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15366

Distr.
LIMITED

UNIDO/IS.595
13 January 1986

UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

ENGLISH

UNIDO ECONOMIC RESEARCH SERVICES

RESTRUCTURING OF THE MEXICAN TEXTILE INDUSTRY: REQUIREMENTS AND POLICY OPTIONS*

Prepared by the

Regional and Country Studies Branch

Division for Industrial Studies

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V.86-50379

PREFACE

The Regional and Country Studies Branch has developed its current Economic Research Services programme in response to requirements for analyses and information for industrial policy-making in individual developing countries.

Through this programme, the Branch is regularly assisting policy-makers in developing countries to monitor pertinent developments at the national and regional levels, in particular as concerns industrial policies in other countries and programmes to upgrade relevant production processes and products; emerging technological trends; prospective changes in national and international markets; relevant trade policies of main trading partners.

An assessment can then be made of the specific country's competitiveness of key industrial activities in national and international markets, the technological status in these activities, and market prospects. On this basis it is possible to identify broad requirements for restructuring of various industrial subsectors of the country and to outline supporting policy options.

The present study was conducted by the Regional and Country Studies Branch on request of the Government of Mexico. Using data collected through field work by an international consultancy company (SOMEA), statistics provided by the Ministry of Commerce and Industry and information available at UNIDO headquarters, the report was prepared by staff of the Regional and Country Studies Branch, in close co-operation on technical issues with staff of UNIDO's Agro-Industries Branch. Mr. Tony Jennings (The University, Leicester), UNIDO consultant, contributed selected sections of the report (in particular chapter I).

On the basis of this report a workshop was organized in Mexico City, 4-5 November 1985, attended by representatives of the Mexican Government, the

Mexican textile industry and a UNIDO team which also contributed to the seminar by reporting on the experience of selected countries in the field of textile policies. The team comprised UNIDO staff members and international consultants: Mr. Ralf H. Mohs (team leader, UNIDO, Regional and Country Studies Branch), Mr. Antero Braneva (UNIDO, Agro-Industries Branch), Mr. Moon Shin Hong (Korea Institute for Economics and Technology), Mr. David Montero (Ministry of Industry, Madrid), Mr. Willy Ramboer (Ministry of Industry, Brussels) and Mr. Brian Toyne (University of South Carolina).

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ABBREVIATIONS

CANAINTEX	Camara Nacional de la Industria Textil (National Chamber of the Textile Industry)
GATT	General Agreement on Tariffs and Trade
IMCE	Instituto Mexicano para el Comercio Exterior (Mexican Institute for Foreign Trade)
ITMF	International Textile Manufacturers Association
MFA	Multi-Fiber Arrangement
OECD	Organization for Economic Cooperation and Development
SECOFI	Secretaria de Comercio y Fomento Industrial (in this study always: Dirección General de la Industria Química y Bienes de Consumo. Dirección de Bienes de Consumo); (Ministry of Commerce and Industry; in this report always: General Division of Chemical and Consumption Goods Industries. Division of Consumption Goods)
SOMEA	Societa per la Matematica e l'Economia Applicate spa

I. REVIEW OF THE MEXICAN TEXTILE INDUSTRY: ACHIEVEMENTS AND RESTRUCTURING OBJECTIVES

To design and implement an efficient restructuring programme for an industrial branch, it is essential to explicitly spell out the final objectives to be achieved through the programme. Such objectives may be established in terms of the desirable contributions of the respective branch to the industrial sector and the economy as a whole. Based on agreed objectives, it will be possible to specify policy targets and policy priorities appropriate to achieving the most efficient and equitable restructuring. Reaching a consensus on policy targets will also facilitate monitoring the success and/or failure of the restructuring exercise.

Final objectives for restructuring the Mexican textile industry may be placed in the general context of objectives set for the industrial sector and foreign trade in the National Development Plan (1984-1988):

- To meet the basic needs of the population through the production of goods for popular consumption and the increase of the industry's capacity to supply productive, permanent and remunerative employment;
- to become the mechanism of self-sustained economic growth, capable of generating jobs, foreign exchange and domestic savings in adequate amounts to establish conditions for stability in these three markets;
- to help in the territorial decentralization of productive activity and social welfare; and
- to induce the consolidation of a natural, solid entrepreneurship, capable of executing efficiently the innovative and creative role that the modernization of the country requires.
- It is also recognized that while a competitive exchange rate is essential, the edge provided by devaluation may be ephemeral, and inflationary. The textile industry may only become internationally competitive through structural change.

In the following sections of this chapter, these objectives will be used as a first yardstick for assessing the past achievements of the Mexican textile industry and for establishing policy targets on which a restructuring programme should be focussed.

1.1 Economic growth

The textile industry has traditionally been regarded in many countries as a key sector in economic growth, although over the post-war period the share of textiles and clothing in manufacturing production in developed and developing countries has declined (see Table 1). Over the period 1977-83 the Mexican textile industry's contribution to GDP has averaged 1.5%. Its share of manufacturing output has declined from 6.2% to 5.8%, and has been about half of the average share of all developing countries (see Table 2). By contrast the share of Mexican clothing at 8% to 9% of manufacturing production, has been double the average for all developing countries.

Since 1977 the average growth rate of the Mexican textile industry at 2.8% per annum has been low compared with GDP growth at 4.8% and manufacturing growth at 4.5% per annum. Over the longer term an analysis of sources of growth for the sector (see Table 3) shows how domestic demand, rather than export expansion, or import substitution, has been crucial in determining growth. Therefore, in 1982 and 1983 the textile industry was particularly badly hit by the domestic recession, the value of its output falling by 6% and 2.8%.

In estimating the contribution to economic growth of the industry one difficulty is to quantify the informal confectioning sector, that is the small and medium factories not officially registered. An attempt has been made by a UNIDO mission to estimate informal sector production, which is shown in Table 4. The mission estimated that approximately 50% of the employed manpower in confectioning are in the informal sector.

To sum up, the contribution of the textile sector to the achievement of the objective "economic growth" has been limited in the past, resulting in a diminishing relative contribution of the textile industry to total manufacturing value added. The latter is a general phenomenon which can be observed across countries with rising income per capita, indicating a below unity income elasticity of demand for textiles. However, this demand constraint is not binding as long as the potential offered by import-

Table 1. Share of textiles and clothing in manufacturing production in developed and developing countries, 1953-1980
(Percentages)

	Textiles					Clothing				
	1953	1963	1970	1975	1980	1953	1963	1970	1975	1980
Market Economies	8.4	7.6	6.4	6.3	5.6	5.2	4.2	3.6	3.5	3.1
Developed Countries	7.4	6.3	5.1	5.0	4.4	5.1	4.0	3.3	3.2	2.8
North America	5.1	4.7	4.1	4.0	3.6	5.2	4.1	3.5	3.4	3.1
Japan	16.5	9.5	5.8	5.1	3.9	1.6	1.6	2.0	2.6	1.9
EC (9)	11.5	8.5	6.1	5.9	5.3	4.8	3.9	3.2	3.1	2.6
Other Western Europe	8.9	6.2	4.6	3.8	3.6	6.1	5.3	3.7	3.3	3.0
Developing Countries	23.5	19.3	16.3	13.3	11.5	6.8	5.9	5.9	5.4	4.5
Southern Europe	24.4	16.4	12.9	10.8	10.3	6.0	6.3	5.8	6.8	5.4
Asia	28.9	25.2	22.9	18.2	15.7	8.2	7.2	6.5	6.8	5.6
Latin America	19.0	15.7	12.7	10.7	8.8	7.1	4.9	5.7	3.6	3.0
Africa	22.5	24.5	27.4	23.5	...	2.1	4.0	5.2	6.0	...

Source: GATT, Textiles and Clothing in the World Economy, Geneva, 1984.

Table 2. Value added of total manufacturing and textile industry and share in Mexico's GDP

(Millions of constant 1970 pesos)

	GDP (1)	Total	MVA (2)	Share in GDP	Textile MVA (3)	Relative Shares 3/1	Relative Shares 3/2
1977	657,722	100	161,037	24.5	10,041	1.5	6.2
1978	711,982	100	176,817	24.8	10,556	1.5	6.0
1979	777,163	100	195,614	25.2	11,864	1.5	6.0
1980	841,855	100	209,682	24.9	12,044	1.4	5.7
1981	908,765	100	224,326	24.7	12,850	1.4	5.7
1982	907,306	100	218,903	24.1	12,081	1.3	5.5
1983	866,477	100	207,958	24.0	11,742	1.3	5.6
		100		24.6		1.4	5.8
Average Annual Growth Rate, 1977/83	4.8		4.8		2.8		

Source: SECOFI

Table 3. Sources of Growth of Textiles, Clothing, Footwear and Leather Industries in Mexico, 1950-80

(based on data in constant prices)

	Average Annual Growth Rates				Sources of Growth		
	Gross Value of Output	Imports	Exports	Domestic Demand	Domestic Demand	Export Expansion	Import Substitution
1950-60	3.7	3.4	1.6	3.7	98.3	1.5	0.2
1960-70	7.9	8.8	1.5	8.1	100.0	0.4	-0.4
1970-80	5.0	2.1	-0.4	5.2	98.4	-0.3	1.9
1970-74	6.2	-0.7	6.1	6.0	91.0	5.7	3.3
1974-77	2.4	-18.5	-9.5	2.7	103.2	-20.0	16.8
1977-80	6.1	32.8	0.8	6.7	106.5	0.6	-7.1

Source: World Bank, Mexico - Future Directions of Industrial Strategy, Washington, 1983.

Table 4. Confectioning Sector - Estimated Production 1983

	Type of Plant				
Production	Large	Medium	Small	Submerged	Total
No. of articles	95,000	98,000	49,000	120,000	590,000
Thousand tons	61,636	63,600	31,764	93,000	250,000

Source: Estimates provided by CANAINTEX and CAMARA DEL VESTIDO and UNIDO mission estimates.

substitution and exports is not fully utilized.[1/] Just this is the case with the Mexican textile industry. The implication for the selection of policy targets is therefore obvious: to raise the international competitiveness of the textile industry, thus enabling it to utilize more fully the potential offered by international markets and by those segments of the domestic market which are currently served by imports.

1.2 Foreign exchange earnings

The importance of the contribution of the Mexican textile industry as a net foreign exchange earner was reduced at the end of the seventies and in the early eighties. This was the result of both a weaker export performance and an influx of imports. In 1983 the Mexican textile industry again became a net earner of foreign exchange with a doubling of export earnings over 1982, but even more significant was the draconian cut in imports. Imports of man-made fibres, both artifical and synthetic, from 1977 to 1983, rose from 6,794 tons to 11,036 tons, but with the import restrictions, in 1983 fell by more than 50%. Even at their peak, however, imports were only about 5% of domestic production of man-made fibres. If account is taken of imports of textile machinery by Mexico the deficits of the total textile complex are even greater, and continue in 1983, despite the cutback in imports (Table 5).

In figures, the share of the Mexican textile industry in total Mexican export earnings fell from 3.9% in 1978 to 0.6% in 1983, and over the same period its contribution to manufacturing export earnings fell from 11.1% to 3.5%. To put this into international perspective, table 6 shows that over the period from 1973 to 1980 whereas many developing countries, for example Brazil and the Republic of Korea strengthened their export earning capacity, Mexico's position worsened.

1/ It should be noted that even the total rate of growth of domestic demand does not necessarily need to impose a binding constraint on textile demand. General economic policies conducive to a more equitable distribution of income and concomitant changes in the structure of demand would stimulate domestic Mexican demand for textiles. However, the complex set of policies required to achieve this result would go far beyond the scope of a policy package to restructure the textile industry and also beyond the scope of this study.

Table 5. The Mexican Textile Industry as a Net Earner of Foreign Exchange (millions of Pesos)

	Exports	Imports	Net Foreign Exchange Earnings/Losses	
			Excluding machinery imports	Including machinery imports
1977	2,435	1,216	+1219	(+11)
1978	4,586	1,426	+3160	(+225)
1979	2,496	2,281	+215	(-4004)
1980	1,806	6,758	-4952	(-11618)
1981	1,852	10,003	-8151	(-17235)
1982	3,118	14,542	-11424	(-44349)
1983	7,424	4,747	+2677	(-2748)

Source: Memoria Estadistica, 1984, and SECOFI, 1985.

Table 6. Net Trade in Textiles and Clothing in Selected Countries ($ Billions)

	Textiles			Clothing			Total		
	1973	1976	1980	1973	1976	1980	1973	1976	1980
Mexico	0.09	0.10	0.11	0.01	-0.01	-0.18	0.10	0.09	-0.07
Brazil	0.16	0.27	0.60	0.08	0.09	0.12	0.24	0.36	0.72
Argentina	0	0	-0.19	0.03	0.04	-0.02	0.03	0.04	-0.21
Rep.of Korea	0.14	0.73	1.79	0.74	2.05	2.94	0.88	2.78	4.73

Source: GATT, Textiles and Clothing in the World Economy, Geneva, 1984.

Most strikingly Mexico's share of textile and clothing production exported in 1983 was only 3% - a situation which could be described as "export neglect" or "frustration". The potential of the Mexican textile industry to contribute increasing amounts of foreign exchange may have been weakened by the practice of US firms, under conditions of rising imports, to pursue a strategy of delocalised production. Utilizing the provisions under P.L. 806/807, segments of their production process with low value added or high labour content were relocated to low wage countries or economic free zones. Although employment in Mexico's northern border industries ("maquiladora industries") benefited from this development, domestic value added, net foreign exchange earnings and backward linkages to the rest of the Mexican economy remained relatively low. In addition, MFA quotas for certain items were filled with little benefit for the Mexican economy, as the quotas are not fixed in terms of the small domestic value added, but in terms of gross output.

To achieve the objective of increased foreign exchange earnings, two policy targets can be derived. Firstly, the Mexican textile industry, which is integrated with the national economy, should be put into a position to compete successfully with "maquiladora-type" industries in the US and European markets. Secondly, the linkages between "maquiladora industries" and the Mexican textile industry should be increased.

The Mexican Government in 1985 initiated the Integrated Programme for the Promotion of Exports "PROFIEX" (Programa de Fomento Integral de las Exportaciones), which in principle takes both policy targets into account. Among others it allows for temporary imports of raw materials, equipment and tools for export production as well as offers drawback incentives. PROFIEX also provides for the establishment of foreign trade consortia with the participation of foreign companies. Under the programme, "maquiladoras" producing textiles will be only authorized for products in which Mexico has unfilled quotas under the MFA and after having fully utilized the supply of national inputs.

The chances of success for these new policies appear to be quite promising, also considering the fact that the attractiveness of the delocalization strategy apparently has diminished. A recent survey of eight

U.S. textile firms revealed that neither of the two firms in this group that had previously engaged in offshore production intended to enlarge these operations and there was "... absolutely no desire to locate offshore among the firms that have never tried it."[1/] One might suspect that this disinterest was related to the lack of a US tariff item permitting the export of uncut fabrics for additional work (cutting and sewing) and the import of finished apparel with duty paid only on the value-added overseas, as the advantage is no where near as great when, in conformity with US tariff provisions, only cut fabrics can be exported for additional work. Yet, in the Federal Republic of Germany, where such a tariff item does exist there is a similar disinclination to pursue a delocalization strategy further.

1.3 Employment creation

Employment in the Mexican textile industry rose in the 1970s and reached a peak in 1981. In the following two years employment fell by almost 20%, more than wiping out job creation over the whole period. In the 1980s employment has also fallen in the clothing sector (Table 7).

Employment data for developing countries are fragmented and not always reliable, but it appears that post-1970 textile employment increased in the Republic of Korea, and declined in Singapore, Hong Kong, the Philippines and Taiwan Province. In Latin America as a whole the share of textiles in manufacturing employment fell from 14.1% to 12.2% between 1975 and 1980, whereas the share of clothing rose from 8% to 8.7%.

Table 8 contrasts trends and changes of employment-related variables in Mexico under the impact of the economic crisis in the early 1980s. At the end of the last decade, the contribution of the textile industry to total manufacturing employment declined, despite growing production, labour productivity and, in absolute figures, a quite impressive growth of the textile labour force.

1/ C.f. Brian Toyne et. al., The Global Textile Industry, London, 1984, p. 136.

Table 7. Employment generation in the Mexican textile industry, 1977 - 1983

(thousands of persons)

	1977	1978	1979	1980	1981	1982	1983
Total employment Mexico	16,238	16,844	17,676	18,795	20,043	19,877	18,120
Employment in manufacturing	2,051	2,133	2,291	2,417	2,542	2,462	2,250
Employment in textile industry	154	156	169	176	180	173	145
Relative shares (%)							
3/1	0.9	0.9	1.0	0.9	0.9	0.9	0.8
3/2	7.5	7.3	7.4	7.3	7.1	7.0	6.4
Employment in clothing industry	-	-	-	-	130	124	121
Relative shares (%)							
5/1	-	-	-	-	0.5	0.6	0.6
5/2	-	-	-	-	5.1	5.0	5.4

Source: SECOFI

Table 8. Changes of employment, value added and labour productivity in the Mexican textile industry, 1977-1983

(per cent)

	Value added a/	Employment	Value added per employee a/	Share of textile employment in total manufacturing employment
1977-1981	27.9	16.9	9.5	-0.4
1981-1983	-8.6	-19.4	13.4	-0.7

a/ Based on constant prices

Source: UNIDO calculations based on data provided by SECOFI.

Two important, although preliminary conclusions, may be drawn from these figures. First, relatively low income elasticities of demand for textile products, combined with labour-saving technological progress and growing labour productivity, did not result in a reduction of the labour force in the context of a growing economy. Secondly, on the other hand, due to certain aspects of labour legislation and other factors the impact of technological modernization on employment might occur only with a time-lag, which might be shortened under the impact of an economic crisis. This is evidenced by the sharp drop in absolute and relative terms of textile employment in the early 1980s with a concomitant smaller reduction of value added, resulting in a further sharp rise of labour productivity. Therefore, future trends of employment in Mexico's textile industry cannot be predicted with sufficient reliability from the available information. However, it may be suggested that overcoming the demand constraint of the internal market through restructuring policies aiming both at an increase of domestic purchasing power and at an improvement of international competitiveness of the industry should lay the foundations for the continued absorption by the textile industry of a growing number of the Mexican labour force. Policy targets resulting from this relate first to aspects of human resource development in order to secure the availability of sufficiently skilled labour to cope with new production technologies. Secondly, current labour market regulations should be scrutinized in order to ensure that industry can adjust flexibly to the new parameters set by a restructuring programme. This aspect will be further dealt with in section 5.4 of this study.

1.4 Price stability and basic domestic needs

A comparison of retail prices of garments in Mexican, European and US stores revealed that in the low quality range prices for trousers and skirts, socks and stockings, sweaters and shirts, blankets and sheets were higher in Mexico than in foreign markets (see Chapter 2 for more detailed analysis). The implications of this for the selection of policy targets might then be seen in focussing restructuring efforts on attempts to improve price competitiveness in the low quality end of the market. It could therefore be argued that the Mexican textile industry is not meeting the policy target of adequately satisfying basic domestic consumption needs.

However, as will be argued in subsequent chapters based on additional evidence, the Mexican textile industry appears to be characterized by a strongly dualistic structure, where modern and outdated enterprises coexist. Both groups of enterprises differ with respect to their market orientation, their technology and the inputs used by them. This dualistic structure of the industry would need to be taken into account in the selection of policy targets calling for a two-pronged restructuring approach, with satisfying basic needs being just one of the policy targets.

1.5 Regional development

An objective of industrial policy in the National Development Plan is to assist in "the territorial decentralization of productive activity." Establishments engaged in the Mexican textile industry (see Table 9 and Figure 1) are heavily concentrated around Mexico City. Almost three quarters of textile establishments engaged in cotton and man-made fibre production are located in Puebla, Distrito Federal, and Estado de Mexico.

Such a heavy concentration of the Mexican textile industry indicates that the effects of restructuring could also be concentrated. It may be that costs and benefits will be asymmetrically distributed. The benefits of increased efficiency from restructuring the Mexican textile industry may be widely felt throughout the economy via lower prices for consumers, and increased foreign exchange earnings. The costs however, insofar as restructuring involves closure of idle capacity and inappropriate technology could be highly concentrated. A more balanced regional development would therefore be among the policy targets to be specifically taken into account in the design of a restructuring policy package.

Figure 1: GEOGRAPHICAL DISTRIBUTION OF THE MEXICAN TEXTILE INDUSTRY

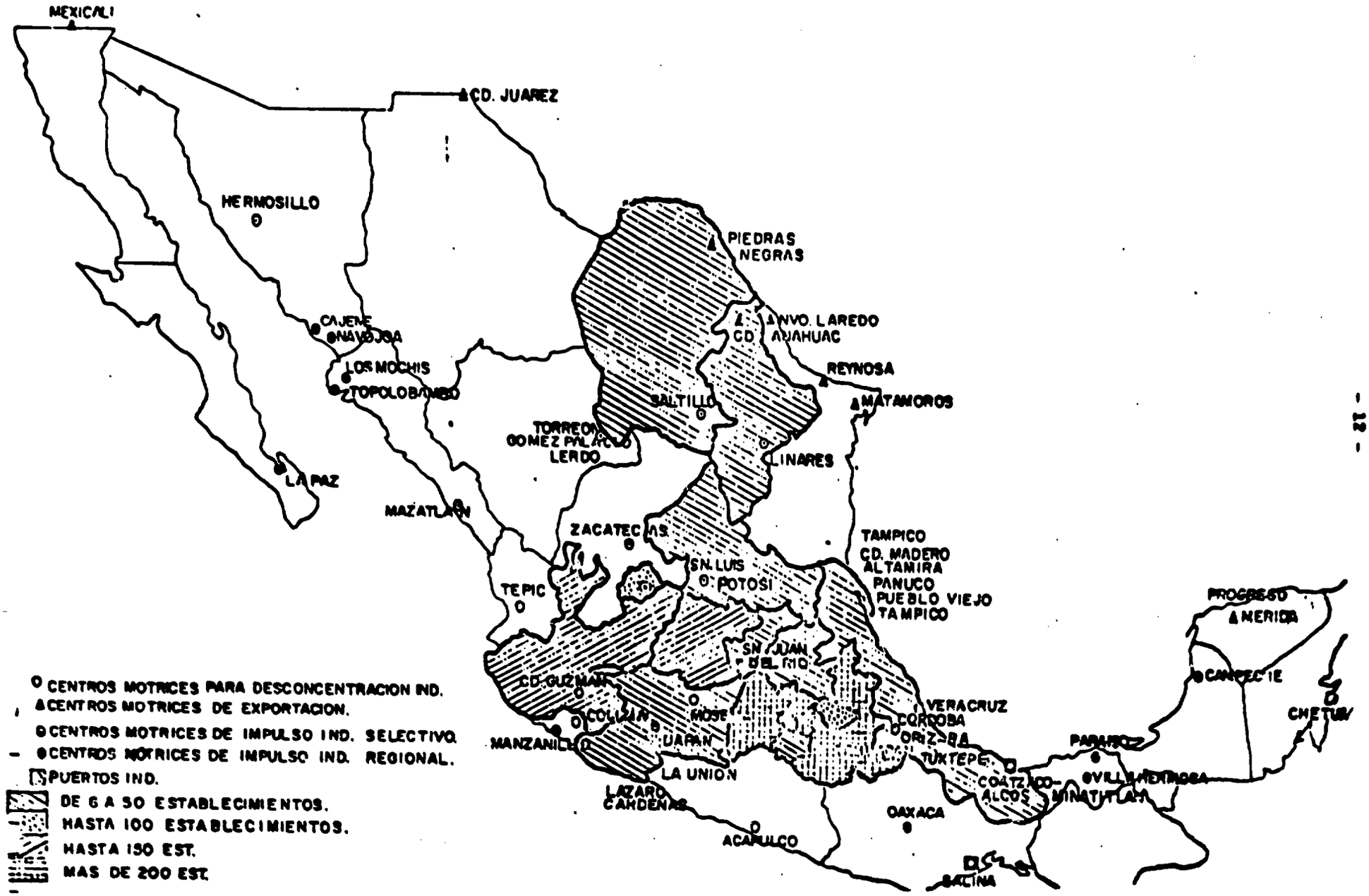


Table 9 Geographical distribution of the Mexican textile industry, 1983

District	Cotton	Wool	Chemical Fibres	Total
Puebla	165	1	154	320
Distrito Federal	81	11	623	715
Estado de México	46	12	309	367
Jalisco	20	-	124	144
Tlaxcala	8	8	35	51
Hidalgo	10	5	35	50
Coahuila	13	-	-	13
Veracruz	4	-	2	6
Guanajuato	6	1	120	127
Nuevo León	7	-	16	23
Querétaro	8	-	7	15
Chiapas	1	-	1	2
Durango	2	-	1	3
Chihuahua	3	-	-	3
Aguascalientes	1	-	76	77
Morelos	2	3	7	12
San Luis Potosí	2	1	13	16
Michoacán	-	-	9	9
Others	29	-	31	60
TOTAL	408	42	1,563	2,013

Source: SECOFI

II. THE MEXICAN TEXTILE INDUSTRY IN INTERNATIONAL PERSPECTIVE: PRICES, COSTS AND COMPETITIVENESS

Having analyzed in the preceding chapter the past contribution of the Mexican textile industry to the achievement of policy objectives within the framework of the national economy, the following sections will review the performance of the Mexican textile industry in the international context. A first criterion to be used will be the international price competitiveness of Mexican textiles. In a second step, the focus will be on some essential factors which determine the international price competitiveness of Mexican textile products: the amount and the structure of production costs.

2.1 Price competitiveness

Given data limitations and methodological problems in making international comparisons of prices any specific conclusions from price comparisons must be treated with reservations. Nevertheless, the data which were collected on retail prices of a limited sample of products indicate some trends of Mexico's international competitiveness. The top quality and lowest quality products were excluded as for the first no significant Mexican production exists, while for the second the market in European countries is virtually non-existent. For price estimates of low quality products the area of Zoccalo was sampled; Perisur and Sears commercial centers were considered for medium quality; Palacio de Hierro for high quality. Prices were compared with those of distribution chains at national and international level, namely Rinascente, Sears, Penny, Metro, Innovazione, Migros, Jelmoli, Globus, Fliene's, Postal Market, and Vastro.

In view of the restrictions on imports prevailing in Mexico, the comparison refers to locally produced items, and for Europe to items which may be either produced in Europe or in other (generally Asian) countries, but marketed with European labels. Special articles with a particularly high workmanship input which are at the border of industrial production (curtains, linens, blankets and high quality stockings), non-woven products and carpets were not considered in order not to widen excessively the sector investigated.

The column named "other" considers all Asian, African and American countries which are competitive in the lower range product categories.

Figures 2 and 3 show the results of the price comparisons for the selected articles. Surprisingly, out of the eight products sampled in only one (dress/suit) was the retail price for the low quality article offered by Mexico found to be more price competitive. Indeed in several cases the price offered by the most price competitive supplier was only half that of Mexico. In the medium quality category the differential is narrower, but still largely unfavourable vis-a-vis Mexican suppliers. Only in the high quality category do Mexican suppliers become more price competitive, and even here some products are sold more cheaply by the European Community and the US.

For cotton and mixed cotton products, of the 12 products sampled in the low quality category, Mexico has a price advantage in curtains only. For medium quality articles Mexico has a price advantage in four of the products. For wool and mixed wool products, in all the 6 products sampled Mexico is less price competitive than both EC and USA in low as well as medium quality categories. For the products sampled which were 100% synthetic Mexico had a price advantage in only curtains and wire guaze. Finally in the blends sampled Mexican products were less price competitive. Overall the sample shows an approximate 20% price differential in favour of the European prices.

As a preliminary and still very global conclusion (which will be modified later on), it may be said that the efficiency of the Mexican textile industry must be substantially increased if it is to become internationally competitive.

Figure 2: International Comparison of Retail Prices for Selected Textile Products

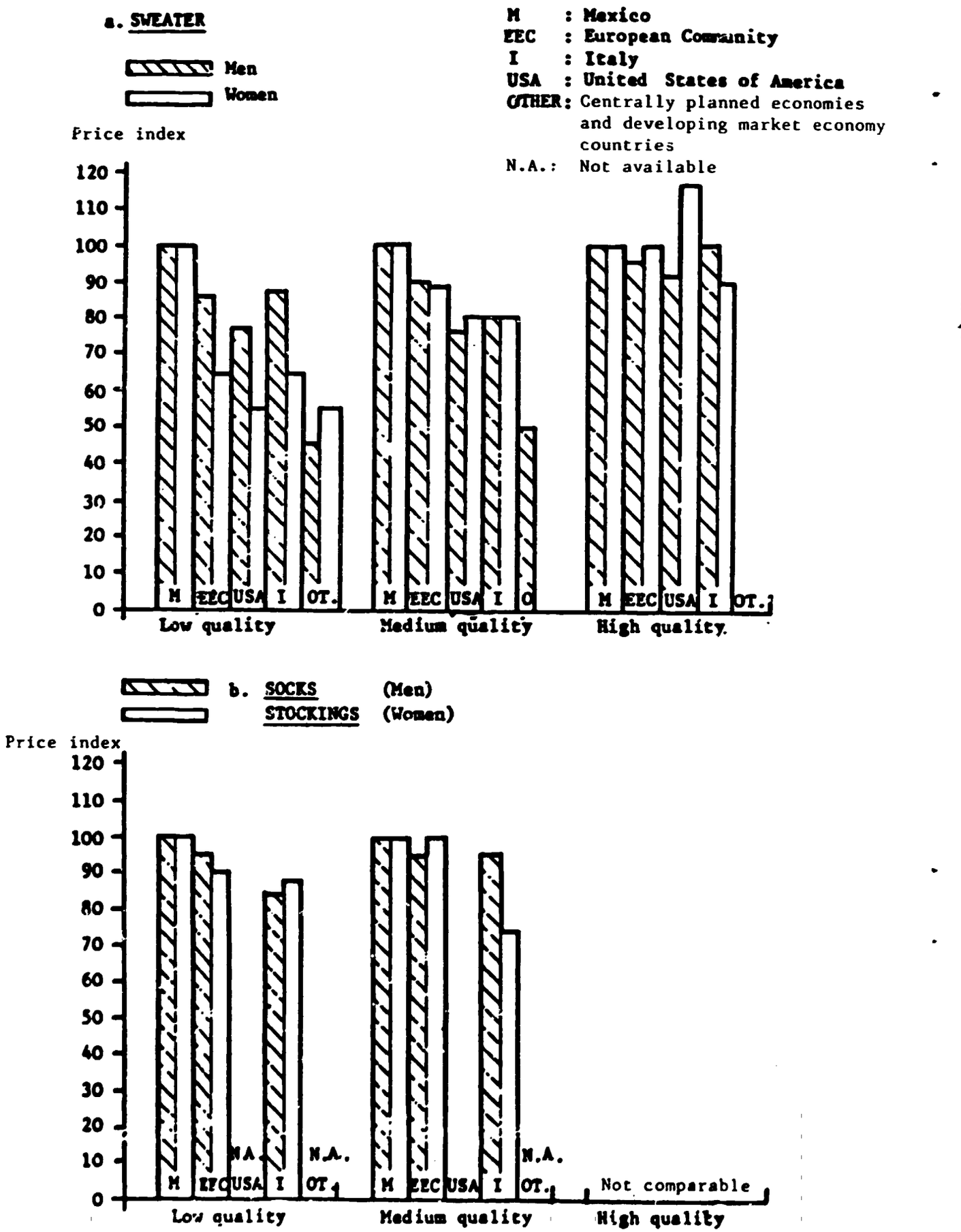
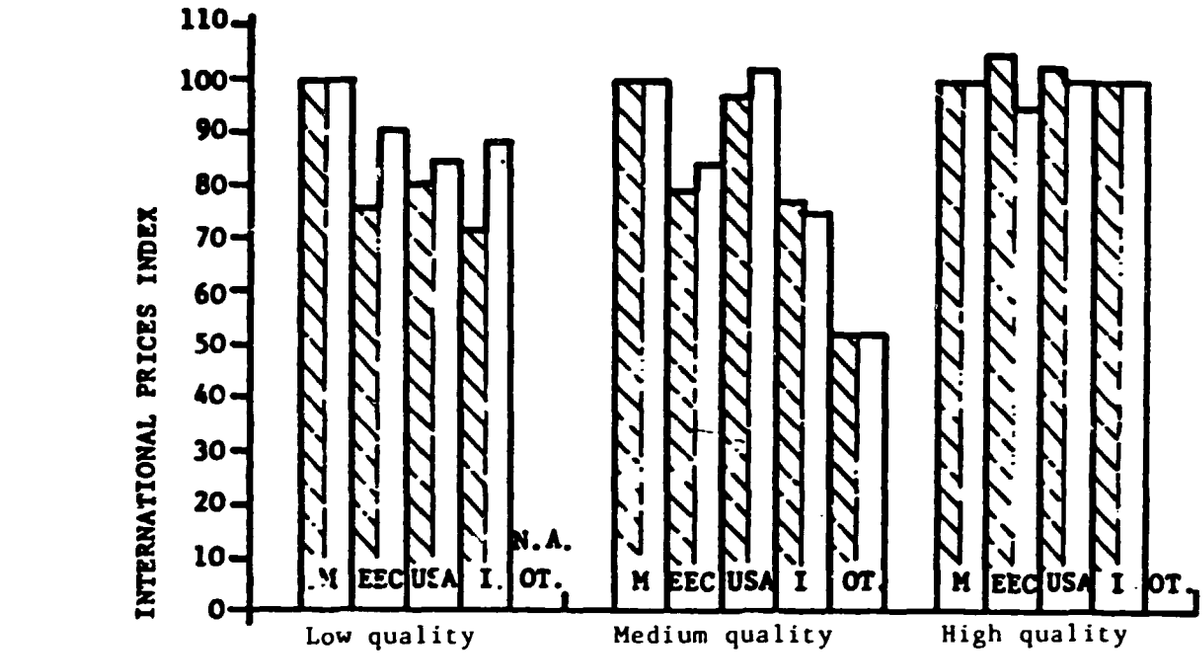


Figure 2 : **continued**

c. **SHIRTS**



d. **TROUSERS AND SKIRTS**

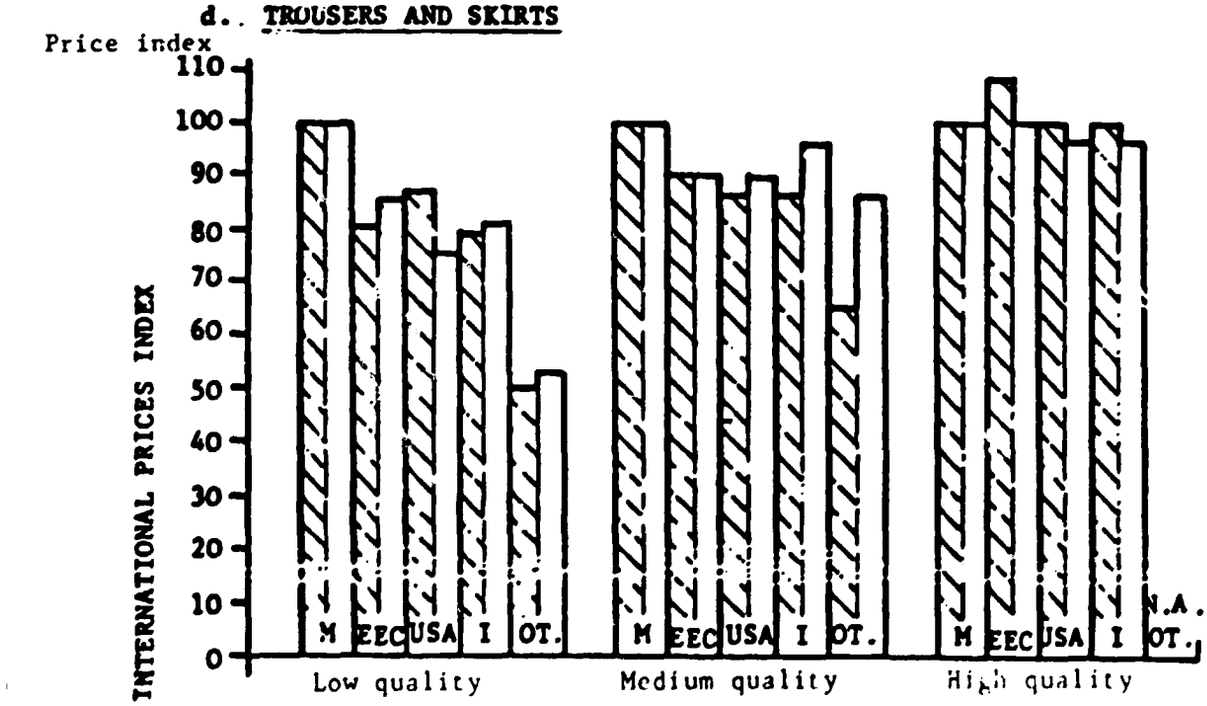
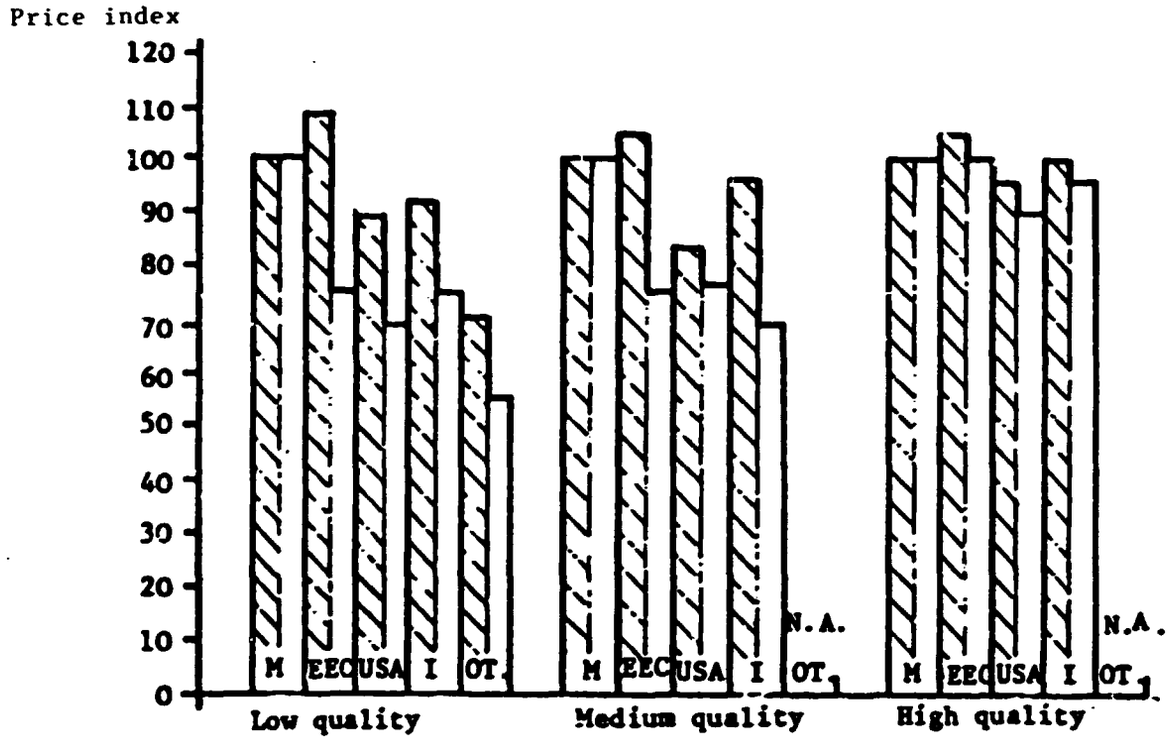


Figure 2 : continued

e. DRESS Women
SUIT Men



f. JACKETS

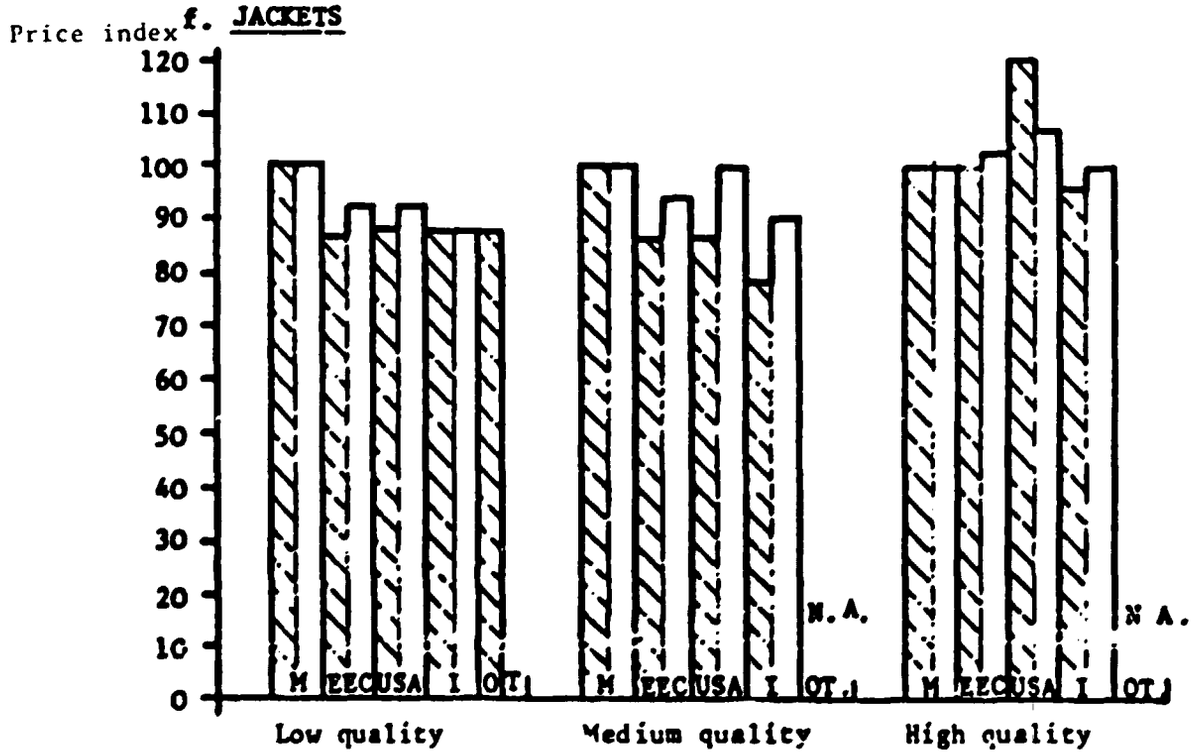
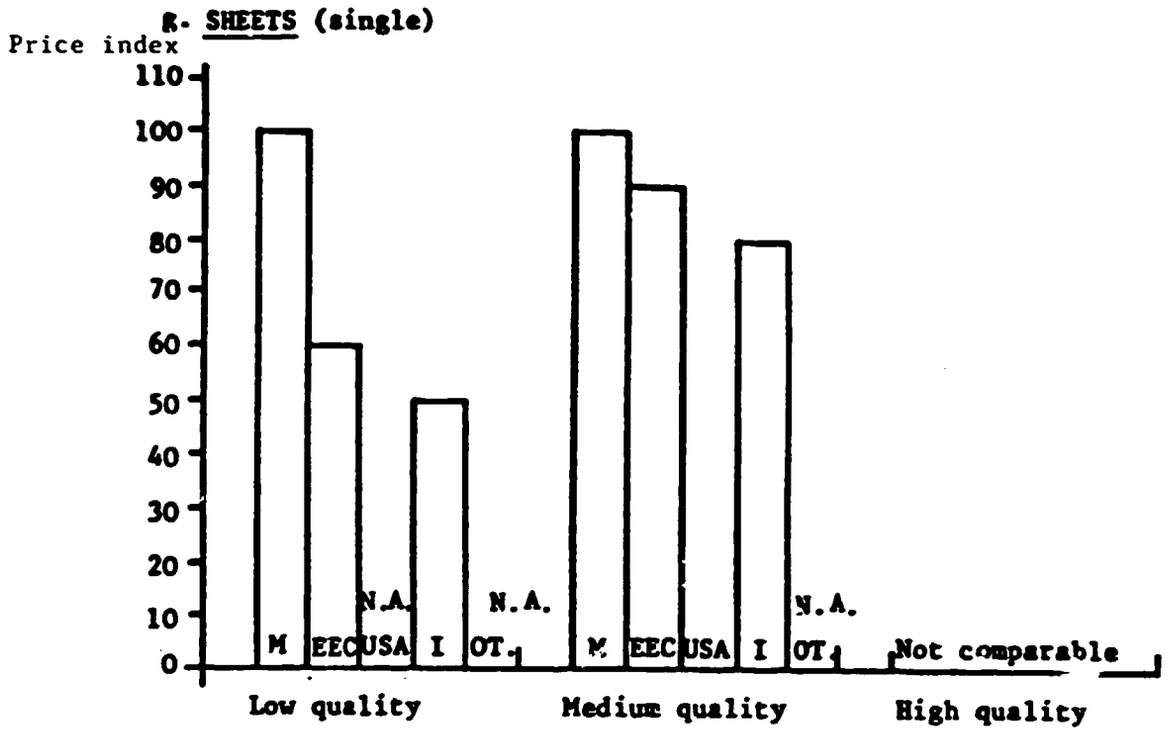
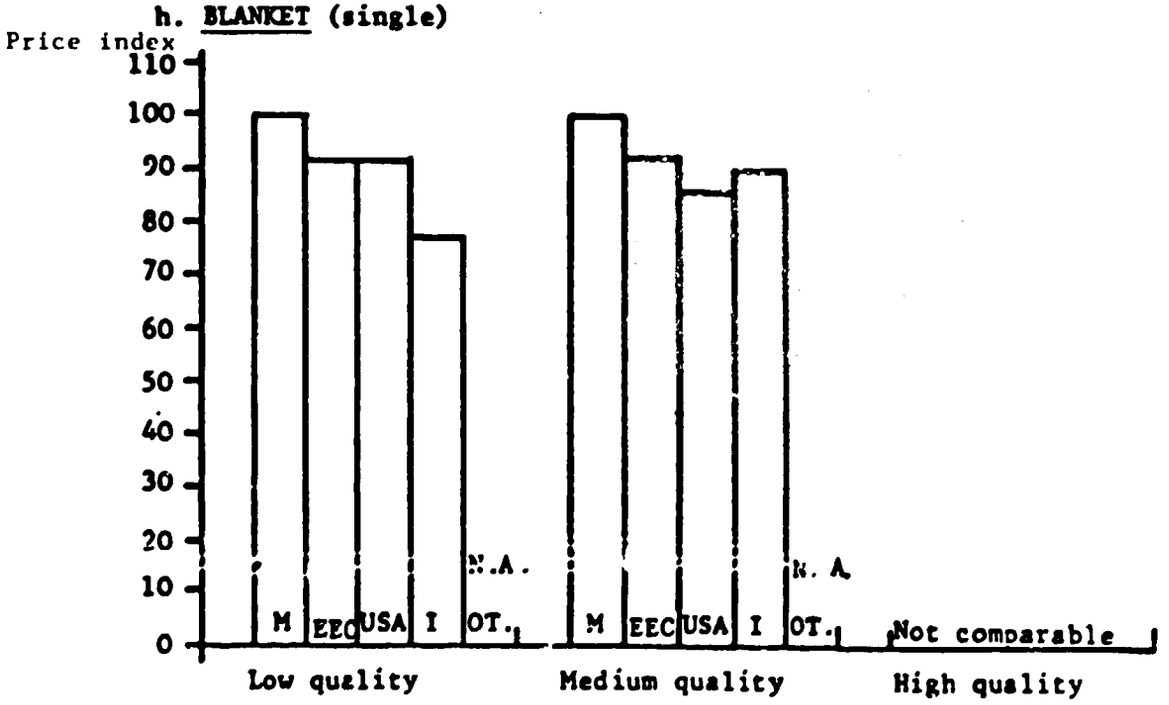


Figure 2 : **continued**

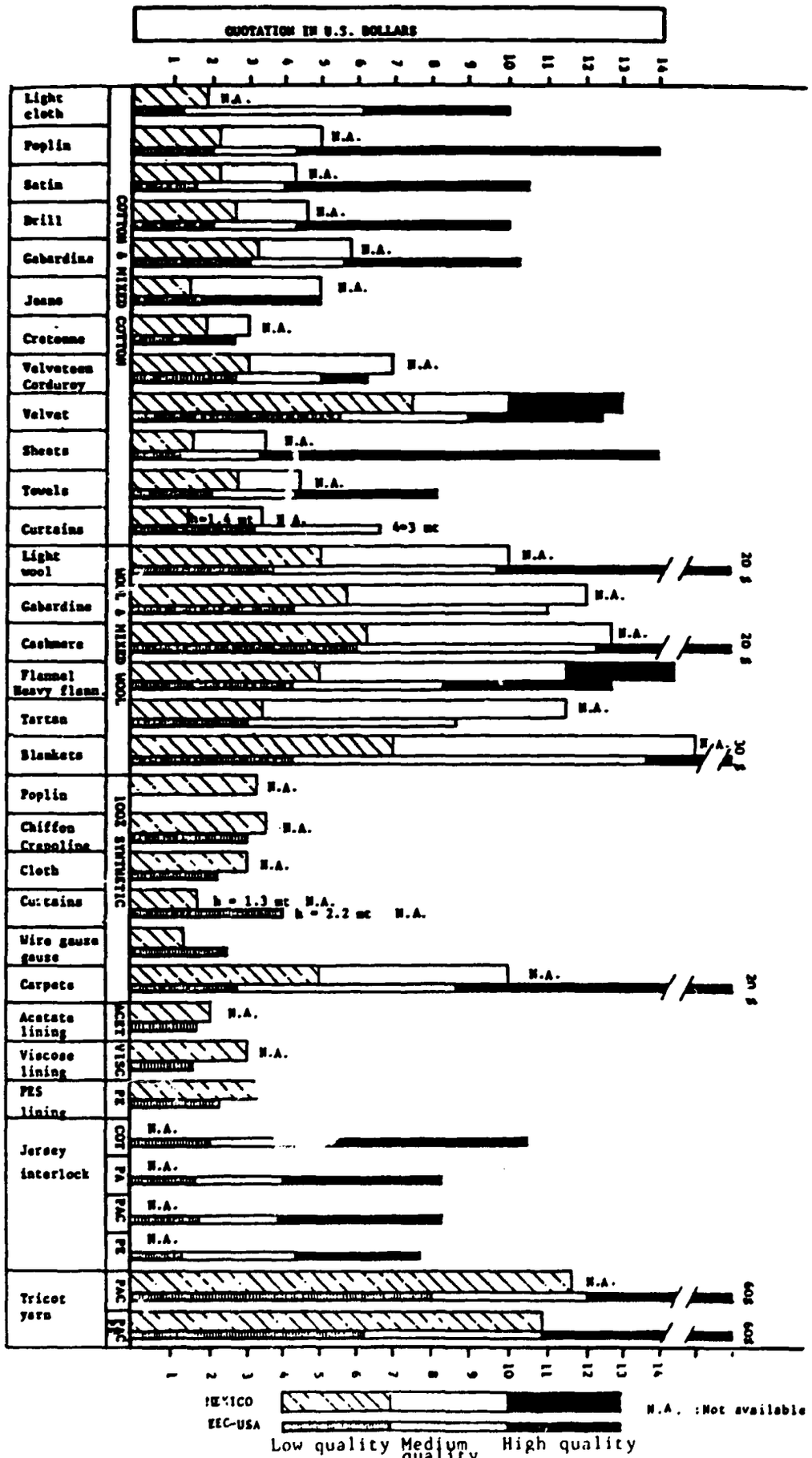




Source: UNIDO mission estimates, catalogues of international chains, mail order catalogues.

FIGURE 3:

Figure 3: International Cost Comparison of Retail Prices for Selected Textile Products, by Type of Fiber



Source: UNIDO mission estimates,
catalogues of international chains, mail order catalogues.

2.2 Labour cost

In order to shed some more light on the causes of the lack of cost competitiveness indicated in the previous section, this section presents an international comparison of labour costs. The figures shown in Table 10 reveal a large variation in average cost per operator hour. In 1984 the disparity between the highest (the Netherlands) and the lowest (Uganda) was 100:1. The corresponding ratio for Mexico was 27:1. Taking the US average cost per operator hour as the benchmark the ratio for Mexico in Spring 1984 was 30%, in Latin America a figure exceeded only by Columbia and Venezuela. The relatively competitive costs of the US and Canada partly reflect their labour market conditions - non-union labour in the US, and low wage rates in the textile region in Canada.

The Republic of Korea's advantage in labour costs have been eroded, although both Taiwan Province and the Republic of Korea on the basis of the Spring 1984 figures are more competitive than Mexico. From 1980 to 1984 Mexico's relative unit labour cost competitiveness deteriorated from rank 20 to rank 23 (Table 11). Changes in exchange rates make a significant difference to relative unit labour costs. If recent changes in Mexico/US$ rates are applied to the Spring 1984 analysis of labour costs then the ratio of Mexican to US cost falls to 13% and Mexico's labour costs would be more competitive than all but Brazil S. in Latin America, and superior to Hong Kong, the Republic of Korea and Taiwan Province.

A comparison of the operator hours and flexibility in shift work and overtime shows that Mexico is marginally less competitive than other Latin American producers, and substantially less so than major Asian competitors. Other statutory social payments, for example unemployment benefit insurance and health insurance are more important in some countries, and such contributions for Mexico appear much higher than for major Asian competitors. Any accurate assessment of this factor would have to take into account non-observance by employers, and the importance of the informal sector operating outside legislation norms - of particular significance in the confectioning sector in Mexico and other Latin American countries.

Table 10. International labour cost comparisons

	Average cost per operator hour ($)	Ratio to U.S. cost (%)	Planned operator hours/year	Mill operating hours/year
North America				
USA	8.60	100	2056	6168
Canada	8.50	99	1872	5760
Mexico	2.62	30	2112	6288
EEC				
Belgium	8.84	103	1705	6384
Denmark	7.97	93	1784	5472
France	6.07	71	1755	5312
Germany, Fed.Rep.	7.54	88	1760	5520
Greece	4.30	50	1848	5544
Ireland	4.20	49	1864	5592
Italy	6.35	74	1792	6528
Netherlands	9.80	114	1776	5568
UK	5.46	63	1747	5592
Other European countries				
Austria	6.76	79	1800	5760
Finland	6.05	70	1793	5382
Norway	9.66	112	1763	5382
Portugal	1.28	15	2008	6024
Spain	3.87	45	1736	5472
Sweden	7.91	92	1800	5400
Switzerland	8.65	101	2040	6120
Near East				
Syria	3.12	36	2256	7656
Turkey	1.19	14	2256	7248
Africa				
Egypt	0.90	10	2360	8472
Ethiopia	0.27	3	2256	7224
Kenya	0.53	6	2091	8520
Madagascar	0.56	5	2224	7248
Nigeria	2.13	25	2048	6816
South Africa	1.64	19	2296	7032
Tunisia	1.21	14	286	7032
Uganda	0.10	1	230	5520

/...

Table 10 (continued)

	Average cost per operator hour ($)	Ratio to U.S. cost (%)	Planned operator hours/year	Mill operating hours/year
South America				
Argentina	2.23	26	2128	6600
Brazil, North	0.93	11	2184	6818
Brazil, Sao Paulo	1.63	19	2184	6818
Brazil, South	1.00	12	2184	6818
Colombia	2.81	33	2216	7056
Venezuela	3.27	38	2288	6750
Asia				
Australia	7.85	91	1733	5198
China	0.26	3	2448	N.A.
Hong Kong	1.65	19	2368	8496
India	0.71	8	2304	8496
Indonesia	0.22	3	2065	7413
Japan	6.28	73	2080	6480
Rep. of Korea	1.89	22	2376	8472
Pakistan	0.49	6	2144	8496
Sri Lanka	0.28	3	2328	8544
Taiwan Province	1.64	19	2352	8544
Thailand	0.56	7	2344	8472

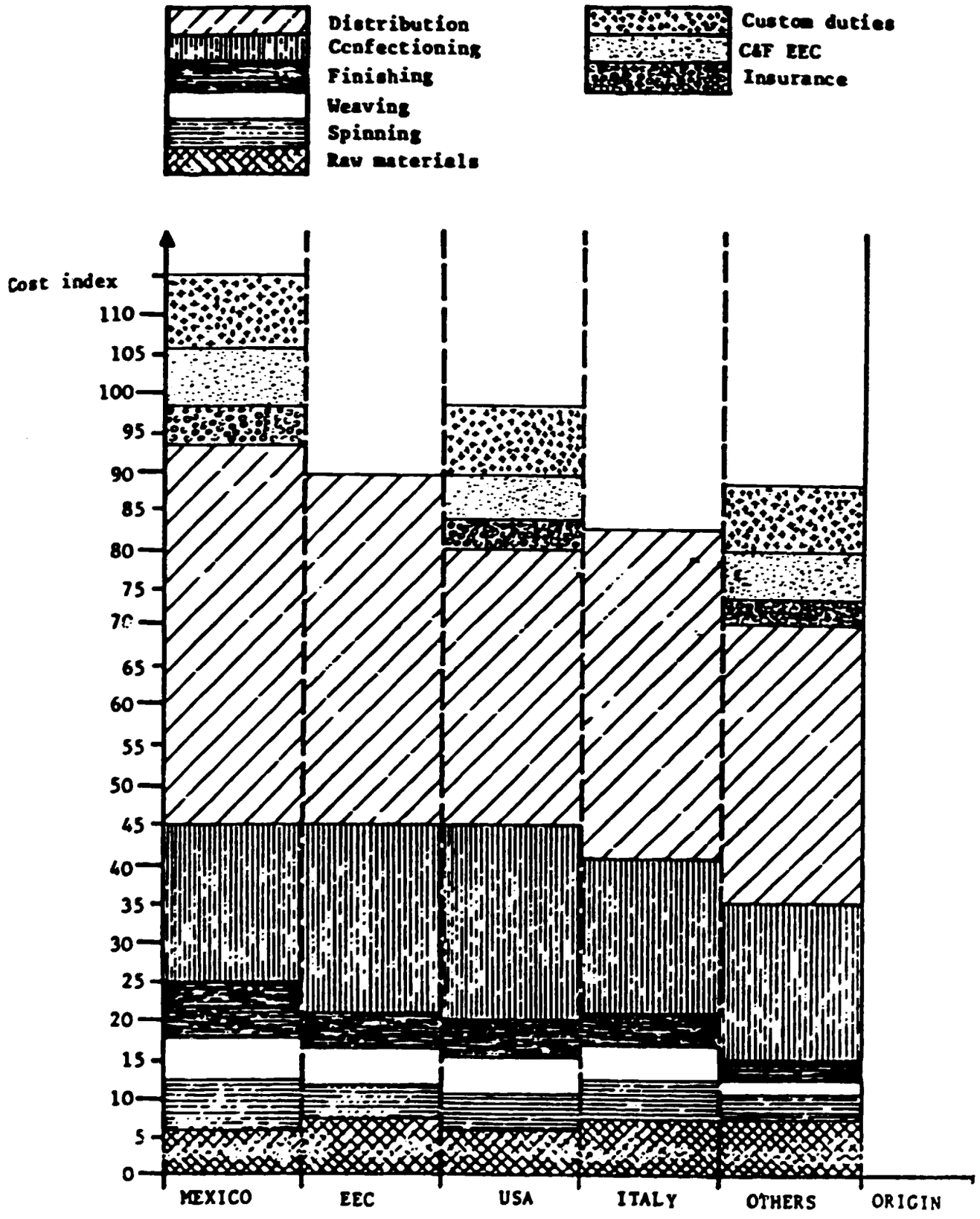
Source: Werner International Management Consultants, Brussels, September 1985.

Table 11 International ranking of labour costs

RATIO 84	COUNTRY	SPRING 84	RANK 84	AUTUMN 82	RANK 82	SPRING 80	RANK 80
100	HOLLAND	9.80	1	10.17	1	11.68	2
99	NORWAY	9.66	2	9.11	4	9.62	6
90	BELGIUM	8.84	3	9.14	3	11.82	1
88	SWITZERLAND	8.65	4	9.44	2	9.65	5
88	U.S.A.	8.60	5	7.53	7	6.37	11
87	CANADA	8.50	6	7.31	9	6.25	12
81	DENMARK	7.97	7	8.78	5	9.12	8
81	SWEDEN	7.91	8	7.52	8	10.43	4
80	AUSTRALIA	7.85	9	-	-	-	-
77	F.R. Germany	7.54	10	8.38	6	10.65	3
69	AUSTRIA	6.76	11	5.84	13	6.42	10
65	ITALY	6.35	12	7.06	10	9.12	7
64	JAPAN	6.28	13	5.64	15	4.35	17
62	FRANCE	6.07	14	6.36	11	8.57	9
62	FINLAND	6.05	15	6.17	12	5.62	14
56	UNITED KINGDOM	5.46	16	5.39	16	5.75	13
44	GREECE	4.30	17	4.76	17	4.03	18
43	IRELAND	4.20	18	4.28	19	5.13	15
39	SPAIN	3.87	19	4.64	18	4.90	16
33	VENEZUELA	3.27	20	5.73	14	-	-
32	SYRIA	3.12	21	2.07	22	0.96	28
29	COLOMBIA	2.81	22	2.88	20	-	-
27	MEXICO	2.62	23	0.91	32	3.10	20
23	ARGENTINA	2.23	24	1.12	30	3.33	19
22	NIGERIA	2.13	25	1.93	23	-	-
19	Rep. of Korea	1.89	26	1.53	27	0.78	32
17	HONG KONG	1.65	27	1.40	29	1.91	22
17	TAIWAN Province	1.64	28	1.43	28	1.26	27
17	SOUTH AFRICA	1.64	29	1.67	24	-	-
17	BRAZIL S.P.	1.63	30	1.61	25	1.57	25
13	PORTUGAL	1.28	31	1.54	26	1.68	24
12	TUNISIA	1.21	32	-	-	-	-
12	TURKEY	1.19	33	0.96	31	0.95	29
9	EGYPT	0.90	34	0.73	35	0.39	34
7	INDIA	0.71	35	0.66	36	0.60	33
6	THAILAND	0.56	36	-	-	-	-
6	MADAGASCAR	0.56	37	-	-	-	-
5	KENYA	0.53	38	0.49	39	-	-
5	PAKISTAN	0.48	39	0.37	40	0.34	35
3	SRI LANKA	0.28	40	0.32	41	-	-
3	ETHIOPIA	0.27	41	0.25	42	-	-
3	P.R. China	0.26	42	-	-	-	-
2	INDONESIA	0.22	43	-	-	-	-
1	UGANDA	0.10	44	-	-	-	-

Source: Werner International Management Consultants, Brussels, September 1985.

FIGURE 4 International comparison of cost structures of cotton products traded in the European Community



Source: UNIDO mission estimates.

2.3 Other Costs and Cost Structure

The cost of labour is obviously only one factor determining the product price, and in view of current trends in the international textile industry its role is decreasing.

A more detailed analysis of costs of synthetic cotton-mix products in the intermediate price range, of Mexican, European, US and Asian origin, and traded in the EC is shown in Figure 4. The indices have been calculated with a benchmark of 45 for total production cost before distribution for the EEC and USA. The analysis attempts to indicate differences in cost structures in the different countries and to illustrate the problems faced by Mexican exports. The analysis indicates that the cost of Mexican raw material inputs and confectioning is competitive with "other producers", but that spinning, weaving, and finishing is more costly. Mexican producers also suffer a much higher distribution cost element, amounting to a surcharge of 17 per cent compared to "other producers".

When compared with producers in Italy, the total EEC and USA, Mexican producer costs are less competitive in spinning, finishing and distribution. Overall the analysis underlines the lack of competitiveness of the Mexican synthetic/cotton mix products on the European market. It shows that this can only partly be attributed to the cost of transport and duties.

Finally, the price at which a product is offered is only one factor among several which decide about success or failure in the market. Design, fashion, speed and reliability of delivery, access to established sales channels and last, not least, the quality of a product are not less important. The latter aspect, quality, depends largely on the material input into manufacturing and on the technology used in the production process. Both factors will be dealt with in more detail in the following two chapters.

III. INTERNATIONAL PARAMETERS FOR A MEXICAN RESTRUCTURING PROGRAMME

Any strategy for restructuring the Mexican textile industry would need to be devised in the context of trends in world production and consumption. The textile industry has witnessed major shifts in the distribution of specialization between developed and developing countries in the last two decades. Radical changes have occurred since the 1960s in the global textile industry as a result of technological developments, the increased use of synthetic fibres, varying wage levels, and differences in consumer tastes. Major shifts have occurred in comparative advantage in the textile industry as between countries. The need to adapt continuously to the international environment is a crucial element of the Mexican textile industry restructuring exercise. This chapter is therefore to review major international trends which need to be considered as relevant parameters for a Mexican restructuring programme. In addition, it will assess the current status of the Mexican textile industry against these trends.

3.1 Trends in world fibre production

World production of textile fibres tripled between 1950 and 1970, increasing by an average annual growth rate of 5.6 per cent. Between 1970 and 1980, the growth rate of output was just 3 per cent, and world output stagnated in the early 1980s. In 1984, world production picked up again, growing at a rate of 10.7 per cent (Table 12).

3.1.1 Competition between natural and man-made fibres

These overall trends in world production conceal significant differences in the growth rates of different textiles fibers. Whereas cotton production grew only slowly, man-made fibers expanded rapidly, which resulted in major changes in the composition of world production. The share of man-made fibers in total fibre production increased from 22.5 per cent in 1960 to 43.3 per cent in 1973. Subsequent to the relative rise of oil prices in the first half of the 1970s, the pace of expansion of man-made fibres slowed down, and between 1979 and 1984 the share of man-made fibres in total fibre production fluctuated between 44 and 47 per cent.

Table 12. World Textile Fibre Production, b/ 1900-1980 (selected years)

(Millions of metric tons)

	Natural Fibres		Man-made Fibres		
	Cotton	Wool	Cellulosic fibres	Synthetic fibres	World Total
1900	3,162	730	-	-	3,892
1950	4,647	1,057	1,608	69	7,381
1960	10,113	1,463	2,656	702	14,934
1970	11,784	1,602	3,579	4,818	21,783
1973	13,738	1,432	3,856	7,744	26,770
1980	13,991	1,607	3,242	10,476	29,316
1982	14,639	1,629	2,942	10,140	29,350
1984	16,479	1,673	3,078	11,893	33,123
1985 a/	-	-	3,721	15,401	
1986 a/	-	-	3,767	15,956	

a/ Producing capacity
b/ Excluding silk

Sources: GATT, Textiles and Clothing in the World Economy, Geneva, 1984.

Various factors are behind these changes of relative shares:

1. New Products - in some end-use areas synthetics have created new products wholly or partly independent of demand for natural fibres. Polyester/cotton (65/35) blends, for example, are replacing cotton in shirts, rayon replacing cotton in some blends with polyester, and polyester coming even into traditional cotton goods such as jeans. Considerable research resources are going into reducing problems with man-made fibres - viz. static electricity, low water absorbency and pilling.

2. Income Growth - in developing countries an average two-thirds of consumption is met by natural fibres. At higher levels of per capita income per capita consumption of man-made fibres increases (see Section 3.2). In Mexico consumption of natural fibres fell from 3.6 kilograms per capita in 1971 to 1.7 in 1983, whereas consumption of man-made fibres rose

to 3.1 from 1.9 kilograms per capita. Thus in Mexico almost two-thirds of domestic consumption is met by man-made fibres.

3. Relative Prices - longer term trends in prices have favoured the substitution of natural by man-made fibres. Between 1955 and 1977 the price of cotton almost exactly doubled, whereas synthetic prices halved between 1955 and 1965 and halved again by 1971. Cotton and wool prices increased significantly more rapidly in the seventies than prices for the most types of synthetic fibres. The major switch from natural to synthetic fibres which has dominated the world textile scene for a generation, assisted by the growing price competitiveness of synthetics, may be illustrated by an index of relative prices of two common fibres (Mexican cotton and US polyester staple). The cotton share of world fibre consumption is also shown (Table 13).

Table 13. Relative prices of cotton and share in world fibre demand, 1957-1982

	Relative price index[a/]	% share cotton in fibre demand		Relative price index	% share of cotton in total fibre demand
1957	0.24	69	1969	0.63	54
1958	0.23	70	1970	0.75	54
1959	0.21	69	1971	0.96	54
1960	0.24	68	1972	1.08	54
1961	0.26	67	1973	1.71	51
1962	0.25	64	1974	1.44	52
1963	0.25	63	1975	1.18	49
1964	0.30	62	1976	1.50	48
1965	0.34	61	1977	1.32	50
1966	0.35	60	1978	1.46	46
1967	0.50	59	1979	1.57	47
1968	0.55	56	1980	1.17	46
			1981	0.87	49
			1982	1.06	50

a/ Cotton divided by polyester. The cotton price index is for Mexican, cif northern Europe; the polyester is type 54, 1.5 denier, fob US plants.

Source: GATT, Textiles and Clothing in the World Economy, Geneva, 1984.

For Mexico in the 1980s prices for natural and man-made fibres have both risen sharply, although on the whole more rapidly for the former. The more favourable price shift for synthetics may be explained by falling unit costs with increasing economies of scale, and technological productivity gains in man-made fibre production. Against this cotton prices tend to rise as diminishing returns apply to almost all fixed acerages of land. The fact that the differential between natural and man-made fibre prices is relatively small in Mexico may be partly attributed to the tariff burden imposed on the latter.

4. Process Technology - the technology developed in spinning, weaving and knitting affects fibre demand indirectly. In Mexico the knitting sector is experiencing serious under-utilisation of capacity problems, due in part to inflexible technology. For example the tinting plants for knitted polyester goods equipped with under pressure jet machines remain idle when mercerised or unmercerised cotton production is required instead of the synthetic fibre (see Chapter 4 for further details).

Despite these factors explaining the structural shift away from natural to man-made fibres, there are recent indications of a renewed growth in demand for natural fibres, and changes in the supply side which may swing the balance back more to natural fibres. The increased cost of energy has hit man-made fibres - 1 ton of man-made fibres uses 5 tons of oil, while processing 1 ton of natural fibres requires only 1 ton of oil. Research has established ways of dealing with the limitations of natural fibres, especially cotton, and there has been a shift in consumer preferences for natural fibres. On the other hand, real energy prices have fallen, and research has made synthetics production more energy efficient. It is therefore not realistic to assume that the trend towards increasing production of synthetic fibres will be reversed. Whether, however, the recent stabilization of natural fibres in world production is a lasting phenomenon remains an open question.

The direction of trends in Mexican fibre production has largely followed the developments outlined above, although there are some important differences regarding the extent of changes. Whereas on the world-scale the production of cotton fibres increased, though at a slower

rate than in the case of synthetic fibres, in Mexico the production of cotton fibres fell from its peak of 497,972 tons in 1974/75 to 220,000 tons in 1983/84 (see Table A-1). Wool production stagnated throughout the 1970s and early 1980s (see table A-2). On the other hand, the production of man-made fibres increased sharply from 111,180 tons in 1971 to 380,723 tons in 1980 (see Table A-3), implying an annual average growth rate of 14.5 per cent. This figure is almost three times as high as the 5 per cent growth rate of world production of man-made fibres in this period. The significant expansion of man-made fibre production by affiliates of major multinational fibre companies in the 1970s was closely linked to the emergence of a substantial petrochemicals industry in Mexico, which is based on the country's rich energy resources. However, in the early 1980s the Mexican growth rate was halved, and in 1983 it became negative.

3.1.2 Competition between man-made fibres

Even more pronounced than the changes of the relative shares of natural and man-made fibers in world production were the changes in the man-made fiber category itself, between cellulosic and synthetic (petro-based) fibers (Table 12). The pioneering products of man-made fibres - the cellulosic fibres - have gradually lost ground to later developed synthetic materials. World production of cellulose filament and staple reached its all time high of 3.8 mn tons in 1973 and by 1984 was only 3.1 mn tons accounting for a mere 20.6 per cent of world man-made fibre production. The development of Mexico's man-made fiber production follows this trend (Table 14).

The production in Mexico of cellulosic fibres fell from 27.7 thousand tons in 1978 to only 14.9 thousand tons in 1984. The major structural change within cellulosic fibre production in Mexico has been the fall in output of staple from 11.0 thousand tons in 1980 to zero producing capacity in 1985. Production of yarn and monofilaments has declined marginally from 17.2 thousand tons in 1978 to 15.0 thousand tons producing capacity in 1986. As a result, Mexico's share in world production of cellulosic fibers in 1986 will be only 0.4 per cent, just half of Mexico's share in world production in 1978.

Table 14 Man-Made Fiber Production and Producing Capacity, 1978-1984: Selected Countries and Years

(a) Cellulosic Fibers (Thousand Metric Tons)

	1978	1980	1982	1984	1986[a/]
F.R. Germany	108.7	111.2	111.0	121.0	123.0
Italy[b/]	86.2	64.1	45.8	30.6	41.0
Argentina	8.2	3.5	1.6	3.3	19.0
Brazil	46.5	51.3	45.0	46.7	53.4
Mexico	27.7	27.8	19.5	14.9	15.0
U.S.A.	413.3	365.6	264.6	285.1	355.1
P.R.China	145.0	170.0	185.0	202.0	230.0
Taiwan Province	70.0	78.3	92.8	128.0	134.3
India	154.4	132.4	101.4	138.7	236.6
Indonesia			10.1	12.6	36.0
Rep. of Korea	22.7	27.4	15.7	12.8	42.1
Total World	3,315.1	3,242.4	2,942.0	3,077.5	3,766.5

Shares in World Total (per cent)

	1978	1980	1982	1984	1986
F.R. Germany	3.3	3.4	3.8	3.9	3.3
Italy	2.6	2.0	1.6	1.0	1.1
Argentina	0.2	0.1	0.1	0.1	0.5
Brazil	1.4	1.7	1.5	1.5	1.4
Mexico	0.8	0.9	0.7	0.5	0.4
U.S.A.	12.4	11.3	9.0	9.3	9.4
P.R. China	4.4	5.2	6.3	6.6	6.1
Taiwan Province	2.1	2.4	3.2	4.2	3.6
India	4.7	4.1	3.4	4.5	6.3
Indonesia	-	-	0.3	0.4	1.0
Rep. of Korea	0.7	0.8	0.5	0.4	1.1
Total World	100	100	100	100	100

(b) Non-cellulosic Fibers
(Thousand Metric Tons)

	1978	1980	1982	1984	1986[a/]
F.R. Germany	729.4	720.1	701.9	771.0	849.1
Italy[b/]	354.4	354.8	428.7	518.9	602.7
Argentina	39.2	34.2	30.0	44.6	78.2
Brazil	180.2	231.4	198.1	215.8	287.8
Mexico	199.3	239.4	237.5	285.2	395.1
U.S.A.	3,218.0	3,242.1	2,603.1	2,936.9	3,630.9
P.R. China	136.6	248.0	369.0	701.0	1,095.0
Taiwan Province	464.2	557.8	630.9	865.9	1,210.0
India	58.5	70.5	106.2	153.0	343.5
Indonesia	66.7	95.4	116.1	148.8	223.0
Rep. of Korea	432.5	536.4	612.4	746.2	841.9
Total World	10,034.4	10,475.7	10,139.9	11,893.2	15,956.2

Shares in World Total (per cent)

	1978	1980	1982	1984	1986
F.R. Germany	7.3	7.2	7.0	6.5	5.3
Italy[b/]	3.5	3.5	4.3	4.4	3.8
Argentina	0.4	0.3	0.3	0.4	0.5
Brazil	1.8	2.3	2.0	1.8	1.8
Mexico	2.0	2.4	2.4	2.4	2.5
U.S.A.	32.1	32.3	25.9	24.7	22.8
P.R. China	1.4	2.5	3.7	5.9	6.9
Taiwan Province	4.6	5.6	6.3	7.3	7.6
India	0.6	0.7	1.1	1.3	2.2
Indonesia	0.7	1.0	1.2	1.3	1.4
Rep. of Korea	4.3	5.3	6.1	6.3	5.3
Total World	100	100	100	100	100

a/ Producing Capacity

b/ Includes Malta

Source: Textile Organon, June 1985, and own calculations.

Non-cellulosic fibre production in Mexico was 285.2 thousand tons in 1984, which was by 43 per cent above the production in 1978. The growth rate in Mexico has greatly exceeded the world growth rate which over the same period was 18.5 per cent, resulting in an increase of Mexico's share in total world production from 2.0 per cent in 1978 to 2.4 per cent in 1984. Major "winners" in this period were the People's Republic of China, where production expanded by 413 per cent, India (161 per cent) and Indonesia (123 per cent); whereas the major "looser" was the U.S. synthetic fiber industry, which experienced a drop by 23 per cent in production over this period.

The most important world trend amongst the three main synthetic fibres - nylon, polyester and acrylic -, has been the increasing share of polyester staple and filament. The main reason for the switch to polyester is its technical advantages, mainly in cotton blends (dresses, shirts and trousers, and net curtains). It provides half the world total of synthetic fibre, and for Mexico over half of synthetic fibre production is polyester. Acrylic staple has held its own in world production and is particularly well established in the West European knitwear industry. In Mexico the share of acrylic has increased to just under a third of synthetic fibre production. Nylon producers have been beset by over-capacity problems and the need for closures, especially in Europe. In Mexico the share of nylon was 13.2 per cent of synthetic production in 1983, compared to 13.8 per cent in 1971, whereas the share of polyester doubled from 27.2 per cent to 54.2 per cent in this period. The share of polyester in Mexico's synthetic fiber production in 1983 corresponds largely to the world average (50.3 per cent), whereas the share of nylon in synthetic fibre production is significantly larger on the world scale (28.6 per cent).

3.2 Trends in Mexican and World Fiber Consumption

Neglecting stocks, aggregate world production of textile fibers as analyzed in the preceding section corresponds to aggregate world consumption. This identity, however, does not hold for the pattern of world production and consumption at the country level, with international trade being the balancing variable between the two. An analysis of Mexican fiber consumption is therefore essential in order to get insight

into the demand prospects offered by the domestic market. There are, however, limits to this analysis, set by the availability of statistical data. On the on hand the different types of fibers are mostly not processed in pure form, but as blends between various fibres. Therefore, the proper units of analysis to assess the current status of the Mexican textile industry would be the various blends. On the other hand, detailed international data for fiber consumption are only available for the individual fiber types, not for blends.

Table 15 shows actual and hypothetical per capita consumption of textile fibers in selected countries in the year 1983. The hypothetical values were derived by inserting the actual GNP per capita for each country into simple linear regressions. These regressions were estimated for each type of fiber, regressing the actual per capita consumption in all countries on the respective per capita incomes.

The estimated results allow to assess the current status of the Mexican textile industry in two different ways[1/]:

- the current Mexican pattern may be compared to the estimated "average pattern" of fiber consumption at the given per capita income in Mexico;

- the estimated regressions may be used to estimate future demand in Mexico for various types of fibers under different scenarios of per capita income growth; although this option is not pursued further in this study, the estimated values for various given per capita incomes give sufficient indications for the direction and order of magnitude of prospective demand changes.[2/]

In general, the observed pattern of consumption (A-values) confirm that textile fiber consumption per capita grows at a significantly lower rate

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1/ The strength of correlation between the respective variables which could be established using this very simple model in fact justifies the following interpretations. See Annex II.

2/ For further details and a short discussion of assumptions, see Annex II.

Table 15. Actual and Hypothetical Consumption Per-Capita of Textile Fibers in Selected Countries, 1983
(Kilograms per Inhabitant)

	Total		Natural Fibers				Man-made Fibers				GNP per capita, 1983, ($)
			Cotton		Wool		Cellulosic Fibers		Synthetic Fibers		
	A	H	A	H	A	H	A	H	A	H	
USA	24.5	21.2	7.2	7.0	0.6	1.9*	3.5	3.0	13.0	8.7*	14,110
Canada	20.3	18.9	5.8	6.4	1.0	1.7	3.5	2.7	7.5	7.7	12,310
F.R. Germany	20.0	17.8	6.3	6.1	2.0	1.6	2.3	2.5	9.0	7.7	11,430
Japan	19.7	16.1	7.6	5.7*	1.2	1.4	2.7	2.2	7.9	6.4	10,120
Australia	18.0	17.9	5.7	6.1	2.5	1.7	2.7	2.5	4.8	7.7	11,490
Switzerland	17.0	24.0*	7.4	7.7	2.8	2.2	2.3	3.4*	5.5	10.0*	16.290
France	15.1	16.6	5.5	5.8	1.2	1.4	1.7	2.3	6.7	6.7	10,500
Italy	13.9	11.4	5.0	4.5	2.2	0.9*	1.7	1.5	5.0	4.3	6,400
Spain	9.3	9.3	2.4	4.0	0.3	0.7	1.4	1.2	5.2	3.4	4,780
Argentina	7.0	5.8	4.0	3.1	1.1	0.4	0.4	0.7	1.4	1.8	2,070
Mexico	4.8	6.0	1.7	3.2*	0.1	0.4	0.2	0.7*	2.8	1.9	2,240
Venezuela	5.6	8.1	2.6	3.7	0.3	0.6	0.7	1.1	2.0	2.8	3,840
Brazil	5.3	5.6	3.0	3.1	0.2	0.4	0.2	0.7	1.8	1.7	1,880
Egypt	5.2	4.1	3.9	2.7	0.1	0.2	0.2	0.5	1.0	1.0	700
Colombia	5.0	5.0	3.2	2.9	0.5	0.3	0.2	0.6	1.1	1.4	1,430
Algeria	4.6	6.2	1.6	3.2	0.3	0.3	1.1	0.8	1.6	1.9	2,340
Peru	3.9	4.5	2.2	2.8	0.1	0.3	0.4	0.5	1.2	1.2	1,040
P.R. China	3.5	3.5	2.5	2.5	0.2	0.2	0.3	0.4	0.4	0.8	300
India	2.2	3.5	1.7	2.5	0.1	0.2	0.3	0.4	0.1	0.7	260

A = actual values
H = hypothetical values (see explanation in text and Annex II)
* = difference between A and B is larger than one standard deviation of the A-distribution

Sources: Actual consumption: CANAINTEX; figures for Mexico: SECOFI
Hypothetical consumption: UNIDO calculations
GNP per capita: World Bank

than income per capita. In addition, it can be observed that with rising income per capita the share of man-made fibers in total fiber consumption increases, from less than 20 per cent in low income developing countries to about 55 per cent in EEC countries and 67 per cent in the USA. Within the category of man-made fibers, cellulosic fibers still play an important role in low income developing countries, but account for only 20 per cent of man-made fiber consumption in advanced industrial countries.

Comparing the pattern of textile fiber consumption in Mexico with world trends reveals that the total fiber consumption of 4.8 kg per inhabitant is clearly below the hypothetical consumption of 6.0 kg per inhabitant which can be expected from the average pattern of fiber consumption and income per capita. This result for total fiber consumption conceals two very opposing patterns for different fiber types:

- the consumption of cotton fibers is just over half of what can be expected from the average pattern, whereas

- the consumption of synthetic fibers is significantly above the average pattern.

This result is, however, influenced by the choice of the year of comparison. Thus, total fiber consumption per capita in Mexico was in 1983 more than one third below its peak in 1979 (Table 16). Inserting the income per capita of Mexico in 1979 into the regression equations estimated in Annex II and using the consumption figures of Tables 16 and A-7, yields a consumption per capita of

- total fibers: 5.3 kg (H) versus 7.3 kg (A)
- cotton fibers: 3.0 kg (H) versus 2.6 kg (A)
- synthetic fibers 1.5 kg (H) versus 4.1 kg (A),

with (H) again indicating hypothetical values, estimated from the average pattern, and (A) indicating actual consumption. Compared to 1983, there are significant differences:

Table 16. Consumption per capita of Natural Fibers in Mexico, 1971-1983 (kg/inhabitant)

	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Cotton	3.393	3.361	3.308	2.921	3.099	2.928	2.838	2.702	2.646	2.573	2.260	2.004	1.670
Growth rate (per cent)		-0.9	-1.6	-11.7	6.1	-5.5	-3.1	-4.8	-2.1	-2.8	-12.2	-11.3	-16.7
Wool	0.175	0.135	0.064	0.053	0.075	0.072	0.064	0.052	0.088	0.098	0.109	0.087	0.056
Growth rate (per cent)		-22.9	-52.6	-17.2	41.5	-4	-11.1	-3.1	41.9	11.4	11.2	-20.2	-35.6
Natural Fibers	3.568	3.496	3.372	2.974	3.174	2.000	2.902	2.764	2.734	2.671	2.279	2.091	1.726
Growth rate (per cent)		-2	-3.5	-11.8	6.7	-5.5	-3.3	-4.8	-1	-2.3	-14.7	-8.2	-17.5
Total Textile Fibers	5.474	5.619	5.996	5.922	6.231	6.364	6.056	6.402	7.313	6.705	6.185	5.602	4.798
Growth rate (per cent)		2.6	6.7	-1.2	5.2	2.1	-4.8	5.7	14.2	-8.3	-7.8	-9.4	-14.6

Source: SECOFI

- total fiber consumption, which in 1983 was 20 per cent below the "expected" level, had surpassed the hypothetical value in 1979 by almost 38 per cent;

- consumption of cotton fibers in 1979 corresponded to the average pattern, within the limits of normal statistical variation;

- synthetic fiber consumption in 1979 was almost three times as high as expected, whereas in 1983 it was just one and a half times as high.

The most important result evolving from these figures is that the consumption of synthetic fibers in Mexico at the end of the last decade was far above of what could be expected from cross-country evidence, given Mexico's income per capita. From a different angle, this is equivalent to saying that the consumption per capita of synthetic fibers in Mexico normally would be associated with a significantly higher income per capita.

To explain this result, it should be remembered that the cross-country comparisons used income per capita as the determining variable of fiber consumption per capita. This procedure implicitly assumes that income per capita is directly related (although not identical!) to effective demand. In cross-country comparisons, this assumption cannot be taken for granted, as it neglects an important intermediating variable which transforms income into effective demand: the distribution of income. Thus, if the income distribution of a country is significantly more inequal than in comparable countries, the resultant structure of effective demand in this country could be expected to correspond more to the structure of demand in a country with higher income, but a more equitable distribution of income.

The figures presented above in fact suggest that this might be an explanation for the pattern of textile consumption in Mexico. In 1979, the share of synthetic fibers in total Mexican fiber consumption was 56 per cent, which was even higher than the respective share in the U.S.A. in 1983 (53 per cent). At the same time, the lower 60 per cent of Mexican families received 22 per cent of all Mexican family income, compared to 28 per cent in Argentina, 31 per cent in Hong Kong, 32 per cent in the Republic of Korea, 33 per cent in the F.R. Germany, 37 per cent in Sweden and 40 per cent in the

Netherlands.[1/] In fact, considering differences in the average size of families would reveal even more pronounced differences in the distribution of income per person.

One should, on the other hand, consider that according to published figures the distribution of income in Mexico does not look quite as unfavourable if compared only in the Latin American context. Therefore, the particular Mexican pattern of income distribution can only partly explain the observed pattern of fiber consumption. As additional factors may be therefore suggested, the proximity of Mexico to the U.S. market (which itself is characterized by the highest preference for synthetic fibers), the close communication links with this market and the resulting influence on the shaping of Mexican preference patterns, and Mexico's resources.

The second important observation concerns the consumption of cotton fibers. In per capita terms, consumption continuously fell from above average levels at the beginning of the last decade to a level significantly below the "expected" level in 1983, thus running counter to the trend normally associated with rising income per capita. In 1982 and 1983, adverse climatic conditions lead to a sharp drop of cotton production. However, corresponding reductions of exports offset the potentially negative impact on domestic processing industries, keeping the supply of cotton fibers to the domestic market at levels comparable to previous years. Therefore, the sharp drop of consumption per capita in 1983 should not be looked at as a result of shortfalls of production, but as reflecting a shortfall of effective domestic demand.

3.3 Demand Outlook and Implications for a Mexican Restructuring Programme

As discussed, with rising income the demand for textile products grows at a lower rate than demand for many other products. If the textile industry is to play a more dynamic role in the industrial sector of a country, this can be only achieved (for a certain time!) through

- gaining a larger share of the world export market, and/or

1/ World Bank figures referring to different years and to be taken only as indications of rough orders of magnitude.

- increasing significantly per capita consumption in the domestic market.

Both options are not mutually exclusive. Concerning the latter, the discussion of Table 15 has shown that total consumption per capita of textile fibers in Mexico in 1979 was significantly above its expected value as derived from international cross-section evidence. Therefore, it does not appear to be a feasible policy target to significantly increase per capita consumption in the short or even medium term, beyond the increases which can be expected with (probably not too quickly) rising per capita income in Mexico. However, even to keep its actual share in a growing domestic market would require a continuous restructuring of the Mexican textile industry.

In the past, the Mexican textile industry has developed primarily on the basis of the growth of a sheltered domestic market and, to a lesser extent, import substitution (c.f. Table 3). In the seventies, textile producers became accustomed to supplying a fast growing domestic market. Between 1973 and 1982, total consumer expenditure grew by 5.7 per cent per annum, and expenditure on clothing grew by 4.6 per cent per annum.

In the eighties, as debt servicing, balance of payments and public sector deficit problems worsened, domestic demand had to be cut back. According to World Bank estimates on the basis of world economy trends, oil price forecasts and availability of foreign finance, depressed levels of per capita private consumption may preserve up to 1990. Recent trends in oil prices and debt servicing problems make even more pessimistic forecasts of private consumption more likely.

The slowdown which has characterized the Mexican economy in the eighties has had a significant impact on the textile industry, and the imbalance between supply and demand has been illustrated by the sizeable unutilized capacity. This has important implications for the required pace of restructuring. In a sellers market, the mills do not have to focus so much on consumer tastes and the quality of the fabrics produced for the domestic market. In a buyers market, shifts in consumer tastes need to be carefully monitored.

Although it is difficult to predict future trends of internal demand, both the firm evidence given by the cross-country regressions and the new

interest of consumers in industrialized countries in fabrics with a significant cotton content suggest that the trend of declining per capita consumption of cotton fibers, which prevailed in Mexico throughout the 1970s and early 1980s, might be reversed in the years ahead. Once internal effective demand has made up for the actual shortfall in 1983 and consumption levels per capita are back to levels which prevailed in the second half of the 1970s, domestic consumption can be expected to grow at a sizeable rate.

The picture for the consumption of synthetic fibers is more difficult to assess. On the one hand, consumption of such fibers usually expands dynamically with rising income. On the other hand, the already advanced consumption levels of Mexico in international perspective do suggest that the impressive growth rates which prevailed during the 1970s will not be maintained in the 1980s. It is therefore essential for the sectors producing and particularly processing synthetic fibers to gain additional sales outlets in external markets.

As to the production of synthetic fibers, the structure of Mexican production corresponds favourably to the worldwide trend of growing polyester consumption, as indicated by Table 17. In 1983, polyester accounted for 58 per cent of Mexican and for 50 per cent of world synthetic fiber production, and therefore the Mexican producers of synthetic fibers would appear to be well prepared to meet international demand.

Table 17 Mexican and World Non-cellulosic Fiber Production: Relative Shares by Fiber in Total Mexican and World Production (per cent)

	1978		1980		1982		1983		1986	
	World	Mexico	World	Mexico	World	Mexico	World	Mexico	World	Mexico
Acrylic and Modacrylic	20	27	20	22	20	24	20	24	17	n.a.
Nylon and Aramid	31	12	30	13	28	14	29	14	28	n.a.
Polyester	47	58	49	62	50	58	50	58	54	n.a.

Calculated from data provided by Textile Organon and Table A-3.

Concerning exports, movements of Mexico's real exchange rate had a significantly negative impact on their competitiveness . From 1977 until 1981, the real effective exchange rate significantly appreciated. This trend was stopped in 1982, when the exchange rate moderately depreciated. In the fourth quarter of 1982 and first quarter of 1983, the trend of the late 1970s was reversed through significant nominal and real devaluations, which, however, were to a major part subsequently eroded by domestic price rises in Mexico.

The overall performance of Mexican textile exports shows the impact of these exchange rate movements, although there are significant divergencies from the general trend for individual product groups (Table 18). In volume terms, total textile exports fell almost by half from 1977 to 1982. However, whereas cotton and wool-based exports experienced dramatic reductions, exports of chemical fiber based products demonstrated a clear upward trend. It were exactly these products which subsequently benefitted most from the exchange rate devaluations end 1982/early 1983. As a result, their share in total earnings from textiles exports increased from less than 10 per cent in 1977 to 61 per cent in 1983.

Actual low average levels of utilization of MFA-quotas by Mexico suggest that there is significant scope to maintain in the short and medium term the more encouraging export trend since 1983. Thus, according to GATT calculations, in 1982 the Mexican (trade weighted) average quota utilization rate in the EEC was 9.8 per cent, a very low figure compared to quota utilizations of 86.6 per cent by Brazil, 89.4 per cent by the Republic of Korea and 93.5 per cent by Peru. Even in the U.S., Mexico's most important export market for textile products, the trade weighted quota utilization rate in 1982 was just 38.6 per cent, down from 70.9 per cent in 1980.

Although there appear clear signs of improvement in quota utilization rates after 1982, the detailed picture of 1978-1984 quota utilization rates (Tables A-5 and A-6) in the US market confirms the result obtained from the analysis of overall volume growth of textile exports: there are significant differences according to product-type and material. Thus, almost all cotton products demonstrate dramatic reductions in quota utilization rates from 1978 to 1983 reflecting shortfalls in domestic cotton production, but a marked

recovery in 1984. On the other hand, almost all products based on man-made fibers demonstrate growing quota utilization rates up to 1982. Beyond the conclusions drawn from the aggregate figures shown in Table 18, the analysis of product specific quota utilization rates indicates that within the group of chemical fiber based products which reacted most dynamically to the 1983 devaluations, it were precisely the synthetic continuous filament yarns which accounted for this development. These trends intensified in 1984, resulting e.g. in a quota utilization rate of 9,829.4 per cent for synthetic continuous filament yarns, making this product group with a total of 98,294,624 square yards the single most important item in Mexican textile exports.

These figures caution against an over-optimistic valuation of prospects to further increase exports of synthetic fibers significantly. In fact, with respect to the EEC market leading international analysts do not expect any substantial increases in demand, and regarding the U.S. market, even a decrease of demand does not seem unlikely.

Just to stay competitive in these markets will require to follow and adopt results of research presently being undertaken by producers in industrialized countries. Future developments in this field will include yarns with better processing properties, such as larger packages, more appropriate finishes and fewer faults. New man-made fibers will lead to a substantial cut in dyeing and after-treatment costs, as well as giving better and more beautiful colors.

The main stimuli, however, to world demand of synthetic fibers will originate within the developing countries themselves. Negotiations related to mutual trade concessions and economic co-operation between developing countries will, therefore, become of increasing importance.

The most promising road towards increasing exports of Mexican textile fibers is increasing exports of Mexican textile fabrics and garments. The analysis of the export performance of specific textile products (Table A-6) reveals a dimension of dualism in the Mexican textile industry, based on the stage of processing in the textile industry's production chain. Whereas exports of synthetic fibers reacted promptly on exchange rate induced changes of international competitiveness, exports of fabrics performed poorly, with a

Table 18 Mexican Exports of Textile Products, 1977-1983

	1977	1978	1979	1980	1981	1982	1983	Annual Change % 1982-1983
				(Thousands of Tons)				
TOTAL	83 456	75 928	83 378	43 687	49 004	44 737	46 701	4.3
COTTON	19 400	16 000	14 300	7 600	1 804	7 514	9 064	20.6
Yarns	10 700	10 700	10 200	5 000	1 380	7 477	8 716	16.6
Fabrics	8 700	5 300	4 100	2 600	424	37	348	840.0
WOOL	190	145	120	87	35	8	23	187.5
Yarns	6	1	9	5	2	6	2	- 66.6
Woven products	184	144	111	82	33	2	21	950.0
CHEMICAL FIBERS								
Yarns	4 066	4 783	4 658	6 200	7 239	6 739	14 914	121.3
Yarns and cordage	59 800	55 000	64 300	29 800	39 926	30 476	22 700	25.5
				(Millions of Pesos)				
TOTAL	2420.1		2496.0	1806.2	1851.6	3210.5	8330.2	138.1
COTTON	1357.4	1037.3	1024.8	670.6	186.3	395.2	857.7	117.0
Yarns	657.5	621.1	664.0	423.7	136.9	391.7	817.7	108.7
Fabrics	699.9	416.2	360.8	249.9	49.4	3.5	40.0	1042.8
Wool	37.6	23.2	26.3	19.9	13.8	1.2	11.8	883.3
Yarns	0.5	0.1	1.1	0.7	0.4	0.8	0.2	75.0
Woven products	37.1	23.1	25.2	19.2	13.4	0.4	11.6	2800.0
CHEMICAL FIBERS								
Yarns	239.5	297.2	336.9	382.3	613.5	1382.9	5088.6	267.9
Yarns and cordage	785.7	793.3	1108.0	733.4	1038.0	1431.2	2372.1	65.7

Source: Economic Studies Department of CANAINTEX, with data provided by Direccion General de Estadistica, SPP and IMCE.

few exceptions. This holds also for domestic producers of fabrics made from synthetic yarns, despite the competitiveness of domestic producers of such yarns as proven by their export success. There are two principal possibilities to explain this phenomenon. The first is that Mexican producers of synthetic fibers, being sheltered from external competition, charge higher prices to Mexican customers, thus reducing their capacity to compete internationally. An alternative explanation would be, that Mexican producers of synthetic yarns sell their products at world market prices also within Mexico. In this case, the problems of lacking price competitiveness of Mexican fabrics would have to be sought in deficiencies at the various stages of fabric formation and finishing. Which alternative gives a better explanation cannot be decided at this point, as there is no information available concerning the pricing policy of Mexican synthetic yarn producers. However, it may be already suggested at this point that improvements at the fabric manufacturing and finishing stages would need to be main targets of a textile restructuring programme.

The picture for exports of garments is more differentiated. Trousers made both from cotton and man-made fibers are the quantitatively most important export items. In this particular case, the figures even suggest that cotton-made trousers are more competitive, as their exports hit the U.S. quota ceiling, whereas chemical fiber-made trousers filled their quota only by two thirds. Assuming that the bulk of cotton based trousers consists of standardized products such as jeans, whereas trousers with a high man-made fiber content would have to satisfy more sophisticated demand requirements in terms of design and quality, the figures point to restructuring needs in more downstream activities in the textile production chain.

Finally, significant lack of competitiveness can be observed for cotton made low value added items such as underwear, with a quota utilization rate of 15.6 per cent. This result underlines the findings of chapter 2.1 of lacking price competitiveness in such items.

IV. NATIONAL PARAMETERS FOR A MEXICAN RESTRUCTURING PROGRAMME

The preceding two chapters have focused on an evaluation of the development of the Mexican textile industry in international perspective and its performance in international markets. As a next step, this chapter is going to relate the findings obtained to variables such as technology or production capacity, which have to be considered as national parameters in a programme aiming at restructuring the textile industry.

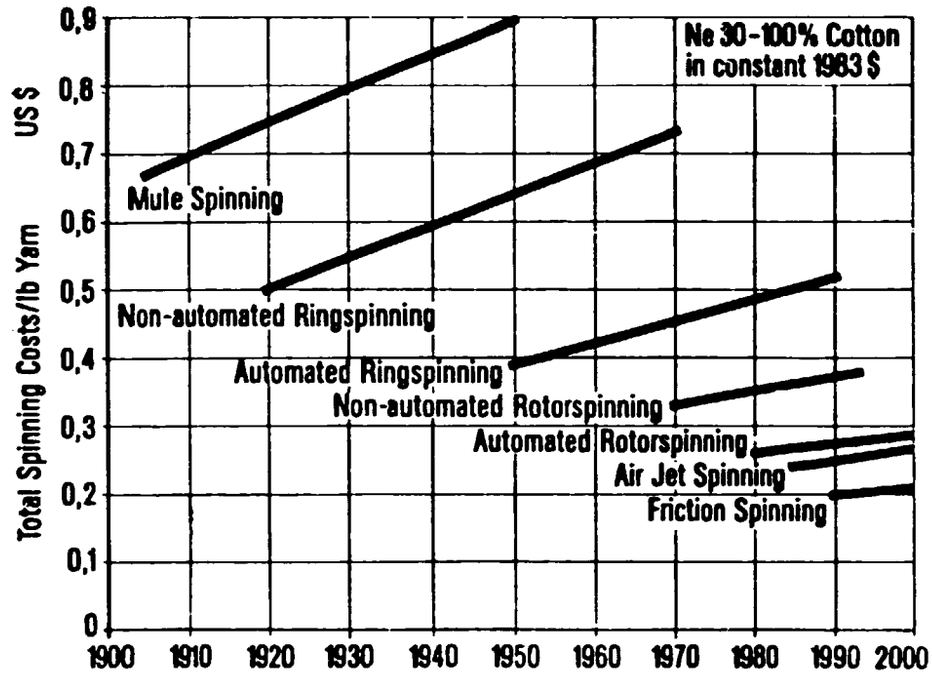
4.1 The Significance of Recent Technological Trends

It is precisely technological advances in combination with Government policies conducive to spread technological progress throughout the industry which are responsible for the regained competitiveness of the textile sector in industrialized countries.

Major technological developments have centered on the spinning process (including winding). Automatic equipment has been developed, and improvements in the ring spinning system have been made as well. Perhaps the most striking technological development in spinning was the introduction of open-end (rotor) spinning in the late 1960's. The main advantages of open-end spinning are as follows: it dispenses with both roving and winding processes; it has increased the spinning speed substantially - the rotor can now operate about three and a half times faster than the ring spindle; and it saves floor space, while at the same time reducing labour costs to roughly one-third of those of ring spinning. Recently, spinners' attention has been paid to the automation of open-end spinning the air-jet spinning and friction spinning.

The economic implications of technological advances in spinning may be illustrated with figure 4.

Figure 5 Effect of Technology Advance on Total Spinning Costs per Pound of 30's Cotton Yarn (constant 1983 dollars)



Source: Schlafhorst Dokumentation, No. 10

As can be seen,

- by about 1950 spinning a pound of 30's yarn on a non-automated ring-spinning frame costs only 72 per cent of producing the same yarn on a mule spinner;

- by about 1975 making a pound of 30's yarn on an automated, high-speed ringspinning frame was 25 per cent less expensive than on a slower ring frame without automatic doffer;

- by 1979 a second-generation rotor-spinning frame lowered the spinning costs by another 29 per cent as compared to the best ring frame;

- today, fully automated rotorspinning brings the cost/lb down to 54 per cent of that of the most modern ring frame;

- by the year 2000 it is likely that yet another spinning technology, possibly friction spinning, reduces the cost/lb to 72 per cent of that of fully automated, high-speed rotorspinning.

It can be expected that lower-cost yarn making systems will conquer even larger market shares, even though the new yarn may not have the same attributes than the one it replaces. If one would continue the lines in this chart, it becomes clear that the ever-widening disadvantage in terms of cost/lb, for instance between non-automated ringspinning and fully-automated rotorspinning by the year 2000 simply would eliminate those mills from competition which have not chosen to use the new yarn-making technologies. Although one can expect significant wage cost differences to persist even in the year 2000, the scope of expected productivity increases through technical progress suggests that lower wage costs in developing countries might not be sufficient to preserve their competitiveness using less advanced technologies.

Against this assessment of future trends, which is based on figures provided by a leading textile machinery manufacturer, one should keep in mind that versatility is still a great advantage of ring spinning. Sophisticated ringframes with automatic features will still be required for spinning combed yarns, yarns of high strength, and yarns having special characteristics that cannot be obtained with any other system. The fact that ringframe sales contribute a large proportion of machinery makers' profits suggests that ringframe developments will, under these circumstances, continue and newer machines will still be produced. This will have a further effect of delaying the introduction of open-end spinning as the future universal spinning system.

In the weaving sector, advances in loom technology have involved the development of shuttleless looms, as well as improvments in the speed of conventional looms. With the exception of Japan, automatic looms have replaced non-automatic looms almost completely in the industrial countries. In developing countries, with the notable exception of India, automatic looms have already become dominant in weaving.

In the 1970s, shuttleless looms have gained increasing importance in developed, but also in developing countries. Depending on the weft insertion mechanism, shuttleless looms may be divided into four categories, rapier, gripper (projectile), water-jet, and air-jet looms. Rapier looms have won popularity because of their versatility, and are widely used in the United States and Western Europe, together with gripper looms. Water-jet (hydraulic) shuttleless looms, which are applicable only to 'hydrophobic' filament yarns such as nylon, acrylic and polyester, have been adopted mainly in Japan and the Centrally Planned Economies.

The knitting sector has particularly benefitted from technological progress. First, knitting is one of the textile branches which has been most favoured by developments in synthetic fibre technology. In 1980, wool's share of total fibre consumption by knitting mills in the EC was only 12 per cent, while synthetic fibre such as acrylic, nylon and polyester accounted for about 65 per cent. Second, since knitting machines can operate much faster than weaving machines, knitting enjoys higher productivity and lower labour costs than weaving. Third, the introduction of electronics and microprocessors into knitting machines have brought about substantial simplification of pattern changes and increased versatility in terms of design scope. Finally, much effort has been directed into making garments more complete on the knitting machine. Socks, for example, are now completely machine-made.

The remarkable improvements in quality, functional property and dyeability of fabrics owe much to post-war developments in finishing and dyeing technologies. The increasing use of synthetic fibres with new properties in fabric making has stimulated the development of new dyes, new dyeing assistants and new dyeing processes. Jet-dyeing machines and computerization of dye cycles have recently made spectacular progress, and computerized colour matching, electronic monitoring of moisture and temperature, and process control by microprocessor systems have been introduced in modern dye mills.

In printing, over the last decade transfer printing in which design patterns printed on paper are transferred to fabrics has been increasingly introduced. This technique combined with a computerized process control, has played a major role in economizing labour and improving clearness of design and colour depth.

4.2 Machinery and Productivity in the Mexican Textile Industry

In the spinning sector, approximately a quarter of the machinery is less than ten years old excluding open-end rotors, all of which have been installed during the last ten years (Table 19). In international perspective, a share of 25 per cent of modern machinery, out of which more than one third has been installed during the last three years, must be considered as a remarkable investment average (Table 21). In fact, the Mexican share of spinning machinery installed during the last ten years in total Mexican spinning machinery is matched only by Italy, Turkey, India and the Province of Taiwan, and surpassed only by the Republic of Korea, Brazil and Egypt. On the other hand, the share of equipment using the most advanced spinning technology, rotor spinning, is only half the corresponding share on the world average.

Table 19. The Mexican Spinning Sector - Installed machinery ('000 units) and their Age

Age	Short staple spindles	% S.S.S.	% Tot. spindle	Long staple spindles	% L.S.S.	% Tot. spindl	Open end rotors	% O.E.R.	% Tot. spindles	Total spindles	% Total
0- 3 years	223	7,50	6,86	72,00	30,40	2,22	5,44	14,20	0,17	300,44	9,25
3-10 years	450	15,00	13,87	63,00	30,10	1,94	32,90	85,80	1,01	546,40	16,82
Over 10 years	2327	77,50	71,65	74,30	35,50	2,28	—	--	--	2400,80	73,93
TOTAL	3000	100,00	92,38	209,30	100,00	6,44	38,34	100,00	1,18	3247,80	100,00

Source: ITT Secofin Consimatex
Year : 1983

In the weaving sector, the machinery is not quite of such recent origin (Table 20). In fact, a share of 82 per cent of machinery older than ten years - although lower than the world average - , is rather high if compared with the corresponding share in several industrialized and Asian developing countries. These figures, however, are misleading as they disregard the technology incorporated in these investments. Thus, one quarter of installed looms are shuttle-less, which compares favourably internationally. On the other hand, almost half of shuttle-less looms are more than ten years old, indicating a persisting technology gap to South-East Asian exporters such as the Republic of Korea and the Province of Taiwan.

Table 20. The Mexican Weaving Sector - Installed Machinery and their Age

Age	No.of looms with shuttle	% with shutt.	% Total looms	No.of shuttle less looms	% shuttleless looms	% Total looms	Total No. of looms	% Total
0 - 3 years	424	1.1	0.8	2.959	22.70	5.60	3.383	6.40
3 -10 "	2.073	5.2	3.95	4.014	30.70	7.65	6.087	11.60
Over 10 "	37.017	93.7	70.44	6.074	46.60	11.56	43.091	82
TOTAL	39.514	100	75.19	13.047	100	24.81	52.561	100

Source: ITMF - SECOFI - CANAINTEX
Year: 1983

This indication is supported by Table 22, which gives an international comparison of spinning and weaving productivity. It should be noted that these figures should be regarded only as rough approximations. In fact, crucial data for carrying out both a spinning

Table 21 Installed Textile Machinery in the World and Their Age

Country	Spindles (%)				Looms (%)				World total (%)		Quantity	
	Age years	Total	Short fibre	Wide fibre	Rotors	Age years	Totals	with shuttle	Shuttle-less looms	Spindles	Looms	Total spindles	Total looms
Mexico	0 - 3	9.25	6.86	2.22	0.17	0 - 3	6.40	0.80	5.60			100.440	3.383
	3 -10	16.82	13.87	1.94	1.01	3 -10	11.60	3.95	7.65			546.400	6.037
	over	73.93	71.65	2.28	—	over	82.00	70.44	11.56	1.7	1.4	2.400.800	43.091
	total	100.00	92.38	6.44	1.18	total	100.00	75.19	24.81			3.247.640	52.561
U.S.A.	0 - 3	2.03	1.90	0.13	0.5	0 - 3	6.07	0.06	6.01			322.996	13.840
	3 -10	5.17	3.30	0.07	1.3	3 -10	16.77	4.25	12.51			791.051	38.240
	over	92.80	86.50	5.90	0.4	over	77.16	72.57	4.59	8.2	6.3	14.376.953	175.975
	total	100.00	91.70	6.1	2.2	total	100.00	76.89	23.11			15.491.000	228.055
Brazil	0 - 3	5.38	5.15	0.07	0.15	0 - 3	1.30	0.75	0.55			265.724	1.970
	3 -10	30.02	29.06	0.1	0.86	3 -10	6.70	5.35	1.35			1.681.112	10.136
	over	64.60	60.67	3.88	0.05	over	92.00	89.95	2.05	2.6	4.1	3.187.168	137.830
	total	5.00	95.88	4.05	1.07	total	100.00	96.05	3.95			4.934.004	149.936
France	0 - 3	4.85	2.58	0.65	1.72	0 - 3	7.24	0.12	7.12			117.696	3.186
	3 -10	8.09	5.50	0.06	2.53	3 -10	22.56	4.96	17.60			196.242	9.925
	over	87.06	61.50	24.48	1.08	over	70.20	65.20	5.00	1.3	1.2	2.112.616	30.883
	total	100.00	69.58	25.19	5.23	total	100.00	70.28	29.72			2.426.554	43.994
Italy	0 - 3	6.37	2.94	2.99	0.44	0 - 3	8.43	0.36	8.07			438.383	8.104
	3 -10	20.34	17.50	1.64	1.20	3 -10	21.73	3.20	17.93			1.399.830	20.895
	over	73.29	25.12	48.39	- 0.22	over	69.84	66.73	3.11	3.6	2.6	5.045.227	67.174
	total	100.00	45.56	53.02	1.42	total	100.00	70.89	29.11			6.883.440	96.173
F. R. Germany	0 - 3	5.38	2.10	1.62	1.66	0 - 3	12.80	0.11	12.69			161.302	4.143
	3 -10	16.25	13.83	0.42	2.00	3 -10	37.18	10.56	26.62			486.850	12.027
	over	78.37	57.47	20.25	0.65	over	50.02	47.62	2.40	1.6	0.9	2.347.714	16.180
	total	100.00	73.40	22.29	4.31	total	100.00	58.29	41.71			2.995.866	32.350
U.S.S.R.	0 - 3	5.56	--	—	5.56	0 - 3	2.42	0.02	2.40			979.079	8.234
	3 -10	9.24	--	—	9.24	3 -10	4.68	0.19	4.49			1.625.344	15.935
	over	85.20	85.22	0.001	- 0.021	over	92.90	73.60	19.30	9.3	9.4	14.995.881	315.921
	total	100.00	85.22	0.001	14.779	total	100.00	73.81	26.19			17.600.304	340.090
Turkey	0 - 3	3.73	1.66	1.90	0.17	0 - 3	5.51	1.65	3.86			135.322	2.608
	3 -10	24.23	23.78	0.07	0.38	3 -10	10.46	6.86	3.60			881.821	4.949
	over	72.04	60.70	11.1	- 0.91	over	84.03	79.80	4.23	1.9	1.3	2.619.843	39.756
	total	100.00	86.14	13.07	0.54	total	100.00	88.31	11.69			3.636.986	47.311
Egypt	0 - 3	13.90	12.7	1.06	0.15	0 - 3	11.60	5.86	5.74			309.764	4.868
	3 -10	33.20	31.4	0.07	1.7	3 -10	17.87	16.90	0.97			739.331	7.503
	over	52.90	49.8	3.15	- 0.03	over	70.53	71.63	- 1.10	1.17	1.1	1.178.330	29.607
	total	100.00	93.9	4.28	1.82	total	100.00	94.39	5.61			2.227.425	41.978
P.R. China	0 - 3	0.18	0.02	0.15	0.01	0 - 3	0.14	0.02	0.11			51.128	862
	3 -10	0.69	0.60	0.02	0.07	3 -10	0.11	0.08	0.03			184.392	777
	over	99.13	99.12	—	0.01	over	99.75	99.76	—	14.2	18.2	26.764.490	659.361
	total	100.00	99.74	0.17	0.09	total	100.00	99.86	0.14			27.000.010	661.000
India	0 - 3	9.5	8.80	0.65	0.4	0 - 3	3.95	3.75	0.20			1.801.891	10.610
	3 -10	19.4	18.80	0.64	0.4	3 - 10	5.51	3.32	0.19			3.696.250	14.781
	over	71.10	69.91	1.12	- 0.1	over	90.54	90.48	0.06	10.8	7.3	15.113.046	261.844
	total	100.00	97.51	2.42	0.7	total	100.00	99.55	0.45			20.611.187	267.235
Japan	0 - 3	2.34	2.17	0.09	0.13	0 - 3	8.14	3.09	5.05			291.928	26.807
	3 -10	6.61	5.97	0.01	0.63	3 -10	12.74	4.26	8.48			823.404	42.326
	over	91.05	73.60	6.35	1.10	over	79.12	78.71	0.81	6.5	9.14	11.342.128	262.867
	total	100.00	1.69	16.45	1.86	total	100.00	86.06	13.94			12.457.460	332.000
Republic of Korea	0 - 3	4.77	4.28	0.45	0.04	0 - 3	26.00	22.80	3.20			237.954	20.996
	3 -10	40.2	8.87	0.91	0.42	3 -10	42.40	34.80	7.50			2.001.593	33.845
	over	55.03	36.55	18.50	- 0.02	over	31.60	30.10	1.60	2.6	2.2	2.742.853	25.159
	total	100.00	79.70	19.86	0.44	total	100.00	87.7	12.30			4.982.400	80.000
Pakistan	0 - 3	3.75	3.35	0.37	0.03	0 - 3	0.73	0.69	0.04			163.052	166
	3 -10	14.02	13.13	0.30	0.59	3 -10	13.51	11.43	2.08			609.664	3.067
	over	82.23	82.30	—	- 0.07	over	85.76	85.80	- 0.04	2.3	0.6	3.575.008	19.460
	total	100.00	98.78	0.67	0.55	total	100.00	97.92	2.08			4.347.724	22.693
Taiwan Province	0 - 3	7.30	5.73	0.95	0.62	0 - 3	13.76	4.95	8.81			333.046	8.454
	3 -10	14.46	12.84	0.29	1.33	3 -10	29.82	18.60	1.22			661.120	18.324
	over	78.24	78.36	- 0.28	0.16	over	56.42	56.42	--	2.4	1.7	3.571.834	34.680
	total	100.00	96.93	0.96	2.11	total	100.00	79.97	20.03			4.566.000	61.458
World Total	0 - 4	4.12	2.90	0.67	0.75	0 - 5	4.20	1.70	2.5			7.355.798	150.704
	3 -10	12.68	10.65	0.28	1.75	3 -10	10.60	5.50	5.1			24.064.987	368.162
	over	83.20	76.25	6.90	0.05	over	85.20	72.30	12.9	100.00	100.00	157.814.235	3.098.933
	total	100.00	89.80	7.65	2.55	total	100.00	79.50	20.5			189.235.020	3.643.799

Source: BECOFI, CANAINTEX, ITMF, International Wool Institute, OECD

Year: 1983

Table 22 (a) International Comparison of Spinning Productivity, 1982 (selected countries)

Country	kg/spindle/year	working hours/ year	kg/working hour
Mexico	80	6,200	.013
U.S.A.	126	6,200	.020
Brazil	108	6,000	.018
France	154	5,200	.030
Italy	138	5,200	.027
F.R. Germany	206	5,200	.040
U.S.S.R.	153	4,500	.034
Turkey	105	7,200	.015
Egypt	111	8,000	.014
P.R. China	138	n.a.	n.a.
India	65	6,145	.011
Japan	102	6,184	.016
Republic of Korea	222	8,270	.027
Pakistan	104	5,500	.019
Taiwan Province	218	8,200	.027
World Total	133	n.a.	n.a.

Table 22 (b) International Comparison of Weaving Productivity, 1982 (selected countries)

Country	m^2/loom/year	working hours/ year	m^2/loom/working hour
Mexico	22,423	6,200	3.6
U.S.A.	36,842	6,400	5.8
Brazil	15,432	5,200	3.0
France	21,720	4,800	4.5
Italy	17,968	5,000	3.6
F.R. Germany	34,096	5,000	6.8
U.S.S.R.	29,411	n.a.	n.a.
Turkey	17,872	7,200	2.5
Egypt	23,631	7,500	3.2
P.R. China	32,754	n.a.	n.a.
India	28,439	6,500	4.4
Japan	13,602	5,800	2.3
Republic of Korea	20,200	8,148	2.5
Pakistan	14,136	5,800	2.4
Taiwan Province	30,655	8,200	3.7
World Total	22,252	n.a.	n.a.

Sources: Italian Textile Association, B.I.T. ITMF, CANAINTEX and Tables 19, 20, 21, 23.

HOK and a weaving HOKm[1/] such as average title of yarn produced, average weight by m^2 of fabric produced or number of insertions per mt of wefts, were not available.

With these reservations in mind one can observe that the technical efficiency of Mexico's spinning sector, measured as kg per spindle per working hour, is in line with developing countries such as Turkey, Egypt and India, but falls a little bit short of productivity in Brazil and is significantly smaller than in the Republic of Korea and the Province of Taiwan. Concerning the latter two, Mexico's productivity amounts to only 48 per cent of productivity achieved in these countries. However, the relative performance of Mexico's spinning sector appears dramatically worse if total spinning productivity is considered, measured as kg per spindle per year.

Now, the Mexican spinning sector falls clearly short of countries such as Turkey, Egypt and Brazil, and compared to the main South-East Asian exporters, productivity is merely 36 to 38 per cent of their respective values. The variable explaining this deterioration of the relative position of Mexico's spinning sector is the number of average working hours per spindle, which, in Mexico, is higher than in the industrialized countries of Europe, but far smaller than in Turkey, Egypt, the Province of Taiwan and the Republic of Korea.

Interpreting these finding one needs to be aware that the figure of average annual working hours per spindle is the result of several factors which vary across countries, such as official regulations of working time, unplanned production stops due to labour disputes or machine failure, and planned reductions of output due to lack of demand. Thus, the high average working hours per spindle in the South-East Asian countries certainly reflect both a higher demand faced by countries which have successfully penetrated international markets and a high degree of labour discipline.

1/ HOK: index of spinning efficiency corresponding to hours needed for production of 100 kg of 24/1 Ne cotton yarn
HOKm: index of weaving efficiency corresponding to hours needed for insertion of 1 km of weft of 24/1 Ne cotton.

In addition, estimating the average output per spindle assumes that, in fact, all spindles are in operation, irrespective of their age. This is not a very realistic assumption, as demand constraints generally will first affect older, less efficient equipment. Comparing the actual efficiency of the spinning sector in various countries one would ideally need to relate actual output to actual spindles under operation. This information is not available, and the figures presented in the table should be regarded as indicating broad efficiency differences and restructuring (including scrapping!) requirements of the total spinning sector in the various countries.

In the weaving sector, surprisingly the average technical efficiency of Mexico's industry appears to be higher in international comparison than the efficiency of the spinning sector despite the higher age of weaving machinery. This result should be, therefore, interpreted with care and the same qualifications concerning quality differences as was discussed in relation to spinning. Taking total weaving productivity measured as average annual sqm produced per loom, the figure for Mexico corresponds to the world average. Again, the same qualifications discussed in connection with spinning apply.

4.3 Production and Capacity Utilization in the Mexican Textile Industry

A detailed break-down by product-type of Mexican textile production in 1983 is given in Table 23. In yarn production, discontinuous spun yarns dominate. The spinning sector's single most important product category continues to be cotton yarns, accounting for 43 per cent of spun yarn output. Cotton/polyester blends are the second most important single category of spun yarns, accounting for 24 per cent of spun yarn output. These blends are widely used to produce fabrics with properties highly preferred by consumers, such as easy care. They also ensure dimensional stability, strength, abrasion resistance and other advantages. An upgrading of the product basket of the Mexican textile industry would, therefore, require to increase the share of this type of products in total yarn production.

Five per cent of spun yarn production is accounted for by rotor spinning, although rotors account for only 1 per cent of installed

Table 23. Mexican Textile Production, 1983

FIBRE COMPOSITION	PRODUCTION ('000/TONS/YEAR)										
	SPINNING				WEAVING						
	Short staple spindles	Long staple spindles	Rotors	Total	WF	K	SO/ST	PMR	CPT	OTHER	TOT
COTTON	114.00			114.00	73.00	22.50	0.30	5.70	0.10	12.40	114.00
COTTON/PES 20/80 COTTON/PES 35/65 COTTON/PES 50/50	63.00			63.00	63.00						63.00
WOOL		2.48		2.48	2.08	0.20	0.10		0.10		2.48
WOOL/PES 20/80 WOOL/PES 45/35		2.10		2.10	2.10						2.10
WOOL/PA 80/20		0.20		0.20	0.20						0.20
WOOL/PAC 50/50		1.88		1.88	1.88						1.88
POLYESTER	3.94		6.00	9.94	0.54	1.40		0.40	2.30	5.30	9.94
ACRYLIC	31.00	20.00	5.66	56.66	12.36	33.30	4.60	0.30	4.70	1.20	56.66
POLYAMIDES		1.74		1.74	0.04	0.20			1.10	0.40	1.74
POLYPROPYLENE			2.00	2.00	1.70					0.30	2.00
ACETATE	6.40			6.40						6.40	6.40
VISCOSE RAYON	2.20			2.20	0.20					2.00	2.20
TOTALS	220.54	28.40	13.66	262.60	157.10	57.80	5.00	6.40	8.30	28.00	262.60
POLYESTER	CONTINUOUS YARN			64.10	34.10	27.30	0.50	1.80		0.40	64.10
POLYAMIDES				24.90	3.00	12.60	6.70	1.00	1.30	0.30	24.90
POLYPROPYLENE				4.80	4.70					0.10	4.80
ACETATE				6.40	3.90	2.20		0.20		0.10	6.40
VISCOSE RAYON				3.00	1.00	0.30			1.20	0.50	3.00
OTHERS				0.10		0.10					
TOTAL CONTINUOUS YARN				103.30	46.70	42.50	7.20	3.00	2.50	1.40	103.30

LEGENDA: WF = woven fabric
K = knitted fabric
SO = socks
ST = stockings
PMR = passementerie
CPT = carpets

PES = polyester
PA = polyamidic
PAC = acrylic

Source: SECOFI

spinning machinery. This difference points to high productivity combined with higher capacity utilization in enterprises which have invested in this technology. As to continuous yarns, polyester yarn is the by far most important product which confirms the results of previous sections of this report.

In fabric formation, weaving is the dominating activity in processing spun yarns. In continuous yarn processing, knitting is challenging weaving, as knitting is one of the textile branches which has been most favoured by developments in synthetic fibre technology.

The UNIDO mission tried to estimate utilization rates of productive capacity in Mexico's textile industry and to put this into international perspective. It should be emphasized that, due to limitations of data availability and problems of data comparability, the figures shown in Table 24 should merely be regarded as indicating rough orders of magnitude. Nevertheless, it becomes clear how seriously the recession has affected the Mexican textile industry. In the fifteen countries included in the indices only one competitor, India, had greater idle production in spinning than Mexico and in weaving five competitors had greater idle capacity.

To get more insight as to the underlying causes of the relatively high capacity underutilization in Mexico, Table 25 gives more detailed information on capacity utilization by product type and by production process. As to stages in the production chain, weaving shows a higher capacity utilization than spinning. This result may be partly explained with the finding of section 4.2 that weaving productivity in Mexico on average is closer to international standards than spinning productivity. However, the figures also indicate a clearly dualistic structure of the spinning sector itself. Thus, the most modern equipment used in cotton spinning (rotors) has a significantly higher utilization rate.

The same consideration concerning the age of the equipment applies to the weaving sector, although the investment level here has not entirely matched that which characterized the spinning sector in recent years. It appears particularly important that the modernization of this sector should continue in the future as many machines are older than 10 years. The latter could be more effectively directed towards the production of special items for seasonal campaigns.

Table 24. International textile idle capacity, 1982/83

(selected countries)

Country	Spinning Indexes				Weaving Indexes			
	Possible production	Present production	Idle production	Idle capacity quantity '000/tons	Possible production	Present production	Idle production	Idle capacity quantity mil./m^2
Mexico	100	66	34	129	100	81	19	286
USA	100	75	25	654	100	92	8	752
Brazil*	100	67	33	272	100	77	23	607
France*	100	87	13	55	100	84	16	186
Italy	100	90	10	114	100	85	15	310
F.R.Germany	100	95	5	32	100	87	13	165
USSR*	100	84	16	546	100	76	24	28.000
Turkey*	100	87	13	60	100	76	24	112
Egypt*	100	66	34	129	100	87	13	150
P.R. China	100	87	13	561	100	83	17	49.500
India*	100	59	41	2.141	100	71	29	4.690
Japan	100	98	2	32	100	87	13	527
Rep.Korea	100	95	5	60	100	91	9	61
Pakistan*	100	89	11	53	100	72	28	119
Taiwan Prov.	100	98	3	22	100	87	13	280
World	100	80	20	6.300	100	81	19	19.770

* = 1982

Source: SOMEA calculations, based on preceding tables.

Note: Calculation of Indeces

Index are calculated as: $I = 100 \left(1 - \frac{P}{F}\right)$

where: P = actual production (kg yarn/hour)

F = potential production = $\sum_{i=1,2,3}$

where: n_i = number of spindles in agerange i

1 = 0 - 3 years

2 = 3 - 10 years

3 = over 10 years

P_i = potential productivity of spindles in agerange i (kg/spindle/hour)

The same formulas apply to looms with P = m^2/hour, n_i = number of looms, P_i = m^2/loom/hour

Table 25. Installed Capacity and Production in the Mexican Textile Industry, 1983

	Installed Capacity		Production Tons/Year					
				Chemical Fibers			Total	Capacity Utilization
SPINNING COTTON	Units	Tons/Year	Cotton	Short Fibers	Filament	Wool	Production	Per cent)
Spindles	1'735,728	189,801	106,611.4	3,000.0	-	-	109,611.4	57.7
Rotors	34,926	25,461	19,520.1	436.0	-	-	19,956.1	78.3
Subtotal cotton:		215,262	126,131.5	3,436.0	-	-	129,567.5	60.2
CHEMICAL FIBERS	1'345,930	147,177	-	117,132.0	-	300	117,432.0	79.7
WOOL	164,938	18,035	-	832.0	-	3,800	4,632.0	25.6
T O T A L :	3'246,596	380,474	126,131.5	121,400.0	-	4,100	251,631.5	66.1
Total Rotors	34,926	-	-	-	-	-	-	-
WEAVING								
Cotton	12,627	102,278	75,342.4	3,367.0	1,500.0	-	80,209.4	78.4
Chemical Fibers	24,471	143,155	18,835.6	53,101.0	45,032.0	-	116,968.6	81.7
Wool	1,340	12,194	-	832.0	168.0	3,700	3,800.0	31.1
T O T A L :	38,438	257,627	94,178.0	57,300.0	46,700.0	3,700	200,978.0	78.0
KNITTING								
Rectilinear machines	4,237	27,684	4,140.0	7,100.0	7,820.0	200.0	19,260.0	69.6
Circular machines with large and medium diameter	5,919	79,154	11,835.0	18,462.6	22,355.0	-	52,652.6	66.5
Socks	7,887	11,570	300.0	3,958.0	4,400.0	100.0	8,758.0	75.7
Stockings	3,996	4,666	-	-	3,218.0	-	3,218.0	68.9
Raschel	936	18,954	2,812.5	4,387.5	5,312.5	-	12,512.5	66.0
Tricot	918	24,786	3,712.5	5,791.5	7,012.5	-	16,516.8	66.6
T O T A L :		166,814	22,800.0	39,700.0	50,118.0	300.0	112,918.0	67.6

Table 25 cont'd

	Installed Capacity		Production Tons/Year					
	"	Tons/Year	Cotton	Chemical Fibers Short Fibers	Chemical Fibers Filament	Wool	Total Production	Capacity Utilization (Per cent)
PASSEMENTERIE								
Braiders		582	3,357.3	6,530.8	3,298.4		13,186.5	75.0
Narrow Fabric Looms		282	2,342.7	4,935.7	2,301.6	-	9,580.0	78.0
T O T A L :		,864	5,700.0	11,466.5	5,600.0	-	22,766.5	76.2
TUFTING	139.0	35,184	100.0	8,100.0	1,300.0	100.0	9,600.0	27.2
GRAND TOTAL		489,489	122,778.0	116,566.5	103,718.0	4,100.0	346,262.5	70.7

Source: SECOFI

The relation between the age of installed machinery and capacity utilization is also supported by Table 26, which shows the results of estimations of idle capacity under various assumptions. The remarkable result is that the estimated capacity of machinery which is either modern or old, but still in good conditions (assumed to comprise half of the machinery older than ten years), is almost identical to the actual spinning and weaving production. It can be concluded that obviously there exists a significant share of obsolete machinery.

The dualistic structure of the Mexican textile industry implied by these figures is, however, less clear-cut than it might seem. In fact, the borderline between both segments runs through individual enterprises, where the mission observed very often that modern machinery was introduced into old departments where it coexists with outdated machines and plants. This, again, adversely affects the efficiency of the modern machinery.

Modernity of equipment is only one factor establishing a dualistic structure of the Mexican textile industry. A second distinguishing criterion is the type of fiber produced, a factor which partly overlaps with the modernity criterion. Thus, in the spinning sector, also the production of chemical fibers shows above average capacity utilization. This finding is in line with the result of section 3.3 that producers of synthetic yarns constitute the most successful segment of the Mexican textile industry when it comes to penetrating foreign markets.

Finally, the knitting sector is a case where the main problems can neither be attributed to technological dualism in the sector nor to an inappropriate product-mix, but mainly to problems which have to be solved in downstream activities.

The sector is experiencing its worst crises particularly as regards large diameters knitting machines for tubular fabrics, with only 66.5% capacity utilisation in 1983. The same phenomenon took place in Europe in the years 1974-75 with an almost vertical drop of the demand for synthetic jersey (polyesther, polyammidic yarn). Here we find idle capacity which stems not only from older inefficient machinery but also from new and modern equipment. Overcoming the depression was possible in Europe only after a radical transformation was achieved which did not interest the

Table 26. Idle and Obsolete Capacity in Mexico's Textile Industry, 1983

	SPINDLES			LOOMS		
	Production '000 tons	Age of installed machinery		Production million m^2	Age of installed machinery	
		0 ÷ 10 years No.	over 10 years No.		0 ÷ 10 years No.	over 10 years No.
Present production	262 A	846.840	2.400.800	1.166 A	9.470	43.091
Possible production	366 B			1.452 B		
Idle capacity 1	104 B-A			286 B-A		
Possible prod. without obsol. machinery	270 B'	846.840	1.200.000	1.210 B'	9.470	24.000
Idle capacity 2	8 B'-A			46 B'-A		

A = Present production with machinery given in following two columns

B = Possible production with machinery given in following two columns

B' = Possible production with elimination of obsolete machinery (about ¼ of machinery older than 10 years) and efficient utilization of all remaining machinery

Source: UNIDO mission estimates, based on information provided by SECOFI and data collected during plant visits.

sector at hand, but rather the next downstream department. It was in fact thanks to the restructuring of the finishing sector that it was possible to start production of mercerized and non-mercerized cotton fabric for casual wear and sport-goods, abandoning the synthetic fibres for this type of product.

The finishing sector emerges as one of the key segments of the Mexican textile industry on which restructuring measures should be focused. In Mexico the lack of standardization of production and the low quality of fabrics used in confectioning pose serious problems for the finishing sector. They originate mainly from poor tinting, printing and finishing technology. The Mexican production is lacking in particular that softness which is a primary characteristic of European production. Moreover the lack of variety of patterns produced and fabrics employed reduces the competitiveness of the Mexican industry from the point of view of quality.

Restructuring the Mexican textile industry could include the introduction of new technologies, created in Europe mainly in order to achieve reductions of energy consumption rather than to improve product quality. These technologies have gained more and more momentum as the machinery developed has proved very versatile and given excellent results as far as product quality is concerned. Processes of minimal bath application have given excellent results on delicate fabrics, very high tentering and drying efficiencies (40% increases in production capacity). Examples include finishing processes carried out with impregnating machines, such as Triatex, Kusters, ASISA etc., and preparation for dyeing, dyeing and washing carried out with the Pad batch system or with the new Mini Steam (padding machine and high temperature steamer). Moreover the utilization of new silicon and epoxy resins achieves a high softness without affecting adversely the texture of traditional fabrics.

4.4 Structure of the Industry

In the last two decades one of the most critical factors determining the structure of the global textile industry has been the growing dominance of a small number of chemical giants, with man-made fibre interests in the textile industry as a whole. Twelve companies account for about two-thirds of world fibres production, and 80 to 90% of world trade in fibres. In Mexico in 1983 there were 2,013 establishments engaged in producing textiles, of which more than three-quarters were engaged in man-made fibre production, 2% in wool, and 20% in cotton.

Man-made fibre production in Mexico is dominated by the following major companies:

Celanese Mexicana, S.A.
Celulosa Y. Derivados, S.A.
Fibras Quimicas, S.A.
Fibras Sinteticas, S.A.
Fibrasomni, S.A.
Finacril, S.A.
Industrias Petroquimicas Mexicanas, S.A.
Kimex, S.A.
Nylon de Mexico, S.A.
Olefin Fiber
Olefin Film Fiber

Major U.S. and Dutch multinational companies are shareholders of several of these companies, such as

Akzo N.V. (Netherlands): Fibras Quimicas 40%, Alfa-group 60%;
Celanese Corporation (USA): Celanese Mexicana 40%, public 60%;
E.I. Du Pont de Nemours & Co. (USA): Nylon de Mexico 40%, Alfa-group 51%, public 9%;
Owens-Corning Fiberglas Corporation (USA): Vitro-Fibras 40%, Vitro Group 60%.

Apart from man-made fiber production, a very high degree of vertical integration is a key characteristic of the structure of the Mexican textile industdry. Against this, in Europe and in the U.S.A. there has been an increasing trend over the last decade towards plants which carry out only one process step, spinning, weaving, finishing or confectioning.

Moreover, for each process step there has been research on the optimal size in relation to production. It is advantageous to reduce the production range to a limited number of articles. In practice a minimum number is given by the optimal size of the plant. The results are significant in terms of cost savings and ease of management. Such enterprises are more dynamic and effective than the old integrated wool or cotton mills. As an example one might consider a spinning plant with 100,000 spindles which may produce, in view of its size, 10 different yarn titles facing all related difficulties for a correct planning of the different work phases (preparation, spinning, cone winding and twisting). The production of only one title with 10,000 spindles is far more simple and effective. The net result is that 10 spinning plants producing one title each are better organized and more effective than the integrated spinning plant, despite a multiplication of management organization (10 plant managers, financial managers, etc.). If one considers a vertical plant having to face all production imbalances between spinning department, weaving, finishing and confectioning the results of reducing the dimensions and standardizing the production are even more evident.

4.5 Organization and Marketing

The UNIDO mission observed that many enterprises are not yet using efficient administrative and management procedures in their plants which would permit far more efficient plant management.

Further weaknesses of the system are related to the distribution pattern of Mexican goods to the public. A wide range of unco-ordinated production centres on the one hand (especially the widespread informal sector) and an undersized organization of production outlets are brought together by means of several intermediate steps which may lead to distortions in terms of pricing and commercial conditions.

The end result is that much of the informal sector output is traded unofficially and the official industry and market is forced to coexist with a parallel organization and black market where illegal imports find an immediate and easy access.

The high costs of transport in Mexico may be explained by deficiencies in the distribution system. As the standstill time for trucks is very high, with changing and discharging being carried out in small lots, transport cost is high with only partial loads. Difficulties in obtaining spare parts and lack of well equipped mechanical shops compound the problem.

Even more serious deficiencies of the system are found at a conceptual level at the marketing end. Only now is the Mexican textile industry beginning to pay the necessary attention to marketing. The reason is to be found in the history of the development of the industry, which has always directed its efforts towards the domestic market sheltered from foreign competition by restrictions on imports. The lack of foreign competition has provided little incentive for research of quality and cost savings.

An appropriate restructuring policy package could have a long term favourable effect on the local industry as it will be forced to rationalize its production and entrepreneurs will be forced to make medium and long term plans in order to meet the sophisticated demands of the international market, with an overall positive effect on the product quality.

V. SUMMARY AND RECOMMENDATIONS: TOWARDS A PROGRAMME OF ACTION

It was the endeavour of the preceding chapters to give a detailed picture of the Mexican textile industry: its past achievements, development prospects and restructuring requirements. It is hoped that the result of this research work will prove useful for the design of a package of policies aiming at facilitating and promoting the required restructuring of the Mexican textile industry.

The specific shape of such a policy package would need to give due consideration to given parameters, such as the existing legal and institutional framework, the social and political aspects of the Mexican reality and the availability of resources to support a restructuring programme. It would therefore go beyond the scope of this advisory study to elaborate the details of a pertinent policy package. Instead, the focus of this concluding chapter is to briefly summarize and mutually relate the various results of the research, to highlight the focal points for a future restructuring programme and to indicate suitable policy orientations for a restructuring policy package.

5.1 Penetrating New Markets

Domestic demand was the major source of growth for the Mexican textile industry for the last three decades (section 1.1). Correspondingly, the industry was particular hard hit by the break down of domestic demand in 1983.

Although it can be expected that consumption per capita of textile fibers in Mexico will in the medium term regain the level of its peak in 1979, a further reliance on those domestic markets which were the predominant source of growth in the past might not ensure satisfactory rates of output growth in the future. The two main reasons in support of this argument are (a) the persisting macro-economic problems of the Mexican economy, which in the medium term do not make a dynamic growth of domestic demand appear to be very likely, and (b) the fact that at its peak in 1979, total textile fiber consumption in Mexico was already

significantly above the level "normally" associated with the per capita income of Mexico in this year (section 3.2). New markets will, therefore, need to be penetrated - and even created.

The latter requirement refers to the fact that a significant potential of the internal market is presently only partly utilized by the domestic industry. A relatively concentrated purchasing power has resulted in a structure of demand and consumption which is "normally" associated with higher levels of average income per capita (section 3.2).

The Mexican textile industry has adjusted its production to this structure of demand. A comparison of sales prices showed that Mexican production was least competitive in low quality items and most competitive in several medium quality items (section 2.1). It, therefore, presently neither utilizes the full potential of demand from Mexico's population with low income nor does it serve the attractive market of high-profit, high-quality items.

To be realistic, however, the potential of demand from great masses of the population which presently have low income should not be expected to become a powerful new source of demand in the short or medium term. Given the actual situation of the Mexican economy, to concentrate restructuring efforts on already existing demand for medium and high quality items in internal and external markets would appear to be a more effective use of scarce resources.

Mexico's situation today cannot be compared to the situation which the export-oriented South East Asian countries were facing in the sixties. Mexico is not a typical low-wage country and has to be counted among the more advanced developing countries. Therefore, a restructuring of the textile industry should not be aimed at repeating the experience which countries like the Republic of Korea had in the sixties with cheap, low quality textiles for the international mass market. Instead, Mexico should make use of its advanced technological potential, the high skill level of its labour force and its resource base. New technological developments like CAD and CAM tend to confer new comparative advantages in the production of high quality fashion textiles on countries with a well developed, but internationally relatively low priced human capital

base, whereas the availability of cheap, unskilled labour is losing importance as a determining factor for cost advantages. Mexico can be expected to gain new, comparative advantages, in the production of quality textiles because it does have the relative factor endowment and industrial experience corresponding to these new technologies.

In view of changed macro-economic conditions in the 1980s, compared to the 1970s, even to preserve the current market share in the domestic market would require significant restructuring of the industry (section 3.3). The success of restructuring efforts would generate additional employment and income and thereby develop new sources of domestic demand.

5.2 Increasing Competitiveness: the Role of Trade Liberalization

The requirement for the industry to penetrate new markets if it wants to secure dynamic growth in the future implies the necessity to become more competitive. To achieve this objective, a restructuring programme would need to aim both at reducing costs for essential inputs to production and at increasing the productivity of production factors.

Issues related to the system of protection need to be considered in this context. The long history of economic protection in Mexico has cushioned local manufacturers from the rigours of international competition and thus reduced the constant pressure originating from the world market to maximize efficiency and productivity. The recent steps of the Mexican authorities to rationalize the system of protection and to reduce non-tariff barriers should, therefore, be welcomed as a step into the right direction.

However, liberalization in the foreign trade sector per se is neither appropriate nor sufficient to bring about the efficiency increasing effects which are normally associated with such policies in the economic textbooks. In fact, changes in only one set of economic parameters faced by industry might result in losses of competitiveness and additional set-backs in production, if other parameters are not allowed to adjust accordingly. For instance, in order to adjust to a new set of relative prices resulting from trade liberalization, industry would normally need to change its product mix, to increase productivity

and to re-allocate factors of production, both within and between enterprises. A consistent package of restructuring policies to facilitate this adjustment is, therefore, not only a complement to, but even an essential prerequisite for the success of trade liberalization policies.

By the same token, selective trade liberalization can be a precondition for the success of restructuring policies, if as a result of such policies internal demand increases for products which cannot be supplied in sufficient amounts, in sufficient quality or at competitive prices by the domestic industry. For instance, the National Chamber of the Mexican Textile Industry have indicated that tariffs and administered official prices result in their having to pay 80 per cent to 100 per cent more than world market prices for critical inputs.

Although it is difficult to assess the weight of the different factors contributing to high prices of inputs for the textile industry, the effects of protection seem to be of importance. It was indicated by industrialists to a UNIDO mission that the prices of dyes, produced by foreign affiliates of European firms in Mexico, were as high as 200 per cent the prices in Europe. As import tariffs are substantially less than this, it seems that foreign companies, insofar as they were more efficient than local producers, did make full use of the profit potential offered to them by the inefficiencies of Mexican competitors and by the tariff regime. Therefore, one might encourage both a gradual and selective liberalizaion of imports and tax policy measures aiming at reducing product prices and profits of foreign enterprises. Through a stimulation of internal competition, this would make possible a reduction of input prices for the domestic textile industry. Measures of this type might be specifically targeted at facilitating the restructuring of the printing, dyeing, finishing sector, which turned out to be a critical link in the Mexican textile industry's production chain.

5.3 Raising Productivity through Modernization

In the past, Mexican labour was not "cheap" by international standards, as was revealed by an international comparison of labour cost (section 2.2). Although recent devaluations have drastically increased

the international cost-competitiveness of Mexican labour, the long term development of the real exchange rate is unpredictable and subject to various factors independent of the international competitiveness of Mexican tradable goods. If employment in the Mexican textile industry is to grow it is essential to continue the modernization of the industry in order to increase labour productivity and international competitiveness (section 1.3).

The international comparison of Mexico's machine productivity in spinning showed that it was in line with other developing countries, except the export-oriented South-East Asian countries, whereas Mexico's weaving production per loom compared more favourably in the international context. The latter result, however, should be regarded with suspicion, particularly as the average age of Mexico's weaving machines is higher than in the case of spinning machinery. One explanation may be that quality differences were neglected.

A dramatic deterioration of the international comparative performance of Mexico's spinning sector resulted from combining machine productivity and operating hours per year, to arrive at average annual output. Now Mexico's productivity falls significantly short of international standards, even compared to other developing countries (section 4.2).

This quite unfavourable result may, however, exaggerate a little bit the "true" situation, as is suggested by explicitly incorporating capacity utilization into the analysis. Capacity utilization within both the spinning and weaving sector varies with machinery age. The estimated capacity of machinery which is either modern or old, but still in good conditions turned out to be in both sectors almost identical to the actual spinning and weaving production (section 4.3).

As a result it may be stated that in both sectors the need for modernization continues to exist. However, the significant deterioration of Mexico's comparative position resulting from incorporating the average working time of the machinery into the analysis made clear that technological modernization alone will not solve the problems of the industry. This issue will be further elaborated in section 5.4.

Further technological modernization in spinning and weaving will not improve the competitiveness of Mexican textile production unless current problems in textile finishing are solved. Poor tinting, printing and finishing technology are currently major bottlenecks against efforts to increase the quality and thus also the international competitiveness of the Mexican textile industry (section 2.3). Particularly the knitting sector, now in a deep crisis, should be helped by timely interventions in the tinting and finishing sector to give it the possibility to process cellulose derived fibres and cotton which are in demand in addition to the synthetic fabrics which have been prevalent in the local production up to now (section 3.2).

5.4 The Role of Labour

As argued in section 5.3, Mexico's labour force worked in past years not only at wage costs which were higher than in competing countries (to be emphasized again: mainly due to the development of the exchange rate!), but also with less productive machinery. Maintaining an exchange rate which keeps manufactured exports competitive and both financial and technical assistance to support efforts of enterprises to improve productivity and quality would therefore be necessary, although not sufficient elements of a restructuring programme. In addition, the average annual operating time of machinery in Mexico turned out to be a key factor reducing Mexico's competitiveness against several other developing countries. A partial explanation for relatively lower operating hours in Mexico may be sought in current labour problems reported to the UNIDO mission by industry. According to various statements, the number and quality of workers in individual factories is subject to large day to day variations. Unskilled workers have to be recruited ad hoc in order to fill shifts affected by absentism. Yet, existing labour legislation makes it diffcult for enterprises to lay off workers.

In the framework of a restructuring programme, an additional case for increased flexibility of the labour market would need to be made with respect to the effect of the programme itself. The results of an effective restructuring programme would be both increased efficiency and changes in the composition of output. In the past, policies of the

labour unions and their strong position to enforce have created obstacles to increased efficiency. For instance in textile mills, unions sometimes enforced that the number of looms and spindles to be taken care of by one worker fell far short of the standards in industrial countries. Industrialists felt that salary increases in line with the increased productivity of labour through raising the number of machines per worker may not be accepted by the trade union.

As to required changes in the composition of output, it cannot be expected that these changes could be accomplished always in the same enterprises. Some reallocation of labour between enterprises might be necessary. This, again, would be facilitated by labour legislation providing for greater flexibility. Existing labour legislation makes it difficult for enterprises to lay off workers in the course of structural change. Dismissal of workers requires payment of a compensation of 4 months' salary plus 20 days per working year; a reduction of one shift has to be compensated by an amount equivalent to 5-6 work months.

It is not being argued here that acquired rights of the labour force should be simply eliminated. Instead, one would need to look for solutions which give due consideration to the interests of all parties concerned and to the requirements of and prospects offered by the restructuring programme itself. One approach to be considered in this context would be to negotiate a specific collective agreement which would pertain only to those enterprises which participate in the restructuring programme. This agreement would couple more flexibility for entrepreneurs to reallocate or (temporarily) reduce the labour force with wage rates (or other forms of compensation) which would be higher than in enterprises outside this agreement and the restructuring programme. Higher wages would be justified by increased labour productivity as result of modernization efforts, but should of course not eliminate the necessary effect of productivity increases on the profitability and thus international competitiveness of enterprises.

To be effective, such a specific collective agreement would need to include all major trade unions presently established in the Mexican textile industry. In the past, the number of various trade unions resulting in various collective agreements with different length of duration, coverage

and content have posed serious obstacles to an efficient and mutually beneficial management of labour-capital relations in the industry.

5.5 Selecting Enterprises

As resources are scarce and support for restructuring cannot be granted to all enterprises indiscriminately, the establishment of oligibility criteria to benefit from a restructuring programme becomes a key element in designing the programme. The result of this report suggests that the structure of the industry would require some principal policy decisions to be taken.

Currently, the sector is characterized by various segments with respect to criteria such as market orientation, machinery age and product type/ fiber type. One segment of the industry consists of highly efficient subsidiaries of multinational companies producing synthetic filament yarns. These enterprises reacted quickly on improvements of their competitive position resulting from exchange rate variations and have established strong positions in the U.S. market, as witnessed by high rates of over-utilization of quotas (sections 3.3 and 4.3). Apparently, there would be no need for specific support.

The main choice to be made by a principal policy decision would be between the one large segment of the industry characterized by unutilized or strongly underutilized, outdated machinery, or the other one large segment of the industry characterized by the co-existence of modern and outdated machinery in the same or in vertically integrated production processes (section 4.3). Whereas one would argue in favour of the former that the need is highest, one would hold against this in favour of the latter that the chances of success would be greatest. Obviously, the eligibility criteria to benefit from the programme would need to be quite different in both cases. The more limited the resources available to be utilized in such a programme, the more meaningful would appear to be a targeted promotion of "half-modern" enterprises where remaining deficiencies due to outdated parts of the equipment reduce also the profitability of the modern equipment.

Actual investment in a specified reference period would be a suitable selection criterion in the "targeted approach" to restructuring, although it could not be relied upon exclusively. One carveat derives from the high

degree of vertical integration of the industry, which might need to be reduced in order to increase its overall efficiency (section 4.3). In this context, inefficiencies in a down-stream department of a highly integrated textile mill would not necessarily make a case for support. Instead, the creation of efficient independent productive units for such activities (e.g. finishing) should be promoted, coupled with measures to encourage subcontracting.

5.6 Establishing an Institutional Framework

The provision of financial resources to selected enterprises in order to promote technological modernization will not lead to the desired results without the creation of a corresponding institutional framework. As indicated in section 5.4, the involvement of labour in the implementation of a restructuring programme and its active co-operation would be essential pre-conditions for the success of the programme. There are no doubts that a successful restructuring programme will affect the labour force in terms of the allocation of jobs within and between enterprises, skill requirements etc. This does not mean, however, that a successful restructuring programme will result in a reduction of the labour force. On the contrary, in view of rapidly changing comparative advantages and increasingly fierce international competition, failing to implement a restructuring programme would actually endanger even the labour force actually employed.

In order to ensure the smooth functioning of the programme it is essential that all parties concerned should be consulted concerning its design and should co-operate in its implementation. It is, therefore, recommended to establish a permanent, tri-partite body, involving the Government, industry and labour, to discuss the key elements and instruments of a restructuring programme, to monitor the restructuring process and to serve as a forum for settling disputes between different actors.

This tri-partite body should be closely attached to or form part of an institution to be created which would be in charge of actually implementing the programme. This institution could, amongst others,

- provide financial support to the modernization efforts of small and medium sized companies;

- support the horizontal amalgamation of companies in order to create more efficient units;
- finance collective activities undertaken by the industry.

The latter type of programmes would include the cost for establishing and operating specific institutions, such as fashion centers, centers for technical studies, textile schools and quality control centers.

The financing of such institutions could come from various sources, and should be tied to some extent to the benefits. Thus, activities which would benefit specific enterprises (such as quality control centers) should be principally financed by their customers, through charging for their services. However, public financial support might be required in the initial phases, and in the long term, the demand for the services of such institutions should be promoted through appropriate policy action, such as the requirement of obtaining quality certifications issued by such institutes. Other activities could be partly financed through levies on imports and/or domestic production, as is currently being done in several European countries. It is recommended to carefully analyze the experience made with such instruments and institutions in countries which are presently implementing a restructuring programme, and to evaluate this experience against the specific Mexican situation.

There is no doubt that a carefully designed restructuring programme, which would be supported by the main actors concerned, would provide new, powerful stimuli to the growth of the Mexican textile industry, and thus, by the same token, contribute significantly to employment generation, foreign exchange earnings and the fulfilment of basic needs.

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Production of Cotton Fibres in Mexico, 1971-84

Crop year	Tons	Bales	Annual Change	Index 1970 = 100%
71-72	385, 804	1'753, 654	23.3	123.3
72-73	415, 609	1'889, 130	7 .7	132 9
73-74	364, 481	1'656, 730	- 12.7	116.5
74-75	497, 972	2'263, 514	36.6	159.2
75-76	199, 520	906, 911	- 60.0	63.8
76-77	224, 796	1'021, 797	12.7	71.9
77-78	357, 235	1'623, 792	58.9	114.2
78-79	340, 918	1'549, 624	- 4.6	109.0
79-80	330, 000	1'500, 000	- 3.2	105.5
80-81	352, 202	1'600, 918	6.7	112.6
81-82	313, 216	1'423, 708	- 11.1	100.1
82-83	216, 353	872, 209	- 39.7	61.3
83-84	220, 000	1'000, 000	12.8	70.3

Source: SECOFI

Apparent National Consumption of Wool Fibres in Mexico, 1970-1983 (tons)

Year	National Purchases	%	Imports	%	Apparent National Consumption	%
1970	1,221.0	100.00	9,783.8	100.00	11,004.8	100.00
1971	1,435.0	117.53	7,304.0	74.65	8,739.0	79.41
1972	1,852.0	151.68	5,090.2	52.03	6,942.2	63.08
1973	1,075.0	88.04	2,374.6	24.27	3,449.6	31.35
1974	600.6	49.19	2,285.5	23.36	2,886.1	26'23
1975	1,493.1	122.29	2,741.6	28.02	4,234.7	38.48
1976	850.9	69.69	3,367.6	34.42	4,218.5	38.33
1977	1,138.8	93.27	2,654.1	27.13	3,792.9	34.47
1978	1,127.0	92.30	3,823.5	39.08	4,950.5	44.98
1979	1,076.8	88.19	4,568.2	46.69	5,645.0	51.30
1980	1,170.6	95.87	5,345.1	54.63	6,515.7	59.21
1981	1,350.3	110.59	6,081.3	62.16	7,431.6	67.53
1982	1,142.2	93.55	4,946.9	50.56	6,089.1	55.33
1983*	1,182.8	96.87	3,626.5	37.07	4,089.3	43.70

* Preliminary

Source: SECOFI

Production of Textile Fibres in Mexico, 1971-1983

	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
FILAMENT													
Acetate	13,500	13,500	13,500	13,500	12,000	12,000	12,000	12,000	13,700	13,700	9,100	9,100	9,100
Rayón	7,500	7,422	7,804	7,964	8,000	8,000	7,900	6,300	6,320	6,743	6,545	6,545	6,545
Nylon	14,890	23,000	29,350	25,391	27,277	27,500	28,710	30,120	36,500	41,300	40,900	44,500	45,400
Polyester	22,490	40,600	57,000	72,656	92,000	100,000	100,000	100,000	122,200	136,600	131,900	138,900	140,700
Polypropylene				4,000	4,000	4,400	6,000	6,600	8,000	9,000	12,000	12,000	12,000
TOTAL	58,380	84,522	107,654	123,511	143,277	151,900	154,610	155,020	186,720	207,343	200,445	211,045	213,745
% Growth	17.8	44.8	27.4	14.7	16.0	6.0	1.8	0.3	20.4	11.0	- 3.3	5.3	1.3
Short Fibres													
Acetate	4,200	4,200	4,500	5,200	6,700	6,000	6,500	6,700	5,000	5,000	9,600	9,600	9,600
Rayón	14,000	14,500	14,500	15,700	16,170	10,500	10,500	12,000	12,000	12,000	12,000	12,000	
Nylon	500	500	500	500	500	700	700	1,200	3,500	4,080	8,780	8,780	8,780
Polyester	15,400	17,500	22,530	22,800	22,500	28,400	42,440	45,600	47,500	75,000	87,200	82,200	82,200
Acrylic	18,700	20,210	30,840	39,000	45,500	50,000	68,600	68,600	68,600	76,600	91,600	91,600	91,600
Poiypropylene								700	700	700	3,000	3,000	5,000
TOTAL	52,800	56,910	72,870	83,200	91,370	95,600	128,740	134,800	137,300	173,380	212,180	207,180	197,180
% Growth	18.9	7.8	28.0	14.2	9.8	4.6	34.7	4.7	1.8	26.3	22.4	7.8	- 4.8
GRAND TOTAL	111,180	141,432	180,524	206,711	234,647	247,500	283,350	289,820	324,020	380,723	412,625	418,225	410,925
% Growth	18.3	27.2	27.6	14.5	13.5	5.5	14.5	2.3	11.8	17.5	8.4	6.5	- 1.8

Source: SECOFI

Consumption Per Capita of Textile Fibres in selected countries, 1970-1983

(kg per inhabitant)

	1970					1983					
	TOTAL	COTTON	WOOL	CELLULOSIC FIBRES	NON-CELLULOSIC FIBRES	TOTAL	COTTON	WOOL	CELLULOSIC FIBRES	NON-CELLULOSIC FIBRES	OTHERS
USA	20.9	8.9	0.8	3.4	7.8	24.5	7.2	0.6	3.5	13.0	0.2
Canada	16.0	6.4	0.9	3.0	5.7	20.3	5.8	1.0	3.5	7.5	2.5
F.R.Germany	16.3	5.4	2.1	3.0	5.8	20.0	6.3	2.0	2.3	9.0	0.4
Japan	15.1	6.0	1.5	2.5	5.1	19.7	7.6	1.2	2.7	7.9	0.3
Australia	17.8	8.1	2.7	2.3	4.7	18.0	5.7	2.5	2.7	4.8	2.3
Switzerland	18.0	6.8	3.4	2.8	5.0	17.0	7.4	2.8	2.3	5.5	...
France	11.4	4.5	1.4	2.1	3.4	15.1	5.5	1.2	1.7	6.7	...
Italy	10.4	4.5	1.5	2.2	2.2	13.9	5.0	2.2	1.7	5.0	...
Poland	9.7	3.9	0.5	3.4	1.9	13.3	4.3	0.8	3.2	3.5	1.5
Spain	7.2	2.3	0.7	1.4	2.8	9.3	2.4	0.3	1.4	5.2	...
Argentina	6.5	4.2	0.9	0.4	1.0	7.0	4.0	1.1	0.4	1.4	0.1
Mexico	4.8	3.1	0.2	0.6	0.8	5.3	1.7	0.1	2.1	1.4	...
Venezuela	5.2	2.3	0.2	1.4	1.3	5.6	2.6	0.3	0.7	2.0	...
Brazil	4.2	3.0	0.1	0.5	0.6	5.3	3.0	0.2	0.2	1.8	0.1
Egypt	3.6	3.0	0.2	0.3	0.1	5.2	3.9	0.1	0.2	1.0	...
Colombia	4.1	3.0	0.2	0.3	0.6	5.0	3.2	0.5	0.2	1.1	...
Algeria	4.1	1.4	0.6	1.2	0.9	4.6	1.6	0.3	1.1	1.6	...
Peru	2.9	2.1	0.1	0.3	0.4	3.9	2.2	0.1	0.4	1.2	...
P.R. China	1.9	1.8	...	0.1	...	3.5	2.5	0.2	0.3	0.4	0.1
India	2.2	2.0	...	0.2	...	2.2	1.7	0.1	0.3	0.1	...

Source: CANAINTEX

Quota Utilization Rates of Mexican Textile Exports to the U.S.A by Product, 1978-1983

NO.	CATEGORY	Utilization Rate (per cent)					
		1978	1979	1980	1981	1982	1983
	Nivel de Consulta - De Algodón -						
300	Hilos de algodón cardado	107.0	37.5	4.2	6.8	17.4	14.0
301	Hilos de algodón peinado	22.6	2.5	0.4	0.1	3.1	1.3
300/301		78.1	24.1	2.8	4.1	12.3	9.0
310	A cuadros	0.1	-	-	-	-	-
311	Terciopelos	-	-	-	-	-	-
312	Panas	-	-	-	-	-	-
313	Para sábanas	580.9	29.0	15.4	7.1	1.4	1.2
314	Popelinas y similares	0.9	0.1	-	4.5	8.9	-
315	Estampadas	443.1	31.6	0.6	1.2	-	-
316	Para camisas	-	-	-	-	-	-
317	Sargas y satinados	890.0	760.1	419.2	60.0	8.7	0.1
318	Con hilos preteñidos	0.3	3.2	0.2	0.1	0.1	0.1
319	Lonas y lonetas	91.9	39.8	1.7	5.8	11.0	9.8
320	Otras telas no comprendidas en categorías no específicas.	321.5	45.3	34.0	24.0	15.8	9.7
360	Fundas para almohadas	-	0.1	-	0.2	0.1	-
361	Sábanas	-	-	-	-	-	-

A - 5 continued

NO.	CATEGORY	Utilization Rate (per cent) 1978	1979	1980	1981	1982	1983
362	Sobrecamas y colchas capitonadas	6.0	4.3	1.3	0.1	0.1	0.2
363	Toallas	11.0	11.0	2.7	0.3	3.5	22.1
369	Otras manufacturas de algodón.	120.1	106.7	135.8	86.2	44.9	61.8
	- De Lana -						
400	Mechas e hilos	18.5	4.1	1.8	0.8	1.5	0.4
410	Lanas y telas tejidas	20.4	1.2	1.4	5.6	-	0.9
411	Tapices y telas para tapicerías.	4.6	2.7	2.6	3.0	3.1	7.7
425	Tejidos de punto	-	-	-	-	-	-
429	Otras telas	-	2.8	0.3	0.8	-	-
464	Cobertores y mantas	13.1	4.7	4.2	1.6	3.9	4.7
465	Alfombras y tapetes	21.2	19.2	35.4	26.0	23.6	19.4
469	Otras manufacturas textiles de lana.	48.6	43.3	23.0	19.0	14.5	8.8
	- Fibras artificiales y sintéticas -						
600	Texturizadas	395.1	134.0	207.0	933.9	1,133.9	851.3
601	Celulósicos contínuos	886.2	764.4	810.5	789.6	541.0	341.8
602	No celúlosicos continuos	3.3	12.5	9.0	11.4	609.4	2,228.4
603	De fibra corta, celulósicas	0.3	-	-	-	-	-

A - 5 continued

NO.	CATEGORY	Utilization Rate (per cent)					
		1978	1979	1980	1981	1982	1983
604	De fibra corta no celulósica	-	-	-	-	-	-
605	Otros hilos	122,5	253,3	180.1	391.6	281.8	363.6
610	De filamentos contínuos - celulósicos, no de punto.	0.1	-	-	-	-	-
611	De fibra corta celulósica no de punto.	-	-	-	-	-	0.2
612	De filamento contínuo, no celulósico, no de punto.	3.9	4.3	2.4	-	6.2	0.1
613	De fibra corta, no celulósica, no de punto	-	-	-	8.6	1.2	0.1
614	Otros tejidos, no de punto	-	-	-	-	2.5	2.1
625	De punto	0.7	3.1	29.7	44.4	8.9	18.8
626	Apeluchados y afelpados	-	-	-	-	0.2	-
627	"Especialidades"	322.6	392.1	500.0	634.8	427.4	271.5
665	Alfombras y tapetes	0.3	0.2	0.2	-	0.2	50.3
666	Otros artículos de casa, - tales como cobertores, colchas, etc.	302.8	649.0	909.1	778.7	738.4	559.3
669	Otras manufacturas textiles de fibras artificiales y sintéticas.	364.3	315.9	252.8	403.8	226.8	170.2
	Niveles Mínimos de Consulta						
332	Medias y calcetines - Algodón	-	-	-	4.3	-	-

A - 5 continued

NO.	CATEGORY	Utilization Rate (per cent)					
		1978	1979	1980	1981	1982	1983
432	Medias y calcetines - Lana	-	-	-	-	-	0.4
632	Medias y calcetines - F.A.S.	1.6	4.1	2.0	3.0	7.4	28.1
634/635		79.2	65.6	68.1	38.2	20.8	9.8
638/639		71.8	70.4	56.2	35.7	21.0	11.3

Source: U.S. General Imports, U.S. Department of Commerce, International Economic Policy Office of Textiles and Apparel.

Bilateral Agreement between Mexico and the U.S.A, concerning Textile Products: Quotas, Exports and Utilization Ratesby Products, 1984

CATEGORIA	D E S C R I P C I O N	NIVEL	CUOTA GLOBAL (yardas cuadrados)	E X P O R T A D O	% UTILIZACION
	A L G O D O N				
300	Hilo cardado.	NC	18'400,000	10'422,202	23.7
301	Hilo peinado.	NC	18'400,000	441,042	1.0
310	Telas a cuadros.	NC	1'000,000	15,142	1.5
311	Terciopelos	NC	1'000,000	-0-	0
312	Panas.	NC	1'000,000	-0-	0
313	Telas para sábana.	NC	1'000,000	733,515	73.3
314	Popelinas y similares.	NC	1'000,000	10,711	1.1
315	Telas estampadas.	NC	1'000,000	194	(0)
316	Telas para camisa.	NC	1'000,000	-0-	0
317	Sargas y satinados.	NC	1'000,000	1'343,035	134.1
318	Telas de hilos protenidos.	NC	1'000,000	6,519	0.6
319	Lonas y lonetas.	NC	1'000,000	1'348,684	134.9
320	Otras telas.	NC	1'000,000	1'957,102	195.7
330	Pañuelos.	NMC	700,000	5,859	0.8
331	Guantes.	NCD	2'000,000	-0-	0
332	Medias y calcetines.	NMC	700,000	4,719	0.7
333	Abrigos tipo saco p/hombre y - nino.	NMC	700,000	19,427	2.8
334	Abrigos p/hombre y niño, (excep to sacos).	NCD	1'000,000	583,338	58.3
335	Abrigos p/mujer, niña e infante	LE	1'988,471	879,395	47.3
336	Vestidos.	NCD	1'000,000	1'108,738	61.2
337	Trajes para jugar.	NMC	700,000	57,350	8.2
338/339	Camisas y blusas.	LE	3'996,935	2'250,635	60.8
340	Camisas no de punto.	NCD	2'200,000	1'916,294	87.1
341	Blusas no de punto.	NCD	1'250,451	1'124,260	89.9
342	Faldas.	NMC	700,000	296,193	42.3
345	Suéteres.	NMC	700,000	293,881	42.0
347/348	Pantalones.	LE	16'924,649	15'363,921	97.1
349	Portabustos, fajas, etc.	NMC	700,000	22,592	3.2
350	Batas.	NMC	700,000	29,127	4.2
351	Ropa para dormir.	NMC	700,000	64,294	9.2

CATEGORIA	D E S C R I P C I O N	NIVEL	CUOTA GLOBAL	E X P O R T A D O	% UTILIZACION
448	Pantalones p/mujer,niña e inf.	NMC	100,000	49,990	50.0
459	Otras prendas.	NMC	100,000	43,477	43.5
464	Cobertores.	NC	100,000	9,830	9.8
465	Alfombras y tapetes.	NC	100,000	14,077	14.1
469	Otras manufacturas.	NC	100,000	8,763	8.7
	FIBRAS ARTIFICIALES Y SINTETICAS.				
600	Hilos texturizados.	NC	1'000,000	41'305,164	4,130.5
601	Hilos celulósicos continuos.	NC	1'000,000	3'597,000	359.7
602	Hilos no celulósicos continuos.	NC	1'000,000	98'294,642	9,829.4
603	Hilos celulósicos de fibra corta.	NC	1'000,000	-0-	0
604	Hilos no celulósicos de fibra corta.	NC	10'250,000	15'478,967	95.6
TSUSA 310.5049	Hilos acrílicos 2 cabos.	NCD	3'075.000	-0-	0
605	Otros hilos.	NC	1'000,000	3'186,000	318.6
610	Tejidos de filamentos continuos celulósicos,no de punto.	NC	1'000,000	13,177	1.3
611	Tejidos de fibra corta, celulósica, no de punto.	NC	1'000,000	121,983	12.2
612	Tejidos de filamento continuo,-no celulósico, no de punto.	NC	1'000,000	300,217	30.0
613	Tejidos de fibra corta,no celulósica, no de punto.	NC	1'000,000	50,204	5.0
614	Otros tejidos no de punto.	NC	1'000,000	146,648	14.7
625	Tejidos de punto.	NC	1'000,000	254,313	25.4
626	Telas apeluchadas y afelpadas.	NC	1'000,000	440,127	44.0
627	Telas especiales.	NC	1'000,000	3'769,632	371.0
630	Pañuelos.	NMC	700,000	-0-	0
631	Guantes.	NMC	700,000	1,234	0.2
632	Medias y calcetines.	NCD	700,000	2'006,114	43.6
633	Abrigos tipo saco p/hombre y -- niño.	LE	2'551.231	1'220,648	51.2

A - 6 continued

CATEGORIA	D E S C R I P C I O N	NIVEL	CUOTA GLOBAL	E X P O R T A D O	% UTILIZACION
352	Ropa interior.	NCD	2'000,000	312,649	15.6
353	Chalecos,sacos, forrados de — plumas, p/hombre y niño.	NMC	1'208,464	-0-	0
354	Chalecos,sacos,forrados de — pl mas p/mujer,niña e infa	NMC	1'208,464	-0-	0
359	Otras prendas de vestir.	LE	4'429,800	5'041,679	121.8
TSUSA 383.5095	Pañales.	NCD	2'001,000	56,734	2.8
360	Fundas para almohada.	NC	1'000,000	17,554	1.8
361	Sábanas.	NC	1'000,000	127,825	12.8
362	Sobrecamas y colchas capitonadas.	NC	1'000,000	42,228	4.2
363	Toallas.	NC	1'000,000	1'126,231	112.8
369	Otras manufacturas.	NC	1'000,000	2'760,315	276.4
	L A N A				
400	Hechos e hilos.	NC	100,000	863	0.9
410	Lanas y telas tejidas.	NC	100,000	102,438	102.4
411	Tapices y telas para tapicería	NC	100,000	150	0.1
425	Tejidos de punto.	NC	100,000	-0-	0
429	Otras telas.	NC	100,000	21,758	21.8
431	Guantes.	NMC	100,000	-0-	0
432	Medias y calcetines.	NMC	100,000	14	(0)
433	Abrigos tipo saco p/hombre y — niño.	NCD	200,000	316,857	117.4
434	Otros abrigos p/hombre y niño.	NCD	125,000	41,146	35.3
435	Abrigos p/mujer,niña e infante.	NCD	800,000	256,701	32.1
436	Ventidos.	NMC	100,000	40,118	40.1
438	Camisas y blusas de punto.	NMC	100,000	2,025	2.0
440	Camisas no de punto.	NMC	100,000	2,400	2.4
442	Faldas.	NMC	100,000	51,211	51.2
443	Trajes p/hombre y niño.	NMC	100,000	270,000	143.0
444	Trajes p/mujer,niña e infante.	NMC	100,000	56,970	57.0
445	Suéteres para hombre y niño.	NMC	100,000	11,402	11.4
446	Suéteres p/mujer,niña e inf.	NMC	100,000	11,805	11.8
447	Pantalones p/hombre y niño.	NMC	100,000	33,755	33.7

A - 6 continued

CATEGORIA	D E S C R I P C I O N	NIVEL	CUOTA GLOBAL	E X P O R T A D O	% UTILIZACION
634/635	Abrigos.	LE	16'592,688	2'431,170	15.7
636	Vestidos.	NCD	7'500,000	2'166,934	28.9
637	Trajes para juego.	NMC	700,000	7,945	1.1
638/639	Camisas y blusas de punto.	LE	19'319,555	2'405,704	13.3
640	Camisas no de punto.	NCD	9'100,000	1'694,147	18.6
641	Blusas no de punto.	LE	5'771,392	2'531,980	46.9
642	Faldas.	NCD	2'000,000	842,591	42.1
643	Trajes p/hombre y niño.	NMC	700,000	54,292	7.8
644	Trajes p/mujer,niña e infante.	NCD	2'000,000	101,812	5.1
645	Suéteres p/hombre y niño.	NMC	700,000	385,724	55.1
646	Suéteres p/mujer,niña e inf.	NMC	700,000	225,122	32.1
647/648	Pantalones.	LE	26'401,565	16'378,193	66.4
649	Portabustos, fajas, etc.	LE	16'398,058	6'833,874	44.6
650	Batas.	NMC	700,000	210,727	30.1
651	Ropa para dormir.	NCD	4'000,000	1'650,735	41.3
652	Ropa interior.	NCD	24'000,000		
653	Chalecos,abrigos,sacos, etc.,- forrados de plumas p/hombre y- niño.	NMC	1'208,464	-o-	0
654	Chalecos,abrigos,sacos,etc. forrados de plumas p/mujer,niña o infante.	NMC	1'208,464	22,958	1.9
659	Otras prendas de vestir.	NCD	18'000,000	8'341,823	46.3
665	Alfombras, tapetes, etc.	NC	1'000,000	1'137,040	113.7
666	Mantas,colchas, manteles, etc.	NC	1'000,000	11'809,619	1,181.0
669	Otras manufacturas.	NC	1'000,000	5'009,252	500.9

FUENTE: EXPEDICION DE VISAS TEXTILES EN LA SUBDIRECCION TEXTIL, SUBDIRECCION DE LA INDUSTRIA MAQUILADORA Y DELEGACIONES FEDERALES.

ELABORO: DIRECCION GENERAL DE LA INDUSTRIA QUIMICA Y BIENES DE CONSUMO.-DIRECCION DE BIENES DE CONSUMO.- SUBDIRECCION DE LA INDUSTRIA TEXTIL Y DEL CALZADO.

Consumption Per Capita of Artificial and Synthetic Fibres in Mexico, 1971-1983

(kg per inhabitant)

	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Population (thousands)	49,725	51,271	52,866	54,510	56,205	57,953	59,756	61,614	63,530	66,080	68,135	70,254	72,439
Acetate	0.231	0.160	0 185	0.182	0.157	0.162	0.151	0.141	0.131	0.139	0.123	0.094	0.090
Rayón	0.139	0.103	0.127	0.116	0.096	0.093	0.117	0.083	0.093	0.083	0.079	0.063	0.041
Nylon	0.292	0.324	0.384	0.363	0.370	0.395	0.382	0.443	0.416	0.478	0.454	0.426	0.344
Polyester	0.358	0.663	0.989	1.207	1.261	1.546	1.391	1.358	1.561	1.323	1.146	1.023	0.844
Polypropylene				0.004	0.025	0.055	0.080	0.065	0.115	0.088	0.087	0.051	0.056
TOTAL	1.020	1.250	1.685	1.872	1.909	2.251	2.121	2.090	2.316	2.111	1.889	1.667	1.425
% Growth		22.5	34.8	11.1	2.0	17.9	- 5.8	- 1.5	10.8	- 9	-10.5	-11.8	-14.5
Short Fibres													
Acetate	0.064	0.062	0.047	0.057	0.054	0.062	0.102	0.073	0.116	0.038	0.097	0.075	0.038
Rayón	0.245	0.240	0.242	0.244	0.214	0.207	0.181	0.198	0.162	0.225	0.220	0.199	0.030
Nylon	0.006	0.010	0.009	0.006	0.014	0.014	0.012	0.019	0.024	0.035	0.056	0.058	0.026
Polyester	0.274	0.302	0.289	0.323	0.329	0.319	0.452	0.502	0.628	0.664	0.702	0.662	0.708
Acrylic	0.245	0.259	0.352	0.446	0.525	0.509	0.638	0.743	0.850	0.911	0.932	0.850	0.795
Polypropylene					0.002	0.002	0.008	0.013	0.025				
TOTAL	0.832	0.873	0.939	1.076	1.148	1.113	1.393	1.548	2.263	1.923	2.017	1.844	1.647
% Growth		4.9	7.6	14.6	6.7	- 3	25.2	11.1	46.2	-15	4.9	- 8.6	-10.7
GRAND TOTAL Chemical Fibres	1.906	2.123	2.624	2.948	3.057	3.364	3.154	3.638	4.579	4.034	3.906	3.511	3.072
% Growth		11.4	23.6	12.3	3.7	10.0	- 6.2	15.3	25.9	-11.9	- 3.2	-10.1	-12.5

Source: SECOFI

ANNEX II - TECHNICAL ANNEX

A II

In order to establish the average pattern of fiber consumption per capita and income per capita, for all types of fibers the correlation coefficients were estimated, using the values shown in Table 15. All coefficients were found to be significant at the 99.9 per cent level, with

	Total fiber consumption	Cotton fiber consumption	Wool fiber consumption	Cellulosic fiber cons.	Non-cellulosic fiber cons.
r_s	0.94	0.86	0.75	0.88	0.87
s_n	7.0	1.9	0.9	1.1	3.4

In order to estimate the influence of changing income per capita on consumption per capita of the various types of fibers, a simple linear regression of fiber consumption on income per capita was run, which yielded the parameters:

	Total fiber cons.	Cotton fiber consumption	Wool fiber consumption	cellulosic fiber cons.	Non-cellulosic fiber cons.
a	3.2	2.5	0.14	0.33	0.60
b	0.00127	0.00032	0.000123	0.0000188	0.00057
R^2	0.88	0.74	0.56	0.77	0.76

with Y = kg per inhabitant

X = GNP per capita, 1983 ($)

As shown, the closest fit is demonstrated using total fiber consumption as independent variable. This indicates a certain degree of substitutability between various fiber types, based on differences in preference structures at the region or country level. One example for this would be the much stronger predominance of synthetic fibers in the U.S. as opposed to European countries.

To utilize the regression results obtained by cross-section analysis to obtain an idea of future demand levels at higher levels of income per capita in a country, means of course to isolate just one of the four factors which were discussed in section 3.1 as determinants of fiber consumption. In other words, consumer preferences, relative fiber prices etcs. are assumed to remain at 1983 levels. This is certainly not a realistic assumption, and changes of these parameters would result in shifts of the estimated regression equation.