TEXTILES AND CLOTHING IN THE WORLD ECONOMY

Appendices I-IV to the GATT Background Study

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APPENDIX TABLE A.1. - SHARE OF TEXTILES AND CLOTHING IN MANUFACTURING[a] PRODUCTION AND EMPLOYMENT, 1975

(Percentages)

	PRODUCTION			EMPLOYMENT		
	Textiles	Clothing	Textiles & Clothing	Textiles	Clothing	Textiles & Clothing
Developed countries						
United States	4.0	3.3	7.3	6.6	7.0	13.6
Canada	4.8	3.9	8.7	6.8	7.1	13.9
Japan	5.1	2.6	7.7	12.6	4.6	17.2
Belgium-Luxembourg	6.5	4.7	11.2	10.5	7.8	18.3
France	6.2	3.6	9.8	7.7	6.1	13.8
Germany, Fed. Rep.	4.3	2.6	6.9	4.9	4.8	9.7
Italy	10.1	3.6	13.7	13.7	9.8	23.5
Netherlands	4.3	1.8	6.1	6.1	4.1	10.2
United Kingdom	5.8	3.0	8.8	7.1	5.1	12.2
Austria	6.0	4.2	10.2	8.5	8.3	16.8
Finland	4.7	4.5	9.2	6.2	7.9	14.1
Norway	2.6	2.0	4.6	4.1	3.4	7.5
Sweden	2.5	1.7	4.2	3.3	3.1	6.4
Switzerland	4.6	4.7	9.3	6.1	4.1	10.2
Australia	5.1	3.8	8.9	6.0	6.0	12.0
South Africa	6.5	4.9	11.4	10.5	9.4	19.9
Developing countries						
Greece	24.0	7.0	31.0	17.6	10.6	28.2
Portugal	18.4	3.3	21.7	20.0	8.4	28.4
Spain	8.6	3.6	12.2	11.3	10.0	21.3
Turkey	20.9	1.2	22.1	20.6	14.3	34.9
Yugoslavia	11.6	4.8	16.4	14.4	7.1	21.5
Hong Kong	20.4	26.2	46.6	17.1	36.0	53.1
Korea, Rep. of	22.6	6.1	28.7	26.6	12.5	39.1
Taiwan	17.8	2.3	20.1	23.1	7.3	30.4
India	17.0	6.8	23.8	26.2	13.5	39.7
Pakistan	38.9	0.3	39.2	62.8	0.9	63.7
Indonesia	25.5	0.3	25.8	37.3	3.2	40.5
Israel	7.0	5.5	12.5	9.7	10.1	19.8
Malaysia	7.3	1.7	9.0	9.3	5.2	14.5
Philippines	11.9	6.0	17.9	19.4	22.0	41.4
Singapore	3.1	3.5	6.6	7.0	11.0	18.0
Sri Lanka	24.6	0.4	25.0	36.7	6.9	43.6
Thailand	20.7	9.5	30.2	30.8	8.7	39.5
Argentina	12.0	3.1	15.1	11.3	4.8	16.1
Brazil	9.5	2.0	11.5	16.3	4.2	20.5
Chile	10.3	2.0	12.3	14.8	7.9	22.7
Colombia	19.1	4.5	23.6	21.1	10.8	31.9
Dominican Republic	8.2	2.3	10.5	13.0	8.7	21.7
Guatemala	16.0	4.6	20.6	23.8	10.9	34.7
Haiti	10.0	4.0	14.0	16.7	8.3	25.0
Jamaica	3.0	21.6	24.6	3.0	23.9	26.9
Mexico	9.1	3.5	12.6	11.7	7.3	19.0
Peru	17.3	4.2	21.5	18.9	10.5	29.4
Trinidad and Tobago	0.7	9.6	10.3	2.4	24.4	26.8
Uruguay	24.9	3.8	28.7	22.8	14.1	36.9
Algeria	16.0	12.9	28.9	8.0	11.1	19.1
Egypt	37.8	1.0	38.8	44.7	2.4	47.1
Ivory Coast	28.5	1.5	30.0	11.4	14.3	25.7
Kenya	9.3	4.4	13.7	12.4	12.4	24.8
Mauritius	2.9	25.7	28.6	5.3	26.3	31.6
Morocco	19.2	2.7	21.9	40.9	16.3	57.2
Nigeria	22.6	0.4	23.0	33.2	0.9	34.1
Tunisia	11.8	8.6	20.4	13.6	18.9	32.5

[a] All manufacturing excluding food beverages and tobacco, petroleum refineries and non-ferrous metals.

Notes: Estimates of production and employment are those used by the UN as weighting co-efficients in their indices of industrial production and industrial employment. Production refers to total value added including handicrafts and is generally in factor values. Employment refers to all persons engaged, including working proprietors, active business partners, unpaid family workers as well as employees.

Sources: UNIDO and national statistics.

APPENDIX TABLE A.2. - TOTAL CONSUMER EXPENDITURE AND EXPENDITURE ON CLOTHING[a] IN SELECTED COUNTRIES, 1963-1982

(Annual average percentage rate of change in volume)

		1963-1973	1973-1982	1974	1975	1976	1977	1978	1979	1980	1981	1982
United States	Total	4.4	2.6	-0.6	2.1	5.5	5.0	4.5	2.7	0.4	2.7	1.5
	Clothing	4.1	4.0	-1.0	3.7	4.8	5.7	9.1	4.1	1.6	6.8	1.5
Canada	Total	5.6	2.8[b]	5.3	5.0	6.6	2.6	2.7	2.1	1.1	2.0	-2.1
	Clothing	4.6	5.5[b]	10.0	7.1	7.9	1.9	5.0	2.3	-0.2	4.4	...
Japan	Total	8.7	3.0	-0.7	4.1	3.4	3.8	4.7	6.0	1.3	0.6	4.2
	Clothing	6.9	0.3	-6.3	5.6	6.6	-1.9	2.5	2.1	-0.9	-4.7	0.5
EC (9)	Total	4.5	2.2	1.2	1.7	3.7	2.7	3.9	3.9	1.7	0.3	0.3
	Clothing	3.9	0.9	0.4	0.1	1.8	1.0	2.5	2.6	1.9	-1.3	-0.8
Belgium	Total	4.6	1.9[b]	3.1	0.4	5.0	2.4	2.3	4.5	1.4	-1.4	-0.1
	Clothing	3.8	1.7[b]	6.7	-2.2	6.2	-1.8	-1.0	3.7	3.4	-0.7	...
France	Total	5.2	3.4	2.9	3.4	5.6	3.1	4.2	3.6	1.7	2.3	3.4
	Clothing	3.7	1.3	0.4	1.4	1.3	0.4	1.0	0.0	0.0	3.3	4.1
Germany, Fed. Rep.	Total	4.8	1.8	0.4	3.5	3.8	3.8	3.6	3.1	1.5	-1.2	-2.3
	Clothing	4.5	-0.1	0.0	3.4	0.8	2.1	1.7	-0.2	1.4	-3.6	-6.0
Italy	Total	5.0	2.1	2.6	-1.7	3.4	1.5	2.8	4.9	4.9	0.5	0.0
	Clothing	4.5	0.8	1.9	-7.2	3.0	2.6	1.4	7.7	7.5	-5.8	-3.3
Netherlands	Total	4.9	2.0[b]	2.7	3.4	5.7	4.4	4.4	2.9	-0.4	-2.5	-2.0
	Clothing	2.3	-0.2[b]	0.0	-2.7	7.3	-1.1	0.6	1.3	-2.0	-4.5	...
United Kingdom	Total	2.9	1.1	-2.0	-0.7	0.0	0.5	5.8	4.9	0.0	0.4	1.1
	Clothing	3.1	2.5	-1.5	1.1	0.4	-0.8	9.4	6.6	0.7	2.7	4.1
Austria	Total	4.6	2.5	3.1	3.2	4.5	5.7	-1.6	4.4	1.4	0.7	1.0
	Clothing	6.2	2.5	-0.8	2.4	2.8	2.6	-1.6	7.3	5.4	2.5	2.2
Finland	Total	4.7	2.4[b]	2.2	3.1	0.9	-1.4	2.6	5.6	2.9	1.6	3.8
	Clothing	3.2	-1.5[b]	-1.1	-13.9	2.2	-4.3	-3.0	5.1	8.6	-2.7	...
Norway	Total	3.5	3.2	3.8	5.2	6.1	6.9	-1.6	3.2	2.3	1.3	1.3
	Clothing	2.1	1.6	-1.4	6.3	6.1	6.5	-4.0	2.1	3.6	-1.7	-2.0
Sweden	Total	3.1	1.4	4.5	3.0	4.1	-1.0	-0.9	2.7	0.2	-0.6	1.2
	Clothing	2.1	4.4	11.9	3.4	6.9	2.9	0.9	5.2	3.7	1.5	3.9
Switzerland	Total	4.2	0.8	-0.5	- 2.9	1.0	3.1	2.2	1.3	2.6	0.5	-0.2
	Clothing	2.6	-1.7	-6.0	-11.4	-3.1	1.2	1.1	0.3	3.8	2.1	-2.7
Australia	Total	4.9	2.7	3.1	3.2	2.5	1.4	3.3	1.8	3.4	3.6	2.6
	Clothing	4.0	0.8	-2.2	-3.3	-3.4	-0.4	0.9	0.8	5.3	4.9	4.6
Greece	Total	7.3	3.6[b]	-0.7	6.1	6.2	4.9	6.5	2.2	0.2	...	...
	Clothing	10.6	0.9[b]	-3.8	7.8	7.3	1.3	1.2	3.6	-10.0	...	...
India	Total	...	3.4[b]	0.9	7.5	-0.1	10.1	3.5	-3.9	6.8	...	...
	Clothing	...	6.7[b]	3.4	8.0	13.1	5.9	10.2	3.2	3.3	...	...
Israel	Total	...	4.0[b]	6.6	0.3	6.1	4.9	8.3	6.2	-4.1	...	...
	Clothing	...	3.5[b]	9.1	1.6	11.8	0.3	18.8	-4.4	-9.5	...	...
Korea, Rep.	Total	8.6	7.6[b]	6.1	6.1	9.0	6.7	10.0	7.8	...	...	...
	Clothing	10.1	4.0[b]	4.2	4.6	9.1	3.8	9.7	-6.2	...	...	...
Mexico	Total	...	5.7[b]	4.5	4.9	4.0	4.0	7.4	8.7	6.5	...	...
	Clothing	...	4.6[b]	-0.1	3.4	2.4	6.8	5.9	10.5	3.4	...	...
Singapore	Total	...	7.5[b]	6.0	3.0	6.5	7.9	8.3	10.7	10.2	...	...
	Clothing	...	7.3[b]	0.8	-1.4	7.8	9.9	8.5	11.7	14.7	...	...
Spain	Total	6.3	2.6[b]	4.1	2.0	4.3	2.5	1.6	0.9	0.7	...	...
	Clothing	5.2	0.6[b]	2.6	-0.3	5.6	1.9	-1.9	-4.0	...	...	...
Thailand	Total	...	6.6[b]	5.3	6.0	7.5	9.1	7.0	6.2	5.1	...	...
	Clothing	...	6.8[b]	3.9	10.4	5.2	9.6	9.9	4.2	4.4	...	...

[a] Including footwear.

[b] Figures refer to years nearest those indicated.

Sources: OECD National Accounts, Volume 2; Eurostat National Accounts ESA; UN, Yearbooks of National Accounts Statistics; national statistics.

APPENDIX TABLE A.3. - IMPLICIT DEFLATORS FOR TOTAL CONSUMER EXPENDITURE AND EXPENDITURE ON CLOTHING[a], SELECTED DEVELOPED COUNTRIES, 1963-1982

(Annual average rate of change)

		1963-1973	1973-1982	1974	1975	1976	1977	1978	1979	1980	1981	1982
United States	Total	3.5	7.6	9.8	7.8	5.3	5.8	6.9	9.1	10.1	8.5	5.7
	Clothing	3.3	3.5	6.7	3.4	4.0	3.0	2.5	3.0	3.9	3.2	1.7
Canada	Total	3.5	9.4	11.2	10.6	7.3	7.6	7.4	9.4	10.7	11.2	...
	Clothing	2.6	6.4	8.2	4.0	5.5	5.5	3.2	9.0	9.5	6.9	...
Japan	Total	6.0	7.9	21.7	11.6	8.8	7.2	4.7	3.4	6.8	4.7	3.0
	Clothing	6.4	6.7	22.4	6.8	6.8	6.2	3.4	3.9	5.4	3.6	2.9
Belgium	Total	4.1	8.0	12.4	12.5	7.6	7.1	4.0	3.8	7.1	8.9	8.6
	Clothing	3.4	5.9	10.3	9.1	6.2	6.4	5.7	3.7	2.7	3.6	...
France	Total	4.7	11.0	13.7	11.2	9.8	9.0	8.7	10.4	13.1	12.6	10.8
	Clothing	3.7	10.6	13.3	13.1	8.9	8.3	9.7	11.2	11.2	10.2	9.3
Germany, Fed. Rep.	Total	1.3	5.0	7.4	5.9	4.2	3.6	2.8	4.1	5.5	6.1	5.3
	Clothing	1.1	4.8	6.8	5.0	3.6	4.8	4.1	4.2	5.9	4.6	4.3
Italy	Total	4.9	17.6	21.1	17.6	18.0	18.3	12.8	15.1	20.2	18.9	16.7
	Clothing	5.1	18.0	22.1	18.2	16.5	22.3	14.9	13.2	19.2	19.3	16.6
Netherlands	Total	6.2	7.0	10.0	10.7	8.9	6.0	4.4	4.4	6.9	6.5	5.7
	Clothing	6.6	7.1	12.6	11.7	6.1	6.9	5.4	1.7	9.5	3.5	...
United Kingdom	Total	5.5	14.2	17.4	23.6	15.7	15.1	8.8	12.9	16.0	10.7	8.1
	Clothing	4.1	9.0	18.2	14.0	10.8	12.7	7.8	9.0	8.2	1.2	0.5
Austria	Total	3.9	6.5	10.1	7.9	6.6	5.3	4.3	4.4	6.5	7.1	6.5
	Clothing	3.0	4.8	10.0	5.8	4.3	4.5	2.8	2.4	3.2	3.4	7.4
Finland	Total	6.4	11.8	18.6	16.4	13.0	11.7	7.6	7.9	10.7	11.5	9.3
	Clothing	5.4	11.4	16.8	17.0	10.6	8.9	5.6	10.7	11.0	11.5	...
Norway	Total	5.4	9.6	9.3	11.6	8.7	8.6	8.2	5.1	9.8	13.8	11.8
	Clothing	5.0	8.9	10.3	7.8	8.2	9.9	8.9	5.5	8.6	13.1	7.9
Sweden	Total	5.3	10.3	9.2	10.9	10.7	10.4	11.1	7.4	11.7	11.7	10.0
	Clothing	3.1	6.6	6.5	10.5	8.0	6.5	6.3	4.3	6.4	6.3	4.7
Switzerland	Total	5.0	4.6	10.1	6.6	2.3	1.2	0.4	4.5	4.6	6.5	5.5
	Clothing	3.8	3.5	9.4	6.5	0.5	1.4	1.2	1.0	3.5	4.4	4.3

[a] Including footwear.

Source: See Appendix Table A.2.

APPENDIX TABLE A.4. - SHARE OF CLOTHING[a] IN TOTAL CONSUMER EXPENDITURE IN SELECTED DEVELOPED COUNTRIES, 1963-1982

	1963	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
						Current prices					
United States	7.9	7.6	7.3	7.1	6.9	6.9	6.9	6.6	6.3	6.2	6.0
Canada	9.2	7.7	8.3	8.0	7.9	7.7	7.6	7.6	7.4	7.3	...
Japan	9.9	8.7	8.3	8.0	8.1	7.6	7.4	7.1	6.9	6.4	6.2
Belgium	10.1	8.8	8.9	8.4	8.4	8.0	7.9	7.8	7.6	7.3	...
France	10.4	8.1	7.9	7.9	7.5	7.2	7.1	6.9	6.6	6.6	6.5
Germany, Fed. Rep.	10.4	10.1	10.1	10.0	9.6	9.6	9.5	9.2	9.2	8.9	8.5
Italy	10.2	9.9	9.9	9.4	9.2	9.7	9.7	9.8	10.0	9.4	9.1
Netherlands	11.9	9.6	9.5	9.1	9.0	8.6	8.3	8.2	8.0	7.6	...
United Kingdom	9.6	8.6	8.7	8.2	7.9	7.6	7.8	7.6	7.2	6.7	6.4
Austria	12.4	13.3	12.8	12.4	12.0	11.5	11.3	11.4	11.5	11.3	11.5
Finland	8.9	6.9	6.6	5.6	5.5	5.2	4.8	4.9	5.3	5.0	...
Norway	11.3	9.6	9.2	8.9	8.9	9.0	8.8	8.7	8.8	8.4	7.9
Sweden	10.3	7.6	7.9	7.9	8.0	8.0	7.8	7.7	7.6	7.4	7.2
Switzerland	8.2	6.3	5.9	5.4	5.1	5.0	5.0	4.8	4.8	4.8	4.6
						Constant prices					
United States	7.9	7.7	7.7	7.8	7.8	7.8	8.1	8.3	8.4	8.7	8.7
Canada	8.8	8.0	8.9	9.1	9.2	9.1	9.3	9.3	9.2	9.4	...
Japan	9.9	8.4	7.9	8.0	8.3	7.8	7.7	7.4	7.2	6.9	6.6
Belgium	9.0	8.4	8.6	8.4	8.5	8.2	7.9	7.8	8.0	8.1	...
France	9.4	8.1	7.9	7.8	7.5	7.3	7.0	6.8	6.7	6.8	6.8
Germany, Fed. Rep.	10.2	9.9	9.9	9.9	9.6	9.5	9.3	9.0	9.0	8.8	8.4
Italy	10.1	9.6	9.6	9.0	9.0	9.1	9.0	9.2	9.5	8.9	8.6
Netherlands	12.8	9.9	9.6	9.1	9.2	8.7	8.4	8.3	8.1	8.0	...
United Kingdom	7.8	8.0	8.0	8.2	8.2	8.1	8.4	8.5	8.6	8.8	9.0
Austria	11.2	13.0	12.5	12.4	12.2	11.8	11.9	12.2	12.7	12.9	13.0
Finland	7.9	6.9	6.7	5.6	5.6	5.5	5.2	5.1	5.4	5.2	...
Norway	10.7	9.3	8.8	8.9	8.9	8.9	8.7	8.6	8.7	8.4	8.2
Sweden	8.1	7.4	7.9	7.9	8.1	8.5	8.6	8.8	9.1	9.3	9.6
Switzerland	7.3	6.3	5.9	5.4	5.2	5.1	5.1	5.0	5.1	5.2	5.0

[a] Including footwear.

Source: See Appendix Table A.2.

APPENDIX TABLE A.5. - CONSUMER EXPENDITURE ON HOUSEHOLD TEXTILES[a] IN SELECTED DEVELOPED COUNTRIES, 1973-1982

	1973-1981/2	1974	1975	1976	1977	1978	1979	1980	1981	1982
					Average annual rate of change in volume					
United States	-0.4	-5.4	-3.8	3.9	3.8	3.6	0	-1.8	3.6	-6.9
Belgium	1.4	10.0	-8.1	8.9	-2.8	-0.4	3.6	1.5	-0.2	...
Italy	1.3	2.6	-7.7	2.8	2.7	2.6	7.7	4.8	-4.5	...
Netherlands	0.4	-13.3	-12.9	21.6	2.2	14.1	3.8	-0.9	-6.5	...
United Kingdom	3.1	0	1.7	6.8	0	12.7	1.4	1.4	4.2	...
Austria	2.3	9.8	6.3	-3.1	6.8	-7.7	3.3	0.4	4.2	...
Finland	-0.9[b]	5.0	-4.8	5.0	-14.3	3.7	10.7	-12.9	3.7	...
Norway	1.6	2.8	2.7	5.2	11.6	-4.4	2.3	-7.6	...	...
Sweden	1.3	10.1	1.1	5.9	-1.0	-3.6	2.6	0.5	-4.1	...
					Percent share in total consumer expenditure					
					Current prices					
United States		0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5
Belgium		1.0	0.9	0.9	0.9	0.8	0.8	0.8	0.8	...
Italy		0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	...
Netherlands		0.7	0.6	0.7	0.7	0.8	0.7	0.7	0.7	...
United Kingdom		1.0	0.9	0.9	0.9	1.0	1.0	0.9	0.9	...
Austria		0.8	0.8	0.7	0.7	0.6	0.6	0.6	0.6	...
Finland		1.1	1.1	1.0	0.9	0.9	0.9	0.8	0.8	...
Norway		1.5	1.5	1.4	1.5	1.4	1.5	1.4	1.4	...
Sweden		1.2	1.2	1.2	1.2	1.1	1.1	1.1	1.0	...
					Constant prices					
United States		0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Belgium		1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	...
Italy		0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	...
Netherlands		0.7	0.6	0.7	0.7	0.8	0.8	0.8	0.7	...
United Kingdom		0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	...
Austria		0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	...
Finland		1.1	1.1	1.1	1.0	1.0	1.0	0.9	0.9	...
Norway		1.5	1.5	1.5	1.5	1.5	1.5	1.3	...	...
Sweden		1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	...

[a] Excluding carpets.

[b] 1973-1980

Sources: OECD National Accounts, Volume 2; EUROSTAT, National Accounts ESA; national statistics.

APPENDIX TABLE A.6. - SHARE OF TEXTILES IN TRADE IN MANUFACTURES, 1955-1982

(Percentages)

EXPORTS	1955	1963	1973	1982	IMPORTS	1955	1963	1973	1982
WORLD	11.3	8.7	6.7	4.9					
Developed countries	10.3	7.8	5.8	3.8	Developed countries	11.3	9.5	6.8	4.5
United States	4.7	3.5	2.8	2.0	United States	12.2	9.8	3.7	2.0
Japan	34.9	18.8	7.1	3.8	Japan	3.3	2.6	11.5	6.1
France	14.6	11.1	6.7	3.9	France	5.1	5.1	6.2	5.3
Germany, Fed. Rep.	5.9	4.2	5.2	3.7	Germany, Fed. Rep.	19.5	15.4	9.4	5.9
Italy	24.4	13.8	8.3	6.6	Italy	6.3	4.6	7.2	5.9
United Kingdom	13.5	7.8	5.9	3.2	Netherlands	11.1	10.6	7.6	5.0
					Switzerland	7.1	7.0	6.0	4.1
					United Kingdom	11.4	10.8	6.2	5.3
Developing countries	34.3	30.1	18.8	10.6	Developing countries	13.5	9.2	7.4	5.4
Southern Europe	21.3	18.8	12.1	9.2					
Brazil	...	9.5	18.9	6.8					
Hong Kong[a]	31.7	18.8	14.2	9.8	Hong Kong[e]	35.2	26.8	24.3	17.4
India	66.2[b]	80.2	44.2	25.9[c]					
(excluding jute textiles)	25.6[b]	31.9	22.2	18.5[c]					
Korea, Rep. of	...	20.5	16.1	12.8[d]					
Pakistan	...	...	75.5	68.2					
Taiwan	...	31.0	15.3	8.9					
Eastern trading area	6.1	5.5	5.1	5.4	Eastern trading area	5.2	4.7	4.4	4.4

[a] Including re-exports. Share of textiles in exports of manufactures (excluding re-exports) is as follows: 1963: 18.5%; 1973: 12.5%; 1982: 6.3%.

[b] Share of total trade less principal non-manufactures.

[c] 1980.

[d] 1981.

[e] Including imports for re-export.

Sources: UN, Yearbooks of International Trade, Commodity Trade Statistics, Comtrade Data Bank; OECD, Foreign Trade Series IV; GATT, World Trade Networks.

APPENDIX TABLE A.7. - SHARE OF TEXTILES IN TOTAL MERCHANDISE TRADE[a], 1955-1982

(Percentages)

EXPORTS	1955	1963	1973	1982	IMPORTS	1955	1963	1973	1982
WORLD	5.6	5.0	4.6	3.6					
Developed countries	6.7	5.2	4.2	2.9	Developed countries	4.6	4.8	4.3	3.1
United States	3.2	2.2	1.8	1.4	United States	3.5	4.5	2.6	1.5
Japan	29.3	17.0	6.6	3.7	Japan	0.4	0.7	3.6	2.0
France	10.0	11.1	6.7	3.0	France	1.5	2.5	4.2	3.8
Germany, Fed. Rep.	5.4	3.7	4.5	3.2	Germany, Fed. Rep.	5.1	6.4	5.6	3.8
Italy	16.3	11.1	7.3	5.9	Italy	2.3	2.3	3.7	3.5
United Kingdom	11.2	6.4	4.9	2.6	Netherlands	6.1	6.9	5.3	3.3
					United Kingdom	2.1	3.4	3.6	3.8
Developing countries	3.7	5.3	7.4	6.1	Developing countries	9.2	6.2	5.1	4.1
Southern Europe	4.1	6.5	7.1	6.6					
Brazil	...	0.3	3.8	2.8					
Hong Kong[b]	24.2	15.8	13.2	9.0	Hong Kong[e]	18.5	15.9	17.2	13.7
India	33.0	34.2	23.6	15.2[c]					
(excluding jute textiles)	12.7	13.6	11.9	10.9					
Korea, Rep. of	...	9.2	13.7	11.6[d]					
Pakistan	...	...	47.4	41.9					
Taiwan	...	11.8	12.8	8.0					
Eastern trading area	3.2	3.6	3.4	3.8	Eastern trading area	2.7	2.9	3.1	3.1

[a] Excluding petroleum.

[b] Including re-exports. Share of textiles in total exports (excluding re-exports) is as follows: 1963: 17.0%; 1973: 12.1%; 1982: 6.1%.

[c] 1980.

[d] 1981.

[e] Including imports for re-export.

Source: See Appendix Table A.6.

APPENDIX TABLE A.8. - SHARE OF CLOTHING IN TRADE IN MANUFACTURES, 1955-1982

(Percentages)

EXPORTS	1955	1963	1973	1982	IMPORTS	1955	1963	1973	1982
World	1.9	2.7	3.6	3.9					
Developed countries	1.6	2.2	2.3	1.9	Developed countries	2.0	3.2	4.5	5.2
United States	0.9	0.7	0.7	0.7	United States	3.9	5.7	5.1	6.0
Japan	6.4	4.2	1.1	0.4	Japan	1.1	0.5	5.8	6.9
France	2.2	3.6	4.1	2.7	France	0.6	1.9	2.6	4.0
Germany, Fed. Rep.	1.1	1.2	1.5	1.7	Germany, Fed. Rep.	2.1	5.1	8.7	8.3
Italy	3.6	8.8	7.1	7.2	Italy	0.6	0.8	1.5	1.9
United Kingdom	1.4	1.2	1.8	2.3	Netherlands	2.6	4.2	5.9	6.6
					Switzerland	...	4.2	5.9	6.6
					United Kingdom	1.8	4.8	4.0	4.2
Developing countries	4.0	7.8	14.2	13.6	Developing countries	1.4	1.7	1.6	2.2
Southern Europe	1.1	4.9	8.6	8.4					
Brazil	...	-	7.4	1.3					
Hong Kong[a]	17.4	33.2	30.4	27.3	Hong Kong[d]	1.8	2.7	3.1	6.2
India	-	1.3	6.5	13.4[b]					
Korea, Rep. of	...	12.8	27.7	20.2[c]					
Pakistan	...	...	2.9	10.6					
Taiwan	...	7.9	19.3	14.7					
Eastern trading area	3.4	3.7	5.1	5.8	Eastern trading area	3.3	3.6	4.0	3.1

[a] Including re-exports. Share of clothing in exports of manufactures (excluding re-exports) is as follows: 1963: 39.2%; 1973: 38.0%; 1982: 35.9%.

[b] 1980

[c] 1981.

[d] Including imports for re-export.

Source: See Appendix Table A.6.

APPENDIX TABLE A.9. - SHARE OF CLOTHING IN TOTAL MERCHANDISE TRADE[a], 1953-1982

(Percentages)

EXPORTS	1955	1963	1973	1982	IMPORTS	1955	1963	1973	1982
WORLD	1.0	1.6	2.4	2.9					
Developed countries	1.0	1.5	1.6	1.5	Developed countries	0.8	1.6	2.9	3.6
United States	0.6	0.4	0.4	0.5	United States	1.1	2.6	3.5	4.6
Japan	5.4	3.8	1.0	0.4	Japan	0.1	0.1	1.8	2.3
France	1.5	3.6	4.1	2.0	France	0.2	0.9	1.8	2.9
Germany, Fed. Rep.	1.0	1.0	1.4	1.5	Germany, Fed. Rep.	0.5	2.1	5.2	5.3
Italy	2.4	7.0	6.2	6.4	Italy	0.2	0.4	0.8	1.1
United Kingdom	1.2	1.0	1.5	1.9	Netherlands	1.4	2.7	4.1	4.4
					Switzerland	...	2.9	4.6	5.5
					United Kingdom	0.3	1.5	2.4	3.0
Developing countries	0.4	1.4	5.6	7.9	Developing countries	1.0	1.1	1.1	1.6
Southern Europe	0.2	1.7	5.0	6.1					
Brazil	...	-	1.5	0.5					
Hong Kong[b]	13.2	27.9	28.2	24.9	Hong Kong[e]	1.0	1.6	2.2	4.9
India	-	0.6	3.5	7.9[c]					
Korea, Rep. of	...	5.7	23.5	18.4[d]					
Pakistan	...	...	1.8	6.5					
Taiwan	...	3.0	16.2	13.3					
Eastern trading area	1.8	2.4	3.4	4.1	Eastern trading area	1.7	2.2	2.8	2.2

[a] Excluding petroleum.

[b] Including re-exports. Share of clothing in exports (excluding re-exports) is as follows: 1963: 36.0%; 1973: 36.7%; 1982: 34.6%.

[c] 1980.

[d] 1981.

[e] Including imports for re-export.

Source: See Appendix Table A.6.

APPENDIX TABLE A.10. - SHARE OF WORLD IMPORTS[a] OF TEXTILES AND CLOTHING PURCHASED BY MAJOR DEVELOPED COUNTRIES, 1963-1982
(percentages)

	United States	Canada[b]	Japan	EC(9) Total	EC(9) Intra	EC(9) Extra	Other Western Europe
Textiles							
1963	10[b]	4	1	33	(23)	(10)	10
1968	10[b]	4	1	35	(25)	(10)	9
1973	7[b]	3	5	39	(27)	(12)	9
1976	5[b]	3	3	40	(26)	(14)	8
1978	6	3	4	41	(27)	(14)	8
1979	5	3	4	43	(27)	(16)	8
1980	5	2	3	41	(25)	(16)	8
1981	6	3	3	34	(21)	(13)	7
1982	6	2	3	35	(22)	(13)	7
Clothing							
1963	18[b]	3	-	35	(23)	(12)	11
1968	19[b]	3	1	36	(24)	(12)	11
1973	17[b]	3	5	46	(26)	(20)	11
1976	18[b]	4	4	48	(23)	(25)	11
1978	22	2	4	48	(24)	(24)	11
1979	18	2	5	51	(24)	(27)	11
1980	17	2	4	49	(22)	(27)	11
1981	20	2	4	43	(19)	(24)	10
1982	22	2	4	42	(18)	(24)	10

[a]World imports are based on f.o.b. values, therefore the share of countries reporting in c.i.f. values is somewhat overstated.

[b]f.o.b.

Sources: UNSO Comtrade Data Bank; GATT, International Trade.

APPENDIX TABLE A.11. - SHARE OF INDIVIDUAL SUPPLIERS IN THE IMPORT MARKET FOR TEXTILES IN THE EUROPEAN COMMUNITY (EXCLUDING EC INTRA-TRADE), 1963-1982

(Percentages)

	1963		1973		1978		1982
Volume index of total world trade in textiles: 1973=100	43		100		114		12[illegible]
Total number of suppliers	129		160		156		156
			Suppliers each with 5% or more of total imports				
Switzerland	16.8	United States	11.4	Switzerland	11.1	Switzerland	11.5
India	14.6	Switzerland	10.5	United States	10.9	United States	8.9
United States	12.7	Iran	8.8	Austria	7.2	Austria	6.9
Austria	7.8	Austria	7.1	Iran	6.5	Japan	5.7
Hong Kong	6.6	Portugal	5.4	India	5.5	Portugal	5.6
Iran	6.4					China	5.4
Japan	6.2					Greece	5.1
						Turkey	5.1
7 suppliers	71.1	5 suppliers	43.2	5 suppliers	41.2	8 suppliers	54.2
			Suppliers each with 1-4% of total imports				
Portugal	3.0	India	4.8	Greece	4.7	India	4.9
China	3.0	Greece	4.1	Portugal	4.5	Spain	3.9
Spain	2.9	Hong Kong	3.8	Spain	4.1	Brazil	3.1
Sweden	2.5	Japan	3.6	Japan	3.9	Pakistan	3.1
Pakistan	2.5	Taiwan	3.5	Turkey	3.9	Korea, Rep. of	2.7
Yugoslavia	2.1	Brazil	3.1	China	3.2	Taiwan	2.5
Canada	1.7	China	3.0	Pakistan	3.0	Iran	2.2
Egypt	1.5	Pakistan	2.8	Korea, Rep. of	2.9	Hong Kong	2.0
Afghanistan	1.3	Turkey	2.5	Brazil	2.5	Sweden	1.8
Czechoslovakia	1.2	Spain	2.5	Hong Kong	2.4	Czechoslovakia	1.4
		Sweden	2.3	Taiwan	2.1	Thailand	1.4
		Yugoslavia	2.1	Sweden	1.8	Egypt	1.3
		Czechoslovakia	2.0	Czechoslovakia	1.6	Yugoslavia	1.3
		Korea, Rep. of	1.2	Morocco	1.4	Morocco	1.2
		Romania	1.2	Thailand	1.3	Israel	1.1
		Canada	1.2	Romania	1.1		
		Bangladesh	1.0				
		Morocco	1.0				
		Poland	1.0				
10 suppliers	21.7	19 suppliers	46.7	16 suppliers	44.4	15 suppliers	33.9
			Suppliers each with less than 1% of total imports				
112 suppliers	7.2	136 suppliers	10.1	135 suppliers	14.4	133 suppliers	11.9

Source: UNSO Comtrade Data Bank.

APPENDIX TABLE A.12. - SHARE OF INDIVIDUAL SUPPLIERS IN THE IMPORT MARKET FOR CLOTHING IN THE EUROPEAN COMMUNITY[a] (EXCLUDING EC INTRA-TRADE), 1963-1982

(Percentages)

	1963		1973		1978		1982	
Volume index of total world trade in clothing: 1973=100	29		100		172		195	
Total number of suppliers	110		156		158		154	
			Suppliers each with 5% or more of total imports					
Hong Kong	45.2	Hong Kong	27.9	Hong Kong	19.8	Hong Kong	17.7
Austria	10.5	Yugoslavia	9.9	Korea, Rep. of	9.3	Korea, Rep. of	10.2
Switzerland	9.0	Taiwan	5.3	Greece	8.5	Greece	7.5
Japan	6.8			Yugoslavia	6.0		
United States	6.6						
5 suppliers	78.1	3 suppliers	43.1	4 suppliers	43.6	3 suppliers	35.4
		Suppliers each with 1-4% of total imports					
Sweden	4.7	Greece	4.5	Austria	3.8	Yugoslavia	4.7
Yugoslavia	2.5	Korea, Rep. of	4.2	Taiwan	3.6	Portugal	4.7
Hungary	1.9	Portugal	4.2	India	3.5	India	3.8
Canada	1.6	Hungary	4.0	Hungary	3.5	Taiwan	3.8
Norway	1.4	Austria	3.6	Romania	3.0	Austria	3.8
Spain	1.2	Romania	3.4	Tunisia	3.0	Tunisia	3.6
Israel	1.2	Poland	2.9	Portugal	2.9	China	2.8
Portugal	1.0	Spain	2.8	Spain	2.6	Romania	2.7
		Switzerland	2.5	Switzerland	2.5	Turkey	2.5
		Sweden	2.1	United States	2.3	Macao	2.5
		United States	1.9	Poland	2.2	Hungary	2.4
		Macao	1.8	Malta	2.1	United States	2.2
		Czechoslovakia	1.8	Macao	2.0	Israel	2.1
		Japan	1.6	Israel	1.6	Spain	1.9
		India	1.5	Czechoslovakia	1.4	Switzerland	1.8
		Finland	1.5	Singapore	1.3	Morocco	1.7
		Israel	1.4	Finland	1.3	Malta	1.5
		Turkey	1.4	China	1.2	Philippines	1.5
		Bulgaria	1.4	Turkey	1.1	Poland	1.4
		Singapore	1.0	Japan	1.1	Thailand	1.4
				Philippines	1.0	Singapore	1.3
				Sweden	1.0	Finland	1.3
				Morocco	1.0	Czechoslovakia	1.0
8 suppliers	15.5	20 suppliers	49.5	23 suppliers	49.0	23 suppliers	56.4
		Suppliers each with less than 1% of total imports					
97 suppliers	6.4	133 suppliers	7.4	131 suppliers	7.4	123 suppliers	8.2

[a] Excluding EC intra-trade.

Source: UNSO Comtrade Data Bank.

APPENDIX TABLE A.13. - SHARE OF INDIVIDUAL SUPPLIERS IN THE IMPORT MARKET FOR TEXTILES IN AUSTRALIA, 1963-1982

(Percentages)

	1963		1973		1978		1982	
Volume index of total world trade in textiles: 1973=100	43		100		114		129	
Total number of suppliers	76		72		76		83	
			Suppliers each with 5% or more of total imports					
Japan	24.3	Japan	25.4	Japan	22.1	Japan	19.4	
United Kingdom	23.7	United Kingdom	11.6	United States	10.5	United States	12.6	
India	11.0	Hong Kong	9.5	United Kingdom	9.9	Hong Kong	8.4	
United States	10.7	China	7.5	Hong Kong	9.4	China	7.9	
		United States	7.4	China	6.8	Taiwan	7.3	
				New Zealand	6.0	New Zealand	5.9	
						Korea, Rep. of	5.5	
4 suppliers	69.7	5 suppliers	61.4	6 suppliers	64.7	7 suppliers	67.0	
			Suppliers each with 1-4.9% of total imports					
Pakistan	4.6	Taiwan	4.9	Taiwan	4.8	United Kingdom	4.9	
Italy	4.1	New Zealand	4.6	India	4.0	Italy	3.4	
China	3.3	India	4.3	Germany, Fed. Rep.	3.6	Germany, Fed. Rep.	3.3	
Hong Kong	2.8	Germany, Fed. Rep.	4.2	Korea, Rep. of	2.9	India	2.5	
Germany, Fed. Rep.	2.5	Italy	2.0	Canada	2.6	Canada	1.9	
Belgium-Luxembourg	1.8	Canada	1.5	Italy	2.1	Malaysia	1.5	
Switzerland	1.8	Belgium-Luxembourg	1.5	Malaysia	1.8	Bangladesh	1.5	
France	1.7	Bangladesh	1.4	Bangladesh	1.3	France	1.5	
Netherlands	1.6	Switzerland	1.3	Singapore	1.2	Pakistan	1.2	
Czechoslovakia	1.1	Czechoslovakia	1.3	France	1.2	Thailand	1.1	
Canada	1.0	Netherlands	1.2	South Africa	1.0	Brazil	1.1	
		Pakistan	1.0			Singapore	1.0	
11 suppliers	26.3	12 suppliers	29.2	11 suppliers	26.5	12 suppliers	24.9	
			Suppliers each with less than 1% of total imports					
61 suppliers	4.0	55 suppliers	9.4	59 suppliers	8.8	64 suppliers	8.1	

Source: UNSO Comtrade Data Bank.

APPENDIX TABLE A.14. - SHARE OF INDIVIDUAL SUPPLIERS IN THE IMPORT MARKET FOR CLOTHING IN AUSTRALIA, 1963-1982

(Percentages)

	1963		1973		1978		1982
Volume index of total world trade in clothing: 1973=100	29		100		172		195
Total number of suppliers	56		69		73		83
			Suppliers each with 5% or more of total imports				
United Kingdom	34.1	Hong Kong	29.6	Hong Kong	23.0	Hong Kong	24.0
Hong Kong	12.9	Taiwan	17.8	Taiwan	20.3	Taiwan	20.5
Japan	11.1	China	11.0	Korea, Rep. of	9.0	China	14.1
Italy	10.5	United Kingdom	10.1	United Kingdom	8.5	Korea, Rep. of	8.8
United States	6.3	India	5.8	China	7.7		
				New Zealand	6.1		
				India	6.1		
5 suppliers	74.9	5 suppliers	74.3	7 suppliers	80.7	4 suppliers	67.4
			Suppliers each with 1-4.9% of total imports				
Switzerland	4.7	Korea, Rep. of	3.6	Italy	3.3	New Zealand	4.4
France	3.9	Japan	3.6	Philippines	2.6	India	3.9
China	3.3	United States	3.4	Japan	2.5	Italy	3.7
Canada	3.3	New Zealand	2.9	France	1.6	Philippines	3.0
Germany, Fed. Rep.	3.1	Italy	2.7	United States	1.6	United States	2.7
		France	1.5			Japan	2.3
		Germany, Fed. Rep.	1.2			Macao	2.2
						United Kingdom	2.1
						France	1.1
						Malaysia	1.1
						Indonesia	1.0
5 suppliers	18.3	7 suppliers	18.9	5 suppliers	11.6	11 suppliers	27.5
			Suppliers each with less than 1% of total imports				
46 suppliers	6.8	57 suppliers	6.8	61 suppliers	7.7	68 suppliers	5.1

Source: UNSO Comtrade Data Bank.

APPENDIX TABLE A.15. - SHARE OF INDIVIDUAL SUPPLIERS IN THE IMPORT MARKET FOR TEXTILES IN NEW ZEALAND, 1964-1982

(Percentages)

	1964		1973		1978		1982
Volume index of total world trade in textiles: 1973=100	43		100		114		129
Total number of suppliers	54		62		69		69
			Suppliers each with 5% or more of total imports				
United Kingdom	35.2	Japan	19.8	Japan	17.6	Japan	16.3
Japan	16.0	Hong Kong	16.0	Hong Kong	15.7	United States	12.3
India	10.0	United Kingdom	14.4	United Kingdom	12.3	Hong Kong	12.1
Hong Kong	9.2	Australia	10.8	Australia	8.0	Australia	10.3
Australia	8.4	India	6.1	United States	7.5	United Kingdom	6.3
United States	7.5	United States	6.1	India	5.6	China	5.6
				Korea, Rep. of	5.0		
6 suppliers	86.3	6 suppliers	73.2	7 suppliers	71.7	6 suppliers	62.9
			Suppliers each with 1-4.9% of total imports				
Germany, Fed.Rep.	2.2	China	4.9	China	4.0	Korea, Rep. of	4.8
Italy	2.0	Germany, Fed. Rep.	3.5	Germany, Fed. Rep.	3.3	Taiwan	4.3
Canada	1.3	Singapore	2.5	Taiwan	3.3	Germany, Fed. Rep.	3.3
Switzerland	1.2	Canada	2.0	Malaysia	3.2	Canada	3.1
China	1.2	Italy	1.6	Singapore	2.2	India	3.1
		Taiwan	1.5	Canada	1.9	Italy	2.8
		Korea, Rep. of	1.2	Italy	1.4	Malaysia	2.5
		Malaysia	1.1	Bangladesh	1.2	Brazil	1.8
		Netherlands	1.1	Netherlands	1.1	Belgium-Luxembourg	1.3
						France	1.2
						Bangladesh	1.2
						Netherlands	1.1
5 suppliers	7.9	9 suppliers	19.4	9 suppliers	21.6	12 suppliers	30.5
			Suppliers each with less than 1% of total imports				
43 suppliers	5.8	47 suppliers	7.4	53 suppliers	6.7	51 suppliers	6.6

Source: UNSO Comtrade Data Bank.

APPENDIX TABLE A.16. - SHARE OF INDIVIDUAL SUPPLIERS IN THE IMPORT MARKET FOR CLOTHING IN NEW ZEALAND, 1964-1982

(Percentages)

	1964		1973		1978		1982	
Volume index of total world trade in clothing: 1973=100	29		100		172		195	
Total number of suppliers	39		43		52		59	
			Suppliers each with 5% or more of total imports					
United Kingdom	61.3	United Kingdom	26.6		Australia	20.6	Hong Kong	23.1
Hong Kong	13.3	Hong Kong	22.7		United Kingdom	19.0	Taiwan	16.6
Australia	6.2	Australia	13.9		Hong Kong	13.2	China	11.9
United States	6.2	Taiwan	9.6		Japan	11.9	Australia	6.5
		Japan	6.8		Taiwan	8.6	Cook Islands	6.1
							Japan	5.6
							Philippines	5.3
4 suppliers	87.0	5 suppliers	79.6		5 suppliers	72.4	7 suppliers	75.1
			Suppliers each with 1-4.9% of total imports					
Germany, Fed.Rep.	3.5	China	4.5		United States	4.4	United States	4.8
Malta	2.2	United States	4.0		China	3.8	United Kingdom	4.1
Japan	1.7	Italy	2.3		Korea, Rep. of	2.8	Korea, Rep. of	2.9
		Germany, Fed. Rep.	1.9		Malaysia	2.7	India	2.6
					Canada	2.4	Italy	1.4
					Germany, Fed. Rep.	2.2	Malaysia	1.1
					Philippines	2.1		
					India	1.3		
					Italy	1.3		
3 suppliers	7.4	4 suppliers	12.7		9 suppliers	23.0	6 suppliers	16.9
			Suppliers each with less than 1% of total imports					
32 suppliers	5.6	34 suppliers	7.7		38 suppliers	4.6	46 suppliers	8.0

Source: UNSO Comtrade Data Bank.

APPENDIX TABLE A.17. - SHARE OF INDIVIDUAL SUPPLIERS IN THE USSR MARKET FOR TEXTILES IN NORWAY, 1963-1982

(Percentages)

	1963		1973		1978		1982
Volume index of total world trade in textiles: 1973=100	43		100		114		129
Total number of suppliers	60		71		74		78
			Suppliers each with 5% or more of total imports				
Germany, Fed. Rep.	17.5	United Kingdom	16.9	Germany, Fed. Rep.	15.9	Germany, Fed. Rep.	16.5
United Kingdom	17.2	Germany, Fed. Rep.	14.4	United Kingdom	14.2	Denmark	11.8
Sweden	10.3	Sweden	13.9	Sweden	13.5	Sweden	11.7
Netherlands	10.1	Denmark	10.6	Denmark	11.4	United Kingdom	10.0
Denmark	6.4	Austria	5.9	Austria	5.0	Belgium-Luxembourg	6.7
France	5.6	Switzerland	5.6			Austria	5.1
Belgium-Luxembourg	5.4						
7 suppliers	72.5	6 suppliers	67.3	5 suppliers	60.0	6 suppliers	61.8
			Suppliers each with 1-4.9% of total imports				
Switzerland	3.9	Portugal	4.9	Belgium-Luxembourg	4.4	Portugal	4.5
Italy	3.6	Netherlands	4.4	Netherlands	4.2	Netherlands	4.3
Japan	3.5	France	3.3	Portugal	4.1	France	4.3
Austria	3.4	Belgium-Luxembourg	3.2	France	4.0	Finland	3.0
United States	2.9	Finland	2.6	Switzerland	3.3	Switzerland	2.8
Portugal	2.0	Italy	2.6	United States	2.6	Italy	2.8
Czechoslovakia	1.4	Japan	1.8	Italy	2.6	United States	2.7
India	1.4	Czechoslovakia	1.6	Finland	2.5	China	1.8
		United States	1.4	Japan	1.5	Czechoslovakia	1.2
				Czechoslovakia	1.4	India	1.2
				Spain	1.1	Japan	1.0
8 suppliers	22.1	9 suppliers	25.8	11 suppliers	31.7	11 suppliers	29.6
			Suppliers each with less than 1% of total imports				
45 suppliers	5.4	56 suppliers	6.9	58 suppliers	8.3	61 suppliers	8.6

Source: UNSO Comtrade Data Bank.

APPENDIX TABLE A.18. - SHARE OF INDIVIDUAL SUPPLIERS IN THE IMPORT MARKET FOR CLOTHING IN NORWAY, 1963-1982

(Percentages)

	1963		1973		1978		1982	
Volume index of total world trade in clothing: 1973=100	29		100		172		195	
Total number of suppliers	44		66		78		79	
			Suppliers each with 5% or more of total imports					
Denmark	22.8	Denmark	24.6	Denmark	18.1	Denmark	18.1
Sweden	18.9	Sweden	18.0	United Kingdom	17.5	Finland	16.7
Germany, Fed. Rep.	9.8	United Kingdom	12.7	Finland	14.8	United Kingdom	11.8
Hong Kong	9.0	Finland	11.6	Sweden	12.6	Sweden	8.8
United Kingdom	8.8	Hong Kong	8.1	Hong Kong	8.0	Hong Kong	7.0
Italy	8.2	Portugal	5.1			Italy	6.4
						Portugal	5.8
						Germany, Fed. Rep.	5.0
6 suppliers	77.5	6 suppliers	80.1	5 suppliers	71.0	8 suppliers	79.6
			Suppliers each with 1-4.9% of total imports				
Netherlands	4.0	Austria	3.7	Portugal	4.6	Austria	4.0
France	3.0	Germany, Fed. Rep.	2.4	Italy	3.6	France	3.6
United States	2.3	Italy	1.8	Austria	3.4	China	1.2
Czechoslovakia	1.9	Switzerland	1.5	Germany, Fed. Rep.	3.0	Ireland	1.1
Austria	1.9	Czechoslovakia	1.3	France	1.9	United States	1.0
Hungary	1.7	India	1.2	United States	1.3		
Germany, Fed. Rep.	1.3			Korea, Rep. of	1.2		
Switzerland	1.1			Switzerland	1.0		
Belgium-Luxembourg	1.1						
9 suppliers	18.3	6 suppliers	11.9	8 suppliers	20.0	5 suppliers	10.9
			Suppliers each with less than 1% of total imports				
29 suppliers	4.2	54 suppliers	8.0	65 suppliers	9.0	66 suppliers	9.5

Source: UNSO Comtrade Data Bank.

APPENDIX TABLE A.19 - TRADE BALANCES[a] OF MAJOR AREAS IN SELECTED COMMODITY GROUPS, 1963-1981

(Billion dollars)

	Textiles			Clothing			Textile Fibres			Textile Machinery			Manufactures			All Commodities		
	1963	1973	1981	1963	1973	1981	1963	1973	1981	1963	1973	1981	1963	1973	1981	1963	1973	1981
Developed countries of which:	0.73	0.68	3.24	-0.07	-4.06	-16.80	-1.48[b]	-0.52[b]	2.64[b]	0.52	2.25	2.90	19.51	51.75	193.87	-2.71	-5.73	-77.93
United States	-0.19	-0.36	0.54	-0.30	-1.88	-6.86	0.28	1.07	3.01	0.09	-0.25	-0.30	7.12	1.14	8.92	5.91	0.77	-45.43
Canada	-0.24	-0.63	-1.08	-0.05	-0.21	-0.61	-0.11	-0.15	-0.19	-0.04	-0.10	-0.16	-1.95	-6.22	-12.60	0.39	1.89	3.38
Japan	0.88	1.32	4.22	0.20	-0.21	-1.22	-0.76	-1.73	-1.64	0.06	0.49	1.27	3.39	24.70	118.27	-1.29	-1.38	11.08
Western Europe	0.69	1.39	1.28	0.10	-1.60	-7.59	-1.96	-2.22	-1.46	0.44	2.25	2.44	13.40	39.93	105.85	-7.66	-8.35	-34.77
EC (9)	0.99	1.98	1.81	0.23	-0.89	-5.37	-1.78	-2.03	-1.34	0.33	1.69	1.43	14.36	41.46	103.38	-5.46	-3.85	-27.38
Developing countries[c] of which:	-0.84	-0.75	-3.12	-0.04	3.24	12.13	1.32	0.94	-0.35	-0.47	-1.98	-3.51	-18.69	-52.02	-207.73	-3.57	-6.93	6.41
Southern Europe	0.01	0.24	1.36	0.03	0.51	2.19	-0.12	-0.32	-0.73	-0.11	-0.44	-0.50	-2.13	-6.96	-5.61	-2.64	-10.25	-31.49
Middle East	-0.20	-0.75	-4.11	-0.04	-0.02	-1.49	0	0.08	-0.04	-0.03	-0.16	-0.28	-1.90	-9.32	-71.07	1.85	10.90	87.40
East & South East Asia	0.13	0.71	3.00	0.23	3.05	13.74	0.01	-0.69	-1.66	-0.15	-0.73	-0.94	-4.49	-5.51	-9.54	-3.10	-3.26	-10.71
Latin America	-0.27	-0.13	-0.63	-0.08	-0.07	-1.04	0.78	0.91	1.40	-0.13	-0.45	-1.12	-5.90	-15.89	-60.39	1.12	-2.39	-16.02
Africa	-0.50	-0.78	-2.69	-0.18	-0.21	-1.22	0.65	0.97	0.68	-0.06	-0.20	-0.67	-4.12	-13.87	-59.83	-0.57	0.27	-16.59
Eastern trading area	0.08	0.10	0.26	-0.24	0.26	1.81	-0.65	-0.72	-1.99	0.02	-0.07	-0.29	0.49	-4.65	-8.95	0.70	-2.00	2.20
USSR	-0.22	-0.50	-1.85	-0.51	-1.04	-2.61	0.04	0.10	0.73	-0.03	-0.14	-0.54	-1.58	-6.95	-27.70	0.21	0.35	6.15
Eastern Europe	0.05	0.01	0.53	0.25	0.96	2.09	-0.59	-0.78	-1.23	0.06	0.10	0.48	1.78	3.45	21.60	0.19	-0.90	-2.95
China[d]	0.25	0.59	1.57	0.03	0.34	2.34	-0.11	-0.05	-1.49	0	-0.03	-0.23	0.29	-1.15	-2.85	0.30	-1.45	-1.00

[a] F.o.b.-c.i.f. for developed countries (except Canada) and Southern Europe; f.o.b.-f.o.b. for Canada and the other areas as well as for the United States in 1963 and 1973.

[b] Including a surplus for Australia, New Zealand and South Africa of $1 billion, $2½ billion and $3 billion in 1963, 1973 and 1981 respectively.

[c] Imports of developing countries are derived from trading partners' returns. For the USSR, developing countries are not completely broken down by destination. The more, part of the USSR's exports to developing countries is included in the total for developing countries only.

[d] Including the other centrally planned economies in Asia.

Sources: UN, Yearbook of International Trade Statistics, Commodity Trade Statistics and Monthly Bulletin of Statistics; UN/UNCTAD, Handbook of International Trade and Development Statistics; UNSO Comtrade Data Bank; OECD, Trade by Commodities series B and C; FAO, Trade Yearbook; national statistics.

APPENDIX TABLE A.20a. - TRADE OF THE EASTERN TRADING AREA IN TEXTILES, 1968-1981

(Billion dollars)

	1968		1973		1981	
	Exp.	Imp.	Exp.	Imp.	Exp.	Imp.
USSR	0.09	0.30	0.14	0.64	0.13	1.98
Eastern Europe	0.37	0.38	0.86	0.85	1.99	1.46
China[a]	0.27	0.01	0.78	0.19	3.22	1.66
Eastern trading area	0.73	0.69	1.78	1.68	5.36	5.10
of which:						
With third countries	0.47	0.43	1.22	1.17	4.25	4.00
World trade	9.90		23.35		55.10	

[a]Including the other centrally planned economies in Asia.

Sources: UN, Yearbooks of International Trade Statistics, Commodity Trade Statistics and Monthly Bulletins of Statistics; national trade returns.

APPENDIX TABLE A.20b. - TRADE OF THE EASTERN TRADING AREA IN CLOTHING, 1968-1981

(Billion dollars)

	1968		1973		1981	
	Exp.	Imp.	Exp.	Imp.	Exp.	Imp.
USSR	0.01	0.70	0.03	1.07	0.03	2.64
Eastern Europe	0.68	0.17	1.38	0.43	2.78	0.70
China[a]	0.08	0.01	0.37	0.03	2.42	0.08
Eastern trading area	0.77	0.88	1.78	1.53	5.23	3.42
of which:						
With third countries	0.20	0.31	0.64	0.39	3.25	1.50
World trade	4.40		12.60		41.30	

[a]Including the other centrally planned economies in Asia.

Source: See Table A.20.

APPENDIX TABLE A.21a. - EXPORTS OF ALL COMMODITIES, MANUFACTURES, TEXTILES AND CLOTHING FROM THE EASTERN TRADING AREA, 1968-1981

(Billion dollars)

		1968	1973	1976	1977	1978	1979	1980	1981
USSR	All commodities	10.65	20.80	37.35	45.10	52.40	64.55	76.60	79.10
	Manufactures	4.25	8.35	13.00	14.95	18.30	19.85	21.75	19.60
	Textiles	0.09	0.14	0.14	0.18	0.18	0.17	0.19	0.13
	Clothing	0.01	0.03	0.03	0.02	0.02	0.03	0.03	0.03
Eastern Europe	All commodities	14.25	30.80	49.10	55.15	63.45	73.30	82.75	82.45
	Manufactures	10.70	23.75	37.15	42.05	49.40	56.35	63.05	62.30
	Textiles	0.37	0.86	1.25	1.35	1.55	1.72	1.79	1.99
	Clothing	0.68	1.38	1.98	2.18	2.46	2.82	3.09	2.78
of which:									
Czechoslovakia	All commodities	3.00	6.04	9.06	10.30	11.75	13.20	14.90	14.95
	Manufactures	2.53	5.24	7.81	8.93	10.15	11.27	12.55	13.10
	Textiles	0.10	0.22	0.28	0.31	0.33	0.39	0.39	0.41
	Clothing	0.08	0.18	0.27	0.31	0.32	0.36	0.39	0.43
Hungary	All commodities	1.79	4.48	6.17	7.19	8.50	10.10	11.70	11.65
	Manufactures	1.25	3.03	4.28	5.05	5.70	6.96	7.45	7.40
	Textiles	0.08	0.15	0.20	0.21	0.24	0.25	0.29	0.28
	Clothing	0.09	0.20	0.26	0.31	0.36	0.43	0.43	0.40
Poland	All commodities	2.86	6.32	11.05	12.27	14.1.	16.25	17.10	13.40
	Manufactures	...	...	...	...	...	...	10.40	8.90
	Textiles	...	0.16	0.28	0.31	0.38	0.37	0.34	0.34
	Clothing	...	0.28	0.47	0.53	0.66	0.69	0.69	0.55
China[a]	All commodities	2.10	5.05	8.00	8.60	12.00	15.20	19.90	23.50
	Manufactures	0.95	2.35	3.45	4.05	5.80	7.20	9.30	11.70
	Textiles	0.27	0.78	1.03	1.12	1.69	2.34	2.57	3.22
	Clothing	0.08	0.37	0.58	0.78	1.06	1.43	1.91	2.42
EASTERN TRADING AREA	All commodities	27.00	56.70	94.50	103.90	127.90	153.10	179.30	185.10
	Manufactures	15.90	34.30	53.60	61.10	73.50	83.40	94.10	93.60
	Textiles	0.73	1.80	2.45	2.65	3.40	4.25	4.55	5.35
	Clothing	0.77	1.80	2.60	2.95	3.55	4.25	5.05	5.25

[a] Including the other centrally planned economies in Asia.

Notes: - With the exceptions of the USSR, Czechoslovakia, Hungary and Poland, the data are largely based on returns of trading partners.
- Figures may not add to totals because of rounding.

Sources: UN, Yearbook of International Trade Statistics, Commodity Trade Statistics and Monthly Bulletin of Statistics; national trade returns.

APPENDIX TABLE A.21b. - IMPORTS OF ALL COMMODITIES, MANUFACTURES, TEXTILES AND CLOTHING INTO THE EASTERN TRADING AREA, 1968-1981

(Billion dollars)

		1968	1973	1976	1977	1978	1979	1980	1981
USSR	All commodities	9.40	20.45	38.70	41.70	51.10	57.60	68.60	72.95
	Manufactures	7.35	15.30	28.30	30.30	35.90	40.75	45.95	47.30
	Textiles	0.30	0.64	1.08	1.25	1.29	1.38	2.00	1.98
	Clothing	0.70	1.07	1.54	1.69	1.90	1.92	2.52	2.64
Eastern Europe	All commodities	14.50	31.70	55.30	61.40	69.90	78.70	88.90	85.40
	Manufactures	8.85	20.30	33.50	36.75	41.20	44.10	47.35	40.70
	Textiles	0.38	0.85	1.14	1.25	1.37	1.52	1.66	1.46
	Clothing	0.17	0.43	0.56	0.63	0.74	0.84	0.95	0.70
of which:									
Czechoslovakia	All commodities	3.08	6.21	9.71	11.19	12.60	14.36	15.15	14.63
	Manufactures	1.60	3.58	5.60	6.42	7.39	7.94	8.32	7.74
	Textiles	0.03	0.10	0.11	0.13	0.13	0.14	0.12	0.12
	Clothing	0.05	0.10	0.11	0.12	0.15	0.16	0.15	0.12
Hungary	All commodities	1.80	3.97	6.83	7.91	9.93	11.12	12.58	12.11
	Manufactures	1.06	2.50	4.40	5.17	6.55	6.90	7.23	7.33
	Textiles	0.04	0.12	0.18	0.22	0.26	0.24	0.30	0.34
	Clothing	0.01	0.03	0.06	0.08	0.11	0.10	0.12	0.14
Poland	All commodities	2.85	7.81	13.85	14.62	16.09	17.58	19.09	15.52
	Manufactures	...	...	...	...	...	...	10.80	8.04
	Textiles	...	0.15	0.22	0.23	0.22	0.28	0.30	0.18
	Clothing	...	0.05	0.07	0.08	0.09	0.11	0.15	0.11
China[a]	All commodities	2.40	6.50	7.80	8.90	13.00	17.65	22.80	24.50
	Manufactures	1.35	3.50	5.30	5.35	8.35	11.65	14.15	14.55
	Textiles	0.01	0.19	0.22	0.35	0.36	0.43	0.97	1.66
	Clothing	0.01	0.03	0.04	0.02	0.02	0.03	0.05	0.08
EASTERN TRADING AREA	All commodities	26.30	58.70	101.80	112.00	134.00	154.00	180.30	182.90
	Manufactures	17.60	39.10	67.10	72.40	85.50	96.50	107.50	102.60
	Textiles	0.69	1.70	2.45	2.85	3.00	3.35	4.65	5.10
	Clothing	0.88	1.55	2.15	2.35	2.65	2.80	3.50	3.45

[a] Including the other centrally planned economies in Asia.

Notes: - With the exceptions of the USSR, Czechoslovakia, Hungary and Poland, the data are largely based on returns of trading partners.
- Figures may not add to totals because of rounding.

Sources: UN, Yearbook of International Trade Statistics, Commodity Trade Statistics and Monthly Bulletin of Statistics; national trade returns.

APPENDIX TABLE A.22. - SHARE OF TEXTILES AND CLOTHING IN MANUFACTURING FIXED INVESTMENT IN SELECTED COUNTRIES, 1963-1981

(Percentages)

		1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
United States	Textiles	3.7	3.8	3.7	4.7	3.8	3.7	4.2	4.2	4.8	5.1	4.7	3.7	3.0	3.0	3.0	2.8	2.4	2.4	..
	Clothing	1.0	0.7	0.7	0.8	0.7	1.0	1.0	0.9	1.2	1.1	1.0	0.8	0.8	0.8	0.8	0.7	0.6	0.7	..
Canada	Textiles	4.2	5.8	5.3	4.2	3.2	3.1	3.6	3.0	3.3	4.2	4.1	3.6	3.5	2.4	1.6	1.9	1.9	2.1	1.7
	Clothing	0.6	0.6	0.5	0.4	0.3	0.4	0.5	0.3	0.5	0.7	0.8	0.5	0.5	0.4	0.4	0.5	0.4	0.4	0.4
Japan	Textiles	6.3	6.7	5.3	4.6	5.0	4.5	4.1	4.7	4.8	4.9	5.2	3.9	2.7	2.7	2.5	2.0	2.6	2.4	2.1
	Clothing	0.5	0.5	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.8	0.5	0.4	0.6	0.5	0.5	0.5	0.3	0.4
Belgium	Textiles	8.7	7.7	6.9	6.8	6.1	7.3	7.8	6.8	5.2	6.0	7.0	5.9	5.2	4.6	5.3	4.9	3.6	...	..
	Clothing	2.1	2.6	1.7	1.5	1.7	1.5	2.3	2.1	1.7	1.8	1.1	0.8	0.9	1.1	1.2	1.3	1.0	...	..
Denmark	Textiles	4.3	4.2	3.6	3.8	3.2	4.0	3.9	5.8	4.2	4.8	5.4	4.7	2.5	4.6	3.2	2.0	2.3	2.5	2.0
	Clothing	2.4	2.4	1.8	2.2	1.0	1.3	1.3	1.7	0.8	1.3	0.8	0.7	0.7	1.7	1.2	0.9	0.7	0.5	0.8
Germany, Fed. Rep.	Textiles	..	4.6	4.8	4.5	4.1	5.1	4.8	3.9	3.8	3.7	3.6	3.0	2.9	3.3	3.0	2.8	3.0	2.5	..
	Clothing	..	1.3	1.3	1.1	0.9	1.1	1.1	0.9	0.8	0.9	0.8	0.6	0.7	0.9	0.8	0.8	0.7	0.5	..
France	Textiles	..	..	..	..	..	..	..	3.9	3.6	3.8	3.2	2.8	2.9	2.8	2.2	2.1	2.2	2.4	..
	Clothing	..	..	..	..	..	..	..	1.7	1.6	1.6	1.4	1.2	1.2	1.2	0.9	0.9	0.9	1.0	..
Ireland	Textiles	8.9	9.4	8.9	6.3	12.5	12.0	13.3	14.0	14.0	8.6	6.9	5.5	5.6	9.6	13.1	6.7	..	..	..
	Clothing	1.3	1.2	1.1	1.8	2.9	3.0	2.2	2.1	1.1	0.7	1.1	0.7	0.8	0.5	1.2	1.4	..	..	..
Italy	Textiles	..	..	5.9	7.3	7.5	6.4	6.6	5.6	4.3	5.9	6.6	6.8	6.2	6.7	5.6	6.2	6.9	7.0	..
	Clothing	..	..	1.0	1.3	1.5	1.3	1.3	1.2	1.0	1.1	1.2	1.4	1.1	1.1	1.2	1.2	1.3	1.5	..
Netherlands	Textiles	..	5.2	4.4	3.3	2.8	3.7	3.9	3.2	2.6	2.4	3.5	2.9	2.4	2.7	2.0	1.6	2.0	1.8	1.7
	Clothing	..	1.9	1.3	1.2	1.0	0.9	1.0	0.6	0.8	0.7	0.5	0.3	0.5	0.5	0.6	0.5	0.6	0.3	0.3
United Kingdom	Textiles	6.0	7.9	8.5	7.7	6.4	6.8	..	5.2	4.3	4.8	6.9	6.4	5.1	3.8	3.6	3.7	3.3	2.3	..
	Clothing	0.8	2.0	1.6	1.6	1.4	0.9	..	0.8	0.6	1.1	1.1	1.1	0.8	0.8	0.8	0.9	1.0	0.8	..
Austria	Textiles	6.8	8.5	6.5	6.7	6.5	8.6	10.6	7.6	6.4	5.6	6.1	6.0	5.0	5.5	4.0	3.8	4.4	4.3	..
	Clothing	2.4	2.4	2.6	2.3	1.8	2.5	1.9	2.2	1.8	1.7	1.8	1.3	1.7	1.6	1.5	1.5	1.4	1.0	..
Finland	Textiles	3.0	3.2	3.1	2.2	3.5	3.9	4.8	3.0	2.9	2.2	3.9	3.3	2.0	1.6	1.4	3.4	2.9	2.7	..
	Clothing	1.3	1.2	1.0	1.4	0.9	1.0	1.5	2.0	1.1	1.0	1.7	1.7	1.2	1.0	1.2	2.1	2.0	1.5	..
Norway	Textiles	3.0	2.6	2.9	2.4	2.6	2.3	3.6	2.8	2.0	1.9	1.7	1.8	1.2	1.3	1.4	2.1	2.2	2.1	0.7
	Clothing	1.3	0.9	0.8	0.9	0.5	0.6	1.0	0.5	0.4	0.4	0.3	0.2	0.3	0.3	0.5	0.5	0.6	0.5	0.3
Sweden	Textiles	2.6	2.6	2.8	1.6	2.4	2.4	2.1	2.2	1.5	1.7	2.0	1.8	1.7	1.3	1.1	1.9	1.9	1.7	1.5
	Clothing	2.1	1.6	1.7	0.8	0.8	0.8	0.9	0.5	0.6	0.6	0.4	0.4	0.5	0.4	0.4	0.3	0.4	0.3	0.3
Australia	Textiles	4.4	3.0	3.3	3.5	2.6	3.4	4.2	4.6	..	2.9	2.5	4.3	2.8	2.4	1.9	1.8	1.7	2.3	1.6
	Clothing	2.4	0.9	0.6	0.5	0.4	0.7	0.9	0.9	..	0.6	0.8	1.0	0.5	0.5	0.5	0.6	0.7	0.8	0.6
New Zealand	Textiles	7.5	5.8	5.5	5.1	5.6	6.0	6.8	8.0	4.1	3.8	3.4	3.9	5.2	2.9	7.3	5.7	6.0	3.8	..
	Clothing	2.0	1.9	1.2	1.1	1.2	1.3	1.2	2.3	1.2	1.3	1.5	1.5	1.5	1.2		0.8	0.8	0.7	
Brazil	Textiles	7.0	6.7	6.5	7.1	8.6	9.4	8.5	..	8.9	8.6	8.4	7.8	..	5.0	3.7	3.7	..	..	..
	Clothing	1.5	2.2	1.6	1.7	1.6	1.7	2.7	..	1.5	1.4	2.4	1.9	..	2.0	1.6	2.1	..	..	..
Chile	Textiles	20.3	10.9	28.9	22.5	16.7	11.7	10.8	12.7	5.1	3.1	2.3	3.1	0.5	2.0	15.2	12.2	5.1	..	..
	Clothing	0.5	1.4	1.1	1.2	1.7	0.7	1.9	0.5	0.4	0.4	0.2	1.6	0.6	2.5	3.0	2.1	1.1	..	..
Hong Kong	Textiles	..	..	..	..	..	..	..	...	..	..	37.4	..	..	33.0	16.8	17.4	16.6	16.6	..
	Clothing	..	..	..	..	..	..	..	..	..	..	7.5	..	..	17.0	14.8	19.1	12.3	14.5	..
India	Textiles	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13.2	9.2	..	..	..
	Clothing	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0.3	0.2	..	..	..
Indonesia	Textiles	..	..	...	..	..	..	..	27.3	15.1	26.7	21.7	..	27.4	21.9	20.0	58.7	57.3	23.7	..
	Clothing	..	..	..	..	..	..	..	-	-	-	-	..	0.4	-	0.9	-	0.1	0.8	..
Korea, Rep. of	Textiles	19.7	..	..	31.4	23.7	15.2	23.1	25.2	20.5	10.2	29.1	27.0	20.9	19.6	20.3	15.9	11.6	9.2	..
	Clothing	0.8	..	..	0.9	0.8	1.4	1.9	1.4	1.3	1.3	2.1	2.3	2.0	3.4	2.2	1.6	1.4	1.2	..
Philippines	Textiles	21.8	11.9	7.7	8.7	..	12.4	9.7	7.0	7.4	7.4	13.1	15.9	23.8	22.0	12.2	..	20.6	.	..
	Clothing	1.5	1.2	1.4	0.8	..	0.2	0.6	0.4	0.9	0.6	0.7	0.4	1.3	1.1	1.5	..	1.7	..	..
Singapore	Textiles	6.7	6.2	5.5	0.5	3.0	10.0	5.8	6.2	4.4	5.9	2.8	7.8	6.0	3.7	1.7	1.3	1.7	2.9	1.4
	Clothing				1.8	2.0	3.1	2.1	1.5	2.2	3.5	1.3	4.9	1.4	2.0	2.3	2.9	1.9	1.8	1.8
Tunisia	Textiles	4.3	..	39.0	51.5	5.6	4.2	15.4	12.0	8.9	11.9	5.8	7.3	9.9	5.3	6.3	3.6	2.2	3.0	..
	Clothing	1.2	..	2.3	3.0	1.2	1.3	2.3	2.2	0.8	2.8	6.7	4.2	7.8	4.5	4.6	6.3	3.3	3.6	..
Venezuela	Textiles	..	..	..	..	..	..	..	..	..	..	..	5.5	..	4.2	2.3	1.1	2.8	..	..
	Clothing	..	..	..	..	..	..	..	..	..	..	..	0.8	..	0.7	0.6	0.5	0.6	..	..

Sources: UN, The Growth of World Industry and Yearbook of Industrial Statistics; national statistics.

APPENDIX TABLE A.23. - SHARE OF MACHINERY AND EQUIPMENT IN TOTAL INVESTMENT IN TEXTILES AND CLOTHING, 1972-1980

(Percentages)

	1972-1974	1975-1977	1978-1980
Textiles			
United States	79.4	81.6	83.1
Canada	77.0	81.1	85.1
Japan	67.5	79.7	82.4
Germany, Fed. Rep.	77.2	82.6	81.8[a]
Italy	79.1	81.4	82.4
Netherlands	83.3	84.6	81.8
United Kingdom	83.7	86.2	83.6
Austria	66.7	68.1	70.5
Finland	63.4	71.7	70.6
Norway	84.-	80.2	78.9
Sweden	74.4	81.1	73.7
Australia	87.5	91.4	87.8
Clothing			
United States	67.9	72.7	73.2
Canaa	68.2	72.7	78.6
Japan	41.2	53.6	51.9
Germany, Fed. Rep.	62.4	66.9	70.7[a]
Italy	62.3	69.6	66.1
Netherlands	82.1	67.6	72.2
United Kingdom	73.1	84.8	76.7
Austria	50.0	51.3	55.0
Finland	54.8	59.7	60.7
Norway	86.7	84.6	75.0
Sweden	75.6	69.4	73.1
Australia	70.0	85.7	73.3

[a] 1979 only.

Source: UN, Yearbooks of Industrial Statistics.

APPENDIX TABLE A.24. - TOTAL EXPORTS OF TEXTILE MACHINERY (SITC 7171) FROM SEVEN MAJOR PRODUCING COUNTRIES, 1962-1982

(Million dollars)

	United States	Shipm.[a]	Japan	France	Germany, Fed. Rep.	Italy	United Kingdom	Switzerland	Total of seven	Idem at 1982 Prices[b]	Idem[c]
1962	158	(417)	74	49	257	67	180	132	917	3 585	(5 213)
1963	145	(529)	56	52	278	66	186	145	928	3 620	(5 683)
1964	180	(425)	83	68	327	75	188	157	1 078	4 036	(5 627)
1965	168	(540)	82	65	350	84	199	175	1 123	4 042	(5 984)
1966	188	(632)	100	69	401	109	230	191	1 288	4 052	(6 710)
1967	168	(544)	106	82	454	127	220	204	1 361	4 699	(6 579)
1968	167	(553)	119	133	499	167	243	234	1 562	5 481	(7 423)
1969	190	(623)	148	154	605	168	267	282	1 814	5 838	(7 844)
1970	227	(580)	196	145	723	200	296	298	2 085	5 829	(7 453)
1971	208	(560)	248	188	890	205	344	358	2 441	6 047	(7 434)
1972	211	(612)	233	191	1 109	225	367	411	2 760	5 963	(7 293)
1973	299	(522)	429	276	1 476	269	407	604	3 760	6 578	(7 491)
1974	438	(549)	630	306	1 662	355	492	707	4 590	7 196	(8 057)
1975	398	(463)	535	334	1 452	419	530	822	4 490	6 187	(5 999)
1976	350	(568)	461	282	1 462	381	454	822	4 212	5 638	(6 399)
1977	315	(542)	502	294	1 445	381	369	782	4 087	4 809	(5 448)
1978	382	(567)	651	396	1 641	401	447	977	4 895	4 871	(5 435)
1979	501	(556)	719	420	2 030	559	542	1 053	5 824	5 089	(5 574)
1980	545	(578)	874	456	2 196	673	648	1 350	6 742	5 797	(6 081)
1981	540		886	351	1 819	622	507	1 191	5 916	5 839	
1982	431		672	278	1 652	534	422	1 065	5 054	5 054	

[a] United States' domestic shipments in current dollars.

[b] The figures in current dollars, taken from official statistics, have been deflated by the Federal Republic of Germany's export price index for textile machinery (after adjustment for exchange rate changes).

[c] Including United States' domestic shipments in constant prices.

Sources: UNSO Comtrade Data Bank; US, Department of Commerce, Bureau of Census, Annual Survey of Manufactures, Value of Product Shipments.

APPENDIX TABLE A.25. - GEOGRAPHICAL DISTRIBUTION OF WORLD SPINNING AND WEAVING CAPACITIES, 1963-1981

(Percentages)

	Spinning[a]			Weaving[c]		
	1963	1973	1981[b]	1963	1973	1981[d]
Developed countries	46.8	34.2	23.7	44.6	33.1	24.4
United States	15.1	13.2	10.4	10.9	11.4	8.7
Japan	10.4	8.3	5.4	14.0	11.5	9.5
EC(9)	18.3	10.6	6.1	17.4	8.7	5.0
Developing countries	29.6	36.5	42.6	28.4	34.2	41.2
Southern Europe	4.5	4.8	5.9	4.9	4.9	4.5
Asia	16.8	21.6	25.0	13.8	16.9	22.3
Latin America	6.7	7.5	7.9	8.3	9.5	10.3
Africa	1.5	2.6	3.8	1.4	2.9	4.0
Eastern trading area	23.7	29.3	33.6	27.0	32.7	34.3

[a] Short-staple, ring spindles.

[b] As for 1981, open-end rotors are first converted into ring spindle equivalent (1 rotor = 3 ring spindles), and then added to the total ring spindles installed.

[c] Cotton-type looms.

[d] Shuttleless looms are included without any adjustment for productivity difference.

Source: IFCATI/ITMF.

APPENDIX TABLE A.26. - CANADA: QUOTAS AND SIMPLE AVERAGE QUOTA UTILIZATION RATES BY SUPPLYING COUNTRIES, 1979-1982

(Number and percentages)

		Number		Simple average quota utilization rate (%)
		Total	Over 90%	
Hong Kong[a]	1979	31	12	76.9
	1980	31	8	66.4
	1981	31	7	67.7
	1982	12	4	75.8
Korea, Rep. of[a]	1979	29	8	62.2
	1980	29	3	42.9
	1981	29	7	57.6
	1982	17	8	71.2
Macao	1979	7	2	73.3
	1980	10	2	58.1
	1981	10	3	56.8
	1982	7	2	53.1
Singapore	1979	7	0	35.3
	1980	7	0	39.9
	1981	7	1	33.7
	1982	9	3	43.8
Thailand	1979	4	2	127.8
	1980	6	2	65.3
	1981	6	0	48.0
	1982	4	0	33.3
Malaysia	1979	-	-	-
	1980	3	0	43.0
	1981	3	1	50.7
	1982	2	1	82.0
India	1979	-	-	-
	1980	8	1	61.6
	1981	8	3	65.5
	1982	8	0	45.0
Pakistan	1979	1	1	105.3
	1980	1	1	102.7
	1981	1	1	97.5
	1982	1	1	106.0
Philippines[a]	1979	11	5	69.3
	1980	11	3	50.6
	1981	11	1	47.5
	1982	10	1	47.1

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APPENDIX TABLE A.26. - CANADA: QUOTAS AND SIMPLE AVERAGE QUOTA UTILIZATION RATES BY SUPPLYING COUNTRIES, 1979-1982 (cont'd)

(Number and percentages)

		Number		Simple average quota utilization rate (%)
		Total	Over 90%	
Bulgaria	1979	8	2	46.1
	1980	8	0	23.8
	1981	8	0	11.4
	1982	4	1	33.0
Czechoslovakia	1979	2	2	102.0
	1980	2	0	70.5
	1981	2	0	60.5
	1982	4	1	69.5
Hungary	1979	1	1	168.8
	1980	1	0	57.0
	1981	1	0	5.0
	1982	1	0	75.0
Poland	1979	14	7	78.4
	1980	14	2	52.6
	1981	14	3	51.2
	1982	11	2	54.3
Romania	1979	11	4	89.6
	1980	12	2	134.6
	1981	12	2	37.9
	1982	7	0	33.0
China[a]	1979	28	19	169.8
	1980	28	10	99.1
	1981	28	8	115.1
	1982	16	3	64.2

[a] 1982 data not comparable to earlier years due to a change in category classification.

Note: Quotas are unadjusted for flexibility provisions. Quota utilization rates calculated by dividing quotas by the corresponding import permits.

Source: Data supplied by the Canadian delegation.

APPENDIX TABLE A.27. - FINLAND: QUOTAS AND SIMPLE AVERAGE QUOTA UTILIZATION RATES BY SUPPLYING COUNTRIES, 1979-1982

(Number and percentages)

		Number		Simple average quota utilization rate (%)
		Total	Over 90%	
Hong Kong	1979	4	3	93.4
	1980	4	0	78.0
	1981	4	2	78.0
	1982	5	1	75.2
Korea, Rep. of	1979			
	1980	7	1	38.7
	1981	7	1	45.0
	1982	7	2	54.6
Macao	1979	2	1	51.8
	1980	3	1	73.1
	1981	3	1	80.3
	1982	5	3	65.8
Singapore	1979	1	0	24.9
	1980	1	0	16.8
	1981			
	1982			
Sri Lanka	1979			
	1980			
	1981			
	1982	1	0	69.7
Thailand	1979	2	0	79.9
	1980	2	1	95.4
	1981	2	1	82.7
	1982	2	0	55.0
Malaysia	1979	1	0	70.2
	1980	1	0	56.9
	1981	1	1	98.5
	1982			
India	1979	3	1	72.9
	1980	3	0	56.1
	1981	3	0	38.6
	1982	3	1	49.7

Note: Data by agreement years which do not necessarily correspond to calendar years.
Quotas are unadjusted for flexibility provisions.

Source: Data supplied by Finnish delegation.

APPENDIX TABLE A.28. - SWEDEN: QUOTAS AND SIMPLE AVERAGE QUOTA UTILIZATION RATES BY SUPPLYING COUNTRIES, 1979-1982

(Number and percentages)

		Number		Simple average quota utilization rate (%)
		Total	Over 90%	
Hong Kong	1979			
	1980	17	11	85.8
	1981	17	2	69.4
	1982	15	12	94.8
Korea, Rep. of	1979			
	1980	13	8	84.5
	1981	13	10	85.0
	1982	17	5	71.6
Macao	1979	11	6	89.6
	1980	11	8	93.0
	1981	12	9	89.2
	1982	12	8	87.0
Singapore	1979			
	1980	8	8	101.8
	1981	8	5	92.3
	1982	10	6	83.6
Sri Lanka	1979			
	1980	4	2	89.5
	1981	4	2	89.8
	1982	4	2	85.8
Thailand	1979			
	1980	8	6	107.4
	1981	8	7	98.4
	1982	9	7	89.6
Malaysia	1979			
	1980	6	2	83.5
	1981	6	4	93.7
	1982	6	2	79.8
India	1979	9	7	97.0
	1980	9	6	91.9
	1981	10	8	93.3
	1982	10	6	85.8

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APPENDIX TABLE A.23. - SWEDEN: QUOTAS AND SIMPLE AVERAGE QUOTA UTILIZATION RATES BY SUPPLYING COUNTRIES, 1979-1982 (cont'd)

(Number and percentages)

		Number		Simple average quota utilization rate (%)
		Total	Over 90%	
Pakistan	1979			
	1980	5	1	51.8
	1981	5	2	70.8
	1982	5	3	79.0
Philippines	1979			
	1980	7	3	91.1
	1981	7	0	59.4
	1982	7	2	79.3
Brazil	1979			
	1980			
	1981	8	3	54.1
	1982	8	2	49.1
Yugoslavia	1979	10	3	82.8
	1980	10	3	68.7
	1981	10	5	75.8
	1982	10	5	73.5

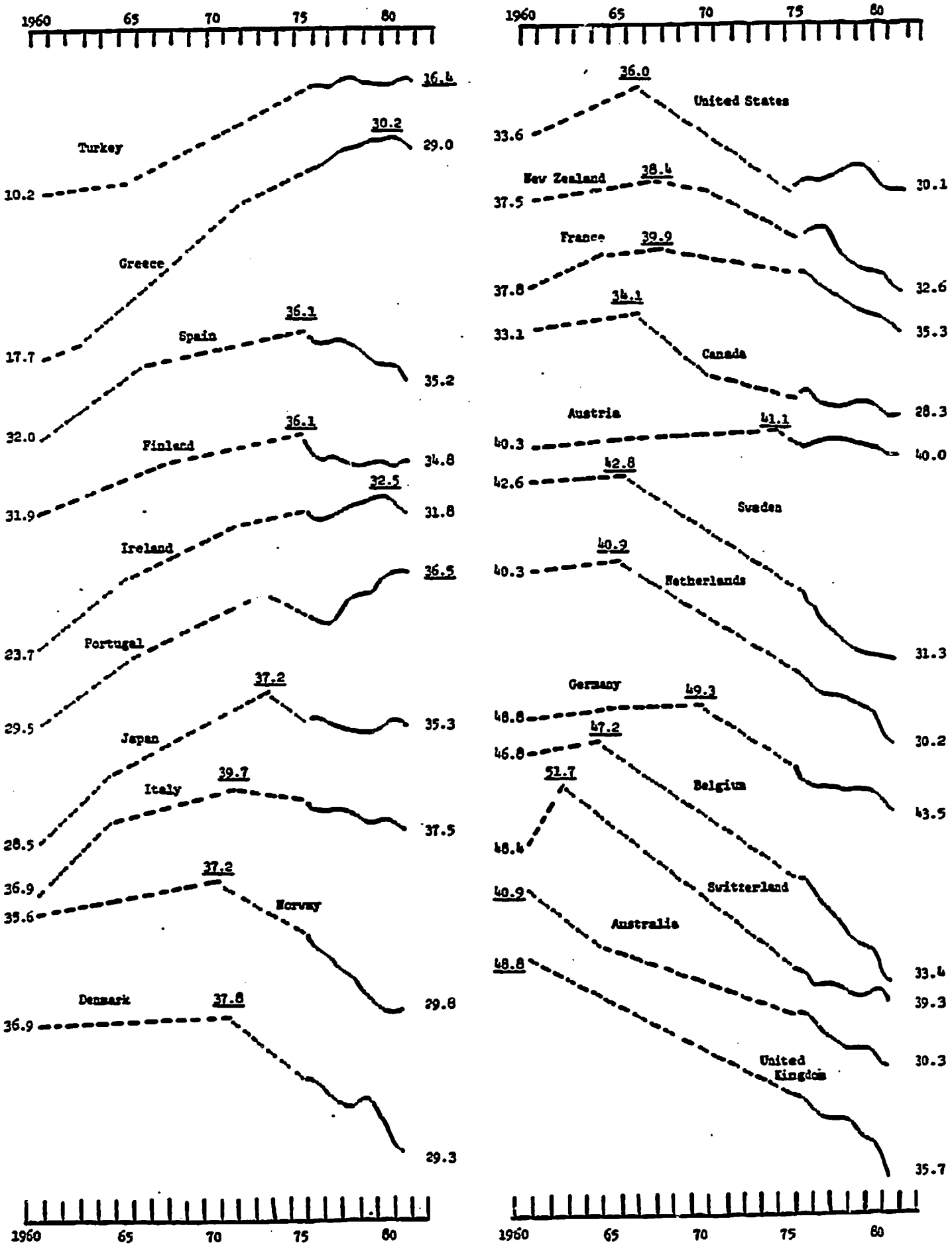
Note: Data by agreement years which do not necessarily correspond to calendar years. Quotas include adjustments for flexibility.

Source: Data supplied by the Swedish delegation.

APPENDIX CHART A.1.

EMPLOYMENT IN INDUSTRY IN SELECTED COUNTRIES (POST 1960)

(as a percentage of civilian employment)



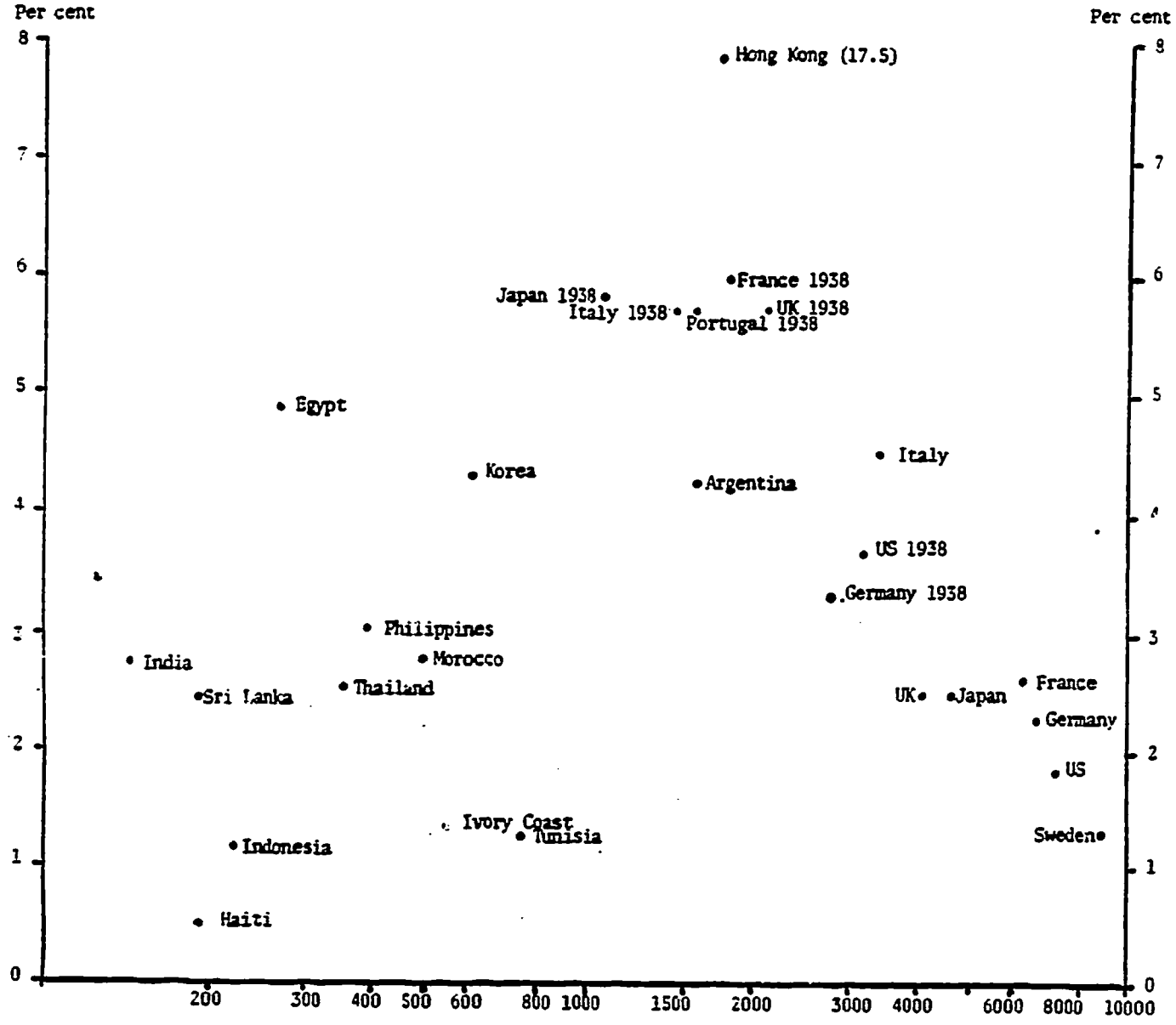
Note: Figures underlined represent peak for period covered in the chart.

Source: OECD, Labour Force Statistics, various issues

APPENDIX CHART A.2

AVERAGE SHARE OF TEXTILES AND CLOTHING PRODUCTION IN GNP AND TOTAL EMPLOYMENT, RELATED TO PER CAPITA GNP. IN SELECTED COUNTRIES, 1938 AND 1975

(Percentages and $US at 1975 prices)



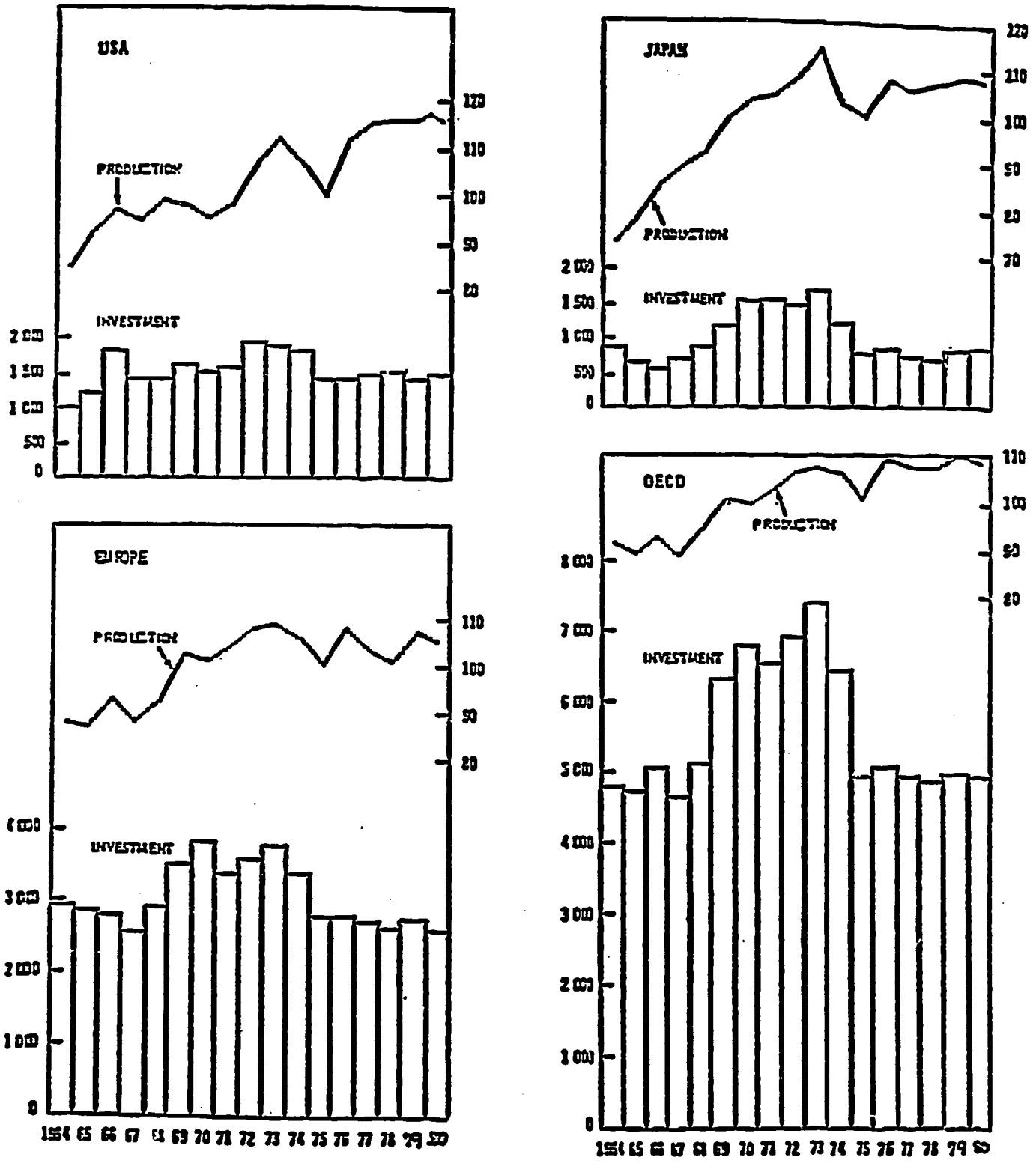
N.B. Unless otherwise noted after country names, the figures refer to 1975.

Sources: UN, Yearbook of Industrial Statistics; OECD, National Accounts, and Labour Force Statistics; national statistics.

APPENDIX CHART A.3.

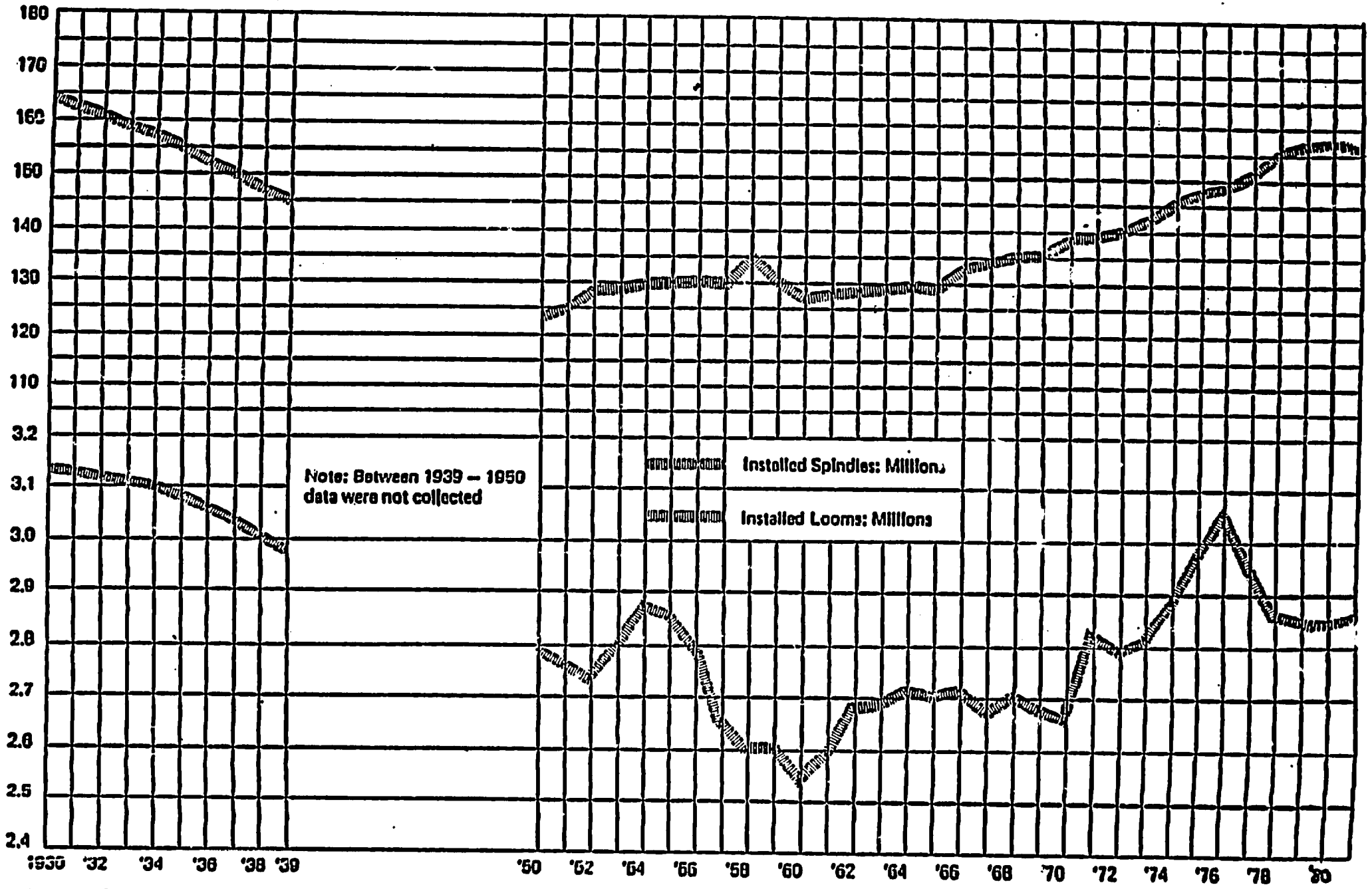
GROSS FIXED INVESTMENT AND PRODUCTION IN TEXTILES AND CLOTHING, IN DEVELOPED AREAS, 1964-1980

Investment in Mill. US$ at 1975 prices and exchange rate (left scale); production indices, 1975=100 (right scale)



Source: OECD, Textile and Clothing Industries: Structural Problems and Policies in OECD countries, Paris, 1983, and Secretariat estimates.

APPENDIX CHART A.4. - CHANGES IN WORLD SHORT-STAPLE SPINNING AND WEAVING CAPACITIES, 1930-1981



Source: ITMF, International Cotton Industry Statistics and Secretariat estimates.

APPENDIX III: PRINCIPAL TECHNOLOGICAL DEVELOPMENTS IN TEXTILES AND CLOTHING

1. The purpose of this Appendix is to give an overview of post-war technological developments and prospects for technological innovations 'on the horizon' in the textile and clothing sectors. In addition to the general developments in transportation and communications described briefly in Chapter 2, post-war technological developments affecting the textiles and clothing industries have taken two main forms:

- material-innovations: fibre developments stemming from remarkable advances in synthetic fibre technology, and
- process-innovations: improvements in traditional production technology and the development of alternative manufacturing methods.

A. MATERIAL DEVELOPMENTS AND INTER-FIBRE COMPETITION

2. The advent of synthetic (non-cellulosic) fibre, which resulted from the development of high polymer chemistry in the pre-World War II years, paved the way for the diversification of fibre material in the post-war period. The commercialization of a variety of synthetic fibres, which featured high strength, durability, thermoplastic, 'wash and wear', and so on, contributed to the remarkable buoyancy of textile demand during the period.

3. Once polyester, nylon and acrylic had formed the 'Big Three' in the synthetic fibre market, interest focused on seeking reductions in production costs through the development of chemical technology and the pursuit of scale economies. Combined with the low-priced supply of petro-chemical feedstock, these efforts led to a steady decline in the relative prices of synthetic fibres during the 1960s and early 1970s. Consumption boomed, thanks in part to success in blending of natural and synthetic yarns, and the share of synthetic fibre in world fibre production increased sharply from 5 per cent in 1960 to 30 per cent in 1973.[1] After 1973, however, fibre substitution slowed down markedly, and from the end of the 1970s to early 1980s inter-fibre competition appears to have turned in favour of cotton (see Table 1).

4. Tremendous progress was also made in the technology for processing synthetic fibre. Taking advantage of such functional properties as thermoplastic, the yarn texturing system (in which continuous filament synthetic yarn was treated to impart 'hand and appearance') was introduced in the 1950s. Since such textured yarn was particularly well-suited to knitting, advances in the texturing of synthetic filament yarn in turn stimulated the growth of the knitting industry in the 1960s. Advances in both synthetic fibre and chemical technologies also animated the existing production methods of 'non-woven' fabrics. Last, but not least, much effort was devoted to overcoming some qualitative disadvantages inherent in synthetic fibre with respect to dyeability, electrical conductivity and pilling, in order to provide fibre material suitable for each end-use. This in turn stimulated developments of process technologies such as dyeing, printing and finishing.

TABLE 1. - INTER-FIBRE COMPETITION: COTTON VS. POLYESTER

Year	Prices		Relative price	% Share of cotton in world fibre demand
	Cotton[a] US current $ Cent/KG (A)	Polyester[b] US current $ Cent/KG (B)	(A) (B) (C)	(based on weight) (D)
1960	65.0	278	0.23	68
1963	64.1	218	0.29	65
1966	61.7	141	0.44	60
1969	62.3	99	0.63	55
1972	82.1	77	1.07	54
1975	122.4	106	1.15	49
1978	159.6	119	1.34	46
1981	187.1	187	1.00	49

[a]Cotton - Mexican Middling 1-3/32", c.i.f. Northern Europe.

[b]Polyester - 1.5 Denier Polyester Staple for Cotton Blending f.o.b. United States Producing Plants.

Sources: World Bank, Price Prospects for Major Primary Commodities; Vol. 3 Agricultural Materials July 1982; C.I.R.F.S. 1982.

5. The sharp increase in petroleum prices in 1974 and again in 1979-80 led to a considerable price rise of naphtha, which is a major feedstock of synthetic fibre. The steep rise in the costs of energy and feedstock, however, seem to have exerted rather limited effects on prices of synthetic fibre. On the other hand, cotton prices showed rather wide fluctuation after the 1973 commodity boom.[2]

6. Table 2 shows the current state of fibre substitution in the EC and the United States in terms of fibre consumption in the main end-uses. Although synthetic fibre has gained ground in the fields of home furnishing (for example, carpets) and industrial uses (for example, tyres), substitution of synthetic for natural fibres has stabilized, or even declined, in clothing consumption, reflecting not only changes in relative prices, but also changes in consumers' tastes.

TABLE 2. - FIBRE CONSUMPTION IN THE MAIN END-USES

(Based on weight - %)

A. EEC[a]

Main end-uses	Man-made fibre[c]					of which: Synthetic fibre					Cotton					Wool				
	1971	1973	1979	1980	1981	1971	1973	1979	1980	1981	1971	1973	1979	1980	1981	1971	1973	1979	1980	1981
Clothing	58	62	59	55	57	42	48	50	44	47	24	22	25	27	25	18	16	16	18	18
Home furnishing																				
Carpets	71	79	81	80	81	56	69	78	78	79	5	3	1	2	2	24	19	18	18	17
Others	43	52	54	53	53	23	28	36	36	36	51	44	41	41	41	6	4	5	6	6
Industrial uses																				
Tyres	95	94	98	98	98	19	21	27	31	30	5	6	2	2	2	-	-	-	-	-
Others[b]	50	55	65	67	71	21	34	40	42	44	47	42	32	31	27	3	2	3	2	2

B. *UNITED STATES*

Main end-uses	Man-made fibre[c]					of which: Synthetic fibre[d]					Cotton					Wool				
	1971	1973	1979	1980	1981	1971	1973	1979	1980	1981	1971	1973	1979	1980	1981	1971	1973	1979	1980	1981
Clothing	56	64	63	62	62	43	53	55	56	55	41	33	34	35	35	3	3	3	3	3
Home furnishing																				
Carpets	90	95	99	99	99	85	94	99	99	99	5	3	1	1	1	5	2	0	0	0
Others	37	44	53	53	54	19	28	42	43	45	63	55	46	46	45	0	1	1	1	1
Industrial uses																				
Tyres	100	100	99	99	99	80	87	94	93	94	0	0	1	1	1	-	-	-	-	-
Others[b]	55	63	77	77	80	22	36	65	64	69	44	37	23	23	20	1	0	0	0	0

[a] Excluding Denmark, Ireland and Greece.

[b] Including acetate tow used in cigarette filters, except for United States from 1977.

[c] Consists of synthetic (non-cellulosic) fibre and cellulosic fibre.

[d] Includes film and spunbonded polypropylene from 1978.

Sources: CIRFS and Textile Organon.

7. Developing countries started to produce synthetic fibre in the 1970s, and their share of world production has increased dramatically over the last decade. As shown in Table 3, this major shift in world production of synthetic fibre is attributable to rapid expansion of production capacity in a handful of developing countries, notably, the Republic of Korea, Taiwan, Mexico and Brazil. Meanwhile, industrial countries have made further progress in synthetic fibre technology in two areas: (1) the development of energy-saving technology, and (2) improvements in quality and diversification of synthetic fibre.

TABLE 3. - SHARE OF WORLD PRODUCTION OF MAN-MADE FIBRE BY REGION AND BY COUNTRY, 1971-1981

(Based on weight - %)

Region and country	1971		1981	
	MMF[b]	SF	MMF[b]	SF
World total	100	100	100	100
Developed countries	75	84	58	62
North America	28	34	27	31
Japan	17	20	12	12
Western Europe	29	30	18	18
EC(9)	26	28	16	17
Developing countries	10	8	23	24
Southern Europe	2	2	4	4
Asia[a]	4	3	14	15
Korea, Rep. of	1	1	5	6
Taiwan	1	2	5	5
Latin America	4	3	5	5
Mexico	1	1	2	2
Brazil	1	1	2	2
Eastern trading area	15	8	19	14

MMF = Man-made fibre.
SF = Synthetic fibre only.

[a] Including East Asia, Southeast Asia, South Asia and West Asia.

[b] Except Olefin.

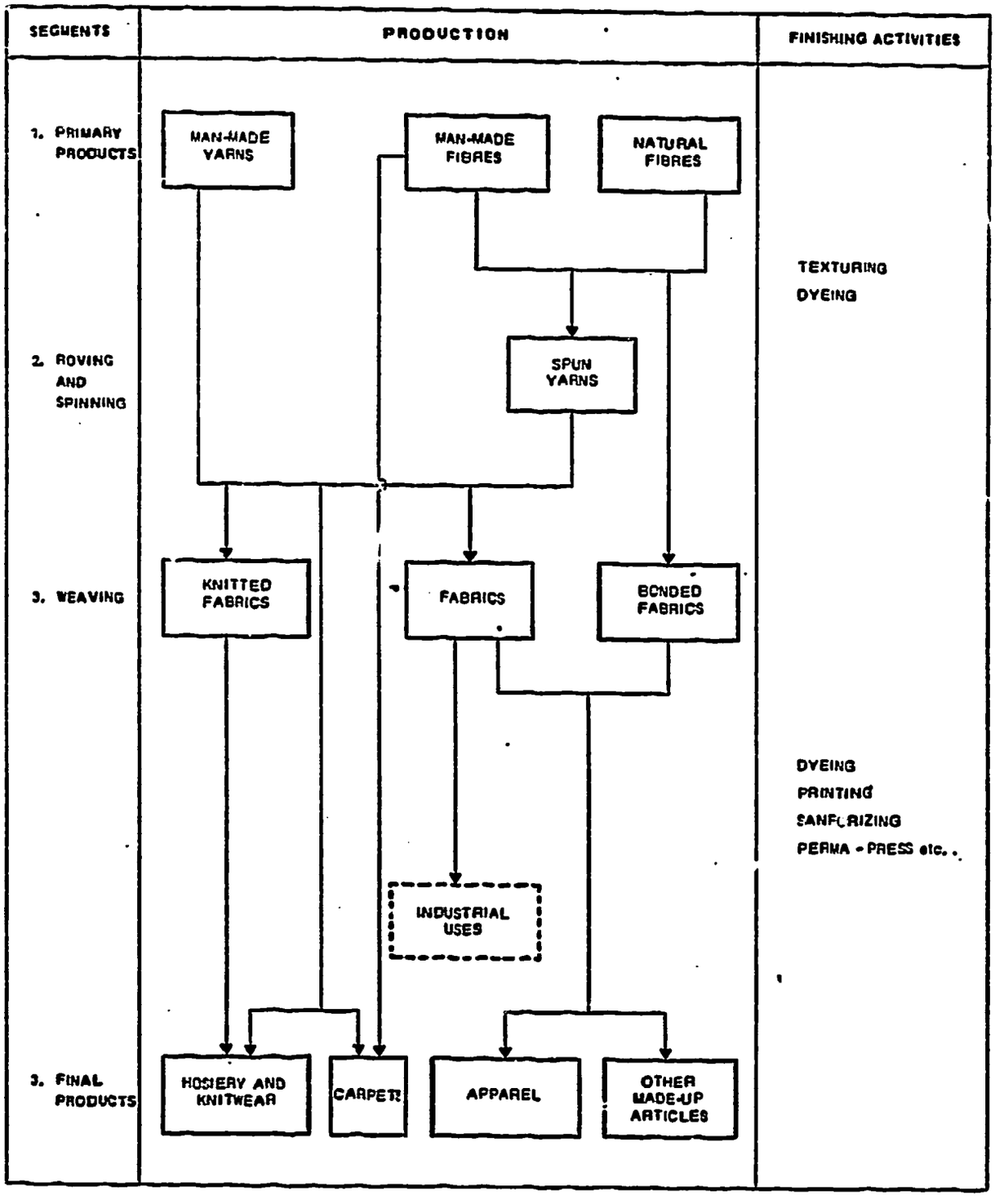
Source: Textile Organon.

B. MAJOR TECHNOLOGICAL DEVELOPMENTS IN PRODUCTION PROCESSES

8. The conventional classification of the textile production system consists of three major parts: (1) the manufacture of yarn from either staple fibre or filament, (2) fabric formation and finishing, and (3) assembly of finished products for end-uses. Each part of the production system can be further divided into several discrete processes. (See Chart 1.)

Chart I

THE MANUFACTURING PROCESS OF TEXTILE PRODUCTS



Source: C.E.P.I.I.

Taken from OECD (1983) Textiles and Clothing Industries: Structural Problems and Policies in OECD Countries, Paris, p. 19.

9. Post-war technological developments in the textile production system have centred on four aspects:

- Improvements in machine speed, leading to more output per unit of time;

- Enlargement of machine capacity, as characterized, for example, by larger cheese on the winder and longer reed on the loom;

- Advances in automation in production lines as well as among individual processes; and

- pure innovations, for example, rotor spinning and shuttleless looms.

10. Developments in process technology in the textile and clothing production were less revolutionary than those in synthetic fibre technology, however. Most technological developments in the textile and clothing industries in the 1950s and 1960s involved improvements in conventional production methods and rationalization of production processes through the introduction of automation. In the 1970s textile machinery manufacturers began developing electronics-related application technologies in their search for increased automation.

(1) Manufacture of yarn

11. Improvements in technology rather than "pure" innovations have dominated the pre-spinning processes of manufacturing spun yarn during the post-war period, though remarkable advances have been made in machine speeds in each of the production processes. A notable exception is the introduction of a continuous automatic spinning system to replace manual handling of fibre materials. This system is applicable only to mass production of highly specific products, however, and improvement in product quality under this system has fallen short of spinners' expectations. Furthermore, converting a conventional system into the fully automatic system is rather expensive, a fact that has limited the popularity of the continuous automatic spinning system.[3]

12. 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. With respect to the former, automatic doffers and fully automatic winders have been introduced on a large scale in countries where labour costs are high, while automatic piecers have been under development, since yarn piecing on the ring frame is a complicated operation. In the latter case, attention has been paid to process control, such as computerized management of ring spinning, energy saving, noise reduction and dust control.

13. Perhaps the most striking technological development in spinning was the introduction of open-end (rotor) spinning in the late 1960s. 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 3½ 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. As against these merits, open-end spinning requires higher capital costs and greater power consumption. Obviously, the labour-saving characteristic of open-end spinning is the main concern for high-wage countries. Although the cost comparison between two different systems involves many difficulties in measurement, it is now clear that the cost advantage of open-end spinning is confined to yarn of coarser count up to 20s-30s.

14. Versatility is the great advantage of ring spinning. With open-end spinning it is not possible to freely change the direction of twisting, and open-end spinning is possible only with cotton and man-made staple fibre. Woollen and worsted spinning, as well as dry flax spinning is possible with ring frames. Recent developments in automatic equipment and various attachments have made the adoption of ring spinning economically more attractive under certain circumstances (especially in low-wage countries).

15. Table 4 shows the world spinning capacity[4] of short-staple spindles in 1963-1981 and of open-end rotors in 1981. It reveals that the geographical shift of spinning capacity from industrial countries to the developing countries and China has occurred on a large scale over the last two decades, and that a greater proportion[5] of spinning frames are still of the conventional type (ring spinning). During the period of 1974-1982 the cumulative shipments of ring spindles and open-end rotors to the world market amounted to 23.5 million and 4.2 million respectively. (See Table 5.) About 80 per cent of ring spindles shipped during the above period went to developing countries, while more than 60 per cent of rotors were shipped to the USSR. Since its initial introduction in the late 1960s, open-end spinning has not been widely accepted by spinners outside the Eastern trading area, partly due to the fact that open-end spinning is less suitable for the finer yarns which industrial country consumers prefer.

16. As mentioned earlier in this section, it is also true that modernization of ring spinning system has proceeded at the same time through application of automatic or semi-automatic attachments and introduction of new machines which can operate much faster than old models. For instance, Table 6 gives a rough idea of the major trend of modernization in Japanese cotton spinning industry during the last decade. It shows that in spinning processes diffusion of technology has occurred unevenly.

17. Recently spinners' attention has been paid to the automation of open-end spinning and the air-jet spinning[6], first introduced in 1980 by a Japanese textile-machinery firm.

TABLE 4. - INSTALLED SPINNING CAPACITY OF SHORE-STAPLE SPINDLES AND OPEN-END ROTORS IN 1963, 1973 AND 1981

(Hundred thousands and percentages)

Region and country	1963[b]		1973[b]		1981[b]			
	Spindles[c]		Spindles[c]		Spindles[c]		Rotors	
World trade	1 282.1	100.0	1 435.4	100.0	1 559.0	100.0	40.1	100.0
Developed countries	599.8	46.8	490.9	34.2	374.0	24.0	8.2	20.4
North America	201.3	15.7	195.7	13.6	175.3	11.2	2.7	6.7
United States	193.6	15.1	188.9	13.2	167.4	10.7	2.6	6.5
Japan	133.5	10.4	118.9	8.3	85.1	5.5	1.7	4.2
Western Europe	259.1	20.2	168.4	11.7	105.3	6.8	3.6	9.0
EC(9)	235.0	18.3	151.8	10.6	92.2	5.9	3.4	8.5
Developing countries	378.9	29.6	524.2	36.5	697.6	44.7	6.1	15.2
Southern Europe	57.4	4.5	69.0	4.8	95.7	6.1	1.3	3.2
Asia[a]	215.8	16.8	309.9	21.6	412.4	26.5	2.6	6.5
Korea, Rep. of	5.9	0.5	13.1	0.9	31.7	2.0	0.2	0.5
Hong Kong	6.3	0.5	8.9	0.6	5.3	0.3	0.6	1.5
Taiwan	4.5	0.4	22.0	1.5	34.5	2.2	0.7	1.7
India	146.7	11.4	184.9	12.9	217.8	14.0	..	
Pakistan	24.2	1.9	32.9	2.3	40.8	2.6	0.3	0.7
Latin America	86.0	6.7	107.7	7.5	127.9	8.2	1.4	3.5
Mexico	16.5	1.3	28.2	2.0	30.0	1.9	0.4	1.0
Brazil	39.4	3.1	40.4	2.8	49.0	3.1	0.5	1.2
Africa	19.7	1.5	37.6	2.6	61.6	4.0	0.8	2.0
Eastern trading area	303.4	23.7	420.3	29.3	487.4	31.3	25.8	64.3
USSR	123.0	9.6	157.4	11.0	153.0	9.8	21.0	52.4
China	105.0	8.2	180.0	12.5	255.9	16.4	-	-

[a] Including East Asia, Southeast Asia, South Asia and West Asia.

[b] As of the end of each year.

[c] Ring spindles, except for 1963 when mule is also included.

Source: IFCATI/ITMF.

TABLE 5. - CUMULATIVE SHIPMENT OF SHORT-STAPLE SPINDLES AND OPEN-END ROTORS, 1974-1982

(Hundred thousands and percentages)

Destination: Region and country	Spindles[b]		Rotors	
World trade	235.3	100.0	41.9	100.0
Developed countries	44.8	19.0	6.9	16.5
North America	7.9	3.3	2.4	5.7
United States	7.4	3.1	2.3	5.5
Japan	9.7	4.1	0.8	1.9
Western Europe	25.4	10.8	3.6	8.6
EC(9)	21.6	9.2	3.3	7.9
Developing countries	187.1	79.5	6.3	15.0
Southern Europe	19.9	8.5	0.9	2.1
Asia[a]	113.2	48.1	3.1	7.4
Korea, Rep. of	20.4	8.7	0.2	0.5
Hong Kong	0.8	0.3	0.8	1.9
Taiwan	7.3	3.1	0.9	2.1
India	43.7	18.6	0.1	0.2
Pakistan	6.7	2.8	0.3	0.7
Latin America	31.1	13.2	1.5	3.6
Mexico	6.7	2.8	0.4	1.0
Brazil	16.6	7.1	0.5	1.2
Africa	22.9	9.7	0.8	1.9
Eastern trading area	3.4	1.5	28.7	68.5
USSR	-	-	26.0	62.1
China	1.6	0.7	0.2	0.5

[a] See Table 2.

[b] Ring spindles only.

Source: ITMF.

TABLE 6. - EQUIPMENT MODERNIZATION RATE[a] IN JAPANESE COTTON SPINNING INDUSTRY

(Percentages)

Process/Item	1970	1975	1980
1. Chute feeding	n.a.	17.9	32.4
2. High-speed card (Doffer: more than 15 r.p.m.)	6.0	20.8	32.7
3. High-speed comber (more than 150 nip p.m.)	18.6	41.6	48.6
4. High-speed drawing frame (more than 160 m.p.m.)	11.0	29.6	52.5
5. High-speed roving frame (more than 800 r.p.m.)	12.2	25.9	44.4
6. Automatic stop-motion on roving frame	67.1	88.2	96.9
7. Automatic doffer on spinning frame	34.3	42.1	51.2
8. Travelling cleaner on spinning frame	63.3	67.6	77.7
9. Automatic stop-motion on spinning frame	74.9	74.7	85.8
10. Continuous automatic spinning system (from mixing, scutching to carding)	7.3	19.6	39.3
11. Continuous automatic spinning system (from mixing, scutching to drawing)	2.9	2.2	3.3
12. Automatic winder	32.7	51.9	64.7
13. Electronic yarn cleaner on winder	13.9	32.2	46.2

[a]Percentage share of the number of machine/equipment incorporating the new technology concerned to total installed capacity.

Source: Japan Spinners' Association, Statistics on Japanese Spinning Industry. Various issues.

(2) Fabric formation and finishing

18. Among major techniques for transforming yarn into fabrics are weaving, knitting, tufting (for carpet making), and non-wovens. For example, in 1980 these processes, taken together, accounted for 87 per cent of total mill consumption of textile fibres in the EC.

Weaving

19. Cloth is woven by interlacing a series of yarns running lengthwise, known as 'warp', with those running across, called 'weft' or 'filling'. There are various kinds of looms in operation today, from traditional hand looms to modern automatic looms. What is crucial in the weaving process from the standpoint of loom design is the weft insertion mechanism. The traditional way of carrying out this operation by projecting a shuttle to one side of the loom to the other, is by modern standards, both energy and noise-intensive.

20. During the post-war period, advances in loom technology have involved the development of shuttleless looms, as well as improvements in the speed of conventional looms. With the exception of Japan, automatic looms have replaced non-automatic looms almost completely in the industrial countries. Even in developing countries, with the notable exception of India, automatic looms have already become dominant in weaving. (See Table 7.)

TABLE 7. - SHARE OF AUTOMATIC LOOMS[a] IN TOTAL WEAVING CAPACITIES OF COTTON-TYPE LOOMS IN 1963, 1973 and 1979

(Percentages)

Region and country	1963	1973	1979
World total	48.6	65.7	68.9
Developed countries	56.7	74.2	73.2
North America	100.0	100.0	100.0
United States	100.0	100.0	100.0
Japan	13.8	37.2	39.4
Western Europe	61.7	85.9	92.5
EC(9)	60.3	85.0	92.1
Developing countries	41.8	59.3	68.6
Southern Europe	42.8	54.4	77.3
Asia[b]	33.6	53.9	64.2
Korea, Rep. of	26.8	95.0	100.0
Hong Kong	79.9	100.0	100.0
Taiwan	46.7	86.8	82.3
India	10.0	18.6	21.9
Pakistan	63.2	74.3	82.3
Latin America	50.8	63.7	68.1
Mexico	68.2	75.6	83.7
Brazil	27.3	45.4	49.4
Africa	63.8	85.3	84.8
Eastern trading area	42.6	63.9	55.9
USSR	57.6	82.3	76.7
China	33.3	56.7	59.2

[a] Including looms with automatic attachments.

[b] See Table 3.

Source: IFCATI/ITMF.

21. The geographical shift of the world weaving capacity of cotton-type looms has shown a pattern similar to that of spinning capacity since the early 1960s, and the majority of looms installed are also accounted for by the traditional (that is, shuttle-type) models. (See Table 8.) What is different from the case of spinning, however, is that shuttleless looms have gained interest among weavers since the mid-1960s and began making inroads into the market, especially of industrial countries in the 1970s, as seen in Table 9.

TABLE 8. - INSTALLED WEAVING CAPACITY OF COTTON-TYPE LOOMS IN 1963, 1973 and 1981

(Thousands and percentages)

Region and country	1963[b]		1973[b]		1981[b]			
	Total looms[c]		Total looms[c]		Total looms[d]		Of which shuttleless looms	
World total	2 697.6	100.0	2 820.6	100.0	2 874.0	100.0	259.8	100.0
Developed countries	1 201.9	44.6	934.8	33.1	702.0	24.4	99.2	38.2
North America	306.9	11.4	333.9	11.8	261.4	9.1	46.0	17.7
United States	294.8	10.9	322.3	11.4	248.9	8.7	44.8	17.2
Japan	376.8	14.0	323.2	11.5	272.6	9.5	15.3	5.9
Western Europe	508.1	18.8	266.2	9.4	155.9	5.4	35.2	13.5
EC(9)	469.5	17.4	244.1	8.7	142.7	5.0	32.2	12.4
Developing countries	767.0	28.4	964.1	34.2	1 184.9	41.2	65.3	25.1
Southern Europe	133.5	4.9	139.0	4.9	130.7	4.5	10.9	4.2
Asia[a]	371.3	13.8	477.9	16.9	642.3	22.3	23.8	9.2
Korea, Rep. of	16.8	0.6	14.1	0.5	91.5	3.2	1.5	0.6
Hong Kong	19.9	0.7	27.8	1.0	23.1	0.8	4.0	1.5
Taiwan	15.2	0.6	45.5	1.6	56.7	2.0	9.2	3.5
India	208.1	7.7	205.8	7.3	209.2	7.3	0.6	0.2
Pakistan	34.0	1.3	29.6	1.0	25.8	0.9	0.5	0.2
Latin America	223.2	8.3	266.8	9.5	296.6	10.3	24.6	9.5
Mexico	45.0	1.7	49.2	1.7	52.5	1.8	12.4	4.8
Brazil	110.0	4.1	140.6	5.0	151.6	5.3	5.4	2.1
Africa	39.0	1.4	80.4	2.9	115.3	4.0	6.0	2.3
Eastern trading area	728.7	27.0	921.7	32.7	987.1	34.3	95.3	36.7
USSR	269.0	10.0	282.5	10.0	320.0	11.1	79.0	30.4
China	300.0	11.1	485.0	17.2	500.0	17.4	-	-

[a] See Table 2.

[b] At the end of each year.

[c] Consists of non-automatic looms, automatic looms and looms with automatic attachment, 18 inches or wider. Looms using cellulosic and non-cellulosic yarn which are installed in cotton mills are also included.

[d] Consists of automatic and non-automatic looms, 75 cm or wider.

Source: IFCATI/ITMF.

TABLE 9. - CUMULATIVE SHIPMENT OF SHUTTLE AND SHUTTLELESS LOOMS, 1974-1982

(Thousands and percentages)

Destination: Region and country	Shuttle looms			Shuttleless looms		
	Total		Of which cotton type	Total		Of which cotton type
World total	244.3	100.0	212.0	223.9	100.0	176.9
Developed countries	67.1	27.5	52.8	118.6	53.0	91.4
North America	10.3	4.2	10.0	36.4	16.3	30.1
United States	10.0	4.1	9.7	35.2	15.7	29.1
Japan	39.8	16.3	28.2	23.5	10.5	11.4
Western Europe	15.9	6.5	13.7	56.5	25.2	47.8
EC(9)	14.8	6.1	12.7	51.6	23.0	43.5
Developing countries	173.3	70.9	156.3	70.9	31.6	54.1
Southern Europe	10.2	4.2	9.1	17.1	7.6	15.0
Asia[a]	114.9	47.0	100.5	29.3	13.1	17.7
Korea, Rep. of	29.9	12.2	24.0	6.8	3.0	2.3
Hong Kong	1.5	0.6	1.5	3.1	1.4	2.9
Taiwan	14.3	5.9	13.7	8.6	3.8	4.2
India	19.8	8.1	17.3	3.3	1.5	2.2
Pakistan	2.7	1.1	2.7	0.5	0.2	0.5
Latin America	16.6	6.8	15.9	16.4	7.3	14.5
Mexico	2.7	1.1	2.4	6.8	3.0	6.0
Brazil	8.7	3.6	8.6	2.7	1.2	2.6
Africa	31.6	12.9	30.8	8.1	3.6	6.9
Eastern trading area	3.9	1.6	2.9	34.4	15.4	31.4
USSR	0.8	0.3	0.1	23.3	10.4	21.9
China	0.7	0.3	0.3	0.6	0.3	0.1

[a] See Table 2.

Source: ITMF.

22. 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

Eastern trading area. The commercialization of air-jet (pneumatic) looms started in the mid-1970s, though the air-jet weft insertion system was invented in Czechoslovakia in 1945. In recent years, there has been increasing interest directed to the development of multi-phase weaving, that is, the simultaneous multiple weft insertion system.

Knitting

23. Behind the successful inroad of knitted goods into the clothing market lie a number of technological factors. 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.

Carpets

24. The tufting method has become dominant in the machine-made carpet industry over the last two decades, thanks to the superior productivity of tufting machines over the conventional looms used to manufacture woven carpets. This basically stems from the simple production process of tufted carpets. The introduction of mechanical and electronic controls has contributed to increasing versatility in tufting machines in terms of carpet styles and texture design.

25. The carpet industry is a good example of a branch of the textile industry in which rapid advances in production technology have gone hand-in-hand with synthetic-fibre developments. By the mid-1960s the share of tufted carpets in total shipments of carpets and rugs passed 80 per cent in the United States, and by 1981 it reached 96 per cent.[8] In the EC tufting carpets accounted for two-thirds of total fibre consumption for textile floor coverings in 1980, followed by woven carpets (20 per cent) and needle-punched carpets (14 per cent).[9] The synthetic fibre industry has supplied a wide range of synthetic fibres particularly suitable for carpet making, taking advantage of the fact that the world supply of 'carpet wool' is very limited.

Non-wovens

26. Non-wovens are an "umbrella" category which includes a wide range of fabrics that are neither made by weaving nor by knitting.[10] The term 'non-wovens' may be defined as "planar assemblies of textile fibres held together either by mechanical interlocking in a random web or mat, by fusing (in the case of thermoplastic fibres), or by bonding with a cementing medium such as starch, glue, casein, rubber latex or one of the cellulose derivatives or synthetic resins."[11] Expectations are that

the use of non-wovens will not only continue to expand in traditional end-uses such as floor coverings, disposable cloths, towels, sanitary protectives and industrial fabrics and filters, but that they will enter new market areas - civil-engineering fabric uses (geotextiles), environmental filtration, agricultural uses, and so forth. The advent of the non-woven technology also made it possible to reduce production costs substantially in fabric making by bypassing spinning, weaving or knitting processes.[12] Although some non-woven technologies have been around for a long time, it was rapid advances in synthetic adhesives in the post-war years that allowed non-wovens to make great strides.

27. Rayon is still regarded as the "bread-and-butter" fibre in the non-wovens industry. In recent years, however, polyester and polypropylene have come to the fore as the main competitors for rayon in the United States and the EC, respectively. In the EC, where polyester is relatively expensive, polypropylene has become more important than polyester in manufacturing non-woven fabrics; the share of polypropylene in total fibre consumption of non-woven fabrics jumped from less than 10 per cent in 1972 to nearly 25 per cent in 1980, while that of polyester remained unchanged at 22 per cent. Meanwhile, the share of rayon declined from 44 to 30 per cent.[13]

Finishing

28. The remarkable improvements in quality, functional property and dyeability of fabrics owe much to post-war developments in finishing and dyeing technologies. Besides regular finishes, special treatments are applied to fabrics to impart various desired effects. In the early 1950s, sanforizing finish for shrinkage-resistance and application of synthetic resin for shrinkage and absorbancy control and crease-resistance were introduced to cotton fabrics. In the mid-1960s major developments occurred in synthetic-fibre fabrics, in particular, 'permanent press' finish for synthetic-fibre blended fabrics, and polyester special finishes to give certain properties such as soil- and spill-resistance and static-electricity control. In addition, water-proofing, fire or flame retarding and sanitized finishes are also applied to specific end-uses. Recently, much attention has been paid to the development of energy-saving measures in finishing processes, including dyeing.

29. 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. New dyeing machines for polyester or polyester and cotton blended products were introduced in the early 1960s, while the boom in knitted goods in the mid-1960s made a great contribution to the development of new dyeing processes suitable for them. Jet-dyeing machines and computerization of dye cycles have 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.

30. The most common technique of printing is roller printing using a variety of dyes and copper rollers on which design patterns are engraved. Development of synthetic-fibre fabrics and blends which are not easily dyed has paved the way for pigment printing in which pigment

colours mixed with synthetic-resin solvents are printed on fabrics by roller printing. Since the mid-1960s flat screen printing and rotary screen printing have made considerable advances. Over the last decade transfer printing in which design patterns printed on paper are transferred to fabrics has been increasingly introduced. This technique armed with a computerized process control, has played a major rôle in economizing labour and improving clearness of design and colour depth.

(3) Clothing

31. The manufacture of clothing consists of three basic processes; (1) preparation, involving pattern grading, fabric spreading, marking and cutting, (2) sewing, and (3) finishing process, including inspection, pressing and packing. In essence, the clothing industry is an assembly production, dominated by the sewing operation. It has remained highly labour intensive, labour's share generally accounting for 90 per cent or more of total value added; sewing alone is responsible for about 90 per cent of the labour costs.

32. Until the late 1960s technological developments in the clothing industry had been less marked than those in the textile sector. Since then the larger clothing manufacturers have been introducing computers, and automatic and semi-automatic machines to aid production management and the "handling" processes. Computerized grading systems which automatically cut various grades of pattern, based on the 'master' pattern that is constructed according to the original design, are a leading example of the new labour-saving hardware. Other examples are automatic fabric spreaders, computerized automatic cutting machines and computerized marking systems. The application of computers to preparation process seems to have made most progress in the mass production of ready-made clothing and some casual-wear industries.

33. It must be stressed, however, that the pre-sewing stage accounts for less than 5 per cent of total labour costs in the manufacture of clothing. The major obstacles to modernization and rationalization of the clothing industry lie in the sewing process. Technological advances in sewing since the late 1960s have been of two main types. The first is the development of automatic sewing machines of various types designed to (1) rationalize the sewing process substantially, (2) reduce the skill requirements of the operators, (3) increase the sewing speed, and (4) enhance the uniformity of the sewing operation, thereby improving the product quality. The actual operating hours of the conventional sewing machines usually correspond to 20 to 30 per cent of total working hours, the remaining hours being taken up with preparatory and supplementary operations. In recent years, the advent of numerically controlled sewing machines has served to increase the machine flexibility, since the remarkable developments of electronics have made it possible for sewing machines to cope with frequent changes in design and pattern grading of clothes.

34. The second stream of technological advances in the sewing process is based on a more radical point of view, namely the complete transformation of production processes so as to do without the sewing operation. A good example is the manufacture of seamless hosiery directly from synthetic filament yarn. There are other attempts to

replace the sewing operation to some extent by much simpler, 'non-seaming' methods; the use of fusible interlinings in outwear and the application of the welding technique to seams.

35. Current efforts to re-vitalize the clothing industry in industrial countries centre on incorporating the "fruits" of the remarkable progress in electronics and robotics in the 1970s. One challenge stems from the upgrading and diversification of consumers' preferences in clothing, and the increasing importance of high value-added and 'high-fashion' items with short cycles in the demand for clothing in industrial countries. In such a setting there is a premium on multi-item, small-lot production systems, and on close and rapid communication between manufacturer and retailer. Other challenges include the handling of soft materials. The development of a 'Flexible Manufacturing System' (FMS) applicable to the clothing industry is a key technological challenge in the 1980s.[14]

C. ON DIFFUSION OF PROCESS TECHNOLOGY IN THE TEXTILE AND CLOTHING INDUSTRIES

36. Why is it that the diffusion of technology, described earlier in this Appendix, has been relatively 'uneven' in the textile and clothing areas? What are the factors that determine the extent to which new technologies are diffused among textile and clothing manufacturers? Some indication of the answers to these questions can be found in the relatively extensive literature on the rates and patterns of diffusion of various technological innovations in different countries.[15]

37. The measure of diffusion is commonly defined as the ratio of the number of actual adopters of the technology concerned to the population of potential adopters. The validity of the 'rate of diffusion' as defined above is based on the implicit assumption that the selection of dates when technological innovations occurred and of the eventual population of potential adopters is plausible. In practice, however, this assumption is far from convincing; improvements in new technologies after their first introduction are of great significance in terms of enhancing reliability, efficiency and applicability. As Gold concisely states: "Taken together, recognition of the dynamics of technological improvements in an innovation and of changes in a firm's evaluation of the available forms of any innovation, reveal a fundamental weakness in 'saturation models' of technological diffusion in industry".[16]

38. Despite the shortcomings of the studies mentioned above, "the general slowness as well as wide variations in the rate of diffusion" can be observed.[17] Generally speaking, several factors are responsible for this. First, the superiority of new technologies over the old ones cannot be established immediately, because most innovations are far from perfect when they are first introduced. In addition, old technologies continue to be improved even after the advent of new ones. Second, accumulation of human skills and know-how on the part of users is prerequisite to exploit effectively the advantages of new technologies over the existing ones. It is unlikely that this can be done in a short period of time. It also takes time, often decades, for machine-makers to produce the specialized machinery that meets the needs of users.

39. Other factors should also be taken into account when trying to understand the diffusion of technology in the textile and clothing industries. It is often argued that ownership characteristics of textile and clothing firms influence the rate at which new technologies are introduced. In many countries the textile and clothing sector is less concentrated than other industries and has traditionally included a large number of small - and medium - scale family enterprises;[18] it is alleged that such firms are often relatively "conservative" and "risk averse" so that many firms are reluctant to invest in new production methods which entail heavy financial burdens and major changes in organization, possibly including the acceptance of new shareholders, a closer control by banks and stronger reliance on professional management.[19]

40. There are other factors to consider, however. Textile and clothing manufacturers are producing today various kinds of goods in highly fragmented markets under different economic and other conditions, some amenable to mass-production methods, others not. Technological requirements which textile and clothing manufacturers demand, therefore, vary according to what and how they produce. From the standpoint of textile-machine manufacturers, it becomes increasingly important to reconcile the pursuit of higher machine-speed with that of greater machine-flexibility. It is not surprising then that conventional machines with automatic attachments often turn out to be more attractive, at least to small firms which usually face relatively short production runs. In other words, the advent of new machines embodying the latest technology does not necessarily make conventional machines obsolete from the standpoint of unit cost calculations.

41. A second point concerns the investment behaviour of textile and clothing manufacturers in industrial countries. Since the recession of 1974-75, they have shown a more cautious approach to investment in machinery and equipment, although this tendency has been less marked in the clothing industry than in textiles.[20] Under less favourable prospects of demand, this has acted to slow down the adoption of new techniques. Finally, since new technologies are nearly always "embedded" in new capital equipment, the rate at which they are adopted will be sensitive to the availability and cost of capital.

FOOTNOTES

[1] C.I.R.F.S., 1982.

[2] See World Bank (1982, p. 11).

[3] In Japan, for example, less than 4 per cent of total cotton spinning capacity has adopted the fully automatic system from mixing and scutching to drawing by 1980, though a part of such system up to carding has been increasingly used over the last decade. (See Table 6).

[4] ITMF spinning capacity and shipment data include estimated figures in many cases. There are also some cases (e.g. China) in which cumulative shipment figures are inconsistent with capacity data. The same caveat applies to weaving capacity and shipment data provided by ITMF.

[5] On the assumption that three spindles are equivalent to one rotor, total spinning capacity in the world reached about 168 million spindle equivalents in 1981, of which open-end spinning accounted for about 7 per cent.

[6] The Japanese machine-maker claims that the air-jet spinning, which creates an open-end state by using two air-nozzles rather than a rotor, is suitable for the finer yarn ranging between 20s and 60s, and that the spinning speed is about ten times that of ring spinning. Similarly, among the present yarn texturing technologies much interest has been directed to the air-jet texturing system in which filament yarn can be processed by means of compressed air. (See Japan Textile News, June 1983, pp. 64-65 and July 1983, pp. 109-110.) Quite recently it is also reported that the Japanese cotton spinning industry will start a new technological development project in April 1984, in which main concern is turned to developing a new method of spinning that incorporates the advantages of both ring spinning and open-end spinning. The spinning speed is expected to reach about seventeen times that of ring spinning, while the yarn quality can be maintained even at such a high-speed spinning. The project period covers four to five years from 1984. (Nihon Keisai Shinbun, 9 January 1984.).

[7] If account is taken of the fact that shuttleless looms can attain much higher productivity than shuttle ones, actual impacts of shuttleless looms on world production of woven fabrics would be much greater than what the shipment figures show.

[8] Textile Hi-Lights, December 1982.

[9] C.I.R.F.S., ibid.

[10] Tufted carpets are excluded from non-wovens, while needle-punched carpets are usually included. Ward, D. (1981), "Nonwoven Event", Textile Asia, July, pp.44.

[11] Fairchild's Dictionary of Textiles, edited by I.B. Wingate, 1975, p.398.

[12]However, non-woven fabrics have encountered the problem of rising material costs since two oil crises. The development of energy-saving technology is, therefore, vital to exploitation of market opportunities for non-wovens.

[13]C.I.R.F.S., ibid.

[14]Since 1982 Japan's Agency of Industrial Science and Technology has launched the so-called "Automated Sewing System" project, a wholly government-financed technological development project. This project aims at developing necessary technologies for multi-item, small-lot production systems. It extends for eight years and total R&D expenses are estimated to reach 13 billion yen ($50-60 million). The first five years (1982-86) are devoted to developing the total system and four areas of component technologies, i.e. preparation, sewing and assembling, fabric handling and system control. For the remaining years, the experimental plant is to be designed, built and operated for the overall evaluation of the new system, but its commercialization will be left to private firms.

[15]See, for example, a series of studies done by the National Institute of Economic and Social Research; Ray, G.F. (1969), "The Diffusion of New Technology - A Study of Ten Processes in Nine Industries", National Institute Economic Review No. 48, May, pp: 40-83, Nabseth, L. & G.F. Ray (eds.) (1974) The Diffusion of New Industrial Processes - An International Study. Cambridge University Press, and Ray, G.F. (1983), "The Diffusion of Mature Technologies", National Institute Economic Review, No. 16, November, pp. 56-62. A sigmoid (e.g. logistic) curve has been widely used, implicitly or explicitly, as the standard diffusion model to measure the extent of inter-firm diffusion of a given technology in industry. However, the statistical analyses of technological diffusion have involved some conceptual problems, as cogently argued by N. Rosenberg and others. For a detailed discussion of the standard diffusion model, see Davies, S. (1979), The Diffusion of Process Innovations, Cambridge University Press, Metcalfe, J.S. (1981), "Impulse and Diffusion in the Study of Technical Change", Futures, Vol. 13, No. 5, October, pp. 347-359, and so on. See Rosenberg, N. (1972), "Factors Affecting the Diffusion of Technology", in Exploration in Economic History, Academic Press, New York, reprinted in Rosenberg, N. (1976), Perspectives on Technology, Cambridge University Press, pp. 189-210, and Gold, B. (1981), "Technological Diffusion in Industry: Research Needs and Shortcomings", Journal of Industrial Economics, Vol. 29, No. 3, March, pp. 247-269.

[16]Gold, B. (1981), p. 250.

[17]Rosenberg, N. (1972), op. cit., p. 191.

[18]See OECD (1983), pp.25-28.

[19]See Hoffman, K. and H. Rush (1983), chapter 6.

[20]OECD (1983), pp.62-65.

APPENDIX IV: RELATING TRADE TO DOMESTIC PRODUCTION AND CONSUMPTION

1. Empirical work on trade issues sometimes includes figures which relate imports and/or exports of particular products to domestic production or consumption of those products. Many researchers seem to accept uncritically the view that such ratios provide useful information in addition to that available from separate figures on production, employment trade and so forth. In certain circumstances, that may be the case. However, in many instances these ratios enter the analysis in ways that range from useless to harmful. There is a danger, in particular, of such ratios being used in ways that - wittingly or unwittingly - reinforce the mercantilist view that imports are bad and exports good.

2. The purpose of this Appendix is threefold: to provide a brief overview of the main conceptual problems involved in the use of ratios of trade in particular products to production or consumption, to note some of the more important statistical limitations of such ratios, and to present data illustrating the values of the ratios for textiles and clothing under different definitions. Because they are the most widely used, the focus is on import penetration ratios.

(1) Conceptual issues

3. There are two main approaches to measuring import penetration:

(A) $M/(P+M-X)$, and
(B) M/P or $M/(P+M)$

where P stands for the value of domestic production, M the value of imports and X the value of exports. The first measure is the ratio of the value of imports to the value of "apparent consumption", while the latter is the ratio of the value of imports to the value of domestic production, or the value of total supply (i.e. domestic production plus imports).

4. One way of approaching the question of the usefulness of such ratios is to ask whether there are certain questions or issues for which they provide useful additional information/insights over and above those available from statistics of the kind provided in Chapter 2 and Appendices I and II of this background study. Actual use of the ratios points to three main possibilities.

(a) The first concerns the use of such ratios as one possible indicator of the relative extent of international specialization in a particular product. For example, in many countries the ratio of imports to consumption for icecream or cement will be smaller than the corresponding ratio for machine tools or clothing; thus we could conclude that international specialization has been carried farther in the latter two products than in the first two.

(b) A second possible use arises in situations involving national security considerations. Armaments, food and certain critical raw materials are examples of areas where countries may believe that a certain level of self-sufficiency is necessary, despite the added costs which this entails during peacetime. Leaving aside the question of the extent to which import penetration ratios are relevant to this issue, it is not clear that many countries would base their concern with import penetration in textiles and clothing on national security arguments.

(c) Import penetration ratios are often used in ways that imply a positive correlation between the values of the ratios and some notion of "pressure" on the domestic industry. In this instance the most important practical shortcoming is that the trend in the value of the ratio tells us nothing about the trend in either imports or production; a rising ratio of imports to production is consistent with expanding domestic production as long as imports are increasing faster than production, and a declining ratio is consistent with declining domestic output provided imports are falling faster than production. Furthermore, if the ratio is based on formula (A) above, it is possible for domestic production to be growing faster than imports at the same time as the penetration ratio is increasing (for example, if as a result of an intensification of intra-industry trade, most of the increment to production is exported). In other words, by itself the fact that domestic production is supplying a smaller share of domestic consumption will say little about the state of the domestic industry if exports are expanding at the same time. These considerations suggest that the separate figures on production, employment and trade are more useful in gauging the output/employment/profit situation of the domestic industry, and the extent of any adjustment problems confronting the industry. This conclusion is reinforced by the fact that, in some circumstances, ratios based on formula (A) move in an opposite direction from those based on (B), plus the fact that there is no <u>a priori</u> basis for judging one formula as superior to the other.

5. Some additional conceptual problems may be mentioned. One involves the absence of objective criteria for selecting the appropriate level of product disaggregation to use when relating trade to production or consumption. For example, should we choose total clothing, ladies' mittens containing at least 51 per cent wool, or something in between? A second problem involves the lack of an objective criterion for choosing among the various definitions of import and export ratios. Finally, when import penetration ratios are used to examine the impact of trade on the size of the domestic industry, allowance must be made for the fact that such ratios yield biased estimates of the impact on domestic value added in the industry in question (see Keesing and Wolf, 1980, pp.205-211).[1]

6. The use of import penetration ratios may also involve a fundamental misunderstanding of the nature of the gains from international specialization. For example, it is sometimes argued that because the ratio of imports from developing countries to production and/or consumption in the developed countries is quite small for nearly all

manufactured goods, it follows that imports of those products from developing countries are not an important source of "disruption" in developed country markets. Although this argument has a practical appeal in certain circumstances, it implicitly endorses the mercantilist view that imports are harmful. This opens the door to debate over what constitutes a "small" import penetration ratio; it encourages the use of highly disaggregated product categories (the narrower the product classification, the more likely it is that some "high" ratios will turn up); and it encourages the argument that once the ratio passes a certain level, constant or even increasing trade restrictions are warranted (or at least are less objectional).

7. Proposals to "stabilize import penetration ratios" (by relating future import growth to the growth of consumption) can thus rest both on arbitrary definitions of product categories and arbitrary assumptions regarding the desirable level of international specialization in various product sectors.

(2) Statistical problems

8. Whenever possible, production statistics are expressed in value added terms to eliminate double counting (for example, counting the value of fabric twice, once at the fabric level and once at the clothing level). Statistics based on value added are not available, however, for imports and exports. As a result, data on a country's imports is virtually certain to include some of its own value added (e.g. if imported fabric is made from previously exported domestic fibres); similarly, its export data is very likely to include foreign value added (e.g. if any of its export products uses foreign inputs); trade figures may also include double counting, as when a country exports fibres, imports cloth made from those fibres, and then exports shirts made from that fabric (in this case, the fibres appear twice in the exports statistics).

9. Calculating import-to-production ratios using gross trade data and value added production data is not satisfactory because it exaggerates the values of the ratios. The usual way of trying to deal with this problem is to use production figures based on gross output rather than value added. In effect, this amounts to compensating for less-than-perfect trade data by introducing questionable production data. Since there is no reason to assume that the degree of distortion in these data is (i) the same for trade and production, (ii) constant over time, or (iii) similar across industries or countries, it is not easy to interpret import penetration ratios at a point in time, let alone their behaviour through time.

10. Other difficulties involved in relating trade to production or consumption include statistical problems with the production data (such as infrequent censuses, and poor coverage of smaller establishments - a particularly important point with respect to clothing), differences in the valuation of goods from different sources (for example, c.i.f.-f.o.b. differences, and exchange rate related problems), the lack of true price indices for imports (needed to calculate penetration

ratios in constant prices), problems of establishing an accurate concordance between trade and production data, and difficulties in being precise about the necessary degree of substitutability between imports and domestic production (the latter problem may be illustrated as follows: it would be absurd to calculate the ratio of imported bananas to domestic production of machine tools because they do not compete with one another, but what about the ratio of bananas to domestic apple production?)

11. Although the problems caused by many of the statistical limitations noted above are not confined to calculations of import penetration ratios, they are often more pronounced in this particular case.

12. In many instances, the main interest is the share of domestic demand supplied by imports. Formula (A) approximates this by using "apparent consumption" as a proxy for domestic demand. Two points need to be made in this connection. The first may be illustrated with the example of textiles. As the concept is used in calculating these ratios, "apparent consumption" of textiles does not take into account textiles embodied in imported clothing - that is, indirect trade - which is, of course, part of the domestic demand for textiles (the problem of indirect trade also affects formula B).[2] Second, it is often very difficult to correct estimates of apparent consumption for changes in inventories (moreover, the relative importance of inventories varies widely among various products).

13. Finally, import penetration ratios are sometimes calculated in physical rather than value terms - as, for example, when imports of textiles and clothing are converted into "tons of fibre equivalent" and related to domestic "mill consumption" of fibre. Such ratios suffer from the same problems as the value-based ratios, including the fact that mill consumption is calculated so as to avoid double counting, whereas the fibre equivalent trade figures are based on statistics for gross trade. An additional problem with the ratios based on physical units is that they ignore differences in value added per unit, that is, differences in quality and/or product mix. Thus when this measure is applied to broad product groups, the ratios will be distorted to the extent that imports are concentrated in higher or lower value added items and/or the product mix changes over time.

(3) Examples of ratios of trade to production and consumption

14. Among several attempts[3] to estimate import penetration ratios, a recent study by the World Bank is the most comprehensive in terms of both industry and country coverages.[4] By way of illustration, Table 1 shows estimates of import penetration ratios as well as export-output ratios from the World Bank study, calculated in value terms, with respect to manufacturing total (ISIC Division 3), textiles (321), clothing (322) and textile & clothing (321 + 322) in the United States, United Kingdom and Japan. Four distinct patterns can be seen from Table 1 in terms of movements in import penetration and export-output ratios:

(a) Not only import penetration but also export-output ratios showed an upward trend during the 1970s (manufacturing total in the United States, the United Kingdom and Japan; textiles in United Kingdom; clothing in the United States and United Kingdom).

(b) Import penetration ratios increased, while export-output ratios decreased during the same period (clothing in Japan).

(c) Import penetration ratios were on the increase, while export-output ratios remained almost unchanged or showed a slight fluctuation (textiles in Japan).

(d) Import penetration ratios remained almost unchanged or showed a slight fluctuation, while export-output ratios showed an upward trend (textiles in the United States).

It seems that except for the clothing industry in Japan, these trends reflect increasing specialization in international trade in manufactured goods, including textiles and clothing.

15. Table 2 presents import penetration and export-output ratios (for the same countries as shown in Table 1), based on data expressed in physical units (tons of fibre equivalent). A comparison of the 'textile & clothing' section of Table 1 with Table 2 shows that not only import penetration, but also export-output ratios calculated in terms of fibre equivalent, are much higher than those measured in value terms. This finding is consistent with the earlier remarks about the shortcomings of ratios based on physical rather than value data, as well as with the hypothesis that imports of textiles and clothing into the developed countries contain, on average, less value added per unit than the corresponding domestic output in the developed countries.[5]

TABLE 1. - ESTIMATES OF IMPORT PENETRATION AND EXPORT OUTPUT RATIOS IN VALUE TERMS: UNITED STATES, UNITED KINGDOM AND JAPAN
(Percentages)

	United States[e]					United Kingdom[e]					Japan[e]				
	(1)	(2)		(3)		(1)	(2)		(3)		(1)	(2)		(3)	
	M/AC	(A) M/P	(B) M/P+M	(A) X/P	(B) X/P+M	M/AC	(A) M/P	(B) M/P+M	(A) X/P	(B) X/P+M	M/AC	(A) M/P	(B) M/P+M	(A) X/P	(B) X/P+M
Manufacturing[a]															
1970	5.6	5.5	5.3	5.8	5.5	16.3	16.0	13.8	18.1	15.6	4.7	4.5	4.3	10.0	9.6
72	6.5	6.5	6.1	5.5	5.2	17.3	17.0	14.5	18.5	15.8	4.1	3.8	3.7	10.6	10.2
74	7.9	7.9	7.3	7.7	7.2	23.4	23.6	19.1	22.5	18.2	5.9	5.5	5.2	12.6	12.0
76	7.5	7.5	7.0	7.9	7.4	23.5	23.1	18.8	24.8	20.1	5.1	4.6	4.4	13.7	13.1
78	8.9	9.0	8.3	7.6	7.0	26.3	25.9	20.6	27.2	21.6	4.2	3.9	3.7	12.3	11.8
80	8.7	8.6	7.9	8.9	8.2	28.2	27.8	21.8	29.1	22.7	6.3	5.7	5.4	15.0	14.2
Textiles[b]															
1970	4.5	4.6	4.4	2.6	2.5	14.1	13.2	11.7	19.8	17.5	4.0	3.5	3.4	16.6	16.1
72	4.7	4.8	4.6	2.7	2.6	18.0	17.5	14.9	20.6	17.5	5.3	4.7	4.5	14.9	14.3
74	4.5	4.4	4.2	5.2	5.0	24.0	23.5	19.0	25.6	20.7	7.6	6.9	6.4	16.0	15.0
76	4.1	4.0	3.9	5.0	4.8	24.7	24.3	19.6	25.8	20.7	6.2	5.6	5.3	15.4	14.6
78	4.7	4.7	4.5	4.7	4.4	29.5	30.6	23.4	26.9	20.6	7.3	6.9	6.4	13.1	12.2
80	4.4	4.3	4.1	6.3	6.1	32.9	33.7	25.2	31.2	23.4	7.4	6.7	6.3	15.9	14.9
Clothing[c]															
1970	6.4	6.8	6.3	1.2	1.1	13.5	13.6	12.0	12.4	10.9	4.4	3.7	3.6	19.3	18.6
72	7.9	8.5	7.8	1.1	1.0	19.2	20.8	17.2	12.9	10.7	3.9	3.6	3.5	11.2	10.8
74	8.8	9.4	8.6	1.6	1.5	25.4	28.7	22.3	15.5	12.0	13.2	14.3	12.5	5.7	5.0
76	11.9	13.2	11.7	2.0	1.8	32.7	38.0	27.5	22.0	15.9	10.3	10.9	9.8	5.7	5.1
78	16.3	19.1	16.0	2.2	1.9	34.0	37.9	27.5	26.6	19.3	9.4	10.0	9.1	3.9	3.6
80	16.7	19.4	16.2	3.2	2.7	38.6	44.9	31.0	28.5	19.7	10.7	11.5	10.3	3.7	3.3
Textiles & Clothing[d]															
1970	5.3	5.5	5.2	2.0	1.9	13.9	13.3	11.7	17.7	15.6	4.1	3.5	3.4	17.1	16.5
72	6.0	6.3	5.9	2.0	1.9	18.4	18.5	15.6	18.3	15.4	5.0	4.5	4.3	14.2	13.6
74	6.2	6.4	6.0	3.8	3.6	24.5	25.1	20.0	22.6	18.0	9.0	8.5	7.8	13.8	12.7
76	7.3	7.6	7.1	3.8	3.5	27.4	28.4	22.1	24.6	19.2	7.3	6.9	6.5	13.0	12.2
78	9.5	10.2	9.2	3.7	3.4	31.0	32.9	24.8	26.8	20.1	8.0	7.8	7.2	10.5	9.7
80	9.4	9.8	8.9	5.2	4.7	35.1	37.8	27.4	30.3	22.0	8.5	8.1	7.5	12.4	11.5

[a]ISIC Division 3 [b]ISIC 321 [c]ISIC 322 [d]ISIC 321 + 322 [e]The sample countries were selected on the basis of the availability of consistent data. The trade data for the United Kingdom include trade with other EC countries. Production data availability is as follows: US = 1970-76; UK = 1971-80 (The coverage for 1971-72 is incomplete.); Japan = 1970-77. For the remaining years, the figures of production are estimated by the World Bank.

Abbreviation: P = Production (total sales) M = Imports X = Exports AC = Apparent Consumption, defined as P+M-X

Source: World Bank 'Import Penetration' Tape.

TABLE 2. - ESTIMATES OF IMPORT PENETRATION AND EXPORT-OUTPUT RATIOS, FOR TEXTILES AND CLOTHING COMBINED, IN TERMS OF FIBRE EQUIVALENT[a]: UNITED STATES, UNITED KINGDOM AND JAPAN

	UNITED STATES			UNITED KINGDOM			JAPAN		
	1974	1979	1980	1974	1979	1980	1974	1979	1980
1) Mill Consumption (MC)[b] (1,000 tons)	4 511	4 940	4 561	771	710	525	1 869	2 234	2 145
2) Imports (M)[c] (1,000 tons)	581	825	840	401	602	550	239	382	301
3) Exports (X)[c] (1,000 tons)	398	528	602	310	309	296	516	416	524
4) Apparent Consumption (AC)[d] (1,000 tons)	4 694	5 237	4 799	862	1 003	779	1 592	2 200	1 922
5) M/AC (%)	12.4	15.8	17.5	46.5	60.0	70.6	15.0	17.4	15.7
6) M/MC (%)	12.9	16.7	18.4	52.0	84.8	104.8	11.5	17.1	14.0
7) M/(MC + M) (%)	11.4	14.3	15.5	34.2	45.9	51.2	7.5	14.6	12.3
8) X/MC (%)	8.8	10.7	13.2	40.2	43.5	56.4	27.6	18.6	24.4
9) X/(MC + M) (%)	7.8	9.2	11.1	26.5	23.6	27.5	24.5	15.9	21.4

[a] This table covers cotton, wool, flax, cellulosic and non-cellulosic (synthetic) fibres.

[b] Mill Consumption is defined as the volume of raw fibres used at the first stage of processing at home.

[c] Processed textile products and clothing imported from or exported to foreign countries are converted to fibre equivalent. For the coverage of textile products and clothing and the conversion factors, see "Explanatory Notes" in FAO (1983).

[d] Apparent Consumption (AC) = Mill Consumption (MC) + Imports (M) - Exports (X).

Source: FAO (1983), World Apparel Fibre Consumption Survey.

FOOTNOTES

[1]This does not exhaust the list of shortcomings. For example, a rise in the import penetration ratio could be a precondition for the survival of certain domestic firms, as when the opportunity to engage in OPT offers the only way of maintaining profits.

[2]However, it should be noted that if, for example, (i) imports of textiles are constant, and (ii) increased imports of clothing cause domestic textile production to decline, the import penetration ratio will increase.

[3]For example, see Hughes, J.J. & A.P. Thirwall (1977) 'Trends and Cycles in Import Penetration in the U.K.', Oxford Bulletin of Economics and Statistics, vol. 39, November, and Wells, J.D. & J.C. Imber (1977), 'The Home and Export Performance of United Kingdom Industries', Economic Trends, CSO, August. See also UNCTAD (1983). Handbook of International Trade and Development Statistics. Part Seven, pp. 544 - 551, FAO (1983), World Apparel Fibre Consumption Survey, U.S. Department of Commerce (1981), U.S. Production, Imports and Import/Production Ratios for Cotton, Wool, Man-made Fiber Textiles and Apparel, International Trade Administration, June., and Keesing & Wolf (1980) Table A.1.p.208.

[4]The World Bank study covers ISIC Division 3 (Manufacturing) that contains 82 4-digit ISIC groups, 23 of which are further disaggregated into 70 5-digit ISIC subgroups. Eleven industrial countries participated in this study; Australia, Belgium, Canada, France, Germany, Italy, Japan, Netherlands, Sweden, United Kingdom and the United States. Production data are provided by the above countries.

[5]Among the alternative approaches that have been developed there is the one put forward by the International Ladies' Garment Workers' Union. The ILGWU's attempt to calculate import penetration in the US apparel industry is based on the view that the value of apparel imports should be expressed in prices charged for equivalent goods produced in the United States. If, for example, a certain amount of T-shirts made in Hong Kong would replace the same amount of higher priced domestically-produced T-shirts in the United States market, the actual impact of increased imports of T-shirts on the United States apparel makers should be evaluated at domestic prices rather than import prices. See ILGWU Research Department (1983), "Estimation of Apparel (Knit and Woven) Imports: Methodological Note", April.