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Tunisia
Review of the Electrical and Mechanical Industries

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Regional Projects Department
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CURRENCY EQUIVALENT

Currency Unit	=	Tunisian Dinar (TD)
US$1.00	=	TD 0.40
TD 1.00	=	US$2.50

ABBREVIATIONS AND ACRONYMS

API	Agence de Promotion des Investissements
BDET	Banque de Développement Economique de Tunisie
CEPEX	Centre de Promotion des Exportations
CNEI	Centre National d'Etudes Industrielles

FISCAL YEAR

January 1 - December 31

TUNISIA

REVIEW OF THE ELECTRICAL AND MECHANICAL INDUSTRIES

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This report is based on the findings of a World Bank mission that visited Tunisia between February and March 1979 at the request of the Tunisian Government to review recent developments and prospects for the electrical and mechanical industries. The mission consisted of Mr. Francois Ettori (Chief of Mission), Miss Khanh Nguyen (Industrial Economist), and Messrs. Franco Batzella (Project Officer), Werner Schelzig (Country Economist), Hans Reichelt (Loan Officer), Michel Cognet (Financial Analyst), Harbaksh Sethi (Mechanical Engineer) and Seiffedine Bennaceur (Consultant, Electrical Engineer).

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TUNISIA

REVIEW OF THE ELECTRICAL AND MECHANICAL INDUSTRIES

SUMMARY AND CONCLUSIONS

Past Performance

i. The Electrical and Mechanical Industries (EMIs) in Tunisia were practically non-existent twenty years ago. The EMIs sector received one-third of total manufacturing investment during the 1960s and 11.5% on average during 1970-78. The large investments of the 1960s, mainly in the public sector, established a core of basic industries (steel mill, foundries). Growth of the sector was rapid during the 60s, but slowed down in the 70s. The sector remains small, representing 1.6% of GDP in 1978, and 14.5% of value added in manufacturing. EMIs contributed 13.5% to employment creation in manufacturing during 1970-1978, and they currently represent 2.2% of the total employment and 10.8% of manufacturing employment in the country. The sector is largely inward-oriented. Exports of EMI goods peaked at $40 million in 1974, representing 10% of manufactured exports and 4.5% of total exports. Subsequently they declined due largely to diminishing surpluses of lead and steel primary products (the subsector's major traditional exports) but their growth resumed in 1978 with the emergence of exports of electrical goods. EMIs enterprises are largely in the public sector. Public and semi-public enterprises account for most of the sector's large enterprises, and for about one-third of the sector's employment; they generate some two-thirds of the sector's output.

ii. After 1970, there was a concentration of public investment and new enterprises in assembly industries with lower investment costs per worker. These were import-substituting industries for consumer durable goods (automobiles, household appliances). Assembly industries rely primarily on imported components. Consequently the growth of value added and of labor productivity slowed down, averaging respectively 8.8% and 1.7% per annum during 1970-78; the global productivity of factors has not increased since 1973. The shift towards assembly industries has also led to insufficient sectorial integration and development and increasing pressures on the balance of payments because of growing imports of EMI intermediate and equipment goods. The ratio of value added to output decreased from over 30% in 1969/1970 to 26.5% in 1978, and the share of EMI goods in total imports increased from 35% in 1970 to 47% in 1978. A comparison with the industrialization pattern of similar countries indicates that EMIs are the most under-developed of Tunisia's manufacturing subsectors, thereby introducing in the structure of manufacturing an undesirable distortion which inhibit them from participating effectively in the country's industrialization process (Chapter I and Annex I).

Priority of the Sector

iii. The major reasons for the modest development of EMIs are their intrinsic complexity, the earlier existence of opportunities for the rapid

development of simpler or resource-based industries (textiles/clothing for exports, construction materials to meet a booming internal market, phosphate derivatives), and institutional and policy constraints. The continued rapid expansion of other major industrial subsectors is no longer possible because of market and resource constraints. Export outlets for textiles/clothing and phosphate products are becoming limited; local resources for food products and chemicals (other than phosphates) are insufficient or uncertain; and the output of construction materials will soon largely meet domestic demand. Further growth in the imports of EMI goods could impose a heavy burden on the balance of payments and constrain the expansion of the overall manufacturing sector; it is therefore necessary to develop a well-balanced EMI sector that can provide standard intermediate and equipment goods. For these reasons the Government intends to give priority to EMIs.

Potential and Prospects

iv. Tunisia has a comparative advantage in selected EMI production lines. The country has a labor force with relatively low wages and of increasing competence and quality; it is relatively close to and has preferential access to EEC and Middle East markets; and it has liberal policies towards foreign investment. On the other hand, the domestic market is small. To exploit its potential fully, Tunisia thus has to export. The potential for exports has already been harnessed in some areas by foreign enterprises (assembly of electronic and electro-mechanical goods and components) as well as by some local firms (electrical transformers, ship repair, cutlery). But exports can be expanded further; a review of the export-oriented firms assembling electrical and electronic products could identify new electrical hardwares and components that could be integrated into exported and local end-products.

v. There is also a potential for further efficient import-substitution of intermediate and capital goods with simple or intermediate technologies. Local enterprises manufacturing these goods have generally selected, and efficiently operated, labor-intensive technologies and have been competitive with European imports despite the small-scale of their operations and the penalizing indirect taxes levied on their local inputs. A first group of intermediate and capital goods identified for efficient import-substitution are those with domestic markets that are large enough to sustain economic operations; this group comprises, among others, ferrous castings, industrial boilers and furnaces, steel structures, agricultural implements, small earth-moving and construction equipment (dumpers, cement mixers), simple lifting and hoisting machinery (cranes, small industrial trucks), pumps and compressors, railroad freight cars, medium power electric motors and transformers, simple equipment for electric distribution and telephone (switchgears, switchboards). Some of these goods, in particular electro-mechanical machinery and heavy structures, also have established or potential export markets in neighboring Mediterranean countries where Tunisia's geographical proximity constitutes an advantage. The imports of these products totalled about D 100 million (US$250 million) in 1977; about D 55 million of these imports could be produced locally over the next few years. This represents currently 16% of total imports of EMI goods and 9% of the total imports of manufactured goods.

vi. A second group of goods with potential for development comprises some capital goods with a small domestic market. Efficient development in this area requires export outlets to absorb 30% to 50% of production. Only foreign partners can provide the necessary know-how in this category which includes mainly power engines, their components and parts, and some derived products (automotive agricultural machinery, tractors). Imports of all these products amounted to D 13.7 million (US$34 million) in 1977. The production of these goods at competitive prices depends essentially on the specific arrangements to be negotiated with foreign partners for export markets and would, if successfully achieved, entail a marked improvement in intrasectorial integration. 1/

vii. Local manufacturing of consumer end-products based on assembly operations is generally uncompetitive, weakly integrated in the sector and not labor-intensive, due to the inter-related disincentives resulting from protection and price control policies. Most enterprises manufacturing mechanical and electrical end-products should strive for higher efficiency and capacity utilization before expanding production or opening new production lines. However, some selected end-products such as hand tools, selected automobile accessories, mechanical and electrical hardware, sanitary fittings and small household electric appliances could be produced, and partly exported, at competitive prices under technical licensing arrangements with foreign associates which would provide know-how and market outlets in an approach similar to the one presently in existence for exports of cutlery.

viii. Further development of small scale industries (SSIs) in the EMI sector depends on the scope of intra-sectorial integration. Small EMIs with good technical and managerial know-how could play a significant role in supporting and complementing the larger industries and should shift their orientation from competition with large firms towards three general areas: (a) production of special goods and services for local needs; (b) production of selected intermediate goods and subcontracting work for large firms; and (c) maintenance/servicing of consumer goods and simple machinery. Typical activities relating to these three areas are respectively small foundries, small specialized machine shops and steel structure/platework enterprises, and standard machining and repair workshops.

Medium-Term Investment Program

ix. The lack of a long-term development strategy for the EMIs has resulted in an insufficient number of clearly identified project necessary to meet planned investment targets. The investment program for the sector for the period 1979-82 comprises 22 identified projects for a total investment of D 105 million (US$262 million), of which D 88 million have been allocated to

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1/ For example machined castings can be integrated into the engines, and the latter can in turn be integrated into the production of major items of the first group identified for local production (pumps and compressors, small earth-moving and construction equipment, lifting and hoisting machinery).

15 projects for import-substitution. The economic efficiency of these 15 projects is unclear or depends crucially on the success of negotiations with foreign partners for complementary exports. Ten other projects, suggested by the mission for further investigation with a focus on the efficient import-substitution of capital goods by the private or semi-public 1/ sector, could add D 33 million to the EMI investments during 1980-1983.

x. The combined investment program of D 138 million (US$345 million) comprises four broad groups of projects: 4 projects primarily oriented to exports, accounting for 10% of total investments; 10 projects designed to substitute efficiently for imports and representing 20% of investments; 6 other import-substituting projects (including a diesel engines project for a cost of D 36 million) requiring complementary export outlets conditional on finding foreign partners, and accounting for 40% of the investment program; and 12 projects of unclear or doubtful efficiency. A major share (62%) of this investment program would be undertaken by the private or semi-public sector. The first two groups comprise two sizeable projects for the expansion and modernization of a foundry and ship repair yard, which are prima facie suitable for external financing, subject to further feasibility studies and to adequate coordination and technical preparation; they would require a total investment of D 16.5 million (US$41 million) over three years. The success of these projects, as well as of the others in the investment program, would be conditional on the removal of the main sector constraints, and on the implementation of the priority measures recommended in para. xvi.

General Constraints and Issues in Manufacturing

xi. Before the potential developments outlined above can be fully exploited, various constraints will have to be removed. Some of these are specific to the EMIs while others are more general in nature and affect the whole manufacturing sector. The development of the manufacturing sector is affected essentially by productivity and efficiency problems due to two major sets of sectoral constraints. The first set, external to the enterprises, originates from the inadequacy of the policy and institutional framework to promote higher factor productivity and efficiency, to encourage export competitiveness and orientation, and to generate efficient sectoral strategies. The second set, related to the first one, is largely internal to the enterprises and results from the weak design and management of production operations (product-mix; scarcity of firm specialization and sectoral integration, capacity planning and capital intensity, labor productivity).

xii. In spite of some corrective measures taken during the 1973-76 Plan, the present economic framework still relies on a complex array of administrative

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1/ Public or semi-public entities would be the major market for some of these equipment goods (electrical machinery, telephone equipment). Corresponding projects could be private, with a minority participation of the major customer.

controls, with mixed effects on the growth of the manufacturing sector. Although applied with greater flexibility intended to liberalize the market and restore competition, a fairly cumbersome price control system remains in existence. In particular, price controls, of a cost-plus-type combined with high protection, do not encourage enterprises manufacturing end-products (including the end-products of the EMIs) for the local market to increase efficiency and expand exports. Given the small size of the domestic market, the achievement of economies of scale depend crucially on Tunisia's ability to increase export, in particular by diversifying its outlets outside the EEC where the entry of new Mediterranean countries represents a substantial threat to Tunisian traditional exports (olive oil, textiles). However, the incentive framework for export-oriented production (Law 1972-38) does not provide incentives for increasing the competitiveness of export prices and for identifying new markets for new products with substantial local value-added. New measures are needed to promote more aggressive marketing schemes abroad and to encourage the backward integration of firms producing goods with export potential, such as selected mechanical and electrical goods. Finally, the weakness of the development strategies outlined for some manufacturing subsectors (in particular for the EMIs) and the resulting low institutional capacity for identification and preparation of projects have not ensured coordination and consistency in the projects and investment programs approved, despite the pervasiveness of public controls on resource allocation and of administrative procedures in project approval. The institutions involved in project preparation (CNEI) and project promotion need to expand the number of their technical staff and/or improve the effectiveness of their organization to contribute more constructively to the design and preparation of projects.

xiii. The biases of the incentives framework and the weaknesses of the planning mechanisms have contributed to the issues and difficulties prevailing at the firms' level. Despite the important and increasingly expensive investments made for modernization and expansion in manufacturing, labor productivity in the sector has remained on average quite low compared to European countries and to some other Mediterranean developing countries. It has probably declined in the public manufacturing sector during 1973-1977, where a significant share of workers seem to be employed for social reasons. The biases of the Investment Code (Law 1974-74) favoring large enterprises irrespective of their efficiency have resulted at times in substantial excess capacity in several subsectors (including some EMI subsectors), insufficient specialization of product-mix and excessive horizontal and vertical integration within large and medium firms, which are encouraged to expand their overall size rather than resorting to subcontracting to SSIs when this is economically appropriate. The latter shortcoming has affected particularly the EMIs, which have failed to achieve their key role in the industrialization process of providing the necessary linkages between the manufacture of parts and of end-products.

Constraints and Issues in the EMIs

xiv. The general constraints on manufacturing affecting particularly the EMIs are primarily: (a) the structure of protection favoring consumer end-product manufacturing; (b) the structure of indirect taxation penalizing the

production of intermediate and capital goods and hampering their competitiveness and the possibility of increasing their domestic value added, especially through the integration of locally produced intermediate goods into exportable goods; (c) the weakness of incentives and institutional support for establishing partnerships or associations with foreign firms; and (d) the shortcomings of the mechanisms and institutions in charge of planning strategies and project identification/preparation. The main issues and constraints specific to the EMI sector are: (i) the insufficient product standardization and the excessive diversification of product-mix resulting from small domestic markets and hampering the exploitation of economies of scale in many production lines; (ii) the scarcity of specialized machinery and the low productivity of labor relatively to Europe and other competitors in some developing countries; and (iii) the low or irregular quality of products, in particular castings and machined products. These specific constraints and the general constraint (a) above affect more particularly the production lines requiring complementary exports to sustain economically viable production. The general constraints (b), (c) and (d) affect all projects and production lines of the EMI sector.

xv. The supply of skilled labor could be a major constraint for the future development of EMIs. The level of skills in the EMI labor force has been so far adequate for existing production lines which are generally equipped with standard machinery. However, the present labor force is not sufficiently qualified to fully exploit the potential of EMIs. 1/ The need to enter more complex activities in the production of intermediate and capital goods will entail a greater recourse to specialized machinery. A substantial effort in training should be undertaken to remove the main constraint arising from the shortage of specialized mechanical workers and production engineers (paras. 3.12 and 3.13).

Summary of Recommendations and Priorities

xvi. Short and medium-term measures are recommended in Chapter VIII to assist in removing the constraints and address the issues outlined above. The implementation of these measures would increase the efficiency of the EMI sector and lay down the basis for the preparation and implementation of a long-term strategy for the EMIs. All this entails, in order of importance, the following:

(a) the Government, on the initiative of the Ministry of Industry, should revise the chapters of the protection and indirect taxation systems affecting the EMIs, with a view to remove the negative protection on intermediate and capital goods industries and to induce cost reductions through lower protection in the firms producing EMI end-products;

1/ The present trend of some firms to by-pass the shortage of highly qualified labor by using very modern automated machinery (numerical control machines) is not economically efficient given Tunisia's labor cost advantage.

(b) it should also revise the objectives of the Investment Codes to encourage EMI enterprises and investors to export, create employment at lower cost, seek partnerships with foreign associates for know-how, improve quality, specialize, and intensify inter/intra sectoral linkages between local and export-oriented firms;

(c) The Ministry of Industry should sponsor the creation of a Sectoral Task Force (STF) for EMIs for purposes of coordinating the efforts of all agencies involved in EMI development. The STF should include representatives from the Ministry of Industry, Ministry of Planning, API, CNEI, CEPEX AND BDET. 1/ The STF should guide and monitor the preparatory studies required (i) to draw the long-term strategy of the sector; (ii) to identify new production lines with a comparative advantage and export potential, (iii) to prepare "strategic" public projects and (iv) to encourage the participation of foreign partners with know how and access to foreign markets in Tunisian ventures;

(d) in support to the new objectives of the Investment Codes for EMIs, the Ministry of Industry, with the STF's cooperation, should establish a "Technological Center" for the mechanical industries to be in charge of standardization, quality control and technological assistance (in technological choice and adaptation of equipment and production processes, operations management, selection of foreign associates etc.);

(e) the STF should also review the guidelines governing the respective objectives and functions of the public and private enterprises.

xvii. Moreover, detailed recommendations specific to each subsector of the EMIs are made to help rationalize and strengthen ongoing activities and identify and prepare new high priority projects. The major specific recommendations are, in order of importance:

Projects Preparation

(a) SOCOMENA (the shipyard company) in coordination with the STF should prepare a comprehensive feasibility study and a long-term investment program for the ship repair yard;

1/ API = Agence de Promotion des Investissements
CNEI = Centre National d'Etudes Industrielles
CEPEX = Centre de Promotion des Exportations
BDET = Banque de Developpement Economique de Tunisie.

(b) the STF in cooperation with the two major foundries (SOFOMECA and FONDERIES REUNIES) should obtain external assistance to assess in detail the possibilities of efficient substitution for imports of castings, and prepare feasibility studies and planning schedules for each foundry's expansion;

(c) on the basis of the results from (b), the Ministry of Industry should authorize the expansion of SOFOMECA to 10,000 tpy capacity (the expansion of the second one remaining conditional on the implementation of the mechanical complex for diesel engines);

(d) all the members of the STF should cooperate to undertake feasibilities studies of the projects contemplated for the fabrication of automobile accessories, and initiate identification and selection of foreign associates for know-how and complementary export outlets;

(e) API should, during the review and approval of EMI projects, focus on the quality of production organization, the technical capabilities of project sponsors, and the content of cooperation agreements with foreign partners (especially for electrical/electronic projects) with respect to possibilities of adaptation and improvement of technology and production processes;

(f) the authorities, and STF in particular, should develop information channels on: (i) products of local suppliers and exporting-enterprises of Law 1972-38; and (ii) technological changes in other countries, especially for electrical/electronic industries;

Consolidation of Ongoing Activities

(g) CNEI should undertake a survey of the steel structure and platework subsector, in order to rationalize production, avoid duplications and excess capacities, and identify new production lines requiring little additional investments;

(h) the Ministry of Industry, CNEI and CEPEX should review the mechanical works subsector, with the same objectives as (g) above;

(i) all members of the STF should cooperate in a survey of the automotive industry subsector, and make recommendations for the rationalization of the product-mix, the standardization of parts and accessories, the desirable level of local integration, and examine possibilities for exports of parts produced in Tunisia;

(j) STF, in particular CNEI and API, should reassess the future demand for dump and container trucks and the viability of the contemplated projects for expanding production in this field;

(k) the STF, preferably through the "Groupement" of mechanical industries, should explore the possibility of coordinated centralized procurement of primary and intermediate inputs for EMIs (steel, electronic components);

Promotion of SSIs in the Sector

(l) the Ministry of Industry should create a special administrative unit responsible for coordinating the conception and implementation of policies affecting SSI development;

(m) the Ministry of Finance, in coordination with the Central Bank, the principal financial institutions, the Ministry of Industry and API, should 1/ study ways and means to supplement the existing financial assistance program with:

(i) a regulatory monetary mechanism which would encourage banks to increase their lending to SSIs; and

(ii) a guarantee scheme which would offer an insurance-type coverage for the bank loans to SSIs;

(n) API and possibly CNEI should expand the scope of their existing technical assistance programs to give special emphasis to quality monitoring, subcontracting promotion, provision of EMI-specific extension services and organization of centralized procurement; and

(o) API should study the possibilities for joint ventures between Tunisian SSIs and foreign partners in the production and exports of selected metal products.

xviii. In order to ensure that local producers are successful in export of mechanical and electrical goods, it is necessary that:

1/ As agreed upon in principles during the ongoing preparation of the SSI project to be financed by the Bank.

- effective incentives and institutional assistance be given to enterprises to acquire technological know-how from foreign associates or partners and to improve production quality;

- marketing and promotion programs of the institutions involved in exports development (CEPEX, OCT, UTICA) be coordinated and extended through a substantial strengthening of these institutions, possibly under the sponsorship of the Ministry of Industry or API; and

- adequate transport facilities or arrangements with regular schedules and competitive rates be established for exports.

xix. These recommendations for the short and medium-term need to be complemented with a more basic effort to initiate shortly the preparation, by the Ministries of Industry and Plan, of a long-term strategy for the development of EMIs in the 1980s. This strategy should focus on the identification and development of export-oriented industries where Tunisia now has, or can develop, a comparative advantage (Chapter VIII).

PART A: MANUFACTURING IN TUNISIA

CHAPTER I. STRUCTURE AND GROWTH OF MANUFACTURING

Growth of Mar facturing

1.01 Historically a nation of farmers, artisans and traders, Tunisia has had little experience in manufacturing industries, with the exception of food processing (flour mills and olive oil), construction materials, artisanal textiles (rugs, caftans), and recently phosphate processing. Tunisian planners have singled out manufacturing as a major vehicle for economic development and employment creation, because of the country's employment problems and its relatively poor endowment with natural resources. During the 1960s, Tunisia followed import-substitution policies, which established a first basis of industrialization, but became quickly constrained by the small domestic market. This strategy contributed little to employment creation due mainly to the capital intensity of the dominant public investment projects (phosphate chemicals, steel mill, spinning/weaving mills). After 1969, economic objectives were shifted away from inward looking strategies to export-orientation, and the private sector was assigned a more important role in the new strategy; the successive Plans of the 1970s put more emphasis on the sector. The growth of manufacturing accelerated from 6.4% p.a. in real terms during the 1960s to 9.7% p.a. during 1970-78 (Table 1.01). The structural changes accompanying the growth of manufacturing have reflected the shift from import-substitution to export promotion. The export-oriented textile and clothing sector has become the leading sector in relative gains, while food processing lost its dominance, due mainly to the weak performance of agriculture.

1.02 The Tunisian manufacturing sector comprises many small enterprises. The most recent industrial census of 1976 reports some 1575 manufacturing firms with five or more workers in that year, of which 25% had more than 50 workers. Information on small workshops with less than five workers is scant; in the Tunis Governorate where more than half of the census establishments are located, small workshops in quasi-manufacturing activities (clothing, mechanical repairs, furniture, shoe-making) totalled 3,640 in 1976.

Table 1.01: MANUFACTURING COMPOSITION AND GROWTH
(in %)

	Share in Value Added			Real Growth Rate		Contribution to GDP Growth
	1961	1969	1978	1962-69	1970-78	in 1970-78
Food Processing	71	39	29	- 1.4	7.8	8.5
Textiles, leather	5	19	23	20.5	12.7	8.7
Mechanical/electrical	6	14	15	18.0	8.8	1.5
Construction Materials	7	9	11	10.8	10.4	1.2
Chemicals	6	9	10	14.0	9.7	1.1
Others (wood,paper, ...)	4	10	12	17.8	10.7	1.4
Total Manufacturing	100	100	100	6.4	9.7	12.4
Manufacturing V.A. as % of GDP (at factor cost)	7.7	9.7	11.0	4.2*	8.2*	
Manufacturing employment as % of Total Employment	9.0	16.3	20.3			

*: GDP real growth rate

Source: Appendixes I.1 and I.2.

1.03 The public sector has played a predominant role in investment in the large enterprises, in particular in construction materials (cement plants), chemicals (fertilizers and petroleum refinery) and in the electrical and mechanical industries (EMIs). The share of the public sector in manufacturing investment declined from 86% in the 1960s to 47% during the 1973-76 Plan, following the 1969 reorientation of economic policies, but it has remained well above 50% in the subsectors mentioned above. By 1976, the share of the public enterprises in total manufacturing employment was 17%, reaching two-thirds in chemical industries and one-third in construction materials and EMIs (Table 1.02).

Table 1.02: SHARE OF PUBLIC SECTOR IN MANUFACTURING INVESTMENT AND EMPLOYMENT

Subsector	As % of Total Investment in 1961-68	1969-72	1973-76	As % of Total Employment 1976
Food Processing	79	66	28	19
Textiles, leather	88	35	16	10
EMIs	94	67	51	34
Construction Materials	93	80	73	31
Chemicals	59	88	65	62
Others	76	71	15	12
Total Manufacturing	86	67	47	17

Source: Appendixes I.3 and I.4.

Foreign Trade and Final Demand for Industrial Products

1.04 Since the reorientation of manufacturing to exports, the share of exports in total manufacturing output has experienced an upward trend, from 18% in 1969 to 23% in 1978. The export-promotion policies had their major effect on the textiles and clothing industries which became the predominant exporting manufacturing subsector, with 41% of its production exported in 1978. Textiles exports grew (in current prices) by 45% p.a. on average during the 1970s; their growth slowed down in 1978 to 8% because of market problems in the EEC, and is likely to remain moderate in future. Setbacks in the foreign markets for olive oil and phosphate derivatives reduced the growth and prospects for exports of these products. The patterns of foreign trade and total demand of manufactured products were:

Table 1.03: PRODUCTION, DEMAND AND FOREIGN TRADE OF MANUFACTURES

Subsector	Exports as % of Output			Composition of Exports	Output, as % of Domestic Demand			Composition of Demand
	1972	1976	1978	1978	1972	1976	1977	1977
Food Industries	29	18	14	24	119	104	100	24
Textiles, leather	13	26	41	41	80	85	94	17
EMIs	18	11	12	7	31	24	24	36
Construction Materials	9	2	2	-	80	56	57	6
Chemicals	44	54	56	25	79	82	88	8
Others	12	8	7	3	63	52	50	9
Total Manufacturing	24	21	23	100	79	65	63	100
Manufactured Exports, as % of Total Exports	57	44	47					

Source: Appendixes I.5 and I.6.

1.05 Due to the rapid growth of domestic demand for manufactures, an increasing share of this demand had to be met by imports, particularly for construction materials and EMI goods (Appendix I.7). While large public investments in construction materials have permitted domestic production to increase sharply (in 1977, imports of construction materials declined to 5% of total manufactured imports), the production of the EMI subsector was increasingly unable to meet the demand resulting from the acceleration of investment during the 1970s. The imports of EMI goods increased from 35% of total imports in 1970 to 46% in 1978, and accounted for 55% of the increase of manufactured imports between those years. With an elasticity of total demand for EMI goods to Gross Fixed Investment greater than 1 (see Appendix I.8) and Investment growing at some 14% p.a., imports of EMI goods have put an increasing pressure on the balance of payments. However, the review of the EMI subsector (see Chapters III and IV) indicates substantial potential for efficient import-substitution.

Foreign Investment

1.06 The Export-Promotion Law 1972-38 provided substantial fiscal incentives and trade facilities to domestic and foreign firms looking for advantageous labor conditions and foreign exchange regulations; it has attracted increasing amounts of foreign direct investment in industry (Appendix I.9). During 1973-1976, some D 50 million (70% of which in joint ventures or foreign-owned) were invested in 240 projects representing 18% of total manufacturing investment and creating 18,500 jobs (30% of total employment creation in manufacturing), essentially in clothing and some in EMIs. The investment cost per job created was lower than in the rest of the manufacturing sector (Appendix I.10). The activities of these "offshore" companies have generally consisted of processing imported raw materials and parts and exporting finished goods, and have significantly contributed to the country's exports (D 26 million net exports in 1977, equivalent to 6.5% of total exports - see Appendix I.11). Moreover, new "offshore" firms have begun to diversify, away from textile and clothing, into assembly of electronics and electrical items for which export markets in The Federal Republic of Germany and The Netherlands have emerged and appear promising (see Chapters III and V). However, foreign investments now appear to be levelling off, following the slow-down of economic growth in OECD countries.

Factor Allocation

1.07 Manufacturing increased its share in total fixed capital formation, from 11.5% in the early 1970s to 18% during 1973-76 and 21% during 1977-78. Its share of total employment creation increased from 20% in the early 1970s to 37% during 1973-76 and 46% during 1977-78. The average cost per job created in manufacturing decreased during the 1973-76 Plan, but has shown a tendency to increase in recent years, in parallel with the share of the public sector in the total manufacturing investment.

Table 1.04: INVESTMENT AND EMPLOYMENT CREATION IN MANUFACTURING
(in percent)

Subsector	1969-1972 Share in Investment	1969-1972 Share in Employment Creation	1969-1972 Cost/Job /1	1973-1976 Share in Investment	1973-1976 Share in Employment Creation	1973-1976 Cost/Job /1	1977-1978 Share in Investment	1977-1978 Share in Employment Creation	1977-1978 Cost/Job /1
Food Industries	17	10	6.6	21	11	4.5	17	14	4.3
Textiles, leather	21	44	1.4	16	51	0.9	7	34	0.9
EMIs	14	18	3.1	11	11	2.5	11	15	2.5
Construction Materials	8	7	3.7	29	11	5.9	43	16	10.9
Chemicals	21	10	7.4	16	5	11.1	18	5	15.7
Others	19	11	6.1	7	11	1.5	4	16	1.0
Manufacturing	100	100	3.3	100	100	2.7	100	100	3.4
Manufacturing, as % of Total Economy	11.6	19.8	50	18.2	36.9	45	20.9	45.9	43
Share of Public Sector in Manufacturing Investment	67.3			46.6			68.4		

/1 In thousand dinars at constant 1972 prices.

Source: Appendixes I.12 and I.13.

Public investment has concentrated on capital-intensive industries (cement plants and chemicals) in an effort to build-up a core of heavy industries and to respond to the booming demand in construction. The major role in clothing and light food industries was taken up by the foreign and private sectors after 1972; due to the nature of activities promoted in these subsectors, investment cost per job has remained low in these subsectors.

Productivity Trends

1.08 The sectorial pattern of factor productivity in manufacturing is summarized in Table 1.05 displaying the growth during 1970-1972 and 1973-1977 of value added per worker, average net capital stock per worker and employment in each manufacturing subsector.

Table 1.05: FACTOR ALLOCATION AND PERFORMANCE IN MANUFACTURING

	1972 Indices (1969 = 100)				1977 Indices (1972 = 100)			
	V.A. per Worker	Capital per Worker	Labor	Total Factor Productivity /1	V.A. per Worker	Capital per Worker	Labor	Total Factor Productivity /1
Food Industries	152	95	110	158	64	84	160	73
Textiles, leather	138	125	105	124	157	106	129	153
EMIs	124	99	113	123	91	95	146	97
Construction Materials	111	106	106	105	107	248	161	63
Chemicals	110	126	151	96	66	112	181	62
Others	134	145	107	111	109	102	136	108
Manufacturing	142	114	107	132	99	123	137	88

/1 Ratio of V.A. index to a weighted average of capital stock and labor indices, for each subsector.

Source: Appendix I.14.

The manufacturing sector on the whole shows a deterioration of the total factor productivity after 1972/1973. The regular increases of the capital intensity in the sector (+4.3% p.a. on average during 1969-1977) did not yield commensurate increases in the sector's average value added per worker during 1973-1977. 1/ Textiles and "others" are the only subsectors where the total factor productivity of factors continued to increase after 1972. In EMIs, the slight decline of the total factor productivity was the result of a diminishing capital intensity (capital stock per worker). There is an apparent decline of the marginal productivity of capital after 1972, at least as reflected by the high level of the 1973-1977 incremental capital-output ratio (ICOR), which averaged 5 for the sector (Appendix I.15).

1.09 The productivity of labor decreased after 1973 as well. The large capital investments of 1973-1977 should have brought about a commensurate increase in value added per worker (at factor cost). In fact, value added per worker increased only marginally in 1973-1977, compared to a 12.4% p.a. increase in real terms during 1970-1972 (Appendix I.16). It averaged $1,800 in 1978, which is low compared to other mediterranean LDCs. Value added per work decreased markedly in food industries and chemicals; in construction

1/ Capital and labor in the sector increased during 1973-1977 by 69% and 37% respectively while output increased by only 36%. By contrast, the 1970-1972 increases in capital and labor (+22% and +7% respectively) yielded higher increases in output (+52%).

materials, it increased only by 2.5% p.a. despite a 20% p.a. average increase in capital intensity. A substantial share of workers in public enterprises (mainly in chemicals and construction materials) may have been employed for social rather than productive reasons. Despite the drop in labor productivity, unit wages increased during 1973-1978 by some 190-205% in nominal terms and by 24 to 34% in real terms, most of the increase taking place after 1975 (Appendix I.17). The competitiveness of labor relatively to Europe has generally been maintained in private (especially foreign) manufacturing; but it has deteriorated comparatively to other LDCs, especially in the construction materials and chemical industries.

1.10 The performance of the manufacturing sector shows a mixed picture. Growth, investment and employment creation during the 1970s were impressive in quantitative terms. Overall productivity was almost maintained in EMIs, and increased markedly in textiles--the leading subsector in terms of growth, employment creation and factor efficiency. The subsectors mainly responsible for the drop of average productivity in the sector were construction materials (excessive maturation period of projects and capital accumulation), food industries (excessive labor relatively to the insufficient supply of raw materials due to poor agricultural crops after 1975), and chemicals (large investments made at a time of depression in the world market for phosphate derivatives). Finally, the relative growth of manufacturing exports did not take off as expected, mainly because of insufficient diversification from traditional exports (olive oil, phosphate fertilizers) which were in lesser demand from abroad. The problem of Tunisian manufacturing is essentially a productivity and efficiency problem, due in some part to policy and incentive issues constraining the sector (see Chapter II).

Subsectorial Priorities

1.11 Ranking manufacturing subsectors according to six major indicators of their past performance confirms that textiles have been the leading subsector on most accounts, followed by the EMIs which have performed adequately without major shortcoming (Appendix I.18). 1/ The continuation of a rapid expansion of several major subsectors is becoming increasingly constrained by market and resource considerations. Opportunities for further growth of textiles/clothing exports to the EEC are diminishing. The present depression in the world price and demand for phosphate derivatives calls for prudent expansion plans in phosphates. Local resources are scarce for the production of other chemicals, 2/ and the development of food industries and food exports

1/ The six performance indicators are: value added per worker, ICOR, investment cost per job, labor intensity (Man-Years per million D output), marginal export/output ratio, and import-substitution potential (imports as % domestic demand). An overall indicator combining these six indicators with equal weights ranks textiles first, followed by EMIs, "others" (paper, wood, cork, etc.), chemicals, food industries, and finally construction materials.

2/ Prospects for the development of production of nitrogen fertilizers based on the Algerian and Miskar natural gas are still quite uncertain.

requires as a prerequisite substantial improvements in the productivity of the agricultural sector. The boom in the internal market for construction materials is likely to slow down soon, and domestic production capacity will soon meet the demand. On the other hand, substantial opportunities for efficient import-substitution in the EMIs have been neglected, and the development of EMIs has lagged behind that of manufacturing overall. The major reasons for this lag have been the intrinsic complexity of EMIs, the focus on past opportunities for a rapid expansion of simple or resource-based industries, and several institutional and policy constraints.

1.12 A comparative analysis of the production patterns in the six major manufacturing subsectors for Tunisia with the production patterns of a group of 32 countries similar to Tunisia in population size, income level and manufacturing orientation 1/ shows that the actual value-added shares (as percent of GDP) of total manufacturing as well as of each subsector in 1968, 1973, 1976 and 1977 are consistently below the normal values predicted for the corresponding years by the analysis. As presented in Table 1.06, these results suggest that Tunisia's industrialization has remained well below its "statistical potential", the contribution of each manufacturing subsector (except chemicals and petrochemicals) to GDP being smaller than would be expected by the country's size and level of development. Moreover, the worsening trend in the variance between actual and expected EMIs shares suggests that the EMIs remain the most underdeveloped manufacturing subsector, contributing most to the lag of the manufacturing sector. Further growth in the imports of EMI goods could impose a heavy burden on the balance of payments (para. 1.05) and constrain the expansion of the overall manufacturing sector. To avoid this, it is necessary for Tunisia to develop a well-balanced EMI sector that can efficiently produce standard intermediate and equipment goods. For these reasons the Government intends to give priority to the development of EMIs.

1/ Application of the results of the World Bank Research Project "Patterns of Industrial Development" (RPO 671-05). See Annex I.

Table 1.06: ANALYSIS OF ACTUAL AND "NORMAL" STRUCTURE OF MANUFACTURING VALUE ADDED FOR TUNISIA - 1968, 1973, 1977

Subsector	1968 Norm /1	1968 Variance /2	1973 Norm /1	1973 Variance /2	1977 Norm /1	1977 Variance /2
Food Industries	27.2	+13.6	23.3	+ 9.4	20.9	+ 5.4
Textiles, Leather	19.1	- 6.3	19.2	+ 0.1	18.6	+ 6.0
EMI's	17.6	- 5.7	21.3	- 8.8	23.7	-10.7
Construction Materials	6.9	+ 1.5	6.5	+ 0.3	6.0	+ 3.0
Chemicals, Rubber, Petrochemicals	15.7	+ 1.0	15.7	+ 3.9	16.5	+ 0.1
Wood, Paper, Misc.	13.5	- 4.1	14.0	- 4.9	14.3	- 3.8
Total Manufacturing	100.0	-	100.0	-	100.0	-
Manufacturing Share in GDP (%)	17.0	- 6.8	20.5	- 9.2	22.5	-11.0

/1 "Normal" shares expected for Tunisia's size and level of development.
/2 Difference between actual and "normal" predicted sectorial shares.

Source: Annex I.

CHAPTER II: POLICY AND INSTITUTIONAL FRAMEWORK

Manufacturing Economic Framework and Policy Issues

2.01 The objective of the 1973-1976 Plan to emphasize manufacturing as a major source of growth and of employment creation was supported by two important pieces of legislation: Law 1972-38 aiming at encouraging foreign investors (para. 1.06), and Law 1974-74 providing incentives for investment and employment creation by domestic investors. The detailed description of the corresponding incentive framework for private investment is given in the 1974 Basic Economic Report (No. 274a-TUN), the 1975 Updating Memorandum (No. 767-TUN) and the BDET VII Appraisal Report (No. 1734b-TUN), and is summarized in Appendix II.1. The following paragraphs will focus on the major shortcomings in the incentive framework.

2.02 The Investment Codes had a large beneficial impact on the initiative of the private sector. However, some distortions, inefficiencies and negative secondary effects have emerged in recent years and constrained the liberalization and development of the manufacturing sector. The major issues affecting the sector, as identified by the mission, are:

- increasing capital intensity of development projects promoted by the 1974 Law;
- little specialization within enterprises and weak linkages between enterprises;
- weak incentives in the 1972 Law for investigating new export markets and increasing local value added through backward integration;
- inadequate incentives and policy framework (pricing, tariffs) for increasing competitiveness and efficiency; and
- weak institutional capacity for industrial planning and project identification/preparation.

2.03 Although Law 1974-74 was intended to encourage employment creation, it failed in this objective because the fiscal exemptions granted by the Law to domestic investors are related to the absolute number of jobs, 1/ without regard to the cost efficiency of production nor to the capital intensity of the project. This has encouraged investors to add to the core of their projects secondary production lines with under-utilized equipment and high operating costs, and to employ more workers than necessary. This basic shortcoming, combined with other policy issues (pricing and protection - see paragraph 2.05), has contributed to undue capital intensity, excess capacity

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1/ Exemptions range from 40% of taxable income in the case of projects creating between 10 and 20 jobs, to 90% of taxable income for projects creating over 150 jobs. No exemptions are granted to projects creating less than 10 jobs; this excludes many SSIs from the benefits of the Law.

and operational inefficiencies at the firm level. The tendency of firms to aim at the maximum expansion of their size, even when economically inefficient, in order to take full advantage of the tax exemptions permitted by the law, has contributed to constraining the specialization of firms and product-mix, the development of inter-enterprise subcontracting and linkages, and the substitution of local inputs for imports. The too rigid application of the fiscal provisions of the Law 1/ and the lack of quality standards have compounded these problems. The introduction in the Investment Codes of special incentives for lower investment costs per job created and for increased sectorial integration, particularly through a simplified indirect tax system, would help to overcome these shortcomings. Further work will be needed to identify these special incentives.

2.04 Law 1972-38 has been quite successful in attracting foreign investors for export-oriented production. Though this was not its expressed objective, it also largely contributed to employment creation in manufacturing (30% during 1973-1976). However, the foreign markets have remained so far limited to the foreign firms' marketing networks and remain dependent on those firms' existence and expansion strategies. In this sense, the Law has promoted foreign exporting firms rather than fostered the development of new export markets for Tunisian firms. This shortcoming, and the weak incentives of Law 1974-74 for exports by local enterprises, have contributed to the slow diversification of foreign markets and to the weakness of Tunisia's export outlets. The net foreign exchange inflows generated by enterprises benefitting from Law 1972-38 have been less than expected, due to the low value added generated locally by these enterprises and the lack of backward integration of their assembly operations. Studies are needed to work out new incentives correcting these shortcomings. Strengthening the various institutions active in export promotion (API, CEPEX, OCT) and improving cooperation between them are also essential.

2.05 The protection structure is mainly characterized by low or negative effective rates of protection (ERPs) for exporting activities (between -100% and 25% on average), high ERPs (averaging between 70 and 95%) for import-substitution activities and, within the latter, by higher protection for final and/or consumption goods than for intermediate and equipment goods. This protection pattern, and the price control procedures (of a cost-plus-type) which allow investors sizeable returns (20% p.a. generally) on their own funds, have made the domestic market a more profitable and less risky outlet than exports and have not encouraged local firms to increase the efficiency and export-orientation of their activities.

1/ It is practically impossible to obtain the legally specified exemption from the production tax on a locally produced good sold to an export-oriented firm, or conversely to purchase from such a firm a good for domestic usage; in both cases, it is easier and cheaper to import goods which are otherwise produced in the country.

2.06 The 1974 Investment Code induced a provision granting special incentives for regionally decentralized projects, so as to reduce the great concentration of industries in the North East and Tunis. However, these incentives (Appendix II.2) were specified and enforced only by mid-1977, due to administrative delays. Their effect on regionalization has so far been moderate, but more time is needed to assess the efficiency of these incentives.

Project Identification, Preparation and Implementation

2.07 Three major constraints hampering the development of industry in Tunisia are (i) the complex, and sometimes uncoordinated, administrative procedures and institutions regulating industrial activity; (ii) the limited capacity to identify and execute investment projects, particularly in the public sector; and (iii) the weakness of long-term development strategies for some subsectors, in particular EMIs. The overall and subsectorial investment targets defined by both the Ministry of Planning and the specialized planning commissions are not supported by a sufficient number of concrete projects; projects "identified" in the 1977-81 Plan represented only two-thirds of planned manufacturing investment. These projects, some of which are still at a very early stage of preparation, are to be undertaken mainly by the public sector. The private sector, which is to account for the remainder, has not been given clear priorities or directions to follow. The authorities, aware of these constraints, have begun to focus their attention on how to improve project identification, preparation and implementation. The public sector agencies in charge of this function will enlarge their number of technically qualified and experienced staff over a long period of time. Meanwhile, the Plan has suggested the creation of sectorial "Groupements" 1/ to be responsible for the preparation and implementation of public sector projects. Although this would enhance intra-sectorial coordination, the "Groupements" will still be subject to the problem of scarcity of qualified staff; furthermore, they will not be in a position to identify the inter-sectorial priorities required for long-term development planning.

2.08 With respect to projects in the private sector, which are expected to play the most important role in employment creation, the need is to reduce administrative red tape to expedite project implementation, and to strengthen the institutions and agencies which provide assistance to private investors in the identification and execution of their projects. The principal focus of intervention of Agence de Promotion des Investissements (API) is the granting of official approval of projects. Only recently has API started to equip itself to provide technical assistance during the preparation/execution phase, especially for small-scale industries unable to obtain technical assistance from other sources. The public Centre National d'Etudes Industrielles (CNEI) should identify projects on the basis of sector studies, but this has not yet materialized; CNEI's intention to establish a "bank of projects" for private investors to choose from will be difficult to implement without a substantial

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1/ For the chemical industries, construction materials, textiles and EMIs.

strengthening of CNEI's staff, particularly through foreign technical assistance. The Employers Association "Union Tunisienne de l'Industrie, du Commerce et de l'Artisanat" (UTICA) has provided entrepreneurs with some sectorial information and investment guidance, but much remains to be done. The rudimentary "extension and advisory" service also set up by UTICA to assist project promoters in understanding the procedures for obtaining the Government's and the financial institution's approval of projects has been valuable, but largely insufficient in volume to meet the needs.

Development of Small-Scale Industry

2.09 During 1973-1976, small-scale industries (SSIs) 1/ represented about 75% of all Tunisian manufacturing enterprises, although they accounted only for 22% of employment, 19% of investment and 14.5% of value added in the sector. The development of SSIs has been restricted by two major sets of constraints. The first set is internal to the SSIs and hinges around the related issues of output quality, price and timely delivery. Removal of these constraints will require: (a) substantial upgrading of the production techniques of SSIs through financial assistance for selected modernization of equipment in order to achieve higher overall productivity and quality, and (b) improvement in management of production operations (product-mix, input procurement, labor skills, production organization) through technical assistance in order to increase labor productivity and reduce production costs.

2.10 The second set of constraints stems essentially from the lack of concrete and coordinated support at the policy and institutional levels for the development of SSIs. At present, SSIs in Tunisia operate within a system of incentives biased towards large and modern enterprises and an institutional framework of dispersed responsibility for their assistance. In effect, the fiscal exemptions of the Investment Code 1974-74 exclude the smallest firms (with less than 10 workers) and are lower for SSIs than for larger firms; moreover these exemptions are not related to investment costs nor to the type of technology. The concessions granted by Law 1972-38 to exporting frims are mostly benefitting foreign investors. The laws do not encourage local subcontracting which would promote the creation of specialized SSIs. In addition, responsibility for the various regulations and policies affecting SSIs rests with several government institutions 2/; lack of coordination and of unified policies has hampered the development of consistent regulations and integrated programs in support of SSIs. This institutional fragmentation also has led to serious inefficiencies due to duplication and to inertia in some agencies. Moreover, there is no specific provision to encourage recourse to small local suppliers in current practices for procurement of supplies by public agencies and enterprises. Finally, the financial assistance provided to

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1/ SSIs are defined here to be small enterprises employing less than 50 workers.

2/ Directorate of Industry; Ministry of Finance; Ministry of Social Affairs; API; Office de l'Emploi.

SSIs by the Government-funded FOPRODI scheme is limited essentially to supplementing SSI equity funds for project financing; however, with the exception of smallest projects (i.e. investments lower than D 75,000, which are entitled also to subsidized credits from FOPRODI), there is no provision to facilitate SSIs' access to bank credit, although it is generally recognized that banks are reluctant to lend to SSIs, especially newly established ones, because of the inadequacy of their track-records and available collaterals.

2.11 Removal of this set of institutional constraints will require the establishment of specific policies to promote and assist the development of SSIs. The most important measures needed are:

(a) provision of incentives and technical assistance schemes to help existing and new SSIs;

(b) provisions to facilitate SSIs' access to bank credit by:

(i) the Central Bank adopting monetary regulations encouraging or leading both commercial and development banks to increase substantially their lending to SSIs; and

(ii) the Ministry of Finance creating a guarantee scheme to supplement, with a credit-insurance coverage, the collaterals which SSIs can offer to lenders, especially in those cases when the absence of valid real estate titles prevents the inscription of mortgages on SSIs' land and buildings;

(c) provision of incentives to promote subcontracting between small and large firms and between foreign and local firms and to encourage public procurement of supplies from small firms in order to establish a more closely integrated industrial structure;

(d) standardization of products at the final and intermediate stages, establishment of quality norms and quality control, and quality monitoring in SSIs by assisting them in meeting the quality norms;

(e) organization of group-procurement of imported raw materials in order to reduce purchasing costs and the need for large inventories; and

(f) organization of special extension services and training programs to develop and modernize the technical skills of the "middle level" workers in small EMIs.

PART B: THE ELECTRICAL AND MECHANICAL INDUSTRIES

CHAPTER III: STRUCTURE AND CHARACTERISTICS OF EMIs

Introduction

3.01 Engineering (electrical and mechanical) industries, which usually grow around the core of power, transportation and manufacturing activities, defy simple definition. From the standpoint of products, they can be defined as providing the design, development and fabrication technology for most man-made products. Their inherent heterogeneous character makes the problems of the engineering industries among the most complex ones in manufacturing. Engineering industries lie also at the heart of the industrialization process, by establishing a crucial link between the end-product assembly industries and the supplier industries manufacturing a wide variety of components and sub-assemblies 1/, and the key role of the engineering industry in any industrial development strategy is to provide and strengthen the link between the manufacture of parts and end-products. The underdeveloped state of engineering and supplier industries in developing countries has generally been a critical constraint to their industrialization process.

Growth Trends and Structural Patterns

3.02 As reported in Chapter I, the development of the Electrical and Mechanical Industries (EMIs) in Tunisia lagged behind that of the country's manufacturing sector and overall economy. Development of EMIs has taken place principally in import substituting assembly industries (most of them public) providing end-products for the local market. Table 3.01 summarizes the structure and growth pattern of Tunisian EMIs:

1/ In countries with advanced engineering industry, the final processing and assembly typically account for 20-30% of the value of an end-product, with 70-80% going to the supplier industries where engineering exercises most of its activity.

Table 3.01: OUTPUT AND GROWTH OF EMIS

EMI Subsector	Gross Output 1972 D Mlns.	1972 %	Gross Output 1978 D Mlns.	1978 %	Growth Rate % p.a. (real terms)
Mechanical Industries					
Capital goods	4.7	11.6	15.1	12.1	11.3
Intermediate goods	21.1	52.1	49.5	39.8	5.7
End-products	8.1	20.0	31.6	25.4	15.0
Total Mechanical Industries	33.9	83.7	96.2	77.3	9.1
Electrical Industries					
Capital/Intermediate goods	3.8	9.4	16.1	13.0	16.6
End-products	2.8	6.9	12.1	9.7	17.0
Total Electrical Industries	6.6	16.3	28.2	22.7	16.8
TOTAL EMIs Output	40.5	100.0	124.4	100.0	10.5
TOTAL EMI Value Added	12.9		33.1		
Value Added/Output, in %	31.9		26.6		

Source: Appendix III.1.

3.03 Tunisia has so far entered a few selected production lines of EMIs, namely:

- the El Fouledh public steel mill, established in 1965 to process local iron ore, and producing about 150,000 t.p.a. of construction bars, wire rods and cables;
- the assembly of automobile vehicles (cars, trucks, buses) by the Societe Tunisienne d'Industries Automobiles (STIA) located in Sousse with capacity and present production respectively at 11,000 and 7,000 units p.a.;
- the smelting and refining of local lead, mainly for exports, by the PENAROYA foundry;
- the production of pig iron and steel castings dominated by the two public enterprises SOFOMECA and FONDERIES REUNIES accounting for about 90% of the country's capacity and production of 11,000 and 7,000 t.p.a. respectively;

- the production of general hardware and simple end-products (hand-tools, cutlery, fasteners, sanitary fittings) by the public Ateliers Mecaniques du Sahel (AMS) created in 1961 and located in Sousse;

- the heavy maintenance and repair of ships by the public Societe Tunisienne de Constructions et de Reparations Mecaniques et Navales (SOCOMENA), established in 1963 in the premises of the former foreign arsenal in Menzel Bourguiba, which can accommodate annually about 120 ships up to 60,000 DWT each;

- the assembly of household appliances (stoves, refrigerators), dominated by the public enterprise LE CONFORT;

- the manufacturing of electrical transformers and electrical motors by the semi-public company Societe Anonyme de Constructions Electro-Mecaniques (SACEM) created in 1966 in Menzel-Bourguiba;

- the assembly of small diesel engines (for agricultural and marine applications) by The Societe Tunisienne des Moteurs (SOTUMO), a public company in Menzel-Bourguiba;

- steel structures and heavy platework, with a total capacity of 50,000 t.p.a. and a current production of about 30,000 t.p.a. scattered over a large number of private companies, generally small;

- the assembly of radio and TV sets by local private enterprises for the domestic market, and recently the assembly of electronic components and consumer goods by some 16 foreign enterprises established under the Law 1972-38 for exports; and

- a variety of small production lines in private enterprises for miscellaneous, generally intermediate products (car batteries, spark plugs, automobile lights, electrical cables and wires).

The most important EMI subsector presently absent from Tunisia's industrial structure is the manufacture of non-electrical machinery (subsector 382 in the International Standard Industrial Classification--see Appendix III.2); Tunisia has not entered this subsector, due essentially to the high level of the technological requirements of this subsector and its intrinsic complexity.

3.04 In addition to the prominent enterprises mentioned above, the EMI sector in Tunisia includes numerous small scale enterprises (SSIs) and small workshops. The Industrial Census of 1976 reports some 260 establishments with 5 or more workers in EMIs, of which 72 (28%) have more than 50 workers. These

260 establishments employed some 18,840 workers; there were in addition 8,720 workers employed in 1976 by some 705 SSIs and small workshops with less than 5 workers. Table 3.02 summaries the structure of EMI enterprises:

Table 3.02: STRUCTURE OF EMIs - 1976

Size of Enterprise (Number of workers)	Less than 20	20 to 50	50 to 100	100 and more	All
Number of enterprises	830 /1	63	32	40	965
Employment	9,990	1,980	2,200	13,390	27,560
Value Added (D Million) /2	4.39	1.43	1.34	16.51	23.67
Value Added/Worker (Index)	41	69	58	118	100
Wages, as % of Value Added	56	53	68	46	48

/1 Including SSIs and small workshops with less than 5 workers, estimated to total 705.
/2 V.A. of manufacturing activities only, excluding trade activities.

Source: 1976 Industrial Census and Mission estimates.

The 13 public enterprises with 50% or more Government ownership are large firms with more than 100 workers each; they contributed in 1976 some 50 to 60% to the total EMI Value Added in manufacturing activities.

Final Demand and Foreign Trade for EMI Products

3.05 Imports of EMIs goods increased rapidly in the 1970s to meet a substantial upsurge in domestic demand for capital and machinery (para. 1.05). The share of demand met by the local production decreased markedly in the sector, except for major consumer goods (automobiles, household electric appliances, TV and radio sets) for which local production increased rapidly as a result of the priorities and investments of the public sector (see Table 3.03).

Table 3.03: PRODUCTION, DEMAND AND FOREIGN TRADE OF EMIS PRODUCTS
(in percent)

	Structure of Demand			Production as % of Demand		
	1972	1978	Growth Rate (% p.a.)	1972	1976	1978
Mechanical Goods						
Capital Goods	35	40	18.8	11	6	7
Intermediate Goods	28	26	14.5	58	42	37
Consumer Goods	21	16	10.1	31	36	44
Sub-Total Mech. Goods	84	82	15.5	32	24	24
Electrical Goods						
Capital/Intermediate Goods	10	13	20.1	31	24	24
Consumer Goods	6	5	11.7	43	28	61
Sub-Total Elec. Goods	16	18	17.5	35	26	33
Total EMIs	100	100	15.9	32	24	25

Source: Appendix III.3.

3.06 Imports of mechanical capital goods represented in 1977 close to half the total of EMI imports (Appendix III.4). The major components were: earth moving/drilling machinery, lifting and hoisting equipment, mining equipment, machinery for textiles and clothing industries, and engines (Appendix III.5). The bulk of imported intermediate mechanical goods, representing one-fourth of the total of EMI imports, consisted mainly of iron and steel primary products (bars, profiles, sheets, plates, coils, pipes) totalling in 1977 about 300,000 tons, of which some 12,000 tons were iron/steel castings. Imports of consumer end-products consisted primarily of built-up cars and CKD/SKD 1/ components and parts for automobile assembly. The most important imports of electrical products have been switchboard/switchgear apparatus and other transmission and distribution equipment, electric and electronic components and parts for radios and television, electric cables and wires, electric generators and large motors, and telephone sets (see Appendix III.6).

3.07 Tunisia's traditional metallurgic exports have been refined lead and simple lead products which have varied during the 1970s between 15 and 25 thousands tons a year, representing some 35 to 42% of total EMI exports. Exports of iron and steel products (construction rods and steel from El Fouledh principally, and iron/steel castings) peaked at 15,000 t in 1973 and have fallen to no more than 2,000 t in 1977. They represented 45 to 55% of EMI exports between 1969 and 1974 but only 10% at present (Appendix III.7). These exports declined because domestic markets for steel have absorbed an increasing share of local production and the needs of export markets for

1/ CKD/SKD: Completely/Semi Knock-Down components.

castings became more complex. 1/ As a result, the share of exports in the output of mechanical industries dropped from one-third in 1970-74 to one-tenth at present. In contrast, the exports of electrical and electronic products increased significantly after 1974 and presently account for almost one-fifth of the total production of electrical goods and one-third of total EMI exports.

3.08 An emerging and promising shift in the structure and nature of EMI exports came from the assembly in Tunisia of electric and electronic products by export-oriented enterprises (Law 1972-38) using imported components and exporting to the EEC (mainly U.K., Netherlands, Federal Republic of Germany). Their production (radio and TV sets and parts, small switchboards, electric cables and wires, measure and control instruments, hi-fi components and watches) totalled D 1.1 million in 1977 (Appendix III.8), representing some 20% of manufactured EMI exports (excluding lead metal). These exports were mainly from 16 enterprises established under Law 1972-38, of which 7 were specialized in assembling electronic components. These 16 firms employed 2,170 workers, representing 6.5% of total EMIs employment (Appendix III.9); this illustrates the impact of Law 1972-38 on employment creation.

Labor Productivity and Labor Demand-Supply Structure

3.09 Labor productivity in EMIs (measured by value added per worker) has fluctuated substantially between D 450 and D 650 (in constant prices) during the period 1969-1978, but has followed an upward trend with an average increase of 1.7% p.a. in real terms. This upward trend reflects in part an improvement in the skills of the labor force. The annual industrial surveys indicate that the share of technicians and foremen rose from 5.7% in 1969 to about 7% in 1977 and that the proportion of unqualified labor and apprentices decreased from 37% to 20% (see Table 3.04).

Table 3.04: SKILLS OF EMI LABOR FORCE
(in % of Total Labor Force)

Year	Management Staff /1	Engineers	Technicians & Foremen	Skilled & Semi Skilled Workers	Unqualified Labor and Apprentices	Administrative Personnel
1968	2.3	3.2	5.7	39.7	37.1	12.1
1972	------4.4------		6.8	47.5	29.4	11.9
1976	2.5	1.5	7.0 /3	59.6 /2	19.3	10.1

/1 Management staff includes a substantial proportion of engineers.
/2 Estimated to include about 25% of semi-skilled labor.
/3 Includes probably some 2% for technicians.

Source: 1968, 1972 and 1976 Industrial Surveys, Survey of EMI labor force (OTTEEFP-1977), and mission estimates.

1/ Local production of castings could not follow the increasing requirements of quality and technology (spheroidal iron); moreover, increased market and price competition in Europe displaced Tunisian exports. Finally, transport facilities to other ldc's where Tunisia used to export were discontinued.

3.10 In broad terms, the 1/7 ratio between supervisory staff (including foremen) and direct production labor appears adequate in comparison with other countries. 1/ However, the proportion of skilled/specialized labor seems low relative to that of semi-skilled and unskilled labor (34 and 45% respectively); similarly, the proportion of production engineers (1.5%) does not seem commensurate with the number of technicians and foremen. The mission's general assessment made during plant visits confirms that specialized skilled labor, and to a lesser extent middle-level engineers and technicians, are in short supply in the sector.

3.11 Tunisian authorities have been aware of the need to further improve the skills of the EMI labor force, and have developed training facilities at all levels in the formal education system and the vocational training schemes. The total annual output of training facilities in Tunisia amounts to about 14,100 workers p.a. 2/ as follows:

Table 3.05: ANNUAL OUTPUT OF MANPOWER TRAINED IN EMIS SKILLS
(Numbers)

Qualification	Mechanical Trades	Automotive Mechanics	Electrical Trades	TOTAL	Total as % of 1976 Labor Force
Engineers	5-10	-	25-50	30-60 /1	8-16
Technicians	100	155	30	285	) 54 (46)
Foremen	450	-	380	830	)
Skilled Labor	415	1260	360	2035	23 (9)
Semi-skilled Labor	3490	1735	2230	7455	62 (47)
In-Job Apprentices	1620	1450	380	3450	—
TOTAL	6075	4600	3415	14100	51 (34)

/1 Excluding engineers trained abroad for which information was not obtained.

( ): Excluding automotive mechanics.

Source: OTTEEFP, Statistiques Education Nationale.

3.12 Work skills required in EMIs are also needed by many other economic sectors. The demographic census shows that the total number of Tunisian workers in possession of skills needed in EMIs is 2.5 times the labor force of

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1/ The proportion of engineers and technicians alone in the labor force of EMIs in developed and semi-developed countries ranges normally between 6 and 9%.

2/ Excluding a substantial part of the graduates from the Vocational Training schemes of the formal education system; these graduates, totalling about 5,000 in 1978 for EMI trades, have had difficulties to find a job in the industrial firms which consider their training inadequate.

the EMI sector alone. Given the high demand for these same skills in other sectors, it is likely that EMI industries will be able to obtain the services of no more than half of the graduates of vocational schools and training programs meeting EMIs skill requirements. Under these circumstances, the development of a well-balanced labor force in the EMI sector would require the training of a larger number of workers skilled in EMI-related trades, and in particular the doubling of the number of electrical specialists being trained. An alternative way to meet EMI's projected need of skilled workers would be to divert to jobs in the EMI sector a substantial number of existing automotive mechanics, and to reconvert their skills toward mechanical and electrical trades.

3.13 The second major constraint to the development of the EMI sector and its diversification into more complex activities (intermediate and capital goods) may well be the availability of engineers, given in particular the need to increase the productivity of the EMI labor force. 1/ Taking into account the needs of other manufacturing sectors for electrical and mechanical engineers and the present supply of such engineers from domestic and foreign schools, the long-term growth rate for the sector may be limited to 8-10% p.a. in real terms unless an additional effort is undertaken to increase the number of electrical and mechanical engineers.

Production Patterns and Performance

3.14 The heterogeneity of the sector, the variety of each subsector's characteristics and performance, and the weak data base make it difficult to draw general conclusions with respect to the performance and potential of the sector. The analysis of a selected sample of enterprises visited by the mission, however, has allowed it to review the operating modes and constraints of each EMI subsector, and to identify some constraints affecting the whole sector as well as the production lines where Tunisia could have an advantage in import-substitution and/or export promotion. The mechanical industries will be examined first in Chapter IV followed by the electrical and electronic industries in Chapter V. The sub-sector's SSIs will be treated separately in Chapter VI because the problems of SSIs are generally of a special nature, and depend more frequently on their size than on the subsector in which they operate.

1/ International comparative studies indicate that, as a rule of thumb, there is in the EMI sector an elasticity of about 1 between the productivity of the overall labor force of the sector and the share of engineers in the labor force. Thus the number of engineers should increase at the same rate as the sector's output, whatever the increase in labor productivity may be.

CHAPTER IV: MECHANICAL INDUSTRIES

General Patterns and Issues

4.01 A detailed review and analysis of the 7 major subsectors of Tunisia's mechanical industries is given in Annex II. The following paragraphs will focus on the salient points and patterns emerging from this review and provide an overall perspective of the mechanical industries' operations and prospects. Table 4.01 summarizes the structure of production costs and prices of the major products manufactured by twelve mechanical enterprises in Tunisia. This information and the mission's findings from plant visits highlight three major patterns:

(i) mechanical industries rely on imported inputs and generally show a low degree of intra-sectorial integration;

(ii) the production lines with higher labor intensity are generally less protected, more competitive with European imports, and less burdened by taxes and duties; and

(iii) utilization of capacities is generally low.

4.02 The manufacturing of end-products in Tunisia relies significantly on assembling imported inputs, with little integration and complementarity between intermediate and end-product manufacturing. Moreover, the low content of labor (5 to 15% of output value) and the substantial amount of duties and taxes on inputs (20 to 25% of output value) have resulted in uncompetitive prices. To protect domestic production, substantial import duties had to be imposed on imported end-products which are also manufactured in Tunisia (30% and above, and up to 160% for automobiles). Other factors inhibiting price competitiveness have been the low degree of capacity utilization (about two-thirds) and the small size of firms because of the size of the domestic market.

4.03 Prices of intermediate and capital goods (except assembled engines) are generally 10 to 30% above European FOB prices and appear more competitive than end-products. Several factors may account for this. First the technologies used are more labor-intensive and make greater use of Tunisia's labor cost advantage; labor cost represents 20 to 45% of output value, and up to 63% in ship repair. Second these technologies rely less on imports and more on local products, which entails a smaller payment of taxes and duties on inputs (5 to 13% of output value). Finally, the low protection given in practice to local intermediate and capital goods, which are in competition with similar imports 1/, constitutes an effective incentive to choose appropriate technologies and to operate efficiently. However, it should be noted that prices in these production lines could be further reduced through a revision of the tariff and tax structures designed to reduce the amount of taxes embodied in products entering investments.

1/ These imports are allowed to enter free of duties in all investments agreed upon by API under the Investment Codes.

TABLE 4.01: STRUCTURE OF COSTS AND PRICES IN SELECTED MECHANICAL INDUSTRIES - 1977
(in percent)

	Capital Goods		Intermediate Goods		End-Products	
	Non-Assembly Activities 1/	Assembly Activities 2/	Foundries	Machine Job	Metal Products 3/	Automotive Industry 4/
Imported Materials	16-24 5/	60	7-26 5/	20	42-51 5/	30-50 5/
Local Materials and Services	24-35	6	28-32	38	8-16	14-24
Indirect Taxes/Duties	10-13	23	6-13	9	17-25	20-24
Labor	23-63	6	24-44	31	6-15	8-10
Capital Returns	10-21	5	8-12	3	6-15	4-15
Ex-Factory Price	100	100	100	100	100	100
V.A/Output	48-59	34	42-65	43	38-49	36-45
Ex Factory Price/ FOB European Price	90-120	155	120/130	110/120	110-140	160-200
Nominal Protection	50(4) 6/	46	15(4) 6/	40	21-27	51-160
Net Protection 7/	[-10,+10]	+32	[+7,+20]	[+1,+10]	[+13,+23] 8/	(+40,+76]

Source: Appendix IV-1

1/ These are essentially steel structure/plateworks and shiprepair enterprises.
2/ These are engine assembly activities.
3/ They comprise: steel pipes, metal containers, cutlery, hardware productions.
4/ They comprise: auto assembly and truck components enterprises.
5/ It is noted that these values are actual data applicable only for the firms visited by the mission. They do not therefore represent a range of values for the activities in question.
6/ Figures in brackets refer to the level of protection for equipment and intermediate goods entering authorized investments.
7/ Net protection defined as ex-factory/european price minus 1 minus indirect taxes and duties.
8/ Except for cutlery/hardware which operates with a net protection of -10%.

Issues, Prospects and Recommendations for Mechanical Industries

4.04 Steel Fabrication and Platework has been a growing subsector of the mechanical capital goods. Existing capacity, totalling 50,000 tpy and operating on average at about 60%, is sufficient to meet traditional domestic requirements up to 1985. Locally produced equipment has little protection against imports, but it incorporates duties and taxes on imported inputs representing 7-8% of total price, and therefore is penalized by a de facto negative protection. Despite this and other disadvantages related to procurement of steel products 1/, local products have a reasonable quality and competitive prices relative to European imports, due to the lower overall cost of labor (one-third of the European average) which more than offsets the fiscal disadvantages and the lower productivity of labor (about half that in Europe). The equipment used in Tunisian steel work activities is sometimes of advanced technology (numerical control machines), perhaps to compensate for the scarcity of highly specialized labor capable of performing complex manual operations on simpler machines. The subsector priority objective over the next years should be to improve the utilization of existing capacities, with marginal complementary investments when necessary to enlarge the product mix, and develop subcontracting links and exchanges of experience with foreign suppliers for the domestic market and possibly for neighboring North African and Middle East markets. To achieve this, the mission recommends that a comprehensive study of the subsector be undertaken by CNEI to (i) survey existing production facilities and make recommendations for rationalizing production; (ii) assess future domestic market requirements and imports; (iii) revise existing incentives to encourage foreign suppliers to subcontract to local firms on the local market and possibly on neighboring markets in the longer run; and (iv) identify on the basis of a detailed review of Tunisian imports (Appendix IV.2) 2/ new product lines requiring little additional investment, such as industrial boilers and furnaces, steel structures for cranes and other lifting equipment for the domestic market. In addition, the possibility of organizing coordinated central procurement of primary steel imports on behalf of interested small and medium firms should also be explored, preferably through the "Groupement" of mechanical industries.

4.05 Ship-repair is based on SOCOMENA's facilities for vessels up to 60,000 dwt. Its prime location on the Mediterranean Basin, the low level of wages (which account for 50-60% of costs in this activity), the comprehensiveness of its services, and the availability of infrastructure and equipment at low cost have enabled SOCOMENA to enter successfully in the international market. SOCOMENA is investing heavily in training its labor

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1/ Because of the small size and heterogeneity of requirements and orders, prices of steel products are 10-15% higher than international prices and enterprises maintain large costly inventories.

2/ Appendix IV.2 is given for illustrative purposes mainly. The recommended review of imports should be based on detailed statistics of imports classified into subcategories at a more disaggregated level than those available to the mission.

force, and in acquiring highly skilled labor; however, it will also need to renew and modernize gradually some of its old equipment. The company's best strategy is to undertake modernization investments in line with the building up of the experience of its work force, and of its reputation in the market. The mission recommends that consultants be hired by SOCOMENA to study its existing facilities, to investigate its market opportunities and requirements, to formulate a long-term investment program and to prepare the necessary technical feasibility studies.

4.06 Mechanical Works (fabrication and maintenance of capital goods and of their components and parts) in Tunisia are at a very early stage of development, and scattered over a number of relatively small specialized firms and of workshops in larger enterprises. The main mechanical operations in existence are machining and assembly, with generally too many common machines and too few specialized ones. Other activities are mainly the assembly of small diesel engines for irrigation pumps and fishing boats (SOTUMO) and of pumps and compressors, combined with the machining of some simple parts based on local castings. The share of labor cost in output value is generally low (5 to 10%), except in specialized machining enterprises where it is up to 30%. Machining enterprises are operating competitively without protection; they could develop further their activities in closer integration with the other mechanical industries for specialized jobbing work. The lack of sectorial integration, by restricting the size of the domestic market for machined parts, has been the most serious constraint on the development and the viability of these activities.

4.07 Within the group of simple technology capital goods currently being imported (Appendix III-5) there are two categories that offer potential for developing existing and new product lines. First, there are goods for which the domestic market is large enough to sustain economic operations; this category includes industrial boilers and furnaces ($5.8 million imports p.a.), agricultural implements ($4 million imports p.a.), simple earth-moving equipment and lifting/hoisting machinery ($33 million imports p.a. for each) and pumps and compressors ($9 million imports p.a.). The second category comprises mainly engines and their components and parts ($25 million imports p.a.), for which the insufficient domestic market must be complemented by exports (between 30 and 50% of production). In this case, foreign partners can provide an entry into foreign markets and the necessary know-how.

4.08 The Tunisian authorities are now trying to develop the second category, with the expansion of the existing SOTUMO plant and the envisaged creation, with a foreign partner, of a major "mechanical complex" at a cost of about $86 million. The complex would produce some 6250 diesel engines, 2200 tractors and 700 agricultural machines for the domestic market. A commitment by the foreign partners to ensure a substantial amount of exports is necessary for the economic viability of these two projects because only higher volumes of production would justify economically the local production of final products as well as of the parts and components (machined castings) to be integrated therein. The outcome of ongoing negotiations with the foreign partners is crucial for other projects as well. The production of engines at competitive prices could lead to a substantial increase in the intra-sectorial integration

by incorporating such engines in the production of the major items identified in the first category (pumps and compressors, small earth moving and lifting/hoisting equipment; see para. 4.07). If negotiations for the export of engines are unsuccessful and these projects are nevertheless implemented, the output would need high protection (between 50 and 70%) and the present objectives to develop and achieve substantial economic integration within the sector 1/ would be jeopardized.

4.09 The mission recommends that a study of the mechanical fabrication activities be undertaken by CNEI and CEPEX with the following objectives: (i) to carry out an inventory and review of existing capacity and assess the domestic market; (ii) to recommend investments for modernizing and expanding existing machine shops for maintenance and repair work of industrial equipment; (iii) to identify on the basis of a detailed review of imports (Appendix IV.2) new product lines for the domestic (and possibly foreign) markets, such as agricultural implements, pumps and compressors, small earth-moving and construction equipment (cement mixers), solar water heaters, lifting/hoisting machinery; and (iv) to recommend revisions or additions to the incentive system encouraging partnerships serving both the domestic and foreign markets. With respect to the mechanical complex, a project team of engineers and economists (hired from abroad if necessary) with experience in production of diesel engines should be established by the Government and BDET to conduct or resume the negotiations with the foreign partners on the exports arrangements.

4.10 Mechanical and Metal Intermediate Products form the most important activity of EMIs, comprising the steel mill, the iron/steel and lead foundries, and the production of some major metal products (pipes, cans, parts and hardware). The steel mill of El Fouledh covers 70% of the domestic demand for primary non-flat products (construction rods/bars, profiles, wires); the consumption of flat products (fully imported) represents only 20% of the total demand for primary steel products, given the early stage of development of other EMI subsectors. Demand for flat products is not expected to reach a level which would justify a new project in the near future, and the best strategy is therefore to import flat products at the lowest price, possibly through a central procurement body. 2/ A project for a direct reduction steel mill with a capacity of 400,000 tpy 3/ has been shelved temporarily until the local market expands.

4.11 The foundry operations, contributing only 3% to total EMI output, are weakly integrated within the whole EMI subsector and need particular

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1/ Integration of machined castings into engines, and of the latter into equipment goods which will remain subject to full competition with imports and will thus have to be produced at competitive prices.

2/ See Footnote 1 of para. 4.04.

3/ The size is reasonable, and the technology appropriate in view of the likely availability of gas to Tunisia at a relatively low price.

attention if they are to become, as they should, a backbone of the development of EMIs. Tunisian foundries, dominated by two public enterprises which account for 90% of the national capacity and output of castings, produce low grade simple castings of iron and steel in small series for varied uses on the domestic market (construction sector, mines, cement and railways, EMIs). Raw materials, which account for 25-50% of the value of output, are largely imported, including pig iron. 1/ The cost of labor, representing 25-40% of the value of output, is low by European standards, but labor productivity is equally low due to old equipment and technical inefficiencies. Low grade iron castings for the construction sector are produced at competitive prices, but better grade or steel castings are up to 20% more costly than European imports. Imported castings used in capital goods for approved investments pay a 3% custom duty compared to the 6-12% paid by local foundries in taxes and duties on their imported inputs. Thus, because of the price and quality advantages of imports, Tunisian industries have not favored the purchase of more local castings, and production has stagnated at about 6000 tpy, representing on average 65% of capacity. Besides the limited size of the domestic market, another constraint on the development of the foundry subsector has been that local firms have found it difficult to adapt to new casting technologies (spheroidal iron) and to substitute further for imports of spare parts and semi-finished products which have amounted to about 12,000 tpy.

4.12 Tunisian foundries need to invest about D 11 million in modernizing their plants, improve sand quality, improve their management and labor skills through training, increase the rate of utilization and use foreign technical assistance. Labor productivity could then be increased, quality standards improved, production costs lowered to 85-90% of European costs; and, in the longer run, production oriented towards exports. 2/ Given the present trend of transferring foundries from developed to developing countries, geographical proximity to Europe gives Tunisia a potential advantage for the export of heavy items, provided that adequate transport facilities are established. With investments to modernize and foreign advice, local production could reach some 20,000 tpy by 1982-1983, including 6,000 t which would substitute for castings presently imported and 4,000 t of automobile castings linked to the implementation of the mechanical complex for diesel engines and tractors (see para. 4.08). The additional capacity requirement of 10,000 tpy capacity would justify the expansion of the two major foundries which could then be brought to an efficient size. Taking into account the recent decisions of the Tunisian authorities with respect to the distribution of production and tasks in the two foundries, and in order to ensure an efficient scale of operations in each foundry, the mission recommends that external assistance be obtained to prepare

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1/ El Fouledh pig iron cannot be used by foundries, because of its chemical content and unsuitable physical characteristics.

2/ SOFOMECA used to export during 1972-1976 more than 1,000 tons of iron and steel castings p.a. to other North African countries and to France under subcontracting arrangements.

a study with a view to assess: (i) the demand of castings of various types (including spheroidal iron) in the consuming industries; (ii) the possibilities of efficient substitution for presently imported castings 1/; (iii) the possibilities of exports to EEC and neighbor countries; (iv) the facilities of SOFOMECA and the investment program required for its modernization and new product mix; (v) the planning of production transfers and of expansion in each foundry; and (vi) the concrete measures necessary to encourage and protect the subsector. The mission recommends that SOFOMECA be expanded to 10,000 tpy in a first phase; the second major foundry should be expanded only if and when the mechanical complex is implemented.

4.13 The Metal Products currently manufactured in Tunisia (tubes and pipes, cans and containers, general hardware, hand tools) are characterized by the heterogeneity of products and their similar manufacturing operations (forging, forming, pressing, stamping). The degree of backward integration in this subsector has remained quite low so far (see Table 4.01). The subsector is dominated by three large enterprises. The first two, producing cans and tubes/pipes for the domestic market only, invested in highly automated equipment on the mistaken assumption that the high efficiency of automated operations would compensate for the uneconomic size of their markets. This resulted in an excessive capacity, an inappropriately low share of labor in output value (6 to 10% only), uncompetitive prices and a level of protection of 20 to 30%. These industries should delay their present expansion plans and increase/adapt capacity utilization in line with the growth of their domestic markets. The third major firm (AMS), on the other hand, has taken advantage of available cheap labor in its major production lines (hand tools, hardware, fittings, fasteners, cutlery) which seem to be competitive with imported goods. In particular, cutlery is produced under a technical license with a foreign firm which supplies know-how and equipment and purchases a large part of the production for export at very competitive prices. This successful approach, which allows Tunisia to compensate for its lack of marketing organization and market name abroad, should be adopted for the other metal products (hand tools, hardwares, sanitary fittings). These products have been imported by the EEC in increasing quantities in recent years (Appendix IV.3) and could be produced in Tunisia by export-oriented SSIs under Law 1972-38. 2/

4.14 The Automotive and related Industries, which constitute the major EMI subsector producing mechanical end-products, has been growing quite rapidly since 1972, due to an expansion of capacity to meet the demand on the heavily protected domestic market, and now represents more than 20% of the

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1/ The market study should select for detailed review all imports of castings and parts with a unit value lower than a level corresponding to the technologies and know-how within the reach of local foundries and machining shops in the next few years. In Appendix IV.2 this level was set at D 1 per kilogram, for illustrative purposes.

2/ Two such enterprises producing hand tools and other metal products have already been established by foreign firms.

EMI's output. The subsector is centered on STIA which assembles various types of cars, buses, and trucks, and on SICAME which assembles components for trucks, trailers and other industrial vehicles; the degree of domestic integration in assembly of new vehicle fleet has been low. The automotive accessories industries (batteries, brakes, lamps and lights) have been producing essentially spare parts for the existing vehicle fleet (about 200,000 units) rather than inputs for STIA and SICAME. Due to serious problems affecting the subsector (excessive diversification of product mix, inefficient organization and management and low utilization of capacities--see Chapter IV of Annex II), productivity has remained low, and costs of production have been up to 50% higher than in Europe, thus necessitating the high degree of protection enjoyed by the subsector. The excessive diversification of production in small runs has also discouraged any effort in engineering adaptation and standardization of parts and components for possible local production; the major inputs (CKD and SKD kits) and most parts and accessories continue to be imported, and value added at international prices is probably very small. The subsector urgently needs, before implementation of the planned expansion, that clear objectives and strategies be defined with respect to the rationalization and consolidation of the subsector's activities, to the standardization of its product-mix, and to the possibilities of exports of local parts in compensation for imports of CKD/SKD kits. Rationalization of the product mix and agreements with foreign partners to assure the export of part of the Tunisian production would facilitate the establishment of joint ventures for domestic production, at reasonably competitive prices, of accessories such as rims, shock absorbers, mufflers, wipers, filters, break pedals and drums, horns, radiators, and possibly starters and carburetors.

4.15 The mission's specific recommendations are for CNEI, in cooperation with API, CEPEX and BDET, to:

(a) undertake a study of the automotive industry with a view to define objectives and make recommendations with respect to: rationalizing and standardizing the product mix; quality control of local parts and accessories; integration rates at the factory and sector levels; engineering adaptation; and export possibilities for local parts under special agreements with the suppliers of imported CKD/SKD kits;

(b) review the demand projections for dump and container trucks and reassess the justification and viability of the contemplated expansion of the truck assembly plant;

(c) undertake feasibility studies of the proposed projects for the fabrication of automobile accessories such as rims, shock absorbers, filters, horns, mufflers, and begin to identify foreign partners to provide know-how and foster exports;

(d) review the needs for assistance to the automotive industry in modern processes and technology, rationalization methods and production organization;

(e) study the possibility to create small enterprises with European partners providing know-how and marketing organization for the production and exports of metal products such as agricultural and mechanical hand tools, hardwares, sanitary fittings. This study should identify the potential markets in the EEC on the basis of a review (at a finely disaggregate level) of the statistics of EEC imports of EMI products from developing countries; 1/ and

(f) explore, preferably through the "Groupement" of the mechanical industries, the possibility of establishing a procedure for central procurement of primary steel imports.

1/ These statistics indicate that EEC imports of metal tools and metal products have been growing rapidly in the recent years (Appendix IV.3).

CHAPTER V: ELECTRICAL INDUSTRIES

General Patterns and Issues

5.01 Table 5.01 summarizes the structure of production costs and prices of the main electrical products manufactured by ten enterprises in Tunisia. It highlights the following characteristics of electrical industries:

(i) the heavy reliance on imported inputs and components (accounting for 60 to 80% of output value) and the quasi-total absence of intrasectorial integration (see item "Local Materials" in Table 5.01);

(ii) the generally low domestic value added which essentially represents direct labor cost and reflects the predominance of assembly activities; and

(iii) the weight of indirect taxes and duties on production lines with higher domestic value added due to their use of heavily taxed domestic inputs.

It should be noted also that large electro-mechanical capital goods have production characteristics similar to mechanical capital goods, while electronic and small electro-mechanical goods are characterized by different production patterns, essentially the assembly of imported semi-finished inputs.

Table 5.01: STRUCTURE OF COSTS AND PRICES IN SELECTED ELECTRICAL INDUSTRIES - 1977
(in percent)

Cost Item	Capital Goods	Intermediate Goods /1	Consumer Durables: Large Household Appliances	Consumer Durables: Small Household Appliances & Transformers	Consumer Durables: TV/Radio Assembly
Imported Materials	27	50-62 /3	40	81 /2	73-87 /2 /3
Local Materials and Services	16	5-23	21	2	1-6
Indirect Taxes	22		23		
Labor	19	5-11	5	8	4-8
Capital Returns	16	10-28	11	9	8-15
Ex-Factory Price	100	100	100	100	100
VA./Output	57	15-37	39	18	12-23
Ex-factory Price/ European FOB Price	100/110	90-120	110	125	120-130
Net Protection /4	[-22,-12]	n.a.	-13	n.a.	n.a.

/1 These include Cables/Wires, Batteries, Electric Meters.
/2 These figures probably include also indirect taxes.
/3 See footnote /5 of Table 4.01.
/4 See footnote /7 of Table 4.01.

Source: Appendix V.1.

Issues, Prospects and Recommendations for Electrical Industries

5.02 Similar to mechanical industries, the firms producing electrical capital goods in Tunisia (transformers and small motors) and large household appliances have practically no protection. They pay substantial duties and taxes on their imported and local inputs, and the prices of the major output (transformers) are fully competitive on the domestic and neighboring markets (where most of its sale contracts to public utilities are obtained through international competitive bidding). The advantages of the enterprise producing transformers are geographical proximity and the lower cost of labor (which accounts for 20% of output value, compared to 25-45% in developed countries in this type of industry where electrical winding cannot be fully automated and requires substantial amounts of labor). With the assistance of its foreign partners, the industry has acquired a good level of labor skill and know-how,

and now plans: to expand its capacity for further exports, to enter new technologies (Aluminum winding), to manufacture higher power equipment, 1/ and to open new production lines for switchboards and switchgears. The development of exports from this industry with established potential will depend on market investigations and opportunities, and also on the availability of adequate transportation facilities and services for the heavy equipment it produces.

5.03 Other existing electrical industries have labor costs ranging between 5 and 10% of output value (as compared to 20 to 30% in similar industries in developed countries), and the share of value added in output ranges generally from 15 to 30%. One industry (automobile battery manufacturing) is based on a domestic resource (lead), and all others rely heavily on imported materials and components. Imported inputs and components are generally expensive by international standards for reasons similar to those applying to steel products. 2/ The organization of production is generally characterized by weak coordination of workshops and poor lay-outs, and by the absence of initiatives to adapt and improve the technological schemes and production processes initially provided by the equipment or license suppliers or the foreign partners. Their output prices are 10 to 30% above European prices, despite the labor cost advantage, due largely to the inefficiencies in production organization and component procurement.

5.04 Little information is available on the sixteen export-oriented electrical industry firms benefitting from Law 1972-38, which were attracted by Tunisia's comparative advantages (geographical proximity to Europe, trade facilities and agreements with the EEC, favorable social climate for investors, and lower cost of labor). These firms operate fully under foreign licenses and processes and they restrict their activities generally to mere assembly of imported components supplied by parent companies for the fabrication of intermediate and end-products (cables, electronic components, radios and TV sets) destined to captive markets in Europe. There is little local integration of their activities. In effect, because of their contractual arrangements with parent companies, these firms do not purchase electro-mechanical hardware from local manufacturers. Furthermore, the rigid application of the fiscal provisions of the law regulating the exchange of goods and services between resident and off-shore companies tends to discourage them from selling locally part of their production of intermediate goods. 3/ Nevertheless, these firms have clearly demonstrated that Tunisian labor constitutes an

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1/ The mission recommends that the industry expand its capabilities for motors up to 38 kw and transformers up to 10 and 20 MVA (2 MVA presently).

2/ Lack of information on suppliers, small size and heterogeneity of requirements and orders, purchase of expensive CKD kits ready for assembly.

3/ It seems that part of their exported production of electronic components is reimported back to Tunisia, through complex channels, at higher prices to the resident enterprises.

advantage in producing electronic goods at competitive prices 1/ provided that efficient technologies, procurement policies and production organizations are put into effect. Their experience should be reviewed and followed by Tunisian manufacturers.

5.05 Electrical industries employ a high proportion of labor and an insufficient proportion of commercial staff and of engineers and technicians (5% on average), despite the increasing availability of such staff in Tunisia. Protection and pricing policies for end-products do not encourage domestic enterprises to enlarge their market to diversify beyond assembly activities, or make simple adaptations and improvements to their processes and products. However, some new local enterprises (in TV assembly) have initiated or are envisaging basic Research and Development (R and D) to develop their own designs, improve product quality and establish their brand name and market image. This trend could be encouraged by adequate fiscal incentives.

5.06 The contribution of electrical industries to the development of EMIs could be expanded and complemented in the next years by some new projects or plant extensions; a number of these projects were identified in a preliminary way by the mission on the basis of the domestic and exports market potential. These projects, which require further study, should preferably be implemented under various forms of foreign assistance and cooperation. Their basic characteristics are summarized in Table 5.02.

1/ Typically in Europe, the share of labor in output value is about 40%, and that of direct labor in total labor is 70-80%. The cost of labor in Tunisia allows well-managed enterprises with labor productivity similar to that in Europe to reduce total production costs by 15 to 25%.

Table 5.02: CHARACTERISTICS OF SUGGESTED PROJECTS IN ELECTRICAL INDUSTRIES

Description	Output (D Millions)	Invest. (D Millions)	Employment	Market (D=domestic) (Ex=exports)	Foreign Assist./1
1 - Electrical Capital Goods					
Motors 38 kw (poly/mono-phased)	2	0.5	300	D+Ex	LTPC
Transformers 10 and 20 MVA	n.a.	n.a.	n.a.	D+Ex	Lc.
Switchgear/boards equipment	10	2	900	D mainly	LTPC/JV
Lifts and other lifting equipment	----------To be studied (feasibility)----------				
2 - Electrical Consumer Goods					
Electrical Hardwares /2 (by 5 SSIs)	10	2	1,300	D+Ex	TA/LTPC
Small household appliances /3	0.5	0.1	50	D mainly	T.A.
3 - Electronic Capital Goods					
Telephone Equipment (receivers first, switchboards later)	6	2.5	400	D mainly	LTPC
4 - Electronic Intermediate Goods					
Diversify production of existing enterprises through integration of local accessories /4	----Comparative Advantages - To be studied-----				

/1 Forms of Foreign Assistance: Lc:License; JV:Joint Venture; TA:Technical Assistance; LTPC:Long-term Production Cooperation.
/2 Switches, circuit breakers, fuses, plugs, ...
/3 Hair dryers, coffee grinders, ... Production of 50,000 to 100,000 units p.a. The project would require a strict organization of operations and full integration from winding to assembling.
/4 Antennas, printed circuits, cooling boards, casings, small transformers, resistors, fuses, switches.

5.07 The mission's specific recommendations for the electrical industries are as follows:

Procurement matters:

(a) disseminate information on products of local suppliers and exporting enterprises benefitting from Law 1972-38;

(b) review and adjust downwards the taxes and duties levied on inputs going into capital goods, as well as the protection on consumer products (paras. 5.02 and 5.03);

(c) explore the possibility for creating small channels of central procurement of electronic components from abroad, specialized by type of products; and

(d) revise the fiscal provisions to facilitate the exchange of goods and services between resident and export enterprises.

Foreign technology and investments:

(e) encourage technology transfers from export firms under Law 1972-38, in particular by undertaking a study (by API preferably) and their technologies, procurement methods and production organizations;

(f) encourage specifically joint ventures providing technological integration and transfer and possibly arrangements with the foreign partners for the export of part of their production; and

(g) encourage the introduction in all partnership contracts of long-term production cooperation arrangements.

Research and Development:

(h) develop information channels on technological changes in other countries; and

(i) encourage through appropriate incentives (mainly fiscal) creation within enterprises of study and development units to work in liaison with the Universities and Engineering Schools and their laboratories.

Preparation of Projects:

(j) focus, especially for API, during review and approval of projects, on the quality of production organizations, the technical capabilities of project sponsors, and the content of cooperation agreements with foreign partners regarding possibilities to adapt and improve technological schemes and production processes.

CHAPTER VI: SMALL-SCALE EMIS

6.01 A detailed review and analysis of the SSIs in the EMI sector is given in Annex III. The following paragraphs focus on the salient points and patterns emerging from this review, and underline the major issues affecting the sector's SSIs.

General Characteristics and Performance

6.02 SSIs employing under 50 workers and small workshops constitute a major source of employment in the EMI sector (43% of total labor force). SSIs are especially active in mechanical works and metal products, where they account for more than half of the employment and one-third of value added. Despite the very diversified nature of their product mix, small EMIs can be classified, on the basis of their functions, as follows:

Group a: consists of SSIs producing intermediate and end-products that are also manufactured by larger firms. These SSIs are mostly found in steel structures and platework, principally producing and/or servicing on order. Their production methods are artisanal, with generally traditional or archaic equipment and only occasionally with any modern machinery.

Group b: consists of SSIs producing standard intermediate or finished goods such as simple castings and electrical goods as well as small metal products (nails, nuts and bolts, screens, locks, cutlery). These SSIs operate with modern equipment and technology, except for some foundries which are of artisan type and work generally on order to meet localized demand for spare parts.

Group c: SSIs producing in small series capital goods of a relatively complex nature for specific local uses. These firms are found mainly in mechanical works, ranging from machining and/or assembling simple agricultural implements (plows, pumps) to production of small construction equipment (wheel barrows, small dumpers, concrete mixers). They operate with a mixture of traditional and modern technologies.

6.03 Most of the small EMIs are equipped with old, often fully amortized, machinery which is generally underutilized; (operating rates average 50% in many production lines). They have little access to institutional finance for modernization or to technical assistance in the selection of appropriate technologies or product-mix. The small firms show high degrees of vertical and/or horizontal integration at the firm level, as each entrepreneur strives for self-sufficiency or attempts to enlarge his operation by diversifying

excessively his production lines. The analysis of the actual allocation and use of production factors in the sector (see Attachment 3 of Annex III) indicates that the production processes in small EMIs have remained labor intensive with low labor productivity; value added per worker in SSIs has been on average 60% of that in large EMIs. However, the productivity is high in some specialized firms of type (c) (small shipyards for fishing boats in particular) and some well equipped firms manufacturing metal products.

6.04 Small EMIs are generally facing serious marketing problems, due to the small size of the local market. Other reasons are their inability to produce at a quality and prices and with delivery dates that meet customers requirements. As a result there are few subcontracting relationships with large enterprises. 1/ Nevertheless, some SSIs of type (c) producing on order to cater to specific local needs have acquired their own markets based on their reputation for good and reliable work.

6.05 Prices of most small EMIs' end-products are markedly higher than those of similar imports, due to the low productivity of labor and capital and the excessive prices paid by small EMIs for their raw materials, because of the small quantities involved and the mark-ups by the intermediate agents and the local wholesale traders. Raw materials (mainly steel products) account for an unduly high proportion (50 to 70%) of production costs. Labor, essentially composed of unskilled or semi-skilled workers, is paid 25 to 50% less than in large firms, and labor costs as a result represent only 10 to 25% of total production costs, leaving little room for a reduction of costs if productivity is not increased. Finally, small EMIs are technically backward with the result that the engineering adaptation and the project standardization necessary for economies of scale and quality monitoring have not been undertaken.

Development Issues and Prospects

6.06 The small size of the local markets and the lack of tradition among Tunisian entrepreneurs in EMIs which require technical and managerial know-how tend to limit the scope for growth in small EMIs in particular in standard production lines for simple end-products (group b of para. 6.02). Nevertheless, small EMIs with low overhead costs and flexibility of operations have the potential to play a significant role in supporting and complementing the larger industries' activities and have better prospects with manufacturing/assembling more complex intermediate goods and special products or services to cater to localized needs. Accordingly, small EMIs should shift their activities towards four general areas: (a) production of selected end-products and of intermediate inputs for larger firms; (b) production of specialized goods for local needs; (c) subcontracting work for larger firms; and (d) maintenance/servicing of consumer goods and of simple equipment. The subsectors where

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1/ As reported in para. 4.02, large enterprises also have tended to prefer self-sufficiency in production and to over-integrate at the firm's level.

small EMIs could contribute most in the above four general areas are the metal and electrical products (provided that firms in these activities do not over-diversify and can find partners for technological transfer), and the automotive related industries (provided that standardization of parts and components and rationalization of product-mix at the national level are adopted--see paras. 4.14 and 4.15). In mechanical works, SSIs can subcontract for accuracy-machining of mechanical parts on universal machines; in steel structures and platework, SSIs have an advantage only for custom-order works (up to one ton weight) and the production of small tanks. Small foundries have an advantage in special custom-order work for local clients (spare parts for renewal or replacement).

6.07 The following specific product lines are considered by the mission to be most promising for small EMIs, subject to removal of the constraints identified in paras. 2.09 and 2.10.

(a) Automotive related industries: production of filter, brakes, wipers, rims, shock absorbers, horns;

(b) Metal Products: cutlery, agricultural and mechanic small/ hand tools, small tubing structures, sanitary fittings, metallic furniture, door/window frames;

(c) Mechanical-electrical activities: machining of intermediate goods, parts, components, and jobbing work for their maintenance and repair; fabrication of small transformers, switchboards, fixed resistors and condensors, of small mechanical-electrical household appliances such as mixer, coffee grinder, fans, etc., and of small simple agricultural equipment specialized to suit local needs (e.g. special pumps);

(d) Steel structure and plateworks: general maintenance/ service works, construction of small containers, boilers, special order structures (e.g. rolling doors), railings, road guards; and

(e) Foundry: general maintenance/service works, production of special foundry pieces, and of spare parts.

Specific Recommendations for Small EMIs

6.08 In addition to the adjustments to the policy and incentives frameworks required from the Government to remove existing biases in favor of large scale enterprises and to encourage the development and promotion of SSIs (para. 2.11), the mission recommends that technical assistance to small EMIs should give special emphasis to:

- quality monitoring, by helping establish quality standards;

- assisting SSIs to meet these standards, and advising them on quality monitoring procedures in coordination with the Technological Center proposed in para. 7.07(e);

- promotion of subcontracting between small and large firms and between local and foreign firms, by helping SSIs which have satisfactorily upgraded the quality of their products, obtain and negotiate subcontracts and carry out orders with respect to prices and timely delivery;

- organization of special extension services and training programs for EMIs' middle level workers to develop and modernize their technical skills; and

- organization of group-procurement of raw materials (imported steel for mechanical industries) and imported components (electrical industries).

PART C. MEDIUM-TERM MEASURES AND LONG-TERM STRATEGY

CHAPTER VII: MEDIUM-TERM DEVELOPMENT APPROACH FOR THE EMIs

Medium-term Objectives

7.01 The comparative advantage of EMIs lie in Tunisia's relatively low cost of labor, a labor force of increasing competence and quality, proximity and preferential access to EEC, and liberal policies toward foreign investment. The EMIs principal constraint is, however, the limited size of the domestic market for their products. The EMI's development depends therefore on the following production/market orientations:

(a) more efficient import-substitution for intermediate and capital goods of simple or intermediate technology;

(b) import-substitution with some dependence on export markets (through buy-back arrangements with foreign partners) for selected capital goods; and

(c) primarily export-orientation for a selected group of EMI products.

A strategy based on the simultaneous development of these orientations will be needed to generate a demand of sufficient size to allow more efficient and competitive production.

Medium-term Investment Program

7.02 There is at present, however, no official development strategy for the EMIs. This lacuna has resulted in the lack of clearly defined and integrated investment program for the EMIs, which, coupled with the limited capacity of the institutional framework to identify and prepare projects, has made it difficult to identify a sufficient number of concrete projects to meet the investment targets set in the Plan (see paras. 2.07 and 2.08). Because of lack of coordination between the various Tunisian institutions involved in the EMI sector, there does not exist a single official list of projects "in the pipeline" (i.e. under preparation and implementation) that is exhaustive. The mission estimates that the ongoing investment program for EMIs during the period 1979-1982 consists of 22 identified projects, mainly in the public and semi-public sectors, for a total investment of D 105 million, including D 51 million for automobile and engine assembly activities (Appendix VII.1 for details). In addition, the mission has identified some 10 production lines and projects which it suggests for further investigation. These suggested projects, which could be added to the list of identified projects after further feasibility studies, would represent an additional investment of about D 33 million over the period 1980-1983. The distribution of these projects and investments by major subsectors of the EMIs is listed in Table 7.01.

Table 7.01: INVESTMENT PROGRAM FOR EMIs DURING 1979-1983

	Number of Projects		Investment (D Millions)	
	Identified	Suggested	Identified	Suggested
I. Mechanical				
Capital Goods	5	4	45.0 /1	15.0
Intermediate Goods	4	1	15.2	2.5
End-Products	5	1	23.2 /2	5.0
Total Mechanical Industries	14	6	83.4	22.5
II. Electrical				
Capital/Intermediate	6	3	16.9	8.5
End-Products	2	1	4.9	2.0
Total Electrical Industries	8	4	21.8	10.5
TOTAL EMIs	22	10	105.2	33.0
Total (combined programs)	32		138.2	

/1 Including D 36 million for the "mechanical complex" (para. 2.17).
/2 Including D 15 million for the expansion of the automobile assembly.

Source: Appendix VII.1.

7.03 The above investment program can be related to the production objectives stated in para. 7.01 as follows in Table 7.02:

Table 7.02: CATEGORIES OF EMI INVESTMENT PROJECTS IN THE PIPELINE

Project Orientation /1	Identified		Suggested		Total		
	No.	D Million	No.	D Million	No.	D Million	%
1) Efficient Import-substitution	4	9.0	6	18.5	10	27.5	20
2) Import-substitution with some dependence on export markets	3	47.3	3	9.5	6	56.8	41
3) Primarily export-oriented	3	8.0	1	5.0	4	13.0	9
4) Others	12	40.9	-	-	12	40.9	30
	22	105.2	10	33.0	32	138.2	100

/1 Classification based on mission's assessment from field visits.

Source: Appendix VII.1

Thus, based on the mission's preliminary assessment on the basis of field visits, there appears that ten projects out of the 22 identified projects could fit into the proposed development strategy for EMIs in Tunisia. This would represent 61 percent of the total identified investments.

7.04 Out of the 12 "Others" projects, four projects (D 22 million) appear difficult to justify economically (expansion of automobile and motor assembly lines, expansion of production lines for cans and electric cables), and six other projects (D 16.5 million) require solid technical preparation and feasibility studies to establish firmly their market and economic justification (expansion of production lines for automobile batteries and household appliances; new projects for aluminum packing and fabrication of vehicle axles, batteries and motor filters). Furthermore, the implementation of two projects (the mechanical complex and the associated foundry) totalling D 45 million should be contingent on the outcome of negotiations with the foreign partners of the diesel engines project to assure the exportation of part of the new plant's production (see para. 4.08). Pending supporting feasibility studies and adequate technical preparation, the remaining ten already identified projects may be considered prima facie as bankable projects. Of these, four would substitute for imports, three would produce partly for the domestic market and partly for exports, while three would be primarily export-oriented.

7.05 The ten projects suggested by the mission focus mainly on capital goods where Tunisia's competitiveness, efficiency and potential are higher than in end-products. They consist of the following:

- in mechanical capital goods oriented toward import- substitution: optimising investment in existing facilities in steel structure and platework (including fabrication of boilers, steel structures for cranes and other lifting equipment), fabrication of pumps and compressors, expansion of facilities for railroad freight cars, accelerated modernization and expansion of SOCOMENA's shipyards (see paras. 4.05 to 4.07);

- in other mechanical goods: fabrication of various automobile accessories for the domestic market (see para. 4.14);

- diversification and modernization of hardware production lines oriented for exports (see para. 4.13); and

- in electrical capital goods: fabrication of larger electric motors, fabrication of switchboards/gear and distribution equipment, assembly of telephone switchboards (see para. 5.06). The first two of these projects, would be based on the domestic and export markets while the third would be based only on the domestic market.

Medium-term Recommendations

7.06 The brief review of the major subsectors of the mechanical and electrical industries made above indicates that some of these subsectors offer potential and opportunities for further development on the domestic and export markets. However, the structure and operations of these subsectors need to be further studied and rationalized before their potential and investment opportunities can be harnessed. A long-term strategy for the development of the Electrical and Mechanical Industries is needed, and its elaboration may require several years. Chapter VIII proposes a possible approach to work out an appropriate strategy. Meanwhile, various short and medium-term measures need to be studied and implemented.

7.07 The design and preparation of a long-term strategy for the mechanical industries must be based on institutional and policy measures designed to increase the efficiency of the subsector. In addition to the recommendations specific to each EMI subsector discussed in Chapter IV, V and VI, the mission's general recommendations in this respect are as follows:

(a) revise the tariffs and the indirect tax structure affecting the EMIs, on the basis of studies (in particular of the effective protection in the EMI subsector), aiming at lowering the protection enjoyed by firms producing EMI end-products and at eliminating the negative protection on industries producing intermediate and capital goods;

(b) enforce more flexibly the regulations of the Investment Codes for local and foreign investors (Laws 74-74 and 72-38) regarding the taxes and duties levied on inputs going into export goods;

(c) revise the objectives of these codes to encourage actively EMI enterprises and investors to:

- seek partnerships with foreign firms and identify export markets (Law 72-38 enterprises) or look for export opportunities (resident enterprises);
- specialize in labor-intensive processes and avoid excessive vertical and horizontal integration at the enterprise's level;
- intensify inter/intra-sectorial linkages, in particular between local and export-oriented firms and between public and private firms;
- undertake maintenance investments and works systematically; and
- implement commitments for employment creation as specified in the approval documents.

(d) Create a Sectorial Task Force (STF) 1/ for:

- coordination of the activities and resources of all institutions;
- preparation of the long-term strategy and identification of production lines with export potential;
- vigorous prospecting for foreign markets and partners;
- preparation of strategic public projects; and
- study of the subsectorian recommendations proposed in Chapters IV, V and VI.

(e) study and prepare the creation of a "Technological Center" for the mechanical industries with the aim of overcoming the weaknesses in engineering adaptation and in standardization and quality control which are a serious handicap for the development of efficient operations and inter-enterprise linkages. This "Technological Center" should gradually fulfill the following functions:

- establishment of norms and standards for Tunisian products;

1/ To be composed of representatives from the Ministry of Industry, Ministry of Planning, API, CNEI, BDET, Centre de Promotion des Exportations (CEPEX).

- quality control for local mechanical products; and

- provision of technical assistance in technological choice and adaptation of equipment and production processes, operations organization and management, and identification and selection of foreign partners.

7.08 The preparation and implementation of these recommendations and studies will require substantial strengthening of the resources of the institutions which the mission proposes should constitute the STF, in particular CNEI, CEPEX and BDET. Provided that additional assistance (foreign experts and consultants, UNIDO) are made available to these institutions, most of the subsectorial tasks recommended in Chapter IV could be tentatively allocated to the STF participants, as follows:

- study of steel structure and platework subsector (para. 4.04) = CNEI;

- study of the mechanical works subsector (para. 4.09) = CNEI and CEPEX;

- study of transport constraints on exports of heavy materials such as castings (para. 4.12) = CEPEX;

- study of the automotive industry (para. 4.15(a) and (b)) = CNEI;

- feasibility study of projects for fabrication of automobile accessories (para. 4.15(c)) = CNEI, CEPEX, API and BDET;

- study of possibilities for creation of small metal products joint ventures with European partners (para. 4.15(e)) = CNEI and API.

CHAPTER VIII: A SUGGESTED APPROACH FOR DEVELOPING A STRATEGY FOR EMIs

Long-term Objectives

8.01 The structure of the international economy gives to developing countries an advantage in one broad family of industries where the major determinant of the total cost is the labor cost. These industries produce multiple products composed of standard items and requiring stable and easily adaptable technologies and large amounts of unskilled and semi-skilled labor; they generally comprise textiles, shoes, household appliances and automotive accessories. Tunisia has entered successfully some of these industries (textiles, shoes). However, given the erosion of its labor cost advantage relative to some other developing countries, the small size of its market and the increasing skill of its labor force, long-term prospects for further development in this first family of industries are becoming less promising for Tunisia.

8.02 A second family of industries where middle income developing countries such as Tunisia have an advantage is characterized by:

(a) multiple finished products fabricated in moderate quantities with little or no standardization;

(b) flexible technologies and equipment easily adaptable to various specific demands and customers requirements;

(c) qualified and versatile labor; and

(d) predominance of quality, timely delivery, flexibility in production objectives.

Typical industries of this second family are specialized mechanical shops, machine tools, engineering and consulting firms. Mechanical and electrical industries of simple or intermediate technology would fit well in the industrialization strategy for Tunisia as being tailored to the country's resource and market constraints, to the increasing skills of its labor force, to its existing industrial base, its potential in selected production lines, and to the difficulties and constraints in more complex technology transfers.

8.03 The development of heterogeneous and relatively complex industries such as EMIs requires a careful elaboration of long-term subsectorial priorities. The subsectorial strategies should focus on the identification of products or production lines that capitalize on the country's geographical proximity to the EEC and Middle East markets, and its relatively cheap and competent labor. Three interrelated objectives should determine the sector's strategy and priorities:

(a) import-substitution of simple intermediate and capital goods to reduce the pressure on the balance of payments;

(b) exporting of selected products, to create sizeable employment opportunities; and

(c) development of a set of well-structured and integrated projects generating substantial backward and forward linkages on the local economy ("industrialization" objective).

Prerequisites

8.04 The policy and incentive frameworks should ensure, as prerequisites to the successful achievement of the above objectives, that:

(a) necessary raw materials and inputs be obtained locally or imported at reasonably competitive costs;

(b) product quality and labor productivity be achieved at levels comparable to those in competing countries; and

(c) local enterprises and institutions be open to technical assistance and capital inflows from foreign firms.

Implementation of the recommendations made in Chapters IV through VII for short and medium-term measures is expected to meet these prerequisites. Recommended adjustments in the protection and indirect taxation structures would meet prerequisite (a), the creation of a Technological Institute would cater to (b), and revisions of the Investment Codes to (c).

Design of the Strategy

8.05 The following sequential procedure is suggested for the planning institutions and the proposed Sectoral Task Force (STF) in selecting and designing the components of the long-term development strategy for the EMIs:

(a) establish an exhaustive but realistic list of viable production lines characterized by a substantial labor content and a moderate requirement of skilled labor 1/;

(b) assess the technological feasibility of manufacturing these products in Tunisia;

(c) forecast the size and prospects of the domestic and export markets for these products;

1/ Two simple criteria requiring little expertise could be: the share of labor cost in total production cost in developed countries (at least 20%); the proportion of skilled labor in total labor required (at most 40%).

(d) establish criteria for ranking and making a final selection of the viable production lines, and select priority groups of products and projects;

(e) identify the foreign markets, establish preliminary commercial links, identify and attract foreign partners when necessary, and finalize the projects and their product-mix and specifications; and

(f) work out programs of feasibility studies and implementation schedules for the selected groups of products and projects.

Appendix VIII.1 proposes a preliminary tentative list of viable production lines for consideration at the first step (a) in the above process. These lines include the items identified in Chapters IV through VI for further review and study.

Selection Criteria

8.06 A crucial step in the procedure suggested above is the ranking and final selection of groups of production lines (step d). The set of criteria used for this purpose should combine and balance the varied and sometimes conflicting benefits expected from various projects and reflect the industrialization and export objectives of the country's long-term strategy. The following list of criteria is given for illustrative purposes as a starting point:

Criteria supporting the broader industrialization objective:

(a) potential of the production line for the development of supporting industries (supplying parts, components, subassemblies);

(b) local value added generated by the production line;

(c) compatibility of the technology of the production line with Tunisia's capabilities and potential;

(d) potential for fostering skills, technologies and new policies beneficial to other production lines or subsectors; and

(e) potential of the production line for the development of forward industries producing end-items.

Criteria supporting the export objective:

(f) labor intensity of production lines (as a measure of the potential cost advantage);

(g) prospects for exports to developed countries 1/;

(h) size and growth prospects of the domestic market to support production for exports;

(i) prospects for exports to developing countries of the region; and

(j) possibilities of partnership with foreign firms, when necessary, to provide technological assistance, quality control management and marketing services abroad.

1/ Based in particular on a detailed review of trade statistics and imports of EMI products by developed countries. Cf. Appendix IV.3.

A N N E X E S

TUNISIA INDUSTRIAL STRUCTURE
(Estimates of "Normal" Production Shares for Tunisia)

1. The production shares of the primary, industry and services sector, as well as those of the manufacturing sector and its subsectors, can be estimated on the basis of cross-country regression equations, such as those developed by the Chenery and Syrquin study 1/ and by the World Bank Research Project "Patterns of Industrial Development" (RPO 671-05). The analytical results of the latter study were applied for estimating a "normal" production pattern for the Tunisian economy. 2/

2. In the "Patterns" project, the value added share of a sector (or subsector) is regressed as a function of various explanatory variables such as per capita-GNP, population, manufactured exports/GNP, primary exports/GNP. Predicted shares are then estimated for aggregate sectors and disaggregate manufacturing subsectors. In the aggregate analysis, GDP is divided into three sectors:

(i) primary, consisting of agriculture and mining;

(ii) industry, consisting of manufacturing and construction; and

(iii) services, estimated as GDP minus (primary + industry).

In the disaggregate analysis, the manufacturing sector is divided into the 13 traditional subsectors of the International Standard Industrial Classification.

3. The analysis of the "Patterns" research project is based on a sample of 98 countries (given in Table 1) which is divided first into large (L) and small (S) countries (a population of 15 million in 1970 is the cut-off point), and then divided into manufacturing (M) and primary (P) orientation according to the trade indices. Of the various regression equations estimated by the "Patterns" project, the following basic regression equation relating to the SM countries is likely to provide the "best" results for Tunisia.

$$S = a_0 + a_1\ L{\cdot}Y + a_2(L{\cdot}Y)^2 + a_3\ L{\cdot}N{\cdot} + a_4\ L{\cdot}EP + a_5\ L{\cdot}EM$$

where S = share of the value added in a sector or subsector as % of GDP,
Y = per capita GNP at 1970 US$,
N = population in thousand,
EP = primary exports as % of GNP, and
EM = manufactured exports as % of GNP.
("L." in front of each variable denotes natural logarithm)

The basic regression results for the sample of 32 SM countries are given in Table 2.

1/ Chenery and Syrquin: Patterns of Development 1950-1970 (World Bank, 1975).

2/ Application of "Patterns" Project for predicting Production Shares for Tunisia - World Bank Memorandum of Mr. V. Prakash - May 16, 1979.

4. The "normal" production shares predicted by the regression equations do not represent by themselves the "likely" structure of Tunisia in any given year. They simply indicate a likely structure of an average SM country with the specified values of Tunisia for per capita income, population and other variables. That is, they only show an intercountry average pattern and need to be adjusted for any year by the likely deviations for Tunisia from the average pattern. The results for Tunisia are given in Table 3 which displays the normal production shares for 1968, 1973, 1976 and 1977, as well as the residuals (differences between actual and predicted sectorial shares). One should note that the actual share of total manufacturing as well as of each subsector have been consistently below the predicted value in all the years, as summarized in the Table below:

ESTIMATED NORMAL PRODUCTION SHARES AND RESIDUALS FOR TUNISIA
1968, 1973, 1977
(in % of GDP)

Subsector	1968		1973		1977	
	Norm	Residual	Norm	Residual	Norm	Residual
Food Industries	4.70	-0.57	4.95	-1.24	4.89	-1.86
Textiles, leather	3.30	-2.01	4.08	-1.89	4.35	-1.51
Basic Metals	0.35	n.a.	0.70	n.a.	0.84	n.a.
Metal Products	2.70	n.a.	3.82	n.a.	4.72	n.a.
(Sub-Total EMIs)	(3.05)	-1.85	(4.52)	-3.11	(5.56)	-4.06
Construction Materials	1.20	-0.34	1.38	-0.61	1.41	-0.37
Chemicals, rubber, petrochemicals	2.72	-1.03	3.30	-1.08	3.88	-1.96
Wood, paper, miscellaneous	2.34	-1.39	2.97	-1.94	3.35	-2.15
Total Manufacturing	16.95	-6.82	20.47	-9.15	22.54	-11.01

Source: Table 3

It indicates that the degree of industrialization and development of manufacturing in Tunisia do not measure up to the country's underlying economic strength.

Table 1

List of Countries in Aggregate and Disaggregate (Full) Country Samples

CC	NAME OF COUNTRY		CC	NAME OF COUNTRY		CC	NAME OF COUNTRY	
4	Afghanistan	SM	372	Ireland	SP	702	Singapore	SM
12	Algeria	SP	376	Israel	SM	706	Somalia	SM
24	Angola	SM	380	Italy	LM	710	South Africa	LM
32	Argentina	LP	384	Ivory Coast	SP			
36	Australia	SP	388	Jamaica	SP	724	Spain	LM
40	Austria	SM	392	Japan	LM	736	Sudan	SP
56	Belgium	SM	400	Jordan	SM	752	Sweden	SM
68	Bolivia	SP	404	Kenya	SM			
76	Brazil	LP	410	Korea Republic	SP	760	Syrian Arab Republic	SP
104	Burma	LP				764	Thailand	LM
116	Khmer Republic	SP	422	Lebanon	SM	768	Togo	SP
120	Cameroon	SM				780	Trinidad and Tobago	SM
124	Canada	LP	430	Liberia	SP	788	Tunisia	SM
144	Sri Lanka	SP	434	Libyan Arab Republic	SP	792	Turkey	LP
148	Chad	SM	450	Malagasy Republic	SM	800	Uganda	SP
152	Chile	SM	454	Malawi	SP	818	Egypt Arab Republic	LM
158	China Republic of	SM	458	Malaysia	SP	826	United Kingdom	LM
170	Colombia	LP	466	Mali	SP	834	Tanzania	SM
178	Congo Peoples Republic	SM	478	Mauritania	SP	840	United States of America	LP
180	Zaire	LM	484	Mexico	LP	854	Upper Volta	SM
188	Costa Rica	SP	504	Morocco	SP	858	Uruguay	SP
204	Dahomey	SM	508	Mozambique	SP	862	Venezuela	SP
208	Denmark	SP						
214	Dominican Republic	SP	528	Netherlands	SM	890	Yugoslavia	LM
218	Ecuador	SP				894	Zambia	SM
222	El Salvador	SM	558	Nicaragua	SP			
230	Ethiopia	LP	562	Niger	SP			
246	Finland	SM	566	Nigeria	LP			
250	France	LM	578	Norway	SM			
280	Germany Federal Republic	LM	586	Pakistan	LM			
288	Ghana	SP	590	Panama	SM			
300	Greece	SP	596	Papua New Guinea	SP			
320	Guatemala	SP	600	Paraguay	SP			
332	Haiti	SM	604	Peru	SP			
340	Honduras	SP	608	Philippines	LP			
344	Hong Kong	SM	620	Portugal	SM			
356	India	LM	646	Rwanda	SP			
360	Indonesia	LP	682	Saudi Arabia	SP			
364	Iran	LP	686	Senegal	SP			
368	Iraq	SP	694	Sierra Leone	SM			

Note: Countries underlined are also included in the disaggregate sample.

CC 3-digit U.N. Country Code
L Large Countries (population in 1970: above 15 million)
S Small Countries (population in 1970: between 1 and 15 million)
M Manufacturing oriented/resource poor
P Primary oriented/resource rich

Table 2. Crosscountry Regression Coefficients: Semi-Log, 1963-74
2.21 Small Manufactured Export Oriented Countries (SM)

Sector/Sub-Sector	Const.	L.Y	$(L.Y)^2$	L.N	L.EP	L.EM	R^2	S.E.E	Mean[a] of Y	No. of[b] Obs.
Disaggregate										
TOTMFG	-175.169	36.868	-2.410	7.195	0.417	-0.510	0.778	4.251	741	239
	(-13.236)	10.744	-9.226	15.717	1.029	-1.826				
FOOD (Early)	-15.751	5.265	-0.398	0.478	-0.059	-0.336	0.137	1.340	741	239
	-3.775	4.867	-4.835	3.314	-0.461	-3.819				
TEXTL (Early)	-41.455	9.571	-0.734	1.629	-0.257	-0.221	0.470	1.266	777	229
	-9.105	8.139	-8.336	11.241	-2.048	-1.969				
CLOTH (Middle)	-11.527	2.979	-0.211	0.287	0.022	-0.090	0.470	0.372	765	218
	-9.512	9.437	-8.747	6.730	0.587	-3.510				
LETHR (Middle)	-8.496	1.965	-0.155	0.324	0.002	-0.023	0.394	0.310	733	205
	-8.270	7.421	-7.647	8.938	0.064	-1.030				
CHEM (Middle)	-35.527	8.386	- .622	1.084	0.482	0.137	0.459	1.104	768	234
	-9.305	8.581	-8.426	8.664	4.473	1.794				
RUBER (Middle)	-5.550	1.553	- .115	.045	0.128	.089	0.429	0.233	760	201
	-5.588	6.222	-6.185	1.486	5.229	4.805				
MINERL (Middle)	-11.612	3.466	-0.252	0.229	-0.219	-0.099	0.449	0.487	741	239
	-7.658	8.816	-8.428	4.369	-4.721	-3.104				
WOOD (Late)	-4.334	0.927	-0.038	0.134	0.026	-0.045	0.405	0.553	741	239
	-2.520	2.079	-1.124	2.249	0.501	-1.249				
PAPER (Late)	-4.898	0.387	0.020	0.304	0.061	-0.140	0.352	0.826	793	231
	-1.538	0.476	0.333	3.128	0.750	-2.451				
PRINTG (Late)	-0.289	-0.159	0.046	-0.031	0.236	-0.010	0.727	0.291	753	214
	-0.297	-0.625	2.364	-0.960	8.315	-0.444				
BSMET (Late)	-15.547	2.806	-0.161	0.733	-0.431	-0.021	0.370	1.229	908	214
	-3.024	2.083	-1.601	5.136	-3.623	-0.214				
METAL (Late)	-40.818	5.224	-0.211	2.354	0.327	0.141	0.772	1.758	753	235
	-7.031	3.459	-1.852	12.254	1.933	1.026				
MISC (Late)	-9.302	2.538	-0.182	0.162	0.039	-0.042	0.294	0.450	713	220
	-6.428	6.753	-6.395	3.195	0.877	-1.190				
Aggregate										
PRIMARY	177.941	-34.935	1.871	-1.115	-1.967	0.547	0.672	8.991	505	463
	10.389	-7.528	5.123	-1.760	-3.308	1.475				
INDUSTRY	-109.652	22.203	-1.237	5.736	-1.451	0.277	0.715	6.120	505	463
	-9.406	7.029	-4.976	13.295	-3.585	1.096				
SERVICES	31.708	12.732	-0.634	-4.620	3.418	-0.824	0.381	7.908	505	463
	2.105	3.119	-1.975	-8.288	6.536	-2.526				

a/ Y ranges from $67 to 4,524 in Disaggregate and $63 to 4,524 in Aggregate Sample.
b/ Number of countries is 9 in Disaggregate and 32 in Aggregate Sample.

Table 3

Estimated Normal Production Shares and Residuals for Tunisia 1963, 1968 and 1973 /a

	Mean /b Residual	1963 Norm	1963 Residual	1968 Norm	1968 Residual	1973 Norm	1973 Residual	1976 /c Norm	1977/c Norm	1977/c Residual
Disaggregate										
TOTFG	-8.42	15.45	-8.05	16.95	-6.82	20.47	-9.15	22.38	22.54	-11.01
FOOD	-1.60	4.62	-1.18	4.70	-0.76	4.95	-2.56	4.96	4.89	-1.86
TEXTL	-1.26	1.81	-1.42	2.04	-1.24	2.54	-1.36	2.68	2.69	
CLOTH	-0.51	0.82	-0.65	0.89	-0.47	1.08	-0.43	1.17	1.16	-1.51
LETHR	-0.30	0.32	-0.28	0.37	-0.29	0.46	-0.33	0.49	0.50	
CHEM	-0.86	2.11	-1.05	2.39	-0.80	2.90	-0.80	3.30	3.35	-1.96
RUBER	-0.23			0.33	-0.23	0.40	-0.28	0.51	0.53	
MINERL	-0.32	1.16	-0.43	1.20	-0.34	1.38	-0.61	1.41	1.41	-0.37
WOOD	-0.57	0.74	-0.59	0.79	-0.58	0.95	-0.60	1.05	1.05	
PAPER	-0.30	0.35	-0.33	0.43	-0.27	0.64	-0.48	0.74	0.72	-2.15
PRINTG	-0.31	0.46	-0.35	0.51	-0.32	0.62	-0.33	0.76	0.75	
BSMET	-0.10	0.25	-0.14	0.35	0.10	0.70	-0.22	0.79	0.84	
METAL	-2.01	2.20	-1.14	2.70	-2.28	3.82	-2.75	4.60	4.72	-4.06
MISC	-0.47	0.55	-0.45	0.61	-0.51	0.76	-0.49	0.83	0.83	
Aggregate										
PRIMARY	-0.61	29.09	-0.66	27.77	-1.84	23.63	5.40	20.98	21.00	
INDUSTRY	-4.71	20.56	-4.38	21.63	-4.40	24.62	-7.48	26.11	26.55	
SERVICES	5.32	50.35	5.04	50.60	6.24	51.75	2.08	52.91	52.46	

/a The data base relate to 1963-73 in the disaggregate, and to 1961-74 in the aggregate analysis.

/b The residuals are defined as (actual minus norm)/GDP (%).

/c Based on the following data for 1976 and 1977:

	Y (1970US$)	N (000)	EP (%GNP)	EM (%GNP)
1976	439	5737	12.41	5.59
1977	447	5892	11.69	7.28

ANNEX II

T U N I S I A

METAL WORKING

AND

MECHANICAL INDUSTRIES

TUNISIA

MECHANICAL SUBSECTOR

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I. STEEL

A. Foreword

1.01 The steel industry is not usually considered as part of the mechanical industries. However, given the importance of steel products as inputs to mechanical industries, the steel sector could not be ignored. The following paragraphs provide some insight into the steel sector without attempting to be as deep and detailed as would result from a sector review.

B. Overall Supply and Demand of Steel Products in Tunisia

1.02 The present situation of production, imports, exports and consumption of steel products in Tunisia is summarized in the table below.

Steel Products - 1978 Production, Imports, Exports and Consumption
(000 tpy)

	Production	Imports	Exports	Consumption
Non Flat Products				
Merchant and reinforcing Bars	108	34	n.s	142
Profiles 1/	-	30	n.s	30
Wire rods	39	-	n.s	39
Sub-total	147	64		211
Flat Products				
Sheets	-	9	n.s	9
Plates	-	48	n.s	48
Sub-total		57		57
Total steel products	147	121		268

1/ does not include 10,000 tons in the form of assembled steel structures

Source: TUNISIA: El Foulehd and import statistics

1.03 As can be seen from above, the local steel production accounts for 55% of the domestic market requirements and 70% of the requirements in non flat products. Steel consumption is heavily oriented towards non-flat products which are used in the construction industry. Flat products consumption is still at a very low level, given the early stage of development of the Tunisian industry.

C. Supply of Steel Products for the Mechanical Industries

1.04 Except for merchant bars produced locally, steel products consumed by the mechanical industry are imported. They include flat products as well as some non flat products such as profiles. Foreign procurement is organized by each enterprise separately based on import licences with annual quotas. A committee comprising importing firms can,on request, give advice on the technical aspects of imports. Steel imports are also handled by agents who supply small scale enterprises. Because of the small quantities involved and the lack of standardization in the requirements, FOB prices obtained for steel imports are an average 10 to 15% above international levels. For the same reasons, enterprises consuming steel products keep large and costly inventories, equivalent to between 5 and 10 months of requirements. Freight, handling charges and import duties add about 20% to the FOB prices and the agent's commission when he is involved, another 40%. As a first contribution towards rationalizing the import of steel products, Tunis Acier has undertaken a DT 5 million investment in cutting,shearing, slitting and roll forming lines to meet the specific requirements (on size, format, etc.) of the local market, including the production of profiles out of imported steel plates. The investment, which will have a capacity of processing 150,000 tpy of imported steel products, is due for commissioning in mid 1979. In principle, the project is good. However, it has been over-designed in view of the domestic market requirements (about 70,000 tons).

D. Existing Production Facilities, Situation vis-a-vis Raw Materials and Competitiveness

1.05 Steel is produced in Tunisia by the El Foulehd plant located at Menzel Bourguiba, on the bay of Bizerte. The plant was built in 1965 based on the conventional process (blast and open-hearth furnaces) and with a capacity of 135,000 tpy of liquid steel. More recently, a 30,000 tpy electric furnace was added, using scrap as the main feed. The present capacity and production of the various facilities are summarized in the table below:

El Foulehd Steelworks: 1978 Capacity and Production
(000 tpy)

	Capacity	Production	Capacity Utilization %
Blast Furnace	140	138	98
Open Hearth Furnace	135	131	97
Electric Furnace	30	29	96
Bar Mill	100	108	108
Wire Rod Mill	70	39	55
Wire drawn machines	20	14	70
Fabrication shop	10	4	40

Source: El Fouledh

1.06 The El Foulehd plant produces primarily reinforcing bars for the construction industry and to a lesser extent wire rods and cables for various applications. The plant also includes a shop for metallic structures (para 3.02). Except for the wire rod mill, the wire drawn machine and fabrication shops, the major facilities now operate close as above capacity.

1.07 Iron ore is processed from local mines at Djerissa and Sejnan close to the Algerian border. The ore is rather poor in quality (54% Fe) and it contains a high level of magnesium, which makes the pig iron impossible to be used by the foundry industry. The price of local iron ore at the plant's gate is about 25% than the present international price, including adequate provision for freight charges, say from Mauritania. Based on the present rate of production, the iron ore mines are expected to be depleted over a 10 year period. Coking coal is imported at the prevailing international price. The steel and iron scrap is at present purchased locally.

1.08 By international standards, the El Foulehd plant is very small and it does not benefit from the economies of scale, typical in the steel industry. For this reason and to a lesser extent, due to the high cost of iron ore supplies, the plant has experienced financial difficulties, in spite of the protection it has benefited on the domestic market. As the plant becomes older, the weight of depreciation and financial charges in production costs decreases and output prices can be set at somewhat lower levels in real terms. At present, ex-factory prices are about 20% higher than international prices.

E. Future Development and Recommendations

1.09 Domestic consumption of flat products is not expected to reach in the near future a level which would justify an investment in steel production. Hot strip mills, which produce flat products, are now built with a capacity of 1,0 million tpy. In comparison, present consumption of steel sheets, plates, and coils does not exceed 60,000 tpy in Tunisia. The priority is therefore to import flat steel products at the lowest price. Given the present inefficiencies with respect to imports (para 1.04), it is recommended to explore the possibility of offering to interested firms a procedure of central procurement.

1.10 As far as non flat products are concerned, several projects are being planned by the Tunisian authorities. First, the capacity of the El Foulehd steelworks will be increased from 170,000 to 200,000 and then 220,000 tpy of finished products, through balancing the existing facilities and expansion of the furnaces and mills. The additional capacity will be for the production of reinforcing bars (25,000 tpy), of wire rods (5,000 tpy), and of small steel products which are currently imported. The project costs are estimated at million DT 3.5 (US$8.8 million) and completion is expected by 1982. Second, the pre-feasibility has been studied for a new steel plant based on the direct reduction process, usually employed in countries with availability of cheap sources of fuel. The project would have a capacity of 400,000 tpy and would produce primarily reinforcing bars. It would be implemented in two steps, with a cost estimated at DT 100 million (US$250 million). The project concept was

developed based on market projections which assumed that consumption of reinforcing bars would grow by 16% per annum, from 170,000 tons in 1976 to 668,000 tons in 1986. In fact, consumption declined to about 150,000 tons in 1978. Assuming a 9% annual growth rate in line with projections for the construction industry to which it is related, consumption of reinforcing bars would not exceed 275,000 tons in 1985, compared to an installed capacity of 125,000 tpy, including the 25,000 tpy to be installed by 1982. Even under more optimistic market assumptions, it would seem difficult to justify a 400,000 tpy investment, although this is a reasonable size for a direct reduction plant producing non flat products. In view of the large amounts of financing required and of the market constraints, the project appears to have been shelved, at least temporarily. Instead, some consideration is given to installing electric furnaces of a smaller size, using scrap as the main feed. Worldwise, electric steel plants have been operating at profit in the last three years, due to the low prices of scrap. However, scrap prices are highly volatile and, at present, they are increasing rapidly. Taking into account the likelihood that in future, gas will be available in Tunisia at a cheap price, either from Algeria or from the Miskar fields, the direct reduction process appears to be the appropriate technology for Tunisia. However, the market should develop first and this might imply that it is waited another five years before making any investment decision.

II. FOUNDRIES

A. Introduction

2.01 A contribution of only 3% of the output from the foundry subsector in the mechanical and electrical manufacturing industries reflects the low degree of national integration of this subsector in the whole sector and being a backbone of an industrial development, this subsector needs special attention to increase its integration with the local industries.

B. Production and Capacity Utilization

2.02. The foundry subsector is being dominated by the two public enterprises SOFOMECA (Societe de Fonderies et de Mecaniques) and FONDERIES REUNIES both located in Tunis. They provide for about 90% of the national capacity and production of castings. Besides these two foundries there are other small scale foundries including one associated with the ship repair facilities of SOCOMENA (Societe Tunisienne de Constructions et de Reparations Mecaniques et Navales), located at Menzel-Bourgiba, about 60 Km north of Tunis. The three mentioned foundries have an industrial character whereas the others could be regarded as handicraft foundries. Total employment by foundries is estimated at about 1000. The capacity and production of these foundries are given below:

TUNISIA: CAPACITY AND PRODUCTION OF CASTINGS
(tons per year)

	Capacity			Production 1978		
	Iron	Steel	Non-Ferrous	Iron	Steel	Non-Ferrous
SOFOMECA	3,500	2,000	-	2,800	1,000	-
FONDERIES REUNIES	4,000	-	300	2,300	-	200
SOCOMENA	1,000	-	-	500	-	-
Others 1/	500	-	-	500	-	-
Total	9,000	2,000	300	6,100	1,000	200

1/ Estimated

Source: Mission estimates and plant accounts

2.03 Since 1973 the production of castings in Tunisia has been around 6,000 tons per year of which about 75% are iron castings and the rest mainly steel castings. The stagnation of production and the present low utilization of the capacity to the extent of 65% is due to various factors: (i) the low degree of integration of the foundry subsector in the overall industrial growth, (ii) limited capacity of automotive and machine building industry as well as construction machinery in Tunisia, (iii) sharp cost competitiveness and decline

in export markets; (iv) lack of adaptation to the new technical developments in casting technology by the Tunisian foundries; (v) difficulties in producing higher qualities of castings; (vi) lack of import substitution of castings due to quality requirements and price comparison; and (vii) commercial constraints in marketing.

C. Product-mix, Market and Protection

2.04 Tunisian foundries produce iron, steel and non-ferrous (mainly brass) low grade and simple type of castings in small series for a wide range of applications. These castings are used either for further processing or as semi-finished items. The main consuming industries are: i) sewage, water and sanitary systems in construction industry with items like water meter body, taps, fittings, valves, bathtubs, flushes, manholes cover, street gratings, radiators etc. accounting for about 50% of the total production; ii) mines and cement industry with components like grinding balls, crushers, linings, bolts with a production share of about 13%; iii) railway equipment with parts like brake blocks, couplings, fasteners, tension rods with a production proportion of about 17% and iv) electrical and mechanical industries like automotive, diesel engines, agricultural with parts like brake drums, supports, flywheels, casings, pumps, counterweights, discs, motors, with production share of about 20%.

2.05 The castings produced by the Tunisian foundries are sold mainly on the domestic market. Under a subcontracting arrangement, SOFOMECA supplied some castings to Berliet in France. In addition, SOFOMECA has also been successful in exporting castings to Algeria, Libya and Morocco. During the years 1973-76, about 1,000-1,500 tons per year of iron and steel castings were exported to these countries, but now the exports have declined due to increased price competition, technical requirements, quality and transport problems. SOFOMECA had been able to export about 50-60% of its steel casting production during 1972-76, but the percentage is reduced to only 10%, the decline being mainly due to the change in requirements of replacing the steel casting through Spheroidal iron, a technology which SOFOMECA perhaps has not been able to adapt to.

2.06 In addition to the local supply of casting through the three foundries, a substantial demand of castings is met through imports of 8-10.000 tons per year (excluding pipes) which could be classified into two groups: First, there are castings used as spare parts in various industries. Such castings will be imported in future too and are uneconomical to be produced in Tunisia as,the local delivery time is too long due to technical preparation process; the local price is too high due to limited quantity; and the requirements of consuming industries are irregular due to non-systematically preventive maintenance of casting consuming equipment. Second,there are castings used as raw materials and semi-finished product. The classification of imported castings being: construction sector 40%; mines, railway and cement industry 10%; electrical and mechanical industries 20%; spare parts and miscellaneous 30%.

2.07 Considering the composition of imports and local production, the Tunisian present consumption of castings is: construction sector 40%; mines, cement and railways 15%; electrical and mechanical industries 20% and spare parts and miscellaneous 25%. This structure substantiates the fact that the Tunisian electrical and mechanical industries have to be developed tremendously so as to allow a larger integration and development of Tunisian foundries. Given the improvement in casting production techniques, availability of technical assistance and entrepreneurship of importers to obtain castings locally,50-60% of the imported castings could be substituted through local production. Lack of these efforts could be derived from the fact that at time of mission's visit the steel foundry of SOFOMECA was not working due to shortage of orders.

2.08 The lack of initiative of importers of castings as well as the hesitation of the suppliers for the homologation of casting may also be due to the fact that the foundry subsector is not protected. The import of castings is not subjected to any control or regulation. Duties and taxes with a weight of 15% on the imported castings are practically the same as those contained in the local manufactured production. In addition, the castings used as equipment goods can be imported with a nominal tax of 3%. Although the local manufacturers are also exempted from taxes in similar circumstances, they still have to pay taxes and duties on the imported raw materials, equivalent to about 8% of the value of castings. Hence there is an advantage to the foreign suppliers, thus discouraging local production. The local importers explain their decision to purchase foreign castings on basis of better quality and prices. Examples are however available that with the initiative and entrepreneurship of the importers like SOTUMO (Societe Tunisienne des Moteurs), manufacturer of low horsepower diesel engines, imported castings could be replaced through local production.

Production Inputs, Cost Competitiveness

2.09 The principal raw materials include iron and steel scrap, pig iron, coke and sand representing about 30-50% of output value. Tunisia is not entirely self-sufficient in iron scrap and it imports about half of its requirements. Steel scrap which was formally available from the domestic market would have to be imported in the future due to expansion plans of El Foulehd. The price of local iron and steel scrap is practically half of international price as a result of national price control system. The use of locally produced pig iron is limited to about 10% of consumption due to its chemical contents. Its price is also below the international level. The rest of pig iron requirements are imported internationally. These raw material give the Tunisian foundries a slight marginal advantage in the production cost of castings in comparison with their European counterparts as far as costs of these raw materials are concerned. The quality of local available sand is much below standard resulting to poor surface finish and low quality of castings. To achieve better casting results, it is urgently needed that improved sand sites are investigated. According to SOFOMECA and FONDERIES REUNIES, efforts are being made to identify improved quality of sand and technical assistance in this field seems desirable.

2.10 The average cost of labor including the social charges, which accounts to about 25-40% of output value, is about 30% that of its European foundries. With such a low labor input, a foundry should be able to have a better cost competitiveness but this advantage is however offset by the Tunisian foundries as they are not running efficiently technically due to old equipment, insufficient production and material flow and handling of various production processing resulting to low productivity of the companies. The major Tunisian foundries are at present bringing out an output of about 6.5 - 7.5 tons of castings per employee which is about one third as compared with European standards. The foundry skill is achieved through training "on job" in each individual company and one of the lacking point seems to be in the acquirement of skill in new technical and technological methods in the casting field and it is recommended that through an institutional support the latest developments in the field of casting technologies are adapted in the Tunisian foundry industry.

2.11 The type of castings produced in Tunisia could be regarded as low graded castings and the quality for the traditional castings for construction sector is acceptable. The price of these castings which occupy about 50% of Tunisian production could be regarded as competitive.1/ Better graded castings are up to 20% more costly than compared with European prices.1/ Assuming new investments for plant modernisation, better quality of sand, improved production management and skill, availability of technical assistance and cooperation and better utilisation of capacity the labor productivity could surely be increased resulting to better quality standard and cost competitiveness.

E. Future Developments and Recommendation

2.12 As a key to the backward linkage between the manufacturing and assembling industries, the development of the foundry subsector depends to a large extent on the overall growth of the electrical and mechanical industries in Tunisia. The local production of castings at present is estimated to increase to about 21.000 tons per year by 1982. The projection of requirement is based on following plans: First, the traditional castings for construction and general engineering produced locally at present are assumed to grow at an annual rate of 8% in line with past experience. Second, the domestic market for railways is presently limited to brake blocks and couplings. An increased demand for iron and steel castings is growing to result from a project to produce 200 wagons per year in Tunisia. SOFOMECA has already ordered the machine for the manufacture of parts and the production is expected to start in May 1979. Third, the development of casting market for automotive industry is linked with the implementation of a project for manufacture of diesel engines and tractors, planned to consume about 4000 tons per year of castings. Finally, about 50% of the castings imported at present are assumed to be substituted through the domestic production.

2.13 The projected production of 21,000 in 1982 justifies the expansion of the existing capacities which are no doubt very small in size by international standards. An expansion would definitely bring an advantage of economies of scale.

1/ Traditional low-graded castings: 600-800 $/T, for 550-700 $/T FOB Europ.
Better graded castings: 850-1250 $/T, for 700-950 $/T Europ.

With respect to the development strategy for the foundry subsector, the Tunisian authorities have planned FONDERIES REUNIES to produce the local automotive castings, including those for the mechanical complex producing diesel engines and tractors, and to transfer its present productions to SOFOMECA. In order to bring both foundries to an economic size, it is recommended to undertake a technico-economic study which should assess: (i) the demand of castings of various types (including spheroidal iron) in the consuming industries; (ii) the possibilities of efficient substitution for presently imported castings; (iii) the possibilities of exports to EEC and neighbor countries; (iv) SOFOMECA's facilities and the investment costs required for its modernization and expansion; (v) the planning of production transfers and expansion in each foundry; and (vi) the concrete measures necessary to encourage and protect the subsector.

2.14 Parallel to the modernization of the foundries, it is essential that technical assistance should be explored for operational and processing methods of production; identification of sites for better quality of sand and for the training of labor in European foundries. For the development of a strategy for exports, it is recommended that sub-contracting arrangements with European foundries and trading companies should be build up or extended and assistance should be specially forthcoming from the public institution like CEPEX. After the implementation of investments, improvement is operational and technical aspects of production and with technical assistance Tunisia can certainly possess production cost advantage of 10-15% as compared to European countries.

III. STEEL FABRICATION AND PLATEWORK

A. Overall Capacity and Production

3.01 Steel fabrication and plate work is one important subsector among the IMME in Tunisia. It accounts for about 75% of the value added by the IMME. Over the recent years, it has been very active; according to API, out of 500 projects approved in the IMME, 200 (40%) were for steel fabrication and plate work. However, in the absence of a comprehensive study covering major aspects of the subsector, new investments do not appear to have been planned with a view to maximizing the utilization of existing capacities. As a result, present production facilities are now operating well below capacity. Based on tentative estimates received from discussions during the visits, the subsector would have a capacity of 50,000 tpy, and a current production not exceeding 30,000 tpy.

3.02. Production is scattered over a large number of small enterprises. However, three medium size companies, SGI, SAMMI, both located in the Tunis area, and El Fouladh in Menzel Bougurba dominate the subsector with their production accounting for more than 50% of that of the subsector. Another medium size firm, Ateliers Mecaniques de Gabes is planned to enter into production by the end of 1979, with the purpose of servicing the south region of Tunisia, and in particular, the Gabes industrial area. The four firms were visited and the findings and recommendations outlined in this section are largely based upon these visits.

B. Product-mix, Markets and Protection

3.03 The major products manufactured in the subsector include: steel structures for industrial buildings, electrification towers for the power company, containers and vessels for the chemical, petroleum and gas industries, and some equipment (grinders, piping work etc.) for the construction industry. All thicknesses of steel and plate work are produced, but within a maximum of 40 mm. The upper range of thickness grades is available from the larger companies (SGI, SAMMI), whereas the lower range is available from small scale firms.

3.04 The steel fabrication and platework industry is entirely geared towards the local market. Yet, imports amount to about 10,000 tpy (DT 5 million or US$ 12.5 million) and they account for 25% of the domestic market requirements. Imports are composed of items not currently manufactured in Tunisia, such as boilers, heavy pressure vessels, cranes, furnaces etc. There are also imports competing with the local industry. In theory, the protection of the local industry is significant, with the weight of taxation on the value of imports being 35% compared to 15% on the value of locally manufactured products. In fact, for all authorized investments, equipment goods that most of the sub-

sector's output qualifies for, can be imported without restriction and free from duties and taxes, except for the 3% custom administration tax. Although local producers are also exempted from the production tax in case of equipment sales for authorized investments, they still incurr duties and taxes on their production inputs. These are estimated to account for 8% of the value of production whereas the custom administration tax on imported equipments does not exceed 3%. There is, therefore, an advantage given to foreign supplies which does not encourage them to subcontract locally.

3.05 In the absence of a market study, only rough assumptions can be made as to the future development of the local market. For the purpose of this report, it has been assumed that the growth of the domestic market for steel and platework would follow that of industrial investments, i.e. about 5% per annum. On this basis, the domestic market would grow from 40,000 tpy in 1978 to 55,000 tpy in 1985. As for export prospects, given the bulkiness of most structural and platework and given the rather low level of technology incorporated in Tunisian production, they are out of limited nature. However, after some experience has developped between foreign and Tunisian suppliers on the domestic market, it could be found as an advantage to extend this cooperation to neighbouring North African and Middle East markets where industrial investments are expected to remain at high levels. In addition, it would be worthwhile to investigate export market opportunities for some specific product lines, such as aluminium doors or window frames which incorporate a high percentage of labor and which have a high final value.

C. Production Inputs, Competitiveness and Financial Situation of Operating Companies

3.06 Raw materials and labor are the two major inputs in steel fabrication and platework and they account respectively for 30 to 35% and 25 to 35% of the value of output. As for capital charges, including profit, their share does not exceed 15 to 20%. Except for El Fouledh,which under a Danish licence, uses its own produced round bars for steel fabrication, steel products, the main input materials, are imported and procurement is organized by each enterprise separately. Because of the small quantities involved and the lack of standardization in the requirements, prices obtained for steel sheets and plates are 10 to 15% higher than the international FOB price and enterprises keep large and costly inventories, equivalent to 8 to 10 months of consumption. Labor appears to be about half as productive (man hour per unit of production) as in industrialized countries, but this is more than compensated by the lower level of wages and social charges combined (about one third of European labor costs). Equipment is modern and well maintained. However, in some instances, excessively capital intensive technology is being employed, leading to large under utilization of equipment.

3.07 All in all, the subsector appears very competitive with reasonable product quality. Output prices, excluding taxes are between -5 and 5 per cent under or above FOB European prices.1/With these prices, large and established firms are in a sound financial position, whereas small or new firms were reported

1/ Steel structures: 850-1100 $/T, for 800-1000 $/T FOB Europ.
Platework: 990-1700 $/T, for 950-1500 $/T FOB Europ.

to be in financial trouble, as their capacities are largely under-utilized due to market constraints. In concept, basic conditions are met for the subsector to be viable. First, the nature of steel fabrication and platework allows small or medium scale operations which are particularly suited to the size of the Tunisian market. Second, steel and platework incorporates a high percentage of labor for which Tunisian has a competitive advantage. Third, the local industry is not protected from foreign competition. On the contrary, in many instances, an advantage is given to foreign suppliers (para 3.04). Provided investments are properly planned, the steel fabrication and platework in Tunisia should contribute positively to the industrial development.

D. Future Development and Recommendations

3.08 As discussed earlier and based on rough assumptions, the domestic market for standard steel fabrication and platework is estimated at 55,000 tons by 1985, including 14,000 tons of those products which are now being imported. In contrast, present production capacity is estimated at 60,000 tpy, not including 6,000 tpy available from Ateliers Mecaniques de Gabes, starting by the end of 1979. The priority over the next five years is therefore towards a better utilization of existing capacities. In this context, it is recommended to undertake a comprehensive study of the subsector covering such areas as existing production facilities, present and future domestic market requirements, imports, export prospects for specific products and fiscal policies in so far as they apply to the subsector. The study should aim at (i) identifying product lines, such as boilers, cranes, furnaces which could be manufactured in Tunisia with little additional investments (DT 5 million or US$ 12.5 million); (ii) identify specific products (i.e aluminium door and window frames) for which Tunisia would be well placed to export; (iii) rationalizing existing facilities and productions whenever necessary, and (iv) revising the incentive system to encourage foreign suppliers to subcontract to Tunisian firms on the local market and possibly, in the long run, on neighboring markets.

IV. TRANSPORT EQUIPMENT

A. Introduction

4.01 In Tunisia, the transport equipment subsector includes only two but major industries, the automotive and related industry and the ship building and repairs. Other transport equipment like locomotive, railway coaches, wagons etc. are practically entirely imported in the country. Ship building and repairs is dealt separately in chapterVII. The automotive and related industry has acquired an important position among the electrical and mechanical industries, as in the past six years about 70 projects with a total investment of about 50 million USS$ with a job creation of about 2000 have been approved. About half of them are in or on way to production. With a share of about 21% of the total output of electrical and mechanical industries, this subsector contributes, due to its assembling character, only about 15% of the employment of this sector.

B. Production and Capacity

4.02 The automotive industry is principally centered on STIA (Societe Tunisienne d'Industrie Automobile) a public owned automobile vehicle assembling plant located at Sousse, 120 km south of Tunis and employing about 1450 people. As for the automotive related industry producing transport equipment for construction, industrial and agricultural sector, a private enterprise SICAME (Societe Industrielle de Carosserie Automobile et Materiel Elevateur) situated in Tunis and employing about 200 people has a dominating position. These two major firms are supported by a number of smaller companies producing automotive accessories. The mission's findings are based on the visits to the plants of STIA and SICAME.

4.03 STIA assembles trucks, buses and cars from the imported CKD and SKD Kits. Since its creation in 1952, it has been expanding its facilities both in quantity and product diversification. The present production and capacity are as follows:

TUNISIA: AUTOMOBILE VEHICLE INDUSTRY 1978
(Number of Units)

	Capacity	Production
Buses	400	200
Cars	4,000	2,900
Pick-up	6,000	3,500
Trucks	800	700
	11,200	7,300

Source: STIA

Though the rate of production growth since 1973 has been quite high (over 25% per annum), the low utilization of the plant seems to be a result of poor and inefficient production organization and management, as well as of restrictive policy of the Tunisian Government for the imports of automobile vehicles combined with high protection in terms of duties and taxes.

4.04. The automotive related industry assembles or produces dump trucks for construction work, truck containers for industries, refuse vehicles for public utilities, trailers for agricultural and metallic plateforms for general application. The capacity and production of this equipment is as follows:

TUNISIA: OTHER TRANSPORT EQUIPMENT
(Number of Units)

	Capacity	Production 1978
Dump and container trucks	600 1/	425
Agricultural trailers	2,500	2,000

1/ Estimated

The major contribution towards the assembly of dump and container trucks is from SICAME which accounts for about 70% of the national production. For the manufacture of the agricultural trailers and platforms there are seven other companies, each producing 200-500 units per year.

4.05 The growth of production of automotive accessories is attributed primarily to the increase in demand of spare parts for the existing automobile park (about 200,000 units) and secondarily to the increase in production of new vehicles in STIA. Ten different companies in Tunisia producing automotive accessories and components could be classified in four different branches: (i) rubber products; (ii) electro-mechanical components; (iii) lining units and (iv) castings and machinery parts. The total output of the major automotive accessories manufacturing industries had an annual increase of over 15% in the last 8 years as against 10% in electrical and mechanical industries, this in spite of the fact that the consumption of automotive accessories by STIA accounts for only about 20% of total output. Capacity and production of some of the main automotive accessories are given below:

TUNISIA: AUTOMOTIVE ACCESSORIES INDUSTRY

		Capacity	Production 1977
Batteries	(Nos.)	220.000	155.000
Sprark Plugs/Ignition	(Nos.)	220.000	60.000
Tires	(Nos.)	220.000	180.000
Lamps/Light	(No. of sets)	60.000	42.000
Brake Linings	Tons)	300	100

Source: API

C. Product-mix, Market and Protection

4.06 Under an agreement with different automobile manufacturers of Europe, mainly France, STIA's assembly program consists of: (i) four models of cars in the range of 3-9 HP from three different manufacturers of which Citroen has a major share of about 85%, (ii) three models of pick-up, Station Wagons in range of 3-8 HP from three producers, Peugeot occupying a share of about 80%, (iii) nine models of trucks in range of 76-260 HP from three suppliers and (iv) five different models of buses in range of 152-190 HP.

Among the different models of automobiles, the Citroen car accounts for about 20% and the Peugeot pick-up for about 50% of STIA's total production. The multiple models of vehicles produced in Tunisia reflect the failure of standardization due to lack of a strategy on automotive industry in the initial years. This has resulted in: no engineering adaptation, higher production costs, increased capital investment, less possibility of local integration and last but not least, enormous problems in after sales service. The duties and taxes on imported cars are about 100% higher than contained in local manufactured cars. Such high protection of the Tunisian automobile production has largely contributed to the developing of inefficient operations.

4.07 The production of the automobile vehicles is completely for the local market and it covers about 60% of the demand of trucks and pick-ups, 35% of that of cars and 55% of that of buses. Exports for neighboring countries would certainly increase the efficiency of the plant but any possibility of exporting to Morocco, Algeria, Lybia seems to be quite less as these countries have their own assembly plants.

4.08 The trucks assembled by STIA are used as transporters by SICAME and equipped with special attachments like different buckets with capacity up to 14 m^3, container vessels with capacity up to 35000 litres for transport of liquid and pulvers and refuse containers of various capacities. As in the case of trucks the diversified product-mix needs here also standardization. This applies equally to different kinds of trailers and plateforms. The local production of such transport equipment is geared only towards domestic market where it enjoys equally good protection against the import of this equipment. The domestic production of dump and container trucks meets about 85% of the local demand and that of trailers and platform satisfies completely the local consumption.

4.09 Of the total domestic consumption of automotive accessories for new vehicles as well as for maintenance of the existing automobile park in Tunisia, the local automotive industries contribute to only about 20% whereas the rest is imported. An increase of local share is handicapped due to diversified product requirements and various technical problems. So far the contribution

of the manufacturers is only towards the local market, primarily for spare parts and secondarily for STIA's assembly plant, but exports could become possible under an agreement of subcontracting with the suppliers of the licence.

D. Production Inputs, Cost Competitiveness

4.10 The principal inputs for the automobile production include imported kits in CKD and SKD condition, imported and local automotive accessories, steel and aluminium sheets and profile, and labor. In case of automobile vehicles, the percentage of the imported parts has reduced constantly over the past years and is at present about 50% of the output value. The kits are purchased in series consisting of about 100 vehicles and due to change in the model as well as the supplier from one series to another, it is hardly encouraging to undertake any efforts in engineering adaptation for the development of the local production in seeking rationalization and cost reduction as well as in improving production organization. This is at present the fundamental drawback of the Tunisian automobile industry and it is urgently recommended that a long term strategy on product-mix, growth of subsector, local integration and engineering adaptation should be developed. The local inputs like tires, batteries, linings etc. contribute only about 8-9% of the output value. Other parts like steel and aluminium sheets and profiles have to be imported completely. The proportion of total materials in automobile industry is about 75% of the output value and about 55% in the automotive related industry.

4.11 Labor accounts for a major proportion of the added value but only for about 8-10% of the output value in the whole subsector. The equipment installed in plant is modern but in addition to the skill of the available labor the productivity depends on production organization and capability of the management. Due to poor production organization and inefficient management the STIA plant does not appear to be fully utilized in its technical capabilities thus resulting in low productivity of labor as compared to similar European assembly lines. Labor productivity is lower by approximately 50%, as illustrated by the high level of man-hours per vehicle: over 100 hours per car or pick-up; 250 hours per truck; and 2,500 hours per bus assembled in STIA. It is recommended that opportunities should be provided to the production managers and foremen to acquire necessary training and experience in engineering and production management.

4.12 As a result of the various inputs and factors discussed above, the cost of production, excluding effects of taxes is in Tunisia up to 50% higher in comparison to European prices. The higher degree of protection (duties and taxes being 50-160%on imported finished equipment) gives the Tunisian transport equipment industry a comfortable position to market their product and make the plants profitably operated. 1/

E. Future Developments and Recommendations

4.13 Considering past developments and in the absence of any future strategy regarding the automotive industry, API (Agence de Promotion des Investissements) has produced a study on the existing automobile park, present situation and future demand projection of the automotive sector. Based on discussions during the

1/ Standard car: 12,500 $, compared to 6,000 $ FOB Europ.
Dump truck 1.2T: 3,700 $, compared to 2,500 $ FOB Europ.
5T: 16,000$, compared to 10,000 $ FOB Europ.

mission's visit, the demand of automobile vehicles is estimated as follows:

TUNISIA: PROJECTED DEMAND FOR AUTOMOBILES 1985
(Number of Units)

Buses	500
Cars and Stations Wagons, Pick-Ups	17.500
Trucks	2.500
	20.500

To meet future demand, STIA is building a new plant covering a total area of 260.000 m^2, about 3 km away from the present STIA's site. The investment cost is to be about US$ 40 million. The new plant is to come in production in two phases: the first phase with a covered area of about 26.000 m^2 and a capacity of 15.000 vehicles per year is planned to go in production in 1981, and the second phase with an additional covered area of about 10.000 m^2 and an additional capacity of 5.000 vehicles per year should start production in 1983. The present facilities will be used for the manufacture of buses and trucks. The question as to what product-mix should be manufactured in the future is not clear at present although construction work of the new plant has already started. Secondly, the rate of internal integration is to be kept the same in the new unit, though production of some items, like seats, plastic products could be obtained from a subcontracting firm thus encouraging the intra-sectorial linkages. The mission stressed that it is extremely essential that a strategy considering standardization and rationalization of product-mix, homologation of products, engineering adaptation, factory and national rate of integration, possibility of exporting the local produced automotive parts in compensation for the imported CKD and SKD kits should be developed before any further step is taken as these factors lay the foundation of a nation's automotive industry.

4.14. The increase in demand of automobile will certainly give a boost to further growth of the automotive accessories. On the basis of the above planning, projection of some of items already being manufactured in Tunisia is as follows:

TUNISIA: PROJECTION DEMAND OF AUTOMOTIVE ACCESSORIES 1985

Tires	(Nos.)	580.000
Batteries	(Nos.)	300.000
Brake Linings	(Tons)	280

Source: API

In addition to various items already being produced in Tunisia, there are a number of additional components like filters, brake pedals, carburators, grills, radiators, starters, shock absorbers, rims, caps, brake drums, mufflers, wipers which could be produced in partnership which could provide know-how and export possibilities. BDET (Banque de Developpement Economique de la Tunisie) has projects in planning for some of the items like rims, shock absorbers, air filters, tires, horns which seem justified. However, feasibility studies determining the size, scope and economies of these projects should be taken.

4.15. The expansion of the automotive related industry producing dump and container trucks is already in implementation through the extension of SICAME's plant and the present local capacity of 600 units will reach to 900 units in 1981. On the basis of the development of construction, public works and industrial sector in vth plan, a demand of 1900 units in 1981 has been estimated by BDET which seems to be on high side. It is recommended that a study should review this industry to undertake further steps for the expansion if the demand projections are correct. The present capacity of 2500 units of agricultural and plateforms seems to satisfy fully the demand of about 2400 units in 1981.

4.16 As already emphasized at various other places of this report, assistance to different enterprises of the subsector in modern production processes and technology, rationalization methods and production organization is necessary to increase the physical productivity of the Tunisian cheap labor thus producing equipment and accessories at much more competitive prices. To increase further the degree of competitiveness and efficiency of plants, it is also essential that the present duty and tariff structure should be revised downwards for final products as well as imported input.

V. MECHANICAL WORKS

A. Definition

5.01 The mechanical subsector includes the manufacture, maintenance and repair of equipment goods (construction, agricultural, mining, industrial etc.) as well as of the intermediate goods entering into the manufacture of equipment goods (engines, various parts and components etc.). Small tools and implements are not under mechanical industries. They are dealt in the metal products chapter.

B. Existing Capacity and Production

5.02 Mechanical industries in Tunisia are at a very early stage of development and their contribution to the IMME's sector has been so far marginal. Production capacities are scattered over a number of small firms and a clear presentation of the subsector is difficult to make in the absence of an overall study. Based on the information obtained during field visits, existing capacities and production would be as follows:

5.03 Engines: Small engines (German Hatz and Swedish Bukh models) are being produced by SOTUMO, a state owned company located at Menzel Bourguiba. SOTUMO's plant has a capacity to assemble 7,500 engines per annum. However, due to market constraints, production does not exceed at present 4,400 engines. 90% of the engines are produced in the range of 3.6 to 11 HP, mostly for agricultural applications. The remaining 10% are in the range of 14 to 100 HP for marine applications. SOTUMO's operations are marginal, being limited to assembling, with not more than 90 persons employed.

5.04 Pumps, Compressors and Hydraulic Cylinders. The production of pumps and compressors in Tunisia appears to be limited and only small firms are engaged in this activity. No information is available on existing capacities and production. SICAME, the leading manufacturer of truck containers has created a subsidiary, Hydromeca, to specialize in the production of hydraulic cylinders. The investment, estimated at DT 2.4 million (US$ 6.0 million) is almost completed and production is expected to start in 1979. The plant, will have an annual capacity of 10.000 hydraulic cylinders and will employ about 100 people. However, the domestic market is not expected to take more than 5000 units per annum. To ensure the viability of operations, negotiations are under way with the licencor (Marrel from France) to export about half the production.

5.05 Parts, Equipment Maintenance and Repair. Several enterprises are engaged in the machinery of parts and in the maintenance and repair of industrial equipment. Rectif, a privately owned enterprise, is at present the leading firm. Yet it is small, with 90 people employed and with old aged equipment. Rectif's facilities include two workshops, one for the reconditioning of truck engines and the other, for the machinery of parts for various industries. At present, Rectif's largest

client is SOTUMO, for which it does the machinery of a number of parts, based on some cases on castings obtained from SOFOMECA. The foundries themselves have their own machine shop. With 40 people, SOFOMECA does the machining of such parts as hydraulic valves, elbow fittings, railway wheels and brake drums. With 30 people, Fonderies Reunies does the machining of water meters, valves and water fittings. As discussed in the chapter on steel and platework, Ateliers de Constructions Metalliques et de Mecaniques de Gabes (ACMG) is supposed to start operations in 1979. ACMG will operate a most modern machine shop. In this shop, they will do maintenance work for industrial facilities, primarily in the Gabes area. SOCOMENA, the ship repair enterprise is also occasionally doing repair work for large industrial equipment. A synopsis of existing machinery capacities and capacity utilization is given below:

TUNISIA: MACHINERY CAPACITIES AND CAPACITY UTILIZATION

	Capacity (number of hours per year) 1/	Capacity Utilization 1/ (%)
Rectif	80.000	90
SOFOMECA	60.000	60
Fonderies Reunies	45.000	70
ACMG	50.000	-
SOCOMENA	20.000	20
Others	n.s.	-

1/ Estimated by the mission based on field visits.

The "other" category shown in the table above includes small scale firms as well as repair shops integrated in steel, mining, chemical textile and other industrial plants. There is no information available in Tunisia on these facilities.

C. Production Inputs, Performances, Constraints and Potentialities

5.06. The main operations performed in the mechanical subsector are machinery and assembling. The share of raw materials in production costs varies considerably depending upon the type of industry and the level of integration. This also applies to labor whose share in production costs varies from 5 to 10% for assembling operations (for example SOTUMO) up to 30% for machinery operations (for example Rectif). The availability of cheap labor in Tunisia is an advantage for the development of the mechanical industries, but it is not sufficient. In fact, the viability of machinery operations, and to a lesser extent, of assembling operations depends on three major factors; the size of the market, the degree of

know-how and the availability of skilled labor. With respect to these factors, mechanical industries, as defined earlier, can be divided into four categories: First, there are simple technology equipment goods such as pumps, various mechanical parts, for which the domestic market may be large enough to sustain economic operations. Tunisia is now starting to build up a force of skilled labor and provided domestic or foreign assistance is available to firms in technology, production process and methods, production of these product lines should be viable. Second, there are equipment goods of simple or intermediate technology for which the domestic market exists but is not large enough to justify an investment. This is now the case of SOTUMO whose viability is maintained through protection from foreign competition. The price of its engine is, excluding the impact of taxes, about 30% higher than international levels.1/ This will also be the case of Hydromeca (hydraulic cylinder)and the diesel engine projects, if they limit themselves to meeting domestic requirements. For these product lines, the domestic market must be complemented by exports opportunities (between 30 and 50% of production) that only foreign partners can provide together with the necessary know-how. As discussed in detail under chapter III the Tunisian entrepreneurs are not provided with any incentives to export part of their production. Third, there is the jobbing work for maintenance and repair of industrial equipment. This type of work is usually performed on universal machines which are not designed for large production series. Firms like Rectif are operating competitively without needing protection.2/ The low productivity of labor is more than compensated by the low wage level and the prices charged by Rectif, excluding the impact of taxes, is in line with those charged in Europe. This should also be the case of Ateliers de Construction Metalliques et Mecaniques de Gabes, when it starts production. Finally, there are equipment goods whose technology is very advanced and sophisticated machine tools, textile machinery for which the domestic market is so small that most of the production would have to be exported. For these product lines, production possibilities in Tunisia are very remote at present.

D. Future Projects

Mechanical Complex Project

5.07 The idea of a mechanical complex project has been discussed in Tunisia for at least two years. A concrete project proposal has now been submitted by BDET, in partnership with KHD (Klockner Humboldt Deutz). KHD is a well known German diesel engine manufacturer with a wide experience in developing countries. With employed people, the project would produce 6,250 diesel of various types (3,4,5, and 8 cylinders), 2,200 tractors and 700 agricultural machines. The project would start with the assembly of engine based on knocked down components supplied from KHD, then would develop by steps, including in later phases the local manufacturing of parts so as to achieve an integration rate of about 52% for the engines, 65% for the tractors and 41 to 52% for the agricultural equipments by the 5th year from the beginning. Castings would be supplied outside the project, by Fonderies Reunies (para 2.13). Investment costs are estimated by BDET at DT 36 million (US$ 86 million) over three phases, including DT 7 million (US$ 17 million) for working capital, but excluding provisions for interest

1/ Prices of engines: 350-575 TD/unit (including taxes), for 190-290 TD/unit FOB Europ.

2/ 9-10 $/hour, as compared to 20 $/hour in Europ.

during construction and price contingencies. In the capital cost estimates, it has also been assumed that no infrastructure would be required. BDET envisages a financing plan with 40% equity and 60% debt. KHD would be prepared to participate in the equity up to 25% and arrange the participation of a German Bank (DEG) up to 10%. The majority of the share capital (65%) would be held by BDET and Tunisian private investors. Loans are being sought from various sources including German and Arab banks, suppliers' credit and IFC which is closely following up the project. The Government has now approved the project concept and negotiations are underway with KHD.

5.08 The project as it is formulated now raises a fundamental issue. Based on an annual program of 6.250 engines to be produced with one shift and taking into account the range of models to be produced and the rates of integration to be achieved, the project is unlikely to be economical. Most diesel engine plants in industrialized countries work on a two shift basis with higher production volumes. According to the marketing study, it is unlikely that the domestic market could take, in the foreseeable future, significant higher produciton volume than presently proposed to be supplied from the project. The Tunisian authorities are aware of this issue and they are seeking compensation arrangements with KHD in the form of either exports of fully assembled Tunisian make engines through KHD sale network or purchase of Tunisian made components by KHD. At present, there is very little incentive for KHD to accept Tunisian's demands. On the one hand, they are the only partner with whom negotiations are being held. On the other hand the project in its present formulation appears financially attractive as it would benefit from protection, with output prices set at more than 70% above the CIF cost of fully assembled engines imported from Germany. Other issues are also related to the degree of integration. Similarly, the viability of machining in Tunisia imported forge parts (such as crankshafts, rods etc.) and of forging these same parts in Tunisia at a later stage appears doubtful. The equipments required for these operations are expensive, and their deletion could reduce final project cost substantially.

5.09 At present, the objective for all parties is to prepare a project which will eventually be financially and economically viable. In this respect, several suggestions can be made. First, although BDET has been very active and professional in promoting the project, there is a need to set up a project team, composed of qualified engineers and economists with experience in diesel engine production. In the absence of this type of production in Tunisia, foreign assistance could be obtained from individuals based on one or two year contracts. Second, it should be made clear to the foreign partner that the protection granted to the project on the domestic market will be marginal and temporary, say 10 to 20% gradually phased out after 5 years. This should be made as an argument in negotiations with the technical partner in order to emphasize the necessity of export arrangements. The project size and scope as well as all the financial calculations should be all made on this basis. Third, if it appears rapidly that the present partner is not ready to offer adequate compensation arrangements, discussions with other potential partners should be initiated.

SOTUMO's Projects

5.10 SOTUMO is at present considering two project ideas. The first project, with an investment cost of DT 0,5 million (US$ 1,3 million) would be a machine shop to produce engine parts for assembling on the existing lines at Menzel Bourguiba. As discussed earlier, the present assembling operations are somewhat inefficient (para 5,03) and this raises some doubts about the viability of further integration, taking also into account the low level of production series necessitated by the domestic market. It would be essential to justify a project of this kind that a significant share of production is exported. SOTUMO is actually negotiating with Hatz export possibilities and arrangements. Depending on the outcome of these negotiations, a feasibility study could be undertaken.

5.11 The other project would be for the production of about 30,000 moped engines, with 70% integration. Investment costs have been preliminary estimated at DT 1.5 (US$ 3.8 million), which appears very low. In concept, the project idea is good, but a market and feasibility study have still to be undertaken to demonstrate its viability.

Other Project Ideas

5.12 As discussed earlier, the information available on the mechanical subsector is very fragmented. There is a need to do the inventory and the review of the existing capacities and to study their market potential. These studies should lead to the identification of new project ideas, including modernization and expansion of existing machine shops and investments for new product lines. In this context, the studies should in particular focus on such products as pumps, and compressors (para 5,04), for which Tunisia imported in 1977 the equivalent of US$ 25 million and on maintenance and repair work for industrial equipment (para 5,05).

E. Outline of Crucial Institutional Recommendations

5.13 Institutional recommendations are presented in detail in chapter II However, those which are crucial to the mechanical subsector are outlined as follows. As discussed earlier, mechanical industries in Tunisia have experienced so far very little development with a major drive towards the domestic market. However, the domestic market which can justify further production investment is very limited. The future development of the mechanical industries in Tunisia therefore relies primarily on finding export opportunities to complement the domestic market and on obtaining adequate know-how. In this context, it is essential (i) to revise the incentive system so as fo favor partnerships serving both the domestic and foreign markets and (ii) to create or reinforce institutions providing Tunisian entrepreneurs with assistance and guidance in such areas as project preparation, technology, know-how and production methods.

VI. METAL PRODUCTS

A. Introduction

6.01 This subsector includes a wide variety of products like cutlery, hand tools (agricultural and mechanical), general hardware, furniture and fixtures of metal, structural metal products like frames, fabricated metal products like nails, nuts, bolts, tin containers, utensils. These products represent the first phase in the transfer of technology for a developing country, mainly aiming at import substitution in the initial stages. The group of these industries are of a heterogenous nature, only their common manufacturing operations like hot forging, cold forming, pressing, bending or stamping of metallic sheets, bars or rods give them a homogeneous character, in spite of the fact that the technologies involved for various products are also somewhat different. The subsector accounts for about 15% of the output value, with the same share for employment, among the electrical and mechanical industries. The development of this subsector, however, depends upon the degree of integration, both backward and forward. There are at present over 60 establishments in this subsector located mainly in the region of Tunis, Sousse, Bizerte and Sfax. Most of the companies are small scale units but three large enterprises, Ateliers Mecaniques du Sahel (AMS) at Sousse, about 120 km south of Tunis, Societe Tunisienne d'Emballages Metallique (STUMETAL) and Societe des Industries Metallurgiques (SIMET) both located in Tunis dominate this subsector. Information available in this subsector is very limited, the review and assessment is mainly based on these enterprises which the mission visited.

B. Product-mix, Production and Inputs

6.02 Tin containers are being manufactured by STUMETAL, employing at present about 700 people, was created in 1965 as a joint venture with the French company CARNAUD. CARNAUD contributes to 37% of share capital and provides technical know-how in all areas. Two metallic packing industries are STUMETAL's major clients; (i) the preserve of food products like fruits, vegetables, fish, halwa, olive oil, juice, beer, etc. (85% of production) and (ii) packing of industrial items like paints, varnishes, petroleum products (oil, grease), gum, printing ink, insecticides etc.(15% of production). The range of containers produced is extremely wide, consisting of about 80 different type of cans and boxes with contents ranging from 250 grms or 0.3 litre to 20 kg or 20 litres, respectively. With present capacity of 22,000 to 25,000 tons per year the production over the last three years has been as follows:

TUNISIA: TIN CONTAINER PRODUCTION
(tons per year)

	1976	1977	1978
Food Products	10.100	11.500	13.700
Industrial Products	1.900	2.100	2.300
Total	12.000	13.600	16.000

The production of tin containers is directly related to the agricultural production. In spite of inter-annual and seasonable fluctuations, the production of tin containers has increased since 1971 at an average rate of about 9% per year.

6.03 The principal inputs in the production of tin containers are raw materials and labor. This industry is fairly well labor intensive, if appropriate equipment and technology is selected. Due to lack of labor in Europe fully automatic production lines have been installed there. This approach has been adopted in Tunisia and is certainly questionable in this country. STUMETAL has recently been relocated and expanded at an investment of about US$10.0 million. Facilities include about 20 production lines (3 for printing of sheets, 10 for can's cover and 8 for cans). Such an equipment is likely to reduce the present share of labor which constitutes about 14% of the sales, Further it requires professional labor skill in the setting-up, maintenance and repairs of its complicated technical and control systems, which is lacking in Tunisia. The major raw material tin accounts for about 70% of the output value. It is entirely imported in the form of sheets or strips.

6.04 The quality of the product (appearance of tins, water tightness, soldering of seams, resistance of material) is still to be improved. The major problems which this industry is likely to continue to face are: (i) underutilization of some of its capital intensive production lines which are unadjusted to a seasonable, fluctuating and over-diversified demand; (ii) technical problems in the resetting of the transfer lines due to change in demand of the size of containers; and (iii) substitution of tin through other materials (plastic, aluminium).

6.05 Steel tubes manufactured in Tunisia vary from 0.5 to 4" diameter and are used primarily in the structural and construction industry. Production is dominated by the private enterprise SIMET which employs about 100 people. SIMET is replacing its existing production lines through an equipment with a higher degree of automation. This will increase the capacity from the present 12.000 tpy to 25.000 tpy, the production in 1978 being 7.000 tpy. One of the

common features among the Tunisian enterprises is to decide further expansion of their plants even if their existing facilities are operating well below capacity. It is hence essential that the appropriate authorities should approve a project for expansion only if the existing capacities are utilized to the maximum extent possible.

6.06 In the production of steel tubes the major inputs raw materials and labor account for 65% and 6% of the value of output respectively. Steel strips of thickness up to 3 mm are the main input material and they are imported completely. The percentage of labor in the value of output will decrease further as a result of the new equipment replacing some of the formerly manual operations like cutting and threading of tubes. The major manual operations left now include galvanization and cleaning of tubes, inspection, maintenance and repair of the equipment.

6.07 The production of a diversified range of products with about 80 items like agricultural hand tools (pickaxes, shovels, hoes, teeth forks, nippers, hammers), hardware (locks, hinges, joints), mechanical hand tools (wrenches, spanners, pliers), sanitary and bath fittings, electric items (plugs, switches, circuit knobs), fasteners (Bolts, nuts and screws) and cutlery is dominated by the public sector enterprise, AMS. With the main objective of achieving a high degree of import substitution in maximum possible number of products, this company was created in 1961 with the technical assistance of the Polish Export Institution CEKOP. The various product lines possessing different manufacturing technologies should be technically in separate production units and their integration in one existing unit should be reviewed so as to rationalize product programs. This could likely lead to creation of new profit centers or of small and medium sized enterprises. In addition to AMS there are a number of small units manufacturing such products in other regions of Tunisia. The production figures for the product lines are not available but from the information collected during the field visits, it is estimated that about 1100 people are employed in the production of these items with a total output value of approximately US$ 15 million, of which the AMS contributes about 65%. The production of these items, with appropriate selection of technology and equipment, is labor intensive (about 15-20% of output value) and Tunisia, having the advantage of cheap labor, is in good position to explore the possibilities of developing these product lines. The share of raw material is about 65% of output value and its consumption is met entirely through imports.

C. Market, Protection and Cost Competitiveness

6.08 The total production of tin containers is geared towards the local consumption. However, about 15% of tins are indirectly exported through the sale of conserved food products. In case of industrial uses, the local production satisfies about 80-85% of the local demand. The local production is protected fairly well. Duties and taxes amount to about 27% on the finished products, and the price level of the local production is about 120%(excluding the impact of taxes and duties) to that of European FOB price.1/To improve the efficiency of the local industry with respect to productivity, cost and quality and to allow international competition, it is recommended that the tariff structure should be revised.

1/ 1100-1250 $/T, as compared to 850-900 $/T FOB Europ.

6.09 Considering the technical equipment installed for manufacture of steel tubes in Tunisia, this industry should be equally competitive with the European manufacturer but due to homologation of prices in Tunisia the price level is about 130% (including about 20% taxes and duties) as compared to prevailing FOB European prices. Import of steel tubes in the manufactured dimension range is levied with about 20% taxes and duties. The justification of protection through homologation of prices and restriction of imports should be reviewed.

6.10 Except for cutlery the production of all other products mentioned in para 6.07 of this chapter are for the local market. Total figures of local capacity and production are not available but the statistical data shows that the domestic demand of various products is also met through imports. The local prices seem to be somewhat competitive as compared to imported goods on which duties and taxes of about 15-20% are levied. Cutlery is a special case with a significant part of production being exported to Italy. This has become possible under an agreement of technical assistance with an Italian firm who has supplied know-how and equipment. With the main advantage of Tunisia's cheap labor the cutlery items are exported to the Italian firms at 35-50% less than the domestic prices.

D. Future Developments and Recommendations

6.11 The demand for tin containers in Tunisia as estimated by two public institutions API and CNET is expected to be in the range of 17.000-20.000 tons per year in 1981 and 23.000-30.000 tons per year in 1986. API, estimating the present domestic capacity at only 13.000 tpy as against the actual existing capacity of 20.000 tpy, recommends the creation of a new enterprises to produce 10.000 tons per year of tins in the initial stage. The new plant could be expanded later. During the mission's visit STUMETAL indicated its intentions to also expand its activities further to manufacture cans and tins for industrial use. In the light of (i) contradicting estimates for future demand; (ii) the present difficulties experienced by the existing plant with respect to product quality, material procurement and organizational functioning; (iii) the development of the packing industry and its technological changes and (iv) the product-mix required for food conservation as well as for industrial application, it is recommended: the present installed capacity should be utilized fully in 3 shifts, changes in the growth of packing industry should be thoroughly studied and discussed before any expansion or new unit is approved.

6.12 With the selection of proper technology and equipment, the metal products industry is labor intensive. Tunisia has built up a labor force with the grade of technology required for the production of such products. The increasing local demand can be met. However, to export such products, Tunisia does not possess an international sales organization and traditional name as manufacturer of metal products. The possibility of exporting such products is through a foreign collaboration. This approach has brought good results in the export of cutlery products. It could be followed for other products like hard tools, electrical and mechanical hardwares, sanitary fitting. Imports of these products in European Community Countries has been increasing over the recent years and provided a priority is attached towards seeking a potential European partners with technical know-how and marketing organization, a number of small enterprises could be feasible in Tunisia.

VII. SHIPBUILDING AND SHIPREPAIR

A. Introduction

7.01 In Tunisia there is a number of yards for the construction of small fishing boats to meet the local market requirements. Some foreign firms have also established under the 72-72 law to manufacture and export sailing boats to European markets. However, shipyards of this type are not included in the IMME, as they perform mainly wood and carpentry type of work. Shipbuilding and repair is being dealt in this chapter in so far as it involves metal working or machining operations, mostly for cargo, passenger and military vessels. Tunisia is not engaged in building vessels of this kind, but it has important facilities for their maintenance and repair. The following paragraphs deal with SOCOMENA, the owner and operator of these facilities. There are also repair shops for small fishing boats, for which no information was available.

B. SOCOMENA's Capacity and Facilities

7.02 SOCOMENA was created in 1963 as a state owned company to substitute the former French military arsenal of Sidi Abdellah. With a work force of about 700, SOCOMENA is located in Menzel Bougurba on the Bizerte bay, a prime location in view of the ongoing traffic between Europe and the Middle East. SOCOMENA's facilities include four dry docks which can accommodate vessels up to 60,000 DWT, repair quays of about 1000 meter length and an important industrial infrastructure (foundry, machine, boiler, woodwork and electrical shops). Most of the installations are old and have not been renewed.

7.03 Based on the existing infrastructure and equipment, SOCOMENA has a capacity to repair about 120 ships per annum. Starting from almost zero capacity utilization four years ago, SOCOMENA's management has succeeded to gradually bring the number of ship repaired to 65 in 1978, out of which more than 80% are from foreign origin. SOCOMENA expects that within two or three years, full capacity will be reached.

7.04 Services provided by SOCOMENA are comprehensive. They include all mechanical, electrical, carpenting, welding, painting and testing work for standard inspection as well as for repair of wrecked vessels. Outside ship repair, SOCOMENA occasionally performs maintenance work for heavy industrial machinery and equipment (cement, steel etc.).

C. Cost Structure and Competitiveness

7.05. Ship repair is a service rather than an industrial activity, with a high labor content. In SOCOMENA's cost structure, labor accounts for about 60%. It is at the same time SOCOMENA's main advantage and also its main constraint. Among competing countries for shiprepair (Malta, Portugal, France, Italy, Yougoslavia, Greece and to a lesser extent northern Europe), Tunisia is probably the country with the cheapest wages. On the other hand, the type of work performed in ship repair yards necessitates highly skilled and specialized labor, difficult to find in Tunisia. SOCOMENA is investing heavily in training its labor force, but the results of such policy are being obtained only gradually.

7.06 Capital charges, related to infrastructure and equipment, are usually after labor the next item in importance in the cost structure of ship yards. However, in the case of SOCOMENA, capital charges are very low as the company's assets were inherited from the years of colonization and as investments were not renewed due to financial difficulties. The availability of infrastructure and equipment at no cost has, no doubt, been an advantage for SOCOMENA in the early years of its operations. However, it is important that the existing equipment is gradually renewed.

7.07 SOCOMENA and prices are subject to international competition. Compared to prices offered by competing ship yards, SOCOMENA's prices are attractive as the firm needs to establish itself on the market.1/ With the prevailing prices, SOCOMENA's operations are now breaking even and it is expected that they will become profitable as the capacity continues to build up and the labor force gains experience and productivity.

D. Future Development

7.08 Worldwide, the ship building industry is in a difficult situation, due to a limited market potentialities and intense competition. In these circumstances and taking into account the high technology requirements of this industry, there is no prospect at present for Tunisia to establish a shipbuilding industry, except for the construction of fishing or sailing boats as now undertaken.

7.09 Although closely related to shipbuilding, shiprepair is a different activity, of the service type and with a high labor content. SOCOMENA's prime location on the Mediterranean Basin, the low level of wages paid in Tunisia and the existence of an infrastructure inherited from the years of colonization are important advantages for the development of SOCOMENA. On the other hand, the constraints SOCOMENA is facing, relate to the lack of qualifications of its labor and to the hazards of the shiprepair market. Given these constraints, the best strategy for SOCOMENA is to expand gradually based on the progressive build up of its work force experience and of its reputation on the market.

1/ 6-7.5 $/hour, for 15 $/hour in Europ.

7.10 SOCOMENA has an investment program to renew some of its equipment (about DT 2.5 million in 1979) and to expand further. The expansion project which is still at the early planning stage, would consist in the enlargement of the existing dry dock to accommodate ships with a capacity of 120,000 DWT and also in the modernization of the various workshops. No investment cost estimates has been prepared. In view of SOCOMENA's development potential, the company and investment program deserves to be studied thoroughly. In this respect, experienced consultants should be hired to review SOCOMENA's existing facilities and to investigate its market opportunities and requirements. This study should lead to the formulation of long term investment program and to the preparation of feasibility studies. A similar study should be undertaken for the repair of small fishing boats.

TUNISIA - MECANICAL INDUSTRIES
FIRMS VISITED
SUMMARY OF MAIN INDICATORS

Sector	Foundries		Structure and Plate Work		Transport		Mecanical			Metal Products		Ship Repair
GENERAL												
Name	SOFOMECA	Fonderies Reunies	SGI	SAMMI	SICAME	STIA	RECTIF	SOTUMO	SIMET	AMS	STUMETAL	SOCOMENA
City	Tunis	Tunis	Tunis	Tunis	Tunis	Sousse	Tunis	Menzel Bourg.	Tunis	Sousse	Tunis	Menzel Bourg.
Ownership	Public	Public	Private	Private	Private	Public	Private	Public	Private	Public	Public	Public
Products	Iron and Steel castings	Iron castings	Primarily containers for petroleum & Chemical Ind.	Primarily Steel Structures	Truck containers	Automobile Assembling	Engine Repairs + Machinery	Diesel Engines	Welded Steel Tubes	Hardware Agricultural tools, cutlery, etc.	Metallic Container	Ship repair
TECHNICAL												
Capacity 1978	5,500 Tons	4,000 Tons	10,000 Tons	8,500 Tons	1200 No.	11,000 No.	120,000 Hours	7.500 No.	25.000 Tons	1.000.000	25.000 Tons	120 No.
Production 1978	3,800 Tons	2,500 Tons	6,500 Tons	5.300 Tons	800 No.	7,300 No.	95,000 Hours	4.400 No.	15.000 Tons	750.000	16.200 Tons	80 No.
Capacity Utilisation (%)	69	63	65	62	67	66	80	59	60	75	65	67
Number of Employees	560	320	450	370	187	1,450	80	90	100	700	500	700
FINANCIAL												
Sales (DT 000-1977)	2,030	2,438	3,422	1,679	2,444	23,148	472	2,288	2,658	3,987	8,098	1,466
As % of Sales												
- Exports	3	-	4	-	-	-	-	-	-	12	-	80
- Materials	27	52	32	26	55	76	50	86	65	66	71	23
- Labor	44	24	20	30	10	8	31	6	6	15	14	64
- Depreciation & Provisions	5	3	7	4	8	1	3	3	3	3	3	3
- Duties & Taxes	9	7	5	4	9	4	2	-	6	5	8	4
- Net Profit	0	6	11	5	4	2	(1)	1	12	4	1	(7)
Net Worth	1,035	961	1,803	865	1,303	2,932	366	254	976	1,222	1,561	317
Net Fixed Assets	1,551	394	2,242	764	1,479	3,443	356	84	352	1,419	4,108	266
Net Profit as a % of Net Worth	0	15	20	9	8	16	0	8	32	14	7	(33)
Debt Equity Rates	45:55	14:86	32:68	12:88	36:64	62:38	5:95	30:70	11:89	44:56	60:40	60:40
Current Rates	1.2	1.7	1.2	1.1	1.3	1.3	1.1	1.2	2.4	1.5	1.2	1.4
Inventories (Number of months)												
- Raw Materials	13.0	1.5	8.3	10.5	5.3	5.4	5.5	2.6	5.0	1.8	3.4	13.6
- Finished Products	2.4	.1	n.a	n.a	1.5	1.5	.3	1.2	0.5	1.9	.2	n.a
PRICES AND TAXES												
- Tunisian domestic price as a % of European FOB Price 1/	-------120-130--------		----------110-120----------		160	200	110-120	155	130		130-140	90-100
- Duties & Taxes included in Tunisian domestic prices	----14 3/----		----14 3/----		19	50	8	25	19		19	-
- Import taxes on finished products 2/	15 4/		51 4/		51	160	40	46	21		27	
ONGOING AND FUTURE INVESTMENTS												
Type of Investment	Extension	Extension and automotive castings	Steel process mill (rolling)	-	1)Extension of present facilities 2)Plant for manufacture of hydraulic systems	Expansion	-	1)Machine shop to produce parts 2)Plant to manufacture moped engines	-	Renewal	Just achieved 4.5 million DT investment and a capacity of Future project to manufacture industrial tin boxes.	Expansion and rehabilitation increase in ships capacity from 60.000 to 120,000 dw.
Annual Capacity	8-10.000	8-10.000	120,000 tons	-	2) 10,000 No.	20.000	-	2) 30,000 No.				
Employment	n.a	n.a	114		2) 100	1,500		n.a				
Investment cost (DT 000)	2.000	9.000	2.2		1) 520	15,000		1) 300		1.000	1.5	2.4
					2)			2) 2000				
Implementation period	1980-1982	1980-1982	1977-1979		1) 1979-1980	1979-1984		1) 1980-1982		1979-81	1981-1983	1981-1983
					2) 1977-1979			2) 1981-1983				

1/ Without taxes
2/ Corresponding to products manufactured by the Company
3/ 8 for equipment destinated to authorized investments
4/ 4 for equipment destinated to authorized investments

Industrial Projects Department
April 1979

ANNEX II
Attachment

ANNEX III

SMALL-SCALE INDUSTRIES IN THE ELECTRICAL-MECHANICAL SECTOR

TUNISIA

SMALL-SCALE INDUSTRIES IN THE ELECTRICAL-MECHANICAL SECTOR

Foreword. In the absence of a structured base of information about small-scale industries, this report is based on the limited surveys that are available and on the observations made during field visits to small-scale electrical-mechanical firms in Tunisia. Characteristics of the 14 firms visited are given in Attachment 1.

Role of SSI in the Sector

1. According to the 1976 Industrial Census, 92% of all electrical-mechanical industries (EMI) in Tunisia is small-scale, employing under 50 workers. Eighty-six percent of these small-scale industries (SSIs) are essentially composed of very small, almost artisanal, production units employing less than 20 workers. Small electrical-mechanical industries are generally labor-intensive as they account for some 43% of the sector employment. Their labor productivity level is, however, very low compared to the larger firms as they contribute only 24% to the sector total value-added and gross output. As the firm size gets smaller, this pattern worsens; firms with under 20 workers account for 36% of the sectoral employment but merely for some 18% of the value added and gross output.

Subsectoral Distribution

2. Table 1 below shows the distribution of small EMIs by sub-branch activities. SSIs are active in all electrical-mechanical activities although

Table 1: SUB-SECTORAL DISTRIBUTION AND CONTRIBUTION OF SMALL EMI's

Subsector /a	SSI Enterprises		SSI Employment		SSI Value Added	
	Total (No.)	Share in Subsector	Total (No.)	Share in Subsector	Total D'000	Share in Subsector
Basic Metals	2	50%	67	2%	230	4%
Foundries, Platework, Electrical Industries	245	89%	3,503	36%	805	24%
Mechanical Works	425	95%	5,409	62%	2,150	32%
Metal Products	190	93%	2,553	55%	1,615	33%
Shipyards	32	86%	435	26%	980	31%
Total	894	92%	11,967	43%	5,780	24%

/a See definition of subsectors in Attachment 2.

Source: 1976 Industrial Census and mission estimates.

their relative importance is more strongly observed in three sub-branches: foundries, plateworks and electrical industries (with a share of 36% in sub-branch employment and 24% in value added), mechanical works (with a share of 62% in employment and 32% in value added) and metal products (with a share of 55% in employment and 33% in value added).

Ownership and Entrepreneurial Ability

3. The predominant form of ownership in all small EMIs is the single or family proprietorship. The typical owner is a self-made man who started as an apprentice/worker in a shop/firm or as a merchant who used to trade the goods he is now producing. He has little formal education but has acquired a few basic technical skills from working experience or from some specialized training courses at local technical schools. Although owners appear resourceful and hardworking, their strong commercial background coupled with their poor level of technical base have resulted in a strong profit motivation but a general lack of technical-innovative instinct among SSI's. (E.g. why spend money trying to innovate or redesign a product when one can earn large profits, thanks to protection, by just assembling imported component?) There is thus a tendency to shy away from new ideas which may involve possibilities of risk and higher costs.

Production Infrastructure

4. Small EMIs generally show a tendency to overbuild their plants, especially if they have moved into industrial zones. Designs have been carried out with limited help of industrial specialists and the results, in many cases, are relatively expensive buildings combined with serious problems of layout, leading to inefficient organization of the production process.

Production Technology and Product Mix

5. Just as for SSIs in other sectors, the EMIs' technology varies greatly between sizes and within sizes. In effect, production methods of small EMIs are based on a mixture of very modern machinery and of traditional, almost archaic equipment. Modern technology is mostly found in the activities of electrical, mechanical works and metal products. This relatively high machine power when confronted with the limited market of the small enterprises in these sub-branches has resulted in a serious problem of under-utilization of capital: in effect, their operating rate averages only about 50% of full production capacity.

6. This excessive capacity results from one or all of the following inter-related factors:

(a) Over equipment within the firm as the small industrialist strives for self-sufficiency in his production process, in the illusion of maximizing profits for himself;

(b) high degree of duplication of certain basic universal machinery among firms within a given sub-branch as each small entrepreneur attempts to diversify his production lines, which often amounts to simply copying other successful projects already existing;

(c) given (a) and (b) above, the limited size of the local market(s) inevitably leads to serious underutilization of capital;

(d) a general taste for more and more machine which may not be of immediate use to the industrialist so that he finds himself in the end with equipment excessive to his needs; and

(e) a lack of access to sound selection procedures which leads him to choose equipment unappropriate/unsuitable to his needs.

7. The high degree of vertical and horizontal integration ((a) and (b)) within each firm resulted in a highly diversified product mix. Unfortunately, however, there has been little initiative for engineering adaptation and standardization in the design of the products, parts or components fabricated, as small EMIs suffer from a lack of proper technical background and from diseconomies of scale either in the existing production lines or in the "research" to identify new production lines.

8. In view of the very diversified nature of the small EMIs operations, a functional classification (based on visits made in the field) of their product mix may be made as follows:

- Group a: SSIs producing semi-final and final goods which are also manufactured by larger sized firms. They are mostly found in the activities of steel structure and plate works, producing and/or servicing basically on order. Their production level is still artisanal with generally traditional, archaic production methods, although there is occasional modernization of the equipment;

- Group b: SSIs producing intermediate finished goods of relatively standardized and straightforward nature such as simple foundry and electrical goods as well as small metal products like nails, nuts/bolts, metallic screens, locks, cutlery, etc. They produce in small series and have modern equipment/technology, with the exception perhaps of a few small foundries where production remains considerably artisanal in method and custom-made in orientation, essentially to meet demand for spare parts;

- Group c: SSIs producing in small series final goods whose nature is relatively more complex and specific to local demand. They are mainly in mechanical works, ranging from

machining and/or assembling simple agricultural equipment (ploughs, pumps, etc.) to production of small construction equipment (wheelbarrows, small dumpers, etc.). They are characterized by a mixture of old and new technology.

In most cases, small EMIs are equipped with a relatively large amount of obsolete or archaic machinery. This results simultaneously in underutilization of capacities and in under-capitalization relatively to large firms, the latter factor leading in turn to a low productivity of labor in small EMIs (see Attachment 3).

Production Inputs and Cost Competitiveness

9. Steel products, the major input for EMIs, small and large alike, are imported. They include flat steel sheets as well as non-flat products such as "profiles". Steel procurement for small EMIs is generally handled by local traders. Because of the small quantities involved, because of the lack of standardization in the requirements and because of the mark-ups at the intermediary agents' level, prices for steel inputs paid by small EMIs are very high and fluctuate widely according to market demand and supply situations. In view of these reasons and of the long waiting periods involved with ordering new purchases, small EMIs often suffer from shortage of materials for production as most of them cannot always afford to keep large and costly inventories. Other steel inputs such as wire rods, cables and iron/scrap metals, are produced and/or purchased locally. Selected small finished input components (e.g. nails, wire, etc.) are procured from local manufacturers as obligated by import restriction laws. However, a host of other semi-finished and finished items (e.g. special precision nuts/bolts, plastic wheel component for water meters, etc.) are also imported. While most entrepreneurs acknowledged that most of these components could very well be supplied locally, they claim that the unreliable quality of the locally produced items mitigate against this possibility. Furthermore, the small quantities demanded tend to result in higher cost of production, and consequently in selling prices that are two or three times higher than for the good quality imported components. In the cost structure, the raw materials share varies considerably with the mix and degree of integration/diversification of the firm's operations. It does account, however, for a major proportion of total production costs, estimated at about 50-70% from field observations (para. 24 d, e). Labor inputs represent an average of 10 to 30% of production costs, and is essentially composed of unskilled or semi-skilled workers (para. 23).

10. At present, there seems to be good profitability in small electrical-mechanical operations. Discussions with small industrialists visited in the field indicate a 20% net profit on fixed assets as the normal rate of return envisaged for a new project in selected activities. This should reflect somewhat the cost competitiveness of small operations, as it does to some extent for production units in Group (a) where product quality is reasonable but capacities are underutilized due to market constraints. In reality, it is possible because of the restrictions in imports of selected locally produced goods and because of the existing system of price controls which in practice only acts to fix firm's profit margins at certain level deemed reasonable on

the basis of production costs. The lack of coordination/effectiveness in this monitoring of input and output prices and in the protection against foreign goods has caused, however, financial problems for most small EMIs, especially in Groups (a) and (c). This lack of coordination has also allowed local producers to fix higher prices for their components, which has the counter-productive effect of discouraging utilization of locally produced goods whose imports are not restricted by law (para. 9).

Marketing and Subcontracting

11. Small EMIs catering to specific local demands and producing on order, such as the ones in Groups (a) and (c), seem to have acquired their own, although limited, market based on their tradition of good and reliable work. Generally, small EMIs are facing some serious marketing problems due to the limited size of the Tunisian demand, in spite of heavy restrictions on imports of certain locally produced items. Some firms have their own marketing outlet. Most, however, sell through wholesalers and other middlemen who can take advantage of local producers, for example by simply using them as last resort inventories in order to avoid having to incur costly inventories themselves.

12. Subcontracting relationships are of limited scope. Thus, ancillary production for larger enterprise or work on commission is only a supplementary activity. The main explanations for this absence of inter-industrial linkages are:

(a) tendency for larger enterprises to prefer self-sufficiency in production and over-integrate at the firm's level;

(b) inability of small EMIs to produce in series with quality, specifications and time delays consistent with requirements of larger enterprises;

(c) high prices of locally produced components produced by SSIs; and

(d) lack of market transparency and information on who produces what.

13. In view of the relative importance of the Tunisian public sector participation in production and services, it is surprising that there is no structured channel for Government procurement from small producers. In effect, very few small EMIs have succeeded in securing Government orders.

Investment

14. Data based on fixed assets for small EMIs are not available, with the exception of the yearly investment statistics reported in the Industrial Censuses. An indication of the investment pattern in the small EMIs compared to SSIs in other sectors may be obtained from the 103 projects, with total investment cost of D 250,000 or under, financed by FOPRODI in 1978. As seen in Table 2, small EMIs' investment intensity averaged at about D 5,500 per job created, which is slightly above the average unit investment cost

for SSIs in all sectors as well as the Bank's eligibility criteria for labor intensive projects (D 5,100 in 1978 prices). This confirms the relative under-capitalization of small EMIs (Attachment 3) and points to their labor intensity characteristics and the potential role they may play in the employment generation objective set by the Government for the industrial sector.

Table 2: SUBSECTORAL DISTRIBUTION OF FOPRODI PROJECTS IN 1978

Subsector	No. of FOPRODI Projects		Investment	Employment	Investment per job (in Dinars)
Electrical-Mechanical	19	18%	D 2,766,600	506	5,467
Textile/Leather	10	10%	D 533,750	208	2,566
Building Materials	15	15%	D 4,378,800	626	6,994
Foodstuffs	34	33%	D 4,381,510	722	6,068
Construction/ Public Works	6	6%	D 621,035	490	1,267
Miscellaneous Mfg. /a	19	18%	D 2,581,547	446	5,788
Total	103	100%	D15,263,242	2,998	5,091

/a Of which 6 projects are in general mechanical works/services.

Source: FOPRODI, 1978.

Finance

15. Just as SSIs in other subsectors, lack of access to institutional finance, particularly for very small sizes, is a very important constraint to the potential growth and development of the small EMIs. In view of the reluctance of the small firms to disclose information on their financial position and of the limited experience of commercial banks dealing with small entrepreneurs, it is difficult to ascertain the exact dimensions of the problem.

16. Discussions with entrepreneurs reveal that projects (new investment or expansion of existing units) are usually financed by borrowing from family/friends or by ploughing back profits. Those firms which reported financial constraints emphasized inadequate financing of working capital. Some small EMIs, in fact, have been able to operate only thanks to a system of advance payment from their customers. The combination of uncertain raw material supplies (para. 10) and lack of working capital puts small EMIs at the mercy of seasonal market fluctuations.

17. In 1974, in an effort to promote SSIs, the government created the FOPRODI (Fonds de Promotion et de Decentralization Industrielle), a budget financed fund intended to give financial assistance to small industrial projects, especially those located outside of Tunis. It is administered

through participating banks which are expected to complete the financial plan for FOPRODI-assisted projects with loans made out of their own regular resources. Since it became operative in December 1976 until December 1978, 226 projects with total investments of D 26,787 million have been approved under FOPRODI. About 24% of this total investment were financed with FOPRODI funds. Sectoral statistics for 1978 alone show that small EMI investments which are assisted by FOPRODI represent only 16% of the total investment in the EMI sector. Thus small EMIs in particular are still faced with difficulties in gaining access to banking credit, compared to other borrowers. In effect, commercial banks remain generally uninterested by small EMI financing because they perceive the risk involved in SSI as excessive and because they feel that there is already too much duplication of activities in the sector (para. 6(b)).

Institutional Support

18. Small EMIs suffered from the same lack of institutional support as SSIs in other sectors. In effect, dispersed institutional responsibility toward SSIs and a system of incentives biased towards large scale modern enterprises are the characteristics of the policy framework for SSIs in Tunisia. There has been nevertheless, increasing attention given to SSIs in terms of financial and technical assistance in the last two Plans. However, SSIs benefits from policy instruments such as fiscal incentives remain constrained by the biases contained in the general criteria of eligibility for investment benefits.

19. As recognized by the Tunisian authorities themselves, SSIs do not fit into the standard incentive scheme (Law 1974-74). In effect, one preliminary condition to benefit from incentives is to set up a firm creating at least 10 new permanent jobs, thus eliminating the bulk of small workshops. Another condition is that 30% of investment must be financed from the investor's own resources, which is not always easy for a small industrialist presenting projects costing more than D 75,000. In addition, income tax exemption increases with employment, irrespective of investment amount as shown below:

Table 3: INCOME TAX EXEMPTIONS OF LAW 1974-74

Category	Number of New Permanent Jobs	Rate of Exemption %
A	10 - 20	40
B	21 - 50	60
C	51 - 100	70
D	101 - 150	80
E	151 and above	90

The concept is thus to give consideration to employment creation but the smallest firms are excluded and firms emloying 10 to 50 people receive less concessions than larger firms. In other words, tax exemption is not related to investment per added working place and the choice of technology is not to be influenced.

20. Location of plants outside Tunis is encouraged through one extra year of tax exemption, grants for infrastructure work and subsidies on the interest rate for specific risk capital loans, to complement the owner's equity. Encouragements toward decentralization apply, in theory, to small and medium firms, but the smallest firms with up to 9 working pl[illegible]s are again excluded. The law 1972-38 provides special incentives for export-oriented enterprises such as total or partial tax exemption for up to twenty years, exemption from customs duties on imported equipment and intermediate goods, exemption from turnover taxes on purchases from domestic sources, and the right granted to non-resident investors to dispose of the proceeds of their exports. These concessions promote foreign enterprises without, however, encouraging local subcontracting and local linkages which could promote small enterprises. Finally, in the procurement of supplies by government agencies, there is no indication of specific efforts to promote supplies from small firms.

21. While it can be argued that small workshops can generally evade tax payments more easily than large firms, such evasion is partially due to their inability to maintain a good accounting system and is often an encouragement against implementing such a system. The only real tax incentive for SSIs in Tunisia is the exemption of registration tax (taxe a l'enregistrement), and some thought is now being given by Government authorities to the possibility of reducing income tax rates for SSIs.

22. Responsibility for implementation of various administrative regulations and policies affecting SSIs rests with several different government institutions (e.g. Directorate of Industries, Ministry of the Economy; A.P.I.; Office de l'Emploi, Ministry of Social Affairs; Ministry of Finance; etc.). Lack of communication and of unified criteria among these agencies has hampered the development of consistent regulations and integrated programs in support of SSIs. This institutional fragmentation also has led to serious inefficiencies due to duplication of actions, competition among some agencies as well as inertia in some others. At present, there is a country-wide system of technical assistance to SSIs recently set-up within API to help small entrepreneurs with project identification (in cooperation with CNEI), preparation and implementation. In addition, a small SSI unit is also found in BDET. Although this is a good start, it is still too early to make an assessment of its effectiveness at this time.

Development Constraints and Needs

23. There are at present two major sets of constraints to the development of small EMIs. One is internal to the small production units themselves and involves the inter-related issues of output quality, price and reliability in delivery. Improvement in these production aspects will require: a) upgrading of production techniques through selective modernization of equipment in order to achieve the quality needed for subcontracting first and exports at a later stage; and b) improvement in management of production operations (e.g. selection of product mix, procurement of raw materials, labor skills, production organization), in order to increase efficiency and reduce production costs. Recommendation of specific actions to be taken for the promotion of SSIs in general and small EMIs particular are found in paras. 25, 26.

24. The other set of constraints is essentially the lack of concrete institutional support at the government level for the development of small EMIs (and SSIs in general). Although exogeneous to the firm, their resolutions will be necessary to complement and enhance the actions taken at the firm level. These involve the establishment of specific policies to promote and assist the development of small EMIs in Tunisia. The most important measures needed are: (a) provision of incentives and technical/financial assistance schemes to help existing and to encourage new SSIs; (b) provision of incentives to promote subcontracting between larger and small firms and to encourage government procurement of supplies from small firms in order to establish a more integrated industrial structure; (c) standardization of products at the final as well as intermediate levels in order to establish quality norms and facilitate quality control; (d) organization of group-procurement of raw materials which need to be imported in order to reduce purchasing costs and needs for large inventories; and (e) strengthening of local suppliers' industries in order to achieve greater overall competitiveness and efficiency. Recommendation of a suitable institutional framework are given in para. 27.

Development Program for Small EMIs and SSIs

25. The financial assistance program should provide SSIs with a special source of credit for investments and permanent working capital, and should also include a guarantee scheme to offer an insurance-type coverage for the poorer SSIs which cannot meet the high collateral requirements from the sponsoring commercial banks. The technical assistance scheme should cover the following aspects:

(a) promotion of entrepreneurship and assistance at pre-investment stage by helping the entrepreneurs, both prospective and established, to formulate bankable projects through preparation of regional surveys, feasibility reports, etc...;

(b) technical counselling regarding the selection and utilization of materials/equipments, production planning and control, etc...;

(c) counselling for the improvement of design, quality and standards of products;

(d) management counselling regarding financial planning, accounting practices, organizational structure, personnel practices, etc...;

(e) marketing assistance regarding price mark-ups, advertising methods, marketing channels;

(f) promotion of subcontracting between large and small industries by dissemination of information by the Technical Assistance Unit; and

(g) establishment of public common service facilities (until these can operate commercially) such as toolroom, testing/ quality control laboratory, leasing of specialized equipment, repair workshops.

26. Most of these functions enumerated above have already been fulfilled by the technical assistance scheme established under the Bank's existing and oncoming SSI projects, namely, (a), (b), (d) and (e). While this program is a good start and has covered a lot of ground, the development of small EMIs in specific will require the following emphasis:

(i) promotion of subcontracting between small and large scale firms, by providing information on subcontracting opportunities, bringing together supply and demand, facilitating the negotiation of contracts and helping the SSIs to carry out the orders, mostly regarding the achievement of good product quality, timely delivery and reasonable prices, all of which are prerequisites for the contribution of SSIs to the production of large industries. Other activities may include subcontractors' fairs in which parts and components required by large industries are exhibited and ancillary industrial estates set up for small contractors, usually in the vicinity of the larger firms. These actions will serve to reinforce the Government's SSI subcontracting policies proposed in para. 24(b);

(ii) quality monitoring by helping establish a system of predetermined standards (based on international/national specifications), assisting the SSIs to meet them, and advising them on quality monitoring procedures such as testing sampling techniques, control charts, etc... The use of mobile vans with machinery and equipment should also be envisaged for promotional actions, training and demonstrations, and servicing in scattered locations. Of relevance to this feature is the recommendation to the Ministry of Industry to create a "Technological Institute" for industrial quality control; and

(iii) organization of special extension services/training programs (in technical schools as well as apprenticeships in enterprises already in operations) to develop, modernize and formalize the technical skills of the EMI's "middle level" workers.

27. Under present conditions, there is a need to establish an effective system of coordination and cooperation (or of division of labor) to maximize the combined contributions of the various institutions interested/involved in SSI development (CNEI, API, UTICA, technical institutes, business and management schools, quality control laboratories, etc...). However, to maximize the effectiveness and efficiency of the above technical and financial assistance programs, there will be a need for an institutional arrangement more appropriate and integrated than the one existing for the FOPRODI scheme. While

several alternatives of institutional scheme may be possible, the most suitable and practical set-up in the Tunisian environment seems to make use of the commercial banks as financial intermediaries and to group the technical assistance and guarantee schemes under the same umbrella forming an autonomous agency located under the aegis of the Ministry of Industry. This combination of functions appears to be most logical as it should help simplify loan processing procedures and allow for smoother project preparation and faster project execution. In effect, it would allow unification of the sectorial criteria used in the SSI project appraisal and approval. Furthermore, it would coordinate under one single roof the SSI investment promotion function and would become a centralized operational counterpart for SSIs outside the Government. The establishment of this agency would essentially involve the expansion and formalization of the existing SSI structure created within API under the Bank's SSI pilot project. The execution of the financial assistance scheme will continue to rely on the already existing financial institutions.

Development Prospects for Small EMIs

28. The small size of the local market and the lack of tradition in an industry requiring technical and managerial know-how and skilled work force tend to limit the scope for growth (exports and import substitution) in Tunisian small electrical-mechanical industries. Nevertheless, small-scale EMIs may have the potential to play a role in selected areas, provided that the constraints and needs discussed in paras. 23 and 24 are met. Undeniably, it would be still difficult for small EMIs to compete effectively with their larger counterparts in Tunisia and especially foreign firms abroad with respect to the production of equipment goods. They should have better prospects with electrical-mechanical intermediate and selected consumer's goods (para. 29). However, the small domestic market and the existing excess capacities tend to mitigate against further growth in many standard, simple production lines (e.g. small hardware goods). It is therefore necessary that Tunisian small EMIs now turn their focus toward manufacturing/assembling of more complex intermediate goods and of special products/services to cater to localized needs. Indeed, equipped with assets such as low overhead costs, flexibility and convenience of operations, small scale EMIs can play a significant role in the development of the sector by supporting and complementing the activities of the larger industries. Accordingly, the prospects for development of small scale EMIs in Tunisia are found to be strongest in four general orientations:

(a) production of selected consumer goods and of intermediate inputs for other firms;

(b) sub-contracting work for larger industries;

(c) production of special characteristics goods for local needs; and

(d) maintenance/servicing of consumer goods and simple selected equipment.

29. More specifically, small EMIs could contribute the most to three production activities: a) the automotive related industries, provided that there is standardization of these parts and components at the national level and that the firm's product mix is appropriately chosen to allow efficient utilization of their equipment/capacity; b) the metal products industries; and c) electrical products, provided that the firms in these two activities do not over-diversify and can find appropriate technical partners for technology transfer and especially, for market arrangement for their output.

30. Small EMIs should also play an important subcontracting role in the mechanical activities where they can do accuracy-machining of mechanical parts utilizing universal machines rather than precision/specialized equipment. (This potential could be enhanced by a diesel engine and tractor project currently being prepared, but is conditional on the degree of integration to be chosen for the project.) Small EMIs/equipment could be maintained at full utilization with complementary servicing works on parts and components etc... for replacement purposes.

31. In the field of steel structure and plateworks, the future potential of small EMIs is lessened by diseconomies of scale and by existing general excess capacities, with the exception, naturally, for custom-order/works with up to one ton weight and/or for production of items of smaller sizes, e.g. containers of up to 400 kg weight. The advantage of small units in the foundry activity rests essentially on their ability to service localized needs and cater to special, custom-order works in view of the small but flexible size of their operations.

Recommendations of product lines for small EMIs

32. In summary, the following specific product lines are considered to be most promising, subject to resolution of the constraints as identified in paras. 23 and 24:

(a) Automotive related industries: production of filter, brakes, wipers, rims, shock absorbers, horns;

(b) Metal Products: cutlery, agricultural and mechanic small hand tools, small tubing structures, sanitary fittings, metallic furniture, door/window frames;

(c) Mechanical-electrical activities: machining of intermediate goods, parts, components, and jobbing work for their maintenance and repair; fabrication of small transformers, switchboards, fixed resistors and condensors, of small mechanical-electrical household appliances such as mixer, coffee grinder, fans, etc... and of small simple agricultural equipment specialized to suit local needs (e.g. special pumps);

(d) Steel structure and plateworks: general maintenance/service works, construction of small containers, boilers, etc..., of special order structures (rolling doors, etc...) of railings, road guards, etc...

(e) Foundry: general maintenance/service works, production of special characteristic foundry pieces e.g. man-hole cover, and of spare parts for other industries.

BASIC CHARACTERISTICS OF SSIs VISITED IN TUNISIA

Date Start Production or Creation	Name of Firm	Ownership	Location	Activity	Production Capacity	Operating Rate (%) or Production	Production Growth Rate per year	Number Engineers Technicians	Number Qualified Labor	Total Employment	Export Value & Prod. Value	Labor Cost & Prod. Cost	Domestic Price / International Price	Ongoing/ Inv. Cost	Planned Period	Investment Additional Employment	Program Additional Production	Comments
1977	Africa Industrie (Capital = 100,000 D)	Private	Tunis (Ben Arous)	Pumps Cement Mixer Dumper	?	50%	70% 60% 50% 100% (77-78)	7	40	67	-	11%		-	-	-	-	Presently in financial Difficulties
1950	Atelier de Const. Metalliques et Mecaniques (Capital = 20,000 D)	Private	Tunis	Steel Structures Grills Rails, Etc.	n.a. (work on Commission)	36.5t (1978)	n.a.	2	4	12	-	6%	n.a.	70,000	?	?	?	Moving and Extension
1967	SIG (Capital = 120,000 D)	Private	Sfax	Metal Screens Grillings Barbed Wire Etc.	2,285t	70%	20% (77-78)	10	25	60 (x2 shifts)	3% ('78)	14%	- (no imports allowed)	-	-	-	-	
1969	SID (Capital = 130,000 D)	Private	Sfax	Nails Rivets General Hardware	1,700t('78) 1,450t('79)	61%	?	5	6	19	-	10%	- (no imports allowed)	75,000	1979-80	-	?	Extension? and automation
1975	SACMA (Capital = 130,000 D)	Private	Sfax	Steel Plates and Structures	3,000t 5,000t	1,000t = (1978)	?	2		60	-	19%	n.a.					
1904	JAMOUSSI Ets. (Capital = 10,000 D)	Private	Sfax	Agricultural Tools Plows	20-30t (1977,78) in function of rain		-	4	18	22	-	30%	n.a.	-	-	-	-	
1977	SIAM	Private	Sfax		-	65%	-	2	13	15	-	21%	-	-	-	-	-	
1967	Fonderie Schifano (Capital= 20,000 D)	Private	Tunis	Foundry	-	Work on Commission	-	2	8	10	-	?	n.a.	-	-	-	-	
1976	Clouteries Tunisiennes Modernes	Private	Tunis	Nails	-	50%	-	2	10	12	-	?	- No imports Allowed	-	-	-	-	
1970	Manufacture Electrodes Tunisiennes	Private	Tunis	Electrodes	-	68%	-	5		20	-	?	- (no imports allowed)	-	-	-	-	
1978	Fonderie Bendhia/ SCAD (Capital= 75,000 D) *(visited by SSI mission)	Private	Sousse	Foundry	Brass 5t/24h Aluminum 3t/8h	Still at trial stage	-	3	-	60 (at full operation)	-	?	n.a.	50,000	1980	?	?	Extension for production of profiles
1964	*Chauvec (Capital = 50,000 D)	Private	Tunis	Boilers Heating equipment	-	85%	-	2		15 (normally 80)	-	30%	1.65	-	-	-	-	
1977	*STIQUAM	Private	Tunis	locks and Hardware	?	60%	-	6		60	-	?	? (no imports allowed)					
1978	*SEMAC	Private	Tunis	Metal Stand for sewing Machines Wheelbarrows etc.	?	Press of 400 t not yet installed	-	2	20 (1978)	22 (1978)	-	-						

COMPOSITION OF EMI SUBSECTORS

1. Basic Metals

   Steel mill, pig iron, iron bars and rods

   Lead Metal and Primary Products

2. Foundries, Platework, Electrical Industries

   Pig Iron/Steel Foundries and castings

   Steel structures and platework

   Steel containers

   Agricultural equipment

   All Electrical Industries

3. Mechanical Works and Repairs

   Automobile Assembly

   Truck Implements and assembly

4. Metal Products

   Hand Tools

   Bolts and Nuts, springs, screens

   General Hardwares, locks and keys

   Non-electric stoves

   Aluminum structures (door and window frames)

   Metal furniture and fixtures

5. Shipyards and Repairs

ALLOCATION AND USE OF PRODUCTION FACTORS IN TUNISIAN EMIs

1. Production Function in Tunisian Electrical and Mechanical Industries

The data available on value added, employment and capital stock in manufacturing have made it possible to adjust, on 1969-1977 time series for the EMI sector, a production function of the Cobb-Douglas form $Y = A.K^{\alpha}.L^{\beta}$, with the following values for the parameters: $\alpha = 0.466$, and $\beta = 0.534$. In a market economy where the relative factor prices would reflect correctly the relative scarcities of factors and where the entrepreneurs would allocate correctly the production factors according to prices, the shares of value added going to capital and to labor would be equal to α and β respectively, as indicated in the appended note.

2. Actual Allocation and Use of Production Factors

The actual share b (a) of value added going to labor (capital) may differ from β (α) in some segments of the manufacturing enterprises, and the ratio $\frac{b}{\beta}$ is shown (see appended note) to represent the ratio between the actual and the correct intensity of labor and can thus be considered as an efficiency indicator of the use and intensity of labor in the production process.

The data available from the 1976 Industrial Survey permit to compute the share b separately for enterprises of different sizes, and in particular for SSIs. The following table summarizes the corresponding values for the ratio $\frac{b}{\beta}$.

Efficiency Indicator b/β of the Use of Labor in EMIs

Size of Enterprise (No. of workers)	[5-20]	[20-50]	SSIs Total	[50+] (MLIs)	TOTAL
Sub-Sector:					
Basic Metals	-	0.56	0.56	1.17	1.14
Foundries, Platework, Electrical	1.17	1.39	1.34	0.99	1.02
Mechanical Works	1.01	1.05	1.03	0.56	0.61
Metal Products	1.16	0.63	0.71	0.97	0.92
Shipyards	0.79	1.67	1.03	1.00	1.00
EMIs Overall	1.05	1.00	1.01	0.89	0.90

These indicators suggest that SSIs in general, and in particular those with less than 20 workers, have allocated to labor a higher share of their surplus than warranted by the marginal productivity of labor. Since this share reflects the intensity of the use of labor for the prevailing relative prices of production factors, it suggests also that SSIs have tended to be under-capitalized, as compared in particular to the larger industries, with the result that the value added per worker in the SSIs has been relatively low as indicated in the following table:

Index of Value Added per Worker (Sectorial average = 100)

Size of Enterprise (No. of workers)	[5-20]	[20-50]	Total SSIs	[50+] (MLIs)	Overall
Sub-Sector:					
Basic Metals	-	192.0	192.0	98.0	100
Foundries, Platework, Electrical	50.8	67.9	63.2	107.4	100
Mechanical Works	30.9	41.9	35.8	121.7	100
Metal Products	29.0	100.5	74.0	109.3	100
Shipyards	137.2	29.6	69.0	103.1	100
EMIs Overall	41.0	68.7	57.9	109.0	100

Source: 1976 Industrial Survey

The high value added per worker achieved in SSIs of the basic metals and shipyards are due to a high intensity of capital ($b/\beta < 1$) coupled with an efficient use of the capital. On the other hand, in the metal products, SSIs with 20 to 50 workers have intensively used capital (indicator b/β) but have not reached a level of productivity commensurate with the capital intensity. In all other cases, SSIs have been under-capitalized with a resulting low productivity of labor; an effort of financial assistance for equipment modernization and upgrading seems necessary, along with the technical assistance required to ensure an efficient use of the modern equipment.

STATISTICAL APPENDICES

Appendix I.1/
Appendice I.1

TUNISIA - GROWTH OF VALUE ADDED/
TUNISIE - CROISSANCE DU PIB

(in percent based on levels in constant prices)
(en pourcentages, sur la base des valeurs aux prix constants)

	1962-1969		1970-1978		
	Growth Rate/ Taux de Croissance (per annum)	Contribution to GDP Growth/ Contribution à croissance PIB	Growth Rate/ Taux de Croissance (per annum)	Contribution to GDP Growth/ Contribution à croissance PIB	
Agriculture	0.2	0.7	10.8	16.0	Agriculture
Mining	17.3	14.9	3.4	2.3	Industries extractives
Electricity and Water	13.6	4.6	8.5	1.9	Energie et eau
Manufacturing	6.4	13.2	9.7	12.4	Industries manufacturières
Food processing	- 1.4	- 1.5	7.8	3.5	Industries agricoles et alimentaires
Textiles, leather	20.5	4.8	12.7	3.6	Textile/confection
Mechanical/electrical	18.0	3.5	8.8	1.5	Industries mécaniques et électriques
Construction materials	10.8	1.9	10.4	1.2	Matériaux de construction
Chemicals	14.0	2.1	9.7	1.2	Chimie caoutchouc
Other	17.8	2.4	10.7	1.4	Divers
Construction	5.1	11.0	9.3	9.2	Bâtiment et T.P.
Services	4.1	55.6	8.7	58.2	Services
GDP at factor cost	4.2	100.0	8.2	100.0	PIB aux coûts facteurs

Source: Ministry of Planning/
Ministère du Plan

TUNISIA - SECTORAL SHARES IN GDP/
TUNISIE - DISTRIBUTION DU PIB PAR SECTEUR

(in percent based on levels in current prices)
(en pourcentages, sur la base des valeurs aux prix courants)

	1961	1969	1976	1978	
Agriculture	23.7	17.2	20.6	18.1	Agriculture
Mining	2.1	6.0	7.9	7.7	Industries extractives
Electricity and Water	1.2	2.0	1.7	1.7	Energie et eau
Manufacturing	7.7	10.0	10.6	11.0	Industries manufacturières
Food processing	5.5	3.9	3.7	3.2	Industries agricoles et alimentaires
Textiles, leather	0.4	1.9	2.7	2.6	Textile, confection
EMIs	0.5	1.4	1.5	1.6	IME
Construction materials	0.6	0.9	0.9	1.3	Matériaux de construction
Chemicals	0.4	0.9	0.7	1.0	Chimie caoutchouc
Other	0.8	1.0	1.2	1.3	Divers
Construction	7.2	8.6	9.8	10.5	Bâtiment et T.P.
Services	58.1	56.2	49.4	51.0	Services
GDP at factor cost	100.0	100.0	100.0	100.0	PIB aux coûts facteurs

Structure of Manufacturing (%)/
Structure des Industries Manufacturières (%)

		1975					
	Tunisia - 1976	Korea	Mexico	Brazil	Turkey	Spain	
Food Processing	34.7	21.2	22.7	17.1	32.6	13.5	Industries agricoles et alimentaires
Textiles/leather	25.8	22.0	10.0	13.2	19.9	15.7	Textile, confection
EMIs	13.6	21.0	33.7	32.0	18.9	31.0	IMEs
Construction Materials	8.1	5.6	5.2	5.9	4.0	8.4	Matériaux de construction
Chemicals	6.4	21.8	18.0	18.8	20.6	19.1	Chimie - caoutchouc
Others	11.4	8.4	10.4	13.0	4.0	12.3	Divers
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	Total

TUNISIA - INVESTMENT BY AGENT
TUNISIE - INVESTISSEMENTS PAR AGENTS

(in millions of dinars, at current prices)
(en millions de dinars, aux prix courants)

	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	
Administration	54.0	42.7	40.7	46.1	45.4	65.4	76.8	92.2	121.8	137.9	Administration
Public enterprises	39.7	48.1	65.9	77.1	76.0	96.5	165.2	227.0	306.2	361.3	Entreprises publiques
Private enterprises	35.1	38.8	44.2	65.0	88.8	110.3	137.9	144.1	125.5	137.8	Entreprises privées
Households	19.2	21.9	21.8	26.0	27.4	43.3	70.7	86.7	91.5	113.0	Ménages
Total Investment	148.0	151.5	172.6	214.2	237.6	315.5	450.6	550.0	645.0	750.0	Investissement total
Public sector	93.7	90.8	106.6	123.2	121.4	161.9	242.0	319.2	428.0	499.2	Par le secteur public
Private sector	54.3	60.7	66.0	91.0	116.2	153.6	208.6	230.8	217.0	250.8	Par le secteur privé
Investment by enterprises	74.8	86.9	110.1	142.1	164.8	206.8	303.1	371.1	431.7	499.1	Investissements des entreprises
of which in manufacturing	16.0	17.8	29.9	25.7	33.4	58.5	83.5	83.7	126.2	164.9	dont: industries manufacturières
- public	10.8	10.9	14.1	12.6	13.6	23.7	34.3	45.9	81.0	118.2	- publiques
- private	5.2	6.9	5.8	13.1	19.8	34.8	49.2	47.8	45.2	46.7	- privées
of which in mechanical and electrical industries	2.0	2.3	3.5	3.4	4.6	8.6	6.5	10.9	14.8	17.1	dont: IMEs
- public	1.0	1.7	2.8	1.9	2.6	5.1	1.6	5.1	8.3	10.1	- publiques
- private	1.0	0.6	0.7	1.5	2.0	3.5	4.9	5.8	6.5	7.0	- privées

Source: Ministry of Planning /
Ministère du Plan

TUNISIA - PUBLIC INVESTMENT IN MANUFACTURING/
TUNISIE - INVESTISSEMENTS PUBLICS DANS LES INDUSTRIES MANUFACTURIERES

(as % of total)
(en % du total des investissements)

	1961-68	1969-72	1973-76	1977-78	
Food Processing	79	66	28	40	Industries agricoles et alimentaires
Textiles, leather	88	35	16	18	Textile, confection
EMIs	94	67	51	58	IMEs
Construction Materials	93	80	73	86	Matériaux de construction
Chemicals	59	88	65	92	Chimie - caoutchouc
Others	76	71	15	21	Divers
Total Manufacturing	86	67	47	68	Industries manufacturières totales

PUBLIC EMPLOYMENT IN MANUFACTURING/
EMPLOI DANS LES INDUSTRIES MANUFACTURIERES PUBLIQUES

	1976 ('000)	% Total Subsector/ % du total du sous-secteur	
Food Processing	4.1	18.6	Industries agricoles et alimentaires
Textiles, leather	16.6	10.4	Textile, confection
EMIs	9.4	34.1	IMEs
Construction Materials	6.9	30.3	Matériaux de construction
Chemicals	4.4	61.9	Chimie - caoutchouc
Others	4.0	12.2	Divers
Total Manufacturing	45.4	16.7	Industries manufacturières totales

Source: Ministry of Planning/Ministère du Plan
Budget Economique 1979

TUNISIA - EXPORTS OF GOODS, FOB/
TUNISIE - EXPORTATIONS EN VALEUR, FOB

(in millions of dinars at current prices)
(Millions de Dinars; aux prix courants)

	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	
Agricultural products	9.5	11.4	11.7	11.8	14.4	12.6	15.1	15.6	20.8	24.0	Produits agricoles
Mining products	13.4	18.5	18.0	15.2	15.0	51.5	50.1	29.6	26.9	25.3	Produits miniers
Energy	22.7	26.1	31.9	41.2	53.6	142.7	150.6	143.2	166.7	181.8	Produits pétroliers
Manufacturing	43.6	42.8	55.6	92.3	95.8	190.9	129.8	149.9	187.6	207.9	Produits manufacturés
Food processing	20.6	18.3	30.8	58.2	44.7	88.0	53.3	54.2	41.7	47.9	Industries agricoles et alimentaires
Construction materials	1.6	1.2	1.0	1.4	1.1	1.5	0.9	0.5	0.5	0.9	Matériaux de construction
Mechanical and Electrical products	6.3	9.2	4.9	7.3	12.6	17.3	8.8	9.8	10.9	14.9	Produits mécaniques et électriques
Chemicals	8.7	8.9	9.7	12.8	18.0	51.9	32.6	35.5	47.0	51.3	Chimie caoutchouc
Textiles	1.7	2.0	4.3	8.4	11.3	22.0	27.2	43.3	77.2	83.2	Textile
Others	4.7	3.2	4.9	4.2	8.1	10.2	7.0	6.6	10.3	9.7	Divers
Total Exports	89.2	98.8	117.2	160.5	178.8	397.7	345.6	338.3	402.0	439.0	Exportations totales
Manufactured Exports, as % of Total	48.9	43.3	47.4	57.5	53.6	48.0	37.6	44.3	46.7	47.4	Produits manufacturés, en % du total

Source: Ministry of Planning/
Ministère du Plan

Appendix I.6/
Appendice I.6

TUNISIA - PRODUCTION, DEMAND AND FOREIGN TRADE
TUNISIE - PRODUCTION, DEMANDE ET ECHANGES EXTERIEURS

Sous-secteur/ Sous-secteur	1976 (MD) Production/ Production	Exports/ Exportations	Imports/ Imports	Local Demand/ Demande Intérieure	1977 (MD) Production/ Production	Exports/ Exports	Imports/ Imports	Local Demand/ Demande Intérieure	
Food Industries	294.0	54.2	43.6	283.4	287.4	41.7	42.9	288.6	Industries agricoles et alimentaires
Textiles/Leather	169.4	43.3	73.9	200.0	199.0	77.2	90.3	212.1	Textiles et confection
Const. Materials	29.0	0.5	23.4	51.9	40.2	0.5	31.4	71.1	Matériaux de construction
EMIs	86.4	9.8	287.6	364.2	107.9	10.9	343.6	440.6	IMEs
Chemicals	66.0	35.5	50.4	80.9	80.9	47.0	58.2	92.1	Chimie caoutchouc
Others	51.3	4.0	51.2	98.5	57.1	4.3	61.5	114.3	Divers
TOTAL	696.1	147.3	530.1	1078.9	772.5	181.6	627.9	1218.8	TOTAL
Total Country		338.3	656.7			402.0	782.4		Total National Imports/Exports

Sub-sector/ Sous-secteur	Production, as % Domestic Demand/ Production, en % Demande Intérieure 1972	1974	1976	1977	Exports, as % Production/ Exports, en % Production 1972	1976	1977	1978	Marginal Propensity to Exports (1977/72), in %/ Propension marginale à exporter (1977/72), en %	
Food Indust.	119	115	104	100	29.0	18.4	14.5	14.3	-18.6	Industries agricoles et alimentaires
Text./Leather	80	80	85	94	13.0	25.6	38.8	40.8	+50.9	Textiles et confection
Const. Mat	80	55	56	57	9.2	1.7	1.2	1.6	- 3.6	Matériaux de construction
EMIs	31	30	24	24	18.3	11.3	10.1	12.0	+ 5.3	IMEs
Chemicals	79	105	82	88	43.7	53.8	58.1	55.8	+66.3	Chimie caoutchouc
Others	63	51	52	50	11.8	7.8	7.5	7.4	+ 4.3	Divers
TOTAL	79	74	65	63	24.3	21.2	23.5	23.1	+22.7	TOTAL
Total Manufacturing Exports, as % Total Exports					57.5	44.3	46.7	47.3		Total Exports Manufacturés en % Total Exports
Total Manufactured Imports, as % of Total Imports					83.4	82.8	81.4	n.a.		Total Imports Manufacturés en % Total Imports
EMI Imports, as % of Total Imports:					40.8	43.8	43.9	46.5		Imports IME en % Total Imports

Source: Ministry of Planning/Ministère du Plan

TUNISIA - IMPORTS OF GOODS BY SECTOR, CIF
TUNISIE - IMPORTATIONS EN VALEUR, CIF

(in millions of dinars at current prices)
(en millions de dinars aux prix courants)

	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	
Agriculture	22.1	25.6	20.6	21.1	29.1	41.6	40.9	44.0	60.1		Produits agricoles
Energy	5.7	6.7	6.9	17.9	23.3	56.9	56.3	73.0	85.1		Energie
Manufacturing	120.0	135.5	163.4	195.9	233.6	390.2	475.6	539.7	637.2		Produits manufacturés
Food/processing	14.5	18.2	19.4	25.7	27.1	55.0	65.4	43.6	42.9		Industries agricoles et alimentaires
Construction material	2.9	3.1	3.0	5.3	7.6	16.9	18.8	23.4	31.4		Matériaux de construction
Chemical industry	20.3	20.2	25.0	29.1	33.1	65.6	71.2	73.8	88.8		Industrie chimique
Textiles	14.2	16.3	16.9	23.9	27.9	47.6	52.5	73.9	90.3		Textiles
Mechanical and electrical	50.7	59.2	76.7	95.8	116.6	165.4	243.0	287.6	343.6	400.9	Produits mécaniques et électriques
Other	17.4	18.5	22.4	16.1	21.3	39.7	24.7	37.4	40.2		Divers
Total imports (CIF)	147.8	167.8	190.9	234.9	286.0	488.7	572.8	656.7	782.4	863.0	Importations Totales
Manufacturing imports as % of Total	81.2	80.8	85.6	83.4	81.7	79.8	83.0	82.2	81.4	n.a.	Imports Manufacturés, en % Total Imports
EMI imports, as % of Total	34.3	35.3	40.2	40.8	40.8	33.8	42.4	43.8	43.9	46.5	Imports IME, en % Total Imports

Source: Ministry of Planning /
Ministère du Plan

TUNISIA - INVESTMENTS AND IMPORTS OF EMI GOODS
TUNISIE - INVESTISSEMENTS ET IMPORTATIONS DE PRODUITS DES IME

		1973	1974	1975	1976	1977	1978	
1.	Gross Fixed Investments (TD Millions)	237	316	461	570	645	750	Formation brute de capital Fixé (FBCF) (TD Millions)
2.	Imports of EMI Goods (TD Millions)	117	165	243	293	339	401	Importations de produits des IME (TD Millions)
3.	Domestic Demand for EMIs (TD Millions)	150	210	305	374	431	510	Demande intérieure pour produits IME (TD Millions)
	Growth Rate of 1 (%)		33.3	45.9	23.6	13.2	16.3	Taux de croissance de 1 (%)
	Growth Rate of 2 (%)		41.0	47.3	20.5	15.7	18.3	Taux de croissance de 2 (%)
	Growth Rate of 3 (%)		39.9	45.2	22.6	15.2	18.3	Taux de croissance de 3 (%)
			(----------1.08----------)					
	Elasticity EMI Imports/Investments		1.23	1.03	0.87	1.19	1.12	Elasticité Imports IME/FBCF
	Elasticity EMI Demand/Investments		1.20	0.98	0.96	1.15	1.12	Elasticité Demande IME/FBCF
			(----------1.07----------)					

Source: National Accounts of Tunisia/Comptes Nationaux de la Tunisie
Appendix I.7/Appendice I.7

TUNISIA - DIRECT FOREIGN INVESTMENT BY SECTOR
TUNISIE - INVESTISSEMENTS ETRANGERS, PAR SECTEUR

(in millions of dinars, at current prices)
(en millions de dinars, aux prix courants)

	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	TOTAL 1972-78	%	
Petroleum Industry	6.2	6.6	10.5	14.0	22.9	22.2	22.1	43.8	31.1	29.0	185.1	77	Industrie petrolière
Manufacturing	--	--	--	1.6	1.9	--	2.4	5.4	9.0	10.0	30.3	12	Industries manufacturières
Tourism	2.1	2.5	2.0	--	--	--	--	--	--	--	--		Tourisme
Financial Institutions	--	1.2	--	--	1.0	0.7	2.0	1.6	--	1.0	6.3	3	Institutions financières
Others	2.2	--	--	--	--	--	0.9	1.5	13.4	4.0	19.8	8	Autres
TOTAL	10.5	10.3	12.5	15.6	25.8	22.9	27.4	52.3	53.5	44.0	241.5	100	TOTAL

Source: Ministry of Planning/
Ministère du Plan

TUNISIA - PROJECT IMPLEMENTATION UNDER LAW 72-38 (1973-76)
TUNISIE - REALISATION DES PROJETS DANS LE CADRE DE LA LOI 1972-38 (1973-76)

(investment in millions in dinars, numbers of employment)
(investissements en millions de dinars, nombre d'emplois)

	Investment/Investissements				Employment/Emplois				Number of projects/ Nombre de projets				Investment Per Job (D'000)/ Investissement par Emploi (D'000)	
	Approved/ Agréés	Realized/ Réalisés	%	Ratio in Percent/ Taux de réalisation (%)	Approved/ Prévus	Realized/ Réalisés	%	Ratio in Percent/ Taux de réalisation (%)	Approved/ Agréés	Realized/ Réalisés	%	Ratio in Percent/ Taux de réalisation (%)		
By Nationality														Par Nationalité
Tunisian	18.00	14.43	29	80.1	4,341	1,937	10	44.6	62	42	18	67.7	7.45	Tunisien
Mixed	56.15	24.84	49	44.2	17,087	8,929	48	52.3	133	81	34	60.9	2.78	Conjoints
Foreign	63.76	10.92	22	17.1	21,415	7,671	42	35.8	171	116	48	67.8	1.42	Etranger
TOTAL	137.91	50.19	100	36.4	42,843	18,537	100	43.3	366	239	100	65.3	2.71	TOTAL
By Sector														Par Secteur
Food Industries	5.56	0.57	1		876	742	4		6	4	2		0.77	I.A.A.
Textiles, leather	67.84	24.14	48		33,984	15,801	85		258	184	77		1.53	Textiles, confection
EMIs	36.46	2.47	5		4,511	780	4		49	25	10		3.16	IMEs
Construction Materials	0.30	-	-		80	-	-		2	-	-		-	Matériaux de construction
Chemicals	22.17	21.34	43		552	473	3		10	7	3		45.11	Chimie caoutchouc
Others	5.57	1.67	3		2,840	741	4		41	19	8		2.26	Divers
TOTAL	137.91	50.19	100		42,843	18,537	100		366	239	100		2.71	TOTAL

Source: API

TUNISIA - BALANCE OF PAYMENT EFFECTS OF FOREIGN DIRECT INVESTMENT (1969-77)
TUNISIE - EFFETS DES INVESTISSEMENTS ETRANGERS SUR LA BALANCE DES PAIEMENTS (1969-77)

	1969	1970	1971	1972	1973	1974	1975	1976	1977	
A. Inflow										Entrées
Direct Investment	10.5	10.3	12.5	15.6	24.5	21.6	26.2	31.5	50.0	Investissements directs
Office Expense	-	-	-	-	-	2.0	1.0	12.3	13.7	Dépenses de bureaux
Total	10.5	10.3	12.5	15.6	24.5	23.6	27.2	43.8	63.7	Total
Outflow										Sorties
Capital Repatriation				0.2	-	0.7	2.8	3.3	6.5	Repatriement de capital
Repatriated Earnings	2.7	4.5	5.0	11.0	12.9	14.0	12.3	12.1	5.9	Repatriement de gains
Dividends				0.8	1.7	1.7	8.3	9.1	4.6	Dividends
Technical Assistance				2.0	1.1	1.0	1.1	1.9	2.2	Assistance technique
Total	2.7	4.5	5.0	14.0	15.7	17.4	23.5	26.4	19.2	Total
Direct Balance of Payment Effects	7.8	5.8	7.5	1.6	8.8	6.2	3.7	17.4	44.5	Effets directs sur la balance des paiements
B. Indirect Effects/Export Promotion Law 1972										Effets Indirects/Exportations Loi 1972-38
Wages					0.4	1.7	4.1	9.6	14.0	Salaires
Contribution to Government					0.1	0.4	0.9	2.1	3.1	Imports et taxes
Services					0.1	0.6	1.8	4.9	7.1	Services
Raw Materials					0.1	1.4	0.8	1.8	1.9	Matières premières
Indirect Effects						4.1	7.6	18.4	26.1	Effets indirects
C. Overall Effects	7.8	5.8	7.5	1.6	0.7	10.3	11.3	35.8	70.5	Effets Globaux

Source: Banque Centrale de Tunisie (partie B)
API "Contribution des Entreprises Exportatrices à l'équilibre de la Balance des paiements", Décembre 1977.

TUNISIA - GROSS FIXED INVESTMENT BY SECTOR
TUNISIE - FORMATION BRUTE DE CAPITAL FIXE, PAR SECTEUR

(in millions of dinars, at current prices)
(en millions de dinars, aux prix courants)

	1965	1969	1970	1972	1975	1976	1977	1978	
Agriculture	26.2	34.5	26.7	30.7	54.0	64.2	70.5	90.2	Agriculture
Extractive Industries	7.7	11.0	14.3	26.2	75.6	85.8	90.5	93.3	Industries extractives
Electricity and Water	5.7	7.1	10.3	23.2	35.0	50.8	57.3	66.2	Electricité et eau
Manufacturing	22.3	16.0	17.8	25.7	83.5	93.4	126.1	164.9	Industries manufacturières
Food Processing	0.3	2.2	2.9	4.8	17.4	20.6	23.7	27.6	Industries agricoles et alimentaires
Textiles, Clothing, Leather	9.7	3.6	3.9	6.6	13.0	10.5	11.6	7.3	Textiles et confection
Mechanical and Electrical	14.5	2.3	2.5	3.4	6.5	11.0	14.7	17.1	IME
Construction Materials	0.8	1.8	0.8	2.8	21.6	31.5	60.0	64.1	Matériaux de construction
Chemicals	0.7	1.9	2.3	4.4	15.1	13.8	10.1	42.1	Chimie caoutchouc
Woodworking, Paper, Other	0.2	4.2	5.4	3.7	5.4	6.0	6.0	6.7	Industrie du bois, papier, autres
Services	43.4	54.6	61.6	90.2	167.1	203.3	223.1	239.6	Services
Infrastructure	21.3	24.8	21.1	18.2	45.8	52.5	77.5	94.8	Equipements collectifs
TOTAL	145.0	148.0	151.5	214.2	461.0	550.0	645.0	750.0	TOTAL
Total in constant 1972 prices	158.6	162.6	161.3	214.2	300.0	330.0	363.0	396.0	Total aux prix constants 1972
Manufacturing as % of Total	15.4	10.8	11.7	12.0	18.1	17.0	19.6	22.0	Industries manufacturières, en % du total

Source: Ministry of Planning /
Ministère du Plan

TUNISIA - EMPLOYMENT CREATION/
TUNISIE - CREATION D'EMPLOIS
('000)

	1970-1972	1973-1976	1977-1978	
Food Processing	1.4	6.7	5.5	
Textiles, leather	6.2	30.6	13.2	Textiles, confection
EMIs	2.5	6.9	5.8	IMEs
Construction Materials	1.0	6.7	6.1	Matériaux de construction
Chemicals	1.4	2.8	1.8	Chimie caoutchouc
Others	1.6	6.5	6.3	Divers
Total Manufacturing	14.1	60.2	38.7	Total Industries Manufacturières
Total Employment	71.3	163.3	84.3	Total Création d'Emplois
Manufacturing as % Total	19.8%	36.9%	45.9%	Emploi des Industries Manufacturières en % du Total

TUNISIA - INVESTMENTS IN MANUFACTURING/
TUNISIE - INVESTISSEMENTS DANS LES INDUSTRIES MANUFACTURIERES
(Millions D)

	1961-1968	1969-1972	1973-1976	1977-1978	
Food Processing	15.1	13.3	59	51	Industries agricoles et alimentaires
Textiles, leather	22.4	17.0	45	19	Textiles, confection
EMIs	35.1	11.2	32	32	IMEs
Construction Materials	12.1	6.3	82	124	Matériaux de construction
Chemicals	8.3	16.3	46	52	Chimie caoutchouc
Others	8.6	15.3	20	13	Divers
Total Manufacturing	101.6	79.4	284	291	Total Industries Manufacturières
Total GFCF	908.9	686.3	1564	1395	Total FBCF
Manufacturing as % GFCF	11.2%	11.6%	18.2%	20.9%	Industries Manufacturières en % FBCF
Public Investment Manuf.	87.6		132.5	199.2	Investissements Publics dans Industries Manufacturières
Public as % of Total Manuf.	86.2%	67.3%	46.6%	68.4%	Investissements Publics en % Total Industries Manufacturières

Source: Ministry of Planning / Ministère du Plan
Budget Economique 1979

Appendix I.14/
Appendice I.14

TUNISIA - SUMMARY OF TRENDS IN MANUFACTURING
TUNISIE - RESUME DES TENDANCES DANS LES INDUSTRIES MANUFACTURIERES

Sub-sector (Constant 1972 Prices) / Sous-secteur (prix constants 1972)		1969	1970	1972	1974	1976	1977	
Food Industries:	Value Added (MD)	25.20	21.70	42.20	41.70	49.20	43.30	I.A.A.: Valeur ajoutée (MD)
	Employment (000)	13.95	14.31	15.32	16.98	22.00	24.55	Emploi (000)
	Net Capital (MD)	75.06	75.04	78.04	85.39	98.06	105.03	Stock de capital net (MD)
Construction Materials:	Value Added	5.70	5.40	6.70	7.10	10.10	11.60	Matériaux de Construction: Valeur ajoutée
	Employment	15.18	15.44	16.19	18.13	22.91	26.02	Emploi
	Net Capital	20.76	20.88	23.26	29.82	62.03	93.00	Stock de capital net
EMIs:	Value Added	9.10	9.10	12.70	14.70	15.50	16.90	IMEs: Valeur ajoutée
	Employment	18.22	18.82	20.65	23.16	27.56	30.11	Emploi
	Net Capital	44.98	46.08	50.30	56.91	63.93	69.99	Stock de capital net
Chemicals:	Value Added	5.70	6.30	9.50	12.50	7.30	11.40	Chimie caoutchouc: Valeur ajoutée
	Employment	2.87	3.32	4.31	5.51	7.14	7.82	Emploi
	Net Capital	15.88	17.96	30.31	42.46	57.60	61.29	Stock de capital net
Textiles:	Value Added	12.70	12.90	18.40	22.90	33.80	37.20	Textiles: Valeur ajoutée
	Employment	121.92	123.50	128.11	141.10	158.66	165.16	Emploi
	Net Capital	32.37	35.77	42.69	52.52	57.16	58.26	Stock de capital net
Paper, Wood, Miscellaneous:								Papier, Bois, Divers:
	Value Added	6.50	8.00	9.30	12.00	12.90	13.80	Valeur ajoutée
	Employment	24.78	25.20	26.36	28.94	32.91	35.90	Emploi
	Net Capital	18.50	24.54	28.51	33.60	37.60	39.69	Stock de capital net
TOTAL:	Value Added	64.90	63.40	98.80	110.90	128.80	134.20	TOTAL: Valeur ajoutée
	Employment	196.92	200.59	211.19	233.82	271.19	289.56	Emploi
	Net Capital	207.55	220.27	253.11	300.70	376.38	427.26	Stock de capital net

Source: Ministry of Planning, IEQ, mission estimates.

Appendix I.15/
Appendice I.15

TUNISIA - SUBSECTORAL ICORS IN MANUFACTURING/
TUNISIE - COEFFICIENTS MARGINAUX DE CAPITAL,
PAR SOUS-SECTEUR DES INDUSTRIES MANUFACTURIERES

Sub-sector/ Sous-secteur	Value Added (1972 Constant Prices)/ Valeur ajoutée (aux prix constants 1972)						Investments (1972 Constant Prices)/ Investissements (aux prix constants 1972)				
	1973	1974	1975	1976	1977	1978	1973	1974	1975	1976	1977
I.A.A.	34.4	41.7	41.7	49.3	43.3	49.3	5.56	10.18	11.33	12.72	13.94
Textiles	21.2	23.9	30.0	33.8	37.2	37.2	8.03	9.59	8.46	6.49	6.82
I.M.C.C.V.	7.5	7.1	8.3	10.1	11.6	13.9	3.00	5.58	16.99	19.46	35.29
I.M.E.	14.1	14.7	15.2	15.5	16.9	19.5	4.06	6.39	4.23	6.79	8.65
I. Chimiques	11.1	12.5	8.8	7.3	11.4	13.1	6.09	8.03	9.83	8.52	5.94
I. Diverses	9.9	12.0	12.2	12.8	13.8	16.3	2.74	3.72	3.52	3.70	3.53
TOTAL	98.2	110.9	116.6	128.8	134.2	149.3	29.48	43.49	54.36	57.69	74.18

Sub-sector/ Sous-secteur	ICOR/ Coefficient Marginal de Capital	
	73-77/74-78 (1 year-lag)/ (décalage d'un an)	73-76/75-78 (2 year-lag)/ (décalage de deux ans)
I.A.A.	1.82*	2.07**
I.T.C.	2.46	2.45
I.M.C.C.V.	12.55	6.62
I.M.E.	5.58	4.47
I.C.H.C.	19.20	n.s.
I.D.	2.69	3.18
TOTAL	5.07	4.82

* : 73-75/74-76

**: 73-74/75-76

Source: Ministry of Planning and Mission Calculations/
Ministère du Plan et Calculs de la Mission

Appendix I.16/
Appendice I.16

TUNISIA/TUNISIE

VALUE ADDED PER WORKER IN MANUFACTURING/
VALEUR AJOUTEE PAR TRAVAILLEUR DANS LES INDUSTRIES MANUFACTURIERES

Sub-sector/ Sous-secteur	1969	1972	1976	1978	1972/69	1978/72	1978/69	
Food Industries	1.806	2.755	2.236	1.793	15.1	- 6.9	- 0.1	Industries agricoles et alimentaires
Construction Mat.	0.375	0.414	0.441	0.479	3.3	2.5	2.8	Matériaux de construction
EMIs	0.500	0.625	0.562	0.584	7.1	- 0.9	1.7	IMEs
Chemicals	1.986	2.204	1.022	1.472	3.5	- 6.5	- 3.3	Chimie caoutchouc
Textiles, leather	0.104	0.144	0.213	0.216	11.5	7.0	8.5	Textiles, confection
Others	0.262	0.353	0.392	0.416	10.4	2.8	5.3	Divers
TOTAL	0.330	0.468	0.475	0.482	12.4	0.5	4.3	TOTAL

VALUE ADDED AS % OUTPUT/
VALEUR AJOUTEE EN % PRODUIT BRUT

	1972	1976	1978	
Food Industries	21.5	20.5	19.8	Industries agricoles et alimentaires
Textiles, leather	27.5	26.4	26.3	Textiles, confection
EMIs	32.3	27.4	26.6	IMEs
Construction Materials	43.8	48.6	46.7	Matériaux de construction
Chemicals	31.7	16.8	23.6	Chimie caoutchouc
Others	37.8	38.8	40.1	Divers
Total Manufacturing	26.5	25.0	25.9	Total Industries Manufacturières

Source: Mission Estimates /
Estimations de la Mission

Appendix I.17 /
Appendice I.17

TUNISIA - WAGES, INFLATION AND LABOR PRODUCTIVITY/
TUNISIE - SALAIRES, INFLATION ET PRODUCTIVITE DU TRAVAIL

Average Wages per Worker	1970	1972	1975 (Current D'000 p.a.) (Millions D par an aux prix courants)	1975 Index/ Indice 1975 (1970=100)	1976 Index/ Indice (1970=100)	1977	1978	Salaires Moyennes par Travailleur
Subsector: Food Industries	.471	.540	.616	131	158	n.a.	n.a.	Sous-secteur: Industries agricoles et alimentaires
Textiles, leather	.106	.125	.160	151	158	n.a.	n.a.	Textiles, confection
EMIs	.420	.475	.685	163	166	n.a.	n.a.	IME s
Construction Materials	.234	.301	.493	211	221	n.a.	n.a.	Matériaux de construction
Chemicals	1.180	1.302	1.592	135	162	n.a.	n.a.	Chimie caoutchouc
Others	.280	.249	.385	185	190	n.a.	n.a.	Divers
Total Manufacturing	.202	.242	.339	168	181			Total Industries Manufacturières
Index (1970=100)	100	120	168		181		225-245*	Indice (1970=100)
Minimum Wage Industry (D/hour)	.084	.104	.145		.145	.193	.214	Salaire minimum dans l'industrie (D/heure)
Index (1970=100)	100	124	173		173	230	255	Indice (1970=100)
Cost of Living Index (1970=100)	100	108	129		136	145	154	Indice du coût de la vie (1970=100)
Wholesale Price Index (1970=100)	100	109	152		154	162	166	Indice des prix de gros (1970=100)
GDP Deflation Index (1970=100)	100	109	146		147	159	167	Coefficient déflateur du PIB (1970=100)

Value Added/Worker Index (in current values)	1970	1975	1976	1978	Wage Index/VA Index Indice Salaire/Indice VA 1975	1976	Indice Valeur Ajoutée/Par Travailleur (aux valeurs courantes)
Subsector: Food Industries	100	185	180	159	71	88	Sous-secteur: Industries agricoles et alimentaires
Textiles, leather	100	252	295	326	60	54	Textiles, confection
EMIs	100	163	192	204	100	86	IME s
Construction Materials	100	152	175	256	139	126	Matériaux de construction
Chemicals	100	152	91	141	89	178	Chimie caoutchouc
Others	100	186	206	234	100	92	Divers
Total Manufacturing	100	203	212	243	83	85	Total Industries Manufacturières

Average Hourly Compensation in Manufacturing (US$ per hour)	Tunisia	France	Italy	Germany	Netherlands	U.K.	U.S.	Salaire Horaire moyen dans les Industries Manufacturières (US$ par heure)
Compensation in 1976	0.43	5.63	5.21	6.62	8.08	3.40	8.00	Niveau en 1976
Compensation in 1977	0.57*	6.16	6.00	7.84	9.40	3.62	8.71	Niveau en 1977

* Estimated /Estimé

Source: Ministry of Planning /Ministère du Plan
Mission Estimates /Estimations de la Mission

TUNISIA/TUNISIE

Appendix I.18/
Appendice I.18

RANKING OF INDUSTRIAL SUBSECTORS BY PERFORMANCE INDICATORS/
CLASSEMENT DES SOUS-SECTEURS MANUFACTURIERES PAR INDICES DE PERFORMANCE

Sub-sector/ Sous-secteur	(1) V.A./ Worker/ Valeur ajoutée par travailleur	(2) ICOR/ Coefficient marginal de capital	(3) Investment cost per job/ Coût d'investissement par emploi	(4) Labor Intensity/ Intensité en travail 1/	(5) Marginal Export-Output Ratio/ Propension marginale à exporter	(6) Import-Substitution Potential/ Potentiel de substitution d'importation	
Food Industries	1	1	4	6	6	6	Industries agricoles et alimentaires
Textiles, leather	6	2	1	1	2	5	Textiles, confection
EMIs	3	4	3	4	3	1	IMEs
Construction Materials	4	5	5	2	5	3	Matériaux de construction
Chemicals	2	6	6	5	1	4	Chimie caoutchouc
Miscellaneous	5	3	2	3	4	2	Divers

Overall Performance Indicators: Subsector/Sous-secteur	Global Productivity (7)/ Productivité globale des facteurs (7)	(1) to (6)	(1) to (7)	Indices Généraux
Food Industries	4	5	5	Industries agricoles et alimentaires
Textiles, leather	1	1	1	Textiles, confection
EMIs	3	2	2	IMEs
Construction Materials	5	5	6	Matériaux de construction
Chemicals	6	4	4	Chimie caoutchouc
Miscellaneous	2	3	3	Divers

1/ Measured by Gross Output per Worker/ Mesuré par la production brute par ouvrier

Source: Appendixes I.6, I.13, I.14 and I.15 and Table 1.05/
Appendices I.6, I.13, I.14 et I.15 et Tableau 1.05

INCENTIVES FOR INVESTMENT, EXPORTS AND EMPLOYMENT CREATION

LEGAL BASE	LAW 1969-35 OF JUNE 26, 1969			LAW 1972-38 OF APRIL 27, 1972		LAW 1974-76 OF AUGUST 3, 1974				
CRITERION	AMOUNT OF INVESTMENT MADE			PRODUCTION FOR EXPORTS		NUMBER OF PERMANENT JOBS CREATED				
TYPE OF INCENTIVE	Category A (I<D50,000)	Category B (D≥50,000 <D250,000)	Category C (I>D250,000)	Production Exclusively for Export	At Least 20% Production for Export	A: 10-20	B: 21-50	C: 51-100	D: 101-150	E ≥ 151
TAX INCENTIVES										
Income Tax	Partial exemption; reinvested profits can be deducted from taxable income up to 50% of annual taxable income for legal entities and up to 30% for individuals	Full exemption for first 3 years of operation with 2 more years possible extension	Full exemption for first 5 years of operation with 5 more years possible extension	Full exemption for first 10 years of operation and taxed at a reduced rate during the next 10 years	All incomes resulting from exports are taxed at a rate 10% less than the normal one	--- Exempt from the operating tax during the first five years of operation -------- and exemption of the net operating income tax according to category:				
						40% of income	60% of income	70% of income	80% of income	90% of income
Registration Taxes -on new or expanded operations		Flat charge for first 3 years with possible extension to 2 more	Flat charge for first 5 years with possible extension to 5 more	Flat charge for 20 years		---------- Flat rate only applies to initial registration ----------				
-on cessation of assets				Normal rates reduced by about 50% during 20 years						
Tax on Income from Tangible Assets -financial charges on borrowings to establish enterprise		Exempt for first 3 years with possible extension to 5 years	Exempt for first 5 years with possible extension to 10 years	Exempt for 20 years						
-distributed profits on instruments		Same as for financial charges but limited annually to 6% nominal value of instrument		Taxes at reduced rate without ceiling for 20 years (6% on registered securities; 8% on bearer paper)						
Custom duties and Turnover Taxes										
Imports		Exempt from all duties on imported capital	Exempt from all duties on imported capital	Exempt from all duties on all goods needed for production purposes		---------- Exemption of duties and taxes on imports ---------- up to 25% of cif value ---------- without limitation ----------				
Local Purchases - from non-producers				Reimbursement of custom duties and turnover taxes	Reimbursement of turnover taxes	---------- Reimbursement of custom duties and turnover tax ---------- up to 25% of cif value ---------- without limitation ----------				
- from producers				---------- Exemption from turn-over tax --------		---------- Exemption from turnover tax ----------				
OTHER INCENTIVES										
Import Controls				No quantitative restrictions on importation of all goods needed for production provided custom declaration is made		All import permits are granted within 30 days from receipt of request by investor				
Repatriation Guarantees	---------- All non-resident investors may freely repatriate all net revenues accruing to their investment made in foreign exchange ---------- Upon liquidation of their investment they may repatriate the proceeds even if the amount is greater than the amount originally invested in									
Employment				Recruitment of foreigners for managerial and foremen positions possible without restriction		---------- If additional employment is created beyond the originally ---------- planned amount the enterprise will be reclassified for the remainder of the initial period. Taxes will be reduced proportionally with additional employment created except that the reduction cannot exceed 25%				
Regionalization						---------- If enterprises are established in certain regions ---------- additional incentives apply - tax exemption for one additional year - interest subsidy for investment loans - investment subsidy up to 10% of fixed investment - provision of infrastructure by the state				
Exports						---------- If exports exceed 10% of total turn-over of enterprises ---------- during the first 5 years of operation, one additional year of income tax exemption will apply				
Incentives available on request and not automatically granted	---------- Accelerated depreciation ---------- ---------- Preferential customs treatment ---------- ---------- Fixed tax rates for 20 years ---------- ------- Provision of free land for production sites ----- ------ Provision of all infrastructure by the state ----- ------ Granting of production and sales monopoly -------- ------ Prohibition of competing imports ---------- ------ Interest rate subsidies of bank lending rates ----					---------- The benefits of the law may be granted by the government ---------- by decree at more favorable conditions than stated above with respect to the duration of tax exemptions and rates, subsidies and other benefits				

Source: L'Agence de promotion des investissements: "Regime particulier en faveur des industries exportatrices, Loi 72-32 du 27 avril 1972," et"Loi 74-74 du 3 avril, 1974 relative aux investissements dans les industries manufacturieres."

INDUSTRIAL DECENTRALIZATION BENEFITS

(Law 77-578; July 6, 1977)

Group A	Group A, B and C
Nabeul, Monastir, Mahdia Gabes, Bizerte, Sousse, Sfax (with exception of Menzel Bourguiba, Sousse Nord, Sousse Sud, Sfax Médina, Sfax Nord, Sfax Sud)	Flat rate registration tax for capital increases. One additional year of exemption from profit tax. During the first five years of operation exemption from income tax levied on distributed profits to stock holders and partial exemption on interest payments on funds borrowed to establish the enterprise, not exceeding 6% of the nominal value of the paper issued.
Group B	Group B and C
Zaghouan, Béja, Siliana, Kairouan, Sidi Bouzid	Apart from all benefits mentioned above, interest rate subsidy applying to lending rates above 5 percent, with the subsidy being equivalent of up to 5 percent of the rate charged. Possibility of state providing all infrastructure.
Group C	Group C
Jendouba, le Kef, Kasserine, Gafsa, Médenine	All benefits set out above plus a 10% investment subsidy not exceeding D 10,000.

Source: Journal Officiel, Décret 77-578; July 6, 1977

Appendix III.1/
Appendice III.1

TUNISIA - OUTPUT AND GROWTH OF EMIs/
TUNISIE - PRODUCTION BRUTE ET CROISSANCE DES IME

ISIC	EMI Subsector/ Sous-secteur IME	Gross Output/Produit brut 1972 D Mlns.	%	1978 D Mlns.	%	Growth Rate % p.a. (real terms)/ Taux de croissance (en termes réels)	
	1 - Mechanical Industries						1 - Industries mécaniques
3813+3843	Steel structures, platework	3.1	7.6	9.6	7.7	10.7	Construction métallique et chaudronnerie
3841	Shipyard*	0.8	2.0	3.1	2.5	14.9	Construction navale*
3821+3822	Engines*, Agric. Implements	0.8	2.0	2.4	1.9	10.1	Moteurs*, équipements agricoles
	Sub-Total Equipment Goods	4.7	11.6	15.1	12.1	11.3	Sous-total biens d'équipement
3710	Steel mill	9.1	22.5	23.0	18.5	7.0	Sidérurgie*
3710	Iron/steel foundries*	1.6	4.0	3.7	3.0	5.4	Fonderies fonte/acier*
3720	Lead foundries/products*	4.6	11.3	7.8	6.3	0.1	Fonderies et produits
3813+3819	Pipes, Cans*, metal parts	5.8	14.3	15.0	12.0	7.4	Tubes et tuyaux, emballages métalliques*, pièces métalliques
	Sub-Total Intermed. Goods	21.1	52.1	49.5	39.8	5.7	Sous-total produits intermédiaires
3843	Automotive/cycle assembly*	5.4	13.3	26.6	21.4	19.6	Montage automobiles et cycles*
3811+3819	Metal Products, hardware	2.7	6.7	5.0	4.0	1.6	Ouvrages en métaux, quincaillerie
	Sub-Total End-Products	8.1	20.0	31.6	25.4	15.0	Sous-total produits finals
	Total Mechanical Industries	33.9	83.7	96.2	77.3	9.1	Total industries mécaniques
	2 - Electrical Industries						2 - Industries électriques
3831	Transformers-Electric Motors	2.8	6.9	11.1	9.0	15.3	Transformateurs, moteurs
3839	Batteries, cables, others	1.0	2.5	5.0	4.0	19.9	Batteries, cables, autres
	Sub-Total Equip/Inter.Goods	3.8	9.4	16.1	13.0	16.6	Sous-total biens d'équipement et intermédiaires
3832	Radio, TV Assembly	2.0	4.9	5.3	4.2	7.8	Montage radios/TV
3829+3833	Household Appliances*	0.8	2.0	6.8	5.5	31.0	Appareils électroménagers*
	Sub-Total End-Products	2.8	6.9	12.1	9.7	17.0	Sous-total produits finals
	Total Electrical Industries	6.6	16.3	28.2	22.7	16.8	Total industries électriques
	TOTAL EMIs Output	40.5	100.0	124.4	100.0	10.5	TOTAL IME
	TOTAL EMI Value Added	12.9		33.1			Valeur ajoutée total IME
	Value Added/Output, in %	31.9		26.6			Valeur ajoutée/Production brute

* Owned largely or totally by the Public Sector/ Possédés en totalité ou grande partie par le secteur public.
Source: V Plan and Budget Economique 1979.

TUNISIA - COVERAGE OF EMI PRODUCTION LINES BY TUNISIAN INDUSTRIES/
TUNISIE - DES LIGNES DE PRODUCTION IME PAR LES INDUSTRIES TUNISIENNES

ISIC	Denomination/Dénomination	Activities undertaken in Tunisia/ Activités entreprises en Tunisie
37	Basic Metals/ Industries métallurgiques de base	
.371	Iron and steel basic industries/ Sidérurgie et première transformation des ferreux	Steel mill (rods only). Foundries/ Sidérurgie (fers à béton seulement). Fonderies
.372	Non-ferrous metal basic industries/ Production et première transformation des métaux non-ferreux	Lead foundry and products/ Fonderies et produits de plomb
38	Fabricated Metal Products and Machinery/Fabrication d'ouvrages en métaux, machines et matériels	
.381	Metal Products, except machinery/ Ouvrages en métaux, sauf machines et matériel:	
3811	Cutlery, hand tools, general hardware/Coutellerie, outils à main, quincaillerie	Generally produced/ Généralement produits
3812	Metal furniture and fixtures/ Meubles et accessoires en métal	Some produced/ Certains produits
3813	Structural metal products and platework/Structures métalliques et chaudronnerie	Generally produced, except boilers/ Généralement produits, sauf chaudronnerie
3819	Other metal products n.e.c., except machinery/Autres ouvrages en métaux, sauf machines et matériels, n.d.a.	Generally produced, except surface-treatment/Généralement produits, sauf traitements de surface
.382	Non-Electrical Machinery/ Machines, sauf machines électriques	
3821	Engines and turbines/ Moteurs et turbines	Only small diesel engine assembly/ Montages petits moteurs diesel
3822	Agricultural Machinery and Equipment/Machines et matériels agricoles	Only non-automotive implements/ Matériels non automobiles

ISIC	Denomination/Dénomination	Activities undertaken in Tunisia/ Activités entreprises en Tunisie
3823	Metal and wood working machinery/ Machines pour travail bois et métal	Void/Aucune
3824	Specialized industrial machinery/ equipment Machines et matériels spéciaux pour l'industrie	Void/Aucune
3825	Office computing/accounting machinery Machines de bureau, de calcul et de comptabilité	Void/Aucune
3829	Non-electrical machinery/ equipment n.e.c. Machines et matériels non électriques n.d.a.	Only pumps, refrigerators, sewing machines, and machining shops/ Pompes, refrigérateurs, machines à coudre, et ateliers d'usinage
.383	Electrical Machinery, appliances and supplies/Machines, appareils et fournitures électriques	
3831	Electrical industry machinery and apparatus/Machines et appareils électriques industriels	Only transformers and small motors/ Transformateurs et petits moteurs
3832	Radio, TV and communication equipment and components/ Appareils de radio, TV et télécommunication	Only assembly of radio/TV sets Montage d'appareils radio et TV
3833	Electrical appliances and housewares/ Appareils électro-ménagers	Only stoves and water heaters/ Fourneaux et chauffe-eau électriques
3839	Electrical apparatus and supplies n.e.c./Appareils et fournitures électriques n.d.a.	Only cables, batteries, small wiring devices/Cables, accumulateurs, petit appareillage d'installation
.384	Transport Equipment/ Matériel de transport	
3841	Ship building and repairing/ Construction et réparation navale	Ship repairing (up to 60,000 DWT)/ Réparation navale (jusqu'à 60.000T)
3842	Railroad equipment/ Matériel ferroviaire	Only freight cars/ Wagons de marchandises

ISIC ISIC	Denomination/Dénomination	Activities undertaken in Tunisia/ Activités entreprises en Tunisie
3843	Motor vehicles and parts and accessories/ Véhicules automobiles	Assembly of cars, trucks, buses/ Montage d'automobiles, camions et autobus
3844	Motorcycles and bicycles/ Motocycles et cyles	Assembly of bicycles/mopeds Montage de cycles et vélomoteurs
3845	Aircraft/Construction aéronautique	Void/Aucune
3849	Transport equipment n.e.c. (animal-drawn)/ Matériel de transport n.d.a.	Void/ Aucune
.385	Measuring and controlling equipment/ Appareils de mesure et contrôle	
	Optical goods/Instruments d'optique	
3851	Measuring and controlling equipment/Appareils de mesure et contrôle	Only electric meters/ Compteurs électriques
3852	Photographic and optical goods/ Instruments photo et optique	Void/ Aucune
3853	Watches and clocks/ Montres et horloges	Assembly of watches (72-38 enterprises/Montage de montres (entreprises de la loi 1972-38)

TUNISIA - PRODUCTION, DEMAND AND TRADE OF MECHANICAL AND ELECTRICAL GOODS
TUNISIE - PRODUCTION, DEMANDE ET ECHANGES EXTERIEURS DE PRODUITS DES IME

(Millions D)

Sub-sector/ Sous-secteur	1972				1976				1978				
	Production	Imports	Exports	Demand	Production	Imports	Exports	Demand	Production	Imports	Exports	Demand	
	Production	Imports	Exports	Demande	Production	Imports	Exports	Demande	Production	Imports	Exports	Demande	
Mechanical Goods													Produits Mécaniques
Equipment Goods	5	40	0.1	44.9	8	130	2.2	135.8	15	189	2.5	201.5	Biens d'équipement
Intermediate Goods	21	22	6.7	36.3	40	61	4.9	96.1	49	88	6.2	130.8	Biens intermédiaires
Consumer Goods	8	18	0.4	25.6	20	37	1.9	55.1	32	42	1.2	72.8	Biens de consommation
Sub-Total	34	80	7.2	106.8	69	228	9.0	288.0	96	319	10.0	405.0	Sous-total
Electrical Goods													Produits Electriques
Intermediate/ Equipment Goods	4	9	0.1	12.9	9	29	0.3	37.7	16	51	1.5	65.5	Biens d'équipement et intermédiaires
Consumer Goods	3	4	-	7.0	8	21	0.5	28.5	12	11	3.5	19.5	Biens de consommation
Sub-Total	7	13	0.1	19.9	17	50	0.8	66.2	28	62	5.0	85.0	Sous-total
TOTAL	41	96	7.3	129.7	86	288	9.8	364.2	124	391	15.0	500.0	TOTAL

Source: Table 2.1, Appendixes II.3 and II.6/
Tableau 2.1, Appendices II.3 et II.6

TUNISIA - IMPORTS OF MECHANICAL AND ELECTRICAL INDUSTRY PRODUCTS
TUNISIE - IMPORTATIONS DE PRODUITS DES INDUSTRIES MECANIQUES ET ELECTRIQUES

(in millions of dinars, at current prices)
(en millions de dinars, aux prix courants)

Subsector/Sous-secteur	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	
Mechanical equipment	16.8	20.0	28.6	32.1	39.1	54.1	87.7	104.6	130.5	158.7	Equipement mécanique
of which:											dont:
Engines and spare parts	1.8	1.9	3.2	3.8	4.8	4.0	8.8	5.8	9.8	13.0	Moteurs, parties et pièces
Pumps and spare parts	1.5	1.5	2.7	3.2	3.6	4.3	5.8	10.0	7.4	12.6	Pompes, parties et pièces
Lifting/hoisting equipment & spare parts	0.8	0.7	1.5	2.0	2.0	3.2	6.9	10.7	13.1	22.3	Appareils de manutention et levage
Earth moving/drilling equipment	0.5	0.6	1.1	1.5	1.4	3.3	8.0	9.4	13.3	10.5	Matériel de forage et terrassement
Mining equipment	0.3	0.2	0.6	0.8	0.9	2.1	4.1	7.1	10.8	16.3	Machines à traiter les matières minérales
Railroad equipment	0.2	0.2	0.5	0.9	3.9	1.3	8.9	5.8	8.7	10.0	Matériels ferroviaires
of which: cars	...	0.1	0.1	0.1	0.1	0.9	4.2	1.8	1.7	4.6	dont: wagons
Naval vessels	0.3	-	1.9	2.7	1.6	7.6	1.9	9.4	6.1	19.4	Constructions navales
Aircraft	0.4	0.6	0.1	4.4	7.4	5.4	5.5	10.1	15.4	0.9	Construction aéronautique
Iron and Steel	9.6	11.0	13.2	14.9	18.7	24.9	39.2	41.9	52.4	64.3	Fer, fontes et aciers
of which:											dont:
Bars	0.4	1.4	0.3	1.6	2.9	3.1	2.7	3.1	6.8	4.5	Barres en fer ou acier
Profiles	0.7	0.6	0.8	0.9	1.9	2.3	3.7	3.1	4.4	4.3	Profilés et palplanches
Sheets	0.2	0.5	0.3	0.5	0.9	1.3	1.0	1.2	1.6	1.2	Feuillards
Pipes	2.6	1.7	2.7	1.7	1.7	2.0	2.8	8.3	4.7	12.6	Tubes et tuyaux
Plates	1.8	2.2	2.0	3.1	4.2	7.6	7.3	8.1	9.8	10.0	Tôles
Construction structures	0.5	0.6	0.8	0.3	0.8	0.7	3.1	3.4	7.6	10.8	Parties de construction
Bolts and Nuts	0.3	0.3	0.8	0.7	0.6	0.8	1.1	1.3	1.7	2.1	Boulonnerie
Castings	0.6	0.5	0.4	0.6	0.6	1.1	1.2	2.4	2.5	3.3	Ouvrages en fers et fontes
Copper products	1.0	1.2	1.0	1.2	1.7	3.2	3.0	2.8	3.5	3.0	Ouvrages en cuivre
Aluminium products	0.7	0.6	1.0	1.0	1.4	1.9	2.3	2.5	6.1	6.2	Ouvrages en aluminium
Tools	0.9	1.0	1.1	1.6	2.0	2.4	2.8	3.1	4.2	4.3	Outillage
Automobiles and Cycles	7.6	9.8	15.2	19.1	18.5	33.3	49.3	45.5	47.0	45.2	Automobiles et cycles
of which:											dont:
Tractors	0.9	2.7	3.6	4.9	3.6	6.6	8.4	6.5	7.2	9.5	Tracteurs
Passenger cars	1.4	1.7	2.4	3.7	3.8	3.6	4.0	7.8	3.2	4.3	Voitures particulières
Vans	1.1	0.9	1.6	1.6	1.8	3.6	3.3	2.4	2.8	1.8	Véhicules pour transports en commun
Lorries	0.7	1.6	2.7	3.0	3.3	5.5	9.8	9.5	5.4	10.0	Véhicules pour transports de marchandises
Spare parts and Accessories	2.5	1.9	3.4	3.5	3.6	8.9	16.5	11.0	17.8	10.5	Parties et accessoires pour véhicules
Common metal products	1.1	1.1	1.2	2.1	2.4	3.1	3.1	2.9	4.6	6.8	Travail des métaux communs
Electrical equipment	9.4	10.7	10.3	12.2	15.0	21.0	29.4	48.2	52.3	57.8	Appareils électriques
of which:											dont:
Generators and spare parts	0.8	0.8	1.5	1.9	1.7	2.2	3.2	6.6	6.8	11.1	Générateurs et moteurs, parties et pièces
Telephone equipment	0.9	1.9	2.0	1.9	2.2	2.4	3.9	11.3	5.9	2.9	Appareils téléphoniques
Radios, TVs and spare parts	1.9	2.0	1.8	1.9	2.5	4.3	5.4	9.9	8.3	8.3	Radios, TV, parties et pièces
Electrical equipment (switchgears)	1.5	1.5	1.7	1.9	2.8	4.3	5.0	6.8	12.9	16.0	Appareils de coupure et branchement
Cables and wires	2.0	1.8	0.9	0.6	1.5	1.8	4.2	3.8	7.7	6.8	Cables et fils
Optical and measuring apparatus	2.7	2.6	2.4	3.3	4.4	6.4	9.0	10.9	12.0	13.8	Appareils d'optique et de mesure
Others	2.0	2.5	2.5	4.0	4.9	6.4	6.8	5.9	9.6	21.6	Autres
TOTAL	50.7	59.2	76.7	95.8	116.6	165.5	243.0	287.6	343.6	400.9	TOTAL

Source: Ministry of Planning/
Ministère du Plan

TUNISIA/TUNISIE

COMPOSITION OF MAJOR MECHANICAL EQUIPMENT GOODS - 1977 IMPORTS
COMPOSITION DES PRINCIPALES IMPORTATIONS DE BIENS D'EQUIPEMENT MECANIQUES - 1977

Customs Code/ Code douanier	Designation/Produits	D Millions
840100	Boilers/Chaudières à vapeur	1.171
8406 et 8408	Engines/parts/Moteurs à pistons et autres moteurs, parties et pièces	9.792
8409..	Road compressors/Rouleaux compresseurs	0.988
8410 + 11	Pumps/parts/Pompes à liquides et air, parties et pièces	7.351
8412..	Air conditioning/Groupes de conditionnement d'air	0.904
8413..	Air Burners/Brûleurs et foyers	0.913
8414..	Industrial oven/Fours industriels	1.178
8415..	Refrigerating equipment/Equipements frigorifiques	1.645
8417..	Water Heaters/Chauffe-eaux non-électriques	9.327
8418..	Centrifugal equipment/Centrifugenses, parties et pièces	5.236
8419..	Industrial washing machines/Machines à nettoyer la vaisselle	2.787
8421..	Fire extinguishers/Extincteurs, parties et pièces	1.105
8422..	Lifting/hoisting equipment/Appareils de manutention et levage, parties et pièces	13.122
8423..	Earth moving equipment/Matériels de forage, terrassement, parties et pièces	13.324
8424..	Agricultural implements/Machines agricoles	1.603
8425..	Agricultural machinery/Autres équipements agricoles	1.453
8426,27,28,29,30	Food industries equipment/Machines et appareils pour industries agricoles et alimentaires	5.983
8431,32,33,34,35	Paper/printing equipment/Machines et appareils pour papier et imprimerie	3.233

Customs Code/ Code douanier	Designation/Produits	D Millions
8436,37,38,40,41	Textiles/clothing equipment/Machines et appareils pour textiles et confection	9.763
8445,46,47,48	Machine tools/Machines - outils, parties et pièces	5.904
8451,52,53,54,55	Office equipment/Machines et appareils de bureau	2.614
8456	Mining equipment/Machines à traiter les matières minérales	10.826
8459	Other machinery n.e.c./Machines, appareils et engins n.d.a.	5.144
8460	Industrial molds/Moules industriels	1.370
8462	Roller bearings/Roulements en tous genres	1.354
8463	Mechanical parts n.e.c./Pièces mécaniques n.d.a.	4.466
TOTAL		122.556

Source: Statistiques du Commerce Extérieur

TUNISIA - MAJOR IMPORTS OF ELECTRICAL GOODS/
TUNISIE - PRINCIPALES IMPORTATIONS DE PRODUITS ELECTRIQUES

Code/ Code	Designation/Produits	1977 Weight (T)/ Poids (T)	1977 Value (000DT)/ Valeur(000DT)
8501..	Electrical motors, generators, parts/ Générations, moteurs, transformateurs et parties	3469	6832
8503oo	Small batteries/Piles électriques	1780	1152
8504..	Auto, batteries and parts/Accumulateurs électriques et parties	885	538
8505..	Hand electrical machines, and parts/ Outils et machines outils à main électriques, et parties	81	365
8506..	Electromechanical household equipment/ Appareils électro-mécaniques à usage domestiques	729	312
8508..	Ignition devices for engines/Bougies d'allumage	1113	1574
8509..	Lighting devices for automobiles/Appareils d'éclairage et signalisation pour véhicules	809	678
8510..	Electric portable torches and parts/ Lampes électriques portatives	15	129
8512oo	Electric water heaters/Chauffe-eau et radiateurs électriques	338	615
8513oo	Telephone equipment and sets/Appareils téléphoniques	562	5883
8514oo	Micros, loudspeakers/Micros, haut-parleurs	30	155
8515..	Radio/TV sets and parts/Récepteurs radio et TV, et pièces détachées	1383	8339
8518oo	Condensers/Condensateurs électriques	38	197
8519..	Switchboards and parts/Appareils électriques de branchement, coupure et commande, pièces et parties	3940	12873

Code/ Code	Designation/Produits	1977 Weight (T)/ Poids (T)	1977 Value (000DT)/ Valeur (000DT)
8520..	Electric lamps and tubes, parts/Lampes et tubes électriques pour éclairage, et pièces	343	733
8521oo	Electronic valves and lamps/Tubes et valves électroniques	988	1593
8523oo	Electric cables/wires/ Fils et câbles électriques	12653	7658
8525,26oo	Insulators/Isolateurs et pièces isolantes	616	481
9026oo	Electric/gas meters/Compteurs d'électricité, gas et liquides	133	453
9027oo	Other meters/Autres compteurs	23	111
9028oo	Measuring electric instruments/ Appareils électriques de mesure	711	3450
9029oo	Parts of measuring instruments/ Parties d'appareils de mesure	41	288
			54409
91....	Watches/parts; time-measuring equipment/ Montres, compteurs de temps, et pièces	107	928
92(11+13)oo	Audio instruments and parts/Appareils d'enregistrement et reproduction du son	56	365

Source: Statistiques du Commerce Extérieur

TUNISIA - EXPORTS OF MECHANICAL AND ELECTRICAL PRODUCTS
TUNISIE - EXPORTATIONS DE PRODUITS IME

(in millions of dinars, at current prices)
(en millions de dinars, aux prix courants)

	1969		1970		1971		1972		1973		1974		1975		1976		1977		1978		
	Tons 000	D.M	Tons 000	D.M	Tons 000	D.M	Tons 000	D.M	Tons 000	D.M	Tons 000	D.M	Tons 000	D.M	Tons 000	D.M	Tons 000	D.M	Tons 000	D.M	
Iron and Steel products	92	3.1	110	4.9	45	2.2	74	3.4	149	6.8	95	7.5	12	1.1	3	0.6	2	0.9		1.7	Ouvrages en fers, fontes et aciers
Copper products	1	0.5	1	0.5	--	0.2	--	0.2	1	0.5	1	0.4	--	0.1	1	0.3	0.5	0.2		0.3	Articles et ouvrages en cuivre
Lead products	15	2.2	19	3.2	14	1.9	22	3.1	261	4.4	25	6.4	21	3.7	21	4.0	15	4.1	16	4.2	Plomb métal et ouvrages
Engines, machinery		0.1		0.1		0.1		0.1		0.1		0.5		0.4		2.2		1.0		2.5	Appareils, machines et engins
Electrical		0.1		0.1		0.1		0.1		0.3		1.0		1.9		0.8		3.6		5.0	Machines et appareils électriques
Others		0.3		0.4		0.4		0.4		0.5		1.5		1.6		1.9		1.1		1.2	Autres
TOTAL		6.3		9.2		4.9		7.3		12.6		17.3		8.8		9.8		10.9		14.9	TOTAL
Iron and Steel products, as % of Total:		49		53		45		47		54		43		13		6		8		11	Ouvrages en fers et fontes, en % du total:
Lead products, as % of Total:		35		35		39		42		35		37		42		41		38		28	Produits en plomb, en % du total:

Source: Ministry of Planning/
Ministère du Plan

TUNISIA/TUNISIE

EXPORTS OF MECHANICAL AND ELECTRICAL PRODUCTS BY DESTINATION (1977)
PRINCIPALES EXPORTATIONS DE PRODUITS DES IME POUR PAYS DE DESTINATION (1977)

Code/ Code	Product/Produit	Total/ Totale	France/ France	Italy/ Italie	Other EEC/ Autres CEE	Other developed/ Autres PD	Libya/ Libye	Malta/ Malte	Algeria/ Algérie	Other developing/ Autres PVD	
731800	Iron/Steel Tubes	119		92	1		1	25			Tubes et tuyayx en fer/acier
732300	Cans/Tins	345	2			46	297				Fûts et bidons en tôle
734002	Other Steel-Iron Works	182	* 9	1	1	3	8	4	156		Autres ouvrages en fers et fontes
7801..	Lead Metal/Products	4110	131	1209	501 /b	1575 /a			405	289	Plomb brut et ouvrages
820501	Drilling Tools	171	40					131			Outils forage et soudage
820502	Tools for Metal Work	133	75		1	36 /e	1	18	2		Outils pour travail des métaux
840609	Parts for Piston Engines	152	2		*132 /b		8			10	Parties et pièces pour moteurs à piston
8422..	Lifts/handling equipment	125	94			28 /e	3				Appareils de manutention et levage
8423..	Earth moving/Drilling equip.	274	42		1	1	93	132		5	Parties et pièces de machines de forage et terrassement
8441..	Sewing Machines and parts	94	6		* 85 /c	1				2	Machines à coudre et parties
845100	Typewriters	46		46							Machines à écrire
846100	Tap factory and faucets	30	5				13	11		1	Robinetterie
8463..	Miscellaneous Mech. Parts	30	6		3		2	15		3	Pièces mécaniques nda
760800	Aluminium Parts/Works	37							* 37		Constructions et parties en aluminium
761000	Aluminium Cans/Containers	68			* 2 /c				55	11	Fûts et bidons en aluminium
860900	Parts of Railroad Cars	32							32		Parties de véhicules ferroviaires
870600	Parts/Accessories for Cars	48	3		5		4			36	Parties et accessoires pour véhicules automobiles
902400	Debit meters/Instruments	14	4		5		3	2			Compteurs et instruments de mesure
	Sub-Total: Mechanical Goods	6010	419	1258	737	1690	423	338	687	357	Sous-total: produits mécaniques
8501..	Electric Generators/ Transformers	121	27		7	6	79	2			Moteurs, transformateurs et parties et pièces
8515..	Radio-TV sets and parts	770	709	2	* 56 /b /d		1	2			Appareils radio et pièces détachées
8519..	Switchboards and parts	2194	1442	223	*526 /c /d		2	1			Appareils électriques de branchement, coupure et commande
852300	Electric Cables and wires	394	148		*221 /c					25	Fils et câbles électriques
902800	Measuring Electric Instruments	268	27		*147 /b	5	7	4	78		Appareils électriques de mesure
91....	Watches; timing instruments	120	1		* 72 /b	*42 /e				4	Montres, compteurs de temps
92(11+13)	Audio instruments/parts	31	* 14		* 17 /c						Appareils enregistrement et reproduction du son; accessoires
	Sub-Total Electrical Goods	3900	2368	225	1035	53	89	0	78	29	Sous-total: produits électriques
	TOTAL	9910	2787	1573	1784	1743	522	347	765	386	TOTAL
				7890				2020			
	of which: Sub-Total*	1281									dont: Sous-total*

/a Greece/Grèce
/b Netherlands/Les Pays Bas
/c West Germany/L'Allemagne fédérale
/d United Kingdom/le Royaume-Uni
/e Switzerland/la Suisse

* Assembled and Re-exported under Temporary Admission Regime/Opérations de montage et exportations effectuées sous régimes suspensifs.

Source: Statistiques du Commerce Extérieur
EMENA/IDF
April 23, 1979

TUNISIA - EXPORT ENTERPRISES OF LAW 1972-38 IN EMIs
TUNISIE - ENTREPRISES EXPORTATRICES DES IME - LOI 1972-38

Mechanical/ Industries mécaniques	Enterprises/ Entreprises	Employment/ Emploi	
Equipment Goods	3	330	Biens d'équipement
Intermediate Goods	4	207	Biens intermédiaires
End-Products	2	58	Produits finals
Total Mechanical	9	595	Total industries mécaniques
Electrical/Industries électriques			
Intermediate/Components	14 (7)	1500 (1400)	Produits intermédiaires et composants
End-Products	2	75	Produits finals
Total Electrical	16	1575	Total industries électriques
TOTAL EMIs	25	2170	Total IME

( ) Electronic components assembly/ Montage de composants électroniques

Source: API

TUNISIA/TUNISIE

STRUCTURE OF COSTS AND PRICES IN SELECTED MECHANICAL INDUSTRIES - 1977/
STRUCTURE DES COUTS DE PRODUCTION ET PRIX DE REVIENT DANS QUELQUES INDUSTRIES MECANIQUES - 1977

(in percent)
(en pourcentage)

Cost Item/ Composant	Equipment goods/ Biens d'équipement				Intermediate goods/ Produits intermédiaires			End-products/Produits finals					
	Steel structure platework/ Charpentes métalliques chaudronnerie		Ship repair/ Réparation navale	Engines assembly/ Montage de moteurs	Foundries/ Fonderies		Machine job/ Atelier d'usinage	Steel pipes/ Tubes acier	Metal containers/ Emballages métalliques	Cutlery hard ware/ Coutellerie quincaillerie	Auto assembly/ Montage voitures	Truck components/ Eléments de camions	
	Firm 1 1ère firme	Firm 2 2ème firme			Firm 1 1ère firme	Firm 2 2ème firme							
Imported Materials	24	16	n.a.	60	26	7	20	42	51	43	50	30	Matières importées
Local Materials	3	9	n.a.	2	26	16	25	8	5	3	3	10	Matières locales
Total Materials	27	25	23 a/	62	52 a/	23	45	50	56	46	53	40	Total matières consommables
Tot. Services/Suppl. (inc. S.T. Interest)	18	25	16	3	4	8	10	7	5	4	9	12	Biens et services locaux (y compris intérêt C.T.)
Misc. Costs	3	1	3	1	2	4	3	1	1	1	2	2	Coûts divers
Indirect Taxes on Production (includes Duties)	13	10	3 a/	23	6 a/	13	9	21	17	25	24	20	Taxes indirectes à la production (y compris droits douane)
Labor	18	28	63	6	24	44	31	6	15	14	8	10	Main d'oeuvre
Capital Cost	8	4	3	3	3	5	3	4	8	6	1	9	Coût du capital (amortissements)
Profit (Gross)	13	6	(10)	2	9	3	0	11	(2)	4	3	6	Bénéfices (bruts)
Ex-Factory Price	100	100	100	100	100	100	100	100	100	100	100	100	Prix sortie-usine
Value Added/Output	52	48	59	34	42	65	43	42	38	49	36	45	V.A./Valeur finale
Capacity Utilization	65	62	67	58	63	70	80	60	65	75	66	67	Taux d'utilisation des capacités
Ex-Factory Prices as % European FOB Prices	--110/120--		90/100	155	--120/130--		110/120	130	130/140	110/115	200	160	Prix sortie-usine/ Prix FOB Europe
Nominal Protection	--50(4) b/--		None	46	--15(4) b/--		40	21	27	N.A.	160	51	Protection nominale
% Output Exported	4	-	80	-	-	3	-	-	-	12	-	-	Part production exportée

a/ Part of the Taxes on Production is included in the Materials Cost/ Une part des taxes à la production est comprise dans les matières premières.

b/ Level of production for equipment and intermediate goods entering authorized investments/ Niveau de protection pour les biens intermédiaires et d'équipement entrant dans la fabrication des investissements agréés.

Source: Mission estimates from plant visits and firms' accounts/ Estimations de la mission à partir des visites d'usines et des comptes des entreprises.

IMPORTS OF MECHANICAL PRODUCTS FOR POSSIBLE SUBSTITUTION/
IMPORTATIONS DE PRODUITS MECANIQUES SUSCEPTIBLES D'UNE SUBSTITUTION LOCALE

Customs Code/ Code douanier	Description/Produits	1977 Imports/ Importations 1977 Tons/ Tonnes	D. Millions/ Millions dinars	Unit value/ Valeur unitaire (D/kg)	
	1. Iron/Steel Castings				Produits de fonderie fonte/acier
731700	Cast Iron Pipes	1206	0.285	0.24	Tubes et tuyaux en fonte
732000	Cast iron/steel pipe fittings	2130	1.603	0.75	Accessoires tuyauterie fonte/acier
733000	Anchors	100	0.049	0.49	Ancres et grappins
733600	Domestic heating appliances in pig iron/steel	1210	1.277	1.05	Appareils domestiques de chauffage en fonte ou fer
733700	Central heating " " " "	745	0.385	0.52	Appareils chauffage central en fonte ou fer
733800	Miscelaneous Domestic " " "	1229	0.738	0.60	Articles de ménage divers en fonte ou fer
734002	Other products in pig iron/steel	2526	2.519	1.00	Autres ouvrages en fonte ou fer
841109	Parts for Air pumps and compressors	762	0.633	0.83	Parties et pièces de pompes et compresseurs
842409	Parts for Agricultural Equipment	165	0.170	1.40	Parties et pièces de machines agricoles
845609	Parts for Mining machinery	509	0.712	1.40	Parties et pièces de machines à traiter les matières minérales
846100	Sanitary tap factory and faucets	2589	4.505	1.74	Articles de robinetterie
871407	Parts for Animal-drawn Carts	492	0.264	0.54	Parties de véhicules de traction animale
	Sub-Total Castings	13662	13.140	0.96	Sous-total pièces de fonderie
	2. Primary and semi-finished steel products				Produits sidérurgiques semi-finis
731400	Steel/iron wires (non-insulated)	1693	0.401	0.24	Fils de fer ou acier (non isolés)
731800	Iron and steel tubes and pipes	14217	4.459	0.31	Tubes et tuyaux fer et acier
732100	Iron and steel structures and parts	19315	7.593	0.39	Constructions métalliques et parties
732200	Large Iron and steel tanks	410	0.588	1.43	Grands réservoirs en fer et acier
732300	Containers and cans	95	0.083	0.87	Fûts et bidons en tôle
732400	Containers for liquified gas	807	0.491	0.61	Récipients pour gaz liquifiés
732500	Iron and steel cables (non-insulated)	971	0.634	0.65	Câbles en fer ou acier (non isolés)
732700	Iron and steel screens	102	0.099	0.97	Grillages en fer/acier
7331..	Nails, staples and construction hardware	337	0.216	0.64	Pointes, clous, chevilles, crochets, agrafes
7332..	Bolts, nuts, washers	2380	1.810	0.76	Boulonnerie/visserie en fer
733500	Steel springs	515	0.508	1.00	Ressorts et lames en fer/acier
	Sub-Total Basic Steel Products	40842	16.882	0.41	Sous-total produits sidérurgiques
	3. Non Ferrous Basic Metal Products				Ouvrages en métaux non-ferreux
740800	Copper pipe fittings	102	0.258		Accessoires tuyauterie en cuivre
741000	Copper cables (non-insulated)	435	0.391		Câbles en cuivre (non isolés)
741500	Copper Bolts and Nuts	44	0.068		Boulonnerie/visserie (en cuivre)
760800	Aluminium Construction Structures	397	0.646		Constructions et parties en aluminium
761000	Aluminium Containers and Cans	949	0.168		Fûts et bidons en aluminium
761200	Aluminium Cables (non-insulated)	2011	1.479		Câbles d'aluminium (non isolés)
	Sub-Total Non-Ferrous Metal Products	3938	3.010		Sous-total ouvrages en métaux non-ferreux

IMPORTS OF MECHANICAL PRODUCTS FOR POSSIBLE SUBSTITUTION/
IMPORTATIONS DE PRODUITS MECANIQUES SUSCEPTIBLES D'UNE SUBSTITUTION LOCALE

Customs Code/ Code douanier	Description/Produits	1977 Imports/ Importations 1977 Tons/ Tonnes	D. Millions/ Millions dinars	Unit value/ Valeur unitaire (D/kg)	
	4. Metal Products and Hardwares				Ouvrages en métaux et pièces diverses
820100	Agricultural hand tools	58	0.068	1.17	Outils agricoles à main
820200	Hand saws and blades	146	0.285	1.95	Scies à main et lames
820300	Hand tools	277	0.754	2.72	Outils à main
8204..	Anvils, clamps weldings lamps, hand forges	402	0.720	1.79	Divers outils à main (enclumes, étaux, forges, lampes à souder)
82(09+10+ 13+14)00	Cutlery (knives, scissors, blades)	77	0.225	2.92	Coutellerie et parties
830100	Locks and Keys	503	0.955	1.90	Serrures, verrous et clés
830200	Metal hardware for furniture	3193	1.533	0.48	Ferrures de meuble
8307..	Lamps and their metal parts	592	0.614	1.04	Lampes d'éclairage et parties non électriques
830900	Metal items for clothing	274	0.539	1.97	Fermoirs métalliques pour vêtements
8313..	Bottle caps	120	0.206	1.72	Bouchons métalliques, capsules en métaux
831500	Soldering electrodes	224	0.184	0.82	Baguettes électrodes
	Sub-Total Metal Products/Hardwares	5866	6.083	1.04	Sous-total ouvrages en métaux divers
	5. Mechanical Equipment and Machinery				Appareils et machines mécaniques
840100	Steam Boilers	813	1.171	1.44	Chaudières à vapeur
840900	Road Compressors	630	0.988	1.57	Rouleaux compresseurs
8411..	Air pumps, fans and compressors	1493	2.867	1.55	Pompes, ventilateurs et compresseurs
8413..	Burners and furnaces	515	0.913		Brûleurs et foyers
8414..	Industrial furnaces and parts	1107	1.178	1.06	Fours industriels et parties
841701	Non-Electric Water Heaters	6998	9.121	1.30	Chauffe-eau non électriques
8421..	Fire extinguishers and parts	1650	1.105	0.67	Extincteurs et parties
8422..	Lifting/hoisting equipment and parts	9125	13.122	1.44	Appareils de manutention et levage, et parties
8423(02+09)	Earth moving equipment and parts	5275	9.594		Machines de terrassement, et parties
8224..	Agricultural implements	1842	1.433	0.78	Equipements agricoles
8425..	Automotive Agricultural Equipment and parts	915	1.453	1.59	Machines agricoles automotrices, et parties
8449..	Hand machine tools and parts	106	0.444		Machines-outils à main, et parties
	Sub-Total Mechanical Equipment/ Machinery	30469	43.389		Sous-total appareils et machines mécaniques/ matériels de transport
	6. Transport Equipment				Matériels de transport
86(07+08+ 09)00	Railroad freight cars and parts	3279	2.337	0.71	Wagons de marchandises et parties
8701(02to 07)	Road tractors (410 units)	1803	2.440	1.35	Tracteurs routiers (410 unités)
8701(08+ 09)	Ind. trucks, tractors, stackers (1430)	3492	4.712	1.35	Tracteurs non routiers à roues (1430 unités)
8707..	Ind. handling trucks (537)	1307	1.917	1.47	Chariots de manutention auto (537 unités)
8709(+12)00	Mopeds, motorcycles, bicycles and parts	1309	1.399	1.35	Motocycles et vélomoteurs et parties
8714(02+08)	Truck trailers and parts	1339	1.449	1.08	Remorques et parties et pièces
8901..	Fishing and other vessels	16578	5.519	0.33	Bâteaux de pêche et autres
		29107	19.773	0.68	Sous-total matériels de transport
	TOTAL MECHANICAL PRODUCTS	123884	102.277		Total produits mécaniques

Source: Statistiques du Commerce Exterieur - 1977

EEC IMPORTS OF EMI PRODUCTS FROM DEVELOPING COUNTRIES/
IMPORTATIONS DE LA CEE DE PRODUITS DES IME EN PROVENANCE
DES PAYS EN VOIE DE DEVELOPPEMENT

Import Code/ Code Douanier	Description/ Produits	Imports in Value ($ Millions)/ Importations en valeur ($ millions) 1974	1975	1976	1977	1974-1977 Growth Rate/ Taux de croissance 1974-1977 (% p.a.)	
73	Iron and Steel Products	300.8	363.9	482.1	410.2	14.3	Fontes, fers et aciers
82	Metal Tool	37.9	50.2	72.6	86.0	35.5	Outillage en métaux communs
83	Metal Products	24.4	23.8	33.4	42.8	24.3	Ouvrages divers en métaux
84	Mechanical Equipment/Machinery	184.6	302.5	704.0	432.6	37.0	Appareils et machines mécaniques
85	Electrical Equipment/Machinery	431.6	470.2	744.2	952.4	34.2	Machines et appareils électriques
86	Railway Equipment	0.4	1.1	1.2	2.4	N.S.	Matériel de chemin de fer
87	Automobiles, Cycles, Tractors	32.7	47.6	90.7	72.8	34.6	Autos, cycles et tracteurs
88	Aerial Transport Equipment	13.5	24.8	64.7	53.1	62.8	Engins de navigation aérienne
89	Sea Transport Equipment	22.8	56.7	60.3	131.4	85.0	Engins de navigation maritime
90	Scientific/Optical Instrument	91.0	123.9	195.9	157.9	23.9	Appareils optiques et scientifiques
91	Watches	13.1	34.6	97.7	121.9	116.7	Horlogerie
	Sub-Total Manufactures	1,152.9	1,499.4	2,546.8	2,463.4	32.8	Sous-total produits manufacturés
74	Copper Metal and Products	2,524.4	1,455.1	1,594.6	1,618.8	(-)	Cuivre et ouvrages en cuivre
76	Aluminum Products	72.3	55.7	92.6	128.8	25.0	Aluminium et ouvrages en aluminium
77	Lead Metal and Products	54.0	28.8	28.3	38.8	(-)	Plomb et ouvrages en plomb
	Sub-Total Metal Products	2,650.7	1,539.6	1,715.5	1,786.4	(-)	Sous-total demi-produits non ferreux
	TOTAL EMI Products	3,803.6	3,039.0	4,262.3	4,249.8	7.0	Total produits des IME

Source: EEC Nimex Statistics /
Statistiques NIMEX-CEE

TUNISIA/TUNISIE

STRUCTURE OF COSTS AND PRICES IN SELECTED ELECTRICAL INDUSTRIES - 1977
STRUCTURE DES COUTS DE PRODUCTION ET PRIX DE REVIENT DANS QUELQUES INDUSTRIES ELECTRIQUES - 1977

(in percent)
(en pourcentages)

Cost Item/ Composant	Equipment Goods/ Biens d'équipement	Cables Wires/ Câbles fils	Batteries/ Accumulateurs	Elec. Meters/ Compteurs électriques	Gros électro-ménager	Transformers/ Petits transformateurs et électro-ménager	TV radio small appliances/* Petits appareils TV radio	TV/radio assembly/ Montage radio/TV Firm 1 1ère firme	Firm 2 2ème firme	Firm 3 3ème firme	
Imported Materials	27	62	50	60	40	81	87	73	80	77	Matières importées
Local Materials	6	-	20	-	18	-	-	-	-	-	Matières locales
Total Materials	33	62	70	60	58	81	87	73	80	77	Total matières premières
Local Supplies/Services	7				2						Biens et services locaux
Misc. Costs	3	23	5	5	1	2	1	6	3	3	Coûts divers
Indir. Taxes on Prod. (including duties)	22				23						Taxes indirectes à la production (y compris droits de douane)
Labor	19	5	8	11	5	8	4	8	6	5	Main d'oeuvre
Capital Cost	5			28	5						Coût du capital (amortissements)
		10	17			9	8	13	11	15	
Profit (Gross)	11			(4)	6						Bénéfices (bruts)
Ex-Factory Price	100	100	100	100	100	100	100	100	100	100	Prix sortie-usine
Value Added /Output	57	15-35	27	37	39	18	12	23	18	21	V.A..Valeur finale
Capacity Utilizatior	66	25	90	80	80	60	n.a.	80	65	80	Taux d'utilisation de capacités
Ex-Factory Prices as % of European FOB Prices	100/110	120	90/100	100/110	110	125	n.a.	130	125	120	Prix sortie-usine/ Prix FOB Europe
Domestic/Ex-Factory Price (%)	116	116	118	118	145	145	165	112	112	112	Prix intérieur/ Prix sortie-usine
% Output Exported	45	-	-	-	-	-	-	5	-	20	Part production exportée
Foreign Assistance Partner		-	Initially	On	-	-	On	-	-	-	Partenaire et assistance extérieurs

* SSI (less than 50 workers)/PI (moins de 50 ouvriers)

Source: Mission estimates from plant visits and firms' accounts/
Estimations de la mission à partir des visites d'usines et des comptes des entreprises.

Appendix VII.1
Appendice VII.1

TENTATIVE LIST OF PROJECTS IN THE PIPELINE/
LISTE PRELIMINAIRE DE PROJETS "DANS LA FILIERE"

I - MECHANICAL INDUSTRIES/INDUSTRIES MECANIQUES

Projet	Investment (MD)/ Investissement	Period/ Période de réalisation	Ownership/ Promoteur	Projet
El Fouladh-Renewal	3.5	1980-82	Public	El Fouladh-Renouvellement
Fonderies Reunies	9.0	1980-82	Public	Fonderies Réunies
SOFOMECA Expansion	2.0	1980-82	Public	SOFOMECA Expansion
STUMETAL Expansion	1.5	1981-83	Public	STUMETAL Expansion
SOCOMENA-Renewal	2.5	1981-83	Public	SOCOMENA-Renouvellement
AMS-Renewal	1.0	1979-81	Public	AMS-Renouvellement
SOTUMO-Diversification	2.3	1980-83	Public	SOTUMO-Diversification
SGI/Tunis	2.2	1979-80	Private/Privé	SGI/Tunis
Off-shore Platforms	2.0	1978-80	Private/Privé	Construction de plateformes de forage
Aluminum Packing-New	4.5	1979-80	BDET Sponsor/Promoteur BDET	Emballage aluminium-Nouveau
Motor Oil Filters-New	1.2	1979-81	BDET Sponsor/Promoteur BDET	Filtres à huile moteur-Nouveau
Vehicle Ascles-New	0.7	n.a.	BDET Sponsor/Promoteur BDET	Essieux de véhicules-Nouveau
Sub-Total	32.4			Sous-total
Mechanical Complex-New	36.0	1979-82	BDET Sponsor/Promoteur BDET	"Complexe mécanique"-nouveau
STIA-Expansion	15.0	1979-84	Public	STLA-Expansion
Total	83.4			Sous-total
Projects Recommended for Investigation:				Projets dont l'étude est recommandée
Metal structures/Optimia Platework	3.0	1980-82	Private/Privé	Optimisation charpentes métalliques et chaudronneries optimisation
AMS-Diversification	5.0	1981-83	Public	AMS-Diversification
Various Auto Components	2.5	1981-83	BDET Sponsor/Promoteur BDET	Divers accessoires auto
Pumps/Compressors	5.0	1981-83	BDET Sponsor/Promoteur BDET	Pompes et compresseurs
Wagons-Expansion	2.0	1980-82	Public	Wagons ferroviaires-Expansion
SOCOMENA-Expansion	5.0	1981-83	Public	SOCOMENA-Expansion
	22.5			Sous-total
TOTAL MECHANICAL	105.9			TOTAL MECANIQUE

II - ELECTRICAL INDUSTRIES/INDUSTRIES ELECTRIQUES

Project	Investment / Investissement	Period/ Période de réalisation	Ownership/ Promoteur	Projet
LE CONFORT-Expansion	2.9	1979-81	Public	LE CONFORT-Expansion
CHAKIRA-Expansion	3.4	1978-82	Private/Privé	CHAKIRA-Expansion
SOTACER-Expansion	2.0	1979-81	Private/Privé	SOTACER-Expansion
SACEM-Expansion	3.5	1980-82	Semi-Public	SACEM-Expansion
NOUR-Expansion	2.8	1979-81	Private/Privé	NOUR-Expansion
SIAME-Expansion	2.8	1979-80	Public	SIAME-Expansion
2nd Battery Project-New	2.4	1980-82	BDET-Sponsor/Promoteur BDET	2ème projet accumulateurs-Nouveau
Telephone Assembly-New	2.0	1979-81	n.a.	Montage de téléphones-Nouveau
	21.8			Sous-total
Projects Recommended for Study				Projets dont l'étude est recommandée
Large Electric Motors-New Expansion	0.5	1980-81	Semi-public preferably	Grands moteurs électriques-Nouveau
Switchgears/boards-New	2.0	1980-82	Semi-pu lic preferably	Appareils coupure/branchement-Nouveau
Electrical Hardwares-New	2.0	1980-83	Private	Appareillage électrique-Nouveau
Telephone Equipment-Expansion	6.0	1981-83	n.a. (Semi-Public preferably)	Equipement téléphonique-Expansion
	10.5			Sous-total
	32.3			Total industries électriques

TOTAL EMIS:	#Projects	Investment	Public/Semi-Public/BDET/Private				TOTAL IME
Identified	22	105.2	10	2	5	5	Identifiés
Recommended	10	33.0	3	3	2	2	Recommendés
	32	138.2	13	5	7	7	