	5.0
25° PLASTIC PRODUCTS (255)	8.4	0.0	5.8	1.7	0.3	2.1
26° STRUCTURAL CLAY PRODS. INCL. BRICKS (258)						
27° GLASS, CEMENT ETC. (256, 257, 259, 260)	1.0	0.0	6.5	0.5	0.1	0.0
28° NON-FERROUS, IRON, STEEL (BASIC) (262, 264)	0.4	0.0	0.0	0.0	0.5	0.9
29° METAL PRODUCTS, MACHINERY (268)	2.7	1.3	2.2	1.3	0.7	1.0
30° ELECTRICAL MACHINERY/EQUIPMENT (278, 279)	0.9	0.0	0.0	0.1	0.1	0.2
31° MOTOR VEHICLES (283)	0.5	0.0	0.3	0.3	0.1	0.3
32° OTHER VEHICLES ETC. (282, 284, 285, 286)	24.3	0.0	0.6	0.1	0.2	1.1
33° OTHER MANUFACTURING (231, 290, 291)	0.1	0.0	0.5	0.3	0.1	0.5
ALL	3.4	0.3	4.3	0.7	0.5	0.8

SAS

	RECEIVING SECTOR					
	25° PLASTIC PRODUCTS (25-5)	26° STRUCTURAL CLAY PRODS. INCL. BRICKS (258)	27° GLASS, CEMENT ETC. (256, 257, 259, 260)	28° NON-FERROUS, IRON, STEEL (BASIC) (262, 264)	29° METAL PRODUCTS, MACHINERY (268)	30° ELECTRICAL MACHINERY/EQUIPMENT (278, 279)
	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW
	% OF OUTPUT	% OF OUTPUT	% OF OUTPUT	% OF OUTPUT	% OF OUTPUT	% OF OUTPUT
PRODUCING SECTOR						
01° SLAUGHTERING, PROCESSING OF MEAT (201)	-	-	-	-	0.0	-
02° CANNING, PRESERVING, FRUIT, VEGETABLES (203)	-	-	-	-	-	-
03° GRAIN MILL PRODUCTS, ANIMAL FEEDS (205)	0.0	0.0	0.0	0.1	0.0	0.1
04° BAKERY PRODUCTS (206)	-	-	-	-	-	-
05° CHOCOLATE AND SUGAR CONFECTIONERY (208)	-	-	-	-	0.0	-
06° DAIRY AND OTHER N.E.C. (202, 204, 207, 209)	0.1	0.0	0.0	0.2	0.1	0.2
07° BEER, WINE AND SPIRITS (211, 212, 213)	0.0	0.0	0.1	0.4	0.4	0.0
08° SOFT DRINKS AND CARBONATED WATERS (214)	0.0	0.0	0.0	0.0	0.0	0.0
09° TOBACCO (221, 222)	-	-	-	-	-	-
10° COTTON (INCL. TEXTILES, CARPETS) (223, 225)	0.9	-	-	-	0.1	0.0
11° KNITTED PRODUCTS, ROPE, CORDAGE (224)	3.7	0.2	0.6	0.4	14.2	1.7
12° OTHER TEXTILE PRODUCTS (226)	0.1	0.1	11.1	19.3	9.9	0.2
13° WEARING APPAREL (229)	0.9	0.0	1.6	42.4	4.1	1.0
14° FOOTWEAR (234)	-	-	-	-	-	-
15° SAWMILLING, WOOD EXCL. FURNITURE (236)	0.1	0.1	0.5	1.6	3.6	3.4
16° FURNITURE, FIXTURES, EXCL. METAL (238)	-	0.2	-	0.1	9.2	0.1
17° PULP, PAPER AND PRODUCTS (239, 240)	1.2	0.2	4.4	1.6	1.8	0.5
18° PRINTING, PUBLISHING, ETC. (242)	1.7	0.4	8.4	1.2	3.7	1.0
19° FERTILIZER, INSECTICIDES (244)	0.0	0.0	0.1	1.6	0.5	0.0
20° PAINTS, VARNISHES, FILLERS (246)	1.8	0.1	1.5	7.3	35.4	6.8
21° SOAPS, DETERGENTS, TOILETRIES, PHARM. (247)	0.2	0.0	0.1	0.6	0.4	0.3
22° MATCHES, INKS, GLUES, AND CHEM. N.E.C. (248)	2.9	0.1	0.4	3.4	3.3	4.0
23° BASIC CHEMICALS, PETROLEUM PRDJS. (243, 250, 251)	0.3	0.1	0.3	22.6	1.7	0.8
24° RUBBER PRODUCTS (253)	0.1	1.7	1.3	10.0	3.2	2.7
25° PLASTIC PRODUCTS (255)	4.1	0.2	0.6	0.4	1.5	1.8
26° STRUCTURAL CLAY PRODS. INCL. BRICKS (258)	-	17.3	10.0	70.7	0.4	0.4
27° GLASS, CEMENT ETC. (256, 257, 259, 260)	0.0	9.6	32.2	8.8	2.2	1.0
28° NON-FERROUS, IRON, STEEL (BASIC) (262, 264)	0.1	0.1	1.4	29.3	50.8	6.2
29° METAL PRODUCTS, MACHINERY (268)	0.5	1.1	14.7	13.8	12.4	1.5
30° ELECTRICAL MACHINERY/EQUIPMENT (278, 279)	0.1	0.2	0.7	14.0	18.5	60.6
31° MOTOR VEHICLES (283)	2.1	1.9	7.1	3.2	4.3	0.5
32° OTHER VEHICLES ETC. (282, 284, 285, 286)	0.8	1.1	13.5	11.7	11.2	1.4
33° OTHER MANUFACTURING (231, 290, 291)	0.2	0.3	0.7	1.7	1.0	1.3
ALL	0.7	0.5	4.3	8.4	10.1	2.7

SAS

	RECEIVING SECTOR			
	31* MOTOR VEHICLES (28-3)	32* OTHER VEHICLES ETC. (282, 284, 285, 286)	33* OTHER MANUFACTURING (231, 290, 291)	ALL
	FLOW	FLOW	FLOW	FLOW
	% OF OUTPUT	% OF OUTPUT	% OF OUTPUT	% OF OUTPUT
PRODUCING SECTOR				
01* SLAUGHTERING, PROCESSING OF MEAT (201)	-	-	8.1	100.0
02* CANNING, PRESERVING, FRUIT, VEGETABLES (203)	-	-	-	100.0
03* GRAIN MILL PRODUCTS, ANIMAL FEEDS (205)	0.0	0.0	0.1	100.0
04* BAKERY PRODUCTS (206)	-	-	-	100.0
05* CHOCOLATE AND SUGAR CONFECTIONERY (208)	-	-	-	100.0
06* DAIRY AND OTHER N.E.C. (202, 204, 207, 209)	0.0	0.0	0.2	100.0
07* BEER, WINE AND SPIRITS (211, 212, 213)	0.0	0.0	0.2	100.0
08* SOFT DRINKS AND CARBONATED WATERS (214)	0.0	0.0	0.0	100.0
09* TOBACCO (221, 222)	-	-	-	100.0
10* COTTON (INCL. TEXTILES, CARPETS) (223, 225)	0.0	-	0.4	100.0
11* KNITTED PRODUCTS, ROPE, CORDAGE (224)	4.1	0.0	10.0	100.0
12* OTHER TEXTILE PRODUCTS (226)	3.8	6.3	5.6	100.0
13* WEARING APPAREL (229)	0.4	0.0	1.3	100.0
14* FOOTWEAR (234)	-	-	-	100.0
15* SAWMILLING, WOOD EXCL. FURNITURE (236)	0.6	1.5	3.6	100.0
16* FURNITURE, FIXTURES, EXCL. METAL (238)	2.5	-	7.0	100.0
17* PULP, PAPER AND PRODUCTS (239, 240)	0.1	0.0	1.1	100.0
18* PRINTING, PUBLISHING, ETC. (242)	0.2	0.1	1.7	100.0
19* FERTILIZER, INSECTICIDES (244)	0.0	0.0	0.2	100.0
20* PAINTS, VARNISHES, FILLERS (246)	13.8	1.0	3.7	100.0
21* SOAPS, DETERGENTS, TOILETRIES, PHARM. (247)	0.1	0.0	1.0	100.0
22* MATCHES, INKS, GLUES, AND CHEM. N.E.C. (248)	0.8	0.4	5.3	100.0
23* BASIC CHEMICALS, PETROLEUM PRODS. (243, 250, 251)	0.1	0.1	1.1	100.0
24* RUBBER PRODUCTS (253)	17.7	0.7	1.2	100.0
25* PLASTIC PRODUCTS (255)	0.1	0.0	3.4	100.0
26* STRUCTURAL CLAY PRODS. INCL. BRICKS (258)	0.0	0.2	0.0	100.0
27* GLASS, CEMENT ETC. (256, 257, 259, 260)	7.8	0.2	0.4	100.0
28* NON-FERROUS, IRON, STEEL (BASIC) (262, 264)	5.7	0.8	1.9	100.0
29* METAL PRODUCTS, MACHINERY (268)	2.8	2.3	6.3	100.0
30* ELECTRICAL MACHINERY/EQUIPMENT (278, 279)	2.2	0.3	1.5	100.0
31* MOTOR VEHICLES (283)	64.3	0.5	1.5	100.0
32* OTHER VEHICLES ETC. (282, 284, 285, 286)	2.5	2.1	5.5	100.0
33* OTHER MANUFACTURING (231, 290, 291)	0.3	0.1	26.8	100.0
ALL	3.0	0.6	2.5	100.0

ANNEX D

**COMMODITY PRODUCTION IN ZIMBABWE
AND USE BY MANUFACTURING SECTOR**

VALUES IN DOLLARS

THIS DATA COVERS DOMESTIC PRODUCTION. USE BY MANUFACTURING, ON THE OTHER HAND, MUST BE TAKEN TO INCLUDE IMPORTS.

SOURCE: COMPILED FROM UNPUBLISHED CSO DATA FROM THE 1981/1982 CENSUS OF PRODUCTION.

SAS

PRODUCT	OUTPUT	USE
	TOTAL	TOTAL
2010 MEAT BY-PRODUCTS	67241880	956007
2011 BEEF, FRESH OR FROZEN	758263932	12165638
2012 LAMB, MUTTON AND GOAT MEAT	24164	.
2013 PORK - FRESH OR FROZEN	6252744	45550
2014 POULTRY - FRESH OR FROZEN	10940844	8350
2015 ANIMAL OILS AND FATS	7338600	1961933
2016 MEAT - PROCESSED/CANNED	24620509	1010036
2017 SKINS/HIDES UNDRRESSED	7596117	1389291
2020 DAIRY PRODUCTS, N.E.S.	19328661	25691
2021 MILK, PROCESSED	263144694	4808889
2023 ICE CREAM	2332685	.
2024 BUTTER	923774	.
2025 CHEESE	3031301	97778
2030 FRUITS AND VEGETABLES AND JAMS	8429316	467594
2040 VEGETABLE OILS, MARGARINE	127435420	17683387
2050 GRAIN MILL PRODUCTS, N.E.S.	33326144	3649845
2051 ANIMAL FEEDS AND FISH MEAL	70159131	1012651
2052 FLOUR	222026496	36204975
2053 MAIZE MEAL	345313350	3171682
2060 BAKERY PRODUCTS, N.E.S.	14998010	.
2061 BREAD	55674380	.
2070 SUGAR PRODUCTS, N.E.S.	25368	333291
2071 REFINED SUGAR	456165028	12690445
2072 MOLASSES AND BAGASSE	2399898	7748661
2080 SWEETS	8483985	.
2081 COCOA, CHOCOLATE, CHOCOLATES	4455657	1973730
2090 FOOD PRODUCTS N.E.S.	19197796	10556448
2091 COFFEE AND CHICORY	5019571	508506
2092 FISH - DRIED OR FROZEN	1310619	2221914
2093 TEA, BLACK BLENDED AND PACKED	.	3825183
2094 EGGS, POWDERED	.	721667
2110 SPIRITS - POTABLE	52344930	2537583
2111 SPIRITS - NON-POTABLE (METHS)	979201	.
2120 WINE	556056	218520
2130 MALT AND MALT EXTRACT ETC.	11359745	18852726
2131 BEER, OPAQUE	46879238	7904
2132 BEER, CLEAR	19576150	.
2140 SOFT DRINKS	213050	.
2141 COCA COLA BASE	30385654	5546934
2210 TOBACCO PACKING AND GRADING, LEAF	33403196	8501214
2220 CIGARETTES, CIGARS, ETC.	16073846	.
2230 TEXTILES - SPINNING, ETC. N.E.S	14098098	12157069
2231 COTTON LINT	302480412	7558929
2233 TEXTILE FABRIC	124822863	97798048
2234 YARNS/THREADS - TRIMMINGS	29776079	72376535
2235 GINNED COTTON SEED	14712319	4384368
2236 TOWELLING AND TOWELS	6819658	.
2237 BLANKETS AND WOVEN GOODS	19151119	7442
2238 HAND KNITTING WOOL	917865	19634
2240 KNITTED PRODUCTS, N.E.S.	2308660	6814
2241 KNITWEAR	39766870	.
2250 CARPETS AND FLOOR RUGS	1639818	107268
2260 TEXTILES N.E.S. COTTON WASTE, CANVAS, ETC.	2578427	873564
2261 HOUSEHOLD LINEN	289322	.

(CONTINUED)

SAS

PRODUCT	OUTPUT	USE
	TOTAL	TOTAL
2262 TEXTILE BAGS AND SACKS	.	5648385
2290 WEARING APPAREL N.E.S.	12953717	159855
2291 LADIES WEAR	57413267	71105
2292 MENS WEAR	60754089	60582
2293 PROTECTIVE CLOTHING	468741867	3201229
2310 LEATHER AND SUBSTITUTE N.E.S	.	897423
2311 HIDES AND SKINS	47225904	6495710
2312 LEATHER AND SYNTHETIC BAGS	2395776	4776
2340 FOOTWEAR	53417179	262896
2360 WOOD AND CORK PRODUCTS, N.E.S.	2622868	2028661
2361 WOODEN CONTAINERS, CRATES, PALLETS	75633516	2567695
2362 JOINERY, PREFABS	7932015	.
2363 WOOD PRODUCTS FOR BUILDINGS	21819072	262368
2364 WOOD, ROUGH/SAWN	270184420	46092356
2380 FURNITURE, FIXTURES - MAINLY WOOD	56899391	72864
2390 PULP, PAPER, PAPERBOARD	35439547	66392877
2400 PAPER PRODUCTS, N.E.S.	17251531	12762147
2401 PAPER CONTAINERS AND CARTONS	54659757	37518073
2420 PRINTED PRODUCTS, N.E.S.	49728113	41180
2421 PUBLISHING	29644105	185554
2430 BASIC INDUSTRIAL CHEMICALS N.E.S.	8463449	137254597
2431 ACIDS	6452872	18390394
2432 GASES AND LIQUID GASES	27780986	2277366
2441 FERTILIZERS	106650878	16114134
2442 INSECTICIDES	7032219	1150407
2450 SYNTHETIC RESINS, MAN-MADE FIBRES, ETC.	2504799	31760049
2451 RUBBER	.	11495598
2460 VARNISHES, LACQUERS, FILLERS, PAINT	28028666	11230025
2470 SOAP, DETERGENTS, CLEANERS	736616776	6140990
2471 MEDICINAL AND PHARMACEUTICAL	26759509	10263448
2472 TOILETRIES AND COSMETICS	21610401	5762269
2480 CHEMICAL PRODUCTS N.E.S.	25319240	25733267
2481 EXPLOSIVES AND CARTRIDGES *	66528	19465487
2482 MATCHES	2321793	.
2501 OILS, LUBRICANTS	80036	134633
2502 PETROLEUM	.	53446
2510 PETROLEUM AND COAL PRODUCTS N.E.S.	50939	.
2511 ASPHALT, BITUMEN AND TAR	5562136	1460444
2530 RUBBER PRDUS. N.E.S.	8805216	1187002
2532 INDUSTRIAL RUBBER PRODUCTS	307869308	33072276
2533 TYRES, RETREADS	128854260	683778
2534 CAMEL-BACK	.	735894
2550 PLASTIC PRODUCTS N.E.S.	38492790	6060481
2551 CONTAINERS - PLASTIC	73040775	33355404
2552 DOMESTIC PLASTIC PRODUCTS	414497	.
2553 INDUSTRIAL PLASTIC PRODUCTS	9594907	18824668
2554 TILES, PLSTIC AND FIBREGLASS	1519818	.
2560 POTTERY, CHINA, EARTHENWARE	11510283	137400
2570 GLASS PRODUCTS N.E.S. - GLAZE	6556750	3633103
2571 GLASS CONTAINERS	95326896	7630057
2572 GLASS PANECS AND SHEETS	31253922	3961031
2580 CLAY PRODUCTS N.E.S. PIPES AND TILES	7522860	1835787
2581 BRICKS (NOT CONCRETE)	11289284	17944242
2590 LIME AND PLASTER	914877	49134

(CONTINUED)

SAS

PRODUCT	OUTPUT	USE
	TOTAL	TOTAL
2591 CEMENT	23202800	16769857
2592 CLINKER, ONLY CEMENT WORKS	16589	1067226
2600 NON-METALLIC MINERAL PRODUCTS, N.E.S.	4251725	3259011
2601 ASBESTOS EXCLUDING TILES	73073648	372208
2602 CONCRETE PRODUCTS - SLEEPER TILES	11610814	5564
2603 TILES - CONCRETE, ABESTOS, ETC.	158132	.
2620 IRON AND STEEL BASIC INDUSTRY	98128579	201981929
2621 GRANULATED SLAG AND SLAG CLINKER	2858034	6333656
2622 FERROUS ALLOY	90856954	428448
2624 WIRE, INCL GALVANISED, EXCL COPPER	157:6487	.
2626 METAL FOR CONSUMERS PRODUCTS, I.E. INGOT OF I	444776	.
2627 FINISHED INDUSTRIAL METAL PRODUCTS	30862065	298269
2640 NON-FERROUS METAL BASIC PRODUCTS	23515189	53416628
2641 COPPER METAL, COPPER SHEETING	2114310	875625
2643 NON-FERROUS METALS, N.E.S.	4014562	.
2644 NON-FERROUS ALLOYS	419337	.
2645 GOLD AND OTHER PRECIOUS METAL	.	51847
2680 METAL PRODUCTS, MACHINERY AND SPARE	252386946	174758978
2681 METAL CONTAINERS - TINS, CANS	243466370	15117951
2682 FURNITURE AND FIXTURES MAINLY METAL	10236676	.
2687 RAZOR BLADES	1656901	.
2688 SOLAR HEATERS	100258	.
2689 MILITARY GUNS AND PARTS	4206531	.
2780 COMM EQUIPT N.E.S.	2066517	545662
2781 RADIOS, STEREOs ETC.	17231183	4454868
2782 TELEVISION RECEIVING SETS	324299	.
2790 ELECTR.MACH.ETC., N.E.S.	27409706	1630083
2791 ELECTR.DOMESTIC APPLIANCES	5807127	330844
2792 ELECTR.EQUIP.-INDUSTRIAL	283040064	36739539
2793 BATTERIES	21733210	270935
2794 COOKERS AND STOVES	68986	.
2795 GEYSERS	2312109	.
2796 ELECTRIC CABLE/WIRE	48512018	294922
2820 RAILROAD EQUIPMENT N.E.S.	4493	.
2821 ROLLING STOCK	3620445	.
2822 LOCOMOTIVES	2582576	.
2830 MOTOR SPARES ETC.N.E.S.INCL.C.K.D.	309130982	34184735
2831 MOTOR VEHICLES - ASSEMBLED	8406920	3956031
2832 MOTOR VEHICLES BODIES	51056740	.
2833 CARAVANS	1675316	.
2834 MILITARY VEHICLES AND PARTS	1254865	.
2835 TRAILERS FOR TRUCKS, ETC.	12960335	.
2840 BICYCLES SPARE PARTS ETC. N.E.S.	273506	.
2841 BICYCLES	1549887	.
2850 AIRCRAFT AND EQUIPMENT	.	2593028
2860 TRANSPORT N.E.S.	156105	393069
2861 BOATS	2799978	407374
2862 CARTS	99991	.
2901 SCIENT./PROF. EQUIPMENT	1337788	228968
2902 WATCHES AND CLOCKS	321742	184614
2903 PHOTOGRAPHIC AND OPTICAL	1441016	324763
2990 OTHER N.E.S.	26736873	1012578
2991 JEWELLERY AND ENGRAVING	4750648	1055513
2993 SPORTS EQUIPMENT	664890	99368
2994 BRUSHWARE	9511887	172738
2995 CURIOS, NOVELTIES	3571719	9024
ALL	8125384436	1532242105

ANNEX E

COMMODITY INPUTS TO MANUFACTURING

FOR 33 SUB-SECTORS

VALUES IN DOLLARS

THIS DATA COVERS ALL REPORTED COMMODITIES OF THE CSO CLASSIFICATION,
I.E. INCLUDING COMMODITIES FROM SECTORS OTHER THAN MANUFACTURING.

SOURCE: COMPILED FROM UNPUBLISHED CSO DATA FROM THE 1981/1982 CENSUS OF PRODUCTION.

SAS

SUBJECT=01* SLAUGHTERING, PROCESSING OF MEAT(201)

COMMODITY	INPUTS TO SUBSECTOR	DOLLARS	PERCENT
30	CATTLE	91,418,817	71.583
31	PIGS	12,983,839	10.167
32	POULTRY LIVE	7,337,171	5.745
2011	BEEF, FRESH OR FROZEN	4,346,767	3.404
2681	METAL CONTAINERS - TINS, CANS	2,955,553	2.314
2680	METAL PRODUCTS, MACHINERY AND SPARE	2,241,240	1.755
2401	PAPER CONTAINERS AND CARTONS	1,150,224	0.901
2016	MEAT - PROCESSED/CANNED	983,714	0.770
2090	FOOD PRODUCTS N.E.S.	822,570	0.644
2051	ANIMAL FEEDS AND FISH MEAL	468,498	0.367
2551	CONTAINERS - PLASTIC	439,424	0.344
2050	GRAIN MILL PRODUCTS, N.E.S.	403,855	0.316
2430	BASIC INDUSTRIAL CHEMICALS N.E.S.	313,096	0.245
2830	MOTOR SPARES ETC.N.E.S.INCL.C.K.D.	252,275	0.198
2470	SOAP, DETERGENTS, CLEANERS	221,236	0.173
2040	VEGETABLE OILS, MARGARINE	207,580	0.163
2293	PROTECTIVE CLOTHING	164,068	0.128
12	LUCERNE	156,166	0.122
2530	RUBBER PRODUCTS N.E.S.	156,166	0.122
2072	MOLASSES AND BAGASSE	134,795	0.106
2262	TEXTILE BAGS AND SACKS	78,573	0.062
2233	TEXTILE FABRIC	54,396	0.043
2094	BRUSHWARE	46,850	0.037
2013	PORK - FRESH OR FROZEN	45,550	0.036
2071	REFINED SUGAR	38,446	0.030
2571	GLASS CONTAINERS	38,308	0.030
2021	MILK, PROCESSED	35,807	0.028
2094	EGGS, POWDERED	35,806	0.028
16	VEGETABLES FRESH	35,759	0.028
2260	TEXTILES N.E.S. COTTON WASTE, CANVAS, ET	31,233	0.024
5555	OTHER	30,220	0.024
2400	PAPER PRODUCTS, N.E.S.	25,958	0.020
23	OTHER LIVESTOCK	18,634	0.015
19	GRAIN OTHER	14,602	0.011
14	CITRUS FRUIT	13,703	0.011
2480	CHEMICAL PRODUCTS N.E.S.	4,447	0.003
9000	UNKNOWN (STEAM, SCRAP GLASS)	3,120	0.002
2110	SPIRITS - POTABLE	1,797	0.001
SUBJECT		127,710,253	100.000

SUBJECT=02* CANNING, PRESERVING, FRUIT, VEGETABLES (203)

COMMODITY	INPUTS TO SUBSECTOR	DOLLARS	PERCENT
15	FRUIT, OTHER	1,121,576	32.600
2681	METAL CONTAINERS - TINS, CANS	1,005,753	29.234
2071	REFINED SUGAR	359,831	10.459
2090	FOOD PRODUCTS N.E.S.	204,702	5.950
16	VEGETABLES FRESH	193,308	5.619
2571	GLASS CONTAINERS	190,132	5.526
2401	PAPER CONTAINERS AND CARTONS	177,590	5.162
2680	METAL PRODUCTS, MACHINERY AND SPARE	50,982	1.482
2551	CONTAINERS - PLASTIC	43,159	1.254
17	MAIZE GRAIN	37,553	1.092
2470	SOAP, DETERGENTS, CLEANERS	11,421	0.332
2830	MOTOR SPARES ETC.N.E.S.INCL.C.K.D.	10,642	0.309
60	FISH	9,674	0.281
2040	VEGETABLE OILS, MARGARINE	9,246	0.269
2052	FLOUR	7,511	0.218
2293	PROTECTIVE CLOTHING	2,852	0.077
2441	FERTILIZERS	1,645	0.048
2011	BEEF, FRESH OR FROZEN	1,501	0.044
2020	DAIRY PRODUCTS, N.E.S.	1,501	0.044
SUBJECT		3,440,379	100.000

SUBJECT=03* GRAIN MILL PRODUCTS, ANIMAL FEEDS (205)

COMMODITY	INPUTS TO SUBSECTOR	DOLLARS	PERCENT
17	MAIZE GRAIN	67,674,306	41.281
18	WHEAT GRAIN	39,001,786	23.791
19	GRAIN OTHER	19,159,401	11.687
5555	OTHER	8,188,735	4.995
2551	CONTAINERS - PLASTIC	4,829,545	2.946
2470	SOAP, DETERGENTS, CLEANERS	3,421,325	2.087
2262	TEXTILE BAGS AND SACKS	2,821,703	1.721
2430	BASIC INDUSTRIAL CHEMICALS N.E.S.	2,727,658	1.664
2680	METAL PRODUCTS, MACHINERY AND SPARE	2,679,207	1.634
2401	PAPER CONTAINERS AND CARTONS	1,449,844	0.884
2090	FOOD PRODUCTS N.E.S.	1,282,269	0.782
2092	FISH - DRIED OR FROZEN	1,110,957	0.678
2050	GRAIN MILL PRODUCTS, N.E.S.	1,101,964	0.672
2071	REFINED SUGAR	1,090,842	0.665
2011	BEEF, FRESH OR FROZEN	1,077,311	0.657
2015	ANIMAL OILS AND FATS	1,077,065	0.657
2010	MEAT BY-PRODUCTS	829,610	0.504
2471	MEDICINAL AND PHARMACEUTICAL	829,610	0.504
2472	TOILETRIES AND COSMETICS	591,627	0.361
2040	VEGETABLE OILS, MARGARINE	577,709	0.352
2021	MILK, PROCESSED	498,429	0.304
2051	ANIMAL FEEDS AND FISH MEAL	495,365	0.302
2441	FERTILIZERS	495,365	0.302
2235	GINNED COTTON SEED	406,554	0.248
2830	MOTOR SPARES ETC.N.E.S.INCL.C.K.D.	187,434	0.114
2681	METAL CONTAINERS - TINS, CANS	137,548	0.084
2053	MAIZE MEAL	93,865	0.057
2293	PROTECTIVE CLOTHING	93,862	0.057
2072	MOLASSES AND BAGASSE	22,518	0.014
9000	UNKNOWN (STEAM, SCRAP GLASS)	21,800	0.013
16	VEGETABLES FRESH	20,048	0.012
2094	EGGS, POWDERED	7,435	0.005
SUBJECT		163,934,420	100.000

SAS

SUBJECT=04* BAKERY PRODUCTS(206)

COMMODITY	INPUTS TO SUBSECTOR	DOLLARS	PERCENT
2052	FLOUR	35,719,435	73.516
2040	VEGETABLE OILS, MARGARINE	3,911,761	8.051
2401	PAPER CONTAINERS AND CARTONS	1,726,772	3.554
2071	REFINED SUGAR	1,653,581	3.403
2090	FOOD PRODUCTS N.E.S.	1,434,990	2.953
2680	METAL PRODUCTS, MACHINERY AND SPARE	803,289	1.653
2011	BEEF, FRESH OR FROZEN	787,600	1.580
2551	CONTAINERS - PLASTIC	653,691	1.345
2094	EGGS POWDERED	413,239	0.851
5555	OTHER	364,066	0.749
2021	MILK, PROCESSED	308,785	0.636
14	CITRUS FRUIT	226,463	0.466
2830	MOTOR SPARES ETC.N.E.S.INCL.C.K.D.	189,967	0.391
2030	FRUITS AND VEGETABLES AND JAMS	75,962	0.156
2470	SOAP, DETERGENTS, CLEANERS	56,247	0.116
2680	TRANSPORT N.E.S.	45,621	0.094
2681	METAL CONTAINERS - TINS, CANS	44,105	0.091
2070	SUGAR PRODUCTS, N.E.S.	35,751	0.074
2293	PROTECTIVE CLOTHING	26,426	0.054
2016	MEAT - PROCESSED/CANNED	26,322	0.054
2081	COCOA, CHOCOLATE, CHOCOLATES	19,166	0.039
2110	SPIRITS - POTABLE	18,043	0.037
15	FRUIT, OTHER	16,641	0.034
2431	ACIDS	12,894	0.027
9000	UNKNOWN (STEAM, SCRAP GLASS)	11,726	0.024
2420	PRINTED PRODUCTS, N.E.S.	10,132	0.021
2014	POULTRY - FRESH OR FROZEN	8,350	0.017
2571	GLASS CONTAINERS	1,988	0.004
2361	WOODEN CONTAINERS, CRATES, PALLETS	1,708	0.003
18	WHEAT GRAIN	1,030	0.002
21	MILK	916	0.002
16	VEGETABLES FRESH	557	0.001
SUBJECT		48,587,204	100.000

SAS

SUBJECT=05* CHOCOLATE AND SUGAR CONFECTIONERY(208)

COMMODITY	INPUTS TO SUBSECTOR	DOLLARS	PERCENT
2071	REFINED SUGAR	2,137,270	23.428
2551	CONTAINERS - PLASTIC	1,393,152	15.271
2401	PAPER CONTAINERS AND CARTONS	1,242,146	13.616
2090	FOOD PRODUCTS N.E.S.	1,139,855	12.495
2081	COCOA, CHOCOLATE, CHOCOLATES	977,282	10.713
2040	VEGETABLE OILS, MARGARINE	797,412	8.741
2052	FLOUR	450,018	4.933
2021	MILK, PROCESSED	264,782	2.902
2094	EGGS, POWDERED	263,634	2.890
2680	METAL PRODUCTS, MACHINERY AND SPARE	129,106	1.415
2030	FRUITS AND VEGETABLES AND JAMS	127,908	1.073
2571	GLASS CONTAINERS	59,716	0.655
15	FRUIT, OTHER	36,298	0.398
2361	WOODEN CONTAINERS, CRATES, PALLETS	33,009	0.362
20	EGGS	28,276	0.310
2011	BEEF, FRESH OR FROZEN	18,042	0.198
2681	METAL CONTAINERS - TINS, CANS	17,406	0.191
2470	SOAP, DETERGENTS, CLEANERS	16,989	0.186
2830	MOTOR SPARES ETC.N.E.S.INCL.C.K.D.	13,818	0.151
2293	PROTECTIVE CLOTHING	3,353	0.037
2110	SPIRITS - POTABLE	2,129	0.023
2020	DAIRY PRODUCTS, N.E.S.	1,019	0.011
SUBJECT		9,122,620	100.000

SAS

SUBJECT=06* DAIRY AND OTHER N.E.C.(202,204,207,209)

COMMODITY	INPUTS TO SUBSECTOR	DOLLARS	PERCENT
42	SUGAR RAW	32,414,171	24.389
21	MILK	31,534,301	23.727
5555	OTHER	9,317,790	7.011
2401	PAPER CONTAINERS AND CARTONS	8,149,718	6.132
2551	CONTAINERS - PLASTIC	7,280,869	5.486
2011	BEEF, FRESH OR FROZEN	5,751,814	4.328
2681	METAL CONTAINERS - TINS, CANS	4,081,492	3.056
2235	GINNED COTTON SEED	3,977,814	2.993
2093	TEA, BLACK BLENDED AND PACKED	3,825,183	2.878
2021	MILK, PROCESSED	3,677,914	2.767
2680	METAL PRODUCTS, MACHINERY AND SPARE	2,385,545	1.795
2480	CHEMICAL PRODUCTS N.E.S.	2,170,969	1.633
11	TEA, BLACK DRIED	2,036,819	1.533
2050	GRAIN MILL PRODUCTS, N.E.S.	1,865,588	1.404
16	VEGETABLES FRESH	1,808,865	1.361
10	COFFEE BEANS	1,652,768	1.244
2040	VEGETABLE OILS, MARGARINE	1,620,479	1.219
2071	REFINED SUGAR	1,537,820	1.157
2571	GLASS CONTAINERS	1,375,009	1.035
2090	FOOD PRODUCTS N.E.S.	1,208,728	0.909
17	MAIZE GRAIN	938,178	0.706
2431	ACIDS	725,367	0.546
2470	SOAP, DETERGENTS, CLEANERS	538,913	0.405
2430	BASIC INDUSTRIAL CHEMICALS N.E.S.	524,485	0.395
2091	COFFEE AND CHICORY	508,506	0.383
14	CITRUS FRUIT	481,293	0.362
9000	UNKNOWN (STEAM, SCRAP GLASS)	348,626	0.262
60	FISH	345,532	0.260
2830	MOTOR SPARES ETC.N.E.S.INCL.C.K.D.	342,930	0.258
15	FRUIT, OTHER	134,393	0.101
2340	FOOTWEAR	87,632	0.066
2472	TOILETRIES AND COSMETICS	69,311	0.052
2053	MAIZE MEAL	59,990	0.045
2361	WOODEN CONTAINERS, CRATES, PALLETS	37,307	0.028
2052	FLOUR	28,011	0.021
2293	PROTECTIVE CLOTHING	20,954	0.016
2010	MEAT BY-PRODUCTS	18,848	0.014
2110	SPIRITS - POTABLE	18,323	0.014
2432	GASES AND LIQUID GASES	16,245	0.012
2282	TEXTILE BAGS AND SACKS	2,401	0.002
2094	EGGS POWDERED	1,553	0.001
2233	TEXTILE FABRIC	1,383	0.001
SUBJECT		132,906,237	100.000

SAS

SUBJECT-07* BEE WINE AND SPIRITS(211,212,213)

COMMODITY	INPUTS TO SUBSECTOR	DOLLARS	PERCENT
17	MAIZE GRAIN	11,748,922	22.876
2130	MALT AND MALT EXTRACT ETC.	9,426,363	18.354
19	GRAIN OTHER	8,349,692	16.257
2090	FOOD PRODUCTS N.E.S.	3,800,149	7.399
2053	MAIZE MEAL	3,014,603	5.870
2401	PAPER CONTAINERS AND CARTONS	2,869,239	5.587
2110	SPIRITS - POTABLE	2,493,413	4.855
2571	GLASS CONTAINERS	1,603,638	3.122
2830	MOTOR SPARES ETC.N.E.S.INCL.C.K.D.	1,245,925	2.426
2361	WOODEN CONTAINERS, CRATES, PALLETS	1,141,991	2.224
2681	METAL CONTAINERS - TINS, CANS	1,049,693	2.044
2680	METAL PRODUCTS, MACHINERY AND SPARE	894,644	1.742
2470	SOAP, DETERGENTS, CLEANERS	879,659	1.713
2551	CONTAINERS - PLASTIC	664,528	1.294
15	FRUIT, OTHER	398,883	0.777
2071	REFINED SUGAR	326,076	0.635
9000	UNKNOWN (STEAM, SCRAP GLASS)	285,811	0.556
2120	WINE	218,520	0.425
2050	GRAIN MILL PRODUCTS, N.E.S.	177,458	0.346
2591	CEMENT	151,867	0.296
2011	BEEF, FRESH OR FROZEN	117,671	0.229
2293	PROTECTIVE CLOTHING	117,471	0.229
2581	BRICKS (NOT CONCRETE)	112,110	0.218
1305	OTHER STONE, CLAY AND SAND	70,069	0.136
2480	CHEMICAL PRODUCTS N.E.S.	52,315	0.102
2430	BASIC INDUSTRIAL CHEMICALS N.E.S.	32,155	0.063
2460	VARNISHES, LACQUERS, FILLERS, PAINT	28,027	0.055
2021	MILK, PROCESSED	23,172	0.045
2020	DAIRY PRODUCTS, N.E.S.	23,171	0.045
2441	FERTILIZERS	23,074	0.045
2431	ACIDS	5,933	0.012
2550	PLASTIC PRODUCTS N.E.S.	5,468	0.011
2791	ELECTR.DOMESTIC APPLIANCES	4,484	0.009
2233	TEXTILE FABRIC	2,989	0.006
SUBJECT		51,359,183	100.000

SAS

SUBJECT-08* SOFT DRINKS AND CARBONATED WATERS(214)

COMMODITY	INPUTS TO SUBSECTOR	DOLLARS	PERCENT
2141	COCA COLA BASE	5,546,934	29.479
2071	REFINED SUGAR	5,498,174	29.220
2571	GLASS CONTAINERS	2,725,252	14.483
2680	METAL PRODUCTS, MACHINERY AND SPARE	1,882,288	10.003
14	CITRUS FRUIT	773,642	4.111
2361	WOODEN CONTAINERS, CRATES, PALLETS	562,298	2.988
2432	GASES AND LIQUID GASES	435,531	2.315
2430	BASIC INDUSTRIAL CHEMICALS N.E.S.	393,000	2.089
2830	MOTOR SPARES ETC.N.E.S.INCL.C.K.D.	272,130	1.446
2090	FOOD PRODUCTS N.E.S.	221,831	1.179
2470	SOAP, DETERGENTS, CLEANERS	182,254	0.969
2551	CONTAINERS - PLASTIC	177,632	0.944
2401	PAPER CONTAINERS AND CARTONS	80,602	0.428
2681	METAL CONTAINERS - TINS, CANS	44,826	0.238
2480	CHEMICAL PRODUCTS N.E.S.	8,930	0.047
2293	PROTECTIVE CLOTHING	7,755	0.041
2053	MAIZE MEAL	3,531	0.019
SUBJECT		18,816,610	100.000

SAS

SUBJECT-09* TOBACCO (221,222)

COMMODITY	INPUTS TO SUBSECTOR	DOLLARS	PERCENT
2401	PAPER CONTAINERS AND CARTONS	3,005,437	26.324
2210	TOBACCO PACKING AND GRADING, LEAF	2,833,738	24.820
2680	METAL PRODUCTS, MACHINERY AND SPARE	1,251,749	10.964
2581	METAL CONTAINERS - TINS, CANS	1,212,257	10.618
2262	TEXTILE BAGS AND SACKS	749,390	6.564
2390	PULP, PAPER, PAPERBOARD	473,373	4.146
2361	WOODEN CONTAINERS, CRATES, PALLETS	416,155	3.645
2551	CONTAINERS - PLASTIC	359,641	3.150
2830	MOTOR SPARES ETC.N.E.S.INCL.C.K.D.	345,981	3.030
5555	OTHER	170,516	1.494
2090	FOOD PRODUCTS N.E.S.	121,178	1.061
2233	TEXTILE FABRIC	84,700	0.742
2640	NON-FERROUS METAL BASIC PRODUCTS	77,186	0.676
2380	FURNITURE FIXTURES - MAINLY WOOD	63,328	0.555
9000	UNKNOWN (STEAM, SCRAP GLASS)	60,538	0.530
2293	PROTECTIVE CLOTHING	53,720	0.471
2581	BRICKS (NOT CONCRETE)	40,485	0.355
2011	BEEF, FRESH OR FROZEN	20,393	0.179
2601	ASBESTOS EXCLUDING TILES	20,245	0.177
2470	SOAP, DETERGENTS, CLEANERS	12,704	0.111
2480	CHEMICAL PRODUCTS N.E.S.	10,399	0.091
2460	VARNISHES, LACQUERS, FILLERS, PAINT	9,410	0.082
2071	REFINED SUGAR	7,084	0.062
2053	MAIZE MEAL	6,798	0.060
2796	ELECTRIC CABLE/WIRE	6,746	0.059
2110	SPIRITS - POTABLE	3,878	0.034
SUBJECT		11,417,029	100.000

SAS

SUBJECT=10* COTTON (INCL. TEXTILES, CARPETS)(223,225)

COMMODITY	INPUTS TO SUBSECTOR	DOLLARS	PERCENT
13	COTTON RAW	96,318,889	46.733
2234	YARNS/THREADS - TRIMMING,	52,500,455	25.473
2233	TEXTILE FABRIC	14,416,636	6.995
2430	BASIC INDUSTRIAL CHEMICALS N.E.S.	12,402,065	6.017
2230	TEXTILES - SPINNING, ETC. N.E.S.	10,311,117	5.003
2231	COTTON LINT	7,516,132	3.647
2680	METAL PRODUCTS, MACHINERY AND SPARE	5,713,286	2.772
2400	PAPER PRODUCTS, N.E.S.	2,337,125	1.134
2431	ACIDS	1,080,992	0.524
2553	INDUSTRIAL PLASTIC PRODUCTS	800,917	0.389
2550	PLASTIC PRODUCTS N.E.S.	528,925	0.257
2830	MOTOR SPARES ETC. N.E.S. INCL. C.K.D.	383,658	0.185
2660	TRANSPORT N.E.S.	347,448	0.169
9000	UNKNOWN (STEAM, SCRAP GLASS)	341,167	0.166
2551	CONTAINERS - PLASTIC	280,235	0.136
2532	INDUSTRIAL RUBBER PRODUCTS	222,927	0.108
2432	GASES AND LIQUID GASES	178,456	0.087
2293	PROTECTIVE CLOTHING	126,933	0.062
2090	FOOD PRODUCTS N.E.S.	87,056	0.042
2262	TEXTILE BAGS AND SACKS	59,692	0.029
2480	CHEMICAL PRODUCTS N.E.S.	56,423	0.027
2361	WOODEN CONTAINERS, CRATES, PALLETS	35,598	0.017
2470	SOAP, DETERGENTS, CLEANERS	25,624	0.012
2260	TEXTILES N.E.S. COTTON WASTE, CANVAS, ET	19,140	0.009
2380	FURNITURE, FIXTURES - MAINLY WOOD	7,817	0.004
2420	PRINTED PRODUCTS, N.E.S.	3,106	0.002
2994	BRUSHWARE	1,065	0.001
2460	VARNISHES, LACQUERS, FILLERS, PAINT	633	0.000
SUBJECT		206,103,717	100.000

SAS

SUBJECT=11* KNITTED PRODUCTS, ROPE, CORDAGE (224)

COMMODITY	INPUTS TO SUBSECTOR	DOLLARS	PERCENT
2234	YARNS/THREADS - TRIMMINGS	14,670,677	66.356
2553	INDUSTRIAL PLASTIC PRODUCTS	1,469,742	6.697
2430	BASIC INDUSTRIAL CHEMICALS N.E.S.	1,276,059	5.772
2230	TEXTILES - SPINNING, ETC. N.E.S.	1,254,258	5.673
2400	PAPER PRODUCTS, N.E.S.	977,968	4.423
2680	METAL PRODUCTS, MACHINERY AND SPARE	743,504	3.363
2233	TEXTILE FABRIC	649,902	2.940
2551	CONTAINERS - PLASTIC	313,895	1.420
2532	INDUSTRIAL RUBBER PRODUCTS	161,835	0.732
2401	PAPER CONTAINERS AND CARTONS	141,050	0.638
2990	OTHER N.E.S.	122,855	0.556
9000	UNKNOWN (STEAM, SCRAP GLASS)	113,597	0.514
2262	TEXTILE BAGS AND SACKS	77,425	0.350
2640	NON-FERROUS METAL BASIC PRODUCTS	47,266	0.214
2550	PLASTIC PRODUCTS N.E.S.	37,321	0.169
2830	MOTOR SPARES ETC. N.E.S. INCL. C.K.D.	34,873	0.158
2470	SOAP, DETERGENTS, CLEANERS	5,765	0.026
SUBJECT		22,108,992	100.000

SAS

SUBJECT=12* OTHER TEXTILE PRODUCTS(226)

COMMODITY	INPUTS TO SUBSECTOR	DOLLARS	PERCENT
2233	TEXTILE FABRIC	6,367,478	63.333
2430	BASIC INDUSTRIAL CHEMICALS N.E.S.	1,194,634	11.882
2550	PLASTIC PRODUCTS N.E.S.	1,089,285	10.834
2234	YARNS/THREADS - TRIMMINGS	696,960	6.932
2400	PAPER PRODUCTS, N.E.S.	169,265	1.684
2680	METAL PRODUCTS, MACHINERY AND SPARE	165,131	1.642
2553	INDUSTRIAL PLASTIC PRODUCTS	134,063	1.333
2511	ASPHALT, BITUMEN AND TAR	71,002	0.706
2532	INDUSTRIAL RUBBER PRODUCTS	53,146	0.529
2551	CONTAINERS - PLASTIC	35,914	0.357
2311	HIDES AND SKINS	27,771	0.276
1630	ASBESTOS	16,894	0.168
2470	SOAP, DETERGENTS, CLEANERS	11,868	0.118
2830	MOTOR SPARES ETC. N.E.S. INCL. C.K.D.	7,217	0.072
2460	VARNISHES, LACQUERS, FILLERS, PAINT	5,488	0.055
2401	PAPER CONTAINERS AND CARTONS	2,811	0.028
2533	TYRES, RETREADS	2,439	0.024
2364	WOOD, ROUGH/SAWN	1,830	0.018
2431	ACIDS	772	0.008
SUBJECT		10,053,968	100.000

SAS

SUBJECT=13* WEARING APPAREL(229)

COMMODITY	INPUTS TO SUBSECTOR	DOLLARS	PERCENT
2233	TEXTILE FABRIC	68,443,032	80.085
2553	INDUSTRIAL PLASTIC PRODUCTS	6,994,977	8.185
2234	YARNS/THREADS - TRIMMINGS	3,528,144	4.128
2400	PAPER PRODUCTS, N.E.S.	1,650,207	1.931
2311	HIDES AND SKINS	980,999	1.148
2680	METAL PRODUCTS, MACHINERY AND SPARE	884,970	1.036
2550	PLASTIC PRODUCTS N.E.S.	752,557	0.881
2230	TEXTILES - SPINNING, ETC. N.E.S	431,063	0.504
2551	CONTAINERS - PLASTIC	428,225	0.501
2480	CHEMICAL PRODUCTS N.E.S.	368,000	0.431
2090	FOOD PRODUCTS N.E.S.	180,706	0.211
2401	PAPER CONTAINERS AND CARTONS	169,322	0.198
2290	WEARING APPAREL N.E.S.	157,822	0.185
2830	MOTOR SPARES ETC.N.E.S. INCL.L.K.D.	157,685	0.185
2430	BASIC INDUSTRIAL CHEMICALS N.E.S.	146,727	0.172
2532	INDUSTRIAL RUBBER PRODUCTS	69,613	0.081
2470	SOAP, DETERGENTS, CLEANERS	46,847	0.055
2291	LADIES WEAR	40,814	0.048
9000	UNKNOWN (STEAM, SCRAP GLASS)	10,081	0.012
5555	OTHER	5,963	0.007
2293	PROTECTIVE CLOTHING	3,588	0.004
2993	SPORTS EQUIPMENT	3,558	0.004
2240	KNITTED PRODUCTS, N.E.S.	3,407	0.004
2312	LEATHER AND SYNTHETIC BAGS	2,388	0.003
2360	WOOD AND CORK PRODUCTS, N.E.S.	2,322	0.003
SUBJECT		85,463,017	100.000

SAS

SUBJECT=14* FOOTWEAR(234)

COMMODITY	INPUTS TO SUBSECTOR	DOLLARS	PERCENT
2311	HIDES AND SKINS	4,952,733	19.228
2532	INDUSTRIAL RUBBER PRODUCTS	3,882,399	15.073
2233	TEXTILE FABRIC	2,721,387	10.566
8	HIDES AND SKINS	2,682,710	10.415
2400	PAPER PRODUCTS, N.E.S.	2,297,047	8.918
2680	METAL PRODUCTS, MACHINERY AND SPARE	1,899,603	7.375
2430	BASIC INDUSTRIAL CHEMICALS N.E.S.	1,572,211	6.104
2550	PLASTIC PRODUCTS N.E.S.	1,434,040	5.568
2600	NON-METALLIC MINERAL PRODUCTS, N.E.S.	1,384,691	5.376
2530	RUBBER PRODS.N.E.S.	1,030,836	4.002
2480	CHEMICAL PRODUCTS N.E.S.	881,572	3.423
2234	YARNS/THREADS - TRIMMINGS	310,118	1.204
2553	INDUSTRIAL PLASTIC PRODUCTS	196,129	0.761
2830	MOTOR SPARES ETC.N.E.S. INCL.C.K.D.	182,107	0.707
2260	TEXTILES N.E.S. COTTON WASTE, CANVAS, ET	116,790	0.453
2551	CONTAINERS - PLASTIC	70,225	0.273
2354	WOOD, ROUGH/SAWN	43,875	0.170
2360	WOOD AND CORK PRODUCTS, N.E.S.	37,678	0.146
2390	PULP, PAPER, PAPERBOARD	31,949	0.124
2230	TEXTILES - SPINNING, ETC. N.E.S	21,422	0.083
2470	SOAP, DETERGENTS, CLEANERS	7,748	0.030
SUBJECT		25,757,270	100.000

SAS

SUBJECT=15* SAWMILLING,WOOD EXCL.FURNITURE(236)

COMMODITY	INPUTS TO SUBSECTOR	DOLLARS	PERCENT
2364	WOOD, ROUGH/SAWN	15,155,178	52.133
50	TIMBER	5,434,443	18.694
2680	METAL PRODUCTS, MACHINERY AND SPARE	3,103,730	10.677
2480	CHEMICAL PRODUCTS N.E.S.	2,608,544	8.973
2572	GLASS PANES AND SHEETS	704,593	2.424
2460	VARNISHES, LACQUERS, FILLERS, PAINT	462,884	1.592
2830	MOTOR SPARES ETC.N.E.S. INCL.C.K.D.	457,946	1.575
2400	PAPER PRODUCTS, N.E.S.	250,144	0.860
2361	WOODEN CONTAINERS, CRATES, PALLETS	217,568	0.748
2233	TEXTILE FABRIC	185,378	0.638
2533	TYRES RETREADS	123,593	0.425
2553	INDUSTRIAL PLASTIC PRODUCTS	109,414	0.378
2601	ASBESTOS EXCLUDING TILES	85,020	0.292
2600	NON-METALLIC MINERAL PRODUCTS, N.E.S.	75,495	0.260
2293	PROTECTIVE CLOTHING	54,764	0.188
9000	UNKNOWN (STEAM, SCRAP GLASS)	20,038	0.069
2550	PLASTIC PRODUCTS N.E.S.	13,222	0.045
2591	CEMENT	5,183	0.018
1305	OTHER STONE, CLAY AND SAND	2,134	0.007
2532	INDUSTRIAL RUBBER PRODUCTS	1,043	0.004
SUBJECT		29,070,312	100.000

SAS

SUBJECT=16* FURNITURE, FIXTURES, EXCL METAL (238)

COMMODITY	INPUTS TO SUBSECTOR	DOLLARS	PERCENT
2364	WOOD, ROUGH/SAWN	19,479,876	58.071
2233	TEXTILE FABRIC	2,986,725	8.904
2532	INDUSTRIAL RUBBER PRODUCTS	2,925,680	8.722
2680	METAL PRODUCTS, MACHINERY AND SPARE	1,732,481	5.165
2460	VARNISHES, LACQUERS, FILLERS, PAINT	1,693,900	5.050
50	TIMBER	1,190,432	3.549
2550	PLASTIC PRODUCTS N.E.S.	757,366	2.258
2572	GLASS PANES AND SHEETS	657,163	1.959
2480	CHEMICAL PRODUCTS N.E.S.	477,022	1.422
2234	YARNS/THREADS - TRIMMINGS	455,469	1.358
2533	TYRES, RETREADS	241,695	0.721
2830	MOTOR SPARES ETC. N.E.S. INCL. C.K.D.	222,962	0.665
2400	PAPER PRODUCTS, N.E.S.	154,423	0.460
2311	HIDES AND SKINS	138,144	0.412
9000	UNKNOWN (STEAM, SCRAP GLASS)	124,574	0.371
2553	INDUSTRIAL PLASTIC PRODUCTS	66,173	0.197
2600	NON-METALLIC MINERAL PRODUCTS, N.E.S.	65,262	0.195
2620	IRON AND STEEL BASIC INDUSTRY	59,775	0.178
2250	CARPETS AND FLOOR RUGS	35,756	0.107
2231	COTTON LINT	28,386	0.085
2238	HAND KNIT ING WOOL (BY KARINA)	19,634	0.059
2293	PROTECTIVE CLOTHING	12,127	0.036
2401	PAPER CONTAINERS AND CARTONS	8,612	0.026
2237	BLANKETS AND WOVEN GOODS	7,442	0.022
2470	SOAP, DETERGENTS, CLEANERS	3,582	0.011
SUBJECT		33,544,661	100.000

SAS

SUBJECT=17* PULP, PAPER AND PRODUCTS (239, 240)

COMMODITY	INPUTS TO SUBSECTOR	DOLLARS	PERCENT
2390	PULP, PAPER, PAPERBOARD	34,757,300	71.277
5555	OTHER	3,788,458	7.769
2680	METAL PRODUCTS, MACHINERY AND SPARE	2,587,441	5.306
2430	BASIC INDUSTRIAL CHEMICALS N.E.S.	1,947,518	3.994
2480	CHEMICAL PRODUCTS N.E.S.	1,535,029	3.148
2553	INDUSTRIAL PLASTIC PRODUCTS	1,150,216	2.359
2364	WOOD, ROUGH/SAWN	1,039,252	2.131
2400	PAPER PRODUCTS, N.E.S.	815,566	1.672
9000	UNKNOWN (STEAM, SCRAP GLASS)	265,341	0.544
2260	TEXTILES N.E.S. CUTTON WASTE, CANVAS, ET	205,108	0.421
2460	VARNISHES, LACQUERS, FILLERS, PAINT	158,815	0.326
2401	PAPER CONTAINERS AND CARTONS	126,338	0.259
2620	IRON AND STEEL BASIC INDUSTRY	120,612	0.247
2792	ELECTR. EQUIP. - INDUSTRIAL	75,831	0.156
2293	PROTECTIVE CLOTHING	70,199	0.144
2640	NON-FERROUS METAL BASIC PRODUCTS	59,530	0.122
2830	MOTOR SPARES ETC. N.E.S. INCL. C.K.D.	34,059	0.070
2532	INDUSTRIAL RUBBER PRODUCTS	27,247	0.056
SUBJECT		48,763,861	100.000

SAS

SUBJECT=18* PRINTING, PUBLISHING, ETC. (242)

COMMODITY	INPUTS TO SUBSECTOR	DOLLARS	PERCENT
2390	PULP, PAPER, PAPERBOARD	27,889,081	72.302
2480	CHEMICAL PRODUCTS N.E.S.	4,448,016	11.531
2680	METAL PRODUCTS, MACHINERY AND SPARE	1,608,079	4.169
2400	PAPER PRODUCTS, N.E.S.	1,168,981	3.031
2430	BASIC INDUSTRIAL CHEMICALS N.E.S.	954,649	2.475
2401	PAPER CONTAINERS AND CARTONS	514,073	1.333
2532	INDUSTRIAL RUBBER PRODUCTS	410,544	1.064
2620	IRON AND STEEL BASIC INDUSTRY	321,081	0.832
2640	NON-FERROUS METAL BASIC PRODUCTS	317,371	0.823
2470	SOAP, DETERGENTS, CLEANERS	258,530	0.670
2421	PUBLISHING	185,554	0.481
2460	VARNISHES, LACQUERS, FILLERS, PAINT	77,529	0.201
2550	PLASTIC PRODUCTS N.E.S.	73,089	0.189
9000	UNKNOWN (STEAM, SCRAP GLASS)	61,437	0.159
2502	PETROLEUM	53,446	0.139
2830	MOTOR SPARES ETC. N.E.S. INCL. C.K.D.	42,870	0.111
2553	INDUSTRIAL PLASTIC PRODUCTS	33,219	0.086
2291	LADIES WEAR	30,291	0.079
2292	MENS WEAR	30,291	0.079
2580	PCTTERY, CHINA, EARTHENWARE	16,286	0.042
2450	SYNTHETIC RESINS, MAN-MADE FIBRES, ETC.	14,460	0.037
2551	CONTAINERS - PLASTIC	14,383	0.037
5555	OTHER	12,432	0.032
2903	PHOTOGRAPHIC AND OPTICAL	11,646	0.030
2792	ELECTR. EQUIP. - INDUSTRIAL	9,582	0.025
2293	PROTECTIVE CLOTHING	5,941	0.015
2990	OTHER N.E.S.	5,193	0.013
2420	PRINTED PRODUCTS, N.E.S.	1,604	0.004
2361	WOODEN CONTAINERS, CRATES, PALLETS	1,268	0.003
2233	TEXTILE FABRIC	1,145	0.003
2571	GLASS CONTAINERS	764	0.002
SUBJECT		38,572,835	100.000

SAS

SUBJECT=19* FERTILIZER, INSECTICIDES(244)

COMMODITY	INPUTS TO SUBSECTOR	DOLLARS	PERCENT
2430	BASIC INDUSTRIAL CHEMICALS N.E.S.	45,575,067	55.266
2441	FERTILIZERS	15,579,376	18.892
1480	PHOSPHATES	9,426,752	11.431
2551	CONTAINERS - PLASTIC	3,399,639	4.123
2680	METAL PRODUCTS, MACHINERY AND SPARE	3,321,373	4.028
1796	IRON PYRITES	1,159,239	1.405
2442	INSECTICIDES	1,141,599	1.384
2460	VARNISHES, LACQUERS, FILLERS, PAINT	396,903	0.481
2620	IRON AND STEEL BASIC INDUSTRY	391,557	0.475
2792	ELECTR. EQUIP.-INDUSTRIAL	353,128	0.428
2640	NON-FERROUS METAL BASIC PRODUCTS	263,916	0.320
1797	BAUXITE AND ALUMINIUM	227,956	0.276
2390	PULP, PAPER, PAPERBOARD	215,260	0.261
2861	BOATS	203,687	0.247
1303	SILICA SAND	195,986	0.238
2532	INDUSTRIAL RUBBER PRODUCTS	184,066	0.223
2431	ACIDS	130,658	0.158
2571	GLASS CONTAINERS	66,198	0.080
2361	WOODEN CONTAINERS, CRATES, PALLETS	56,404	0.068
1302	LIMESTONE FOR LIME	41,699	0.051
1305	OTHER STONE, CLAY AND SAND	27,155	0.033
2401	PAPER CONTAINERS AND CARTONS	25,461	0.031
2591	CEMENT	24,228	0.029
2262	TEXTILE BAGS AND SACKS	15,277	0.019
2830	MOTOR SPARES ETC.N.E.S. INCL.C.K.D.	14,294	0.017
2470	SOAP, DETERGENTS, CLEANERS	13,900	0.017
2480	CHEMICAL PRODUCTS N.E.S.	8,002	0.010
2471	MEDICINAL AND PHARMACEUTICAL	6,636	0.008
SUBJECT		82,465,410	100.000

SAS

SUBJECT=20* PAINTS, VARNISHES, FILLERS(246)

COMMODITY	INPUTS TO SUBSECTOR	DOLLARS	PERCENT
2430	BASIC INDUSTRIAL CHEMICALS N.E.S.	12,305,238	85.757
2681	METAL CONTAINERS - TINS, CANS	1,545,687	10.772
2401	PAPER CONTAINERS AND CARTONS	227,725	1.587
9000	UNKNOWN (STEAM, SCRAP GLASS)	91,732	0.639
2680	METAL PRODUCTS, MACHINERY AND SPARE	28,693	0.200
2470	SOAP, DETERGENTS, CLEANERS	28,275	0.197
2480	CHEMICAL PRODUCTS N.E.S.	24,320	0.169
2830	MOTOR SPARES ETC.N.E.S. INCL.C.K.D.	23,106	0.161
2460	VARNISHES, LACQUERS, FILLERS, PAINT	21,365	0.149
2551	CONTAINERS - PLASTIC	14,526	0.101
2532	INDUSTRIAL RUBBER PRODUCTS	14,137	0.099
2293	PROTECTIVE CLOTHING	12,699	0.089
2792	ELECTR. EQUIP.-INDUSTRIAL	8,401	0.059
1305	OTHER STONE, CLAY AND SAND	1,954	0.014
2390	PULP, PAPER, PAPERBOARD	1,063	0.007
SUBJECT		14,348,921	100.000

SAS

SUBJECT=21* SOAPS, DETERGENTS, TOILETRIES, PHARM. (247)

COMMODITY	INPUTS TO SUBSECTOR	DOLLARS	PERCENT
2430	BASIC INDUSTRIAL CHEMICALS N.E.S.	17,338,698	28.940
2040	VEGETABLE OILS, MARGARINE	10,559,200	17.624
2471	MEDICINAL AND PHARMACEUTICAL	8,156,844	13.614
19	GRAIN OTHER	8,118,473	13.550
2401	PAPER CONTAINERS AND CARTONS	5,799,502	9.680
2551	CONTAINERS - PLASTIC	2,394,872	3.997
2681	METAL CONTAINERS - TINS, CANS	1,656,789	2.765
2571	GLASS CONTAINERS	1,473,700	2.460
2480	CHEMICAL PRODUCTS N.E.S.	1,207,941	2.016
2015	ANIMAL OILS AND FATS	884,868	1.477
2680	METAL PRODUCTS, MACHINERY AND SPARE	804,186	1.342
2390	PULP, PAPER, PAPERBOARD	394,336	0.658
2472	TOILETRIES AND COSMETICS	241,110	0.402
5555	OTHER	162,221	0.271
2902	WATCHES AND CLOCKS	106,846	0.178
2830	MOTOR SPARES ETC.N.E.S. INCL.C.K.D.	99,974	0.167
15	FRUIT, OTHER	91,632	0.153
2460	VARNISHES, LACQUERS, FILLERS, PAINT	67,065	0.112
2532	INDUSTRIAL RUBBER PRODUCTS	63,796	0.106
2361	WOODEN CONTAINERS, CRATES, PALLETS	62,459	0.104
16	VEGETABLES FRESH	50,370	0.084
2010	MEAT BY-PRODUCTS	48,889	0.082
2025	CHEESE	48,889	0.082
2071	REFINED SUGAR	30,864	0.052
2293	PROTECTIVE CLOTHING	28,664	0.048
2550	PLASTIC PRODUCTS N.E.S.	9,360	0.016
2620	IRON AND STEEL BASIC INDUSTRY	8,642	0.014
2262	TEXTILE BAGS AND SACKS	3,007	0.005
SUBJECT		59,913,197	100.000

SAS

SUBJECT=22* MATCHES, INKS, GLUES, AND CHEM. N.E.C. (248)

COMMODITY	INPUTS TO SUBSECTOR	DOLLARS	PERCENT
2430	BASIC INDUSTRIAL CHEMICALS N.E.S.	3,990,371	34.583
2480	CHEMICAL PRODUCTS N.E.S.	2,524,461	21.835
2681	METAL CONTAINERS - TINS, CANS	1,516,803	11.389
2401	PAPER CONTAINERS AND CARTONS	908,728	7.860
2551	CONTAINERS - PLASTIC	689,303	5.962
2450	SYNTHETIC RESINS, MAN-MADE FIBRES, ETC.	479,930	4.151
2511	ASPHALT, BITUMEN AND TAR	308,526	2.689
2364	WOOD, ROUGH/SAWN	236,878	2.049
2680	METAL PRODUCTS, MACHINERY AND SPARE	189,200	1.663
2532	INDUSTRIAL RUBBER PRODUCTS	148,281	1.283
2330	PULP, PAPER, PAPERBOARD	130,666	1.130
2830	MOTOR SPARES ETC. N.E.S. INCL. C.K.D.	130,356	1.127
2571	GLASS CONTAINERS	94,812	0.820
1305	OTHER STONE, CLAY AND SAND	69,480	0.601
2011	BEEF, FRESH OR FROZEN	64,539	0.558
2090	FOOD PRODUCTS N.E.S.	52,290	0.452
15	FRUIT, OTHER	41,831	0.362
16	VEGETABLES FRESH	41,831	0.362
2792	ELECTR. EQUIP. - INDUSTRIAL	38,596	0.334
2620	IRON AND STEEL BASIC INDUSTRY	17,978	0.155
2591	CEMENT	17,140	0.148
2460	VARNISHES, LACQUERS, FILLERS, PAINT	16,215	0.140
2010	MEAT BY-PRODUCTS	15,130	0.131
2471	MEDICINAL AND PHARMACEUTICAL	11,844	0.102
2640	NON-FERROUS METAL BASIC PRODUCTS	11,844	0.102
2071	REFINED SUGAR	10,457	0.090
2230	TEXTILES - SPINNING, ETC. N.E.S.	4,713	0.041
2262	TEXTILE BAGS AND SACKS	4,218	0.036
2293	PROTECTIVE CLOTHING	3,478	0.030
2361	WOODEN CONTAINERS, CRATES, PALLETS	1,930	0.017
2053	MAIZE MEAL	1,792	0.015
SUBJECT		11,561,621	100.000

SAS

SUBJECT=23* BASIC CHEMICALS, PETROLEUM PRODS. (243,25)

COMMODITY	INPUTS TO SUBSECTOR	DOLLARS	PERCENT
2072	MOLASSES AND BAGASSE	7,464,918	47.521
2430	BASIC INDUSTRIAL CHEMICALS N.E.S.	3,193,823	20.332
2511	ASPHALT, BITUMEN AND TAR	1,027,095	6.538
2620	IRON AND STEEL BASIC INDUSTRY	887,820	5.652
2480	CHEMICAL PRODUCTS N.E.S.	767,298	4.885
1001	COKE, COAL PRODS., CLINKER	637,532	4.059
2621	GRANULATED SLAG AND SLAG CLINKER	637,532	4.059
2680	METAL PRODUCTS, MACHINERY AND SPARE	317,310	2.020
2401	SUGAR PRODUCTS, N.E.S.	297,540	1.894
2070	PAPER CONTAINERS AND CARTONS	232,470	1.480
2471	MEDICINAL AND PHARMACEUTICAL	79,738	0.508
2681	METAL CONTAINERS - TINS, CANS	66,651	0.424
2551	CONTAINERS - PLASTIC	51,016	0.325
2590	LIME AND PLASTER	13,800	0.088
2640	NON-FERROUS METAL BASIC PRODUCTS	11,131	0.071
2591	CEMENT	8,726	0.056
2830	MOTOR SPARES ETC. N.E.S. INCL. C.K.D.	4,180	0.027
2293	PROTECTIVE CLOTHING	3,752	0.024
2792	ELECTR. EQUIP. - INDUSTRIAL	3,183	0.020
2400	PAPER PRODUCTS, N.E.S.	1,881	0.012
2532	INDUSTRIAL RUBBER PRODUCTS	604	0.004
2460	VARNISHES, LACQUERS, FILLERS, PAINT	533	0.003
SUBJECT		15,708,533	100.000

SAS

SUBJECT=24* RUBBER PRODUCTS (253)

COMMODITY	INPUTS TO SUBSECTOR	DOLLARS	PERCENT
2451	RUBBER	11,195,634	39.853
2450	SYNTHETIC RESINS, MAN-MADE FIBRES, ETC.	3,370,771	11.999
2480	CHEMICAL PRODUCTS N.E.S.	3,128,752	11.137
2430	BASIC INDUSTRIAL CHEMICALS N.E.S.	2,870,896	10.219
2553	INDUSTRIAL PLASTIC PRODUCTS	1,365,500	4.861
2620	IRON AND STEEL BASIC INDUSTRY	1,338,329	4.764
2680	METAL PRODUCTS, MACHINERY AND SPARE	1,235,115	4.397
2532	INDUSTRIAL RUBBER PRODUCTS	1,186,294	4.223
2534	CAMEL-BACK	1,735,894	2.620
2640	NON-FERROUS METAL BASIC PRODUCTS	569,596	2.028
2401	PAPER CONTAINERS AND CARTONS	325,012	1.157
1302	LIMESTONE FOR LIME	251,649	0.896
2260	TEXTILES N.E.S., COTTON WASTE, CANVAS, ET	131,917	0.470
2501	OILS, LUBRICANTS	105,370	0.375
2792	ELECTR. EQUIP. - INDUSTRIAL	56,638	0.202
2233	TEXTILE FABRIC	48,346	0.172
2830	MOTOR SPARES ETC. N.E.S. INCL. C.K.D.	42,371	0.151
2400	PAPER PRODUCTS, N.E.S.	32,181	0.115
2364	WOOD, ROUGH/SAWN	29,738	0.108
9000	UNKNOWN (STEAM, SCRAP GLASS)	22,538	0.080
1305	OTHER STONE, CLAY AND SAND	20,985	0.075
2460	VARNISHES, LACQUERS, FILLERS, PAINT	18,108	0.064
1830	ASBESTOS	6,198	0.022
2293	PROTECTIVE CLOTHING	2,939	0.010
2420	PRINTED PRODUCTS, N.E.S.	1,881	0.007
SUBJECT		28,092,650	100.000

SAS

SUBJECT=25* PLASTIC PRODUCTS(255)

COMMODITY	INPUTS TO SUBSECTOR	DOLLARS	PERCENT
2450	SYNTHETIC RESINS, MAN-MADE FIBRES, ETC.	13,646,967	62.890
2553	INDUSTRIAL PLASTIC PRODUCTS	2,659,788	12.257
2233	TEXTILE FABRIC	1,288,743	5.939
2830	MOTOR SPARES ETC.N.E.S.INCL.C.K.D.	1,072,981	4.945
2480	CHEMICAL PRODUCTS N.E.S.	666,301	3.163
2401	PAPER CONTAINERS AND CARTONS	610,772	2.815
2680	METAL PRODUCTS, MACHINERY AND SPARE	573,624	2.643
2430	BASIC INDUSTRIAL CHEMICALS N.E.S.	357,044	1.645
2460	VARNISHES, LACQUERS, FILLERS, PAINT	181,624	0.837
2390	PULP, PAPER, PAPERBOARD	174,796	0.806
2620	IRON AND STEEL BASIC INDUSTRY	140,126	0.646
2400	PAPER PRODUCTS, N.E.S.	131,584	0.606
2364	WOOD, ROUGH/SAWN	53,336	0.246
9700	UNKNOWN (STEAM, SCRAP GLASS)	36,674	0.169
2792	ELECTR. EQUIP.-INDUSTRIAL	24,642	0.114
2532	INDUSTRIAL RUBBER PRODUCTS	22,646	0.104
2640	NON-FERROUS METAL BASIC PRODUCTS	17,133	0.079
2255	PROTECTIVE CLOTHING	11,112	0.051
2551	CONTAINERS - PLASTIC	5,732	0.026
2234	YARNS/THREADS - TRIMMINGS	3,229	0.015
2451	RUBBER	1,026	0.005
SUBJECT		21,699,880	100.000

SAS

SUBJECT=26* STRUCTURAL CLAY PRODS.INCL.BRICKS(258)

COMMODITY	INPUTS TO SUBSECTOR	DOLLARS	PERCENT
2580	CLAY PRODUCTS N.E.S. PIPES AND TILES	1,497,426	26.167
2680	METAL PRODUCTS, MACHINERY AND SPARE	1,492,710	26.085
2830	MOTOR SPARES ETC.N.E.S.INCL.C.K.D.	865,047	15.117
1305	OTHER STONE, CLAY AND SAND	551,203	9.632
2532	INDUSTRIAL RUBBER PRODUCTS	391,586	6.843
2570	GLASS PRODUCTS N.E.S. - GLAZE	253,384	4.438
2430	BASIC INDUSTRIAL CHEMICALS N.E.S.	150,421	2.628
2401	PAPER CONTAINERS AND CARTONS	148,021	2.587
2553	INDUSTRIAL PLASTIC PRODUCTS	124,426	2.174
2792	ELECTR. EQUIP.-INDUSTRIAL	58,157	1.016
2591	CEMENT	37,809	0.661
2620	IRON AND STEEL BASIC INDUSTRY	31,090	0.543
2990	OTHER N.E.S.	30,385	0.531
2581	BRICKS (NOT CONCRETE)	24,187	0.423
2400	PAPER PRODUCTS, N.E.S.	21,227	0.371
2480	CHEMICAL PRODUCTS N.E.S.	14,237	0.249
2360	WOOD AND CORK PRODUCTS N.E.S.	12,702	0.222
2460	VARNISHES, LACQUERS, FILLERS, PAINT	6,674	0.152
2364	WOOD, ROUGH/SAWN	4,040	0.071
2640	NON-FERROUS METAL BASIC PRODUCTS	3,504	0.061
9000	UNKNOWN (STEAM, SCRAP GLASS)	1,678	0.029
SUBJECT		5,722,514	100.000

SAS

SUBJECT=27* GLASS, CEMENT ETC.(256,257,259,260)

COMMODITY	INPUTS TO SUBSECTOR	DOLLARS	PERCENT
2680	METAL PRODUCTS, MACHINERY AND SPARE	19,230,684	38.923
1630	ASBESTOS	5,707,961	11.553
2591	CEMENT	5,388,305	10.906
2401	PAPER CONTAINERS AND CARTONS	3,304,253	6.688
1305	OTHER STONE, CLAY AND SAND	2,518,055	5.097
2930	MOTOR SPARES ETC.N.E.S.INCL.C.K.D.	2,195,271	4.443
2570	GLASS PRODUCTS N.E.S. - GLAZE	1,577,812	3.193
2620	IRON AND STEEL BASIC INDUSTRY	1,216,399	2.462
2592	CLINKER, ONLY CEMENT WORKS	1,067,226	2.160
2581	BRICKS (NOT CONCRETE)	969,175	1.962
2572	GLASS PANES AND SHEETS	834,060	1.688
2430	BASIC INDUSTRIAL CHEMICALS N.E.S.	720,370	1.458
1302	LIMESTONE FOR LIME	649,964	1.316
2400	PAPER PRODUCTS, N.E.S.	547,309	1.108
2600	NON-METALLIC MINERAL PRODUCTS, N.E.S.	507,688	1.028
1790	OTHER MINING N.E.S.	400,519	0.811
2553	INDUSTRIAL PLASTIC PRODUCTS	397,475	0.804
1303	SILICA SAND	327,975	0.664
2580	CLAY PRODUCTS N.E.S. PIPES AND TILES	324,247	0.658
2532	INDUSTRIAL RUBBER PRODUCTS	318,613	0.615
2364	WOOD, ROUGH/SAWN	257,292	0.521
9000	UNKNOWN (STEAM, SCRAP GLASS)	221,752	0.449
2460	VARNISHES, LACQUERS, FILLERS, PAINT	156,703	0.317
2792	ELECTR. EQUIP.-INDUSTRIAL	141,815	0.287
2481	EXPLOSIVES AND CARTRIDGES *	136,472	0.276
2480	CHEMICAL PRODUCTS N.E.S.	98,175	0.199
2560	POTTERY, CHINA, EARTHENWARE	64,942	0.131
2293	PROTECTIVE CLOTHING	41,728	0.084
2590	LIME AND PLASTER	29,816	0.060
2450	SYNTHETIC RESINS, MAN-MADE FIBRES, ETC.	15,209	0.031
2501	OILS, LUBRICANTS	14,304	0.029
2640	NON-FERROUS METAL BASIC PRODUCTS	12,789	0.026
2262	TEXTILE BAGS AND SACKS	11,070	0.022
2790	ELECTR.MACH.ETC., N.E.S.	1,886	0.004
SUBJECT		49,407,314	100.000

SAS

SUBJECT=28* NON-FERROUS, IRON, STEEL (BASIC) (262, 264)

COMMODITY	INPUTS TO SUBSECTOR	DOLLARS	PERCENT
2620	IRON AND STEEL BASIC INDUSTRY	51,686,641	30.857
1170	IRON ORE	25,524,548	15.238
1130	CHROME	18,394,522	10.981
2680	METAL PRODUCTS, MACHINERY AND SPARE	16,756,127	10.003
2640	NON-FERROUS METAL BASIC PRODUCTS	11,996,188	7.162
2581	BRICKS (NOT CONCRETE)	10,871,174	6.490
2792	ELECTR. EQUIP.-INDUSTRIAL	5,274,255	3.149
1790	OTHER MINING N.E.S.	4,528,047	2.703
1302	LIMESTONE FOR LIME	4,072,862	2.431
2430	BASIC INDUSTRIAL CHEMICALS N.E.S.	3,348,063	1.999
2532	INDUSTRIAL RUBBER PRODUCTS	2,354,976	1.406
2432	GASES AND LIQUID GASES	1,678,847	0.972
2621	GRANULATED SLAG AND SLAG CLINKER	1,420,593	0.848
2293	PROTECTIVE CLOTHING	1,158,484	0.692
2400	PAPER PRODUCTS, N.E.S.	1,064,772	0.636
2600	NON-METALLIC MINERAL PRODUCTS, N.E.S.	965,029	0.576
2480	CHEMICAL PRODUCTS N.E.S.	940,512	0.561
2364	WOOD, ROUGH/SAWN	806,628	0.482
2481	EXPLOSIVES AND CARTRIDGES *	790,039	0.472
2460	VARNISHES, LACQUERS, FILLERS, PAINT	752,242	0.449
2591	CEMENT	589,445	0.352
1305	OTHER STONE, CLAY AND SAND	477,913	0.285
2622	FERROUS ALLOY	428,448	0.256
2450	SYNTHETIC RESINS, MAN-MADE FIBRES, ETC.	394,105	0.235
2401	PAPER CONTAINERS AND CARTONS	313,278	0.187
2830	MOTOR SPARES ETC.N.E.S.INCL.C.K.D.	305,555	0.182
2553	INDUSTRIAL PLASTIC PRODUCTS	257,558	0.154
2790	ELECTR.MACH.ETC., N.E.S.	149,080	0.089
2072	MOLASSES AND BAGASSE	126,440	0.075
2471	MEDICINAL AND PHARMACEUTICAL	32,091	0.019
2451	RUBBER	23,790	0.014
2470	SOAP, DETERGENTS, CLEANERS	19,586	0.012
2262	TEXTILE BAGS AND SACKS	16,323	0.010
2580	CLAY PRODUCTS N.E.S. PIPES AND TILES	13,313	0.008
2051	ANIMAL FEEDS AND FISH MEAL	12,998	0.008
2501	OILS,LUBRICANTS	6,199	0.004
2360	WOOD AND CORK PRODUCTS, N.E.S.	4,264	0.003
2571	GLASS CONTAINERS	540	0.000
SUBJECT		167,505,475	100.000

SAS

SUBJECT=29* METAL PRODUCTS, MACHINERY (268)

COMMODITY	INPUTS TO SUBSECTOR	DOLLARS	PERCENT
2620	IRON AND STEEL BASIC INDUSTRY	101,473,947	62.715
2680	METAL PRODUCTS, MACHINERY AND SPARE	15,847,407	9.794
2450	SYNTHETIC RESINS, MAN-MADE FIBRES, ETC.	10,871,529	6.595
2640	NON-FERROUS METAL BASIC PRODUCTS	7,402,128	4.575
2792	ELECTR. EQUIP.-INDUSTRIAL	6,529,540	4.035
2430	BASIC INDUSTRIAL CHEMICALS N.E.S.	3,702,485	2.288
2460	VARNISHES, LACQUERS, FILLERS, PAINT	3,665,360	2.265
9000	UNKNOWN (STEAM, SCRAP GLASS)	1,789,410	1.106
2364	WOOD, ROUGH/SAWN	1,770,461	1.094
2401	PAPER CONTAINERS AND CARTONS	1,243,788	0.769
2830	MOTOR SPARES ETC.N.E.S.INCL.C.K.D.	980,820	0.606
2553	INDUSTRIAL PLASTIC PRODUCTS	936,026	0.578
1792	PRECIOUS STONES	924,443	0.571
2480	CHEMICAL PRODUCTS N.E.S.	875,638	0.541
2532	INDUSTRIAL RUBBER PRODUCTS	747,327	0.462
2780	COMM.EQUIP N.E.S.	505,853	0.313
1302	LIMESTONE FOR LIME	420,970	0.260
1160	GOLD AND SILVER	202,690	0.125
2642		202,689	0.125
2400	PAPER PRODUCTS, N.E.S.	192,109	0.119
2260	TEXTILES N.E.S. COTTON WASTE, CANVAS, ET	184,668	0.114
2233	TEXTILE FABRIC	181,591	0.112
2390	PULP, PAPER, PAPERBOARD	154,442	0.095
2591	CEMENT	148,754	0.092
2600	NON-METALLIC MINERAL PRODUCTS, N.E.S.	139,728	0.086
2601	ASBESTOS EXCLUDING TILES	125,287	0.077
1305	OTHER STONE, CLAY AND SAND	121,739	0.075
2293	PROTECTIVE CLOTHING	105,793	0.065
2570	GLASS PRODUCTS N.E.S. - GLAZE	71,754	0.044
2581	BRICKS (NOT CONCRETE)	68,736	0.042
2262	TEXTILE BAGS AND SACKS	59,424	0.037
2550	PLASTIC PRODUCTS N.E.S.	55,364	0.034
2360	WOOD AND CORK PRODUCTS, N.E.S.	52,114	0.032
2451	RUBBER	50,180	0.031
2560	POTTERY, CHINA, EARTHENWARE	47,022	0.029
2790	ELECTR.MACH.ETC., N.E.S.	46,543	0.029
2234	YARNS/THREADS - TRIMMINGS	26,312	0.015
2441	FERTILIZERS	14,680	0.009
2572	GLASS PANES AND SHEETS	9,730	0.006
2501	OILS,LUBRICANTS	8,760	0.005
2420	PRINTED PRODUCTS, N.E.S.	8,070	0.005
2432	GASES AND LIQUID GASES	7,214	0.004
2010	MEAT BY-PRODUCTS	6,088	0.004
2131	BEER, OPAQUE	3,952	0.002
2551	CONTAINERS - PLASTIC	3,388	0.002
2681	METAL CONTAINERS - TINS, CANS	3,388	0.002
2442	INSECTICIDES	2,936	0.002
2311	HIDES AND SKINS	2,597	0.002
2290	WEARING APPAREL N.E.S.	2,033	0.001
30	CATTLE	1,920	0.001
2602	CONCRETE PRODUCTS - SLEEPER TILES	1,391	0.001
5555	OTHER	1,032	0.001
2471	MEDICINAL AND PHARMACEUTICAL	1,018	0.001
2380	FURNITURE, FIXTURES MAINLY WOOD	573	0.000
2090	FOOD PRODUCTS N.E.S.	124	0.000
SUBJECT		161,802,993	100.000

SAS

SUBJECT=30* ELECTRICAL MACHINERY/EQUIPMENT(278,279)

COMMODITY	INPUTS TO SUBSECTOR	DOLLARS	PERCENT
2640	NON-FERROUS METAL BASIC PRODUCTS	13,166,436	30.271
2792	ELECTR. EQUIP.-INDUSTRIAL	10,264,925	23.600
2620	IRON AND STEEL BASIC INDUSTRY	4,550,144	10.461
2781	RADIOS, STEREO'S ETC.	4,454,868	10.242
2364	WOOD, ROUGH/SAWN	1,815,827	4.175
2680	METAL PRODUCTS, MACHINERY AND SPARE	1,807,826	4.156
2450	SYNTHETIC RESINS, MAN-MADE FIBRES, ETC.	1,628,351	3.744
2553	INDUSTRIAL PLASTIC PRODUCTS	1,162,399	2.672
2480	CHEMICAL PRODUCTS N.E.S.	1,067,081	2.453
2460	VARNISHES, LACQUERS, FILLERS, PAINT	705,825	1.623
2532	INDUSTRIAL RUBBER PRODUCTS	645,571	1.484
2430	BASIC INDUSTRIAL CHEMICALS N.E.S.	343,636	0.790
2791	ELECTR. DOMESTIC APPLIANCES	326,360	0.750
2401	PAPER CONTAINERS AND CARTONS	266,953	0.614
2790	ELECTR. MACH. ETC., N.E.S.	259,478	0.597
2793	BATTERIES	194,777	0.448
2451	RUBBER	161,853	0.372
2601	ASBESTOS EXCLUDING TILES	141,656	0.326
2830	MOTOR SPARES ETC. N.E.S. INCL. C.K.D.	129,015	0.297
2591	CEMENT	71,141	0.164
2400	PAPER PRODUCTS, N.E.S.	55,258	0.127
2581	BRICKS (NOT CONCRETE)	55,007	0.126
2511	ASPHALT, BITUMEN AND TAR	53,821	0.124
9000	UNKNOWN (STEAM, SCRAP GLASS)	50,013	0.115
2780	COMM EQUIPT N.E.S.	39,810	0.092
2293	PROTECTIVE CLOTHING	21,842	0.050
1790	OTHER MINING N.E.S.	19,034	0.044
1305	OTHER STONE, CLAY AND SAND	11,516	0.026
2796	ELECTRIC CABLE/WIRE	8,366	0.019
2560	POTTERY, CHINA, EARTHENWARE	8,339	0.019
2390	PULP PAPER, PAPERBOARD	3,241	0.007
2260	TEXTILES N.E.S. COTTON WASTE, CANVAS, ET	1,959	0.005
2420	PRINTED PRODUCTS, N.E.S.	1,406	0.003
2470	SOAP, DETERGENTS, CLEANERS	1,252	0.003
SUBJECT		43,494,980	100.000

SAS

SUBJECT=31* MOTOR VEHICLES(283)

COMMODITY	INPUTS TO SUBSECTOR	DOLLARS	PERCENT
2830	MOTOR SPARES ETC. N.E.S. INCL. C.K.D.	17,376,973	38.249
2620	IRON AND STEEL BASIC INDUSTRY	8,714,117	19.181
2532	INDUSTRIAL RUBBER PRODUCTS	4,186,425	9.215
2831	MOTOR VEHICLES - ASSEMBLED	3,946,195	8.686
2680	METAL PRODUCTS, MACHINERY AND SPARE	3,648,938	8.032
2640	NON-FERROUS METAL BASIC PRODUCTS	1,912,487	4.210
2572	GLASS PANES AND SHEETS	1,699,962	3.742
2460	VARNISHES, LACQUERS, FILLERS, PAINT	1,429,317	3.146
2792	ELECTR. EQUIP.-INDUSTRIAL	867,667	1.910
2450	SYNTHETIC RESINS, MAN-MADE FIBRES, ETC.	626,067	1.378
2364	WOOD, ROUGH/SAWN	315,364	0.694
2480	CHEMICAL PRODUCTS N.E.S.	215,355	0.474
2430	BASIC INDUSTRIAL CHEMICALS N.E.S.	127,706	0.281
2600	NON-METALLIC MINERAL PRODUCTS, N.E.S.	86,277	0.190
2451	RUBBER	58,796	0.129
2260	TEXTILES N.E.S. COTTON WASTE, CANVAS, ET	58,364	0.128
2553	INDUSTRIAL PLASTIC PRODUCTS	49,579	0.109
2401	PAPER CONTAINERS AND CARTONS	41,470	0.091
2400	PAPER PRODUCTS, N.E.S.	36,515	0.080
9000	UNKNOWN (STEAM, SCRAP GLASS)	12,189	0.027
2293	PROTECTIVE CLOTHING	11,374	0.025
2581	BRICKS (NOT CONCRETE)	5,729	0.013
2470	SOAP, DETERGENTS, CLEANERS	2,803	0.006
1305	OTHER STONE, CLAY AND SAND	1,818	0.004
SUBJECT		45,431,487	100.000

SAS

SUBJECT=32* OTHER VEHICLES ETC. (282,284,285,286)

COMMODITY	INPUTS TO SUBSECTOR	DOLLARS	PERCENT
2680	METAL PRODUCTS, MACHINERY AND SPARE	2,994,635	33.731
2790	AIRCRAFT AND EQUIPMENT	2,593,028	29.208
2620	IRON AND STEEL BASIC INDUSTRY	1,445,641	16.284
2364	WOOD, ROUGH/SAWN	776,357	8.745
2450	SYNTHETIC RESINS, MAN-MADE FIBRES, ETC.	316,429	3.564
2532	INDUSTRIAL RUBBER PRODUCTS	160,646	1.810
2480	CHEMICAL PRODUCTS N.E.S.	108,063	1.217
2460	VARNISHES, LACQUERS, FILLERS, PAINT	105,152	1.184
2792	ELECTR. EQUIP.-INDUSTRIAL	97,486	1.098
2430	BASIC INDUSTRIAL CHEMICALS N.E.S.	96,704	1.089
2640	NON-FERROUS METAL BASIC PRODUCTS	29,324	0.330
2581	BRICKS (NOT CONCRETE)	27,188	0.306
1305	OTHER STONE, CLAY AND SAND	27,187	0.306
2591	CEMENT	27,187	0.306
2572	GLASS PANES AND SHEETS	24,693	0.278
2830	MOTOR SPARES ETC. N.E.S. INCL. C.K.D.	23,663	0.267
2401	PAPER CONTAINERS AND CARTONS	12,230	0.138
2553	INDUSTRIAL PLASTIC PRODUCTS	6,911	0.078
2451	RUBBER	4,319	0.048
2293	PROTECTIVE CLOTHING	917	0.010
5555	OTHER	90	0.001
SUBJECT		8,877,870	100.000

SAS

SUBJECT*33* OTHER MANUFACTURING(231.290.291)

COMMODITY	INPUTS TO SUBSECTOR	DOLLARS	PERCENT
2680	METAL PRODUCTS, MACHINERY AND SPARE	7,470,900	23.8297
2640	NON-FERROUS METAL BASIC PRODUCTS	3,740,533	11.9311
8	HIDES AND SKINS	2,633,651	8.4005
2430	BASIC INDUSTRIAL CHEMICALS N.E.S.	1,793,878	5.7219
2480	CHEMICAL PRODUCTS N.E.S.	1,441,975	4.5694
2017	SKINS/HIDES UNDRRESSED	1,389,291	4.4314
2550	PLASTIC PRODUCTS N.E.S.	1,304,484	4.1609
2991	JEWELLERY AND ENGRAVING	1,055,513	3.3667
2553	INDUSTRIAL PLASTIC PRODUCTS	899,156	2.8680
2310	LEATHER AND SUBSTITUTE N.E.S.	897,423	2.8625
2990	OTHER N.E.S.	854,145	2.7244
2620	IRON AND STEEL BASIC INDUSTRY	759,733	2.4233
2364	WOOD, ROUGH/SAWN	747,939	2.3857
2390	PULP, PAPER, PAPERBOARD	637,449	2.0333
2450	SYNTHETIC RESINS, MAN-MADE FIBRES, ETC.	596,231	1.9018
2401	PAPER CONTAINERS AND CARTONS	395,039	1.2600
2311	HIDES AND SKINS	393,468	1.2550
2460	VARNISHES, LACQUERS, FILLERS, PAINT	385,606	1.2300
2233	TEXTILE FABRIC	364,017	1.1611
2903	PHOTOGRAPHIC AND OPTICAL	313,117	0.9987
9000	UNKNOWN (STEAM, SCRAP GLASS)	309,994	0.9888
2641	COPPER METAL, COPPER SHEETING	291,875	0.9310
2532	INDUSTRIAL RUBBER PRODUCTS	281,006	0.8963
2363	WOOD PRODUCTS FOR BUILDINGS	262,368	0.8369
2234	YARNS/THREADS - TRIMMINGS	185,171	0.5906
5555	OTHER	176,170	0.5619
1790	OTHER MINING N.E.S.	169,318	0.5401
2830	MOTOR SPARES ETC.N.E.S.INCL.C.K.D.	163,282	0.5208
1792	PRECIOUS STONES	150,408	0.4798
2230	TEXTILES - SPINNING, ETC. N.E.S.	134,496	0.4290
2260	TEXTILES N.E.S. COTTON WASTE, CANVAS, ET	124,365	0.3967
2551	CONTAINERS - PLASTIC	124,010	0.3956
2792	ELECTR. EQUIP. - INDUSTRIAL	118,794	0.3789
2400	PAPER PRODUCTS, N.E.S.	105,444	0.3363
2993	SPORTS EQUIPMENT	95,810	0.3056
2360	WOOD AND CORK PRODUCTS, N.E.S.	95,445	0.3044
2902	WATCHES AND CLOCKS	77,768	0.2481
1160	GOLD AND SILVER	51,955	0.1657
2645	GOLD AND OTHER PRECIOUS METAL	51,847	0.1654
2471	MEDICINAL AND PHARMACEUTICAL	41,528	0.1325
2010	MEAT BY-PRODUCTS	41,432	0.1322
2470	SOAP, DETERGENTS, CLEANERS	39,929	0.1274
2600	NON-METALLIC MINERAL PRODUCTS, N.E.S.	34,841	0.1111
2572	GLASS PANES AND SHEETS	30,830	0.0983
2293	PROTECTIVE CLOTHING	29,246	0.0933
2900		16,153	0.0522
2231	COTTON LINT	14,411	0.0460
2051	ANIMAL FEEDS AND FISH MEAL	11,930	0.0381
2432	GASES AND LIQUID GASES	9,790	0.0312
2420	PRINTED PRODUCTS, N.E.S.	7,467	0.0238
2570	GLASS PRODUCTS N.E.S. - GLAZE	6,038	0.0193
33	OTHER LIVESTOCK	5,372	0.0171
1305	OTHER STONE, CLAY AND SAND	4,668	0.0149
2591	CEMENT	4,587	0.0148
2995	CURIOS, NOVELTIES	4,512	0.0144
2581	BRICKS (NOT CONCRETE)	1,551	0.0049
2994	BRUSHWARE	1,173	0.0037
2262	TEXTILE BAGS AND SACKS	901	0.0029
2560	POTTERY, CHINA, EARTHENWARE	811	0.0026

SAS

SUBJECT*33* OTHER MANUFACTURING(231.290.291)

COMMODITY	INPUTS TO SUBSECTOR	DOLLARS	PERCENT
2580	CLAY PRODUCTS N.E.S. PIPES AND TILES	811	0
SUBJECT		31,351,233	100
		1814116646	3300

ANNEX F

COMMODITY OUTPUTS OF MANUFACTURING

FOR 33 SUB-SECTORS

SOURCE: COMPILED FROM UNPUBLISHED CSO DATA FROM THE 1981/1982 CENSUS OF PRODUCTION.

SAS

SECTOR=01* SLAUGHTERING, PROCESSING OF MEAT(201)

OBS	COMM	OUTPUTS OF SECTOR	DOLLARS	PERCENT
1	2011	BEEF, FRESH OR FROZEN	84,251,548	55.913
2	2018	MEAT - PROCESSED/CANNED	24,606,829	16.330
3	2010	MEAT BY-PRODUCTS	11,206,980	7.437
4	2014	POULTRY - FRESH OR FROZEN	10,940,844	7.261
5	2017	SKINS/HIDES UNDRESSED	7,596,117	5.041
6	2013	PORK - FRESH OR FROZEN	6,252,744	4.150
7	2015	ANIMAL OILS AND FATS	3,669,300	2.435
8	2030	FRUITS AND VEGETABLES AND JAMS	2,068,430	1.373
9	2140	SOFT DRINKS	33,822	0.022
10	2012	LAMB, MUTTON AND GOAT MEAT	24,164	0.016
11	2090	FOOD PRODUCTS N.E.S.	19,016	0.013
12	2070	SUGAR PRODUCTS, N.E.S.	12,684	0.008
SECTOR			150,682,478	100.000

SAS

SECTOR=02* CANNING, PRESERVING, FRUIT, VEGETABLES(203)

OBS	COMM	OUTPUTS OF SECTOR	DOLLARS	PERCENT
13	2030	FRUITS AND VEGETABLES AND JAMS	4,577,487	98.842
14	2092	FISH - DRIED OR FROZEN	53,612	1.158
SECTOR			4,631,099	100.000

SAS

SECTOR=03* GRAIN MILL PRODUCTS, ANIMAL FEEDS(205)

OBS	COMM	OUTPUTS OF SECTOR	DOLLARS	PERCENT
15	2053	MAIZE MEAL	57,552,225	28.340
16	2051	ANIMAL FEEDS AND FISH MEAL	55,647,559	27.402
17	2052	FLOUR	55,506,624	27.332
18	2040	VEGETABLE OILS, MARGARINE	12,737,633	6.272
19	2050	GRAIN MILL PRODUCTS, N.E.S.	8,331,536	4.103
20	2470	SOAP, DETERGENTS, CLEANERS	5,303,849	2.612
21	2130	MALT AND MALT EXTRACT ETC	4,847,499	2.387
22	2472	TOILETRIES AND COSMETICS	1,806,799	0.890
23	2480	CHEMICAL PRODUCTS N.E.S.	702,372	0.346
24	2090	FOOD PRODUCTS N.E.S.	605,950	0.298
25	2060	BAKERY PRODUCTS, N.E.S.	19,597	0.010
26	2072	MOLASSES AND BAGASSE	19,293	0.010
SECTOR			203,081,036	100.000

SAS

SECTOR=04* BAKERY PRODUCTS(206)

OBS	COMM	OUTPUTS OF SECTOR	DOLLARS	PERCENT
27	2061	BREAD	55,315,925	82.912
28	2060	BAKERY PRODUCTS, N.E.S.	11,365,050	17.035
29	2081	COCOA, CHOCOLATE, CHOCOLATES	31,896	0.048
30	2220	CIGARETTES, CIGARS, ETC.	3,228	0.005
SECTOR			66,716,099	100.000

SAS

SECTOR=05* CHOCOLATE AND SUGAR CONFECTIONERY(208)

OBS	COMM	OUTPUTS OF SECTOR	DOLLARS	PERCENT
31	2080	SWEETS	7,464,579	49.175
32	2081	COCOA, CHOCOLATE, CHOCOLATES	4,419,625	29.116
33	2060	BAKERY PRODUCTS, N.E.S.	3,062,181	20.173
34	2090	FOOD PRODUCTS N.E.S.	233,182	1.536
SECTOR			15,179,567	100.000

SAS

SECTOR=06* DAIRY AND OTHER N.E.C.(202,204,207,209)

OBS	COMM	OUTPUTS OF SECTOR	DOLLARS	PERCENT
35	2021	MILK, PROCESSED	43,857,449	26.326
36	2071	REFINED SUGAR	41,469,548	24.893
37	2040	VEGETABLE OILS, MARGARINE	17,265,712	10.364
38	2090	FOOD PRODUCTS N.E.S.	14,739,439	8.848
39	2470	SOAP, DETERGENTS, CLEANERS	14,094,493	8.460
40	2051	ANIMAL FEEDS AND FISH MEAL	11,083,974	6.653
41	2020	DAIRY PRODUCTS, N.E.S.	6,442,887	3.867
42	2091	COFFEE AND CHICORY	5,019,571	3.013
43	2025	CHEESE	2,823,379	1.695
44	2023	ICE CREAM	2,332,685	1.400
45	2480	CHEMICAL PRODUCTS N.E.S.	1,449,939	0.870
46	2092	FISH - DRIED OR FROZEN	1,257,007	0.755
47	2080	SWEETS	1,019,406	0.612
48	2024	BUTTER	923,774	0.555
49	2030	FRUITS AND VEGETABLES AND JAMS	844,689	0.507
50	2072	MOLASSES AND BAGASSE	793,535	0.478
51	2235	GINNED COTTON SEED	363,205	0.218
52	2061	BREAD	358,455	0.215
53	2472	TOILETRIES AND COSMETICS	256,948	0.154
54	2140	SOFT DRINKS	179,228	0.108
55	2442	INSECTICIDES	11,794	0.007
56	2081	COCOA, CHOCOLATE, CHOCOLATES	4,136	0.002
57	5555	OTHER	2,684	0.002
SECTOR			166,593,937	100.000

SAS

SECTOR-07* BEER, WINE AND SPIRITS(211,212,213)

OBS	COMM	OUTPUTS OF SECTOR	DOLLARS	PERCENT
58	2131	BEER, OPAQUE	46,878,262	53.700
59	2132	BEER, CLEAR	19,576,150	22.425
60	2110	SPIRITS - POTABLE	8,724,155	9.994
61	2130	MALT AND MALT EXTRACT ETC.	6,512,246	7.460
62	2051	ANIMAL FEEDS AND FISH MEAL	2,288,441	2.621
63	2430	BASIC INDUSTRIAL CHEMICALS N.E.S.	1,136,345	1.302
64	2111	SPIRITS - NON-POTABLE (METHS)	879,201	1.122
65	2120	WINE	556,056	0.637
66	2060	BAKERY PRODUCTS, N.E.S.	551,182	0.631
67	2432	GASES AND LIQUID GASES	48,666	0.056
68	2090	FOOD PRODUCTS N.E.S.	41,626	0.048
69	9000	UNKNOWN (STEAM, SCRAP GLASS)	4,039	0.005
SECTOR			87,296,369	100.000

SAS

SECTOR-08* SOFT DRINKS AND CARBONATED WATERS(214)

OBS	COMM	OUTPUTS OF SECTOR	DOLLARS	PERCENT
70	2141	COCA COLA BASE	30,385,654	93.442
71	2210	TOBACCO PACKING AND GRADING, LEAF	2,100,883	6.461
72	2430	BASIC INDUSTRIAL CHEMICALS N.E.S.	31,545	0.097
SECTOR			32,518,082	100.000

SAS

SECTOR-09* TOBACCO (221,222)

OBS	COMM	OUTPUTS OF SECTOR	DOLLARS	PERCENT
73	2210	TOBACCO PACKING AND GRADING, LEAF	31,384,636	66.135
74	2220	CIGARETTES, CIGARS, ETC.	16,070,618	33.865
SECTOR			47,455,254	100.000

SAS

SECTOR-10* COTTON (INCL. TEXTILES, CARPETS)(223,225)

OBS	COMM	OUTPUTS OF SECTOR	DOLLARS	PERCENT
75	2233	TEXTILE FABRIC	109,775,593	37.499
76	2231	COTTON LINT	100,826,804	34.442
77	2234	YARNS/THREADS - TRIMMINGS	29,431,126	10.053
78	2237	BLANKETS AND WOVEN GOODS	19,151,119	6.542
79	2235	GINNED COTTON SEED	14,349,114	4.902
80	2236	TOWELLING AND TOWELS	6,779,016	2.316
81	2550	PLASTIC PRODUCTS N.E.S.	3,711,346	1.268
82	5555	OTHER	2,695,951	0.921
83	2230	TEXTILES - SPINNING, ETC. N.E.S	2,349,683	0.803
84	2240	KNITTED PRODUCTS, N.E.S.	1,487,376	0.508
85	2238	HAND KNITTING WOOL (BY KARINA)	917,865	0.314
86	2232		634,271	0.217
87	2250	CARPETS AND FLOOR RUGS	552,826	0.189
88	2260	TEXTILES N.E.S. COTTON WASTE, CANVAS, ET	37,920	0.013
89	2261	HOUSEHOLD LINEN	32,745	0.011
90	2380	FURNITURE, FIXTURES - MAINLY WOOD	12,797	0.004
SECTOR			292,745,552	100.000

SAS

SECTOR-11* KNITTED PRODUCTS, ROPE, CORDAGE(224)

OBS	COMM	OUTPUTS OF SECTOR	DOLLARS	PERCENT
91	2241	KNITWEAR	31,007,762	76.420
92	5555	OTHER	7,099,028	17.496
93	2260	TEXTILES N.E.S. COTTON WASTE, CANVAS, ET	1,337,061	3.295
94	2240	KNITTED PRODUCTS, N.E.S.	821,284	2.024
95	2553	INDUSTRIAL PLASTIC PRODUCTS	208,512	0.514
96	2234	YARNS/THREADS - TRIMMINGS	101,913	0.251
SECTOR			40,575,560	100.000

SAS

SECTOR-12* OTHER TEXTILE PRODUCTS(226)

OBS	COMM	OUTPUTS OF SECTOR	DOLLARS	PERCENT
97	2241	KNITWEAR	8,759,108	61.355
98	2291	LADIES WEAR	2,335,527	16.360
99	2250	CARPETS AND FLOOR RUGS	980,062	6.865
100	2260	TEXTILES N.E.S. COTTON WASTE, CANVAS, ET	855,985	5.996
101	2600	NON-METALLIC MINERAL PRODUCTS, N.E.S.	812,300	5.690
102	2680	METAL PRODUCTS, MACHINERY AND SPARE	245,737	1.721
103	2292	MENS WEAR	185,540	1.300
104	2090	OTHER N.E.S.	63,730	0.446
105	2261	HOUSEHOLD LINEN	38,238	0.268
SECTOR			14,276,227	100.000

SAS

SECTOR=13* WEARING APPAREL(229)

OBS	COMM	OUTPUTS OF SECTOR	DOLLARS	PERCENT
106	2292	MENS WEAR	60,568,549	42.102
107	2291	LADIES WEAR	55,077,740	38.285
108	2293	PROTECTIVE CLOTHING	14,204,299	9.874
109	2290	WEARING APPAREL N.E.S.	12,875,171	8.950
110	2090	FOOD PRODUCTS N.E.S.	263,892	0.183
111	5555	OTHER	248,800	0.173
112	2261	HOUSEHOLD LINEN	157,903	0.110
113	2340	FOOTWEAR	124,838	0.087
114	2312	LEATHER AND SYNTHETIC BAGS	112,946	0.079
115	2553	INDUSTRIAL PLASTIC PRODUCTS	99,473	0.069
116	2233	TEXTILE FABRIC	53,256	0.037
117	2236	TOWELLING AND TOWELS	40,640	0.028
118	2234	YARNS/THREADS - TRIMMINGS	34,720	0.024
SECTOR			143,862,027	100.000

SAS

SECTOR=14* FOOTWEAR(234)

OBS	COMM	OUTPUTS OF SECTOR	DOLLARS	PERCENT
119	2340	FOOTWEAR	52,999,217	100

SAS

SECTOR=15* SAWMILLING,WOOD EXCL.FURNITURE(236)

OBS	COMM	OUTPUTS OF SECTOR	DOLLARS	PERCENT
120	2363	WOOD PRODUCTS FOR BUILDINGS	21,819,072	39.683
121	2364	WOOD, ROUGH/SAWN	13,509,221	24.570
122	2362	JOINERY, PREFABS	7,922,804	14.410
123	2361	WOODEN CONTAINERS, CRATES, PALLETS	6,302,793	11.463
124	2380	FURNITURE, FIXTURES - MAINLY WOOD	2,165,211	3.938
125	2380	WOOD AND CORK PRODUCTS, N.E.S.	1,949,445	3.546
126	2682	FURNITURE AND FIXTURES MAINLY METAL	1,171,820	2.131
127	2602	CONCRETE PRODUCTS - SLEEPER TILES	74,231	0.135
128	2680	METAL PRODUCTS, MACHINERY AND SPARE	62,986	0.115
129	2480	CHEMICAL PRODUCTS N.E.S.	5,341	0.010
SECTOR			54,982,924	100.000

SAS

SECTOR=16* FURNITURE, FIXTURES, EXCL. METAL (238)

OBS	COMM	OUTPUTS OF SECTOR	DOLLARS	PERCENT
130	2380	FURNITURE, FIXTURES - MAINLY WOOD	54,432,963	98.103
131	2682	FURNITURE AND FIXTURES MAINLY METAL	456,375	0.823
132	2340	FOOTWEAR	293,124	0.528
133	2260	TEXTILES N.E.S. COTTON WASTE, CANVAS, ET	122,321	0.220
134	2250	CARPETS AND FLOOR RUGS	106,930	0.193
135	2360	WOOD AND CORK PRODUCTS, N.E.S.	58,651	0.106
136	2362	JOINERY, PREFABS	15,211	0.027
SECTOR			55,485,575	100.000

SAS

SECTOR=17* PULP, PAPER AND PRODUCTS(239,240)

OBS	COMM	OUTPUTS OF SECTOR	DOLLARS	PERCENT
137	2390	PULP, PAPER, PAPERBOARD	31,067,143	42.922
138	2401	PAPER CONTAINERS AND CARTONS	29,114,726	40.225
139	2100	PAPER PRODUCTS, N.E.S.	9,893,340	13.669
140	2553	INDUSTRIAL PLASTIC PRODUCTS	859,870	1.201
141	2550	PLASTIC PRODUCTS, N.E.S.	822,554	1.136
142	2420	PRINTED PRODUCTS, N.E.S.	539,358	0.745
143	5555	OTHER	60,568	0.084
144	2621	GRANULATED SLAG AND SLAG CLINKER	12,801	0.018
SECTOR			72,380,100	100.000

SAS

SECTOR=18* PRINTING, PUBLISHING, ETC. (242)

OBS	COMM	OUTPUTS OF SECTOR	DOLLARS	PERCENT
145	2420	PRINTED PRODUCTS, N.E.S.	48,869,209	59.154
146	2421	PUBLISHING	29,644,105	35.883
147	2401	PAPER CONTAINERS AND CARTONS	3,498,445	4.235
148	2480	CHEMICAL PRODUCTS N.E.S.	307,045	0.372
149	2680	METAL PRODUCTS, MACHINERY AND SPARE	95,631	0.116
150	2290	WEARING APPAREL N.E.S.	78,546	0.095
151	2261	HOUSEHOLD LINEN	60,438	0.073
152	2580	POTTERY, CHINA, EARTHENWARE	52,363	0.063
153	5555	OTHER	7,402	0.009
SECTOR			82,613,182	100.000

SAS

SECTOR=19* FERTILIZER, INSECTICIDES(244)

OBS	COMM	OUTPUTS OF SECTOR	DOLLARS	PERCENT
154	2441	FERTILIZERS	102,953,111	89.464
155	2442	INSECTICIDES	6,900,561	5.996
156	2430	BASIC INDUSTRIAL CHEMICALS N.E.S.	2,697,002	2.344
157	2432	GASES AND LIQUID GASES	1,252,157	1.088
158	2431	ACIDS	1,127,716	0.980
159	2051	ANIMAL FEEDS AND FISH MEAL	147,679	0.128
SECTOR			115,078,226	100.000

SAS

SECTOR=20* PAINTS, VARNISHES, FILLERS (246)

OBS	COMM	OUTPUTS OF SECTOR	DOLLARS	PERCENT
160	2460	VARNISHES, LACQUERS, FILLERS, PAINT	24,304,588	100

SAS

SECTOR=21* SOAPS, DETERGENTS, TOILETRIES, PHARM. (247)

OBS	COMM	OUTPUTS OF SECTOR	DOLLARS	PERCENT
161	2470	SOAP, DETERGENTS, CLEANERS	34,153,254	35.221
162	2040	VEGETABLE OILS, MARGARINE	19,486,415	20.395
163	2471	MEDICINAL AND PHARMACEUTICAL	19,153,352	19.752
164	2472	TOILETRIES AND COSMETICS	18,910,780	19.502
165	2480	CHEMICAL PRODUCTS N.E.S.	1,759,375	1.814
166	2051	ANIMAL FEEDS AND FISH MEAL	951,603	0.981
167	2030	FRUITS AND VEGETABLES AND JAMS	628,847	0.649
168	2090	FOOD PRODUCTS N.E.S.	446,648	0.461
169	2994	BRUSHWARE	438,417	0.452
170	2430	BASIC INDUSTRIAL CHEMICALS N.E.S.	346,397	0.357
171	2902	WATCHES AND CLOCKS	215,902	0.223
172	2025	CHEESE	207,922	0.214
173	2400	PAPER PRODUCTS, N.E.S.	179,805	0.185
174	2460	VARNISHES, LACQUERS, FILLERS, PAINT	56,986	0.059
175	2501	OILS, LUBRICANTS	20,009	0.021
176	2442	INSECTICIDES	13,491	0.014
SECTOR			96,969,203	100.000

SAS

SECTOR=22* MATCHES, INKS, GLUES, AND CHEM. N.E.C. (248)

OBS	COMM	OUTPUTS OF SECTOR	DOLLARS	PERCENT
177	2480	CHEMICAL PRODUCTS N.E.S.	14,783,908	69.133
178	2482	MATCHES	2,321,793	10.857
179	2511	ASPHALT, BITUMEN AND TAR	859,024	4.017
180	2471	MEDICINAL AND PHARMACEUTICAL	845,173	3.952
181	2687	RAZOR BLADES	706,067	3.302
182	2472	TOILETRIES AND COSMETICS	584,936	2.735
183	2553	INDUSTRIAL PLASTIC PRODUCTS	483,200	2.260
184	2030	FRUITS AND VEGETABLES AND JAMS	309,863	1.449
185	2090	FOOD PRODUCTS N.E.S.	309,863	1.449
186	2360	WOOD AND CORK PRODUCTS, N.E.S.	179,913	0.841
187	2432	GASES AND LIQUID GASES	1,039	0.005
SECTOR			21,384,779	100.000

SAS

SECTOR=23* BASIC CHEMICALS, PETROLEUM PRODS. (243,25)

OBS	COMM	OUTPUTS OF SECTOR	DOLLARS	PERCENT
188	5555	OTHER	11,756,328	41.501
189	2432	GASES AND LIQUID GASES	6,619,781	23.368
190	2430	BASIC INDUSTRIAL CHEMICALS N.E.S.	3,450,049	12.179
191	2511	ASPHALT, BITUMEN AND TAR	3,237,868	11.430
192	2795	GEYSERS	1,857,659	6.558
193	2431	ACIDS	591,684	2.089
194	2090	FOOD PRODUCTS N.E.S.	507,676	1.792
195	2480	CHEMICAL PRODUCTS N.E.S.	307,045	1.084
SECTOR			28,328,090	100.000

SAS

SECTOR=24* RUBBER PRODUCTS (253)

OBS	COMM	OUTPUTS OF SECTOR	DOLLARS	PERCENT
196	2533	TYRES, RETREADS	32,213,565	66.091
197	2532	INDUSTRIAL RUBBER PRODUCTS	9,931,268	20.375
198	2530	RUBBER PRODS. N.E.S.	4,402,608	9.033
199	2627	FINISHED INDUSTRIAL METAL PRODUCTS	1,805,991	3.293
200	2554	TILES, PLSTIC AND FIBREGLASS	588,900	1.208
SECTOR			48,741,532	100.000

SAS

SECTOR=25* PLASTIC PRODUCTS (255)

OBS	COMM	OUTPUTS OF SECTOR	DOLLARS	PERCENT
201	2551	CONTAINERS - PLASTIC	19,087,155	46.158
202	2550	PLASTIC PRODUCTS N.E.S.	12,084,524	29.224
203	2553	INDUSTRIAL PLASTIC PRODUCTS	6,760,013	16.340
204	2233	TEXTILE FABRIC	1,071,001	2.590
205	2851	BOATS	657,266	1.589
206	2554	TILES, PLSTIC AND FIBREGLASS	475,243	1.149
207	2552	DOMESTIC PLASTIC PRODUCTS	414,497	1.002
208	2390	PULP, PAPER, PAPERBOARD	354,367	0.881
209	2511	ASPHALT, BITUMEN AND TAR	282,564	0.683
210	2420	PRINTED PRODUCTS, N.E.S.	53,251	0.129
211	2510	PETROLEUM AND COAL PRODUCTS N.E.S.	50,939	0.123
212	2472	TOILETRIES AND COSMETICS	50,938	0.123
SECTOR			41,351,758	100.000

SAS

SECTOR=26* STRUCTURAL CLAY PRODS. INCL. BRICKS (258)

OBS	COMM	OUTPUTS OF SECTOR	DOLLARS	PERCENT
213	2581	BRICKS (NOT CONCRETE)	10,151,765	84.37
214	2580	CLAY PRODUCTS N.E.S. PIPES AND TILES	1,880,715	15.63
SECTOR			12,032,480	100.00

SAS

SECTOR-27* GLASS, CEMENT ETC.(256,257,259,260)

OBS	COMM	OUTPUTS OF SECTOR	DOLLARS	PERCENT
215	2591	CEMENT	22,616,756	29.715
216	2601	ASBESTOS EXCLUDING TILES	18,268,412	24.002
217	2602	CONCRETE PRODUCTS - SLEEPER TILES	11,503,632	15.114
218	2571	GLASS CONTAINERS	7,943,908	10.437
219	2572	GLASS PANEES AND SHEETS	4,464,846	5.866
220	2600	NON-METALLIC MINERAL PRODUCTS, N.E.S.	2,993,656	3.933
221	2560	POTTERY, CHINA, EARTHENWARE	2,864,420	3.784
222	2570	GLASS PRODUCTS N.E.S. - GLAZE	1,311,350	1.723
223	2581	BRICKS (NOT CONCRETE)	1,117,070	1.468
224	2441	FERTILIZERS	967,845	1.272
225	2590	LIME AND PLASTER	646,021	0.849
226	1305	OTHER STONE, CLAY AND SAND	552,383	0.726
227	2360	WOOD AND CORK PRODUCTS, N.E.S.	376,895	0.495
228	2460	VARNISHES, LACQUERS, FILLERS, PAINT	166,686	0.219
229	2603	TILES - CONCRETE, ABESTOS, ETC.	150,132	0.200
230	2790	ELECTR.MACH.ETC., N.E.S.	126,893	0.167
231	2592	CLINKER, ONLY CEMENT WORKS	16,589	0.022
232	2667	RAZOR BLADES	16,478	0.022
SECTOR			76,112,032	100.000

SAS

SECTOR-28* NON-FERROUS, IRON, STEEL (BASIC)(262,264)

OBS	COMM	OUTPUTS OF SECTOR	DOLLARS	PERCENT
233	2620	IRON AND STEEL BASIC INDUSTRY	93,323,925	35.530
234	2622	FERROUS ALLOY	90,856,954	34.591
235	2627	FINISHED INDUSTRIAL METAL PRODUCTS	28,840,056	10.980
236	2624	WIRE, INCL GALVANISED, EXCL COPPER	15,716,487	5.984
237	2640	NON-FERROUS METAL BASIC PRODUCTS	15,648,068	5.957
238	2680	METAL PRODUCTS, MACHINERY AND SPARE	8,921,514	3.397
239	2643	NON-FERROUS METALS, N.E.S.	4,014,562	1.528
240	2830	MOTOR SPARES ETC.N.E.S.INCL.C.K.D.	1,640,598	0.625
241	2796	ELECTRIC CABLE/WIRE	1,285,784	0.490
242	2641	COPPER METAL, COPPER SHEETING	1,011,705	0.385
243	2554	TILES, PLSTIC AND FIBREGLASS	455,675	0.173
244	2626	METAL FOR CONSUMERS PRODUCTS, I.E. INGOT	444,776	0.169
245	2621	GRANULATED SLAG AND SLAG CLINKER	341,670	0.130
246	2993	SPORTS EQUIPMENT	150,742	0.057
247	2051	ANIMAL FEEDS AND FISH MEAL	39,875	0.015
248	2591	CEMENT	32,558	0.012
249	2430	BASIC INDUSTRIAL CHEMICALS N.E.S.	27,659	0.011
SECTOR			262,662,608	100.000

SAS

SECTOR-29* METAL PRODUCTS, MACHINERY(268)

OBS	COMM	OUTPUTS OF SECTOR	DOLLARS	PERCENT
250	2680	METAL PRODUCTS, MACHINERY AND SPARE	221,263,349	76.024
251	2550	PLASTIC PRODUCTS N.E.S.	21,795,340	7.489
252	2681	METAL CONTAINERS - TINS, CANS	17,390,455	5.975
253	2682	FURNITURE AND FIXTURES MAINLY METAL	8,608,481	2.958
254	2689	MILITARY GUNS AND PARTS	4,085,499	1.404
255	2822	LOCOMOTIVES	2,582,576	0.887
256	2621	GRANULATED SLAG AND SLAG CLINKER	2,434,264	0.836
257	2551	CONTAINERS - PLASTIC	1,926,915	0.663
258	2832	MOTOR VEHICLES BODIES	1,903,496	0.654
259	2821	ROLLING STOCK	1,532,266	0.526
260	2790	ELECTR.MACH.ETC., N.E.S.	1,284,750	0.441
261	2834	MILITARY VEHICLES AND PARTS	1,254,865	0.431
262	2687	RAZOR BLADES	934,356	0.321
263	2780	COMM EQUIPT N.E.S.	747,103	0.257
264	2401	PAPER CONTAINERS AND CARTONS	648,429	0.223
265	2627	FINISHED INDUSTRIAL METAL PRODUCTS	418,818	0.143
266	2635	TRAILERS FOR TRUCKS, ETC.	310,679	0.107
267	2380	FURNITURE, FIXTURES - MAINLY WOOD	282,798	0.097
268	2400	PAPER PRODUCTS, N.E.S.	262,408	0.090
269	2450	SYNTHETIC RESINS, MAN-MADE FIBRES, ETC.	227,709	0.078
270	2990	OTHER N.E.S.	221,419	0.076
271	2620	IRON AND STEEL BASIC INDUSTRY	208,898	0.072
272	2860	TRANSPORT N.E.S.	148,969	0.051
273	2442	INSECTICIDES	106,373	0.037
274	2688	SOLAR HEATERS	100,258	0.034
275	2792	ELECTR. EQUIP - INDUSTRIAL	72,896	0.025
276	2360	WOOD AND CORK PRODUCTS N.E.S.	53,868	0.019
277	2680	NON-FERROUS METAL BASIC PRODUCTS	48,548	0.017
278	2260	TEXTILES N.E.S. COTTON WASTE, CANVAS, ET	45,028	0.015
279	2830	MOTOR SPARES ETC.N.E.S.INCL.C.K.D.	34,816	0.012
280	2795	GEYSERS	29,957	0.010
281	2901	SCIENT./PROF. EQUIPMENT	27,974	0.010
282	2995	CURIOS, NOVELTIES	13,060	0.004
283	2481	EXPLOSIVES AND CARTRIDGES #	9,504	0.003
284	2210	TOBACCO PACKING AND GRADING, LEAF	7,677	0.003
285	2600	NON-METALLIC MINERAL PRODUCTS, N.E.S.	7,139	0.002
286	2820	RAILROAD EQUIPMENT N.E.S.	4,493	0.002
287	2602	CONCRETE PRODUCTS - SLEEPER TILES	3,381	0.001
288	30	CATTLE	2,277	0.001
289	2581	BRICKS (NOT CONCRETE)	1,573	0.001
290	17	MAIZE GRAIN	1,301	0.000
291	2131	BEER, OPAQUE	976	0.000
SECTOR			291,042,941	100.000

SAS

SECTOR-30* ELECTRICAL MACHINERY/EQUIPMENT(278,279)

OBS	COMM	OUTPUTS OF SECTOR	DOLLARS	PERCENT
292	2781	RADIOS, STEREOE ETC.	17,231,183	23.092
293	2796	ELECTRIC CABLE/WIRE	15,742,078	21.097
294	2792	ELECTR. EQUIP.-INDUSTRIAL	12,882,144	17.237
295	2793	BATTERIES	10,886,605	14.563
296	2790	ELECTR.MACH.ETC., N.E.S.	8,668,021	11.614
297	2780	ELECTR.DOMESTIC APPLIANCES	5,389,415	7.196
298	2780	COMM EQUIPT N.E.S.	1,319,414	1.768
299	2641	COPPER METAL, COPPER SHEETING	1,101,832	1.477
300	2680	METAL PRODUCTS, MACHINERY AND SPARE	597,788	0.801
301	2795	GEYSERS	424,493	0.569
302	2782	TELEVISION RECEIVING SETS	324,299	0.435
303	2794	COOKERS AND STOVES	68,986	0.092
304	2621	GRANULATED SLAG AND SLAG CLINKER	44,799	0.060
SECTOR			74,619,057	100.000

SAS

SECTOR-31* MOTOR VEHICLES(283)

OBS	COMM	OUTPUTS OF SECTOR	DOLLARS	PERCENT
305	2832	MOTOR VEHICLES BODIES	49,153,244	61.944
306	2835	TRAILERS FOR TRUCKS, ETC.	11,548,767	14.554
307	2830	MOTOR SPARES ETC.N.E.S.INCL.C.K.D.	8,090,936	10.196
308	2680	METAL PRODUCTS, MACHINERY AND SPARE	4,725,006	5.955
309	2831	MOTOR VEHICLES - ASSEMBLED	4,203,460	5.297
310	2833	CARAVANS	1,630,302	2.055
SECTOR			79,351,715	100.000

SAS

SECTOR-32* OTHER VEHICLES ETC.(282,284,285,286)

OBS	COMM	OUTPUTS OF SECTOR	DOLLARS	PERCENT
311	2861	BOATS	2,142,712	25.113
312	2821	ROLLING STOCK	2,088,179	24.474
313	2841	BICYCLES	1,549,867	18.165
314	2680	METAL PRODUCTS, MACHINERY AND SPARE	1,169,964	13.712
315	2835	TRAILERS FOR TRUCKS, ETC.	1,100,889	12.903
316	2840	BICYCLES SPARE PARTS ETC. N.E.S.	273,506	3.208
317	2862	CARTS	99,991	1.172
318	2833	CARAVANS	45,014	0.528
319	2550	PLASTIC PRODUCTS N.E.S.	34,807	0.408
320	2553	INDUSTRIAL PLASTIC PRODUCTS	21,754	0.255
321	2380	FURNITURE, FIXTURES - MAINLY WOOD	5,622	0.066
SECTOR			8,532,305	100.000

SAS

SECTOR-33* OTHER MANUFACTURING(231,290,291)

OBS	COMM	OUTPUTS OF SECTOR	DOLLARS	PERCENT
322	2990	OTHER N.E.S.	13,225,862	33.29
323	2311	HIDES AND SKINS	7,870,984	19.81
324	2991	JEWELLERY AND ENGRAVING	4,750,648	11.96
325	2995	CURIOS, NOVELTIES	3,558,659	8.86
326	2994	BRUSHWARE	3,024,490	7.61
327	2312	LEATHER AND SYNTHETIC BAGS	2,282,830	5.75
328	2901	SCIENT./PROF. EQUIPMENT	1,309,814	3.30
329	2903	PHOTOGRAPHIC AND OPTICAL	720,508	1.81
330	2993	SPORTS EQUIPMENT	604,148	1.52
331	2680	METAL PRODUCTS, MACHINERY AND SPARE	463,787	1.17
332	2791	ELECTR.DOMESTIC APPLIANCES	437,712	1.10
333	2400	PAPER PRODUCTS, N.E.S.	384,221	0.97
334	2640	NON-FERROUS METAL BASIC PRODUCTS	372,313	0.94
335	2480	CHEMICAL PRODUCTS N.E.S.	285,915	0.72
336	2689	MILITARY GUNS AND PARTS	121,032	0.30
337	2902	WATCHES AND CLOCKS	105,840	0.27
338	2553	INDUSTRIAL PLASTIC PRODUCTS	88,645	0.22
339	2600	NON-METALLIC MINERAL PRODUCTS, N.E.S.	87,726	0.22
340	2016	MEAT - PROCESSED/CANNED	13,680	0.03
341	2860	TRANSPORT N.E.S.	7,136	0.02
342	2550	PLASTIC PRODUCTS N.E.S.	6,317	0.02
343	2360	WOOD AND CORK PRODUCTS, N.E.S.	2,048	0.01
344	2641	COPPER METAL, COPPER SHEETING	773	0.00
SECTOR			39,725,088	100.00
			2804310687	3300.00

ANNEX G

SUB-SECTORAL DATA

VALUES OF KEY VARIABLES IN THOUSANDS OF CURRENT DOLLARS

SOURCE: CSO CENSUS OF PRODUCTION 1977/78 AND 1982/83

NOTES:

- 1. GROSS OUTPUT AND PURCHASES EXCLUDE GOODS PURCHASED FOR RESALE.*
- 2. THE TOTALS FOR MANUFACTURING AS A WHOLE HAVE BEEN RE-CALCULATED AND MAY DIFFER FROM THE CENSUS TOTALS.*
- 3. VALUE ADDED IS THE DIFFERENCE BETWEEN GROSS OUTPUT AND THE SUM OF PURCHASES AND SERVICE INPUTS.*
- 4. LABOUR IN THOUSANDS.*
- 5. TOTAL MANUFACTURING EXCLUDES SUB-SECTORS 13 AND 14 (CLOTHING AND FOOTWEAR) IN THE YEARS 1967 AND 1968.*

VALUES OF KEY VARIABLES (CURRENT PRICES): 33 SUBSECTORS AND TOTAL
IN THOUSANDS OF DOLLARS (LABOUR IN THOUSANDS)

----- SUBJECT-1* SLAUGHTERING, PROCESSING OF MEAT(201) -----

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	27324	1508	25206	1986	2323	608	304	344	22	670
1968	31133	3783	26706	2149	2587	634	387	144	45	576
1969	33501	4045	28796	2155	2496	658	1298	800	56	2154
1970	38926	4388	33724	2600	2866	814	1287	1204	63	2554
1971	47422	4119	42312	3155	3547	991	862	696	113	1671
1972	62689	5270	56196	3631	3716	1223	1371	415	154	1940
1973	79971	6454	71946	4069	3664	1571	4027	431	297	4755
1974	76692	6867	67581	4487	3968	2244	8032	461	125	8618
1975	79610	5230	71959	5367	3994	2421	8656	2237	132	11025
1976	98207	12303	83883	6699	4667	3221	818	1298	614	2729
1977	116611	13920	98877	7718	5208	3814	199	359	298	858
1978	116628	15758	96154	8844	5806	4716	66	279	198	545
1979	127019	16617	105404	9878	5814	4998	573	379	400	1353
1980	121456	10100	107009	12077	5743	4349	683	514	247	1445
1981	149824	20918	115137	15332	5168	4769	1073	933	585	2560
1982	213427	30461	174775	20359	5844	8191	1029	1625	695	3350

----- SUBJECT-2* CANNING, PRESERVING,FRUIT, VEGETABLES(203) -----

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	1645	493	1022	286	549	130	36	56	6	98
1968	1492	417	968	288	561	107	32	33	11	76
1969	1591	363	1110	311	584	118	20	103	10	133
1970	1700	441	1119	310	595	140	20	91	9	120
1971	2427	648	1533	619	1068	246	52	37	11	100
1972	2562	892	1467	431	690	203	15	33	13	61
1973	3001	550	2143	488	923	308	4	12	0	16
1974	3195	689	2283	560	1144	223	33	76	57	186
1975	3737	839	2592	700	920	306	81	87	170	170
1976	3688	1032	2205	657	1083	331	21	42	30	92
1977	4027	1003	2599	653	972	218	21	71	37	129
1978	3353	737	2378	653	792	238	64	59	48	171
1979	4012	1025	2623	701	704	364	0	89	42	131
1980	4136	1012	2802	753	738	322	1	46	12	49
1981	5333	1328	3633	971	650	372	20	196	88	304
1982	2233	614	1293	502	294	326	292	60	76	429

VALUES OF KEY VARIABLES (CURRENT PRICES): 33 SUBSECTORS AND TOTAL
IN THOUSANDS OF DOLLARS (LABOUR IN THOUSANDS)

----- SUBJECT-3* GRAIN MILL PRODUCTS,ANIMAL FEEDS(205) -----

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	18183	2720	14022	1963	2148	1441	35	56	19	110
1968	23669	3149	18882	2223	2332	1838	1	56	30	87
1969	23837	2667	19088	2357	2510	2082	6	103	-9	128
1970	33310	4633	27021	2768	2849	1656	-17	56	-7	32
1971	32887	4848	26140	3056	3059	1899	74	80	94	248
1972	32455	4753	25360	3338	3206	2342	131	42	177	350
1973	42147	6452	32927	4080	3618	2768	302	331	286	919
1974	45157	7376	35499	4492	3818	2282	541	1056	455	2052
1975	55859	8659	43963	5394	4447	3237	294	835	457	1586
1976	60622	6874	49280	6085	3947	4468	1174	1288	337	2719
1977	70117	11262	54116	6795	4233	4739	382	1590	469	2443
1978	80882	12324	62826	7807	4480	5732	860	1721	496	3077
1979	104317	20475	78738	10381	4724	4104	1068	4125	721	5814
1980	145678	27218	112936	14856	5076	5524	1909	3252	1216	6377
1981	211125	36101	162316	21191	5735	12708	7821	6401	1996	16216
1982	272195	41424	214619	26428	6339	16152	4410	6817	2672	13822

----- SUBJECT-4* BAKERY PRODUCTS(206) -----

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	12300	2888	8622	1954	2939	790	62	214	150	426
1968	13638	3172	9436	2187	3106	927	52	84	135	271
1969	14667	3562	10034	2458	3337	1071	447	342	125	914
1970	16465	4041	11223	2674	3478	1201	20	486	596	1102
1971	18398	4679	12510	2859	3592	1209	97	402	265	784
1972	19699	4790	13853	3145	3796	1298	265	300	301	866
1973	20873	5325	14333	3495	3896	1315	40	149	112	901
1974	24724	5949	17139	4001	4063	1838	288	418	255	961
1975	27227	6213	19290	4463	3949	1724	186	393	368	947
1976	28911	6926	20255	4543	3830	1728	20	342	136	498
1977	31872	7489	22406	4769	3677	1777	18	217	308	542
1978	34967	7908	25076	4978	3618	1983	108	408	418	633
1979	40592	10332	28194	5784	3888	2066	-23	461	217	857
1980	50069	13563	34070	7757	4116	2466	637	1482	2387	4503
1981	66797	17539	46093	10348	4950	3165	117	2771	967	3855
1982	79265	20554	54180	12721	4900	4531	68	1144	646	1857

VALUES OF KEY VARIABLES (CURRENT PRICES): 33 SUBSECTORS AND TOTAL
IN THOUSANDS OF DOLLARS (LABOUR IN THOUSANDS)

----- SUBJECT-5* CHOCOLATE AND SUGAR CONFECTIONERY (208) -----

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND, BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	2036	696	1232	344	580	108	42	54	-10	86
1968	2337	763	1457	390	614	117	3	120	5	131
1969	2630	809	1638	413	671	183	5	115	21	141
1970	3107	1007	1891	466	765	209	76	279	23	378
1971	3804	1341	2184	587	873	279	40	140	14	194
1972	4155	1448	2370	635	952	337	37	140	14	184
1973	4568	1445	2803	756	983	318	57	194	9	260
1974	5956	1997	3634	900	1061	325	70	155	45	270
1975	6020	1973	3668	992	1098	379	93	266	38	397
1976	6130	2133	3601	1061	978	396	53	186	35	271
1977	5831	1923	3497	1064	862	411	7	221	27	259
1978	6576	2190	3943	1117	906	443	0	143	28	172
1979	7191	2337	4368	1167	871	486	118	135	25	277
1980	10851	3699	6482	1720	977	677	60	517	85	662
1981	15347	6013	8302	2413	1076	1011	348	1479	200	2027
1982	19139	8079	10558	2835	1101	502	158	809	174	1142

----- SUBJECT-6* DAIRY AND OTHER N.E.C. (202,204,207,209) -----

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND, BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	29414	6237	21572	3419	3917	1605	628	779	94	1501
1968	30781	6243	22920	3730	4029	1618	478	426	98	1002
1969	32722	7074	23718	4009	4290	1930	1335	1265	101	2701
1970	36273	8035	25958	4341	4517	2280	198	425	252	875
1971	40894	8969	29542	4874	4719	2383	1103	1524	742	3389
1972	44225	10377	30940	5270	4917	2908	1112	1591	194	2997
1973	52410	11496	37700	5995	5432	3214	978	1444	560	2983
1974	63857	13064	46923	7309	5704	3870	1505	3474	282	5261
1975	74248	17078	52169	9204	6531	5001	1396	2258	795	4449
1976	86436	19174	62319	10561	6428	4943	1478	2001	686	4163
1977	89051	21709	62383	11919	7000	4959	1001	1765	404	3169
1978	99299	24092	69597	13144	6953	5610	1463	2885	478	4825
1979	122794	27928	87486	16732	6947	6870	182	1573	651	3106
1980	152409	34704	107747	18472	7321	9652	1090	3058	1262	5411
1981	163346	38469	115504	22165	7643	9373	1079	7424	801	9305
1982	202014	54769	134525	28003	7856	12720	2915	2665	1602	7181

VALUES OF KEY VARIABLES (CURRENT PRICES): 33 SUBSECTORS AND TOTAL
IN THOUSANDS OF DOLLARS (LABOUR IN THOUSANDS)

----- SUBJECT-7* BEER, WINE AND SPIRITS (211, 212, 213) -----

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND, BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	16110	8808	5008	2480	2608	2294	184	276	104	564
1968	17340	9266	5290	3004	2892	2784	518	660	101	1279
1969	19541	10594	6214	3395	3111	2733	344	669	270	1283
1970	22362	13038	6214	3748	3411	3110	611	887	205	1703
1971	25331	14678	7919	4198	3638	2734	757	771	82	1610
1972	27914	16240	8893	4446	4120	2781	633	1334	309	2276
1973	30788	17569	9929	5261	4090	3290	641	1557	202	1400
1974	35543	19038	11386	6341	4633	5119	2466	1000	489	3955
1975	39732	19926	13653	7438	4799	6113	2709	3937	705	7351
1976	43031	21443	15362	8736	4708	6226	1589	1568	424	3579
1977	46675	22636	17342	9576	4762	6697	1294	984	455	2728
1978	56792	24857	19349	10960	4786	12586	1291	1667	284	3246
1979	56443	22230	21720	10718	3884	12493	694	2850	416	3759
1980	69309	28980	26317	13226	4115	14012	1891	3410	263	5564
1981	87113	32287	37746	17980	4383	17080	2312	9275	2143	13730
1982	110978	37958	50162	22513	5032	22858	840	5671	1776	8288

----- SUBJECT-8* SOFT DRINKS AND CARBONATED WATERS (214) -----

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND, BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	5332	1954	2638	1022	1042	740	86	112	56	254
1968	5927	2327	2839	1107	1050	761	28	101	88	217
1969	6265	2645	3009	1245	1157	611	49	142	164	355
1970	7137	2543	3871	1498	1268	723	108	205	82	395
1971	8043	2743	4286	1663	1427	1012	54	245	80	379
1972	10079	3506	5555	1911	1815	1018	132	409	116	657
1973	10747	4145	5618	2214	1780	984	60	183	308	551
1974	13522	5173	6637	2491	1861	1712	347	583	270	1200
1975	15666	6025	7897	3138	1993	1744	1472	83	470	2034
1976	17030	6143	8690	3343	2223	197	452	798	310	1581
1977	17575	6426	8719	4145	2229	2430	187	79	350	817
1978	19540	7252	9638	4007	2099	2650	39	734	128	900
1979	21917	9034	9800	5104	2313	3083	335	416	141	891
1980	29651	10583	15216	6015	2172	3852	630	2310	372	3312
1981	33965	14070	14963	7292	2414	4922	301	995	914	2209
1982	45918	18148	22344	9244	2469	5426	316	1169	949	2432

VALUES OF KEY VARIABLES (CURRENT PRICES): 33 SUBSECTORS AND TOTAL
IN THOUSANDS OF DOLLARS (LABOUR IN THOUSANDS)

----- SUBJECT-9* TOBACCO (221,222) -----

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	14014	6722	5192	3800	4028	2100	62	-148	56	-30
1968	13218	5858	5096	3394	3284	2264	81	11	78	170
1969	15128	7528	5445	3993	3804	2155	373	73	117	563
1970	15320	7311	5582	4409	3998	2427	235	62	195	492
1971	16622	8376	5809	5005	4737	2437	344	239	140	723
1972	17250	8620	6250	5117	4600	2380	181	201	158	540
1973	18073	8646	6772	5609	4722	2455	9	202	124	335
1974	23366	11097	8907	8326	5072	3382	395	1342	265	2002
1975	27709	13023	10755	7185	4959	3337	202	1013	116	1331
1976	29404	13153	13379	7931	5621	2872	1819	506	90	2417
1977	30251	15740	11726	8319	5302	2785	216	244	71	535
1978	34843	18108	13332	9293	5271	3403	330	352	91	774
1979	44449	24862	15657	19813	5218	3934	104	762	290	1156
1980	52801	29531	17188	15005	6117	6082	3014	1150	632	4796
1981	61556	41461	10546	16921	5259	9549	1872	-990	803	1684
1982	72935	42835	20956	19612	5705	9144	484	2457	2263	5205

----- SUBJECT-10* COTTON (INCL. TEXTILES, CARPETS) (223,225) -----

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	28810	8423	19130	3868	6305	1057	792	1738	98	2628
1968	34587	9611	23381	4373	6748	1585	479	755	28	1262
1969	48238	9126	37254	4856	7380	1858	1473	1180	54	2707
1970	45169	11673	31897	5598	7514	1599	1503	1422	42	2967
1971	57436	13697	41734	6187	8374	2005	619	1597	56	2272
1972	71459	17284	51349	6998	9655	2826	200	1248	56	1504
1973	84639	20301	61539	7782	11530	2799	125	2539	106	2770
1974	115675	25638	85780	9415	18615	4287	2212	4582	137	6931
1975	112644	25446	82834	10787	10747	4364	3639	10584	108	14331
1976	126010	28039	92216	12525	10608	5755	1764	6315	145	8222
1977	131513	31024	94641	13538	10896	5848	793	3328	61	4183
1978	140740	34060	98771	14826	10969	7909	994	1784	128	2905
1979	168447	45472	13218	17537	11743	9571	654	1764	200	2617
1980	212199	64032	137189	24111	12502	10978	3628	12972	423	17023
1981	258800	81605	162759	32861	15077	14436	7917	31493	631	40041
1982	250977	67090	170338	37733	15502	13549	5071	16768	692	22532

VALUES OF KEY VARIABLES (CURRENT PRICES): 33 SUBSECTORS AND TOTAL
IN THOUSANDS OF DOLLARS (LABOUR IN THOUSANDS)

----- SUBJECT-11* KNITTED PRODUCTS, ROPE, CORDAGE (224) -----

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	5618	1811	3406	1246	2198	401	48	250	12	310
1968	6642	2155	3881	1678	2656	606	75	210	4	289
1969	7246	2446	4126	1782	2865	674	83	158	17	258
1970	9664	3399	5502	2147	3176	763	261	508	22	791
1971	10850	4005	6000	2385	3306	845	205	350	11	586
1972	12451	5034	6389	2700	3642	1028	199	342	27	568
1973	13641	5604	6884	2878	3878	1153	52	399	10	461
1974	17139	6670	9304	3180	3729	1165	206	998	13	1217
1975	16716	6590	8791	3531	3506	1335	331	379	14	724
1976	17780	6475	9843	3918	3739	1442	380	241	11	632
1977	18304	6792	8039	4382	3545	1473	359	671	23	1052
1978	15987	5897	8582	4432	3161	1508	26	151	64	240
1979	19526	7489	10286	5014	3259	1751	11	295	11	318
1980	26933	11425	13423	6358	3864	2085	505	710	46	1261
1981	39091	17466	18420	9222	4344	3205	1238	2331	134	3702
1982	36387	17302	17122	10932	4310	3963	57	938	69	1062

----- SUBJECT-12* OTHER TEXTILE PRODUCTS (226) -----

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	1428	382	950	190	337	81	4	62	2	68
1968	1098	369	662	218	329	67	21	61	4	86
1969	1521	457	980	259	387	84	0	12	3	15
1970	1787	509	1180	308	434	118	2	26	3	34
1971	2218	654	1417	367	513	147	84	175	7	266
1972	2323	669	1479	402	516	175	46	91	20	157
1973	3036	924	1889	539	616	223	155	48	27	230
1974	3957	1193	2421	785	791	343	67	125	25	217
1975	4924	1631	2782	956	876	511	1945	895	50	2890
1976	4961	1299	3244	1157	1068	418	108	248	5	361
1977	6595	2189	4012	1323	1068	394	39	82	40	141
1978	6620	2006	4035	1209	893	579	25	88	80	192
1979	8382	2506	5285	1499	962	591	42	141	55	239
1980	12301	3448	8203	2128	1007	650	107	381	60	547
1981	14233	4020	9338	2494	996	875	1529	271	158	1959
1982	13051	4397	7641	3158	977	1013	7	144	231	382

VALUES OF KEY VARIABLES (CURRENT PRICES): 33 SUBSECTORS AND TOTAL
IN THOUSANDS OF DOLLARS (LABOUR IN THOUSANDS)

----- SUBJECT=13* WEARING APPAREL (229) -----

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND, BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	.	.	.	.	.	.	.	.	.	.
1968	.	.	.	.	.	.	.	.	.	.
1969	30395	10838	16989	7203	11121	2568	314	318	104	736
1970	35787	12521	20225	8120	12115	3841	572	472	124	1168
1971	40987	14857	22477	9757	13153	3653	1070	534	122	1726
1972	45905	17120	24594	10580	13873	4191	210	443	113	766
1973	52937	19525	29006	11392	14262	4406	370	504	153	1027
1974	62001	21590	33914	12609	14500	6497	1258	833	170	2261
1975	65478	24928	33106	13471	14587	7444	2737	678	234	3649
1976	61596	20878	33482	14090	14023	7444	347	263	186	796
1977	56042	19814	30110	13811	12406	6118	101	321	88	516
1978	55180	19773	29679	13820	11765	5728	75	399	89	560
1979	71711	24473	40294	16944	13061	6944	27	729	1168	917
1980	99709	35626	54859	23208	14624	9224	1705	1559	362	3625
1981	142534	55270	74151	35505	16127	13113	2410	3249	671	6329
1982	145495	58152	73504	41429	16530	13839	643	1874	820	3341

----- SUBJECT=14* FOOTWEAR (234) -----

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND, BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	.	.	.	.	.	.	.	.	.	.
1968	.	.	.	.	.	.	.	.	.	.
1969	8395	3508	4161	2072	2484	726	158	246	21	425
1970	9442	3662	4865	2087	2942	915	77	241	20	338
1971	11328	4553	5751	2517	3107	1024	113	319	30	462
1972	13804	5655	6837	2991	3583	1312	3	73	6	82
1973	15466	5438	8070	3397	3904	1958	44	373	72	489
1974	19889	7670	10328	4246	4322	1891	352	641	50	1043
1975	21728	9326	10510	5451	4134	1892	168	495	48	711
1976	21795	9541	10035	5756	4101	2319	204	350	20	573
1977	22536	9448	10695	5864	3999	2393	318	434	26	778
1978	24228	10241	11260	6044	3863	2727	388	496	36	922
1979	32819	15530	15115	6979	3819	2330	208	546	50	804
1980	40380	17135	19531	9363	4546	3714	1003	1252	34	2289
1981	57382	28919	24046	14039	5125	4417	472	2367	381	3217
1982	65764	32977	26499	17532	5349	6288	704	1911	169	2785

VALUES OF KEY VARIABLES (CURRENT PRICES): 33 SUBSECTORS AND TOTAL
IN THOUSANDS OF DOLLARS (LABOUR IN THOUSANDS)

----- SUBJECT=15* SAWMILLING, WOOD EXCL. FURNITURE (236) -----

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND, BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	7824	2885	4258	2006	4881	691	48	202	58	308
1968	7898	2786	4448	2086	4480	664	128	801	46	975
1969	8581	3339	4457	2401	4459	785	77	187	90	354
1970	10228	4173	5167	2701	4697	888	195	733	135	1063
1971	11657	4459	5955	3073	5264	1243	18	535	188	741
1972	12574	4406	6810	3204	5862	1358	122	392	115	629
1973	14625	5706	7630	3496	5258	1289	56	196	74	326
1974	17192	6727	8960	3827	4485	1505	348	997	212	1557
1975	15711	6051	7985	3868	4370	1675	243	860	266	1369
1976	17276	6682	8652	4027	4371	1942	125	196	100	423
1977	16221	6140	8183	4410	4234	1898	112	149	97	356
1978	17488	6688	8890	4620	4034	1910	22	55	30	108
1979	30085	12108	14511	7950	8300	3466	97	260	819	1178
1980	42100	19171	18386	11396	8678	4543	373	983	1094	2449
1981	51753	23099	22255	16402	8775	6399	960	1105	922	2989
1982	45546	19560	20605	16067	6433	5381	1337	633	265	2235

----- SUBJECT=16* FURNITURE, FIXTURES, EXCL. METAL (238) -----

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND, BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	6874	2843	3298	1688	2908	533	150	94	32	276
1968	7244	2902	3703	1929	3315	639	42	168	25	235
1969	8439	3216	4392	2166	3727	831	147	196	78	421
1970	10655	4095	5492	2728	4462	1068	982	384	46	1412
1971	12098	4515	6366	3285	5035	1217	431	348	61	840
1972	14021	5173	7319	3722	5045	1529	122	275	66	663
1973	16386	6671	8264	4261	5084	1451	0	161	52	213
1974	20211	7815	10472	4937	5355	1924	45	283	202	530
1975	19728	7334	10280	5442	5215	2114	36	333	150	519
1976	19008	6567	10346	5320	4733	2095	28	111	216	353
1977	18283	5328	9007	4694	4013	1950	50	98	-85	59
1978	18587	6178	10228	4956	3906	2181	-16	257	58	309
1979	23516	7592	13282	6202	4363	2642	1034	205	138	1374
1980	36899	13341	20130	8801	5094	3428	1170	475	712	2355
1981	51661	19219	27654	13170	5771	4788	785	917	1111	2815
1982	48418	14604	24261	12042	6491	9553	86	909	523	1517

VALUES OF KEY VARIABLES (CURRENT PRICES): 33 SUBSECTORS AND TOTAL
IN THOUSANDS OF DOLLARS (LABOUR IN THOUSANDS)

SUBJECT-17* PULP, PAPER AND PRODUCTS (239,240)

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND, BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	10249	4007	5662	2015	1835	580	20	539	40	599
1968	10978	4304	6058	2095	1811	616	-21	597	66	642
1969	12729	4936	7089	2290	1911	704	69	327	104	500
1970	14682	5724	8056	2493	1995	902	102	435	95	632
1971	16337	6222	9063	2863	2190	1052	130	958	80	1168
1972	18961	6628	11326	3194	2237	1027	154	327	193	674
1973	24041	8868	14105	3783	2368	1048	110	230	100	440
1974	32297	11912	18877	4863	2368	1508	378	903	51	1332
1975	39389	12820	24806	5737	2908	1763	822	1658	123	2603
1976	32118	10207	20274	5157	2290	1637	600	785	42	1425
1977	31215	10962	18286	5636	2100	1967	242	1504	118	1865
1978	35020	9576	22870	6087	2336	2574	572	466	136	1172
1979	35602	10417	23019	5628	2030	2166	621	1282	110	2012
1980	40770	7310	30558	8149	2469	2902	536	1983	497	3018
1981	66880	20801	40035	13002	3424	6044	205	3947	360	4512
1982	80485	23488	48843	17352	4077	8154	1796	4196	88	6083

SUBJECT-18* PRINTING, PUBLISHING, ETC. (242)

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND, BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	12293	6500	4415	5066	2924	1378	18	334	36	368
1968	13440	7015	4963	5650	3185	1462	149	488	35	672
1969	15482	8042	5621	6406	3382	1819	153	462	55	670
1970	18275	9015	6867	7119	3561	2393	162	356	104	624
1971	20040	10097	7394	7809	3358	2549	180	444	71	695
1972	22266	11492	8013	8752	3972	2761	402	740	119	1261
1973	25138	13514	8526	9949	4117	3098	35	320	60	415
1974	30714	16143	11168	11672	4300	3403	321	1006	209	1536
1975	33272	16847	11914	12299	4386	4511	728	1749	308	2785
1976	30890	17290	9910	11525	4248	3630	746	718	119	1561
1977	31766	16164	11202	13554	4230	4100	246	60	116	80
1978	33914	16728	12173	14828	4272	5013	149	940	124	1213
1979	45520	21562	17999	17.65	4677	5959	113	1100	189	1401
1980	59969	29084	22967	21630	5143	7918	395	3776	507	4678
1981	75334	37046	28120	24839	5040	10168	1380	5308	1163	7844
1982	83004	41454	30514	24965	5368	11036	3679	10895	666	15240

VALUES OF KEY VARIABLES (CURRENT PRICES): 33 SUBSECTORS AND TOTAL
IN THOUSANDS OF DOLLARS (LABOUR IN THOUSANDS)

SUBJECT-19* FERTILIZER, INSECTICIDES (244)

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND, BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	13760	2783.0	10407	1582	1042	570.0	4	42	8	54
1968	16600	4797.0	11260	1666	1082	543.0	2050	7108	82	9240
1969	22592	6738.0	15180	1825	1302	674.0	132	4443	66	4641
1970	26678	8627.0	16851	2512	1543	1200.0	493	954	86	1533
1971	27659	8677.8	19019	2701	1674	2.2	581	58	4	643
1972	32731	8619.0	21738	3267	1716	2374.0	329	6556	51	6936
1973	30531	6887.0	21593	3948	1781	2051.0	215	1034	157	1406
1974	45449	10115.0	32000	4466	1875	3334.0	122	966	333	1421
1975	51581	9870.0	37071	4866	1811	4640.0	208	918	696	1822
1976	49566	12651.0	32150	5352	1848	4765.0	157	593	124	873
1977	55531	15564.0	35786	6287	1973	4181.0	1289	803	155	2246
1978	62344	17652.0	40658	6855	2071	4034.0	266	813	170	1247
1979	62370	13812.0	44724	8088	2103	3834.0	1249	1037	189	2655
1980	88109	16411.0	66882	9622	2296	4816.0	980	1809	254	3043
1981	115462	22913.0	85848	12538	2496	6701.0	2608	2605	104	5517
1982	131945	20818.0	103593	15101	2564	7534.0	4764	887	29	6480

SUBJECT-20* PAINTS, VARNISHES, FILLERS (246)

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND, BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	3254	882	2128	498	438	244	44	14	24	82
1968	3682	1223	2423	555	493	236	112	32	10	154
1969	3750	995	2537	588	590	218	82	173	40	175
1970	4788	1451	2954	735	605	383	15	29	33	77
1971	5475	1768	3218	820	626	489	15	56	72	143
1972	6370	2245	3643	998	713	482	2	34	38	74
1973	7075	2526	4065	1075	690	484	18	34	33	85
1974	9141	2845	5879	1188	734	617	184	17	10	211
1975	9733	3443	5734	1238	616	556	112	63	26	201
1976	8390	3018	4973	1148	557	408	4	21	27	52
1977	8920	2892	5549	1253	479	479	28	10	79	117
1978	8295	3116	4712	1297	494	467	39	20	81	141
1979	10198	4031	5731	1525	488	436	8	35	49	92
1980	13304	4397	8161	2028	511	746	-86	268	116	288
1981	18322	6250	11063	2703	595	1009	152	250	129	531
1982	22276	10594	10471	3063	587	1211	96	336	77	508

VALUES OF KEY VARIABLES (CURRENT PRICES): 33 SUBSECTORS AND TOTAL
IN THOUSANDS OF DOLLARS (LABOUR IN THOUSANDS)

SUBJECT=21* SOAPS, DETERGENTS, TOILETRIES, PHARM. (247)

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND, BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	12332	4658	6213	2405	1732	1461	176	242	96	616
1968	13896	4955	7115	2705	1937	1828	379	400	-1	778
1969	14844	5255	7480	2871	2083	2109	344	283	126	753
1970	17606	7382	7947	3280	2276	2577	503	262	76	841
1971	20201	6473	10609	3715	2460	3119	190	245	78	513
1972	22370	8026	10939	4139	2546	3405	248	192	154	594
1973	25507	9433	12359	4765	2633	3715	156	271	149	576
1974	32997	11556	17397	5812	2816	4044	295	408	335	1038
1975	36865	14026	19737	6961	2961	5102	433	433	783	1712
1976	37988	12793	20479	7189	2668	4716	389	1257	361	2010
1977	38450	12971	19932	7812	2536	5547	400	487	209	1097
1978	40623	14054	20789	8369	2479	5780	124	424	475	1023
1979	47423	17526	23781	9158	2389	6116	463	581	213	1357
1980	67922	22386	32990	11065	2610	12546	192	1306	336	1824
1981	89265	32420	46088	14744	2948	10757	1272	2130	828	4232
1982	97056	37339	46619	18492	2992	13098	3843	4864	1459	10162

SUBJECT=22* MATCHES, INKS, GLUES, AND CHEM. N.E.C. (248)

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND, BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	2445	1234	906	565	547	305	32	64	30	126
1968	2652	1281	986	539	450	385	68	64	24	156
1969	2935	1332	1166	614	486	437	135	54	25	214
1970	3337	1466	1376	697	525	495	96	77	18	191
1971	3983	1818	1578	801	574	587	51	67	17	135
1972	4482	2034	1866	916	526	582	-9	21	31	43
1973	4958	2274	2069	989	587	615	-78	14	36	-28
1974	6219	2815	2680	1202	611	724	182	434	43	659
1975	7052	3074	3221	1465	703	757	567	324	66	957
1976	8784	3293	4407	2068	946	1094	271	202	41	514
1977	8608	3390	4179	2118	815	1039	164	98	50	311
1978	9903	4290	4630	2135	815	983	180	262	63	505
1979	12678	5162	6369	2438	813	1147	223	227	24	473
1980	15273	6120	7877	3138	855	1276	555	230	80	867
1981	20393	8960	9847	3837	864	1586	423	462	271	1157
1982	22491	9612	10904	4586	951	1975	537	937	105	1576

VALUES OF KEY VARIABLES (CURRENT PRICES): 33 SUBSECTORS AND TOTAL
IN THOUSANDS OF DOLLARS (LABOUR IN THOUSANDS)

SUBJECT=23* BASIC CHEMICALS, PETROLEUM PRODS. (243, 250, 25)

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND, BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	1818	542	822	874	504	454	36	140	36	212
1968	2060	659	791	711	485	410	41	132	5	178
1969	2713	1080	1100	869	569	533	12	114	59	185
1970	3331	1281	1429	989	623	621	89	203	87	374
1971	3497	1223	1538	1059	642	736	-68	110	110	53
1972	5032	1705	2427	1458	791	900	-17	260	11	345
1973	5747	1739	2976	1555	803	1032	330	312	24	882
1974	8484	3225	4047	2090	941	1212	124	455	166	745
1975	9870	3598	4955	2426	1023	1317	339	809	143	1291
1976	9042	2993	4905	2047	754	1144	51	671	114	836
1977	9230	3929	4039	2523	827	1262	118	254	81	454
1978	7872	3145	3244	2372	815	1483	312	280	58	660
1979	8725	3510	3866	2700	853	1349	341	304	64	709
1980	18218	6547	8712	3782	843	2699	329	4531	203	5062
1981	25048	9202	13790	4733	837	2056	309	1088	458	1853
1982	28408	5687	20122	5788	880	2589	720	764	367	1851

SUBJECT=24* RUBBER PRODUCTS (253)

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND, BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	8034	2750	2712	1248	964	572	186	126	40	352
1968	8714	3080	3030	1418	1013	604	121	339	16	476
1969	8198	3678	3705	1899	1230	815	342	345	33	720
1970	8986	3770	4148	1970	1311	1048	527	771	68	1366
1971	10241	4830	4182	2163	1376	1229	485	826	67	1348
1972	11954	5742	4979	2426	1454	1233	310	986	39	1375
1973	12921	6446	5370	2635	1539	1105	243	405	51	899
1974	17214	8933	8804	3131	1671	1477	361	448	68	877
1975	20752	8533	10582	3544	1824	1897	186	518	56	740
1976	19471	7714	9952	3844	1825	1805	83	566	191	839
1977	20862	8190	10991	4084	1855	1681	45	316	105	467
1978	21202	8260	10972	4573	1805	1970	70	364	74	507
1979	29363	11864	15257	5722	2125	2242	218	594	90	909
1980	37202	15746	18516	7256	2259	2938	117	1251	184	1530
1981	47196	18913	23267	9378	2377	5015	1070	2083	244	3398
1982	49162	17482	24040	11096	2283	7640	115	3338	324	3777

VALUES OF KEY VARIABLES (CURRENT PRICES): 33 SUBSECTORS AND TOTAL
IN THOUSANDS OF DOLLARS (LABOUR IN THOUSANDS)

SUBSECT=25* PLASTIC PRODUCTS(255)										
YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	3875	1385	2097	942	1053	393	22	96	19	137
1968	4745	1980	2377	1199	1313	388	8	198	22	228
1969	5388	2100	2777	1300	1372	511	5	253	43	301
1970	6155	2405	3174	1401	1429	576	94	260	44	398
1971	7859	3055	4115	1709	1557	729	387	1878	42	2287
1972	9703	3765	4964	2011	1849	974	103	838	26	967
1973	11986	5252	5753	2468	1838	981	27	681	113	821
1974	17444	7853	8179	2656	1894	1412	53	815	101	969
1975	16039	6755	7586	2929	1938	1698	190	845	59	1094
1976	18804	6497	8584	3249	1870	1723	219	833	104	1155
1977	16471	7105	7602	3435	1808	1764	56	528	31	514
1978	17021	7534	7680	3914	1945	1807	1413	1319	88	2819
1979	23939	9784	11886	4958	2041	2269	321	938	199	1458
1980	30344	12413	15324	6207	2206	2607	1625	1508	83	3214
1981	40005	17689	18835	8458	2460	3481	3068	3357	205	6632
1982	43908	19167	20365	10032	2688	4376	600	1532	266	2398

SUBSECT=26* STRUCTURAL CLAY PRODS. INCL. BRICKS(258)										
YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	2292	1362	664	694	1763	286	54	54	34	142
1968	3271	2043	831	995	2513	297	146	172	38	356
1969	3827	2362	1134	1154	2867	331	164	118	93	375
1970	4436	2677	1326	1300	3045	433	504	237	95	836
1971	5142	3133	1407	1502	3269	602	347	216	71	634
1972	6575	3843	1963	1829	3640	769	276	424	71	771
1973	6902	3997	2258	2160	3735	747	254	187	94	535
1974	7134	3768	2552	2254	3513	814	380	485	226	1061
1975	7163	3582	2876	2445	3351	705	293	178	82	553
1976	4853	2345	1898	1624	1941	610	83	36	28	145
1977	4198	1955	1671	1250	1442	572	30	21	15	65
1978	5049	2532	1801	1375	1714	716	39	82	147	268
1979	7051	3655	2655	1967	1630	711	29	179	219	696
1980	9130	4766	3517	3055	2075	847	402	27	229	858
1981	10768	5594	3948	3864	2054	1226	65	217	355	636
1982	10108	4960	4059	4334	1914	1089	157	132	489	777

VALUES OF KEY VARIABLES (CURRENT PRICES): 33 SUBSECTORS AND TOTAL
IN THOUSANDS OF DOLLARS (LABOUR IN THOUSANDS)

SUBSECT=27* GLASS, CEMENT ETC. (256,257,259,260)										
YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	9996	5159	4187	2412	2734	650	46	241	178	465
1968	12657	6791	5126	2671	3042	740	137	238	99	474
1969	14138	7932	6494	3157	3472	712	509	353	314	1176
1970	17236	9680	6675	3709	3096	881	387	527	98	1012
1971	20074	10899	8088	4300	4402	1087	303	427	293	1023
1972	23867	13525	9139	5071	4807	1203	527	2009	401	2937
1973	28837	15784	11622	5896	5289	1431	573	1919	73	2565
1974	34156	16855	15613	6324	5418	1688	390	709	470	1569
1975	37479	17044	18128	7577	5466	2307	678	1322	523	2523
1976	37862	17310	18087	8233	5642	2465	1701	15474	210	17386
1977	35867	17272	16261	8177	5256	2334	556	1130	209	1894
1978	32087	16067	13745	7940	4576	2275	66	1839	585	2490
1979	38744	19615	16906	8809	4591	2223	161	680	456	1301
1980	51833	26672	22072	11063	5035	3089	1444	3404	929	5778
1981	75820	39505	31991	16107	5723	4324	1456	2910	2483	6852
1982	84253	45210	33533	20277	5904	5510	1050	1778	1113	3939

SUBSECT=28* NON-FERROUS, IRON, STEEL (BASIC)(262,264)										
YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	25806	23033	1442	7172	6544	1331	429	1197	60	1687
1968	28797	970	18041	7898	7019	1055	399	1363	217	1979
1969	33657	13261	19330	8198	6633	1086	343	5882	178	6201
1970	48286	22124	24540	9663	7448	1622	157	1785	209	2151
1971	58304	29177	27552	11742	8425	1575	2162	4679	269	7110
1972	65136	28499	34592	14097	9311	2045	1382	3860	402	5644
1973	83304	38936	41663	17511	10725	2705	3616	34912	1892	40420
1974	114956	55769	54284	22632	13043	4923	5096	35986	368	41450
1975	148983	65805	76967	28046	14744	6191	8724	35661	800	45185
1976	156820	68987	80177	32874	15188	7656	7403	6482	562	14447
1977	142429	51528	83701	32127	13954	7200	11680	8693	743	21115
1978	165493	82116	75959	34221	13072	7416	4032	2317	271	6624
1979	217481	103860	105135	39982	13807	8486	-732	3337	97	2688
1980	278421	113163	148820	52378	14960	16638	4479	7354	1049	12885
1981	265015	93908	151880	60776	15473	19227	9693	10639	541	20872
1982	248536	72487	159270	68586	15495	16763	3820	4105	849	8776

VALUES OF KEY VARIABLES (CURRENT PRICES): 33 SUBSECTORS AND TOTAL
IN THOUSANDS OF DOLLARS (LABOUR IN THOUSANDS)

SUBSECT-29* METAL PRODUCTS, MACHINERY (268)

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND, BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	29944	11676	16129	8042	8209	2139	442	834	173	1449
1968	34610	14546	17513	10055	9674	2551	338	1383	231	1952
1969	45639	18296	24232	11929	11464	3111	876	1541	312	2729
1970	59824	23077	32777	13997	12831	3970	830	1504	654	2988
1971	73964	30816	37790	18019	15053	5358	1344	3040	497	4881
1972	84134	33087	44053	21480	16945	6994	1105	2466	599	4270
1973	95989	40279	47795	24109	18544	7915	1804	2766	420	4950
1974	124738	49287	65105	30227	20963	10346	1658	4471	828	6957
1975	130586	53364	65248	34528	21000	11974	2929	4403	808	8136
1976	124775	50942	61846	34707	18907	11987	1596	3962	426	5990
1977	115933	46913	57568	32979	17390	11452	1163	2754	659	4586
1978	125111	51918	60778	33922	16754	12415	-44	3339	638	3944
1979	151120	63885	74234	38246	17477	13001	885	3684	865	5441
1980	203218	87944	95556	58006	20026	19718	2299	8330	1504	12131
1981	282276	120185	138429	71453	21567	23662	3900	10091	3201	17187
1982	302108	127556	144243	80951	21444	30309	6157	10711	2427	19293

SUBSECT-30* ELECTRICAL MACHINERY/EQUIPMENT (279, 279)

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND, BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	15579	5216	9683	2394	2805	680	242	237	38	517
1968	13592	4694	7972	2090	2974	726	181	213	47	441
1969	16134	6009	9288	2979	3795	837	153	163	72	388
1970	19888	7118	11744	3521	3499	1026	198	350	26	574
1971	21731	7744	12695	4141	3998	1292	316	379	83	778
1972	23292	8523	13331	4630	3928	1438	110	396	62	568
1973	27922	10418	16257	5450	4476	1747	235	580	70	885
1974	39582	11832	26006	6779	5043	1744	270	821	145	1236
1975	38214	13080	23040	7324	5138	2094	487	625	197	1206
1976	34740	12791	19375	7647	4496	2574	233	984	137	1356
1977	36685	13232	20286	9051	4646	3167	382	840	148	1370
1978	38333	13472	21633	9225	4386	3228	120	672	127	914
1979	43488	14511	18208	4500	4208	3590	220	861	143	1227
1980	58852	22469	32131	12690	5280	4252	1071	1264	308	2639
1981	75270	29678	39976	16231	5311	5616	390	3316	396	4099
1982	38493	36070	44676	19730	5298	7747	759	1718	686	3167

VALUES OF KEY VARIABLES (CURRENT PRICES): 33 SUBSECTORS AND TOTAL
IN THOUSANDS OF DOLLARS (LABOUR IN THOUSANDS)

SUBSECT-31* MOTOR VEHICLES (283)

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND, BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	5364	720	4306	1918	1318	-338	44	156	-8	192
1968	5311	1920	2997	1817	1401	394	110	134	33	277
1969	12347	3942	7638	2540	1966	767	98	184	34	316
1970	13061	3939	8330	2883	2168	792	247	200	21	468
1971	16994	5658	10447	3438	2565	889	105	200	34	339
1972	18794	6611	11167	4048	2773	1016	353	343	97	793
1973	17293	6008	10280	4229	2770	1005	258	168	69	365
1974	19820	7681	11046	4725	2942	1093	340	547	66	953
1975	27904	8141	17370	6465	3548	1893	578	365	59	1002
1976	25560	10476	13540	6774	3268	1544	143	151	14	308
1977	24159	9479	13300	6544	2916	1380	61	345	41	449
1978	23356	9335	11927	6368	2732	1494	119	812	101	1043
1979	26962	11379	13804	7475	2764	1779	233	622	162	1006
1980	39587	15092	22364	9711	3249	2131	540	1237	141	1919
1981	59942	23733	32976	12694	3820	3233	1301	1724	204	3229
1982	73707	25394	44394	16408	4114	3919	1367	2628	253	4248

SUBSECT-32* OTHER VEHICLES ETC. (282, 284, 285, 286)

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND, BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	4252	1700	2259	1295	1168	293	17	72	12	131
1968	5276	1766	3097	1312	1335	413	104	107	17	228
1969	5980	2142	3437	2183	1133	401	13	121	114	248
1970	5886	2245	3227	1708	1129	414	26	164	335	525
1971	8630	3223	4915	2136	1411	492	172	247	108	527
1972	11186	3953	6527	2925	1958	706	362	285	99	746
1973	15586	5225	11384	3513	2146	147	0	13	167	1043
1974	20501	5451	14101	4104	2176	949	1012	291	81	1384
1975	17851	7086	9664	4494	2112	901	215	486	94	715
1976	15724	6176	8423	4404	1600	1125	151	292	129	572
1977	18915	5670	11732	4103	1551	1513	309	467	51	828
1978	16394	4895	9811	4238	1522	1688	179	309	7	493
1979	17820	7296	8974	5434	1965	1248	206	206	217	440
1980	13597	4813	7828	3360	1046	1058	272	206	27	359
1981	13781	4809	7832	3050	1267	1340	1565	246	62	1873
1982	20129	5562	12953	3971	1131	1614	197	546	177	922

VALUES OF KEY VARIABLES (CURRENT PRICES): 33 SUBSECTORS AND TOTAL
IN THOUSANDS OF DOLLARS (LABOUR IN THOUSANDS)

SUBSECT-33* OTHER MANUFACTURING (231, 290, 291)

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND, BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	3727	1469	1733	1071	1213	525	87	114	13	214
1968	4392	1847	1940	1229	1553	605	72	56	32	160
1969	5075	2125	2181	1458	1891	769	-12	114	27	129
1970	5895	2421	2595	1668	2028	879	130	191	30	241
1971	6819	2839	3047	1970	2160	933	132	167	14	213
1972	8437	3427	3753	2433	2568	1257	16	149	44	209
1973	10102	4450	4238	2871	2320	1414	473	184	61	698
1974	12142	4762	5620	3075	2581	1760	235	291	78	604
1975	12870	5829	5311	3513	2580	1680	387	214	87	688
1976	12829	5719	5329	3424	2455	1781	217	223	49	482
1977	14218	5967	6343	3852	2815	1908	125	246	57	567
1978	16532	6600	7963	4274	1969	2724	68	246	40	383
1979	21020	8012	10450	4831	2840	2558	84	896	130	1110
1980	29177	11422	14662	6650	3194	3093	161	1489	174	1824
1981	39668	14721	20971	8986	3193	4176	151	1427	253	1835
1982	37195	14549	18307	9966	3411	4339	5	1378	303	1685

SUBSECT-34* TOTAL MANUFACTURING

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND, BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	339532	123446	191323	66443	73556	24763	4410	8591	1530	14532
1968	379057	125803	226292	73361	79262	27862	6719	16654	1674	25047
1969	488125	162442	290802	93135	100029	34881	9547	20519	2943	33009
1970	579125	199211	349271	108128	108199	41164	10580	15788	3884	30255
1971	669462	234794	388524	124285	121334	46044	12755	21899	3777	38421
1972	768875	262961	440881	142105	131522	56033	10535	27225	4397	42257
1973	900245	308907	529766	162778	137859	61572	15060	51874	6023	72927
1974	1121064	377355	664306	193088	148012	79403	29536	66077	6630	102243
1975	1233470	413189	726864	223242	152014	93417	42044	76254	8482	126696
1976	1280760	418866	758011	23176	146629	98203	24422	49003	6023	79360
1977	1290354	416066	774580	247813	141233	97510	12795	27325	5536	57370
1978	1389659	469359	805083	262515	137814	115217	13442	28029	6837	45305
1979	1682510	579893	977624	319017	147423	124993	10444	32285	7757	50665
1980	2161839	730385	1250285	397814	160747	171169	3707	74095	15808	123595
1981	2121504	943911	1557759	525699	172942	219834	59262	121987	23962	205201
1982	3049006	986763	1400289	620306	176221	262155	48379	96139	23600	168442

ANNEX H

SUB-SECTORAL DATA

ANNUAL GROWTH RATES OF KEY VARIABLES

SOURCE: ANNEX G

NOTES:

- 1. GROSS OUTPUT AND PURCHASES EXCLUDE GOODS PURCHASED FOR RESALE.*
- 2. THE TOTALS FOR MANUFACTURING AS A WHOLE HAVE BEEN RE-CALCULATED AND MAY DIFFER FROM THE CENSUS TOTALS.*
- 3. VALUE ADDED IS THE DIFFERENCE BETWEEN GROSS OUTPUT AND THE SUM OF PURCHASES AND SERVICE INPUTS.*
- 4. LABOUR IN THOUSANDS.*
- 5. TOTAL MANUFACTURING EXCLUDES SUB-SECTORS 13 AND 14 (CLOTHING AND FOOTWEAR) IN THE YEARS 1967 AND 1968.*

SHARES OF KEY VARIABLES (CURRENT PRICES) OF SUBSECTORS IN TOTAL MANUFACTURING IN PERCENT

SUBJECT-1* SLAUGHTERING, PROCESSING OF MEAT(201)

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	8.04755	9.9587	13.1756	2.98903	3.15814	2.45528	6.8934	4.00419	1.4379	4.61051
1968	8.19382	10.1710	11.8016	2.92335	3.26386	2.27550	5.7598	0.86465	2.6882	2.29968
1969	6.86320	8.5219	9.9030	2.31385	2.49552	1.88641	13.5959	3.89883	1.9028	6.52549
1970	6.76195	8.2900	10.0691	2.44987	2.64882	1.97746	12.1645	7.62605	1.6220	8.44158
1971	7.08392	8.6708	10.8885	2.53852	2.92816	2.12228	6.7581	3.17968	2.9918	4.34918
1972	8.15334	10.1334	12.4913	2.55515	2.82538	2.18264	13.0138	1.51876	3.5024	4.59096
1973	8.88325	10.9974	13.5807	2.49972	2.65779	2.55148	26.7397	0.83086	4.9311	6.51754
1974	6.84100	8.2445	10.1732	2.32363	2.68086	2.82609	27.1339	0.69767	1.8854	8.42894
1975	6.45415	7.8339	9.8999	2.40412	2.62739	2.59161	20.5880	2.93362	1.5562	8.70193
1976	7.81792	9.5689	11.1443	2.81854	3.18286	3.27994	3.3494	2.64882	10.1943	3.43876
1977	9.03713	11.1457	12.7652	3.11364	3.68752	3.82356	0.9048	1.20353	5.3829	1.49556
1978	8.39256	10.1853	11.9434	3.36855	4.21292	4.09315	0.4910	1.07258	3.3922	1.20296
1979	7.54938	9.0547	12.7817	3.09639	3.94375	3.99862	5.4864	1.17392	5.1566	2.67048
1980	5.81827	6.5939	8.4909	3.03584	3.57269	2.54076	2.0263	0.69367	1.5625	1.18914
1981	5.17449	6.1096	7.3912	2.91650	2.98829	2.16936	1.8106	0.74024	2.4414	1.24756
1982	6.99989	8.5341	9.7082	3.28209	3.31625	3.12211	2.1402	1.68675	2.9449	1.98882

SUBJECT-2* CANNING, PRESERVING, FRUIT, VEGETABLES (203)

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	0.484490	0.494914	0.534175	0.430444	0.746370	0.524977	0.816327	0.651845	0.392157	0.674374
1968	0.392760	0.391710	0.427766	0.329379	0.707779	0.384036	0.476261	0.198451	0.657109	0.203630
1969	0.325941	0.322680	0.381703	0.333924	0.583831	0.338293	0.209490	0.501974	0.397899	0.402920
1970	0.295312	0.291804	0.334103	0.292100	0.549913	0.340103	0.189036	0.576387	0.231720	0.396629
1971	0.362546	0.312962	0.394499	0.498009	0.881668	0.534269	0.407683	0.169035	0.291236	0.260274
1972	0.333214	0.337809	0.326086	0.303297	0.524627	0.362287	0.142383	0.120769	0.295656	0.144355
1973	0.333354	0.326234	0.404518	0.299795	0.669525	0.500227	0.026560	0.023133	0.000000	0.021931
1974	0.284987	0.284241	0.342657	0.290026	0.772910	0.280846	0.111728	0.115017	0.859729	0.162358
1975	0.302966	0.297880	0.356600	0.313561	0.605207	0.327564	0.192655	0.114092	0.023579	0.134179
1976	0.281173	0.276500	0.293647	0.276427	0.738599	0.337057	0.085988	0.085709	0.498091	0.115927
1977	0.280543	0.291581	0.309716	0.263505	0.688224	0.218546	0.095476	0.238023	0.668353	0.224856
1978	0.241282	0.243298	0.295373	0.248748	0.574688	0.206567	0.476120	0.226818	0.822340	0.377442
1979	0.238453	0.237949	0.268304	0.219738	0.477537	0.291216	0.000000	0.275670	0.541446	0.258561
1980	0.191319	0.192171	0.222331	0.189284	0.459107	0.188118	0.002967	0.062079	0.075911	0.039446
1981	0.195958	0.201926	0.233220	0.184706	0.375849	0.169219	0.033748	0.160673	0.367248	0.148147
1982	0.073237	0.064856	0.071822	0.080928	0.166834	0.124259	0.607334	0.062280	0.322034	0.254687

SHARES OF KEY VARIABLES (CURRENT PRICES) OF SUBSECTORS IN TOTAL MANUFACTURING IN PERCENT

SUBJECT-3* GRAIN MILL PRODUCTS, ANIMAL FEEDS(205)

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	5.35531	5.9515	7.3290	2.95441	2.92022	5.81917	0.7937	0.6518	1.2418	0.7570
1968	6.28203	7.1064	8.3441	3.03022	2.94214	6.59680	0.0149	0.3363	1.7921	0.3473
1969	4.88338	5.3867	6.5639	2.53073	2.50927	5.96887	0.0628	0.5020	0.6456	0.3878
1970	5.78638	6.7432	8.0677	2.60817	2.63311	4.02293	-0.1607	0.3547	-0.1802	0.1058
1971	4.91267	5.5964	6.7268	2.45886	2.52530	4.12430	0.5802	0.3655	2.4887	0.6455
1972	4.22110	4.6913	5.6370	2.34897	2.43761	4.17968	1.2435	0.1537	4.0255	0.8283
1973	4.68173	5.2226	6.2154	2.50648	2.62297	4.49555	2.0053	0.6381	4.7485	1.2586
1974	4.02805	4.5232	5.3438	2.32642	2.57952	2.87395	1.8317	1.5981	6.8627	2.0070
1975	4.52861	5.1513	6.0483	2.41621	2.92539	3.46511	0.6993	1.0950	5.3879	1.2518
1976	4.77726	5.3659	6.5628	2.56021	2.69183	4.54976	4.8071	2.6284	5.5952	3.2622
1977	5.43394	6.2138	6.9865	2.74199	2.99717	4.75088	1.7368	5.3304	8.4718	4.2583
1978	5.82028	6.6549	7.8037	2.97393	3.25076	4.97496	6.3979	6.6162	8.4975	6.7917
1979	6.20008	7.2533	8.1563	3.25406	3.20439	3.28338	10.2260	12.7768	9.2948	11.6728
1980	6.73861	7.8662	8.9611	3.73441	3.15776	3.22722	5.6635	4.3887	7.6923	5.1596
1981	7.75766	8.9691	10.4198	4.03101	3.31614	5.78073	13.1973	5.2473	8.3299	7.9025
1982	8.92734	10.5992	11.9214	4.26048	3.59715	6.15654	9.1724	7.0761	11.3220	8.2568

SUBJECT-4* BAKERY PRODUCTS(206)

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	3.82283	3.84817	4.50652	2.94087	3.99560	3.19024	1.40590	2.49098	9.8039	2.93146
1968	3.56303	3.73977	4.17116	2.98115	3.91739	3.32711	0.77392	0.50438	8.0645	1.08197
1969	3.00476	3.09295	3.45046	2.63918	3.33603	3.07044	4.68210	1.66675	4.2474	2.76894
1970	2.86019	2.93905	3.35088	2.51960	3.21445	2.91760	0.18904	3.07829	15.3450	3.64237
1971	2.74830	2.87115	3.21930	2.30036	2.96531	2.62574	0.76049	1.83654	7.0162	1.98850
1972	2.56205	2.68039	3.03480	2.21315	2.88621	2.24154	2.51542	1.09790	6.8456	2.04936
1973	2.32970	2.39135	2.70553	2.14710	2.62608	2.13571	0.26560	0.28723	1.8595	0.41257
1974	2.20540	2.34930	2.57989	2.07213	2.74505	2.06038	0.97508	0.63260	3.8462	0.93992
1975	2.20735	2.29491	2.65387	1.99918	2.59779	1.84549	0.44239	0.51538	4.3386	0.74746
1976	2.27830	2.2634	2.89743	1.91143	2.61203	1.75962	0.08189	0.69792	2.2580	0.62752
1977	2.45452	2.66507	2.89286	1.92443	2.60350	1.78145	0.08184	0.72748	5.5636	0.94474
1978	2.51623	2.78759	3.11471	1.89627	2.62528	1.72110	0.80345	1.56851	7.1612	2.05938
1979	2.41259	2.64368	2.88393	1.81307	2.50184	1.65289	-0.22022	4.5232	2.7975	3.27050
1980	2.31743	2.50343	2.70336	1.84991	2.56055	1.44068	1.88982	2.00003	15.0998	3.64335
1981	2.45441	2.69660	2.95893	1.96843	2.86223	1.43972	0.19743	2.27155	4.0356	1.87886
1982	2.50970	2.86256	3.00952	2.05076	2.78057	1.72705	0.14143	1.18747	2.7373	1.10246

SHARES OF KEY VARIABLES (CURRENT PRICES) OF SUBSECTORS IN TOTAL MANUFACTURING IN PERCENT

SUBJECT-5* CHOCOLATE AND SUGAR CONFECTIONERY(208)										
YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	0.599649	0.637871	0.643937	0.517737	0.788515	0.436135	0.95238	0.62856	-0.65359	0.59180
1968	0.815070	0.856540	0.643858	0.531818	0.774646	0.419927	0.04465	0.72055	0.47790	0.52302
1969	0.538796	0.564829	0.563270	0.443442	0.670805	0.524641	0.05237	0.56046	0.71356	0.42716
1970	0.539726	0.567734	0.564601	0.439092	0.707031	0.507725	0.71834	1.76716	0.59217	1.24938
1971	0.568243	0.588656	0.562026	0.472302	0.720689	0.605940	0.31360	0.63959	0.37066	0.50493
1972	0.540400	0.557700	0.526806	0.446853	0.723833	0.601431	0.37969	0.51235	0.31840	0.45910
1973	0.507195	0.516648	0.529102	0.464436	0.713047	0.516429	0.37849	0.37398	0.14943	0.35637
1974	0.531281	0.557523	0.547037	0.466114	0.716834	0.409304	0.23700	0.23457	0.67873	0.26400
1975	0.488054	0.507084	0.504634	0.444361	0.722302	0.405708	0.22120	0.34883	0.44801	0.31335
1976	0.483069	0.500809	0.479557	0.446406	0.666989	0.403246	0.21702	0.37957	0.58111	0.34148
1977	0.451891	0.462032	0.451470	0.429358	0.610339	0.412030	0.03183	0.74089	0.48772	0.45146
1978	0.473210	0.495688	0.489763	0.425499	0.657408	0.384492	0.00000	0.54975	0.47970	0.37965
1979	0.427397	0.447154	0.446798	0.365811	0.590817	0.368822	1.13941	0.41815	0.32229	0.54673
1980	0.501934	0.531184	0.514328	0.432363	0.607787	0.391426	0.17800	0.69772	0.53770	0.53562
1981	0.563916	0.602337	0.532945	0.459008	0.622174	0.469445	0.58722	1.21242	0.83465	0.98781
1982	0.627713	0.729431	0.586462	0.457032	0.624777	0.191344	0.32863	0.83974	0.73729	0.67798

SUBJECT-6* DAIRY AND OTHER N.E.C.(202,204,207,209)										
YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	8.66310	9.82177	11.2752	5.14576	5.32519	6.48144	14.2404	9.0676	6.1438	10.3289
1968	8.10118	9.12447	10.1285	5.08445	5.08314	5.80719	7.1142	2.5579	5.8542	4.0005
1969	8.70361	7.43747	8.1561	4.30450	4.28876	5.53310	13.9835	6.1650	3.4319	6.1826
1970	6.30109	6.92205	7.7503	4.09034	4.17472	5.53882	1.8715	2.6919	6.4882	2.8921
1971	3.10876	6.73949	7.6023	3.92163	3.89569	5.17546	8.6476	6.9624	19.6452	8.7686
1972	5.75191	6.31587	6.8774	3.70853	3.73854	5.18980	10.5553	6.1885	4.121	7.023
1973	5.82175	6.39759	7.1163	3.39536	3.94026	5.21991	6.5007	2.7837	9.2977	4.0887
1974	5.69611	6.20782	7.0635	3.78536	3.85374	4.87387	5.0955	5.2575	4.2534	5.1456
1975	6.01944	6.54911	7.1773	4.12288	4.29631	5.35342	3.3203	2.9612	9.3728	3.5116
1976	6.81151	7.60183	8.2992	4.44344	4.38385	5.03345	6.0519	4.0834	11.3897	5.2457
1977	6.90128	7.65525	8.0538	4.80968	4.95635	4.97143	4.5510	5.9171	7.2977	5.5238
1978	7.14557	7.95957	8.6447	5.00695	5.04521	4.86907	10.8838	11.0910	3.1891	10.6500
1979	7.26853	7.96383	8.2929	5.26367	4.71229	5.49631	7.4876	5.1820	8.3924	6.1285
1980	7.04997	7.76344	8.5494	4.64338	4.55436	5.81764	3.2337	4.1269	7.8833	4.3780
1981	6.00205	6.67054	7.4140	4.21629	4.41940	4.26367	1.8207	6.0859	3.3428	4.5346
1982	6.62557	7.44531	7.4724	4.51438	4.45799	4.84839	6.0629	2.7663	6.7881	4.2632

SHARES OF KEY VARIABLES (CURRENT PRICES) OF SUBSECTORS IN TOTAL MANUFACTURING IN PERCENT

SUBJECT-7* BEER,WINE AND SPIRITS(211,212,213)										
YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	4.74477	4.56497	2.61756	3.73252	3.54560	9.2638	4.17234	3.21266	6.79739	3.88109
1968	4.56367	4.14445	2.33769	4.09482	3.64866	9.9921	7.70948	3.96301	6.03345	5.10640
1969	4.00328	3.72471	2.13685	3.64525	3.14110	7.8352	3.60323	3.26039	9.17431	3.88682
1970	3.88457	3.61930	1.85533	3.53158	3.15252	7.5551	5.77505	5.61819	5.27806	5.62882
1971	3.78395	3.68641	2.03786	3.37772	3.00329	5.9378	5.93493	3.52232	2.17104	4.19042
1972	3.63050	3.62461	1.97674	3.12867	3.13256	4.9631	6.00854	4.88198	7.02752	5.38609
1973	3.41996	3.29001	1.87422	3.23201	2.96680	5.3433	4.25631	1.07376	3.35381	1.91894
1974	3.17047	2.83805	1.71397	3.28403	3.13015	6.4469	8.34913	1.51339	7.37557	3.86824
1975	3.22116	2.85130	1.87834	3.31181	3.15669	5.8866	6.4325	5.16301	8.31172	5.80208
1976	3.39102	3.00817	2.04581	3.67559	3.21082	6.3399	6.50643	3.19980	7.03968	4.50983
1977	3.61722	3.22468	2.23889	3.86420	3.37173	6.7138	5.88316	3.29880	8.21893	4.75510
1978	4.08676	3.8541	2.40335	4.17500	3.47280	10.9237	9.62654	6.40858	4.86551	7.16477
1979	3.35489	2.68325	2.22171	3.35970	2.63480	9.9950	6.61624	8.20815	5.36290	7.41932
1980	3.20602	2.64123	2.08816	3.32467	2.55992	8.1861	5.61011	4.60195	1.66371	4.50180
1981	3.20091	2.63430	2.42310	3.42021	2.53438	7.7895	3.90132	7.60327	8.94333	6.89100
1982	3.63981	3.02846	2.78633	3.62934	2.85547	8.7126	1.74712	5.88650	7.52542	4.92039

SUBJECT-8* SOFT DRINKS AND CARBONATED WATERS(214)										
YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	1.57040	1.43763	1.37882	1.53816	1.41661	2.98833	1.95011	1.30369	3.68013	1.74787
1968	1.55991	1.45623	1.25457	1.50898	1.32472	2.73132	0.41673	0.60646	5.25687	0.86637
1969	1.28348	1.22435	1.03472	1.33677	1.15666	1.75167	0.51325	0.69204	5.57255	1.07546
1970	1.23979	1.14781	1.15577	1.41150	1.17191	1.78639	1.02079	1.26845	2.11123	1.30557
1971	1.20147	1.07553	1.10347	1.33805	1.17803	2.19789	0.42336	1.11928	2.11808	0.98644
1972	1.31088	1.25277	1.23477	1.34478	1.22793	1.81679	1.25297	1.49680	2.63816	1.55477
1973	1.19379	1.11689	1.06047	1.36013	1.29117	1.59813	0.39841	0.35278	5.11373	0.75524
1974	1.20818	1.09819	0.99909	1.28010	1.25733	2.15609	1.17484	0.88230	4.07240	1.17367
1975	1.27008	1.17825	1.08845	1.40585	1.31106	1.86690	3.50109	0.10885	5.64725	1.60542
1976	1.34203	1.23139	1.15728	1.40654	1.51607	2.23720	1.85079	1.62847	5.14694	1.96899
1977	1.36203	1.16675	1.12564	1.67263	1.57824	2.43609	0.85019	0.26484	6.32225	1.07547
1978	1.40610	1.27312	1.19714	1.52839	1.52307	2.30001	0.29014	2.82177	2.10201	1.98654
1979	1.30264	1.10860	1.00243	1.59991	1.56895	2.46654	3.20758	1.28852	1.81771	1.75861
1980	1.37156	1.24205	1.20735	1.51201	1.35119	2.25041	1.86905	3.11745	2.38244	2.87972
1981	1.24802	1.10027	0.96095	1.38711	1.39584	2.24351	0.50791	0.81566	3.81347	1.07651
1982	1.50600	1.44243	1.24113	1.49023	1.40107	2.08619	0.65725	1.21342	4.02119	1.44382

SHARES OF KEY VARIABLES (CURRENT PRICES) OF SUBSECTORS IN TOTAL MANUFACTURING IN PERCENT

----- SUBJECT-9* TOBACCO (221,222) -----

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	4.12745	3.26748	2.71374	5.71919	5.47610	8.48039	1.40590	-1.7227	3.66013	-0.20644
1968	3.47881	2.71226	2.25196	4.62644	4.14322	8.12576	1.20554	0.0661	4.65950	0.67872
1969	3.09921	2.49369	1.87241	4.28732	3.80290	6.17815	3.90699	0.3558	3.57554	1.70560
1970	2.68128	1.88053	1.66663	4.15442	3.69504	5.89593	2.22117	0.3927	5.02060	1.62618
1971	2.48300	1.93930	1.49488	4.02703	3.91055	5.29274	2.69698	1.0919	3.70665	1.88178
1972	2.24354	1.70884	1.38926	3.60086	3.49751	4.24750	1.71808	0.7356	3.59336	1.27789
1973	2.00756	1.48085	1.27830	3.44580	3.42524	3.98770	0.05976	0.3894	2.05877	0.45917
1974	2.06427	1.61188	1.34080	3.27626	3.42675	4.23410	1.33735	2.0310	3.99698	1.95808
1975	2.19778	1.80986	1.47964	3.21848	3.26220	3.56573	0.48045	1.3285	1.36760	1.05055
1976	2.31715	1.99348	1.78173	3.33690	3.83348	5.92455	7.44820	1.0326	1.49427	3.04561
1977	2.34440	2.03088	1.51385	3.35697	3.75408	2.79198	0.98204	0.8180	1.28251	0.93254
1978	2.50731	2.18860	1.65598	3.53959	3.82472	6.85356	2.45499	1.3532	1.55902	1.70842
1979	2.64183	1.67154	1.60113	6.21064	3.53947	3.14738	0.99579	2.3602	3.7856	2.28165
1980	2.42421	1.99101	1.36382	3.77186	3.80536	3.55321	8.94176	1.5520	3.99798	3.88042
1981	2.26184	1.77563	0.67700	3.21876	3.04090	4.34373	3.15885	-0.8116	3.35114	0.82066
1982	2.39209	2.03933	1.16404	3.16167	3.23738	3.48515	1.00668	2.5504	9.58898	3.09008

----- SUBJECT-10* COTTON (INCL. TEXTILES, CARPETS) (223,225) -----

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	8.4263	9.5379	9.9988	5.82153	8.57170	4.26847	17.9592	20.2305	6.40523	18.0842
1968	9.0976	10.2639	10.3322	5.96093	8.51354	5.68875	7.1290	4.5334	1.67264	5.0385
1969	9.8823	11.5310	12.8108	5.21394	7.37786	5.32668	15.4289	5.7508	1.83486	8.2008
1970	7.8464	8.8643	9.5236	5.27476	6.94461	3.88446	14.2060	9.0068	1.08136	9.8066
1971	8.5798	9.8665	10.7397	4.97807	6.91301	4.35451	4.8530	7.2959	1.48266	5.9134
1972	9.2940	10.3167	11.4139	4.85416	7.34898	5.04346	1.8984	4.5672	1.27360	3.5592
1973	9.4018	10.9570	11.6163	4.78074	6.95638	4.54590	0.8300	4.8946	1.75992	3.7968
1974	10.3183	12.0205	12.9127	4.87607	7.17172	5.36126	7.4892	6.9343	2.06637	6.7789
1975	9.1323	10.6339	11.3961	4.83198	7.06974	4.67153	8.6552	13.8799	1.27320	11.3113
1976	9.9301	11.5455	12.2807	5.26978	7.23459	5.86031	7.2230	12.8870	2.40744	10.3604
1977	10.1920	11.8931	12.2184	5.46299	7.71491	5.86266	3.6054	11.1569	1.10188	7.2913
1978	10.1277	11.6614	12.2684	5.8468	7.95972	6.8444	7.3947	6.3584	2.19291	6.4121
1979	10.0116	11.3571	11.5809	5.49720	7.96551	7.80604	6.2620	5.4638	2.57832	5.1653
1980	9.8157	11.1190	10.8856	6.06087	7.77744	6.41354	10.7633	17.5063	2.67586	13.7732
1981	9.5094	10.7038	10.4483	6.25092	8.71795	6.56677	13.3593	25.8167	2.63334	19.5131
1982	8.2314	9.2181	9.4617	6.08297	8.79681	5.16438	9.2182	17.4052	2.93220	13.3767

SHARES OF KEY VARIABLES (CURRENT PRICES) OF SUBSECTORS IN TOTAL MANUFACTURING IN PERCENT

----- SUBJECT-11* KNITTED PRODUCTS, ROPE, CORDAGE (224) -----

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	1.65463	1.59911	1.78024	1.87529	2.98820	1.61935	1.08844	2.91002	0.78431	2.13322
1968	1.74809	1.56350	1.71504	2.28732	3.35091	2.17501	1.11624	1.26096	0.23895	1.15383
1969	1.48446	1.33015	1.41883	1.91335	2.86417	1.93228	0.86938	0.77002	0.57764	0.78161
1970	1.67876	1.57667	1.64275	2.02303	2.93533	1.85356	2.46692	3.21763	0.56643	2.61444
1971	1.62078	1.52674	1.54403	1.91898	2.72921	1.83519	1.60721	1.59898	0.29124	1.47315
1972	1.61938	1.52937	1.42015	1.90000	2.76912	1.83463	1.88894	1.25160	0.61406	1.34416
1973	1.51225	1.42182	1.29944	1.76805	2.66794	1.87260	0.34529	0.78917	0.16603	0.63188
1974	1.52882	1.50770	1.40056	1.64693	2.51939	1.46720	0.69745	1.51036	0.19608	1.19030
1975	1.35520	1.29252	1.20944	1.58169	2.30637	1.42908	0.78727	0.45702	0.16506	0.57145
1976	1.39956	1.32892	1.31083	1.64846	2.54997	1.46839	1.55597	0.49111	0.18263	0.79637
1977	1.26353	1.10831	1.03785	1.76827	2.51004	1.47669	1.63219	2.24949	0.41546	1.83371
1978	1.15043	0.99286	1.06598	1.88828	2.29367	1.30883	0.19342	0.58053	1.09645	0.52974
1979	1.16053	1.03036	1.05214	1.57170	2.21065	1.40088	0.10532	0.91374	0.14181	0.62785
1980	1.24584	1.16081	1.06508	1.59823	2.40378	1.21809	1.49821	0.95818	0.29099	1.02027
1981	1.43637	1.34941	1.18247	1.75424	2.51182	1.45792	2.08903	1.91086	0.55922	1.80408
1982	1.25900	1.08441	0.95107	1.76236	2.44576	1.51055	0.11855	0.97365	0.29237	0.63048

----- SUBJECT-12* OTHER TEXTILE PRODUCTS (226) -----

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	0.420579	0.459879	0.496542	0.285959	0.458154	0.387675	0.09070	0.72169	0.13072	0.46793
1968	0.288980	0.291676	0.292542	0.297161	0.415079	0.240471	0.31255	0.36628	0.23895	0.34335
1969	0.311601	0.327123	0.336909	0.278091	0.386888	0.240819	0.00000	0.05848	0.10194	0.04544
1970	0.310425	0.317716	0.346344	0.290216	0.401113	0.286658	0.01890	0.16468	0.07724	0.11238
1971	0.331326	0.341413	0.364648	0.295289	0.423498	0.319258	0.65857	0.79949	0.18533	0.69233
1972	0.302130	0.305920	0.328754	0.282889	0.392330	0.312316	0.43664	0.33303	0.45486	0.37154
1973	0.337242	0.336443	0.356573	0.331126	0.446833	0.362178	1.02922	0.09253	0.44828	0.31525
1974	0.352968	0.333382	0.364440	0.406555	0.534416	0.431974	0.22684	0.18917	0.37707	0.21224
1975	0.395199	0.377068	0.382740	0.428235	0.444696	0.547010	4.62811	1.17371	0.58948	2.28105
1976	0.390947	0.362880	0.432014	0.486797	0.727005	0.425649	0.44222	0.50609	0.08302	0.45489
1977	0.511100	0.517400	0.517958	0.533870	0.756197	0.394987	0.17731	0.20785	0.72254	0.24577
1978	0.476376	0.477505	0.501191	0.460545	0.647975	0.502530	0.18598	0.30831	1.37057	0.42379
1979	0.498184	0.508034	0.540596	0.469881	0.652544	0.472826	0.40214	0.43674	0.70904	0.47173
1980	0.589006	0.597857	0.650885	0.534923	0.626450	0.37942	0.31744	0.51418	0.37955	0.44257
1981	0.522983	0.549806	0.599451	0.474416	0.575916	0.398028	2.58007	0.22215	0.85938	0.95487
1982	0.428041	0.409999	0.424432	0.508781	0.554411	0.386118	0.01456	0.14947	0.97881	0.22678

SHARES OF KEY VARIABLES (CURRENT PRICES) OF SUBSECTORS IN TOTAL MANUFACTURING
IN PERCENT

SUBSECTOR-13* WEARING APPAREL (229)

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	0.00000	0.00000	0.00000	0.00000	0.0000	0.00000	0.00000	0.00000	0.00000	0.00000
1968	0.00000	0.00000	0.00000	0.00000	0.0000	0.00000	0.00000	0.00000	0.00000	0.00000
1969	6.22689	5.72715	5.64212	7.73393	11.1178	7.36217	3.28899	1.54978	3.53381	2.22969
1970	6.21567	5.74877	6.03863	7.65114	11.1970	7.38752	5.40643	2.98961	3.19258	3.86052
1971	6.12265	5.52531	5.78419	7.85050	10.8582	7.93368	8.38887	2.43958	3.23008	4.49233
1972	5.97041	5.45330	5.46678	7.45224	10.5480	7.47952	1.99336	1.62123	2.56993	1.61272
1973	5.88029	5.49479	5.47525	6.99849	10.3454	7.15585	2.45684	0.97158	2.54026	1.40768
1974	5.53055	5.05495	5.10518	6.53025	9.7965	8.18231	4.25921	1.26065	2.56410	2.21140
1975	5.30844	4.86065	4.55463	6.03426	9.5958	7.96857	6.50985	0.88913	2.75878	2.88012
1976	4.85402	4.31575	4.45891	5.92824	9.5636	7.26841	1.42085	0.53670	3.08816	1.00302
1977	4.34315	3.83044	3.88727	5.57315	8.7841	6.13333	0.47738	1.07613	1.58960	0.89942
1978	3.97076	3.52120	3.68645	5.26446	8.5369	4.97149	0.55795	1.53391	1.52476	1.23607
1979	4.26214	3.86136	4.12163	5.31132	8.8595	5.55551	0.25852	2.25801	2.03687	1.80993
1980	4.61223	4.22367	4.35290	5.83388	9.0975	5.38883	5.05830	2.10394	2.28998	2.93297
1981	5.23732	4.75290	4.76011	6.7386	9.3251	5.96496	4.06669	2.66340	2.80027	3.08429
1982	4.77188	4.16494	4.08290	6.67880	9.3802	5.74931	1.33738	1.94521	3.47458	1.98347

SUBSECTOR-14* FOOTWEAR (234)

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
1968	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
1969	1.71985	1.55425	1.43087	2.22473	2.48328	2.08136	1.65497	1.19889	0.71356	1.28753
1970	1.64020	1.50337	1.45256	1.96649	2.71906	2.22282	0.72779	1.52648	0.51493	1.17177
1971	1.69218	1.56020	1.47095	2.02518	2.56493	2.22395	0.86693	1.45735	0.79428	1.20247
1972	1.79535	1.66469	1.51274	2.10478	2.72426	2.34148	0.02848	0.26715	0.13646	0.19405
1973	1.71798	1.49594	1.52331	2.08689	2.83188	3.18002	0.29216	0.71905	1.19542	0.67026
1974	1.77412	1.62060	1.52002	2.19902	2.92003	2.38152	1.19177	0.97008	0.75415	1.02012
1975	1.76153	1.56903	1.44594	2.44174	2.71949	2.02533	0.39958	0.64915	0.56590	0.56119
1976	1.71753	1.48110	1.33639	2.42178	2.79635	2.64311	0.83531	0.71424	0.32758	3.51347
1977	1.62550	1.51455	1.38075	2.36630	2.80317	2.39900	1.44578	1.45496	0.66965	1.35611
1978	1.74345	1.52748	1.39861	2.30234	2.80305	2.36684	2.88648	1.90681	0.61676	2.03510
1979	1.95987	1.91086	1.54610	2.18766	2.59050	1.86410	1.99157	1.68933	0.64458	1.58689
1980	1.86785	1.71409	1.54973	2.35361	2.82805	2.16979	2.97564	1.68963	0.21508	1.85202
1981	2.10847	1.96997	1.54363	2.67054	2.96342	2.00924	0.79646	1.94037	1.59002	1.56773
1982	2.15690	1.93616	1.47193	2.82635	3.03536	2.39675	1.46426	1.98362	0.71610	1.65339

SHARES OF KEY VARIABLES (CURRENT PRICES) OF SUBSECTORS IN TOTAL MANUFACTURING
IN PERCENT

SUBSECTOR-15* SAWMILLING, WOOD EXCL. FURNITURE (236)

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	2.30435	2.06865	2.22556	3.01913	6.63576	2.75007	1.08844	2.35130	3.7908	2.11946
1968	2.07866	1.84692	1.96560	2.84377	5.65214	2.38317	1.90505	4.80966	2.7479	3.89268
1969	1.75795	1.49816	1.53266	2.57798	4.45771	2.25051	0.80654	0.91135	3.0581	1.07243
1970	1.77874	1.54983	1.54272	2.54504	4.34108	2.15722	1.84310	4.64277	3.4758	3.51347
1971	1.74133	1.47084	1.53245	2.47254	4.34560	2.69958	0.14112	2.44415	4.9775	1.92863
1972	1.63538	1.40380	1.51373	2.25467	4.45705	2.42357	1.15804	1.43458	2.6154	1.46851
1973	1.62456	1.45585	1.44026	2.14771	3.81404	2.09348	0.37185	0.37784	1.2286	4.4684
1974	1.53354	1.39764	1.34878	1.98202	3.03016	1.89539	1.17822	1.50885	3.1976	1.52284
1975	1.27372	1.10906	1.09855	1.73265	2.87474	1.79304	0.57797	1.12781	3.1361	1.08054
1976	1.36142	1.21178	1.15222	1.69432	2.98099	1.97754	0.51183	0.39998	1.6603	0.53301
1977	1.25710	1.05145	1.05644	1.77957	2.99788	1.90276	0.50921	0.48951	1.7522	0.62053
1978	1.25844	1.08288	1.10423	1.75990	2.92713	1.65774	0.16367	0.21144	0.5140	0.23838
1979	1.78810	1.50739	1.48431	2.49203	5.63006	2.77296	0.92876	0.80533	10.5582	2.32508
1980	1.94742	1.64240	1.45888	2.86466	5.39855	2.65410	1.10660	1.32660	6.9205	1.98147
1981	1.90163	1.46520	1.42865	3.12004	5.07396	2.91083	1.61993	0.90583	3.8478	1.45682
1982	1.49380	1.12328	1.14454	2.59017	3.65049	2.05104	2.78084	0.65705	1.1229	1.32687

SUBSECTOR-16* FURNITURE, FIXTURES, EXCL. METAL (238)

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	1.96585	1.79321	1.72379	2.54052	3.95345	2.15240	3.40136	1.09417	2.0915	1.89926
1968	1.90653	1.67759	1.63638	2.62946	4.18233	2.29345	0.62509	1.00877	1.4934	0.93824
1969	1.72886	1.51121	1.51031	2.32566	3.72592	2.38239	1.53975	0.95521	2.6504	1.27541
1970	1.85091	1.69119	1.63976	2.57048	4.12388	2.59450	9.29186	2.43223	1.1843	4.66700
1971	1.80720	1.52193	1.63821	2.64312	4.15655	2.64311	3.37907	1.58984	1.6150	2.18630
1972	1.82357	1.53661	1.62687	2.61919	3.83586	2.72875	1.15804	1.00640	1.5010	1.09568
1973	1.82017	1.37924	1.55993	2.61768	3.68783	2.35659	0.00000	0.31037	0.8634	0.29195
1974	1.80284	1.57323	1.57638	2.55689	3.61795	2.42308	0.15236	0.42829	3.0488	0.51837
1975	1.99639	1.32765	1.41429	2.43771	3.43061	2.28297	0.08562	0.43870	1.7885	0.40964
1976	1.49781	1.24243	1.37781	2.23834	3.22787	2.13334	0.11465	0.22654	3.5863	0.44481
1977	1.26190	1.02239	1.62892	1.89617	2.84140	1.95489	0.22732	0.32854	-1.5354	0.10284
1978	1.33752	1.13150	1.27043	1.88789	2.83425	1.89295	-0.11903	1.02645	0.9937	0.68204
1979	1.39767	1.18466	1.35860	1.94410	2.95951	2.11372	9.90042	0.63497	1.7790	2.71193
1980	1.70683	1.54879	1.59726	2.21234	3.16895	2.00270	3.47109	0.64103	4.5040	1.90542
1981	1.89825	1.70564	1.77524	2.50524	3.33698	2.17801	1.32463	0.75172	4.0365	1.37183
1982	1.58799	1.23817	1.34782	1.94130	3.67773	3.64125	0.17887	0.94354	2.2161	0.90061

SHARES OF KEY VARIABLES (CURRENT PRICES) OF SUBSECTORS IN TOTAL MANUFACTURING
IN PERCENT

----- SUBJECT=17* PULP, PAPER AND PRODUCTS (239,240) -----

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND, BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	3.01857	3.08224	2.95939	3.03267	2.49470	2.34220	0.45351	6.27401	2.61438	4.12194
1968	2.88927	2.96591	2.67707	2.85574	2.28483	2.21090	-0.31255	3.58472	3.94265	2.56318
1969	2.60773	2.70335	2.43774	2.45880	1.91045	2.01829	0.72274	1.59364	3.53381	1.51474
1970	2.55045	2.63487	2.40530	2.34905	1.84382	2.19124	0.96408	2.75526	2.44593	2.08891
1971	2.44043	2.48887	2.33225	2.30358	1.80792	2.28476	1.01921	4.37663	2.11808	3.04000
1972	2.46867	2.58613	2.51755	2.24763	1.70086	1.83285	1.46179	1.19671	4.38936	1.59500
1973	2.67050	2.84216	2.66250	2.32402	1.71770	1.70207	0.73041	0.44338	1.66030	0.63090
1974	2.88092	3.05524	2.84161	2.51857	1.59987	1.89317	1.27979	1.36659	0.79233	1.30278
1975	3.19335	3.47825	3.41274	2.56986	1.91298	1.88724	1.95509	2.17431	1.45013	2.05452
1976	2.53103	2.71399	2.69996	2.16976	1.56176	1.66696	2.45680	1.80194	0.69733	1.79561
1977	2.41910	2.49918	2.36076	2.29447	1.62851	1.57193	1.10025	5.04207	2.13150	3.25083
1978	2.52004	2.60483	2.84070	2.31872	1.69504	2.23405	4.25532	1.79148	2.32996	2.58691
1979	2.11601	2.22915	2.35459	1.82686	1.37699	1.73290	5.94600	3.97088	1.41807	3.97118
1980	1.88589	1.86577	2.42469	2.04844	1.53595	1.69540	1.59017	2.67615	3.14398	2.44185
1981	2.45746	2.42078	2.57004	2.47328	1.97985	2.74935	0.34592	3.23559	1.50238	2.19882
1982	2.63971	2.53787	2.71307	2.79733	2.31355	3.10800	3.73552	4.35545	0.37288	3.61133

----- SUBJECT=18* PRINTING, PUBLISHING, ETC. (242) -----

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND, BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	3.62057	2.35537	2.30762	7.62458	3.97520	5.56475	0.40816	3.8878	2.35294	2.66997
1968	3.53724	2.27026	2.19318	7.70164	4.01832	5.24729	2.21759	2.9302	2.09808	2.68296
1969	3.17173	2.01522	1.93293	6.81819	3.38102	5.21487	1.60260	2.2516	1.86884	2.02975
1970	3.17461	2.04566	2.05030	6.70794	3.29116	5.81333	1.53119	2.2675	2.67765	2.06247
1971	2.99358	1.97995	1.90276	6.12222	2.77214	5.53598	1.41121	2.0284	1.87980	1.80891
1972	2.89592	1.88406	1.78114	6.15883	3.02003	4.92745	3.81585	2.7081	2.70639	2.99412
1973	2.92325	1.78889	1.60939	6.11201	1.86638	5.03151	0.23240	0.6169	0.99618	0.56883
1974	2.73972	1.84297	1.68115	6.04497	2.90517	4.28573	1.08681	1.5225	3.15234	1.50230
1975	2.69743	1.79557	1.63910	5.50927	2.88526	4.82889	1.73152	2.2937	3.63122	2.19818
1976	2.43426	1.67990	1.31975	4.84904	2.89711	3.75752	3.05462	1.4652	1.97576	1.99219
1977	2.46187	1.46501	1.44620	5.46945	2.99505	4.41103	1.11844	2.0450	2.09538	1.69078
1978	2.79235	1.59571	1.51202	5.64844	3.09933	4.35092	1.10847	3.7137	2.74338	2.87741
1979	2.70548	1.80024	1.84100	5.41194	3.17250	4.76747	1.08196	3.4072	2.43651	2.76522
1980	2.77398	1.90984	1.82237	5.43721	3.19944	4.62584	1.17186	5.0959	3.20724	3.78494
1981	2.76810	2.04087	1.80516	4.72495	2.91427	4.62531	2.32864	4.3513	4.85352	3.82259
1982	2.72233	1.96197	1.69495	4.75007	3.04614	4.20651	7.65199	11.3090	2.82203	9.04762

SHARES OF KEY VARIABLES (CURRENT PRICES) OF SUBSECTORS IN TOTAL MANUFACTURING
IN PERCENT

----- SUBJECT=19* FERTILIZER, INSECTICIDES (244) -----

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND, BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	4.05264	4.67450	5.43949	2.38099	1.41661	2.30182	0.0907	0.4889	0.52288	0.3716
1968	4.36892	5.16299	4.97587	2.27096	1.36509	1.94889	30.5105	42.6804	4.89845	36.8906
1969	4.62032	5.57970	5.22005	1.95952	1.30162	1.93228	1.3826	21.6531	2.24261	14.0598
1970	4.63432	5.38125	5.03125	2.36895	1.42608	2.91517	4.6597	6.0426	2.21421	5.0669
1971	4.13769	5.00815	4.89431	2.17323	1.38194	0.00478	4.5551	0.2650	0.10590	1.6736
1972	4.25700	4.74649	4.83194	2.29900	1.30472	4.23679	3.1229	23.9927	1.15988	18.4138
1973	3.39141	3.62956	4.07595	2.42539	1.29190	3.33106	1.4276	1.9933	2.60667	1.9272
1974	4.05410	4.43673	4.81706	2.31296	1.26679	4.19883	0.4131	1.4619	5.02262	1.3898
1975	4.18178	4.58928	5.10013	2.17970	1.19134	4.96698	0.4947	1.2039	8.20561	1.4381
1976	3.90600	4.22778	4.28152	2.25180	1.26032	4.85219	0.6429	1.2101	2.05877	1.1001
1977	4.30355	4.77974	4.62005	2.53699	1.39598	4.19148	5.8604	2.6920	2.79886	3.9149
1978	4.48628	5.08485	5.05016	2.61128	1.50275	3.50122	1.9789	3.1255	2.91246	2.7525
1979	3.70696	4.07331	4.57476	2.53529	1.42651	3.06737	11.9590	3.2120	2.43651	5.2403
1980	4.07585	4.62509	5.30689	2.41872	1.42833	2.81359	2.9074	2.4413	1.60678	2.4621
1981	4.24258	4.86966	5.51099	2.38501	1.44326	3.04821	4.4008	2.1355	1.26868	2.6886
1982	4.32748	5.04583	5.75425	2.43444	1.45497	2.87168	9.9087	0.9207	1.39407	3.8470

----- SUBJECT=20* PAINTS, VARNISHES, FILLERS (246) -----

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND, BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	0.95838	1.01157	1.11226	0.749513	0.595465	0.98534	0.99773	0.162961	1.56863	0.564272
1968	1.02169	1.10894	1.07074	0.756535	0.621988	0.84703	1.66691	0.192146	0.59737	0.614844
1969	0.76825	0.81753	0.87241	0.631342	0.589829	0.62498	0.85891	0.258297	1.35916	0.530158
1970	0.83174	0.85674	0.91198	0.692560	0.559155	0.93042	0.14178	0.183684	0.84964	0.254503
1971	0.81788	0.83269	0.78811	0.667820	0.516783	1.06202	0.11780	0.255836	1.90627	0.372192
1972	0.82848	0.85879	0.80977	0.702298	0.542115	0.86021	0.01898	0.124428	0.86423	0.175119
1973	0.78590	0.81610	0.76732	0.680409	0.500511	0.78607	0.11952	0.065543	0.54790	0.118507
1974	0.81539	0.86687	0.85488	0.604912	0.495906	0.77705	0.62297	0.025728	0.15083	0.206371
1975	0.78907	0.86615	0.78887	0.553859	0.405226	0.59518	0.26639	0.08219	0.30653	0.158847
1976	0.68188	0.73337	0.66227	0.483010	0.379870	0.41547	0.01638	0.042855	0.44828	0.065524
1977	0.69128	0.76242	0.71639	0.505623	0.391552	0.48020	0.12730	0.033524	1.42702	0.203939
1978	0.59891	0.64540	0.65828	0.494067	0.358454	0.40532	0.29014	0.076888	1.38770	0.311224
1979	0.60612	0.66508	0.68622	0.478031	0.331020	0.34882	0.07660	0.108409	0.63169	0.181585
1980	0.61540	0.66108	0.64755	0.509786	0.317891	0.43583	-0.25514	0.361678	0.73381	0.241110
1981	0.67323	0.73938	0.71019	0.514173	0.344046	0.45898	0.25649	0.204940	0.53835	0.258771
1982	0.73060	0.83098	0.58163	0.493789	0.333101	0.46159	0.19967	0.348768	0.36267	0.301887

SHARES OF KEY VARIABLES (CURRENT PRICES) OF SUBSECTORS IN TOTAL MANUFACTURING IN PERCENT

SUBJECT-21* SOAPS, DE TERGENTS, TOILETRIES, PHARM. (247)

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND, BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	3.63206	3.40923	3.24739	3.61964	2.35467	5.89993	3.99093	2.81690	6.40523	3.55078
1968	3.65726	3.35983	3.14417	3.68725	2.44379	6.55373	5.64072	2.40183	-0.05974	3.10616
1969	3.64102	2.73917	2.57220	3.08262	2.08240	6.04627	3.60323	1.37921	4.28135	2.28120
1970	3.05839	2.74272	2.37276	3.09061	2.10353	6.26032	4.75425	1.65949	1.95675	2.77971
1971	3.01763	2.67821	2.73010	2.98910	2.03081	6.77393	1.40961	1.11928	2.06513	1.33521
1972	2.90945	2.59769	2.43153	2.91264	1.93580	6.07678	2.35406	0.70265	3.50239	1.40568
1973	2.83334	2.51918	2.33292	2.92730	1.90992	6.03359	1.03586	0.52242	2.47385	0.78951
1974	2.94336	2.72704	2.61882	3.01006	1.90390	5.09301	0.99879	0.61746	5.05279	1.01523
1975	3.15087	2.92339	2.71536	3.1814	1.94785	5.46153	1.02987	1.02683	5.84768	1.35127
1976	2.99361	2.79533	2.72726	3.02471	1.81956	4.80230	1.59283	2.56515	5.99369	2.53276
1977	2.97980	66135	2.57327	3.15238	1.79561	5.56990	1.81860	1.63264	3.77529	1.91215
1978	2.92324	61620	2.58222	3.18801	1.79880	5.01662	0.92248	1.63002	6.13774	2.25803
1979	2.81859	2.59580	2.42353	2.97069	1.62051	4.89307	4.43317	2.10934	2.74591	2.67838
1980	3.14186	2.78186	2.61766	2.78145	1.62367	7.32960	0.53995	1.76251	2.12551	1.47579
1981	3.27999	2.26997	2.85861	2.80465	1.70462	4.89324	2.14640	1.74609	3.45547	2.06237
1982	3.18320	3.02196	2.58953	2.98111	1.69785	4.99247	7.99309	5.04864	6.18220	6.03284

SUBJECT-22* MATCHES, INKS, GLUES, AND CHEM. N.E.C. (248)

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND, BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	0.720199	0.634247	0.473545	0.850353	0.743651	1.23168	0.72562	0.74497	1.96078	0.86705
1968	0.697974	0.619546	0.457770	0.734723	0.638181	1.38181	1.01206	0.38429	1.43369	0.62283
1969	0.601280	0.523175	0.400960	0.659258	0.485859	1.25283	1.41406	0.26317	0.84947	0.64831
1970	0.579680	0.500735	0.410836	0.656754	0.485217	1.20251	0.90737	0.48771	0.46344	0.63130
1971	0.594982	0.519933	0.406079	0.644486	0.473855	1.27486	0.39984	0.30609	0.45009	0.35137
1972	0.582930	0.522833	0.414776	0.644594	0.399933	1.03867	-0.08543	0.07685	0.70503	0.10176
1973	0.550739	0.498231	0.390850	0.607576	0.425797	0.99883	-0.51793	0.02699	0.59771	-0.03838
1974	0.554741	0.505907	0.403429	0.624223	0.412804	0.91180	0.16240	0.65681	0.64857	0.64454
1975	0.571720	0.526826	0.443137	0.656239	0.462457	0.81035	1.34859	0.42490	0.77812	0.75535
1976	0.692215	0.603585	0.586895	0.870092	0.645166	1.10384	1.10966	0.41222	0.68072	0.64768
1977	0.667104	0.578177	0.539518	0.854677	0.577061	1.04160	0.74562	0.32654	0.90318	0.54210
1978	0.712621	0.670503	0.575096	0.813287	0.591377	0.85317	1.33909	1.00723	1.07932	1.11467
1979	0.753517	0.734195	0.651477	0.764223	0.551474	0.91765	2.13520	0.70311	0.30840	0.93358
1980	0.706482	0.681731	0.625017	0.788811	0.531892	0.74546	1.64654	0.31040	0.50607	0.70148
1981	0.749328	0.757602	0.632126	0.729885	0.499589	0.72145	0.71378	0.37873	1.13096	0.56384
1982	0.737650	0.735340	0.605681	0.739313	0.539657	0.75200	1.11691	0.97261	0.44492	0.93563

SHARES OF KEY VARIABLES (CURRENT PRICES) OF SUBSECTORS IN TOTAL MANUFACTURING IN PERCENT

SUBJECT-23* BASIC CHEMICALS, PETROLEUM PRODS. (243, 250, 25)

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND, BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	0.535443	0.197321	0.42964	1.31541	0.685192	1.83338	0.81633	1.62961	2.35294	1.45885
1968	0.542167	0.336880	0.34955	0.96918	0.611895	1.47154	0.61021	0.79260	0.29869	0.71066
1969	0.555800	0.364056	0.37826	0.93305	0.568835	1.52805	0.12569	0.55558	2.00476	0.56045
1970	0.578638	0.401755	0.42666	0.93189	0.575791	1.50860	0.84121	1.28579	2.11123	1.23616
1971	0.522383	0.341012	0.39579	0.85207	0.529992	1.59846	-0.53312	0.50254	0.29124	0.13795
1972	0.554463	0.468517	0.53948	1.02600	0.601420	1.60620	-0.16137	0.95151	2.31976	0.81643
1973	0.638382	0.467528	0.56176	0.95529	0.582479	1.67609	2.19124	0.60146	3.98473	1.20893
1974	0.756781	0.610671	0.60921	1.08242	0.635759	1.52639	0.41983	0.68859	2.50377	0.72866
1975	0.800182	0.668295	0.68170	1.08671	0.672964	1.40981	0.80630	1.06093	1.68592	1.01897
1976	0.712546	0.627056	0.65322	0.86126	0.514223	1.16493	0.20883	1.36930	1.89274	1.05343
1977	0.715308	0.577541	0.52144	1.01811	0.585557	1.26516	0.53649	0.85152	1.46315	0.79135
1978	0.568470	0.396965	0.40294	0.90357	0.591377	1.28714	2.32108	1.11487	0.99366	1.45879
1979	0.585710	0.377533	0.39545	0.84635	0.578607	1.07926	3.26503	0.94161	0.82506	1.39939
1980	0.842708	0.738108	0.71190	0.94567	0.524427	1.57680	0.97606	6.11479	1.28416	4.09563
1981	0.920373	0.924052	0.89525	0.90033	0.483977	0.93525	0.52141	0.89:90	1.91136	0.90302
1982	0.931713	0.924183	1.11771	0.93309	0.499367	0.99064	1.49754	0.79303	1.55508	1.09889

SUBJECT-24* RUBBER PRODUCTS (253)

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND, BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	1.77715	1.69777	1.41750	1.87529	1.31057	2.30990	4.21789	1.46665	2.61438	2.42224
1968	1.76704	1.68333	1.38898	1.93291	1.27804	2.16783	1.80086	2.03555	0.95579	1.90043
1969	1.67949	1.57841	1.27406	1.82423	1.22964	2.33652	3.58278	1.68137	1.12130	2.18122
1970	1.55751	1.38852	1.23840	1.85625	1.21166	2.54591	4.98110	4.88346	1.75077	4.51496
1971	1.52980	1.37226	1.07619	1.74035	1.13593	2.66917	3.80243	3.77358	0.97961	3.50850
1972	1.55474	1.45338	1.10674	1.70719	1.10552	2.20049	2.94257	3.84501	1.56925	3.25390
1973	1.43528	1.35835	1.01366	1.61877	1.11638	1.79465	1.61355	0.78074	0.84675	0.95810
1974	1.53551	1.48555	1.32529	1.62156	1.12986	1.86013	1.22224	0.67800	1.02564	0.85776
1975	1.68241	1.69184	1.44484	1.87515	1.19989	1.81659	0.39482	0.67931	0.66022	0.58408
1976	1.53439	1.48131	1.32534	1.61733	1.24464	1.83803	0.33986	1.15503	3.17118	1.05721
1977	1.61677	1.60131	1.41896	1.64802	1.31343	1.68521	0.20459	1.05937	1.89668	0.81401
1978	1.52570	1.44862	1.36284	1.74200	1.30974	1.70982	0.52076	1.39935	1.26777	1.11908
1979	1.74519	1.72782	1.58062	1.79363	1.44143	1.79370	2.08732	1.83986	1.26338	1.78414
1980	1.72085	1.69557	1.46919	1.82397	1.40531	1.71643	0.34711	1.68828	1.03745	1.23791
1981	1.73415	1.66004	1.49362	1.78391	1.37445	2.28127	1.80554	1.70756	1.01828	1.65594
1982	1.61239	1.40449	1.33534	1.78879	1.29552	2.91208	0.23919	3.46485	1.37288	2.24231

SHARES OF KEY VARIABLES (CURRENT PRICES) OF SUBSECTORS IN TOTAL MANUFACTURING IN PERCENT

SUBSECT=25* PLASTIC PRODUCTS(255)

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAG.S	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	1.14128	1.02285	1.09605	1.41776	1.43156	1.58705	0.4989	1.11745	1.24183	0.94275
1968	1.24883	1.13298	1.05041	1.63438	1.65653	1.39258	0.1191	1.18890	1.31422	0.91029
1969	1.10382	0.99331	0.95495	1.39582	1.37160	1.46498	0.0524	1.23300	1.46109	0.91187
1970	1.06920	0.97533	0.94767	1.32010	1.32071	1.39928	0.8885	1.64682	1.13285	1.31549
1971	1.17996	1.09416	1.05895	1.37507	1.28535	1.58326	0.0341	6.57965	0.58247	5.95247
1972	1.26197	1.17707	1.10340	1.41515	1.40585	1.73826	0.9777	3.06679	0.59131	2.28838
1973	1.33142	1.26307	1.08595	1.51618	1.33325	1.59326	0.1793	1.31280	1.87614	1.12532
1974	1.55602	1.57629	1.23121	1.37555	1.27963	1.78272	0.1794	1.23341	1.52338	0.94774
1975	1.30032	1.24475	1.04366	1.31203	1.27488	1.81766	0.4519	1.10814	0.89559	0.86348
1976	1.32422	1.26804	1.14316	1.36699	1.27533	1.75453	0.8967	1.69990	1.72671	1.45539
1977	1.27647	1.19560	0.98144	1.38613	1.28015	1.76842	0.2546	1.77009	0.55997	1.07025
1978	1.22483	1.11668	0.95394	1.49096	1.41132	1.56834	10.5118	5.07074	1.50762	6.22227
1979	1.42281	1.35664	1.21580	1.52594	1.38445	1.81530	3.0735	2.90537	2.56542	2.87773
1980	1.40382	1.35166	1.21592	1.56028	1.37234	1.52306	4.8210	2.03512	0.52505	2.60043
1981	1.46996	1.42036	1.20911	1.68991	1.42244	1.58347	5.1770	2.75193	0.85552	3.23195
1982	1.44006	1.36174	1.13121	1.61727	1.52534	1.66797	1.2479	1.59022	1.12712	1.42364

SUBSECT=26* STRUCTURAL CLAY PRODS. INCL. BRICKS(258)

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	0.675047	0.536392	0.347057	1.04450	2.39681	1.07418	1.22449	0.62856	2.22222	0.97715
1968	0.860887	0.709996	0.411415	1.35631	3.17050	1.06597	2.17294	1.03278	2.27001	1.42133
1969	0.784020	0.650359	0.389956	1.23906	2.86617	0.94894	1.71782	0.57508	3.16004	1.13605
1970	0.770591	0.630987	0.395907	1.22494	2.81426	1.05189	1.05189	1.50114	2.44593	2.76318
1971	0.768114	0.608692	0.362075	1.20851	2.69866	1.30744	2.72050	0.98680	1.87980	1.65014
1972	0.855146	0.696818	0.436338	1.28708	2.76760	1.37241	2.61984	1.55169	1.61474	1.82455
1973	0.766690	0.591068	0.426226	1.32696	2.70929	1.21321	1.68659	0.36049	1.56068	0.73331
1974	0.686360	0.479156	0.384160	1.16736	2.37346	1.02515	1.18499	0.73399	3.40875	1.03772
1975	0.580719	0.437713	0.395672	1.03522	2.20440	0.97468	0.65689	0.23343	0.99675	0.43648
1976	0.382436	0.280680	0.252763	0.68328	1.32375	0.62116	0.33986	0.07346	0.64888	0.18271
1977	0.325337	0.252018	0.215730	0.50441	1.02101	0.57343	0.13639	0.07040	0.27095	0.11330
1978	0.363327	0.292314	0.223704	0.52378	1.24371	0.62144	0.29014	0.31524	2.51842	0.59155
1979	0.417293	0.348244	0.271577	0.62599	1.24133	0.56883	2.84374	0.55444	2.81036	1.37373
1980	0.422326	0.328215	0.279064	0.76795	1.29085	0.49483	1.19263	0.30635	1.44663	0.69420
1981	0.395664	0.253441	0.253441	1.18767	1.18767	0.55769	0.10968	0.17789	1.48151	0.30984
1982	0.331518	0.216263	0.225464	0.69869	1.08612	0.41509	0.32655	0.13702	2.07203	0.46129

SHARES OF KEY VARIABLES (CURRENT PRICES) OF SUBSECTORS IN TOTAL MANUFACTURING IN PERCENT

SUBSECT=27* GLASS, CEMENT ETC. (256,257,259,260)

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	2.94405	2.79230	2.18845	3.63018	3.71690	2.62488	1.04308	2.8053	11.6340	3.1998
1968	3.33117	3.31714	2.26521	3.64090	3.83790	2.65959	2.03899	1.4291	5.9140	1.8924
1969	2.89639	2.85164	1.88926	3.38970	3.47099	2.04123	5.32152	1.7204	10.6694	3.5627
1970	2.98412	2.95212	1.99297	3.49484	2.86139	2.14022	3.65784	3.3380	2.2232	3.3449
1971	2.98686	2.94268	2.08135	3.45979	3.63399	2.36078	2.37554	1.9508	7.7575	2.8626
1972	3.10415	3.08213	2.03143	3.56848	3.65480	2.14695	5.00237	7.0522	9.1199	6.9503
1973	3.20324	3.18245	2.19380	3.62211	3.83653	2.32411	3.80478	3.6993	1.2120	3.5158
1974	3.04675	3.00893	2.35027	3.27522	3.66051	2.12586	1.32042	1.0730	7.0890	1.5346
1975	3.03850	3.00989	2.49400	3.39407	3.59572	2.46957	1.61260	1.7337	6.1660	1.9914
1976	2.98388	2.91118	2.40871	3.46396	3.84781	2.51011	6.96503	31.5777	3.4866	21.9078
1977	2.77962	2.68946	2.09933	3.29967	3.72151	2.33985	2.52785	3.7893	3.7753	3.3014
1978	2.38894	2.18142	1.70728	3.07459	3.32042	1.87454	0.49100	7.0698	10.0223	5.8611
1979	2.30275	2.23755	1.72929	2.76129	3.11417	1.77850	1.54155	2.1062	5.8786	2.5678
1980	2.39763	2.36563	1.75135	2.78095	3.13225	1.80465	4.28398	4.5939	5.8768	4.6749
1981	2.78596	2.80313	2.05366	3.06392	3.30920	1.96694	2.45689	2.3855	10.3622	3.3392
1982	2.76329	2.69883	1.86265	3.26887	3.35030	2.10021	2.18391	1.8456	4.7161	2.3385

SUBSECT=28* NON-FERROUS, IRON, STEEL (BASIC)(262,264)

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	7.6005	6.9679	0.7537	10.7942	8.8966	5.37495	9.7279	13.9332	3.9216	11.6069
1968	7.5790	7.1193	7.9724	10.7659	8.8554	3.78652	5.9384	8.1842	12.9630	7.9011
1969	6.8952	6.7738	6.6471	8.8023	6.6311	3.05611	3.5928	27.6914	5.9803	18.7858
1970	8.3879	8.6376	7.3270	9.1050	6.8836	3.94034	1.4839	11.3061	5.3811	7.1096
1971	8.7095	8.0136	7.0902	8.4476	6.9551	3.42083	16.9502	21.3760	7.1221	18.5055
1972	8.4716	8.5843	7.6891	9.9201	7.0794	3.64964	13.1182	14.1263	9.1426	13.3564
1973	9.2535	9.3340	7.8644	10.7576	7.7797	4.39323	24.0106	67.3015	31.4129	55.4025
1974	10.2542	10.2997	8.1685	11.7212	8.8121	6.20002	17.2535	54.4607	5.5505	40.5407
1975	12.0767	12.5136	10.5889	12.5630	9.6991	6.62727	20.7497	46.7661	9.4317	35.6641
1976	12.3581	12.4629	10.6774	13.8314	10.3581	7.79610	30.3128	13.2278	9.3309	18.2044
1977	11.0380	10.9358	10.8060	12.9642	9.8801	7.21805	53.1030	29.1428	13.4212	36.8050
1978	11.9089	12.2394	9.4349	13.0358	9.4852	6.43829	29.9955	8.9074	4.6428	14.8209
1979	12.8260	13.6482	10.7541	12.5266	9.3656	6.78918	-7.0088	10.3361	1.2505	5.3054
1980	12.8789	13.1466	11.7926	13.1660	9.3066	9.72022	13.2880	7.9246	6.6359	10.4252
1981	9.7378	9.3631	9.7499	11.5810	8.9469	8.74614	16.3562	8.7214	2.2577	10.1715
1982	8.1514	7.5325	8.8469	11.0568	8.7928	6.39172	7.9453	4.2610	3.5975	5.2101

SHARES OF KEY VARIABLES (CURRENT PRICES) OF SUBSECTORS IN TOTAL MANUFACTURING IN PERCENT

SUBSECT-29* METAL PRODUCTS, MACHINERY (268)

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND, BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	8.8192	7.9585	8.43025	12.1036	11.1602	8.6379	10.0227	9.7078	11.3072	9.9711
1968	9.1099	7.8943	7.73912	13.7062	12.2051	9.1558	5.0305	8.3043	13.7993	7.7933
1969	9.3499	8.4971	8.33262	12.8083	11.4607	8.9359	9.1757	7.4510	10.6014	8.2674
1970	10.3922	9.7712	9.78631	13.1888	11.8587	9.8443	9.7850	9.5262	16.8383	9.8761
1971	11.0488	10.1356	9.72480	14.4981	12.4267	11.6366	10.5370	13.8883	13.1586	12.7040
1972	10.9425	9.7523	9.79215	15.1156	12.8838	12.4819	11.4381	9.0247	13.6229	10.1048
1973	10.6625	9.4637	9.02191	14.8110	13.4514	12.8549	11.9788	5.3322	6.9733	6.8396
1974	11.1268	9.9184	9.80045	15.6547	14.1630	13.0297	5.6135	6.7663	12.4887	6.8044
1975	10.5859	9.1714	8.97664	15.4666	13.8145	12.1576	10.0801	5.7741	9.5261	6.4217
1976	9.8328	8.3680	8.23624	14.6027	12.8944	12.2069	6.5351	8.0852	7.0729	7.5479
1977	8.9846	7.5841	7.43216	13.3080	12.3130	11.4807	5.2876	9.2326	11.9039	7.9937
1978	9.0030	7.7846	7.54928	12.9219	12.1570	10.7753	-0.3273	12.8364	10.8960	8.7054
1979	8.9818	8.0640	7.59331	11.9887	11.8550	10.4014	8.4738	11.4109	11.1512	10.7392
1980	9.4002	8.3306	7.58209	12.7713	12.4581	11.5196	6.8205	11.2417	9.5142	9.8151
1981	10.3721	9.4718	8.86542	13.5920	12.4707	10.7638	6.5809	8.2722	13.3587	8.3757
1982	9.9084	8.8097	8.01222	13.0502	12.1687	11.5527	12.8060	11.1180	10.2839	11.4538

SUBSECT-30* ELECTRICAL MACHINERY/EQUIPMENT (278, 279)

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND, BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	4.58837	5.03572	5.06107	3.60309	3.81342	2.74603	5.48753	2.75870	2.48366	3.55767
1968	3.57725	3.86605	3.52288	2.84893	3.75211	2.60570	2.89385	1.27897	2.80765	1.76069
1969	3.30530	3.42063	3.19393	3.19858	3.29404	2.35809	1.0260	0.79439	2.44648	1.17544
1970	3.45481	3.58125	3.50644	3.11889	3.23386	2.49247	1.87146	2.21687	0.66941	1.89721
1971	3.24618	3.26546	3.26691	3.31886	3.30048	2.80600	2.47746	1.73146	2.19751	2.02493
1972	3.02936	3.01785	2.96323	3.25815	2.98657	2.36634	1.04414	1.44922	1.41005	1.34416
1973	3.10160	3.14028	3.06871	3.34812	3.24680	2.02527	1.56042	1.11809	1.16221	1.21304
1974	3.53075	3.66014	3.91476	3.51087	3.40716	2.19639	0.91414	1.24249	2.18703	2.10888
1975	3.09870	3.14089	3.28074	3.27995	3.27995	2.24157	1.84831	1.25526	1.10823	0.95188
1976	2.97855	2.82772	2.58023	2.7741	2.66624	2.62110	0.95406	2.00804	2.27461	2.17461
1977	2.84302	2.59577	2.61897	3.65235	3.28960	3.17494	1.73676	2.81605	2.67341	2.38801
1978	2.75845	2.55750	2.68705	3.51408	3.18255	2.80167	0.89272	2.58342	2.17578	2.01744
1979	2.61255	2.27291	2.64386	3.82676	3.36447	2.87216	2.10647	2.66687	1.84350	2.42179
1980	2.72231	2.63122	2.54950	3.18993	3.28266	2.48629	3.17738	2.70583	1.94838	2.13520
1981	2.70363	2.58163	2.56225	3.07851	3.07857	2.58465	0.65809	2.71832	1.65262	1.97755
1982	2.90236	2.81654	2.48160	3.18069	3.00642	2.95277	1.57865	1.78329	2.90678	1.86617

SHARES OF KEY VARIABLES (CURRENT PRICES) OF SUBSECTORS IN TOTAL MANUFACTURING IN PERCENT

SUBSECT-31* MOTOR VEHICLES (283)

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND, BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	1.57982	1.25158	2.25064	2.88668	1.79183	1.36494	0.99773	1.81585	-0.52288	1.32122
1968	1.39779	1.12117	1.32440	2.47679	1.76756	1.41411	0.63715	0.80461	1.97133	1.05021
1969	2.52948	2.51035	2.26253	2.72722	1.96543	2.19890	1.02650	0.89673	1.15528	0.95731
1970	2.26887	2.19110	2.48711	2.71653	2.00372	1.92401	2.33459	2.26678	0.54068	1.54685
1971	2.53557	2.53795	2.68841	2.76622	2.11749	1.93075	0.82321	0.91370	0.90019	0.88233
1972	2.44435	2.40566	2.48221	2.84860	2.10839	1.81322	3.35074	1.25526	2.20605	1.87661
1973	1.92092	1.78411	1.94048	2.8074	2.37995	2.10839	0.84993	1.32383	1.14561	0.50029
1974	1.76796	1.65006	1.66279	2.44710	1.98768	1.37652	1.15114	0.82782	0.99548	0.93209
1975	2.26224	2.13196	2.45851	2.89596	2.33400	2.02640	1.37475	0.47866	0.69559	0.79087
1976	2.01223	1.84784	1.80317	2.85010	2.22875	1.57225	0.58554	0.30814	0.23244	0.38810
1977	1.87228	1.72201	1.71706	2.64070	2.06467	1.38346	0.27734	1.15659	0.74061	0.78264
1978	1.63752	1.47185	1.48146	2.42577	1.92338	1.49563	0.85258	3.16006	2.30217	2.30217
1979	1.60249	1.42979	1.41189	2.34314	1.87488	1.31228	2.33095	1.9018	2.08844	0.94559
1980	1.83117	1.74184	1.77452	2.44109	2.02119	1.24497	1.60204	1.66939	0.89195	1.55265
1981	2.20253	2.22751	2.11689	2.41469	2.20883	1.47066	2.19534	1.41327	0.85135	1.57358
1982	2.41741	2.46406	2.46594	2.64515	2.33454	1.49378	2.84324	1.07287	1.07203	2.52194

SUBSECT-32* OTHER VEHICLES ETC. (282, 284, 285, 286)

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND, BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	1.25231	1.07278	1.18073	1.94904	1.58791	1.18322	1.06576	0.83809	0.78431	0.90146
1968	1.38558	1.27397	1.36859	1.78842	1.68429	1.48231	1.54785	0.64249	1.01553	0.91029
1969	1.22510	0.94305	1.18190	2.34391	1.3267	1.14962	0.13617	0.89970	3.87360	0.75131
1970	1.02247	0.87868	0.96349	1.60938	1.04345	1.00573	0.24575	1.03876	8.62513	1.73525
1971	1.28915	1.20256	1.26482	1.71863	1.16483	1.06854	1.34849	1.12842	2.85941	1.37165
1972	1.45485	1.32373	1.45083	2.05834	1.48872	1.25997	3.43617	1.04300	2.25154	1.78539
1973	2.06455	1.95237	2.14897	2.40369	1.55666	2.33882	0.00000	0.29687	0.21584	0.22890
1974	1.82811	1.82046	2.12267	2.12548	1.47015	1.19517	3.42633	0.44040	1.22172	1.35644
1975	1.43100	1.33681	1.32955	2.01306	1.38935	0.96449	0.51137	0.63734	1.10823	0.56434
1976	1.23912	1.09261	1.12172	1.85294	1.09119	1.14559	0.61829	0.95988	2.14179	0.72077
1977	1.46588	1.41060	1.51463	1.65568	1.09919	1.51679	1.40486	1.56559	0.92124	1.44326
1978	1.17971	1.03446	1.21863	1.61438	1.10439	1.46506	1.33165	1.18791	1.19992	1.08818
1979	1.04130	0.87509	0.91794	1.70336	1.33290	0.99846	0.16277	0.63897	2.79747	0.86845
1980	1.03996	0.93887	0.94462	1.40462	1.05071	1.05071	0.00000	0.00000	0.63080	0.29080
1981	0.50637	0.47526	0.50277	0.58018	0.32262	0.60955	2.64082	0.20166	0.25874	0.91276
1982	0.66018	0.67136	0.71950	0.64017	0.64180	0.61520	0.40974	0.56675	0.75000	0.54737

SHARES OF KEY VARIABLES (CURRENT PRICES) OF SUBSECTORS IN TOTAL MANUFACTURING IN PERCENT

SUBSECT-33* OTHER MANUFACTURING (231, 290, 291)

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND, BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	1.09769	0.85815	0.90580	1.61191	1.64908	2.12010	1.97279	1.32697	0.84967	1.47261
1968	1.15992	0.91772	0.85730	1.67528	1.95932	2.17142	1.07159	0.33698	1.91159	0.63880
1969	1.03969	0.70887	0.74999	0.56547	0.89045	2.20484	-0.12569	0.55558	0.91743	0.39080
1970	1.02404	0.78624	0.77480	0.78432	0.74432	2.13536	0.18904	1.20978	0.77240	0.79656
1971	1.01862	0.78461	0.78411	1.58507	1.76829	2.02631	1.03489	0.30609	0.37086	0.55438
1972	1.09732	0.83173	0.83422	1.71211	1.95253	2.24332	0.15187	0.54529	1.00088	0.49459
1973	1.12214	0.89023	0.79998	1.64089	1.68288	2.29850	3.14077	0.31615	1.01278	0.95873
1974	1.08308	0.86109	0.84600	1.59255	1.74378	2.21654	0.79564	0.1040	1.17647	0.59075
1975	1.03934	0.81931	0.73067	1.57383	1.68406	1.79839	0.82046	0.28064	1.02570	0.64303
1976	1.01098	0.81696	0.70968	1.44104	1.67429	1.81359	0.86807	0.45507	0.81355	0.60736
1977	1.10187	0.89712	0.81890	1.55440	1.99318	1.91278	0.56831	1.26052	1.02962	0.70889
1978	1.18964	1.03535	0.98909	1.55648	1.97658	1.70895	0.50588	0.94572	0.89528	0.80124
1979	1.24932	1.10061	1.08892	1.51434	1.92643	2.02653	0.80478	0.00000	1.87591	2.00088
1980	1.34964	1.21077	1.18339	1.67164	1.98697	1.80699	2.47765	2.00647	1.10071	1.47579
1981	1.46483	1.35154	1.34623	1.70934	1.84628	1.89962	0.25480	1.16980	1.05584	0.89425
1982	1.21991	1.05662	1.01689	1.60663	1.93582	1.85387	0.01040	1.43037	1.28390	1.00034

SUBSECT-34* TOTAL MANUFACTURING

YEAR	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND, BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967	100	100	100	100	100	100	100	100	100	100
1968	100	100	100</							

ANNEX I

SUB-SECTORAL DATA

SUB-SECTORAL SHARES OF MANUFACTURING TOTALS

SOURCE: ANNEX G

NOTES:

- 1. GROSS OUTPUT AND PURCHASES EXCLUDE GOODS PURCHASED FOR RESALE.*
- 2. THE TOTALS FOR MANUFACTURING AS A WHOLE HAVE BEEN RE-CALCULATED AND MAY DIFFER FROM THE CENSUS TOTALS.*
- 3. VALUE ADDED IS THE DIFFERENCE BETWEEN GROSS OUTPUT AND THE SUM OF PURCHASES AND SERVICE INPUTS.*
- 4. LABOUR IN THOUSANDS.*
- 5. TOTAL MANUFACTURING EXCLUDES SUB-SECTORS 13 AND 14 (CLOTHING AND FOOTWEAR) IN THE YEARS 1967 AND 1968.*

ANNUAL GROWTH RATES (CURRENT PRICES): 33 SUBSECTORS AND TOTAL

SUBJECT-1* SLAUGHTERING, PROCESSING OF MEAT (201)

PERIOD	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967-1968	13.94	151.53	5.94	8.21	11.36	4.28	27.30	-58.14	104.55	-14.03
1968-1969	7.31	8.43	0.38	0.38	-1.52	3.79	235.40	-51.56	24.44	229.77
1969-1970	16.19	8.48	17.11	20.85	14.82	23.71	-0.85	50.50	12.50	18.57
1970-1971	21.83	-6.13	25.47	21.35	23.76	21.74	-33.02	-42.19	79.37	-34.57
1971-1972	32.19	27.94	32.81	15.09	4.76	23.41	59.05	-40.37	36.28	16.10
1972-1973	27.57	22.47	28.03	12.06	-1.40	28.45	193.73	3.86	92.86	145.10
1973-1974	-4.10	6.40	6.07	10.27	8.30	42.84	89.45	6.96	-57.91	81.24
1974-1975	3.80	-23.84	6.48	19.51	0.68	7.89	7.77	365.25	5.60	27.93
1975-1976	24.62	135.24	16.29	24.82	16.85	33.04	-90.55	-41.98	365.15	-75.25
1976-1977	17.54	13.14	18.16	15.18	11.59	18.41	-75.67	-72.34	-51.47	-66.56
1977-1978	0.01	13.20	-2.75	14.62	11.48	23.65	-66.83	-22.28	-33.56	-36.48
1978-1979	8.91	5.45	9.62	11.69	0.14	5.98	768.18	35.84	102.02	148.26
1979-1980	-4.38	-39.22	1.54	22.26	-11.22	-12.99	19.20	35.62	-38.25	6.80
1980-1981	15.94	107.71	7.60	26.95	-10.01	5.66	57.10	75.68	136.84	77.16
1981-1982	51.56	45.62	51.80	32.79	13.08	71.76	-4.10	79.96	18.80	30.86

SUBJECT-2* CANNING, PRESERVING, FRUIT, VEGETABLES (203)

PERIOD	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967-1968	-9.30	-15.42	-5.28	0.70	2.19	-17.69	-11.11	-41.07	83.33	-22.45
1968-1969	6.64	-12.95	14.67	7.99	4.10	10.20	-37.50	212.12	-5.09	75.00
1969-1970	6.85	21.49	0.31	-0.32	-1.88	18.94	0.00	-11.65	-10.00	-10.00
1970-1971	42.76	46.94	37.00	99.68	79.50	75.11	160.00	-59.34	22.22	-16.67
1971-1972	5.56	37.65	-4.31	-30.37	-35.39	-17.48	-71.15	-10.81	18.18	-39.00
1972-1973	17.14	-38.34	46.08	13.23	33.77	51.72	-73.33	-63.64	-100.00	-73.77
1973-1974	6.46	25.27	6.53	14.75	23.94	-27.60	725.00	533.33		937.50
1974-1975	16.96	21.77	13.53	25.00	-19.58	37.22	145.45	14.47	-96.49	2.41
1975-1976	-4.52	23.00	-14.93	-6.14	17.72	8.17	-74.07	-51.72	1400.00	-45.88
1976-1977	1.46	1.46	-0.80	-0.61	-0.25	-34.14	0.00	69.05	23.43	40.22
1977-1978	-7.38	-26.52	-0.88	0.00	-18.52	9.17	204.76	-16.90	29.73	32.56
1978-1979	19.65	39.08	10.30	7.35	-11.11	52.94	-100.00	50.85	-12.50	-23.39
1979-1980	3.09	-1.27	6.82	7.42	4.83	-11.54		-48.31	-71.43	-62.60
1980-1981	28.94	31.23	29.66	28.95	-11.92	15.53	1900.00	326.09	633.33	520.41
1981-1982	-58.13	-53.77	-64.41	-48.30	-54.77	-12.37	1360.00	-69.39	-13.64	41.12

SUBJECT-3* GRAIN MILL PRODUCTS, ANIMAL FEEDS (205)

PERIOD	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967-1968	31.27	15.77	34.66	13.25	8.57	27.55	-97.14	0.00	57.89	-20.81
1968-1969	-0.13	-15.31	1.09	6.03	7.63	13.28	500.00	83.93	-36.67	47.13
1969-1970	39.74	73.72	41.56	17.44	12.51	-20.46	-383.33	-45.63	-136.84	-75.00
1970-1971	-1.27	4.64	-3.26	10.40	7.37	14.67		42.86		675.00
1971-1972	-1.31	-1.96	-2.98	9.23	4.81	23.33	77.03	-47.50	88.30	41.13
1972-1973	29.86	35.75	29.84	22.23	12.79	18.19	130.53	688.10	61.58	182.57
1973-1974	7.31	2.37	7.81	10.10	5.59	-17.56	79.14	219.03	59.09	123.29
1974-1975	23.70	17.39	23.84	20.08	16.47	41.85	-45.66	-20.93	0.44	-22.71
1975-1976	8.53	20.61	12.09	12.81	-11.24	38.03	299.32	54.25	-26.26	71.44
1976-1977	15.66	63.83	9.81	11.67	7.25	6.07	-67.46	23.45	39.17	-10.15
1977-1978	15.35	9.43	16.10	14.89	5.84	20.95	125.13	8.24	25.95	25.95
1978-1979	28.97	66.14	26.92	32.97	5.45	-28.40	24.19	139.69	45.36	92.20
1979-1980	39.65	32.93	41.63	42.11	7.45	34.60	74.75	-21.16	68.65	7.83
1980-1981	44.93	32.64	43.72	42.64	12.98	130.05	309.69	96.83	64.14	154.29

SUBJECT-3* GRAIN MILL PRODUCTS, ANIMAL FEEDS (205)

PERIOD	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1981-1982	28.93	14.74	32.22	24.71	10.53	27.10	-43.61	6.50	33.87	-14.76

SUBJECT-4* BAKERY PRODUCTS (206)

PERIOD	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967-1968	10.07	9.83	9.48	11.92	5.65	17.34	-18.13	-60.75	-10.00	-36.38
1968-1969	8.34	12.30	6.30	12.39	7.47	15.53	759.62	307.14	-7.41	237.27
1969-1970	12.26	13.45	11.85	8.79	4.23	12.14	-95.53	42.11	376.80	20.57
1970-1971	11.74	15.79	11.47	6.92	3.28	0.87	385.00	-17.28	-55.84	-30.67
1971-1972	7.07	2.37	9.14	10.00	5.68	3.89	173.20	-25.37	12.58	13.25
1972-1973	8.47	11.17	4.98	11.13	2.63	4.70	-84.81	-50.33	-64.78	-68.24
1973-1974	17.88	11.72	19.58	14.48	4.29	24.41	620.00	180.54	127.68	127.68
1974-1975	10.12	4.44	12.55	11.55	-2.81	5.38	-35.42	-5.98	44.31	-1.45
1975-1976	8.19	11.51	5.00	1.79	3.01	0.23	-89.25	-12.98	-63.04	-47.41
1976-1977	9.55	8.10	10.62	4.97	-3.99	2.84	-10.00	-36.55	126.47	8.84
1977-1978	10.40	5.59	11.92	4.38	-1.60	11.59	500.00	88.02	35.71	72.14
1978-1979	16.09	30.65	12.43	16.19	1.93	4.19	-121.30	258.09	-48.09	77.60
1979-1980	23.42	31.27	20.84	34.11	11.61	19.36		1.44	1000.00	171.76
1980-1981	33.33	29.32	35.29	33.40	20.26	28.35	-81.63	86.98	-59.49	-14.39
1981-1982	18.67	17.19	17.54	22.93	-1.01	43.18	-41.88	-58.72	-33.20	-51.83

SUBJECT-5* CHOCOLATE AND SUGAR CONFECTIONERY (208)

PERIOD	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967-1968	14.78	9.63	18.26	13.37	5.86	8.33	-92.86	122.22		52.33
1968-1969	12.64	6.03	12.42	5.90	9.28	56.41	66.67	-4.17	162.50	7.63
1969-1970	18.14	24.47	15.45	12.83	14.01	14.21	1420.00	142.61	-9.52	168.09
1970-1971	22.43	33.17	15.49	25.97	14.12	33.49	-47.37	-49.82	-39.13	-48.68
1971-1972	9.23	7.98	8.52	8.18	9.05	20.79	0.00	0.00	0.00	0.00
1972-1973	6.89	-0.21	18.27	19.06	3.26	-5.84	42.50	38.57	-38.71	34.02
1973-1974	30.44	38.20	29.65	19.05	7.93	2.20	22.81	-20.10	400.00	3.85
1974-1975	1.07	-1.20	0.94	10.22	3.49	16.82	32.86	71.61	-15.56	47.04
1975-1976	1.83	6.11	-1.83	6.96	-10.93	4.49	-43.01	-30.08	-7.89	-31.74
1976-1977	-4.88	-9.85	-2.89	0.28	-5.10	3.79	-86.79	18.82	-22.86	-4.43
1977-1978	12.78	13.88	12.75	4.98	5.10	7.79	-100.00	-38.29	3.70	-33.59
1978-1979	9.35	8.71	10.78	4.48	3.86	9.71		-10.71	61.95	61.95
1979-1980	50.90	58.28	48.40	47.39	12.17	37.86	-49.58	282.96	240.00	138.99
1980-1981	41.43	62.56	28.08	40.29	10.13	54.03	480.00	186.07	135.29	206.19
1981-1982	24.71	34.36	27.17	17.49	2.32	-51.36	-54.60	-45.00	-13.00	-43.66

ANNUAL GROWTH RATES(CURRENT PRICES): 33 SUBSECTORS AND TOTAL

SUBJECT-6* DAIRY AND OTHER N.E.C.(202,204,207,209)

PERIOD	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967-1968	4.65	0.10	6.25	9.10	2.86	0.81	-23.89	-45.31	4.28	-33.24
1968-1969	6.31	13.31	3.48	7.48	6.48	19.28	179.29	196.95	3.06	169.56
1969-1970	10.85	13.58	9.44	8.28	5.29	18.13	-85.17	-66.40	149.50	-67.60
1970-1971	12.74	11.62	13.81	12.28	4.47	4.52	457.07	258.59	194.44	285.03
1971-1972	8.15	15.70	4.73	18.12	4.20	22.03	-0.82	10.96	-73.85	-11.04
1972-1973	18.51	10.78	21.85	13.00	10.47	10.52	-11.96	-14.61	188.66	-0.47
1973-1974	21.84	13.64	24.46	22.74	5.01	20.41	53.73	140.58	-49.64	76.37
1974-1975	16.27	30.73	11.18	25.93	14.50	29.22	-7.24	-35.00	181.91	-15.43
1975-1976	16.42	12.27	19.46	14.74	-1.58	-1.16	5.87	-11.38	13.71	-6.43
1976-1977	3.03	13.22	0.10	12.86	8.90	0.32	-32.27	-11.79	18.32	52.26
1977-1978	11.51	10.98	11.56	10.28	-0.67	13.13	46.15	-42.01	36.19	-35.65
1978-1979	23.16	15.92	25.72	27.75	-0.09	22.46	-46.55	82.79	93.86	74.27
1979-1980	24.63	24.26	23.15	10.00	5.38	44.95	-1.01	142.77	-36.53	71.96
1980-1981	7.18	10.85	7.20	19.99	4.40	-5.87	170.16	-64.10	100.00	-22.83
1981-1982	23.67	42.37	16.47	26.34	2.79	35.71				

SUBJECT-7* BEER,WINE AND SPIRITS(211,212,213)

PERIOD	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967-1968	7.64	5.20	5.63	21.13	10.89	21.36	181.52	139.13	-2.88	126.77
1968-1969	12.69	14.33	17.47	13.02	7.57	-1.83	-33.59	32.59	-167.33	0.31
1969-1970	14.44	23.07	0.00	10.40	9.64	13.79	9.64	32.59	24.07	32.74
1970-1971	13.28	12.58	27.44	12.01	6.65	-12.09	23.90	-13.08	-60.00	-5.46
1971-1972	10.20	10.64	12.30	5.91	13.25	1.72	-16.38	73.02	276.83	41.37
1972-1973	10.30	8.18	11.65	18.33	-0.75	18.30	1.26	-58.25	-34.63	-38.49
1973-1974	15.44	8.36	14.67	20.53	13.28	55.59	284.71	79.53	142.08	182.50
1974-1975	11.79	4.66	19.91	17.30	3.58	20.20	-9.85	293.70	64.17	85.87
1975-1976	8.30	7.61	12.52	17.45	-1.90	1.19	-41.34	-60.17	-39.86	-51.31
1976-1977	8.47	5.56	12.59	17.45	1.15	7.57	-18.57	-37.24	7.31	-23.78
1977-1978	21.68	9.11	11.57	14.45	0.50	87.93	0.00	69.41	-37.58	18.99
1978-1979	-0.61	-10.57	12.25	-2.21	-18.85	-0.74	-46.60	58.97	46.48	15.00
1979-1980	22.79	30.36	21.16	23.40	5.95	12.16	173.66	28.66	-35.78	48.02
1980-1981	25.69	11.41	43.43	35.94	6.51	21.90	22.25	171.99	714.83	146.76
1981-1982	27.40	17.56	32.69	25.21	14.81	33.83	-63.67	-38.86	-17.13	-39.64

SUBJECT-8* SOFT DRINKS AND CARBONATED WATERS(214)

PERIOD	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967-1968	11.16	19.09	7.62	8.32	0.77	2.84	-67.44	-9.82	57.14	-14.57
1968-1969	5.70	13.67	5.99	12.47	10.19	-19.71	75.00	40.55	86.36	63.59
1969-1970	13.92	-3.86	28.65	20.32	9.59	18.33	-120.41	44.37	-50.00	-11.27
1970-1971	12.69	7.86	10.77	11.01	12.54	39.97	-20.00	19.51	-2.44	-4.05
1971-1972	25.31	27.82	29.55	14.91	13.17	0.59	144.44	66.94	45.00	73.35
1972-1973	6.63	18.23	1.13	15.86	10.22	-3.34	-54.55	-55.26	165.52	-16.13
1973-1974	25.82	24.80	18.14	12.51	4.55	73.98	478.33	218.58	-12.34	117.89
1974-1975	15.86	16.47	18.98	25.97	7.09	1.87	324.21	-85.76	77.41	69.50
1975-1976	8.71	1.96	10.04	6.53	11.54	25.97	-69.29	861.45	-35.28	-23.25
1976-1977	3.20	4.61	0.33	23.99	0.27	10.41	-58.13	-90.10	12.90	-60.47
1977-1978	11.18	12.85	10.54	-3.42	-5.83	9.05	-79.14	829.11	-63.43	45.87
1978-1979	17.16	12.57	1.68	27.38	10.20	16.34	758.97	-43.32	10.16	-1.00
1979-1980	35.29	17.15	55.27	17.85	-6.10	24.94	88.06	455.29	153.83	271.72
1980-1981	14.55	32.95	-1.66	21.23	11.14	28.04	-52.22	-56.93	145.70	-33.30

SUBJECT-8* SOFT DRINKS AND CARBONATED WATERS(214)

PERIOD	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVIC PAYMENT	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1981-1982	35.19	28.98	49.33	26.77	2.28	10.02	4.98	17.49	3.83	10.10

SUBJECT-9* TOBACCO (221,222)

PERIOD	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967-1968	-5.68	-12.85	-1.85	-10.68	-18.47	7.81	30.65		39.29	
1968-1969	14.45	28.51	6.85	17.65	15.83	-4.81	360.49	563.64	50.00	231.18
1969-1970	1.27	-2.88	2.52	10.42	-5.10	12.82	-37.00	-15.07	66.87	-12.61
1970-1971	8.50	14.57	4.07	13.52	18.48	10.41	-58.38	285.48	-28.21	46.95
1971-1972	3.78	2.91	7.59	-3.24	-2.89	-2.34	-47.38	-15.90	12.86	-25.31
1972-1973	4.79	2.62	8.35	6.62	2.65	3.15	-95.03	0.50	-21.52	-37.96
1973-1974	29.29	25.45	31.53	12.78	7.41	36.95	4288.89	564.36	113.71	497.61
1974-1975	16.02	17.36	20.75	13.68	-2.23	-0.82	-48.86	-24.52	-56.23	-33.52
1975-1976	8.47	1.00	24.40	10.38	13.35	-13.78	800.50	-50.05	-22.41	81.59
1976-1977	2.88	19.67	-12.36	4.89	-5.88	-3.03	-88.13	-51.78	-21.11	-77.87
1977-1978	15.18	15.04	13.70	11.71	-0.58	22.19	52.78	44.26	28.17	44.67
1978-1979	27.57	37.30	17.41	113.20	-1.01	15.60	-68.48	116.48	218.68	49.35
1979-1980	16.79	18.78	9.81	-24.27	17.23	54.60	2798.08	50.92	117.93	314.88
1980-1981	16.58	40.40	-38.64	12.77	-14.03	57.00	-37.89	-186.09	27.06	-84.89
1981-1982	16.49	3.31	98.71	15.90	8.48	-4.24	-74.15		181.82	209.09

SUBJECT-10* COTTON (INCL.TEXTILES, CARPETS)(223,225)

PERIOD	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967-1968	20.82	13.99	22.22	13.06	7.03	49.95	-39.52	-56.56	-71.43	-51.98
1968-1969	39.55	-4.85	59.33	11.05	9.37	17.22	207.52	56.29	92.86	114.50
1969-1970	-8.36	27.91	-14.38	15.28	1.82	-13.94	2.04	20.51	-22.22	9.80
1970-1971	27.16	17.34	30.84	10.52	11.45	26.39	-58.82	12.31	33.33	-23.42
1971-1972	24.42	28.19	23.04	11.49	15.30	40.85	-87.88	-37.80	0.00	-33.80
1972-1973	18.44	17.48	19.84	12.87	-0.87	-0.86	-37.80	103.45	89.29	84.18
1973-1974	28.87	28.29	20.98	10.69	10.69	52.09	1689.60	80.48	29.25	150.22
1974-1975	3.82	0.15	-3.43	14.57	1.24	2.51	64.51	130.99	-21.17	108.77
1975-1976	11.87	10.19	11.39	16.11	-1.29	31.87	-51.53	-40.33	34.26	-42.63
1976-1977	4.37	10.65	2.63	8.09	2.71	1.62	-85.95	-47.30	-57.83	-49.12
1977-1978	7.02	9.79	4.36	9.51	0.67	25.24	28.35	-49.49	109.84	-30.55
1978-1979	19.68	23.51	14.63	18.29	7.08	12.51	-34.21	-1.12	56.25	-9.91
1979-1980	25.87	40.82	21.17	37.49	6.48	12.51	454.74	635.37	111.50	650.48
1980-1981	21.96	27.44	18.44	36.29	20.60	31.50	118.22	142.78	49.17	135.22
1981-1982	-3.02	-17.79	4.66	14.83	2.82	-8.14	-35.95	-46.78	9.67	-43.73

ANNUAL GROWTH RATES (CURRENT PRICES): 33 SUBSECTORS AND TOTAL

SUBJECT-11* KNITTED PRODUCTS, ROPE, CORDAGE (224)

PERIOD	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967-1968	18.23	19.00	13.95	34.67	20.84	51.12	56.25	-16.00	-66.67	-6.77
1968-1969	9.09	13.50	6.31	6.20	7.87	11.22	10.67	-24.76	325.00	-10.73
1969-1970	32.37	38.96	32.35	20.46	10.86	12.20	214.46	221.52	29.41	206.59
1970-1971	12.27	17.83	9.08	11.09	6.59	10.75	-21.46	-31.10	-50.00	-24.45
1971-1972	14.76	25.69	6.48	13.21	10.16	21.66	-2.93	-2.29	145.45	0.35
1972-1973	9.56	11.32	7.75	6.59	0.99	12.16	-73.67	16.67	-62.96	-18.84
1973-1974	25.64	19.02	35.15	10.49	1.39	1.04	296.15	150.13	30.00	163.99
1974-1975	-2.47	-1.20	-5.51	11.04	-5.98	14.59	60.68	-62.02	7.69	-40.51
1975-1976	6.25	-1.75	11.97	10.96	6.65	8.01	14.80	-36.41	-21.43	-12.71
1976-1977	-8.20	-4.90	-18.33	11.84	-9.19	2.15	-5.53	178.42	109.09	65.46
1977-1978	-1.94	-13.18	6.75	1.14	-10.83	2.38	-92.76	-77.50	178.26	-77.19
1978-1979	22.14	27.00	19.86	13.13	3.10	16.11	-57.69	95.36	-82.81	32.50
1979-1980	37.93	52.56	30.50	26.80	18.56	19.07	4490.91	140.68	318.18	296.54
1980-1981	45.14	52.88	37.23	45.05	12.42	53.72	145.15	228.31	191.30	193.58
1981-1982	-1.80	-0.94	-7.05	18.54	-0.78	23.65	-95.40	-59.76	-48.51	-71.31

SUBJECT-12* OTHER TEXTILE PRODUCTS (226)

PERIOD	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967-1968	-23.11	-3.40	-30.32	14.74	-2.37	-30.21	425.00	-1.61	100.00	26.47
1968-1969	38.52	23.85	48.04	18.81	17.63	25.37	-100.00	-80.33	-25.00	-82.56
1969-1970	17.49	11.38	18.37	18.92	12.14	40.48	116.67	116.67	0.00	126.67
1970-1971	24.12	28.43	22.16	19.16	18.20	14.73	4100.00	577.04	133.33	682.35
1971-1972	4.73	7.29	4.38	9.54	0.58	19.05	-45.24	-48.00	185.71	-40.98
1972-1973	30.69	38.12	27.72	34.08	19.38	27.43	236.96	-47.25	35.00	46.50
1973-1974	30.34	29.11	28.16	45.64	28.41	53.81	-56.77	160.42	-7.41	-5.65
1974-1975	24.44	36.71	14.91	21.78	-14.54	48.98	2802.99	616.00	100.00	1231.80
1975-1976	0.75	-20.36	16.61	21.03	57.69	-18.20	-94.45	-72.29	-90.00	-87.51
1976-1977	32.94	68.51	23.67	14.95	14.65	5.07	-69.74	22.05	70.00	-65.84
1977-1978	0.38	-8.36	0.57	-8.62	-16.39	46.95	-39.90	-61.94	100.00	36.17
1978-1979	26.62	24.93	30.98	23.99	7.73	2.07	68.00	60.23	-31.25	24.48
1979-1980	46.75	37.59	55.21	41.96	4.68	9.98	154.76	170.21	9.09	128.87
1980-1981	15.71	18.59	13.84	17.20	-1.09	34.62	1328.97	-28.87	163.33	258.14
1981-1982	-8.30	8.38	-18.17	26.54	-1.91	15.77	-99.54	-46.86	46.20	-80.50

SUBJECT-13* WEARING APPAREL (229)

PERIOD	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967-1968										
1968-1969										
1969-1970	17.74	15.53	19.05	12.73	8.94	18.42	82.17	48.43	19.23	58.70
1970-1971	17.53	19.68	11.13	20.16	8.57	20.12	87.06	13.14	-1.61	47.77
1971-1972	12.00	15.23	9.42	8.54	6.47	14.73	-80.37	-17.04	7.38	-55.62
1972-1973	15.32	14.05	17.84	7.57	2.80	5.13	76.19	13.77	35.40	34.07
1973-1974	17.12	10.58	16.92	10.68	1.67	47.46	240.00	65.28	11.11	120.16
1974-1975	5.61	15.46	-2.38	6.84	0.60	14.58	117.57	-18.61	37.65	61.39
1975-1976	-5.93	-16.25	1.14	4.60	-3.87	-2.79	-87.32	-61.21	-20.51	-78.19
1976-1977	-9.02	-5.10	-10.07	-1.99	-11.53	-15.45	-69.74	22.05	-52.69	-35.18
1977-1978	-5.44	-0.21	-1.43	0.07	-5.17	-6.37	-28.57	24.30	1.14	-8.53
1978-1979	29.96	23.77	35.77	22.60	11.02	21.23	-64.00	82.71	77.53	63.75
1979-1980	39.04	45.57	36.15	36.97	11.97	32.83	6214.81	113.85	129.11	295.31
1980-1981	42.95	55.14	35.17	52.99	10.28	42.16	41.35	108.40	85.36	74.59

SUBJECT-13* WEARING APPAREL (229)

PERIOD	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1981-1982	2.08	5.21	-0.87	16.68	2.50	5.54	-73.32	-42.32	22.21	-47.21

SUBJECT-14* FOOTWEAR (234)

PERIOD	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967-1968										
1968-1969										
1969-1970	12.47	4.39	16.92	0.72	18.44	26.03	-51.27	-2.03	-4.76	-20.47
1970-1971	19.97	24.33	18.21	20.60	5.61	11.91	46.75	32.37	50.00	36.69
1971-1972	21.86	24.20	18.88	18.83	15.32	28.13	-97.35	-77.12	-80.00	-82.25
1972-1973	12.04	-3.84	18.03	13.57	8.96	49.24	1366.67	410.96	1100.00	496.34
1973-1974	28.60	41.04	27.98	24.99	10.71	-3.42	700.00	71.85	-30.56	113.29
1974-1975	9.25	21.59	1.76	28.38	-4.35	0.05	-52.27	-22.78	-4.00	-31.83
1975-1976	0.31	2.31	-4.52	5.60	-0.60	17.28	21.43	-29.29	-58.33	-19.41
1976-1977	5.40	-0.87	6.58	1.88	-3.46	7.84	55.88	24.00	30.00	35.78
1977-1978	7.51	8.39	5.28	3.07	-2.42	13.98	22.01	14.29	38.46	18.51
1978-1979	36.10	51.65	34.24	15.47	-1.14	-14.56	-46.39	10.08	38.89	-12.80
1979-1980	22.46	10.33	29.22	34.16	19.04	59.40	382.21	129.30	-32.00	184.70
1980-1981	42.11	68.77	23.12	49.94	12.74	18.93	-52.94	89.06	1020.59	40.54
1981-1982	14.61	14.03	10.20	24.88	4.37	42.36	49.15	-19.26	-55.64	-13.43

SUBJECT-15* SAWMILLING, WOOD EXCL. FURNITURE (236)

PERIOD	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967-1968	0.95	-3.43	4.46	3.99	-8.22	-2.50	166.67	296.53	-20.69	216.56
1968-1969	8.65	10.85	0.20	15.10	-0.47	18.22	-39.84	-76.65	95.65	-63.69
1969-1970	19.19	24.98	15.93	12.49	5.34	13.12	153.25	291.98	50.00	200.88
1970-1971	13.97	8.85	15.25	13.77	12.07	39.98	-90.77	-27.01	39.26	-30.29
1971-1972	7.87	-1.19	14.36	4.26	11.36	9.25	577.76	-26.73	-38.83	-15.11
1972-1973	16.31	29.51	12.04	9.11	-10.30	-5.08	-54.10	50.00	-35.65	-48.17
1973-1974	17.85	17.89	17.43	9.47	-14.70	16.76	521.43	408.67	186.49	377.61
1974-1975	-8.21	-10.05	-10.88	1.07	-2.56	11.30	-30.17	-13.74	25.47	-12.07
1975-1976	9.96	10.43	8.35	4.11	0.02	15.94	-48.56	-77.21	-62.41	-69.10
1976-1977	-8.11	-8.11	-5.42	9.51	-3.13	-2.27	-10.40	-23.98	-3.00	-15.84
1977-1978	7.81	8.93	8.64	4.78	-4.72	0.83	-80.36	-63.09	-69.07	-69.66
1978-1979	72.03	81.04	63.23	72.08	105.75	81.47	340.91	372.73	2630.00	900.74
1979-1980	39.94	58.33	26.70	43.35	4.55	31.07	284.54	278.08	33.58	107.69
1980-1981	22.93	20.49	21.04	43.93	1.12	40.85	157.37	12.41	-15.72	22.05
1981-1982	-11.99	-15.32	-7.41	-2.04	-26.69	-15.91	39.27	-42.71	-71.26	-25.23

ANNUAL GROWTH RATES(CURRENT PRICES): 33 SUBSECTORS AND TOTAL

SUBSECT-16* FURNITURE, FIXTURES, EXCL. METAL (238)

PERIOD	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967-1968	8.54	2.08	12.28	14.28	14.00	19.89	-72.00	78.72	-21.88	-14.86
1968-1969	16.50	10.82	18.61	12.29	12.43	30.05	250.00	16.67	212.00	78.15
1969-1970	26.26	27.33	25.05	25.95	19.72	28.52	568.03	95.92	-41.03	235.39
1970-1971	13.54	10.26	15.91	20.42	12.84	13.95	-56.11	-9.38	32.61	-40.51
1971-1972	15.90	14.57	14.97	13.30	0.20	25.64	-71.69	-20.98	6.20	-44.86
1972-1973	16.87	28.96	12.91	14.48	0.77	-5.10	-100.00	-41.45	-21.21	-54.00
1973-1974	23.34	17.15	26.72	15.86	5.33	32.60		75.78	288.46	148.83
1974-1975	-2.39	-6.15	-1.83	10.23	-2.61	9.88		-20.00	17.67	-25.74
1975-1976	-3.65	-10.46	0.64	-2.24	-9.24	-0.90		-22.22	-66.67	-44.00
1976-1977	-14.34	-18.90	-12.94	-11.77	-15.21	-6.92		78.57	-11.71	-83.29
1977-1978	14.15	16.00	13.56	5.58	-2.67	11.85		-132.00		423.73
1978-1979	26.52	22.99	29.86	25.14	11.70	21.14			137.93	344.86
1979-1980	56.91	75.72	51.56	41.91	16.75	29.75		131.71	415.94	71.40
1980-1981	40.01	44.06	37.38	49.64	13.29	39.67		93.05	56.04	19.53
1981-1982	-6.28	-24.01	-12.27	-8.56	12.30	99.52		-89.04	-52.93	-46.11

SUBSECT-17* PULP, PAPER AND PRODUCTS (239, 240)

PERIOD	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967-1968	7.11	7.41	6.99	3.97	-1.31	6.21	-205.00	10.76	65.00	7.18
1968-1969	15.95	14.68	17.02	9.31	5.52	14.29		-45.23	57.58	-22.12
1969-1970	15.34	15.86	13.64	8.86	4.40	28.13		33.03	-8.65	26.40
1970-1971	11.27	8.70	12.50	14.84	9.77	16.63		120.23	-15.79	84.81
1971-1972	16.18	6.53	24.97	11.56	2.15	-2.38		18.46	141.25	-42.29
1972-1973	26.65	34.10	24.54	18.44	5.86	2.04		-28.57	-29.66	-34.72
1973-1974	34.34	34.02	33.83	28.55	0.00	43.89		243.64	-49.00	202.73
1974-1975	21.96	7.62	31.41	17.97	22.80	16.91		117.46	83.61	141.18
1975-1976	-18.46	-20.38	-18.27	-10.11	-21.25	-7.15		-27.01	-52.85	-65.26
1976-1977	-2.81	7.40	-9.81	10.26	0.44	20.16		-59.67	91.59	30.88
1977-1978	12.19	-12.84	25.07	-7.05	-1.57	30.86		136.36	-69.02	-37.16
1978-1979	1.66	8.78	0.65	-4.25	-13.10	-15.85		8.57	175.11	71.67
1979-1980	14.52	-29.83	32.75	39.82	21.63	33.98		-13.69	35.82	350.00
1980-1981	64.04	184.56	31.01	59.55	38.68	108.97		-61.75	99.04	49.50
1981-1982	20.34	12.92	22.00	33.46	19.07	34.91		776.10	6.31	34.82

SUBSECT-18* PRINTING, PUBLISHING, ETC. (242)

PERIOD	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967-1968	9.33	7.92	12.41	11.53	8.93	6.10	727.78	46.11	-2.78	73.20
1968-1969	15.19	14.64	13.26	13.38	6.19	24.42		2.68	57.14	-6.30
1969-1970	18.04	12.10	22.17	11.13	6.29	31.56		5.89	-22.51	-6.87
1970-1971	9.66	12.00	7.67	6.88	-5.70	6.52		11.11	24.02	-31.73
1971-1972	11.11	13.82	8.37	15.02	18.28	8.32		123.33	66.67	81.44
1972-1973	12.90	17.59	6.40	13.68	3.65	12.21		-91.29	-56.78	-67.09
1973-1974	22.18	19.45	30.99	17.32	4.44	9.85		817.14	214.37	270.12
1974-1975	8.33	4.36	6.88	5.37	2.00	32.56		126.79	73.86	81.32
1975-1976	-7.16	2.63	-16.82	-6.29	-3.15	-18.20		12.47	-58.95	-43.23
1976-1977	2.84	-6.51	13.04	17.61	-0.42	19.24		-67.02	-15.04	-38.65
1977-1978	6.76	3.49	8.67	9.40	0.99	13.93		-39.43	54.10	25.05
1978-1979	34.22	28.90	47.86	16.44	9.48	18.87		-24.16	17.02	15.50
1979-1980	31.74	34.89	27.60	25.28	9.96	32.97		249.56	243.27	232.90
1980-1981	25.62	27.38	22.44	14.84	-2.00	28.42		249.37	40.57	67.68

SUBSECT-18* PRINTING, PUBLISHING, ETC. (242)

PERIOD	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1981-1982	10.18	11.90	8.51	18.62	6.51	8.54		166.59	105.26	-42.73

SUBSECT-19* FERTILIZER, INSECTICIDES (244)

PERIOD	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967-1968	20.64	72.37	8.20	5.31	3.84	-4.74	51150.00	16823.81	925.00	17011.11
1968-1969	36.10	40.46	34.81	9.54	20.33	24.13		-93.56	-37.49	-49.77
1969-1970	18.09	28.04	11.01	37.64	18.51	78.04		273.48	-78.53	-66.97
1970-1971	3.83	0.59	12.87	7.52	8.49	-89.82		17.85	-93.92	-58.06
1971-1972	19.17	0.68	14.30	20.96	2.51	107760.06		-43.37	11203.45	978.69
1972-1973	8.72	-20.10	-0.67	20.84	3.79	-13.61		-34.65	-84.23	-78.73
1973-1974	48.86	46.87	48.20	13.12	5.28	62.55		-43.26	-6.58	1.07
1974-1975	13.49	-2.42	15.85	8.96	-3.41	39.17		70.49	-4.97	28.22
1975-1976	-2.91	26.18	-13.27	9.99	2.04	-2.69		-24.52	-35.40	-52.09
1976-1977	12.03	23.03	11.31	17.47	6.76	-12.26		721.02	35.41	157.27
1977-1978	12.27	13.42	13.61	9.03	4.97	-3.22		-79.36	1.25	-44.48
1978-1979	0.04	-21.75	10.00	17.99	1.55	-4.86		369.55	27.55	112.91
1979-1980	41.27	18.82	49.54	18.97	9.18	25.51		-21.54	74.45	14.61
1980-1981	31.04	39.62	28.36	30.31	8.71	39.14		166.12	44.00	81.30
1981-1982	14.28	-9.14	20.67	20.44	2.72	12.43		82.67	-65.95	17.48

SUBSECT-20* PAINTS, VARNISHES, FILLERS (246)

PERIOD	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967-1968	19.30	38.68	13.86	11.45	12.56	-3.28	154.55	128.57	-58.33	87.80
1968-1969	-3.40	-18.64	4.70	5.95	19.68	-7.63		-28.79	65.63	13.64
1969-1970	27.88	45.83	16.44	25.00	2.54	75.69		-81.71	-45.28	-56.00
1970-1971	14.35	21.85	8.94	12.93	3.47	27.68		93.10	118.18	85.71
1971-1972	16.35	26.96	13.21	20.24	13.90	-1.43		-86.67	-39.29	-48.25
1972-1973	11.07	12.52	11.58	7.72	-3.23	0.41		800.00	0.00	14.86
1973-1974	29.20	12.63	39.70	8.65	6.38	27.48		922.22	-50.00	148.24
1974-1975	6.48	21.02	0.97	5.82	-16.08	-9.89		-30.13	270.59	-4.74
1975-1976	-13.71	-12.34	-13.27	-7.12	-9.58	-26.62		-96.43	-66.67	-74.13
1976-1977	6.20	-4.17	11.58	9.15	-0.72	17.40		600.00	-52.38	125.00
1977-1978	-7.81	7.73	-15.88	3.51	-10.61	-2.81		38.29	103.80	20.51
1978-1979	25.84	29.32	21.83	17.58	-1.21	-6.64		-28.48	75.00	-34.75
1979-1980	30.46	9.08	42.40	32.98	4.71	71.10		-1175.00	665.71	223.91
1980-1981	37.72	42.14	35.58	33.28	16.44	35.25			-6.72	78.19
1981-1982	21.58	69.50	-5.35	13.32	-1.34	20.02		-36.84	34.40	-4.33

ANNUAL GROWTH RATES (CURRENT PRICES): 33 SUBSECTORS AND TOTAL

SUBJECT-21* SOAPS, DETERGENTS, TOILETRIES, PHARM. (247)

PERIOD	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967-1968	12.68	6.38	14.52	12.47	11.84	24.98	115.34	65.29	-101.02	50.78
1968-1969	6.82	6.05	5.13	6.14	7.54	15.50	-29.23	-29.25	4.17	-3.21
1969-1970	18.61	24.01	6.28	14.25	9.27	22.19	46.22	-7.42	-39.68	11.69
1970-1971	14.74	-8.60	33.50	13.26	8.08	21.03	-62.23	-6.49	2.63	-39.00
1971-1972	10.74	23.99	3.11	11.41	3.50	9.17	30.53	-21.63	97.44	15.79
1972-1973	14.02	17.53	12.98	15.12	3.42	9.10	-37.10	41.15	-3.25	-3.03
1973-1974	29.36	22.51	40.76	21.97	7.03	8.86	89.10	50.55	124.83	80.21
1974-1975	17.78	21.37	13.45	19.77	5.07	2.15	46.78	91.91	48.06	64.93
1975-1976	-2.25	-8.79	-3.76	3.28	-9.90	-7.57	-10.16	60.54	-27.22	17.41
1976-1977	-1.25	-1.39	-2.67	8.67	-4.95	17.62	2.83	-61.26	-42.11	-45.42
1977-1978	5.65	8.35	4.30	7.13	-2.25	4.20	-69.00	-12.94	127.27	-6.75
1978-1979	16.74	24.70	14.39	9.43	-3.63	5.81	273.39	60.61	-55.16	32.65
1979-1980	43.23	27.73	38.72	20.82	9.25	105.19	-60.69	91.78	57.75	34.41
1980-1981	31.42	44.82	39.70	33.25	12.95	-14.28	598.90	63.09	146.43	132.02
1981-1982	8.73	15.17	1.15	25.42	1.48	21.76	202.12	128.36	76.21	140.12

SUBJECT-22* MATCHES, INKS, GLUES, AND CHEM. N.E.C. (248)

PERIOD	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967-1968	8.47	3.81	8.83	-4.60	-17.73	26.23	112.50	0.00	-20.00	23.81
1968-1969	10.67	3.98	18.26	13.91	8.00	13.51	98.53	-15.63	4.17	37.18
1969-1970	13.70	10.06	18.01	13.52	8.02	13.27	-28.89	42.59	-28.00	-10.75
1970-1971	14.36	-4.53	14.88	14.92	9.33	18.59	-46.88	-12.99	-5.56	-29.32
1971-1972	12.53	11.88	18.25	14.36	-8.36	-0.85	-117.65	-68.66	82.35	-68.15
1972-1973	10.62	11.80	10.88	7.97	11.60	5.67		-33.33	16.13	-165.12
1973-1974	25.43	23.79	29.53	21.54	4.09	17.72	211.54	3000.00	19.44	45.22
1974-1975	13.39	9.20	20.19	21.88	15.06	4.56	-52.20	-37.65	-37.88	-46.29
1975-1976	24.56	7.12	36.82	41.16	34.57	43.20	-39.48	-51.49	21.95	-39.49
1976-1977	-2.00	-2.95	-7.63	2.42	-13.85	-4.15	-0.00	-5.39	9.76	62.38
1977-1978	15.04	26.55	10.79	0.80	0.00	16.68	23.89	-13.36	-61.90	-6.34
1978-1979	28.02	20.33	37.56	14.19	-0.25	11.25	148.88	1.32	233.38	83.30
1979-1980	20.47	18.56	23.68	28.71	5.17	11.25	-23.78	100.87	238.75	33.45
1980-1981	33.52	46.41	25.01	22.28	1.05	24.29	-2.78	102.81	61.25	36.21
1981-1982	10.29	7.28	10.73	19.52	10.07	24.53	26.95			

SUBJECT-23* BASIC CHEMICALS, PETROLEUM PRODS. (243,250,25)

PERIOD	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967-1968	13.31	58.49	-3.77	-18.65	-3.77	-9.69	13.89	-5.71	-86.11	-18.04
1968-1969	31.70	25.73	39.06	22.22	17.32	30.00	-70.73	-13.64	108.00	51.26
1969-1970	22.78	18.61	29.91	13.81	9.49	16.51	641.67	78.07	38.98	102.16
1970-1971	4.88	-4.53	7.63	7.08	3.05	18.52	-176.40	-45.81	-86.59	-85.83
1971-1972	43.89	39.11	57.80	37.68	23.21	22.28		136.36	827.27	550.94
1972-1973	14.21	1.99	22.62	6.65	1.52	14.67		20.00	135.29	155.65
1973-1974	47.62	85.45	35.99	34.41	17.19	17.44	-62.42	45.83	-30.83	-15.53
1974-1975	16.34	11.57	22.44	16.08	8.71	8.66	173.39	-77.80	-13.86	72.99
1975-1976	-8.39	-16.81	-1.01	-15.62	-26.30	-13.14	-84.96	-17.06	-20.28	-35.24
1976-1977	2.08	31.27	-17.66	16.81	6.68	10.31	131.37	-62.15	-28.95	-45.69
1977-1978	-1.70	-19.95	-19.68	-5.98	-1.45	17.51	164.41	14.17	-28.40	45.37
1978-1979	10.84	11.61	19.17	13.83	4.66	-9.04	9.29	4.83	10.34	7.42
1979-1980	108.80	86.52	132.07	39.33	-1.17	100.07	-3.52	1390.46	217.19	613.96
1980-1981	37.49	40.55	53.70	25.81	-0.71	-23.82	-6.08	-75.99	125.62	-63.39

SUBJECT-23* BASIC CHEMICALS, PETROLEUM PRODS. (243,250,25)

PERIOD	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1981-1982	13.41	-38.20	45.92	22.29	5.14	26.41	133.01	-29.78	-19.87	-0.11

SUBJECT-24* RUBBER PRODUCTS (253)

PERIOD	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967-1968	11.27	12.00	11.73	13.80	5.08	5.59	-34.95	169.05	-60.00	35.23
1968-1969	22.10	19.42	22.28	19.82	21.42	34.83	182.84	1.77	108.25	51.26
1969-1970	9.37	2.50	11.98	15.95	8.59	28.59	54.09	123.48	108.06	89.72
1970-1971	14.22	28.12	0.82	9.80	4.96	17.27	-7.97	7.13	-45.59	-1.32
1971-1972	16.73	18.88	19.06	12.16	5.87	0.33	-36.08	20.58	86.49	2.00
1972-1973	8.00	12.28	7.85	6.62	5.85	-10.38	-21.61	-59.34	-26.09	-49.16
1973-1974	33.22	7.56	63.95	18.82	8.58	33.67	48.56	10.62	33.33	25.46
1974-1975	20.55	23.37	19.29	13.19	9.16	14.80	-54.02	15.63	-17.65	-15.62
1975-1976	9.17	-8.81	-5.24	8.47	0.05	8.36	-50.00	9.27	241.07	13.38
1976-1977	7.14	8.17	10.44	6.24	12.84	-6.87	-45.78	-44.17	-45.03	-44.34
1977-1978	1.63	0.85	-0.17	11.97	-2.70	17.19	55.56	15.19	-29.52	8.57
1978-1979	38.49	43.83	39.05	25.13	17.73	13.81	211.43	63.19	32.43	79.29
1979-1980	28.70	32.74	21.36	26.81	6.31	31.04	-46.33	110.61	67.35	68.32
1980-1981	28.86	20.10	25.66	29.24	5.22	70.89	814.53	66.51	48.78	122.09
1981-1982	4.17	-7.57	3.32	18.32	-3.95	52.34	-89.25	60.25	32.79	11.15

SUBJECT-25* PLASTIC PRODUCTS (255)

PERIOD	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967-1968	22.45	42.06	13.35	27.28	24.69	-1.27	-63.64	106.25	15.79	66.42
1968-1969	13.55	6.06	18.83	8.42	4.49	31.70	-37.50	27.78	95.45	32.02
1969-1970	14.24	14.52	14.30	7.77	4.15	12.72	1780.00	2.77	-2.33	32.23
1970-1971	28.33	27.03	29.85	21.98	8.96	26.56	311.70	622.31	-50.00	474.62
1971-1972	23.84	23.24	20.63	17.67	18.75	33.61	-73.39	-35.38	18.18	-57.72
1972-1973	48.84	39.80	15.89	22.73	0.59	0.72	-73.79	-18.74	334.62	-15.10
1973-1974	8.00	12.28	7.85	6.62	5.85	-10.38	-21.61	-59.34	-26.09	-49.16
1974-1975	33.22	7.56	63.95	18.82	8.58	33.67	48.56	10.62	33.33	25.46
1975-1976	20.55	23.37	19.29	13.19	9.16	14.80	-54.02	15.63	-17.65	-15.62
1976-1977	9.17	-8.81	-5.24	8.47	0.05	8.36	-50.00	9.27	241.07	13.38
1977-1978	7.14	8.17	10.44	6.24	12.84	-6.87	-45.78	-44.17	-45.03	-44.34
1978-1979	1.63	0.85	-0.17	11.97	-2.70	17.19	55.56	15.19	-29.52	8.57
1979-1980	38.49	43.83	39.05	25.13	17.73	13.81	211.43	63.19	32.43	79.29
1980-1981	28.70	32.74	21.36	26.81	6.31	31.04	-46.33	110.61	67.35	68.32
1981-1982	28.86	20.10	25.66	29.24	5.22	70.89	814.53	66.51	48.78	122.09
1981-1982	4.17	-7.57	3.32	18.32	-3.95	52.34	-89.25	60.25	32.79	11.15

ANNUAL GROWTH RATES (CURRENT PRICES): 33 SUBSECTORS AND TOTAL

SUBJECT-26* STRUCTURAL CLAY PRODS. INCL. BRICKS (258)

PERIOD	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967-1968	42.71	50.00	40.21	43.37	42.54	11.65	170.37	218.52	11.76	150.70
1968-1969	17.00	15.61	21.80	15.98	14.09	11.45	12.33	-31.40	144.74	5.34
1969-1970	15.91	13.34	16.93	12.65	6.21	30.82	207.32	100.85	2.15	122.93
1970-1971	15.92	17.03	6.11	15.54	7.36	39.03	-31.15	-8.86	-25.26	-24.16
1971-1972	27.87	22.66	39.52	21.77	11.35	27.74	-20.46	96.30	0.00	21.61
1972-1973	4.97	1.41	15.03	18.10	2.61	-2.86	-7.97	-55.90	32.39	-30.61
1973-1974	3.36	-3.31	13.02	4.35	-5.94	8.97	37.80	159.36	140.43	98.32
1974-1975	0.41	-4.94	12.70	8.47	-4.61	-13.39	-16.29	63.30	-63.72	-47.88
1975-1976	-32.25	-34.53	-34.01	-33.58	-42.08	-13.48	-17.67	-79.78	-65.85	-73.78
1976-1977	-13.50	-16.63	-11.96	-23.03	-25.71	-6.23	-63.86	-41.67	-46.43	-55.17
1977-1978	20.27	29.51	7.78	10.00	18.86	25.17	30.00	290.48	880.00	312.31
1978-1979	39.06	44.35	47.42	45.24	8.77	-0.70	661.54	118.29	48.30	159.70
1979-1980	30.04	30.40	32.47	52.98	13.39	19.13	35.35	26.82	5.05	23.28
1980-1981	17.94	17.37	12.25	26.48	-1.01	44.75	-83.83	-4.41	55.02	-25.87
1981-1982	-6.13	-11.33	2.81	12.16	-6.82	-11.17	141.54	-39.17	37.75	22.17

SUBJECT-27* GLASS, CEMENT ETC. (256,257,259,260)

PERIOD	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967-1968	26.82	31.63	22.43	10.74	11.27	13.85	197.83	-1.24	-44.38	1.94
1968-1969	11.70	16.80	7.18	18.20	14.14	-3.78	271.53	48.32	217.17	148.10
1969-1970	21.91	22.04	21.50	17.48	-10.43	23.74	-23.97	49.29	-68.79	-13.95
1970-1971	16.47	12.59	21.17	15.93	42.18	23.38	-21.71	-18.98	198.98	1.09
1971-1972	18.90	24.09	12.99	17.93	9.20	10.67	73.93	370.49	36.86	187.10
1972-1973	20.82	16.70	27.17	10.03	18.95	18.95	8.39	-4.88	-81.80	-12.67
1973-1974	18.45	6.79	34.34	7.26	2.44	17.96	-31.94	-63.05	543.84	-38.83
1974-1975	9.73	1.12	16.11	19.81	0.89	36.67	73.85	86.46	11.28	60.80
1975-1976	1.02	1.56	-0.23	8.66	3.22	6.85	150.88	1070.50	-59.85	589.10
1976-1977	-5.27	-0.22	-10.10	-0.68	-6.84	-5.31	-67.31	-92.70	-10.48	-89.11
1977-1978	-10.54	-6.98	-15.47	-2.90	-12.94	-2.53	-88.13	62.74	179.93	31.47
1978-1979	20.75	22.08	23.00	10.94	0.33	-2.29	143.94	293.42	-22.05	-59.47
1979-1980	33.78	35.98	30.58	25.59	9.67	38.96	796.89	400.59	103.73	344.12
1980-1981	46.28	48.11	44.94	45.59	13.66	39.98	0.83	-14.51	167.28	18.59
1981-1982	11.12	14.44	4.82	25.89	3.16	27.43	-27.88	-38.90	-55.18	-42.51

SUBJECT-28* NON-FERROUS, IRON, STEEL (BASIC) (262,264)

PERIOD	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967-1968	11.59	-57.88	1151.11	10.12	7.26	-20.74	-6.99	13.87	261.67	17.31
1968-1969	16.88	36.70	7.14	3.80	-5.20	1.04	-14.04	316.87	-18.89	213.34
1969-1970	43.46	66.84	26.95	17.87	12.29	52.16	-54.23	-68.59	18.75	-65.31
1970-1971	20.75	31.88	12.27	21.52	13.12	-2.90	1277.07	162.13	28.71	230.54
1971-1972	11.72	-2.32	25.55	20.06	10.52	29.84	-36.08	-17.50	49.44	-20.62
1972-1973	27.89	36.62	20.44	24.22	15.19	32.27	161.65	804.46	370.65	618.16
1973-1974	38.00	43.23	30.25	29.24	21.61	82.00	40.93	3.48	-80.55	2.55
1974-1975	29.58	18.00	41.84	23.32	13.04	25.76	71.19	-0.90	117.39	9.01
1975-1976	5.27	4.84	4.17	17.21	3.01	23.66	-15.14	-81.82	-29.75	-68.03
1976-1977	-9.18	-25.31	4.40	-2.27	-8.12	-5.96	57.77	34.11	32.21	46.15
1977-1978	16.19	59.36	-9.25	6.52	-6.32	3.03	-65.48	-73.35	-63.53	-68.63
1978-1979	31.41	26.48	38.41	16.78	5.62	14.40	-118.15	64.21	-59.47	-59.47
1979-1980	28.02	8.96	41.36	31.06	9.35	96.06	120.38	120.38	981.44	379.35
1980-1981	-4.82	-17.02	2.19	16.04	3.43	15.56	116.41	44.67	-48.43	61.99

SUBJECT-28* NON-FERROUS, IRON, STEEL (BASIC) (262,264)

PERIOD	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1981-1982	-5.22	-22.80	4.87	12.85	0.14	-12.78	-60.59	-61.42	56.83	-57.95

SUBJECT-29* METAL PRODUCTS, MACHINERY (268)

PERIOD	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967-1968	15.58	24.58	8.58	25.03	17.85	19.26	-23.53	65.83	33.53	34.71
1968-1969	31.87	25.78	38.37	18.84	18.50	21.95	159.17	11.42	35.06	39.81
1969-1970	31.08	28.13	35.26	17.34	11.92	27.61	-5.25	-2.40	109.82	9.49
1970-1971	23.64	33.54	15.29	28.73	17.32	34.98	61.93	102.13	-24.01	63.35
1971-1972	13.75	7.37	18.57	19.21	12.57	30.53	-10.34	-18.88	20.52	-12.52
1972-1973	14.06	21.74	8.49	12.24	9.44	13.17	49.71	12.17	-29.88	16.86
1973-1974	20.95	22.36	36.22	25.38	13.04	30.71	-8.09	61.64	97.14	39.42
1974-1975	4.89	8.27	-0.22	14.23	0.18	15.74	-78.66	-1.52	-2.42	-16.95
1975-1976	-4.45	-4.54	-2.21	0.52	-9.97	0.11	-45.51	-10.02	-47.28	-26.38
1976-1977	-7.08	-7.91	-6.92	-4.98	-8.07	-4.46	-27.13	-30.49	54.69	-23.44
1977-1978	7.92	10.67	5.58	2.86	-3.66	8.41	-103.78	21.24	-3.49	-14.00
1978-1979	20.79	23.05	22.14	12.75	4.32	4.72	159.77	10.33	36.01	37.96
1979-1980	34.47	37.66	28.72	32.84	14.58	51.67	159.77	126.11	73.87	122.96
1980-1981	36.90	38.66	44.87	40.64	7.69	20.00	69.64	21.14	112.83	41.68
1981-1982	7.03	6.13	4.20	13.29	-0.57	28.09	57.87	6.14	-24.18	12.25

SUBJECT-30* ELECTRICAL MACHINERY/EQUIPMENT (278,279)

PERIOD	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967-1968	-12.75	-6.17	-17.87	-12.70	6.02	6.76	-25.21	-10.13	23.68	-14.70
1968-1969	18.70	22.78	16.51	42.54	10.79	15.29	-15.47	-23.47	53.19	-12.02
1969-1970	23.27	18.46	26.44	18.19	6.19	22.59	29.41	114.72	62.89	47.94
1970-1971	9.27	8.79	8.10	17.81	14.26	25.93	59.60	8.25	-219.23	35.54
1971-1972	7.18	10.06	5.01	11.81	-1.75	11.30	-68.18	4.49	-25.30	-26.99
1972-1973	19.88	22.23	21.95	17.71	-3.95	-13.28	113.64	46.46	12.90	55.81
1973-1974	41.76	13.57	59.97	24.39	12.67	39.86	14.89	41.55	107.14	39.66
1974-1975	-3.46	10.55	-11.41	8.04	-1.88	20.07	80.37	-23.87	-35.17	2.43
1975-1976	-9.09	-2.21	-15.91	4.41	-12.50	22.92	-52.18	57.44	45.74	12.44
1976-1977	6.60	3.46	4.70	18.38	3.34	23.04	82.95	-14.83	8.03	1.03
1977-1978	4.69	1.81	6.64	1.92	-5.60	1.93	-68.59	-20.00	-14.19	-33.28
1978-1979	14.65	7.71	19.48	32.34	13.09	11.21	83.33	28.13	12.60	34.25
1979-1980	33.91	54.84	24.31	3.95	6.45	18.44	386.82	46.81	115.38	115.08
1980-1981	27.90	32.08	24.42	27.90	0.59	32.08	-63.59	162.34	28.57	55.32
1981-1982	17.57	21.54	11.76	21.56	0.24	37.95	94.62	-48.19	73.23	-22.74

ANNUAL GROWTH RATES(CURRENT PRICES): 33 SUBSECTORS AND TOTAL

SUBJECT-31* MOTOR VEHICLES(283)

PERIOD	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967-1968	-0.99	166.67	-30.40	-5.27	6.30	16.57	150.00	-14.10		44.27
1968-1969	132.48	105.31	154.85	39.79	40.33	94.67	-10.91	37.31	3.03	14.08
1969-1970	5.78	-0.08	9.06	13.50	10.27	3.26	152.04	8.70	-38.24	48.10
1970-1971	30.11	43.64	25.41	19.25	18.31	12.25	-57.49	0.00	61.90	-27.56
1971-1972	10.59	16.84	6.89	17.74	8.11	14.29	236.19	71.50	185.29	139.92
1972-1973	-7.99	-9.12	-7.94	4.47	-0.11	-1.08	-63.74	-51.02	-28.87	-33.87
1973-1974	14.61	27.85	7.45	11.73	6.21	8.76	165.63	225.60	-4.35	161.10
1974-1975	40.79	5.99	61.78	36.83	20.60	73.19	-75.26	-58.63	-10.61	5.14
1975-1976	-8.40	28.68	-24.23	4.78	-7.89	-18.44	-57.34	128.48	-76.27	45.78
1976-1977	-5.48	-9.52	-1.77	-3.40	-10.77	-10.62	95.08	138.26	192.86	132.29
1977-1978	-5.81	-1.52	-10.32	-2.69	-6.31	8.26	95.08	138.26	146.34	47.78
1978-1979	18.48	21.90	15.74	17.38	1.17	19.08	95.80	-25.30	60.40	-3.55
1979-1980	46.83	32.63	62.01	29.91	17.55	19.79	131.76	101.47	-12.96	90.76
1980-1981	51.42	57.26	47.45	30.72	17.57	51.71	140.93	39.37	44.68	86.26
1981-1982	22.96	7.00	34.63	29.26	7.70	21.22	5.07	52.44	24.02	31.56

SUBJECT-32* OTHER VEHICLES ETC.(282,284,285,286)

PERIOD	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967-1968	24.08	3.88	37.10	1.31	14.30	40.96	121.28	48.61	41.87	74.05
1968-1969	13.34	21.29	10.98	66.39	-15.13	-2.91	-87.50	13.08	570.59	8.77
1969-1970	-1.57	4.81	6.11	-21.78	-0.35	3.24	100.00	35.54	193.86	111.69
1970-1971	46.62	43.58	52.31	25.06	24.98	18.84	561.54	50.61	-87.76	0.38
1971-1972	29.62	22.65	32.80	38.94	38.77	43.50	110.47	15.38	-8.33	41.56
1972-1973	66.15	44.83	74.41	33.78	9.60	109.21	-100.00	-45.96	-86.87	-77.61
1973-1974	10.30	-4.79	23.87	4.88	-1.40	-35.75	-78.75	88.96	523.08	728.74
1974-1975	-13.90	29.99	-31.47	9.50	-2.94	-5.06	-29.77	-34.92	67.01	-48.34
1975-1976	-10.92	-12.84	-12.84	-2.00	-24.24	23.86	104.64	59.93	37.23	-20.00
1976-1977	26.29	-8.19	39.99	-6.83	3.06	34.49	104.64	59.93	-60.47	44.76
1977-1978	-13.33	-13.67	-18.37	3.29	-1.87	11.57	-42.07	-33.83	-86.27	-40.48
1978-1979	6.87	49.09	-8.53	28.22	29.11	-26.07	-90.50	-33.33	3000.00	-10.75
1979-1980	-22.39	-33.23	-15.00	-38.17	-46.77	-12.18	1500.00	-70.39	-12.96	-18.41
1980-1981	1.35	-5.42	2.67	-9.23	21.13	22.26	475.37	303.28	129.63	421.73
1981-1982	46.06	20.68	65.39	30.20	-10.73	20.45	-57.41	121.85	185.48	-50.77

SUBJECT-33* OTHER MANUFACTURING(231,290,291)

PERIOD	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967-1968	17.84	25.73	11.94	14.75	28.03	15.24	-17.24	-50.88	146.15	-25.23
1968-1969	15.55	15.05	12.42	18.63	21.76	27.11	-116.67	103.57	-15.63	-13.88
1969-1970	16.16	13.93	18.98	13.03	7.24	14.30	560.00	67.54	11.11	86.82
1970-1971	15.67	17.27	17.42	19.54	5.82	6.14	-64.92	-53.33	-53.33	-11.62
1971-1972	23.73	20.71	23.17	23.50	18.89	34.73	-87.88	122.39	214.29	-1.88
1972-1973	19.73	29.85	12.92	9.78	-9.66	12.49	2856.25	10.07	38.64	233.97
1973-1974	20.19	7.01	32.61	15.13	11.25	24.47	-50.32	77.44	27.87	-13.47
1974-1975	5.58	22.41	-5.50	14.24	-0.81	-4.55	64.68	-26.46	11.54	13.91
1975-1976	0.07	-1.89	0.34	-2.50	-4.10	6.01	-45.22	4.21	-43.68	-29.84
1976-1977	10.83	4.34	19.03	12.47	14.66	7.13	-41.04	68.61	16.33	15.56
1977-1978	16.63	10.61	25.54	6.07	-3.23	3.20	-45.60	-34.57	-29.82	-34.83
1978-1979	27.15	21.39	31.23	18.23	4.26	29.91	23.53	264.23	225.00	205.79
1979-1980	38.81	42.58	40.31	37.65	12.46	20.91	91.67	66.18	33.85	64.32
1980-1981	36.64	28.86	43.03	35.13	-0.03	35.01	-6.21	-4.16	45.40	0.60

SUBJECT-33* OTHER MANUFACTURING(231,290,291)

PERIOD	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1981-1982	-6.70	-1.17	-12.70	10.91	6.83	3.90	-96.69	-3.43	19.76	-8.17

SUBJECT-34* TOTAL MANUFACTURING

PERIOD	GROSS OUTPUT	VALUE ADDED	TOTAL PURCHASES	WAGES	LABOUR	SERVICES PAYMENTS	INVESTMENT: LAND,BUILDING	INVESTMENT: PLANT	INVESTMENT: VEHICLES	INVESTMENT: TOTAL
1967-1968	11.81	1.91	18.28	10.41	7.76	12.51	52.36	93.85	9.41	72.36
1968-1969	28.47	20.12	28.61	26.95	26.20	25.19	42.09	23.21	75.81	31.79
1969-1970	17.93	22.86	15.17	13.95	8.17	16.01	10.82	-23.06	31.97	-8.34
1970-1971	16.29	17.65	18.02	17.11	11.95	11.88	20.56	38.64	-2.75	26.89
1971-1972	19.89	19.99	19.77	14.34	8.58	21.69	-17.40	24.83	16.42	9.95
1972-1973	16.28	19.49	19.78	14.55	4.82	9.88	42.95	89.64	36.98	72.65
1973-1974	24.53	22.16	25.40	18.62	7.36	28.96	96.12	27.38	10.08	40.14
1974-1975	10.03	9.50	9.42	15.62	2.70	17.85	42.35	15.40	27.93	23.92
1975-1976	2.88	1.62	3.31	6.47	-3.54	5.12	-41.91	-35.74	-28.99	-37.36
1976-1977	1.89	-0.82	3.15	4.27	-3.68	1.58	-9.94	-39.13	-8.09	-27.71
1977-1978	7.70	12.82	3.94	8.93	-2.42	15.81	-38.89	-12.80	5.44	-21.03
1978-1979	21.07	23.56	21.43	21.52	6.07	8.48	-22.30	24.12	32.89	11.83
1979-1980	28.49	25.99	28.91	24.70	9.04	36.94	222.74	129.52	103.79	143.95
1980-1981	28.89	28.23	23.60	32.15	7.59	28.43	75.82	64.63	51.58	66.03
1981-1982	12.03	4.50	15.57	18.00	1.90	19.34	-18.87	-21.03	-1.51	-17.91

ANNEX J

QUESTIONNAIRE FORM

THIS FORM WAS SENT TO A SELECTED NUMBER OF MANUFACTURERS IN ZIMBABWE
AND THE RESULTS ARE REFLECTED IN VOL. II OF THE STUDY.

STRICTLY
CONFIDENTIAL

THE MINISTRY OF INDUSTRY & TECHNOLOGY,
UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANISATION
AND THE CONFEDERATION OF ZIMBABWE INDUSTRIES

STUDY OF THE MANUFACTURING SECTOR IN ZIMBABWE

QUESTIONNAIRE ON INTERLINKAGES, CAPACITY UTILISATION
AND TECHNOLOGICAL CAPABILITIES IN THE MANUFACTURING SECTOR

Please return this at the latest by Friday 22 March 1985 to

Study Team
Confederation of Zimbabwe Industries
PO Box 3794
Harare

Please telephone Harare 702431 if you have any question or difficulty.
We thank you very much for your cooperation in this matter.

SECTION A

NAME AND ADDRESS OF COMPANY

Name and telephone number of the person to whom questions should be directed
relating to this study:

name _____

telephone number _____

3. Industrial classification

Indicate in the table under which sub-sector your company is classified.

If your operations cover more than one sub-sector, indicate in the right-hand column the percentage of total turnover attributable to each relevant sub-sector.

Sub-Sector	Tick the appropriate category	Percentage of turnover
1. Slaughtering and processing of meat		
2. Canning and preserving, fruit and vegetables		
3. Grain mill products and animal feeds		
4. Bakery products		
5. Chocolate and sugar confectionery		
6. Dairy and other food products		
7. Beer, wine and spirits		
8. Soft drinks and carbonated waters		
9. Tobacco products including post-auction grading and packing		
10. Cotton ginning, spinning, weaving, finishing textiles and carpets		
11. Knitted products, rope and cordage		
12. Other textile products		
13. Wearing apparel		
14. Footwear		
15. Sawmilling and wooden products except furniture		
16. Furniture and fixtures except primarily of metal		
17. Pulp, paper, paperboard and their products		
18. Printing, publishing and allied industries		
19. Fertilizers, insecticides and pesticides		
20. Paints, varnishes and filling materials		
21. Soaps, detergents, toilet preparations and pharmaceuticals		
22. Matches, inks, candles, glues, polishes and other chemical products n.e.c.		
23. Basic industrial chemicals, petroleum products and gases		

continued...

3. continued

Sub-Sector	Tick the appropriate category	Percentage of turnover
24. Rubber products		
25. Plastic products		
26. Structural clay products including bricks		
27. Glass, cement and associated products and other non-metallic mineral products		
28. Non-ferrous metal and iron and steel basic industries including smelting (iron and steel only)		
29. Metal products, machinery and equipment other than electrical except vehicles		
30. Electrical machinery and equipment, radio, and communication equipment		
31. Motor vehicles, including reconditioning		
32. Other vehicles and equipment including repairs		
33. Other manufacturing industries		

4. Turnover

The figure for turnover required here excludes sales of goods not produced on your premises.

Record in the table the total value of turnover for the years specified.

Value of	1981-1982	1982-1983	1983-1984
turnover			

The boxes refer to the Censuses of Production carried out by the Central Statistical Office.

Please give the turnover figures for the same periods as those for which you completed the census returns.

Does the figure include sales and excise taxes? *YES ___ *NO ___

What is the total amount of sales and excise taxes? _____

(please circle as appropriate)

SECTION B

SOURCES AND TYPES OF INPUTS AND DESTINATION OF OUTPUTS

In this section we wish to trace the source of purchase of all raw materials, fuel and energy inputs used in the production process, whether purchased for production for the domestic market or for export.

5. Year to which data provided applies

We would like information on the origin of raw material inputs for your financial year 1982-1983. However, if the 1982-1983 information is not readily available, please indicate the year to which the information applies in the table.

Does the information refer to your financial year 1982-1983? (Please circle appropriate box.)	YES	NO
If not, then specify the year to which it does refer.		

6. Source of raw material, fuel and energy inputs

Indicate in the table the source, domestic or foreign, of raw materials used in 1982-1983 or other specified year.

Foreign goods that happen to be bought from a local agent or distributor should still go in under imports.

Source	Value \$	Percentage
Local*		
Imported		
Total		100

* Assume all fuel and energy purchases are local purchases.

(The total should be the same as the Census of Production Section II, items 2 to 6 (old form) and items 5.1 to 5.4 [new form])

7. Channel for receipt of raw materials that are imported

Indicate in the table the channel through which imported raw materials were received.

Channel for receipt of imports	Value \$	Percent
Industrial Import Control (including Export Revolving Fund)		
Commercial Import Control		
Commodity Aid Programmes		
No Currency Involved		

continued ...

7. continued

Channel for receipt of imports	Value \$	Percent
Other (please state)		
Total*		100

* should be the same as the total imported value in question 6.

8. Source of local raw material, fuel and energy inputs by sub-sector

Indicate in the table below the source by broad sub-sector of domestic raw material, fuel and energy inputs used in the production process. In responses to this and subsequent questions, estimates are quite acceptable should accounts analysis entail considerable extra work.

Source of domestic purchases	Value \$	Percent
From other manufacturers		
From the agricultural sector		
From the construction sector		
From the transport and communication sector		
Electricity and water purchases		
Petrol, diesel, furnace oil purchases		
From any other domestic source (specify)		
Total domestic input purchases*		100

* should be the same as the total in question 6.

9A. Source of local raw material purchases from within the manufacturing sector.

Indicate in the table below the value of domestic input purchased from the different categories of manufacturing sub-sectors specified. The total figure should be the same as that given for the value "from other manufacturers" in table 8. above.

Source of purchases from within the manufacturing sector	Value \$	Percent
1. Slaughtering and processing of meat		
2. Canning and preserving, fruit and vegetables		
3. Grain mill products and animal feeds		

continued...

9A. continued

Source of purchases from within the manufacturing sector	Value \$	Percent
4. Bakery products		
5. Chocolate and sugar confectionery		
6. Dairy and other food products		
7. Beer, wine and spirits		
8. Soft drinks and carbonated waters		
9. Tobacco products including post-auction grading and packing		
10. Cotton ginning, spinning, weaving, finishing textiles and carpets		
11. Knitted products, rope and cordage		
12. Other textile products		
13. Wearing apparel		
14. Footwear		
15. Sawmilling and wooden products except furniture		
16. Furniture and fixtures except primarily of metal		
17. Pulp, paper, paperboard and their products		
18. Printing, publishing and allied industries		
19. Fertilizers, insecticides and pesticides		
20. Paints, varnishes and filling materials		
21. Soaps, detergents, toilet preparations and pharmaceuticals		
22. Matches, inks, candles, glues, polishes and other chemical products n.e.c.		
23. Basic industrial chemicals, petroleum products and gases		
24. Rubber products		
25. Plastic products		
26. Structural clay products including bricks		
27. Glass, cement and associated products and other non-metallic mineral products		

continued ...

Source of purchases from within the manufacturing sector	Value \$	Percent
28. Non-ferrous metal and iron and steel basic industries including smelting (iron and steel only)		
29. Metal products, machinery and equipment other than electrical, except vehicles		
30. Electrical machinery and equipment, radio, and communication equipment		
31. Motor vehicles, including reconditioning		
32. Other vehicles and equipment including repairs		
33. Other manufactures (specify)		
Totals		100

9B Markets for the products you manufacture

In this part of the questionnaire we want to know where your products go.

Domestic market destination:

	Value \$	Percent
Agriculture sector (public and private)		
Mining sector (public and private)		
Construction sector (public and private)		
Other manufacturers (public and private)		
Utilities (power, transport, communications, public and private)		
Services (hotels, restaurants, finance, etc. public and private)		
Retailers/private households		
Other central and local government purchasers not already included above		
Other (please specify)		
Exports: (give countries of destination)		

Total*		100

*This total should be the same as the Census of Production, Section I, item 2 (old form) or Item 3.2 (new form)

(see NB on next page)

9B continued

NB - Wholesaler is not a category. If in fact you sell to wholesalers, please try instead to give the final destination of your products, i.e. the sector which actually uses them.

SECTION C

PLANT CAPACITY UTILIZATION

Plant capacity refers to the potential theoretical level of output that could be achieved from the present machinery installed, assuming no machinery breakdown, a complete range of spare parts, available machine operatives and optimum labour and skills, access to raw materials and the ability to sell all that is manufactured.

10. At what level of plant capacity are you at present operating?
Please circle:

100%	95 - 99%	90 - 94%	80 - 89%	70 - 79%
60 - 69%	50 - 59%	40 - 49%	30 - 39%	20 - 29%
10 - 19%	Less than 10%			

- 11. What has been the peak level of plant capacity achieved? 2
- 12. What year was the highest level achieved? 19
- 13. How many shifts a day did you work then? _____
- 14. What was the length in hours of these shifts? _____
- 15. How many shifts per week do your machines operate now? _____
- 16. Obstacles to increased capacity utilization

There is clearly a range of obstacles preventing you from achieving the full potential of your plant capacity. Indicate in the table the seriousness of each obstacle on a score of 0 - 10, 0 indicating that there is not an obstacle and 10 indicating that it is a fundamental constraint.

Type of constraint	Score from 1 to 10 indicating importance of constraint
Shortage of local raw materials	
Shortage of imported raw materials	
Lack of domestic market demand	
Lack of export market demand	
Machine breakdown	
Lack of machine spare parts	
Shortage of machine operatives	
Shortage of supervisory staff	
Shortage of machine repair personnel	
Shortage of other skilled labour	
Labour stoppages/ go-slows	
Cash flow difficulties	

continued...

16. continued

Type of constraint	Score from 1 to 10 indicating importance of constraint
Central or local government decision-making (be specific)	
Other (specify)	

SECTION D

*Please circle as appropriate

PLANT AND EQUIPMENT

17. Did you install additional plant/equipment after 1965? YES NO *

If so, pre independence post independence *

18. Percentage origin of major items of your capital stock (e.g. UK 70%)

19. Was the plant/equipment NEW or USED *

If it was used plant/ equipment, what was the reason for such a purchase?

20. In the case of Zimbabwe firms making the plant/equipment, give names:

21. Have you, by modification of existing production lines, been able to increase your output capacity? YES NO *

If your answer is yes, what was your approximate percentage output increase?

_____ %

22. List the new products made by your firm in the last five years as a result of your own inhouse production equipment/process modification.

SECTION E

MAINTENANCE FACILITIES AND SKILLS

23. Do you have your own machinery and equipment necessary for plant maintenance? YES NO *

24. If no, state your maintenance facility contractor(s)

25. If the answer to 23. is yes, list the main machinery and equipment available for plant maintenance:

Machinery/equipment	Approximate size/capacity
_____	_____
_____	_____
_____	_____

26. If you have spare maintenance capacity would you be willing to offer this service facility to other firms? YES NO *

27. Does your company undertake any of the following?
planned maintenance *
management by objectives
loss prevention systems

28. If your answer to question 27 is yes, what is the status of the person responsible?
professional engineer *
technical
skilled worker

29. Do you consider your plant is of current design and output:
in terms of the Zimbabwe market YES NO *
in terms of the PTA region market YES NO *
in terms of the South African market YES NO *
in terms of the overseas market YES NO *

30. Are there potential purchasers (in Zimbabwe) of your redundant equipment? YES NO *

SECTION F

RESEARCH AND DEVELOPMENT

31. Do you carry out market research in search of outlets for your perceived new products and/or new processes? YES NO *

32. Are you able to undertake any product/process or machinery design in page ten

33. Have you carried out any significant modification of process equipment leading to:

increased production	YES	NO *
greater plant/process reliability	YES	NO *
increased range of items produced	YES	NO *

34. Do you have an R & D budget? YES NO *

If so, can you express this as a percentage of your gross output?

_____ %

SECTION C

* circle as appropriate

PROCESS AND MANUFACTURING TECHNOLOGY

35. Is your process/manufacturing technology developed in house?

YES NO *

If yes, list the production/manufacturing technology involved:

36. Is your process/manufacturing technology obtained from a local consultant or licensors?

YES NO *

If yes, list the process/manufacturing technology involved:

37. Is your process/manufacturing technology obtained from a foreign licensor?

YES NO *

If yes, list the process/manufacturing technology involved:

If yes, from which countries? _____

What is the period of the license agreement? _____ years

What is the percentage royalty on the licence fee amount? _____ %

SECTION H

* Please circle as appropriate

INNOVATION

38. Does your firm sustain a budget for innovation with a reward system to all levels of personnel responsible for ideas that are put into production?

YES NO *

39. If your answer to 38. is no, have you considered introducing such a scheme?

YES NO *

41. If your answer is yes, what is this method and where is it being used at the moment?

42. Would this method use the same raw materials? YES NO *

43. If the answer is no, please specify the differences:

44. For each of the following items, please indicate whether the alternative method would use less, the same, or more of the item, compared to your present method, to produce the same quantity of product. (Please put an X as appropriate unless you have worked out figures on these questions, in which case put them in instead.)

	1	2	3
	less	same	more
1. Machine capacity			
2. Buildings/ space			
3. Professional staff			
4. Technical staff			
5. Semi-skilled labour			
6. Unskilled labour			
7. Energy use			
8. Licence fees			

45. If the alternative method involves the acquisition of different machinery or equipment, where would it come from?

LOCAL IMPORTED *

46. Would the alternative method involve acquiring skilled staff from abroad?

YES NO *

47. What are the main obstacles to your introducing this method?
