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231

Matthias Lücke

Traditional
Labour-Intensive Industries
in Newly Industrializing Countries

The Case of Brazil



J.C.B. MOHR (PAUL SIEBECK) TÜBINGEN

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CONTENTS

List of Tables and Figures	VII
Abbreviations and Acronyms	XII
Preface	XV
I. Introduction	1
II. The Economic Performance of Labour-Intensive Industries in Brazil	4
1. Labour-Intensive Industries and Brazil's Industrial Development since 1967	4
2. Output, International Trade, and Apparent Consumption of Labour-Intensive Products in Brazil	9
a. Textiles and Clothing	9
b. Leather and Footwear	13
3. Brazil's Position in World Production and Trade of Labour- Intensive Products	20
a. Textiles and Clothing	20
b. Leather and Footwear	23
III. A Quantitative Assessment of the International Competitiveness of Labour-Intensive Industries in Brazil	32
1. Indicators Based on Export Performance	32
a. Country Rankings in World Exports	32
b. Constant Market Shares Analysis	36
c. Export Performance Ratios	40
d. Summary	47
2. An International Comparison of Production Costs	49
a. The Structure of Total Costs	49

b. Unit Labour Costs	54
c. Real Interest Rates	59
3. Brazil's Performance in Terms of Price and Other Parameters of Competitive Behaviour	64
IV. Determinants of Brazil's Competitiveness in Labour-Intensive Industries	70
1. Brazil's Comparative Advantage in Labour-Intensive Industries	70
a. Theoretical Considerations	70
b. Specialization in Labour-Intensive Industries and Factor Endowments: A Cross-Country Econometric Analysis	72
c. Factor Intensities in the Textile, Clothing, Leather, and Footwear Industries: An International Comparison	79
2. Trade and Exchange Rate Policies	83
a. Basic Considerations	83
b. The Institutional Framework	85
c. Protection and Export Promotion Rates	90
d. Exchange Rate Policy and Footwear Exports: An Exploratory Econometric Analysis	97
3. Policies Affecting Input Markets	100
a. Labour Market Policies	100
b. Machinery	102
c. Raw Materials	110
4. An Explanation of the Export Performance of Labour- Intensive Industries in Brazil	113
a. Firm-Level Determinants of Export Behaviour	114
b. Conclusions: Textiles and Clothing	115
c. Conclusions: Leather and Footwear	118
V. Prospects	123

1. Demand for Labour-Intensive Products	123
a. Income Elasticities	123
b. Importing Country Protectionism	130
2. Supply Conditions	139
a. Technological Progress and Brazil's Future Competitive Position in Labour-Intensive Industries	139
b. The Domestic Labour Supply	150
VI. Summary and Conclusions	158

APPENDICES	167
I. Tables	168
II. Constant Market Shares Analysis of Trade in Individual Products	190
III. The Methodology of International Comparisons of Unit Labour Cost Trends	192
IV. Domestic Resource Costs of Labour-Intensive Exports from Brazil: Results and Methodological Issues	195
V. The Measurement of Factor Intensities: A Comment on Methodology	202
References	204

List of Tables and Figures

Table 1 - Value Added, Employment, and Foreign Trade of Selected Industries in Brazil, 1967-1987	5
Table 2 - Output, Trade, and Domestic Consumption of Textiles and Clothing in Brazil, 1971-1987	10
Table 3 - Brazilian Textile and Clothing Exports by Product Categories, 1971-1987	12
Table 4 - Production, Foreign Trade, and Apparent Consumption of Bovine Leather in Brazil, 1975-1986	14
Table 5 - Production, Foreign Trade, and Apparent Consumption of Footwear in Brazil, 1974-1987	17
Table 6 - Brazilian Exports of Hides and Leather, Leather Goods, and Footwear, 1971-1987	18
Table 7 - Fibre Consumption by the Textile Industry in Selected Regions, 1960-1986	21
Table 8 - Production, International Trade, and Apparent Consumption of All Apparel Fibres in Selected Countries, 1974 and 1984	24
Table 9 - Production and International Trade of Bovine Leather in Selected Countries, 1970 and 1985	26
Table 10 - Production and International Trade of Footwear in Selected Countries, 1970-1985	30
Table 11 - Country Rankings in World Exports of Textiles and Clothing, Brazil, South Korea, and Taiwan, 1965-1985	34
Table 12 - Country Rankings in World Exports of Leather, Leather Products, and Footwear, Brazil, South Korea, and Taiwan, 1965-1985	35
Table 13 - Constant Market Share Analysis of Textile Exports in Selected Countries, 1973-1986	38
Table 14 - Constant Market Share Analysis of Leather and Footwear Exports in Selected Countries, 1973-1986	41
Table 15 - Export Performance Ratios for Textiles and Clothing in Selected Countries, 1970-1986	44
Table 16 - Export Performance Ratios for Leather, Leather Products, and Footwear in Selected Countries, 1970-1986	48

VIII

Table 17 - The Structure of Production Costs in the Brazilian Leather Industry, 1984/85 and 1988	53
Table 18 - The Structure of Footwear Production Costs in Canada and Brazil, 1974, 1982, and 1988	54
Table 19 - Labour Cost Trends in Labour-Intensive Industries in Selected Countries, 1963-1986	56
Table 20 - Materials and Fixed Capital Intensity of Selected Manufacturing Industries in Brazil, 1975-1984	61
Table 21 - Real Interest Rates for Short-Term Credit in Selected Countries, 1973-1988	62
Table 22 - Real Interest Rates for Treasury Bills and Other Financial Investments in Selected Countries, 1973-1988	64
Table 23 - Product Differentiation in US Imports of Textiles and Clothing in Selected Countries, 1970-1985	66
Table 24 - Product Differentiation in US Imports of Leather and Footwear in Selected Countries, 1970-1985	67
Table 25 - Specialization in Labour-Intensive Industries, 1975: Cross-Country OLS Regression Results	74
Table 26 - Actual versus "Normal" Specialization in Labour-Intensive Industries in Selected Countries, 1975	78
Table 27 - Factor Intensities in Selected Labour-Intensive Industries: An International Comparison, 1973/75 and 1981/84	81
Table 28 - Preferential Tariffs and Selected Non-Tariff Barriers for Selected Manufacturing Industries in Brazil, 1975-1984	87
Table 29 - Selected Incentive Rates for Manufactured Exports in Brazil, 1969-1985	89
Table 30 - Number of BEFIEX Contracts Concluded for Selected Manufacturing Industries in Brazil, 1972-1985	90
Table 31 - Protection and Export Incentive Rates for Selected Manufacturing Industries in Brazil, 1967-1985	92
Table 32 - Real Exchange Rates and the Destination of Footwear Exports from Rio Grande do Sul, 1973-1987: Regression Results	100
Table 33 - Average Wages per Employee in Labour-Intensive Industries as a Multiple of the Minimum Wage in Brazil, 1972-1984	102

Table 34 - International Trade in Machinery for the Textile, Clothing, Leather, and Footwear Industries in Brazil, 1971-1987	105
Table 35 - Adoption of Major Technological Innovations in the Textile Industry in Selected Countries, 1977-1986	107
Table 36 - Gross Fixed Capital Formation in Labour-Intensive Industries in Brazil, 1965-1984	109
Table 37 - The Development of Raw Material Prices in Brazil Relative to the US, 1969-1988	111
Table 38 - Firm-Level Determinants of the Export Performance of Labour-Intensive Industries in Brazil, 1978	116
Table 39 - Regional Distribution of Footwear Output and Exports, Brazil, 1958-1987	122
Table 40 - Income Elasticities of Per Capita Consumption of Textile Fibres and Footwear, 1982-1984: Cross-Country Regression Results	125
Table 41 - Income Elasticities of Real Expenditure on Clothing and Footwear, 1975: Cross-Country Regression Results	128
Table 42 - Deflated Expenditure on Clothing and Footwear and Total Consumer Expenditure in Selected Countries, 1963-1982	129
Table 43 - Textile and Clothing Exports from Brazil by Destination, 1975-1985	132
Table 44 - US Bilateral Agreements under the MFA with Selected Suppliers, 1979 and 1982	134
Table 45 - EC Bilateral Agreements under the MFA with Selected Suppliers, 1979-1991	135
Table 46 - Footwear Exports from Brazil by Destination, 1971-1986	137
Table 47 - Changes in Factor Requirements through the Use of Advanced Technology in Brazil	142
Table 48 - The Regional Distribution of Employment and Value Added in Brazil's Labour-Intensive Industries, 1970-1984	152
Table A1 - Employment and Value Added in Sub-Branches of Labour-Intensive Industries in Brazil, 1970-1984	168

Table A2 - Fibre Consumption by the Brazilian Textile Industry, 1965-1987	171
Table A3 - Production, International Trade, and Apparent Consumption of Cotton Products in Selected Countries, 1974 and 1984	172
Table A4 - Production, International Trade, and Apparent Consumption of Artificial Fibres in Selected Countries, 1974 and 1984	174
Table A5 - Production, International Trade, and Apparent Consumption of Synthetic Fibres in Selected Countries, 1974 and 1984	176
Table A6 - Output and International Trade of Bovine Hides and Skins in Selected Countries, 1970-1985	178
Table A7 - The Structure of Yarn Production Costs in Selected Countries, 1981 and 1987	179
Table A8 - The Structure of Fabrics Production Costs in Selected Countries, 1981 and 1987	179
Table A9 - Clothing Production Costs for Cotton Shirts, 1985	180
Table A10 - Short-Term Real Interest Rates in Brazil, 1980-1988	180
Table A11 - Specialization in Labour-Intensive Industries: Cross-Country Regression Results with Real GDP as an Independent Variable, 1975	181
Table A12 - Factor Endowments in Selected Countries, 1975	182
Table A13 - Capital Intensity in Sub-Branched of Labour-Intensive Industries in Brazil, 1970-1984	183
Table A14 - The Development of the Price of Raw Hides and Skins in Brazil Relative to the US, 1977-1988	186
Table A15 - Capital Ownership in Labour-Intensive Industries in Brazil, 1980	187
Table A16 - The Size-Distribution of Firms in Labour-Intensive Industries in Brazil, 1980 and 1981	188
Table A17 - Concentration Ratios for World Market Economy Exports of Labour-Intensive Products, 1970 and 1985	189
Table A18 - Domestic Resource Costs of Labour-Intensive Exports in Brazil, 1970-1980	196

Synoptical Table 1 - A Framework for an Analysis of Protection and Export Promotion in Brazil	86
Synoptical Table 2 - Major Innovations in Textile and Clothing Manufacturing Technology by Stage of Production	141
Figure 1 - The Structure of Yarn Production Costs in Selected Countries, 1981 and 1987	50
Figure 2 - The Structure of Fabric Production Costs in Selected Countries, 1981 and 1987	50
Figure 3 - The Structure of Clothing Production Costs (Cotton Shirt) in Selected Countries, 1985	52

Abbreviations and Acronyms

ABPFAS	Associação Brasileira de Produtores de Fibras Artificiais e Sintéticas (Brazilian Association of Artificial and Synthetic Fibre Producers)
ACI-NH	Associação Comercial e Industrial de Novo Hamburgo (Chamber of Commerce and Industry, Novo Hamburgo)
ADICAL	Associação das Indústrias de Calçados do Rio Grande do Sul (Association of the Footwear Industry in the State of Rio Grande do Sul)
AICSUL	Associação das Indústrias de Curtume do Rio Grande do Sul (Association of the Tanning Industry in the State of Rio Grande do Sul)
ATESP	Associação Têxtil do Estado de São Paulo (Association of the Textile Industry in the State of São Paulo)
BEFIEIX	Benefícios Fiscais à Programas Especiais de Exportação (Fiscal Benefits to Special Export Programmes)
BNDES	Banco Nacional de Desenvolvimento Económico e Social (National Bank for Economic and Social Development)
BRDE	Banco Regional de Desenvolvimento Económico (Regional Bank for Economic Development)
CACEX	Carteira de Comércio Exterior (Foreign Trade Office, Bank of Brazil)
CAD	Computer-Aided Design
CAM	Computer-Aided Manufacturing
CDI	Conselho de Desenvolvimento Industrial (Industrial Development Council)
CICB	Centro das Indústrias de Curtumes do Brasil (Information Centre of the Brazilian Tanning Industry)
cif	cost, insurance, and freight
CNC	Computer Numerically Controlled
CNIT	Conselho Nacional da Indústria Têxtil (National Council of the Textile Industry)
CPEs	Centrally Planned Economies
CTCCA	Centro Tecnológico do Couro, Calçados e Afins (Technology Centre for Leather, Footwear, and Related Products)

EC	European Community
EPRs	Export Performance Ratios
FAO	Food and Agriculture Organization of the United Nations
FENAC	Feira Nacional do Calçado (National Footwear Exhibition)
FIESP	Federação das Indústrias do Estado de São Paulo (Federation of Industries in the State of São Paulo)
FINOR	Fundo de Investimentos do Nordeste (North-east Investment Fund)
fob	free on board
FUNCEX	Fundação Centro de Estudos do Comércio Exterior (Centre for the Study of Foreign Trade)
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
IBGE	Instituto Brasileiro de Geografia e Estatística (Brazilian Institute of Geography and Statistics)
ICM	Imposto sobre Circulação de Mercadorias (State Value Added Tax)
ICs	Industrialized Countries
ILO	International Labour Organisation
IMF	International Monetary Fund
IPA	Índice de Preços para Atacado (Wholesale Price Index)
IPI	Imposto sobre Produtos Industrializados (Federal Value Added Tax)
ISIC	International Standard Industrial Classification
ITMF	International Textile Manufacturers' Federation
LDCs	Developing Countries
MFA	Multi-Fibre Agreement
NBM	Nomenclatura Brasileira de Mercadorias (Brazilian Commodity Classification)
NICs	Newly Industrializing Countries
OECD	Organisation for Economic Co-operation and Development

XIV

OG	Oferta Global (Total Supply)
OLS	Ordinary Least Squares
OTN/ORTN	Obrigações do Tesouro Nacional (Indexed National Treasury Bonds)
RCA	Revealed Comparative Advantage
SATRA	Shoe and Allied Trades Research Association
SIFTG	Sindicato da Indústria de Fiação e Tecelagem em Geral no Estado de São Paulo (Employers' Federation of the Spinning and Weaving Industry, State of São Paulo)
SME	Small or Medium-Sized Enterprise
UN	United Nations
UN/ECLAC	United Nations/Economic Commission for Latin America and the Caribbean
UNCTAD	United Nations Conference on Trade and Development
UNIDO	United Nations Industrial Development Organization
USITC	United States International Trade Commission
VA	Value Added

Preface

This study is part of a research project on the present problems and future prospects of the Brazilian economy in the international division of labour. The study analyses how the international competitiveness of traditional labour-intensive industries in Brazil has been determined by the interplay of genuine locational advantages and economic policies. The impact of technological change and the protectionism of importing industrialized countries are also evaluated. The study concludes that, given a less discriminatory policy environment, traditional labour-intensive industries in Brazil could expand their exports and thus create urgently needed employment opportunities, especially at low to moderate skill levels.

The field research on which this study is based could not have been undertaken without the assistance of the German-Brazilian Chambers of Commerce and Industry in São Paulo and Porto Alegre. The author wishes to extend his thanks to all those individuals in government and academic institutions, companies, industry associations, and trade unions in Brazil who provided essential information. Financial support for this research project has been received from members of the "Gesellschaft zur Förderung des Instituts für Weltwirtschaft" as well as the "Robert Bosch Jubiläumsstiftung von 1986".

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Kiel, March 1990

Horst Siebert

I. Introduction

Labour-intensive industries have played an important role in the industrialization of many newly industrializing countries (NICs). The economic growth of South-East Asian NICs since the early 1960s has been based to a large extent on a rapid expansion of textile and clothing exports. Only at a later stage capital-intensive industries began to contribute significantly to manufactured exports, while labour-intensive products continued to be a mainstay of the export performance. Some second-generation NICs such as Thailand are now following a similar development path.

Contrary to the experiences of South-East Asian NICs, the export performance of labour-intensive industries in Brazil since the partial opening of the economy in the late 1960s has been less significant. Manufactured export growth has consisted largely of capital-intensive products such as automobiles and steel [Fasano-Filho et al., 1987; Fischer, Nunnenkamp et al., 1988]. This development might be attributed, on the one hand, to a shift of Brazil's comparative advantage away from labour-intensive products towards standardized industrial goods, as suggested by the product cycle hypothesis [Fischer, Nunnenkamp et al., 1988, pp. 3 ff.]. In this case comparative advantage in labour-intensive products now lies with less advanced developing countries where unskilled and semi-skilled labour is relatively more abundant than in Brazil. Alternatively, modest export growth in labour-intensive industries might be the result of government policies that discriminate against "traditional" industrial activities.

The available evidence on the validity of these hypotheses is rather limited. Fasano-Filho et al. [1987, pp. 36 ff.] find that labour-intensive exports rose faster than other manufactured exports between 1967 and 1973; during this period economic policy in Brazil maintained a largely non-discriminatory stance towards production for the domestic versus the export market. By contrast, in the years 1973 to 1981, when policy was geared towards import substitution, capital-intensive exports increased overproportionately. This suggests that the change in economic policy (rather than a shift of comparative advantage) has led to the (overall) modest export performance of labour-intensive industries in Brazil.

Fischer, Nunnenkamp et al. [1988] analyse the determinants of the favourable export performance of two physical-capital-intensive industries (automobiles and steel) in greater detail. They conclude that Brazil is in the process of gaining a comparative advantage in those sub-branches that utilize standardized technologies and do not require large amounts of human capital. However, the rapid growth of output and exports in the two industries could not have occurred without large subsidies as well as protection from imports.

The present study analyses the performance of labour-intensive industries in Brazil in analogy to Fischer; Nunnenkamp et al. [1988]. The focus is on four sectors: textiles and clothing, leather and footwear. The first two have been chosen because in South-East-Asian NICs the clothing industry was frequently the first manufacturing industry to enter the world market, usually followed by textiles. By contrast, clothing exports from Brazil are very small, and textile exports have also remained limited relative to the size of the industry. The leather and leather footwear industries in Brazil, however, are very successful exporters. Hence, a comparison of the impact of economic policies on these four industries should render it possible to assess how genuine locational advantages interact with economic policies in determining export performance.

The analysis proceeds as follows: Chapter II provides the statistical background information for this study by first assessing the contribution of labour-intensive industries to manufacturing value added, employment and exports in Brazil. Subsequently output, foreign trade and consumption in the more important sub-sectors are analysed in detail and compared to other producer countries. Chapter III assesses the competitive position of Brazilian labour-intensive industries through quantitative indicators related to foreign trade performance and through an international comparison of production costs. Chapter IV first analyses the structure of Brazil's comparative advantage on the basis of the country's factor endowments and the factor intensities in the four selected industries. Subsequently, input and factor market, trade, and exchange rate policies in Brazil are evaluated. Finally, the impact of economic policies is related to the structure of Brazil's comparative advantage in order to assess their relative weight in determining the actual export performance. Chapter V discusses the prospects for labour-intensive industries

in Brazil as regards future demand growth for clothing and footwear, the outlook concerning the protectionism of importing countries, likely technological developments, and the future supply of unskilled and semi-skilled labour in Brazil. The final chapter presents a summary and the conclusions.

II. The Economic Performance of Labour-Intensive Industries in Brazil

1. Labour-Intensive Industries and Brazil's Industrial Development since 1967

This section assesses the contribution of the textile, clothing, leather, and footwear industries in Brazil to manufacturing value added, employment, and exports. In order to place the development of these labour-intensive industries in proper perspective, their performance is compared to two typical physical capital-intensive sectors (metallurgy, transport equipment) as well as two human-capital-intensive industries (mechanical and electrical engineering).

In the mid-1960s the economic development strategy in Brazil shifted from import-substituting industrialization towards a more outward-oriented approach. The overvaluation of the Cruzeiro was eliminated, a crawling peg was instituted, fiscal and financial incentives for manufactured exports were introduced in 1967, and nominal tariff rates on imports were reduced [Simonsen, 1987; Fasano-Filho et al., 1987, pp. 6 f.]. The year 1967 also marks the beginning of a phase of accelerated economic growth in Brazil, particularly in the manufacturing sector, that lasted until 1973 (Table 1). The textile, clothing, leather, and footwear industries contributed to this development: their combined share in manufacturing value added remained almost constant at close to 14 per cent. Their share in manufactured exports (broadly defined) even showed a marked increase since a moderate relative decline in textile exports (from 37.5 to 31.1 per cent) was more than compensated for by higher exports of both clothing and footwear, which rose from almost nil to 6.0 and 5.4 per cent.

The first oil price shock led to a balance-of-payments crisis in 1974 and a reversal of the cautious liberalization initiated in the mid-1960s. Tariffs were increased again on a wide range of products and quantitative restrictions tightened. Public sector investment as well as fiscal and financial subsidies were directed towards import substitution in capital-intensive industries (petrochemicals, iron and steel, fuel alcohol, capital goods). Incentives for manufactured exports were largely maintained, though. Economic growth continued until 1980, but at a slower pace. Labour-intensive industries, however, grew less rapidly than total manu-

Table 1 - Value Added, Employment, and Foreign Trade of Selected Industries in Brazil, 1967-1987

		1967	1973	1980	1984	1987
Value Added	IBGE	per cent of manufacturing				
Leather, leather goods	19	0.8	0.7	0.5	0.9(a)	na
Textiles	24	9.8	9.3	6.5	5.7(a)	6.0(d)
Clothing, footwear etc.	25	3.1	3.6(f)	4.8	4.9(a)	4.2(d)
Clothing, similar manufactures		na	2.0(h)	3.2	2.6(a)	na
Footwear		na	1.2(h)	1.5	2.2(a)	na
Metallurgy	11	10.5	11.9	11.5	10.7(a)	10.6(d)
Transport equipment	14	8.4	7.6	7.7	7.0(a)	6.5(d)
Mechanical engineering	12	5.1	8.7	10.1	8.4(a)	9.7(d)
Electrical engineering	13	6.1	5.7	6.4	5.7(a)	6.7(d)
		per cent of GDP at factor costs				
Manufacturing		24.3	29.8	31.4	29.9	27.8(i)
		real GDP at market prices; 1980=100				
Total		29.7	61.9	100.0	100.5	121.2
Employment (year-end)		per cent of manufacturing				
Leather, leather goods	19	1.2	0.9	0.9	1.1(a)	1.1(b,c)
Textiles	24	15.2	11.6	7.7	6.7(a)	6.7(b,e)
Clothing, footwear etc.	25	5.6	6.9(g)	9.4	12.7(a)	na
Clothing, similar manufactures		na	3.4(h)	6.0	6.5(a)	6.5(b,e)
Footwear		na	2.7(h)	3.2	6.0(a)	5.3(b)
Metallurgy	11	11.3	11.1	10.8	10.5(a)	10.7(b)
Transport equipment	14	6.9	6.7	5.7	5.6(a)	5.4(b)
Mechanical engineering	12	4.8	9.4	10.9	10.7(a)	11.9(b)
Electrical engineering	13	5.5	5.5	5.0	4.9(a)	5.3(b)

Table 1 - continued

		1967	1973	1980	1984	1987
		per cent of economically active population				
Manufacturing		na	11.0(h)	16.1	14.2	16.2(i)
		economically active population; million				
Total		na	29.6(h)	43.2	50.2	55.4(i)
Exports	NBM	per cent of manufacturing				
Leather, leather goods	41-42	6.2	4.2	1.9	2.2	1.7
Textiles	50-59	37.5	31.1	8.6	7.6	5.9
Clothing, footwear etc.	60-67	0.3	11.5	7.6	11.0	10.2
Clothing	60-62	0.2	6.0	2.6	2.3	2.3
Footwear	64	0.1	5.4	5.0	8.7	7.9
Metallurgy	73-83	13.5	8.3	14.6	24.0	21.0
Transport equipment	86-89	2.5	5.3	18.5	11.0	18.8
Mechanical engineering	84	7.7	7.4	16.9	11.4	11.1
Electrical engineering	85	1.3	4.9	5.7	4.8	6.0
		per cent of total exports				
Manufacturing (excluding processed food)(j)	28-98	22.9	27.8	40.6	45.5	56.2
		bill. US \$				
Total		1.7	6.2	20.1	27.0	26.2
Imports		per cent of manufacturing				
Leather, leather goods	41-42	0.0	0.2	0.1	2.5	2.4
Textiles	50-59	0.9	1.8	1.0	1.4	1.6
Clothing, footwear etc.	60-67	0.2	0.3	0.4	0.1	0.3
Clothing	60-62	0.0	0.2	0.1	0.0	0.1
Footwear	64	0.0	0.0	0.0	0.0	0.1
Metallurgy	73-83	18.3	17.9	14.3	8.1	8.6
Transport equipment	86-89	12.5	9.4	8.1	9.9	11.6
Mechanical engineering	84	24.9	26.8	22.9	18.7	22.7
Electrical engineering	85	8.9	10.3	11.2	13.8	14.0

Table 1 - continued

		1967	1973	1980	1984	1987
	NBM	per cent of total imports				
Manufacturing (excluding processed food)(j)	28-98	65.7	74.3	45.2	36.3	54.4
		bill. US \$				
Total		1.4	6.2	12.3	13.9	15.1
<p>(a) Figures include only establishments with 5 or more employees. - (b) Calculated from 1984 shares and growth rates of employment in production published in Banco Central do Brasil [various issues]. - (c) Growth rates of employment relate to leather, rubber, and tobacco industries. - (d) Calculated from 1984 shares and growth rates of output. - (e) Growth rates of employment relate to textiles and clothing. - (f) 1970: 3.2 per cent. - (g) 1970: 6.2 per cent. - (h) 1970. - (i) 1986. - (j) The definition of manufactures in terms of the chapters of NBM is in accordance with CACEX as quoted by World Bank [1983, Table 3.7]. The range of products covered by this definition (excluding processed food) corresponds closely to the definition of manufacturing industry by IBGE (indústria de transformação) - used throughout this study. Therefore, it is preferred to the narrower definition of manufactured exports (SITC 5-8 less 67 and 68) used e.g. by UNCTAD [various issues].</p>						

Source: Banco Central do Brasil [various issues]; Banco do Brasil/ CACEX [a, various issues]; IBGE [a, 1987; b, 1975; 1980; c, 1984]; World Bank [1983]; own calculations.

facturing, especially the textile industry whose share in manufacturing value added declined by almost a third from 9.3 to 6.5 per cent. This was only partly compensated for by the footwear and clothing industries. Their value added rose from 3.6 to 4.8 per cent of total manufacturing. Labour-intensive industries lost even more ground in the field of exports. Only the footwear industry held its share of manufactured exports, whereas textiles, clothing, and leather registered large losses in relative terms. By contrast, metallurgy, transport equipment, and mechanical engineering contributed substantially to the rapid growth of manufactured exports from Brazil during the 1970s.

Between 1980 and 1984 the Brazilian economy went through a deep recession. Economic policy was characterized by the absence of a coherent strategy; numerous short-term measures were undertaken in re-

sponse to external shocks, such as the second large oil price increase in 1979, the recession in OECD countries in the early 1980s, and the escalation of dollar interest rates. In December 1979 the government eliminated the accumulated overvaluation of the Cruzeiro and reintroduced the crawling peg to the US dollar which had been abolished in 1974. In subsequent years foreign trade policies became increasingly geared towards creating a surplus in the balance of trade to service the foreign debt. Exports continued to be promoted through financial and fiscal incentives, while imports were reduced through high tariff and non-tariff trade barriers.

Recovery from the recession started in 1985 and turned into a demand-led boom in 1986 when the implementation of the Cruzado Plan in March 1986 led to substantial real wage increases. Inflation, which had become rampant, was held back temporarily through a price and wage freeze that lasted until the end of 1986. As manufacturing output was approaching the limits of capacity, inflationary pressures built up again, and three-digit inflation returned in 1987. Gross domestic product (GDP) in that year was only marginally higher than in 1986.

Throughout the 1980s the contribution of labour-intensive industries to manufacturing value added remained more or less unchanged in spite of the frequent alterations of economic policies.¹ Together they accounted for roughly 11 per cent of manufacturing value added in the middle of the decade - or about as much as the metallurgical industry alone. Their combined share in manufacturing employment was much higher at close to 20 per cent. Growing employment in the footwear industry had compensated to a large degree for the relative decline of employment in the textile industry during the 1970s and 1980s. Growing footwear exports also made up for the continuing relative decline of textile exports. Even so, all the labour-intensive industries covered by this study accounted for only about 18 per cent of manufactured exports in 1987 - less than the metallurgical industry alone.

To summarize, the performance of the four selected labour-intensive industries in Brazil since 1967 may be characterized as follows:

- The textile industry experienced a strong decline relative to total manufacturing in terms of value added, employment, and exports.

¹ The small changes shown in Table 1 should not be overinterpreted as 1984 and 1987 data are not strictly comparable to those for 1980.

- Value added and employment in clothing production grew faster than in total manufacturing; clothing exports, however, remained modest in spite of seemingly promising growth between 1967 and 1973.
- The leather and leather goods industry grew about as fast as total manufacturing in terms of output and employment; export growth lagged behind other manufacturing industries.
- The footwear industry registered a rapid increase of its shares in manufacturing value added, employment, and exports.
- Overall, the contribution of these four industries to manufacturing value added and employment declined only slowly between 1967 and 1987, while their share in 1987 manufactured exports was less than half of that achieved twenty years earlier.

2. Output, International Trade, and Apparent Consumption of Labour-Intensive Products in Brazil

In the previous section the performance of labour-intensive industries in Brazil has been described at a fairly highly aggregated level. However, each of the four labour-intensive industries includes a wide range of economic activities with rather different characteristics regarding factor intensities, technology requirements, export performance, etc. (Table A1). Therefore, an analysis of international competitiveness and the impact of economic policies needs to proceed at a less aggregated level. This section assesses output, foreign trade, and domestic consumption of the more important sub-branches of the industries analysed.

a. Textiles and Clothing

The product structure of the textile and clothing industries is highly diversified. Therefore, fibre input is used as an overall measure of textile output that can easily be related to foreign trade and apparent domestic consumption (Table 2). Fibre consumption and, by implication, textile output almost doubled between 1971 and 1980. During the same period textile and clothing exports fluctuated between 13 per cent (1971) and 25.7 per cent (1979) of output in weight terms, while imports never

Table 2 - Output, Trade, and Domestic Consumption of Textiles and Clothing in Brazil, 1971-1987

	Mill consumption of textile fibres	Exports										Imports					Domestic fibre availability		
		total		yarns			fabrics			clothing and other final manufactures(a)	other manufactures(a)	total	yarns	fabrics	clothing and similar final manufactures(a)	other manufactures(a)	total	per head	
				total	cotton	artificial/synthetic fibres	total	cotton	artificial/synthetic fibres										
1000 t	per cent of fibre consumption	1000 t	per cent of export volume										1000 t	per cent of import volume				1000 t	kg
1971	539	13.0	70	16.0	9.3	1.9	25.0	12.7	3.9	4.9	54.1	30	35.6	10.1	1.0	54.4	498	5.1	
1972	604	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	
1973	722	20.3	147	29.1	20.0	5.2	25.2	17.2	2.5	10.2	35.5	41	35.3	9.7	2.2	52.9	617	6.0	
1974	752	18.9	142	30.2	19.9	8.0	19.6	14.2	2.6	11.0	39.1	63	28.3	16.4	1.3	54.0	673	6.4	
1975	768	17.6	135	14.8	9.2	2.7	23.0	17.2	1.8	13.6	48.7	31	17.3	26.3	1.3	55.1	664	6.2	
1976	843	18.7	157	29.2	26.0	0.7	10.9	3.7	1.2	11.6	48.4	35	13.0	19.5	1.4	66.0	721	6.6	
1977	827	23.0	190	34.1	27.6	3.4	15.9	11.1	1.8	9.7	40.7	19	19.9	68.8	2.2	9.1	656	5.8	
1978	878	22.3	196	34.2	27.0	5.2	16.2	10.7	2.6	10.6	39.0	22	33.3	55.3	1.8	9.6	704	6.1	
1979	951	25.7	248	27.9	22.7	3.8	21.2	10.6	2.8	8.6	42.3	15	43.2	39.0	2.1	15.8	722	6.1	
1980	1008	21.4	216	32.5	26.6	4.1	17.4	11.6	2.2	10.8	39.4	13	48.4	26.6	3.1	21.9	806	6.6	
1981	912	26.9	245	38.3	29.5	7.3	16.2	12.2	2.4	9.0	36.5	10	39.2	24.7	3.1	33.0	677	5.5	
1982	928	21.7	202	39.5	32.1	5.9	20.4	13.1	2.4	8.5	31.5	7	37.4	21.1	4.2	36.2	734	5.8	
1983	844	33.8	285	38.7	28.8	8.8	20.1	15.2	2.4	6.9	34.3	7	18.8	7.2	2.9	71.0	566	4.4	
1984	862	42.9	370	34.2	24.1	9.0	20.5	15.2	2.6	9.6	35.7	6	30.0	8.3	1.7	60.0	498	3.8	
1985	979	30.7	300	32.2	22.3	8.4	17.6	13.5	2.3	11.5	38.8	5	46.3	22.2	3.7	27.8	684	5.0	
1986	1133	21.6	245	28.9	20.4	6.8	19.7	14.6	3.1	13.4	38.0	13	54.3	22.5	3.1	20.2	901	6.5	
1987	1196	21.6	258	37.5	28.3	7.7	18.4	15.3	2.2	13.3	31.6	14	46.7	28.9	4.4	19.3	952	6.4	

(a) Cf. Table 3 for a list of products included.

Source: Banco do Brasil/CACEX [a, various issues]; IBGE [a, various issues]; Ministerio de Fazenda [various issues]; SIFTG/ATESP [1987]; own calculations.

exceeded 10 per cent of domestic consumption and declined steadily after 1974. The growth in total fibre consumption was largely absorbed by a growing population; fibre availability per head increased only modestly. The recession in the early 1980s caused a steep decline in domestic fibre consumption. Exports increased to 33.8 per cent of output in 1983 and further to 42.9 per cent in 1984. Therefore, the fall in output was less precipitous than the fall in demand. When consumption recovered in 1985 and particularly in 1986 as a result of the Cruzado Plan, exports were reduced to little more than 20 per cent of output - a level similar to that achieved in the late 1970s. To summarize, the Brazilian textile and clothing industries have exported a significant but still relatively small proportion of output since the early 1970s. Overall, the Brazilian textiles and clothing complex remains inward-oriented.

The product composition of exports provides some clues as to the competitive positions of the various sub-branches of the textile and clothing industries (Table 3). As regards raw materials, the share of cotton in Brazil's exports of yarns and especially fabrics is higher than in total fibre consumption by the Brazilian textile industry (Table A2). This is probably explained by Brazil's large domestic cotton supply, while the availability of modern weaving technology required for the processing of synthetic fibres remains limited (cf. Section IV.3.b).

When exports are categorized according to the successive stages of the textile and clothing production process (raw materials, yarns, fabrics, clothing and similar final manufactures, various intermediate manufactures), certain trends in the composition of the value of textile and clothing exports can be identified. The share of basic textile materials was reduced from about two thirds of textile and clothing exports in 1971 to roughly 15 per cent in the mid-1980s. The importance of textile manufactures and clothing grew accordingly (Table 2). Within this group the share of yarns fluctuated around 30 per cent and that of fabrics around 20 per cent. Exports of knitwear, clothing, and home textiles rose sharply between 1971 and 1975. Knitwear subsequently stabilized at about 8 per cent of the export value of textile manufactures and clothing, while the corresponding share of home textiles grew further to almost 13 per cent in 1987. Clothing exports, however, declined sharply in relative terms between 1975 (20.8 per cent) and 1980 (5.5 per cent) and only recovered slowly in the 1980s to 12 per cent in 1987.

Table 3 - Brazilian Textile and Clothing Exports by Product Categories (a), 1971-1987

	NBM	1971 (b)	1975	1980	1985	1987
				mill. US \$		
Basic textile materials		168.4	153.0	93.8	128.3	208.2
				per cent		
Silk	50.03	0.1	0.7	1.1	1.2	0.7
Wool/animal hair	53.01-03	6.5	13.9	10.0	3.0	3.2
Cotton	55.01-04	83.5	65.4	18.7	63.9	79.8
Sisal	57.04.01	9.1	19.7	62.9	22.4	10.5
Flax/ramie	54.01.02	-	-	7.2	8.4	5.8
Others	57.03	0.9	0.3	0.1	1.0	0.0
				mill. US \$		
Textile manufactures and clothing		84.1	407.4	838.1	872.6	981.9
				per cent		
Yarns		(29.1)	(26.3)	(31.7)	(31.3)	(33.9)
Silk	50.04-07	4.2	4.9	3.4	3.2	2.8
Artificial/synthetic fibres	51.01-03;					
	56.05.06	2.3	2.1	4.9	7.5	7.1
Wool	53.07.10	6.8	2.2	0.8	0.8	0.6
Cotton	55.05.06	14.9	16.6	21.6	19.0	22.6
Flax/ramie	54.03.04	0.7	0.5	0.8	0.7	0.7
Others	52;53.09;					
	57.06.07;58.07	0.2	0.0	0.2	0.1	0.1
Fabrics		(21.5)	(13.3)	(21.3)	(25.5)	(20.6)
Silk	50.09	0.0	0.2	0.8	3.2	0.3
Artificial/synthetic fibres	51.04;56.07	3.4	4.1	4.6	4.3	3.3
Flax/ramie	54.05	0.8	0.9	0.5	0.7	0.7
Cotton	55.07-09	13.1	6.6	13.1	15.8	15.3
Juta	57.10	2.7	1.2	1.3	0.6	0.1
Others	53.11.12;57.11;					
	58.04-06.08-10	1.5	0.3	1.0	0.9	0.8
Clothing and other final manufactures		(18.8)	(39.8)	(24.5)	(31.3)	(33.9)
Knitwear	60 except 60.01	3.8	8.9	6.9	8.4	8.2
Clothing made of woven fabrics	61	8.8	20.8	5.5	10.3	12.0
Home textiles (except carpets)	62.02	4.9	9.1	10.5	10.9	12.7
Sacks/packing materials	62.03	0.1	0.2	0.7	1.2	0.7
Others	62.01.04.05	1.2	0.8	0.9	0.5	0.3
Various manufactures		(30.6)	(20.2)	(22.5)	(14.7)	(12.5)
Synthetic fibres	56.01-04	1.2	0.7	1.2	2.6	1.6
Wool tops	53.05.01.04	0.0	5.4	7.1	4.1	4.6
Carpets	58.01-03	0.0	0.1	0.4	0.6	0.4
Ropes	59.04	3.6	5.7	8.6	6.1	4.5
Others	53 (except 53.05.01.04);					
	59(except 59.04);					
	60.01;63	25.8	8.3	5.2	1.3	1.4
				mill. US \$		
Total	Section XI	252.5	560.4	931.9	1000.6	1190.1
(a) Product categories in accordance with SIFTC/ATESP [1988, Table 1]. - (b) 1971 is the first year for which export data are available according to the NBM classification.						

Source: Banco do Brasil/CACEX [a, various issues]; own calculations.

The shift in the product composition of exports away from raw materials and intermediate products (various manufactures) towards final products suggests that the competitiveness of the Brazilian textile and clothing industries in export markets has improved since the early 1970s. However, clothing exports remained conspicuously small compared with home textiles and knitwear. Only few firms in a limited number of sub-sectors throughout the textiles and clothing complex have become committed exporters since the 1970s. The determinants of this behaviour are discussed in Chapter IV.

b. Leather and Footwear

Coherent time series of output in these industries have been collected only since the mid-1970s. However, even these data often constitute no more than rough estimates. Data on leather production are limited to bovine leather, which accounts for 60 to 70 per cent of total leather output in Brazil [Bins Luce et al., 1986, p. 27]. Besides, bovine leather is the most important raw material for the leather footwear industry. Table 4 presents estimates of bovine leather production reported by the industry's association in the state of Rio Grande do Sul [AICSUL, 1985] along with alternative estimates based on the sales of tanning chemicals [Frizzo, 1985].¹

In contrast to textile output, which has increased steadily during the period of observation, the production of leather (semi-finished and finished) has fluctuated about a given level since 1975. Imports of hides and skins and leather "wet blue" were relatively small. Therefore, the limiting factor for leather output was probably the raw material supply, i.e. the slaughter of cattle, which has also remained by and largely unchanged. The long-term level of leather output is difficult to quantify as the available data diverge widely. According to AICSUL [1985] it should be slightly below the equivalent of 11 mill. cattle hides per year, whereas Frizzo [1985] places it closer to 15 mill. hides. If the figures report-

¹ Leather output and the use of tanning agents are related through fixed technical coefficients. As tanning chemicals are only supplied by a small number of firms, data on consumption are reasonably accurate.

Table 4 - Production, Foreign Trade, and Apparent Consumption of Bovine Leather in Brazil, 1975-1986 (mill. cattle heads)

	Slaughter of cattle	Hides and skins, raw		Leather, wet blue	
		imports	exports	imports	exports
1975	8.5	0.1	0.1	-	0.0
1976	10.7	0.0	-	0.0	0.1
1977	11.3	-	-	-	0.2
1978	11.4	-	-	-	0.3
1979	10.0	0.0	-	-	0.2
1980	9.6	0.0	0.0	-	0.1
1981	10.0	0.0	0.0	0.0	0.5
1982	11.7	0.0	0.4	0.0	1.1
1983	11.5	0.0	0.4	0.0	1.8
1984	10.2	0.0	0.0	0.2	1.0
1985	10.6	0.0	0.0	0.1	1.4
1986	8.7	na	na	na	0.8
	Leather, semi-finished, finished				Production (alternative estimate(a) [Frizzo, 1985])
	production	imports	exports	apparent availability	
1975	10.3	0.1	1.0	9.4	na
1976	10.6	0.3	1.7	9.2	na
1977	12.2	0.2	1.7	10.7	na
1978	11.3	0.6	2.0	9.9	16.2
1979	10.2	0.5	2.4	8.3	13.7
1980	10.7	0.2	1.3	9.6	13.9
1981	11.2	0.8	1.7	10.3	13.8
1982	12.8	1.6	1.5	12.9	17.0
1983	11.5	1.7	2.3	10.9	16.3
1984	10.5	2.4	2.1	10.8	na
1985	10.5	1.7	2.0	10.2	na
1986	na	3.7(b)	1.5	na	na

(a) Based on the consumption of tanning chemicals. - (b) Authorized.

Source: AICSUL [1985]; Frizzo [1985]; IBGE [a, various issues]; own calculations.

ed by AICSUL are regarded as representing the "formal economy", it can be concluded that leather output in the informal sector (included in Frizzo's data) amounts to more than one third of "formal" production.

Besides, leather output according to AICSUL has been higher than could have been sustained through the supply of raw hides and skins (IBGE data) plus net imports of hides and leather wet blue. Hence, the clandestine slaughter of cattle was apparently even more wide-spread than clandestine production of leather.

Exports of semi-finished and finished leather, like output, have remained stagnant at around the equivalent of 2 mill. cattle hides per year since 1975. However, the leather market in Brazil has become more strongly integrated into the world market since 1980 when exports of leather wet blue and imports of semi-finished and finished leather began to increase sharply. The rise in exports of wet blue stems from the establishment of large tanneries, often in conjunction with slaughterhouses, in Brazil's central and northern regions, which have become an important cattle-growing area. These tanneries perform only the first stage of processing (from raw hides to leather wet blue). In that state the product can economically be shipped elsewhere for further processing without a loss of quality, in contrast to raw hides which deteriorate quickly. Exports of wet blue have been controlled through quotas for extended periods as both footwear manufacturers and traditional tanners lobbied for protection of their raw material base.¹ Increased imports of semi-finished and finished leather resulted from the extended use of drawback facilities by footwear exporters. Such imports, mainly from Argentina, helped to compensate for the low quality of a large proportion of the raw hides available in Brazil (due to insect bites, etc.)

Little information is available on the relative importance of the various sources of demand for leather made in Brazil. If Frizzo's estimate of leather output equivalent to about 15 mill. hides per year is accepted, direct leather exports (including wet blue) amount to roughly one fourth of output. Exported footwear now accounts for about one half of the bovine leather available in Brazil (including imports), so that indirect and direct leather exports combined probably exceed 60 per cent of output. This figure indicates a significant outward orientation of the leather industry. Footwear sold in the domestic market takes up another 40 per cent of domestic leather availability, and leather manufactures for per-

¹ The relationship between domestic and international leather prices, on which the profitability of exports depends, is explored further in Section IV.3.c.

sonal and industrial use account for the rest (unpublished information provided by AICSUL).

Footwear output in Brazil grew steadily between 1974 and 1987 (Table 5).¹ This applies to all types of footwear. Exports, however, consisted mostly of leather footwear and rose from less than 30 per cent of output in that category to about two thirds in the mid-1980s. Conversely, the share of leather footwear in domestic apparent consumption fell from 37 per cent in 1974 to 16 per cent in 1987. While non-leather footwear now dominates the domestic market, exports of such footwear have mostly remained conspicuously small. Domestic consumption of footwear per head (all types) increased from 1.8 pairs in 1974 to 3.4 pairs in 1980, but has more or less stagnated since then. To summarize, the propensity to export on the part of the footwear industry follows a dual pattern: the major part of leather footwear output is exported, while non-leather footwear is sold mainly in the domestic market.

The composition of exports by the leather and footwear complex has undergone a shift away from raw materials towards manufactured products, similar to exports of textiles and clothing (Table 6). Thus exports of hides have become insignificant over time, and leather exports have grown much less rapidly than total exports by the leather and footwear industries combined. Exports of travel goods registered a strong rise in the first half of the 1970s but grew more slowly after 1975 (a development similar to that of clothing exports; cf. Table 3). Footwear exports increased substantially throughout the period; leather footwear, predominantly women's, contributed more than 90 per cent of footwear export value. To summarize, the increase in exports by the leather and

¹ The fast rise in leather footwear production especially between 1974 and 1979 may seem difficult to reconcile with the stagnation of apparent consumption of leather in Brazil (Table 4). Several explanations suggest themselves, apart from the somewhat fragmentary nature of the available data. Specific leather consumption (i.e. per pair of footwear) may have declined, e.g. as a result of the growing use of synthetic components, or because the proportion of the tanned area actually utilized has increased due to improved technology. Besides, the share of other leather manufactures, especially for industrial use, in total leather consumption may have declined. Widely diverging estimates of footwear output are also found in the literature [e.g. AICSUL, 1985; CTCCA, 1983]. They are not reported here because they either cover only a very short period or are inconsistent with other information presented in the same source.

Table 5 - Production, Foreign Trade, and Apparent Consumption of Footwear in Brazil, 1974-1987

	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
	mill. pairs													
Leather Production	94.9	114.1	130.5	128.6	146.3	162.9	164.0	163.2	166.4	162.4	175.3	179.8	193.3	178.1
	per cent													
of which:														
Shoes	67.0	63.4	59.7	63.0	72.1	72.1	54.3	54.4	54.0	54.5	52.9	52.4	52.1	50.1
Boots	1.7	2.7	3.5	6.1	4.4	4.4	4.6	4.6	4.7	4.6	4.9	5.0	4.5	4.5
Sandals, etc.	17.2	18.4	23.2	15.6	8.2	8.2	25.7	25.6	25.9	25.5	25.6	27.1	26.4	25.8
Children's footwear	14.2	13.1	13.5	13.6	14.0	14.0	13.6	13.6	13.6	13.6	11.7	13.7	15.4	18.0
Exports	25.5	28.1	22.5	17.5	23.6	22.0	27.7	38.9	34.1	50.6	71.5	66.0	66.5	63.1
	mill. pairs													
Rubber Production	68.3	56.7	85.0	90.4	109.7	115.8	146.2	145.0	150.0	143.7	164.3	171.5	208.4	213.7
	per cent													
Exports	0.6	0.6	0.5	0.5	0.6	0.3	0.3	0.5	0.5	1.0	1.5	1.7	1.7	1.8
	mill. pairs													
Plastics Production	12.7	19.5	14.1	13.0	14.8	24.6	75.1	74.2	77.7	73.3	87.7	92.8	87.1	55.7
	per cent													
Exports	4.9	2.6	2.5	5.9	1.3	1.6	1.7	2.2	2.7	8.5	14.0	7.8	4.8	7.4
	mill. pairs													
Other footwear Production	41.8	36.6	65.2	58.6	56.1	56.7	80.2	79.5	82.3	78.8	90.1	94.0	111.3	107.2
	per cent													
Exports	6.0	4.4	1.8	2.4	6.9	9.1	2.5	4.9	2.3	4.3	4.4	4.4	3.4	3.5
	mill. pairs													
Total Production	217.6	237.0	294.8	290.6	328.8	360.1	465.5	462.0	476.3	458.2	517.5	538.1	602.2	554.7
Exports	27.8	34.7	31.8	25.2	39.7	41.9	49.2	69.8	61.4	93.3	144.3	131.7	140.3	136.6
Imports	na	0.1	na	na	na	na	0.7	0.5	1.1	0.6	0.3	0.5	na	na
Apparent consumption	189.8(a)	202.2	263.0(a)	265.4	289.1(a)	318.2(a)	416.9	392.7	416.0	365.5	373.6	405.9	461.9(a)	418.1(a)
	mill. inhabitants													
Population	104.7	107.3	110.0	112.7	115.5	118.3	121.3	124.1	126.9	129.8	132.7	135.6	138.5	141.5
	pairs													
Apparent consumption per head	1.8	1.9	2.4	2.4	2.5	2.7	3.4	3.2	3.3	2.8	2.8	3.0	3.3	3.0
(a) Calculated by subtracting exports from production. Since imports were generally small, neglecting them does not seriously bias the result.														

Sources: Banco do Brasil/CACEX [a, various issues]; IBGE [a, 1986 edition, population data]; Ministerio da Fazenda [various issues]; unpublished production data from Sindicato da Industria de Calçados no Estado de São Paulo (based on IBGE data).

Table 6 - Brazilian Exports of Hides and Leather, Leather Goods, and Footwear, 1971-1987

	NBM	1971(a)	1975	1980	1985	1987
		mill. US \$				
Total hides and leather	41	31.7	53.2	101.2	139.2	183.4
		per cent				
Hides	41.01	(55.5)	(16.2)	(0.3)	(1.1)	(0.1)
Bovine (cattle)	41.01.02.03	19.9	0.4	0.0	0.8	0.0
Hides from other animals	41.01 (except 41.01.02.03)	35.6	15.8	0.3	0.3	0.1
Leather	41 (except 41.01)	(44.5)	(83.8)	(99.7)	(98.9)	(99.9)
Bovine	41.02	(24.0)	(55.5)	(67.0)	(80.4)	(81.5)
Wet blue	41.02.02.01	na	1.1	1.6	20.2	1.0
Semi-finished	41.02.02.02	na	1.3	0.1	7.5	18.7
Finished	41.02.02.03.04	na	13.0	42.0	33.1	23.1
Other (incl. leather from calves)	41.02 remainder of	24.0	40.0	23.2	20.4	38.3
Leather from other animals	41.03.04.05	7.3	14.8	20.9	12.8	12.8
Special finishings etc. (varnished, metallized, reconstituted)	41.06.08-10	19.9	13.2	11.8	4.8	5.6
		mill. US \$				
Leather goods	42	3.0	32.3	54.9	116.2	71.3
		per cent				
Travel goods, handbags, etc.	42.02	(20.0)	(64.7)	(61.7)	(85.6)	(80.2)
Leather	var. sub-categories of 42.02	0.0	55.4	12.0	19.6	21.7
Plastic	var. sub-categories of 42.02	3.3	5.3	26.8	65.5	57.2
Other materials	var. sub-categories of 42.02	16.7	4.0	23.0	0.9	0.8
Clothing	42.03	20.0	27.6	18.8	7.3	8.8
Other manufactures of leather or animal guts	42.01.04-06	46.7	7.1	17.5	7.1	10.9

Table 6 - continued

	NBM	1971(a)	1975	1980	1985	1987
		mill. US \$				
Footwear	64	29.5	168.0	407.7	968.7	1168.8
		per cent				
Rubber	64.01.01	1.0	0.2	0.1	0.2	0.3
Plastic	64.01.02	0.7	0.2	0.6	0.9	0.7
Leather		(97.2)	(94.8)	(89.6)	(91.4)	(91.7)
Shoes for men/ boys	64.02.01.01	} 52.9	} 62.3	} 37.4	10.3	11.0
Shoes for women/girls	64.02.01.02				59.0	58.0
Sport	64.02.02	0.3	1.1	0.5	0.2	0.2
Boots for men/ boys	64.02.03.01	} 24.7	} 11.8	} 12.9	1.8	1.1
Boots for women/girls	64.02.03.02				7.2	11.6
Sandals	64.02.04	19.3	19.6	38.8	12.9	9.8
Other (textile materials, wood, etc.)	64.01.03;64.02. 05.99;64.03.04.06	0.7	2.9	4.9	1.2	1.1
Parts of shoes (various materials)	64.05	0.3	1.2	4.8	6.3	6.3
		mill. US \$				
Total hides and leather, leather goods, and footwear	41-42.64	64.2	253.6	563.7	1224.1	1423.5
(a) 1971 is the first year for which export data are available according to the NBM classification.						

Source: Banco do Brasil/CACEX [a, various issues]; own calculations.

footwear complex was restricted to a very small number of products, mainly women's footwear made of leather, and bovine leather. Non-leather footwear and travel goods remained less important.

3. Brazil's Position in World Production and Trade of Labour-Intensive Products

So far the performance of labour-intensive industries in Brazil has been considered merely in a national context. The focus of this study, however, is on international competitiveness. Therefore, this section compares the development of output and international trade of the textile, clothing, leather, and footwear industries in Brazil with other producer countries at different levels of economic development. It is investigated how the development pattern of labour-intensive industries in Brazil was related to structural change in these industries at the global level.

a. Textiles and Clothing

Only fragmentary information is available on individual output items. In order to obtain a comprehensive picture of the regional structure of world output and trade, fibre consumption by textile mills (mill consumption) is again used as a proxy for output (cf. Section II.2.a). At the global level fibre consumption by the textile industry more than doubled between 1960 and 1985 from 15.2 to 34.7 mill. tons (Table 7). The increase was caused mostly by population growth; consumption per head rose only from 5.0 kg in 1960 to 7.2 kg in 1985. A pronounced change took place in the composition of world apparel fibre consumption. The share of synthetic fibres rose from 5 per cent in 1960 to 41 per cent in 1986, while that of cotton declined from more than two thirds in 1960 to less than one half in the mid-1980s. The shares of artificial fibres and wool were roughly halved between 1960 and 1985. The few available data for flax [FAO, a] suggest that this fibre registered a similar decline.

The relative importance of individual fibres differs considerably between the world's regions. On the one hand, these differences are related to climatic conditions. On the other hand, the local availability of particular fibres, such as synthetic fibres in industrialized countries, probably plays a certain role. Both the production and the processing of synthetic fibres, and especially of mixes with natural fibres, require

Table 7 - Fibre Consumption by the Textile Industry in Selected Regions, 1960-1986 (per cent)

	Natural fibres			Man-made fibres			Total	Consumption per head
	cotton	wool	total	artificial	synthetic	total	mill. t	kg
	per cent							
World								
1960	67.7	9.8	77.5	17.8	4.7	22.5	15.2	5.0
1965	62.4	8.1	70.5	18.3	10.8	29.1	18.6	5.6
1970	54.3	7.6	61.9	15.8	22.2	38.0	21.5	5.8
1975	49.5	6.7	56.2	12.5	31.4	43.9	23.7	5.8
1980	47.6	5.4	53.0	11.0	36.0	47.0	29.3	6.6
1985	49.0	4.8	53.8	8.6	37.6	46.2	34.7	7.2
1986	45.2	5.1	50.3	8.9	41.0	49.8	na	na
US								
1971	37.7	1.8	39.5	13.4(a)	47.1	60.5	na	na
1985	30.0	1.3	31.3	5.7(a)	63.0	68.7	na	na
Western Europe								
1971	32.4	12.4	44.8	18.2(a)	37.0	55.2	na	na
1985	30.5	11.0	41.5	13.5(a)	45.0	58.5	na	na
Japan								
1971	35.6	7.8	43.4	16.9(a)	39.7	56.6	na	na
1985	32.6	5.5	38.1	9.5(a)	52.4	61.9	na	na

(a) Rayon and acetate.

Source: Anson, Simpson [1988, Tables 1.5, 1.6]; SIFTG/ATESP [1987, Table 5]; UN [a]; own calculations.

relatively sophisticated technology. Therefore, the high share of synthetic fibres in industrialized country consumption has served to enhance the competitive position of local producers. Conversely, the demands on the technological competence of developing country firms which intend to enter overseas export markets have increased.

As a result, the share of the textile industries in developing countries in world cotton consumption increased from 52.2 per cent in 1974 to 59.5 per cent in 1984 (Table A3), while their share in world mill consumption of synthetic fibres was a mere 17.9 and 34.6 per cent, respectively (Table A5). Some Asian NICs (Hong Kong, South Korea, Taiwan (included under China)) successfully adopted synthetic fibre technology

during this period, as is evident from their rapidly rising share in world exports (Table A5). Although synthetic fibre production in Brazil was already substantial in the 1970s [ABPFAS, 1978; Cortopassi, 1985], the country's share in world exports remained insignificant.

Substantial structural change has occurred within the world textile and clothing industries since the early 1970s (Table 8).¹ Between 1974 and 1984 mill consumption of textile fibres in developing countries increased from 35.1 to 45.1 per cent of the world total. While Brazil's share grew only marginally, textile output in South Korea and China (comprising both Taiwan and the People's Republic) expanded markedly. The changes in exports are even more pronounced. The shares of developing countries in world exports of both textiles (yarns and fabrics) and manufactures (clothing, etc.) grew from less than one third in 1974 to more than one half in 1984. This was due mainly to rapid export growth in certain developing countries in Asia, especially Hong Kong, South Korea, and China (Taiwan and People's Republic). Brazil's performance was rather modest; while its share in world textile exports grew slowly (from 1.8 to 3.3 per cent), its clothing exports remained insignificant.

The relative decline of the textile and clothing industries in developed regions was concentrated on certain advanced industrialized countries (North America, West Germany, the UK [cf. also Field, 1987, Table 1]). South European countries (Italy, Spain, Yugoslavia) maintained or even increased their shares in world fibre consumption and exports.

The extent of specialization in particular market segments differed substantially across countries. For example, the shares of the European Community (EC) in world exports of textiles and clothing were more than twice as high as its shares in fibre consumption. At the same time the EC was a net importer of textiles and clothing. This indicates considerable intra-industry specialization among European firms [Breitenacher et al., 1988]. Hong Kong's position in the international division of labour in

¹ Until 1973 the growth rates of output in the textile industry did not differ much between developed and developing countries [Anson, Simpson, 1988, Table 2.19]. Only in the clothing industry output growth in developing market economies exceeded that in developed countries (5.8 per cent annually during 1963/73 versus 2.1 per cent for developed market economies).

the textile and clothing industries was rather similar. By contrast, South Korea was an important exporter of both textiles and clothing with a high exports-to-output ratio. However, its imports in both categories were comparatively small. Hence, intra-industry specialization was probably much less pronounced than for example in Hong Kong.

To summarize, the very modest export performance of the textile and clothing industries in Brazil contrasted sharply with that of Asian NICs that expanded their world market shares at the expense of their European and North American competitors. This confirms the conclusion drawn in Section II.2 that the sector is still very inward-oriented. Although the world textile and clothing economy was affected substantially by structural change in favour of developing and especially NICs, Brazil did not benefit from this favourable external environment.

b. Leather and Footwear

The available data on leather and footwear production for many countries are no more than rough estimates and therefore can only convey an approximate picture of the structure of world output and international trade. Nevertheless, structural change at the global level can be identified in several areas. The discussion focuses on bovine leather which is the most important raw material for the footwear industry.

The production of heavy leather, which is used mainly for soles and industrial manufactures, has undergone a significant shift from developed to developing countries (Table 9). The latter accounted for 40.1 per cent of world output in 1985 as against 29.8 per cent in 1970, while global output declined moderately. The shares of Brazil in world output and especially exports increased considerably. Developing countries also increased their share of world output of light leather, which is the main raw material for footwear and travel goods (46.3 per cent in 1985 versus 38.0 per cent in 1970). During the same period world output grew by almost 36 per cent. The share of developing countries in apparent consumption increased from 33.1 to 41.1 per cent, reflecting the rapid growth of the footwear industry in some NICs (cf. below). Latin American countries, especially Argentina, were net exporters of light leather, while South Korea's imports increased from almost nil to 10.2 per cent of

Table 8 - Production, International Trade, and Apparent Consumption of

	Consumption by textile industry		Exports			
			spun yarns and fabrics		clothing and other manufactures	
	1974	1984	1974	1984	1974	1984
	per cent of world total					
Developed countries	64.9	54.9	67.8	47.6	67.9	45.9
North America	18.2	14.0	6.8	1.7	8.1	5.4
EC (10)	13.7	10.2	35.8	27.7	42.1	24.1
France	2.7	1.6	5.5	3.8	5.7	2.2
West Germany	3.3	2.4	9.0	7.7	10.6	3.8
Italy	2.6	2.7	5.8	6.1	5.7	5.8
UK	2.9	1.6	4.1	1.8	6.0	2.3
Other Western Europe	4.4	3.9	7.8	7.2	8.4	7.2
Spain	1.4	1.3	1.2	2.0	1.0	1.4
Yugoslavia	0.9	0.9	0.8	0.7	0.7	0.9
USSR, Eastern Europe	20.0	18.9	5.1	3.3	4.5	5.8
Oceania(c)	0.6	0.5	0.1	0.2	0.6	0.2
Other(d)	7.9	7.4	12.2	7.5	4.2	3.2
Japan	7.1	6.6	12.1	7.2	4.0	2.5
Developing countries	35.1	45.1	32.2	52.4	32.1	54.1
Africa	1.3	1.5	0.8	0.9	0.8	1.5
Latin America	6.2	5.9	4.5	4.6	2.1	1.1
Mexico	1.3	1.1	1.0	0.1	0.3	0.1
Brazil	2.3	2.5	1.8	3.3	0.8	0.5
Near East	3.6	4.3	2.8	5.2	1.8	2.7
Egypt	0.9	1.1	1.6	1.5	0.2	0.1
Turkey	1.3	1.9	1.0	3.2	0.5	1.7
Far East	11.2	14.3	15.1	23.5	22.6	33.6
India	5.5	5.7	2.2	1.6	3.0	3.2
Pakistan	1.5	1.8	3.9	4.4	1.0	2.3
Hong Kong	0.8	0.7	4.5	7.3	9.7	13.6
South Korea	1.4	3.4	2.8	6.8	5.5	7.4
Asian CPEs	12.8	19.2	9.0	18.2	4.8	15.2
China(e)	12.6	18.8	9.0	18.2	4.7	15.1
Oceania	0.0	0.0	0.0	0.0	0.0	0.0
	1000 t					
World	26226.7	32639.4	3124.8	5194.5	2128.8	3985.6
(a) For data on individual fibres (cotton, artificial, and synthetic) New Zealand. - (d) Israel, Japan, South Africa. - (e) People's						

Source: FAO [a, 1983; 1987]; own calculations.

All Apparel Fibres (a) in Selected Countries, 1974 and 1984

Imports				Availability for domestic consumption(b)		Availability per head	
spun yarns and fabrics		clothing and other manufactures					
1974	1984	1974	1984	1974	1984	1974	1984
per cent of world total				kg			
73.1	70.6	83.0	78.5	67.3	63.7	15.9	17.0
8.6	10.0	18.7	27.8	19.6	19.0	21.9	23.3
38.9	38.5	42.5	32.2	14.4	12.9	14.3	15.3
5.9	6.0	5.4	5.0	2.6	2.2	13.1	13.0
9.7	8.8	15.6	12.5	4.1	3.8	17.3	19.8
4.3	5.9	3.0	1.4	2.3	2.2	10.8	12.5
6.4	7.4	6.3	5.5	3.3	2.9	15.3	16.4
9.2	5.9	11.1	7.3	4.9	3.7	13.3	11.5
0.7	0.2	0.4	0.3	1.3	0.9	9.7	7.3
1.1	0.6	0.7	0.2	0.9	0.8	11.4	11.4
7.0	5.4	1.6	5.3	19.9	19.4	14.6	16.0
4.9	3.7	3.3	2.2	1.5	1.3	24.1	21.5
4.5	7.2	5.8	3.7	7.1	7.5	13.3	15.1
3.1	6.0	4.5	2.9	6.0	6.1	14.5	17.7
26.9	29.4	17.0	21.5	32.7	36.3	3.0	3.3
5.8	3.8	3.4	1.3	2.3	1.9	1.9	1.5
3.2	1.9	2.7	2.3	6.0	5.5	5.1	4.5
0.1	0.0	0.4	0.1	1.2	1.1	5.4	4.7
0.4	0.0	0.3	0.0	2.0	1.8	5.1	4.4
4.5	4.1	4.5	8.6	4.0	4.9	6.1	7.2
0.1	0.2	0.1	0.4	0.7	0.9	5.2	6.1
0.1	0.1	0.0	0.1	1.2	1.1	8.0	7.5
12.8	18.4	4.6	8.8	9.0	9.7	2.2	2.3
0.0	0.1	0.0	0.0	4.9	5.0	2.1	2.2
0.1	0.0	0.0	0.1	0.9	0.7	3.2	2.3
6.1	12.1	1.4	6.2	0.2	0.3	15.2	14.8
1.0	0.9	0.3	0.1	0.8	1.4	5.2	11.1
0.5	1.0	1.9	0.3	11.4	4.3	3.1	4.0
0.5	0.6	0.3	0.1	11.0	13.8	3.2	4.2
0.1	0.1	0.2	0.1	0.0	0.0	2.7	2.4
1000 t							
3126.3	4665.0	2240.7	4070.4	26427.4	32218.2	6.7(f)	6.8(f)
cf. Tables A3, A4, and A5. - (b) Fibre equivalent. - (c) Australia, Republic, Taiwan. - (f) World average (kg/head).							

Table 9 - Production and International Trade of Bovine Leather in

	Heavy leather							
	production		exports		imports		apparent availability	
	1970	1985	1970	1985	1970	1985	1970	1985
	per cent of world total							
Developed countries	70.2	59.9	90.2	83.5	89.9	93.6	70.0	61.0
North America	10.7	5.6	13.2	1.1	3.5	3.2	10.2	5.9
US	10.3	5.2	11.7	1.1	2.6	2.6	9.9	5.3
Western Europe	15.1	14.7	66.8	45.7	86.3	89.3	15.6	19.3
France	1.2	0.5	4.2	4.9	10.6	10.0	1.5	1.0
West Germany	1.2	0.9	7.9	12.3	22.0	18.2	1.8	1.5
Italy	5.2	8.0	5.3	17.8	5.7	10.7	5.2	7.2
Spain	1.8	2.2	3.4	0.8	2.6	22.4	1.8	4.5
UK	2.3	0.8	14.3	4.9	15.4	10.7	2.2	1.4
Yugoslavia	0.8	0.9	17.7	0.0	4.4	8.5	0.1	1.8
USSR, Eastern Europe	41.3	33.0	na	na	na	na	41.6	33.0
USSR	32.9	27.8	na	na	na	na	33.2	27.9
Czechoslovakia	1.4	0.8	na	na	na	na	1.4	0.8
Poland	2.4	1.3	na	na	na	na	2.4	1.3
Romania	2.2	2.0	na	na	na	na	2.2	2.0
Oceania(a)	1.3	4.3	10.6	36.6	0.4	1.1	0.8	0.6
Other(b)	1.8	2.3	0.4	0.0	na	0.0	1.8	2.3
Japan	1.2	1.5	na	0.0	na	0.0	1.2	1.5
Developing countries	29.8	40.1	9.8	16.5	10.1	6.4	30.0	39.0
Latin America	10.9	12.6	7.9	15.6	2.2	1.3	10.6	11.1
Argentina	2.4	3.8	0.0	5.3	na	na	2.4	3.3
Brazil	1.8	4.1	1.5	5.7	na	na	1.8	3.5
Mexico	2.2	0.9	na	na	na	na	2.2	0.9
Uruguay	0.2	0.2	0.8	0.2	na	na	0.2	0.2
Africa	0.6	0.7	1.1	0.0	1.3	0.0	0.6	0.7
Near East(c)	3.8	4.6	na	na	3.1	4.1	4.0	5.0
Far East	7.7	16.5	0.8	0.8	3.5	0.4	7.9	16.5
Hong Kong	na	na	0.0	0.2	3.1	0.2	0.1	0.0
India	5.6	9.8	0.4	0.4	na	na	5.6	9.8
South Korea	0.8	3.3	na	na	na	na	0.1	3.3
Pakistan	0.1	2.5	na	0.0	na	na	1.0	2.5
Asian CPEs(d)	6.9	5.6	0.0	0.0	0.0	0.6	6.9	5.7
	1000 t							
World	504	446	27	47	23	47	500	445
	(a) Australia, New Zealand. - (b) Israel, Japan, South Africa. - (c)							

Source: FAO [b, various issues]; own calculations.

Selected Countries, 1970 and 1985

Light leather							
production		exports		imports		apparent availability	
1970	1985	1970	1985	1970	1985	1970	1985
per cent of world total							
62.0	55.7	56.0	56.5	90.2	66.8	66.9	58.9
19.1	8.5	5.3	7.3	22.0	9.5	15.7	9.2
11.4	7.7	3.8	7.1	19.0	8.6	13.8	8.2
27.0	26.4	44.1	38.8	53.9	50.7	27.6	29.8
3.0	1.3	5.3	2.2	5.1	8.2	2.8	3.2
4.7	2.9	7.4	5.0	13.5	9.1	5.4	4.1
4.4	11.5	7.7	17.5	10.0	11.4	4.6	9.5
3.0	2.5	0.1	1.3	0.2	2.8	3.1	3.0
4.1	1.4	7.0	2.2	7.4	4.3	4.1	2.1
2.1	2.6	1.3	0.3	1.0	1.0	2.1	2.8
16.6	16.9	0.4	0.1	11.0	4.5	18.7	18.5
8.3	8.3	na	na	5.5	2.5	9.4	9.2
1.8	2.4	na	na	0.6	0.4	1.9	2.6
2.8	2.2	0.0	0.0	0.8	0.5	3.0	2.4
1.5	1.1	na	na	1.3	0.5	1.8	1.3
1.2	0.6	0.7	1.8	0.7	1.0	1.2	0.4
4.1	3.3	5.4	8.5	2.5	1.1	3.6	0.9
3.2	2.6	5.3	8.4	0.1	0.4	2.4	0.0
38.0	46.3	44.0	43.5	9.8	33.2	33.1	41.1
15.6	19.1	30.1	18.5	1.4	3.6	11.1	14.5
3.9	5.1	22.0	9.8	na	na	0.2	2.0
3.6	4.9	3.1	5.0	0.0	2.1	3.2	4.0
3.3	4.5	0.0	0.2	0.1	0.8	3.4	4.8
1.2	1.0	3.7	2.7	0.2	0.4	0.6	0.3
1.8	2.2	1.2	1.3	2.0	1.3	1.9	2.2
2.6	3.4	0.0	0.1	0.6	0.6	2.8	3.7
13.9	16.1	12.7	22.0	4.2	25.7	12.8	17.1
0.3	0.1	0.1	13.2	2.8	14.9	0.7	0.4
9.4	8.1	6.2	3.8	0.6	0.1	8.7	7.0
0.4	3.9	0.1	0.3	0.4	10.2	0.5	7.0
1.4	1.4	2.1	2.9	na	na	1.1	0.5
4.0	3.4	0.1	1.6	1.6	2.0	4.4	3.6
mill. square feet							
6351	8633	1075	2752	832	2593	6108	8474
Including Egypt, Libya, Sudan. - (d) Including Taiwan.							

the world total. International trade itself grew rapidly; world exports reached 30 per cent of production in 1985 as against 17 per cent in 1970.¹ The leather market in Brazil also became more intensively integrated into the world market as exports increased from 3.1 to 5.0 per cent and imports from almost nil to 2.1 per cent of the world total. The limited increase in leather output in Brazil does not indicate a long-term trend but rather cyclical fluctuations (cf. Section II.2.b on the evolution of leather output in Brazil).

The production of leather footwear also shifted from developed to developing countries (Table 10). The share of the latter in world output expanded from 23.2 per cent in 1970 to 38.6 per cent in 1985. The increase was particularly large in Brazil, South Korea, and China (including the People's Republic and Taiwan). Among developed countries production declined strongly in the US, West Germany, the UK, and Japan. By contrast, Italy increased its share in world production slightly to 9.9 per cent of the world total in 1985, while output in Spain and Yugoslavia grew at an even faster rate to 3.5 and 2.1 per cent. The volume of international trade more than doubled between 1970 and 1985, with exports rising from 13 to 26.9 per cent of world output. Exports by developing countries rose from 7.2 per cent of global exports in 1970 to 37.1 per cent in 1985. The lion's share of this increase was accounted for by Brazil, South Korea, and China (including Taiwan). Among developed countries Italy and Spain remained important exporters although their shares in the world total declined.²

Hence, the overall conclusion from this section is that Brazil participated substantially in the shift of leather and footwear production towards developing countries. This performance contrasts sharply with that of the Brazilian textiles and clothing complex that was unable to

¹ A similar internationalization occurred in the world market for raw hides and skins where exports increased from 28 per cent of output in 1970 to 35 per cent in 1985 (Table A6).

² The available data for footwear of all types only cover a much shorter period (1979-1984; Table 10). However, they convey a picture of structural change that is essentially very similar to the world leather footwear industry.

benefit from similar structural change in the world textiles and clothing economy. Brazilian producers of leather and footwear face strong competition not only from other NICs but also from some less advanced developed countries in Southern Europe with a relatively low wage level.

Table 10 - Production and International Trade of Footwear in Selected

	Leather footwear, all types							
	production		exports		imports		apparent availability	
	1970	1985	1970	1985	1970	1985	1970	1985
	per cent of world total							
Developed countries	76.8	61.4	92.8	63.0	96.4	97.3	77.1	70.5
North America	15.7	6.6	0.9	0.3	36.8	45.5	20.2	18.7
US	14.7	5.9	0.4	0.2	33.4	44.2	19.0	17.7
Western Europe	26.1	23.3	73.8	54.0	39.4	41.0	21.4	19.7
France	2.9	2.3	6.5	2.7	3.3	5.6	2.4	3.1
West Germany	3.9	1.7	3.1	2.5	14.2	14.0	5.2	4.7
Italy	8.8	9.9	43.4	28.8	0.4	0.8	0.2	2.3
Spain	2.5	3.6	9.1	7.5	0.1	0.1	1.3	1.6
UK	3.3	1.5	3.0	0.9	4.3	6.5	3.5	3.0
Yugoslavia	-1.0	2.0	2.4	3.6	1.1	0.0	0.9	1.1
USSR, Eastern Europe	30.6	28.7	17.4	8.6	19.0	10.1	30.9	29.2
USSR	22.6	20.9	0.3	0.1	16.9	8.7	24.9	23.3
Czechoslovakia	1.9	1.5	7.1	2.7	na	na	1.0	0.8
Poland	2.1	1.9	3.5	1.7	0.9	0.1	1.7	1.4
Romania	1.3	1.8	3.1	1.8	0.1	0.1	1.0	1.3
Oceania(a)	1.5	0.6	0.1	0.0	0.7	0.4	1.6	0.7
Other(b)	3.0	2.2	0.7	0.1	0.5	0.4	3.0	2.3
Japan	1.8	1.4	0.7	0.0	0.1	0.2	1.8	1.5
Developing countries	23.2	38.6	7.2	37.1	3.6	2.7	22.9	29.5
Latin America	6.3	11.8	1.7	12.3	1.1	0.5	6.3	8.7
Argentina	1.2	0.9	0.0	0.0	na	na	1.2	0.9
Brazil	0.9	6.1	0.5	12.8	0.0	0.0	0.8	3.0
Mexico	1.3	1.3	0.2	0.2	0.0	0.0	1.3	1.3
Africa	1.3	1.6	0.4	0.5	1.4	0.4	1.4	1.6
Near East(c)	2.9	4.9	0.1	0.5	0.3	0.7	3.0	5.0
Far East(d)	9.2	14.0	4.1	15.6	0.8	1.0	8.9	10.1
Hong Kong	0.0	0.1	0.3	0.6	0.4	0.7	0.0	0.1
India	6.9	7.7	1.7	0.7	na	na	6.7	7.6
South Korea	0.4	3.8	1.9	13.3	0.0	0.0	0.1	0.3
Pakistan	1.2	1.1	0.0	0.1	na	na	1.2	1.0
Asian CPEs(e)	3.4	6.2	0.9	8.1	na	0.0	3.4	4.0
	mill. pairs							
World	2998	3766	398	1014	360	993	2959	3745
(a) Australia, New Zealand. - (b) Israel, Japan, South Africa. - (c) Middle East (market economies). - (e) Including Taiwan.								

Source: FAO [b, various issues]; SATRA [various issues]; own cal-

Countries, 1970-1985

Footwear, any material									
production		exports		imports		apparent consumption			
1979	1984	1979	1984	1979	1984	1979	1984	1979	1984
per cent of world total						total		per head (pairs)	
54.1	46.1	43.0	37.2	96.1	92.0	64.0	61.2	4.4	5.5
6.9	4.9	0.7	0.5	38.3	40.4	14.7	15.8	4.6	5.0
6.5	4.3	0.5	0.4	35.0	37.7	13.5	14.5	4.7	5.1
17.4	16.4	33.6	30.9	44.1	37.8	18.1	34.1	3.7	7.4
2.7	2.4	2.7	2.5	7.5	6.6	3.5	3.5	4.9	5.2
1.4	1.1	1.2	1.2	12.7	9.7	3.6	3.4	4.4	4.6
6.3	5.9	19.6	16.3	1.8	2.4	1.9	1.9	2.5	2.7
2.3	2.4	3.9	4.4	0.4	0.3	1.4	1.2	2.9	2.7
1.9	1.5	1.0	0.7	7.5	7.3	3.2	3.3	4.3	4.8
1.1	1.3	1.2	1.4	0.1	0.0	0.9	0.9	2.9	3.2
22.1	18.0	7.5	5.1	8.5	6.8	22.7	18.7	5.3	4.0
14.8	11.6	0.2	0.1	7.5	5.9	16.8	13.4	6.0	4.0
1.7	1.6	3.1	2.4	0.1	0.2	1.0	0.9	4.8	5.0
2.1	1.5	1.6	0.7	0.1	0.3	1.8	1.4	3.8	3.1
1.3	1.4	1.3	0.9	0.1	0.0	1.0	1.2	3.5	3.8
0.5	0.5	0.0	0.0	1.9	1.9	0.9	1.1	3.7	3.6
7.0	6.4	1.2	0.6	3.3	5.1	7.6	7.7	4.0	4.3
6.2	5.6	1.2	0.6	2.6	3.9	6.7	6.6	4.3	4.5
45.9	53.9	57.0	62.8	3.9	8.0	36.0	38.8	0.8	0.8
11.8	13.0	3.1	5.9	0.0	0.5	11.4	8.3	3.0	1.7
1.5	na	0.1	na	0.0	na	1.5	na	4.9	na
5.4	6.7	2.4	5.2	0.0	0.0	5.0	5.4	3.2	3.4
1.9	2.4	0.3	0.7	0.0	0.0	1.9	2.2	2.3	2.4
2.3	3.1	1.2	0.3	0.7	0.3	3.2	3.2	1.1	0.5
na	na	na	na	na	na	na	na	na	na
22.3	23.3	39.4	48.3	3.9	6.9	12.8	11.6	0.9	0.3
1.3	1.3	6.0	8.2	3.0	5.8	0.4	0.5	6.8	8.4
4.4	4.2	0.8	0.7	0.0	0.0	4.4	4.0	0.5	0.5
3.6	3.6	10.4	10.9	0.0	0.0	1.1	0.5	2.2	1.2
1.6	1.5	1.2	0.2	0.0	0.0	1.4	1.5	1.4	1.4
9.6	14.5	2.7	8.3	0.0	0.0	9.2	12.4	0.7	0.8
mill. pairs									
7729	8430	1911	2411	1475	2233	7459	8251	1.7	1.7
Including Egypt, Libya, Sudan. - (d) Footwear, any material: Asia and									

culations.

III. A Quantitative Assessment of the International Competitiveness of Labour-Intensive Industries in Brazil

1. Indicators Based on Export Performance

An improvement in a country's comparative advantage in the production of some particular good will normally be reflected by a change in its foreign trade position. Net imports should fall, or at least grow less rapidly than domestic consumption. Similarly, at any one point in time exports of a good in which a country enjoys a comparative advantage vis-à-vis the rest of the world should account for a larger share in that country's total exports than in world exports.

However, the link between a country's comparative advantages and its trade structure may be distorted by government interventions. For example, a reduction in net imports of a particular good may result from protection granted to the industry rather than from a change in comparative advantage. Similarly, a relatively high share of a particular good in a country's exports may reflect export subsidies rather than genuine comparative advantage. Therefore, the indicators presented in this section can serve only as a measure of the competitive position of the respective industries. Chapters IV and V will assess the relative importance of genuine comparative advantage as against government policy in determining actual competitiveness.

a. Country Rankings in World Exports

Whenever a country's competitiveness in a particular industry improves, its exports will grow faster than those of its competitors, and its ranking among exporters of the particular good will also improve.¹

¹ Changes in net exports might be a more appropriate measure, since they also reflect gains in comparative advantage leading to import substitution. However, restrictions on imports of labour-intensive products are probably more pervasive, especially among developing countries, than the subsidization of exports. Therefore, gross export rankings are probably less prone to distortions resulting from trade policy interventions than net exports. Besides, most developing countries at the relevant stage of industrialization are net exporters of labour-intensive products with relatively small imports.

This is the rationale underlying the following analysis of country rankings in exports of textiles and clothing (Table 11) as well as leather, leather products, and footwear (Table 12).

Both tables include all relevant SITC categories (Rev. 1) at the three-digit level, as well as at the four-digit level if Brazil's performance is noteworthy. The tables have been compiled from data which group exports by origin as well as destination (world, industrialized countries, developing countries). In each of the resulting nine categories of exports (from world to world, industrialized countries, developing countries; from industrialized countries to world, industrialized countries, developing countries; from developing countries to world, industrialized countries, developing countries) the top five exporters are listed by the data source along with those countries whose ranking underwent a particularly pronounced change. Brazil's performance is compared to that of South Korea and Taiwan, two NICs which play an important role in world trade of labour-intensive products.¹

Table 11 on country rankings in textile and clothing exports reveals that Brazil's export performance and, hence, competitiveness improved only in a very small number of product categories, such as yarns, cordage, and home textiles (SITC 656). As one passes from resource-related (e.g. yarns; SITC 651) to downstream activities, Brazil's exports become so small that very often they are not listed by the data source. By contrast, both South Korea and Taiwan are important exporters not only of various textile products but also of clothing. The improvement in the three countries' rankings took place mostly between 1965 and 1973 (and in some cases again between 1973 and 1978). Since then their relative positions have remained more or less unchanged.

Table 12 on leather and footwear exports reveals that the competitiveness of all three countries in leather manufactures, travel goods, and footwear improved considerably between the mid-1960s and mid-1970s. Only Brazil played a significant (and largely unchanged) role in leather exports from developing countries. Concerning the destination of

¹ Data for Taiwan are included in the data source under the category of "Areas not elsewhere specified". This is one of very few sources of international trade data which separately list Taiwanese exports at all. The number of export categories listed in Tables 11 and 12 is reduced from nine to six because no industrialized countries are included.

Table 12 - Country Rankings in World Exports of Leather, Leather Products, and Footwear, Brazil, South Korea, and Taiwan, 1965-1985

	Brazil					South Korea					Taiwan					
	1965	1973	1978	1983	1985	1965	1973	1978	1983	1985	1965	1973	1978	1983	1985	
Leather (SITC (a) 611)	not among top 8 in 1985					not among top 8 in 1985					not among top 8 in 1985					
World to world	4	4	3	3	3	not among top 5	in 1985	not among top 5	in 1985	not among top 5	in 1985	not among top 5	in 1985	not among top 5	in 1985	
LDCs to world	not among top 5	in 1985	not among top 5	in 1985	not among top 5	in 1985	not among top 5	in 1985	not among top 5	in 1985	not among top 5	in 1985	not among top 5	in 1985	not among top 5	in 1985
World to ICs	6	4	3	3	4	not among top 5	in 1985	not among top 5	in 1985	not among top 5	in 1985	not among top 5	in 1985	not among top 5	in 1985	
LDCs to ICs	not among top 6	in 1985	not among top 6	in 1985	not among top 6	in 1985	not among top 6	in 1985	not among top 6	in 1985	36	29	8	4	6	
World to LDCs	23	13	7	5	4	not among top 7	in 1985	not among top 7	in 1985	not among top 7	in 1985	18	17	2	2	2
LDCs to LDCs																
Leather etc. manufactures (SITC (a) 612)	not among top 5 in 1985					not among top 5 in 1985					not among top 5 in 1985					
World to world	23	5	4	4	3	21	1	1	3	4	17	2	2	1	1	
LDCs to world	53	18	7	5	3	not among top 5	in 1985	not among top 5	in 1985	not among top 5	in 1985	33	13	9	3	2
World to ICs	30	4	2	3	3	11	1	1	4	5	12	2	3	1	1	
LDCs to ICs	not among top 6	in 1985	not among top 6	in 1985	not among top 6	in 1985	not among top 6	in 1985	not among top 6	in 1985	32	9	2	3	3	
World to LDCs	not among top 5	in 1985	not among top 5	in 1985	not among top 5	in 1985	not among top 5	in 1985	not among top 5	in 1985	17	1	1	1	1	
LDCs to LDCs																
Prepared parts of footwear (SITC (a) 6123)	not among top 5 in 1985					not among top 5 in 1985					na 0 3 2 2					
World to world	15	11	4	4	3	19	2	2	3	4	na	1	1	1	1	
LDCs to world	na	33	8	5	5	not among top 5	in 1985	not among top 5	in 1985	not among top 5	in 1985	na	9	5	2	1
World to ICs	na	12	3	3	3	7	1	1	4	5	na	2	2	1	1	
LDCs to ICs	not among top 5	in 1985	not among top 5	in 1985	not among top 5	in 1985	not among top 5	in 1985	not among top 5	in 1985	na	5	2	3	3	
World to LDCs	14	5	12	13	5	20	44	2	3	3	na	1	1	1	1	
LDCs to LDCs																
Travel goods, handbags (SITC (a) 631)	not among top 8 in 1985					41	7	3	3	3	26	5	2	1	1	
World to world	22	6	5	5	6	19	3	2	2	2	9	2	1	1	1	
LDCs to world	not among top 7	in 1985	not among top 7	in 1985	not among top 7	in 1985	not among top 7	in 1985	not among top 7	in 1985	22	5	2	1	1	
World to ICs	11	5	4	5	6	12	3	2	2	2	6	2	1	1	1	
LDCs to ICs	not among top 7	in 1985	not among top 7	in 1985	not among top 7	in 1985	not among top 7	in 1985	not among top 7	in 1985	43	4	1	1	2	
World to LDCs	not among top 5	in 1985	not among top 5	in 1985	not among top 5	in 1985	not among top 5	in 1985	not among top 5	in 1985	20	12	4	4	4	
LDCs to LDCs																
Footwear (SITC (a) 651)	not among top 7 in 1985					not among top 7 in 1985					not among top 7 in 1985					
World to world	42	10	7	4	4	19	8	3	3	3	24	5	2	2	2	
LDCs to world	20	3	3	3	3	4	2	2	2	2	5	1	1	1	1	
World to ICs	30	7	6	4	4	14	6	3	3	3	22	4	2	2	2	
LDCs to ICs	9	3	3	3	3	2	2	2	2	2	5	1	1	1	1	
World to LDCs	not among top 5	in 1985	not among top 5	in 1985	not among top 5	in 1985	not among top 5	in 1985	not among top 5	in 1985	51	4	3	2	2	
LDCs to LDCs	not among top 5	in 1985	not among top 5	in 1985	not among top 5	in 1985	not among top 5	in 1985	not among top 5	in 1985	40	23	3	4	4	
LDCs to LDCs																

(a) SITC Rev. 1.

Source: As for Table 11.

exports, the performance of Brazil tended to be more favourable in the markets of industrialized compared with developing countries. This is compatible with the hypothesis that the competitiveness of NICs in labour-intensive industries is greatest in product varieties of at least medium quality which are bought mainly in industrialized countries. Less advanced developing countries, by contrast, should specialize in low-

quality varieties. South Korea and Taiwan held a prominent position in the markets of both developing and industrialized countries. Within the limits of the present study it is impossible to analyse in sufficient detail the causes of this difference in performance compared with Brazil. One conceivable reason is that non-leather footwear, which is consumed in both industrialized and developing countries, plays a much larger role in the export of South Korea and Taiwan than in Brazil's.

To summarize, it may be stated from the findings of this section that all three NICs improved their competitive position in labour-intensive products markedly between the mid-1960s and mid-1980s. However, Brazil's exports were concentrated on a much smaller number of products than those of South Korea and Taiwan. This applies especially to textiles and clothing, where Brazil's role in international trade is restricted to upstream, i.e. resource-related products. Since all three countries are at a broadly similar stage of industrial development, this result suggests that differences in economic policies explain at least part of the differences in export performance.

b. Constant Market Shares Analysis

Constant market shares analysis compares the actual increase in a country's exports to the hypothetical increase that would have kept the country's share in all its export markets constant. If actual export growth exceeds hypothetical growth this is taken as an indication of improved competitiveness. Constant market shares analysis is usually applied to a country's total exports [Leamer, Stern, 1970, pp. 171-183; Fasano-Filho et al., 1987, pp. 21-24]. For the purpose of this analysis, which concentrates on individual commodities, the formulas are slightly modified. The methodology is described in detail in Appendix B. Three country groups are considered separately: advanced industrialized countries, relatively low-wage countries in Southern Europe, and developing countries.

Table 13 reports the calculated supply (competitiveness) effects for selected textile products of which Brazil is a significant exporter.¹ In

¹ Data for the clothing sector are not included because Brazilian exports were so small that it seemed impossible to obtain meaningful results.

the spinning subsector (SITC Rev. 2: 651) the competitiveness of both South European and developing countries has improved relative to that of advanced industrialized countries. This is evidenced by the fact that rising import demand explains only 43 and 69 per cent respectively of the increase in exports by South European and developing countries; the remainder is attributed to more favourable supply conditions. In individual developing countries the supply effect is even larger with Hong Kong taking the lead (76 per cent), followed by South Korea (65 per cent) and Brazil (48 per cent). By contrast, exports from advanced industrialized countries increased more slowly than demand, with a supply effect of -51 per cent for the whole group. The growing competitiveness of developing and South European countries is reflected by their rising shares in world market economy exports between 1973 and the mid-1980's.

In the case of cotton fabrics (SITC Rev. 2: 652) the changes in export shares of the three country groups are less pronounced. About one third of the increase in exports of South European countries is attributed to improved competitiveness, whereas the competitive position of advanced industrialized and developing countries was by and large unchanged (with supply effects of 10 per cent and -10 per cent. However, within each group there are some countries with a significantly positive supply effect, notably West Germany, Japan, Hong Kong, and South Korea. Brazil's performance with only 13 per cent of extra exports not being accounted for by increased demand was modest, but still better than that of the whole group of developing countries.

In the export markets for special textile products (felt, coated textiles, cordage, etc.; SITC Rev. 2: 657) and home textiles (SITC Rev. 2: 658) the competitiveness of advanced industrialized countries was eroded considerably, while the reverse is true for South European exporters. The competitiveness of developing countries improved in the case of special textile products, while their performance in home textiles was more varied. Brazil's position improved in both sectors, with supply factors accounting for 72 and 37 per cent of the export increase.

Summarizing the evidence on the competitiveness of the Brazilian textile industry, it is found that in the few product groups where the country did play a significant role (cf. Section III.1.a) its competitiveness improved. However, even in this very limited number of products

Table 13 - Constant Market Share Analysis of Textile Exports in Selected Countries, 1973-1986 (a)

	Share in world market economy exports			Supply effect(b)	Share in world market economy exports			Supply effect(b)
	1973	1985	1986	1973/85	1973	1985	1986	1973/85
	textile yarns (SITC Rev. 2: 651)			cotton fabrics (SITC Rev. 2: 652)				
	per cent							
Advanced industrialized countries	70.1	55.6	56.3	-50.6	51.9	52.9	54.9	9.6
US	4.5	4.8	3.7	14.4	9.5	3.1	3.7	(566.8)
West Germany	18.0	13.7	14.9	-62.0	9.4	14.3	14.8	46.6
Japan	9.5	7.6	7.5	-46.4	7.1	10.0	8.9	46.7
Less advanced industrialized countries in Europe(c)	11.5	17.7	17.4	57.1	7.2	8.5	9.3	30.5
Italy	7.5	9.1	9.8	43.4	3.5	5.9	6.8	57.9
Spain	1.0	2.1	1.9	74.5	na	na	na	na
Developing countries	10.9	16.7	17.8	30.8	27.4	24.5	26.5	-10.3
Brazil	1.6	2.6	1.9	48.1	2.0	2.1	1.6	12.5
Hong Kong	2.3	5.8	5.8	75.8	9.7	11.4	12.6	38.5
South Korea	1.4	4.6	4.1	65.3	2.0	2.6	2.8	70.0
Countries not in sample	7.5	10.0	8.5		13.6	14.2	9.4	
	mill. US \$							
World market economy exports	6111.9	13413.8	15650.9		2765.7	6651.8	8304.6	
	per cent							
Share of importers in sample in world market economy imports	74.0	80.6	79.0		77.3	77.0	78.1	

Table 13 continued

	Share in world market economy exports			Supply effect(b)	Share in world market economy exports			Supply effect(b)
	1973	1985	1986	1973/85	1973	1985	1986	1973/85
	special textile products (felt, coated textiles, cordage, textiles for industrial usage) (SITC Rev. 2: 657)				textile products, not elsewhere specified (home textiles, etc.) (SITC Rev. 2: 658)			
	per cent							
Advanced industrialized countries	85.2	75.2	77.6	-31.2	43.9	34.7	34.4	-66.7
US	9.1	11.6	10.5	19.7	9.1	6.6	5.9	-32.6
West Germany	21.5	19.1	20.7	-15.5	5.9	7.8	9.1	29.0
Japan	9.2	7.7	7.1	-104.5	4.5	1.5	na	(7708.0)
Less advanced industrialized countries in Europe(c)	7.5	11.3	11.0	39.8	13.0	18.6	23.0	32.9
Italy	5.1	8.9	8.9	52.9	4.5	5.0	5.4	-3.7
Spain	0.6	1.0	1.0	45.1	2.3	4.0	3.4	46.6
Developing countries	2.6	8.9	8.3	61.8	28.6	25.0	28.4	-18.2
Brazil	0.6	2.1	1.2	71.8	1.9	3.5	3.3	37.1
Hong Kong	0.6	4.0	3.3	89.0	7.0	6.9	7.3	-51.8
South Korea	1.4	2.9	3.4	46.8	1.8	5.7	4.9	79.6
Countries not in sample	4.7	4.6	3.1		14.5	21.6	14.1	
World market economy exports	1873.3	4396.6	5648.0	mill. US \$				
Share of importers in sample in world market economy imports	77.5	76.2	75.9	per cent				
					70.4	76.1	82.8	
(a) Figures in parentheses indicate a decline in nominal export values. - (b) Per cent of nominal export increase. - (c) Portugal, Spain, Italy, Yugoslavia, Greece, Turkey.								

Source: Own calculations based on UN [b, various issues].

Brazil was outperformed by Hong Kong and South Korea. Brazil faced strong competition also from less advanced industrialized countries in Southern Europe whose competitive position improved considerably. Advanced industrialized countries lost market shares (except in cotton fabrics), but remain important suppliers.

Turning now to exports of leather, leather products, and footwear (Table 14), the general pattern of developing countries gaining in competitiveness at the expense of advanced industrialized countries is repeated. Advanced industrialized countries lost ground particularly in travel goods (supply effect of -162 per cent; SITC Rev. 2: 831) and footwear (-73 per cent; SITC Rev. 2: 851), whereas developing countries improved their competitiveness substantially in leather manufactures (90 per cent; SITC Rev. 2: 612) and footwear (61 per cent; SITC Rev. 2: 851). The performance of less advanced industrialized countries in Southern Europe was varied. Their exports of leather (SITC Rev. 2: 611) and basic manufactures (saddlery articles, etc.; SITC Rev. 2: 612) grew faster than demand, with supply factors accounting for 78 and 55 per cent of the increase. However, for both travel goods and footwear a negative supply effect was calculated not only for the group of South European countries as a whole, but also for the three countries individually, with the single exception of travel goods exports from Yugoslavia.

Among developing countries Brazil's performance was exceptional in two respects: its leather exports increased more rapidly than demand (with a supply effect of 53 per cent), while the reverse was true for travel goods (supply effect of -88 per cent). Its performance in basic leather manufactures and footwear was similarly successful as that of the whole group of developing countries.

c. Export Performance Ratios

The indicators of competitiveness discussed in the previous two sections capture only changes over time in a country's position. This section calculates export performance ratios (EPRs) that relate the share of a particular commodity in a country's manufactured exports to the

Table 14 - Constant Market Share Analysis of Leather and Footwear Exports in Selected Countries, 1973-1986
(a)

	Share in world market economy exports			Supply effect(b)	Share in world market economy exports			Supply effect(b)
	1973	1985	1986	1973/85	1973	1985	1986	1973/85
	leather (SITC Rev. 2: 611)				leather manufactures (SITC Rev. 2: 612)			
	per cent							
Advanced industrialized countries	51.0	37.9	40.2	-37.3	58.7	35.6	35.7	-18.1
US	6.0	6.5	6.2	33.0	3.8	10.7	8.9	75.2
West Germany	8.6	7.4	8.2	20.7	17.8	9.3	10.9	-46.9
Japan	4.7	5.8	5.3	-99.0	7.1	1.5	1.3	(2495.9)
Less advanced industrialized countries in Europe(c)	9.8	23.1	24.2	77.9	24.1	27.1	26.4	55.4
Italy	8.0	20.4	21.9	80.3	17.8	19.6	19.0	53.9
Spain	1.8	2.7	2.4	57.7	4.5	3.4	3.3	45.4
Yugoslavia	1.6	0.7	0.7	na	1.1	1.1	na	11.2
Developing countries	27.4	24.2	28.6	4.8	4.5	19.4	27.9	89.9
Brazil	2.7	3.6	3.2	53.1	0.9	6.7	6.6	96.0
Hong Kong	0.3	1.7	2.3	na	0.8	1.3	1.7	63.6
South Korea	0.1	0.3	0.5	na	2.1	3.9	4.7	84.7
Countries not in sample	11.8	14.8	7.0		12.7	18.0	10.1	
	mill. US \$							
World market economy exports	1427.7	4453.6	5104.3		268.1	1125.7	1353.0	
	per cent							
Share of importers in sample in world market economy imports	89.4	83.1	88.4		78.9	79.8	83.6	

Table 14 continued

	Share in world market economy exports			Supply effect(b)	Share in world market economy exports			Supply effect(b)
	1973	1985	1986	1973/85	1973	1985	1986	1973/85
	travel goods (SITC Rev. 2: 831)				footwear (SITC Rev. 2: 851)			
	per cent							
Advanced industrialized countries	42.8	25.0	25.5	-161.7	29.1	19.9	20.4	-73.3
US	4.2	1.7	1.2	-390.9	0.8	1.1	1.4	20.9
West Germany	10.7	6.3	6.5	-144.7	4.9	4.2	4.3	-40.2
Japan	10.2	2.7	1.8	-5101.6	1.6	0.5	0.3	-1019.4
Less advanced industrialized countries in Europe(c)	25.4	24.0	23.8	-31.6	53.0	49.7	50.1	-21.1
Italy	20.9	21.8	22.3	-13.8	37.2	33.2	34.6	-27.1
Spain	3.3	1.6	1.6	-386.7	9.9	7.3	6.8	-101.4
Yugoslavia	1.2	0.6	na	-80.0	4.2	6.0	4.5	45.3
Developing countries	22.6	41.9	45.3	31.2	9.2	26.1	26.1	61.4
Brazil	1.5	1.3	0.9	-87.9	3.4	10.3	8.2	63.2
Hong Kong	14.1	20.2	19.6	11.2	1.9	2.2	2.2	14.6
South Korea	5.6	19.7	20.1	64.6	3.8	13.6	14.8	67.2
Countries not in sample	9.1	9.0	5.4		8.8	4.3	3.4	
	mill. US \$							
World market economy exports	569.6	2385.9	3146.2		2770.1	11296.0	13879.6	
	per cent							
Share of importers in sample in world market economy imports	89.8	94.2	93.1		92.2	93.9	93.4	
(a) Figures in parentheses indicate a decrease in nominal export values. -(b) Per cent of nominal export increase. - (c) Portugal, Spain, Italy, Yugoslavia, Greece, Turkey.								

Source: As for Table 13.

share of that commodity in world manufactured exports during a given year:

$$[1] \quad \text{EPR}_i = (X_i / \text{MX}_i) / (X_{\text{world}} / \text{MX}_{\text{world}})$$

X = exports of commodity under consideration
 MX = manufactured exports
 i = country index

If the share of a particular good in country i 's manufactured exports is larger than in world manufactured exports (i.e. $\text{EPR} > 1$), this is taken to indicate a competitive advantage of country i in this commodity (and vice versa).¹ In addition, a comparison of EPRs at different points in time provides an insight into changes in competitiveness.²

Table 15 reports EPRs for textiles and clothing, covering the same range of countries as the constant market shares analysis in the previous section. Between 1970 and 1986 EPRs tended to be highest for the developing countries in the sample (far greater than unity for many years and products), followed by Southern Europe (EPRs generally close to unity) and the advanced industrialized countries (EPRs mostly below unity). The differences between the three country groups are more pronounced for exports of clothing (SITC 84) than for textiles (SITC 65), implying a greater competitive advantage of developing and less advanced industrialized countries in clothing production. These findings are consistent with the hypothesis that labour-rich countries should be particularly competitive in labour-intensive industries (apart from policy-

¹ In the absence of policy-induced distortions competitive advantage would be equivalent to comparative advantage.

² There is some debate in the literature as to the most appropriate indicator of competitive advantage. UNIDO [1986b], for example, uses net exports rather than total exports in a formula otherwise very similar to [1]. Alternatively, an indicator of "revealed comparative advantage" (RCA) has been suggested that is based on a country's net exports of a particular good, normalized by the same country's net exports of all manufactures [Fasano-Filho et al., 1987, p. 27]. For the purpose of this study RCA values have been calculated for the same ranges of products and countries as the EPRs reported below. However, they offer little additional information because import restrictions for labour-intensive products distort the results for some developing countries. The findings for the remaining countries are similar to those derived from EPRs.

Table 15 - Export Performance Ratios for Textiles and Clothing in Selected Countries, 1970-1986

	1970	1980	1985	1986	1970	1980	1985	1986	1970	1980	1985	1986
	textile yarn (SITC Rev. 2: 651 (651))(a)				cotton yarn(b) (SITC Rev. 2: 6513 (6513+6514))(a)				cotton fabrics, woven (SITC Rev. 2: 652 (652))(a)			
Advanced industrialized countries												
US	0.27	0.40	0.36	0.33	0.06(b)	0.17	0.09	0.08	0.47	0.60	0.23	0.32
West Germany	0.94	0.72	0.94	0.91	0.13(b)	0.21	0.41	0.43	0.42	0.80	0.99	0.91
Japan	1.23	0.70	0.49	0.49	0.11(b)	0.16	0.08	0.09	1.24	0.59	0.64	0.57
Less advanced industrialized countries in Europe												
Italy	1.21	1.16	1.47	1.51	0.53(b)	0.68	0.95	0.96	0.49	0.85	0.96	1.04
Spain	1.27	1.32	1.36	1.20	1.16(b)	2.21	1.58	1.30	1.05	0.21	0.43	0.48
Yugoslavia	1.75	1.54	0.96	0.86	5.45(b)	4.47	1.54	1.20	3.28	0.86	1.25	1.17
Developing countries												
Brazil	1.73	2.65	1.90	2.10	14.50(b)	8.91	5.50	6.49	2.68	2.25	1.52	1.73
Hong Kong	0.74	1.34	2.31	2.33	3.56(b)	0.91	0.93	1.18	7.79	4.92	4.53	5.09
South Korea	1.17	2.97	1.79	1.67	3.73(b)	6.27	2.25	1.71	5.21	1.42	1.00	1.14
	woven and knitted textiles (SITC Rev. 2: 653+654+655 (653))(a)				lace, ribbons, tulle etc. (SITC Rev. 2: 656 (654))(a)				special textiles (SITC Rev. 2: 657 (655))(a)			
Advanced industrialized countries												
US	0.23	0.47	0.29	0.29	0.34	0.44	0.57	0.71	0.56	0.91	0.88	0.93
West Germany	0.74	0.84	0.86	0.86	0.50	0.54	0.66	0.66	1.21	1.08	1.31	1.27
Japan	2.26	1.53	1.19	1.06	1.10	0.77	0.46	0.35	0.71	0.59	0.49	0.46
Less advanced industrialized countries in Europe												
Italy	1.78	2.07	2.75	2.59	0.53	0.67	0.60	0.52	0.87	1.18	1.44	1.36
Spain	0.69	0.68	0.80	0.73	0.79	1.39	1.12	1.01	0.96	0.64	0.67	0.61
Yugoslavia	0.24	0.83	0.96	0.42	0.11	0.12	0.07	0.06	0.50	0.80	0.51	0.40
Developing countries												
Brazil	0.34	0.59	0.27	0.32	1.70	0.37	0.22	0.22	1.42	2.78	1.48	1.33
Hong Kong	0.55	1.54	2.68	3.12	0.90	1.35	2.25	2.36	0.36	0.95	1.60	1.32
South Korea	1.97	4.24	3.56	4.13	3.58	5.16	3.24	3.03	2.26	1.97	1.12	1.40

Table 15 continued

	1970	1980	1985	1986	1970	1980	1985	1986	1970	1980	1985	1986
	other textile products (SITC Rev. 2: 658 (656))(a)				men's outerwear not knit (SITC Rev. 2: 842 (84111))(a)				women's outerwear non knit (SITC Rev. 2: 843 (84112))(e)			
Advanced industrialized countries												
US	0.48	0.61	0.50	0.52	0.23(c)	0.25	0.14	0.16	0.14(c)	0.15	0.11	0.11
West Germany	0.28	0.44	0.53	0.56	0.51(c)	0.45	0.43	0.47	0.64(c)	0.72	0.73	0.73
Japan	0.78	0.13	0.09	0.07	0.26(c)	0.05	0.09	0.08	0.39(c)	0.13	0.17	0.13
Less advanced industrialized countries in Europe												
Italy	0.88	0.99	0.80	0.83	0.96(c)	2.00	2.41	2.40	1.04(c)	1.56	1.48	1.57
Spain	1.99	2.83	2.56	2.18	1.22(c)	0.79	0.52	0.53	0.36(c)	0.20	0.25	0.23
Yugoslavia	1.91	1.16	2.40	2.51	3.49(c)	1.77	2.71	5.69	1.00(c)	1.14	1.17	3.59
Developing countries												
Brazil	1.47	3.54	2.51	3.66	2.06(c)	0.45	0.22	0.39	1.93(c)	0.16	0.40	0.55
Hong Kong	5.42	3.85	2.75	2.93	9.28(c)	8.03	5.61	5.14	9.86(c)	9.28	7.56	7.02
South Korea	0.67	2.53	2.23	2.01	9.80(c)	6.36	4.96	4.36	1.91(c)	3.39	2.87	2.82
	undergarments not knit (SITC Rev. 2: 844 (84113+84114))(a)				outerwear knit nonelastic (SITC Rev. 2: 845 (84144))(a)				undergarments knitted (SITC Rev. 2: 846 (84125+84143))(a)			
Advanced industrialized countries												
US	0.22(d)	0.20	0.13	0.19	0.10(c)	0.24	0.08	0.07	0.15(e)	0.46	0.29	0.29
West Germany	0.27(d)	0.25	0.20	0.22	0.35(c)	0.55	0.37	0.35	0.81(e)	0.60	0.48	0.45
Japan	0.07(d)	na	0.01	0.00	0.36(c)	0.12	0.08	0.06	0.02(e)	0.02	0.04	0.02
Less advanced industrialized countries in Europe												
Italy	0.84(d)	0.88	0.57	0.63	4.60(c)	3.66	3.63	3.62	1.51(e)	1.26	1.36	1.36
Spain	0.77(d)	0.25	0.26	0.20	0.62(c)	0.38	0.56	0.47	2.48(e)	0.99	0.75	0.58
Yugoslavia	0.85(d)	1.82	2.27	5.12	3.16(c)	2.73	2.13	1.59	0.34(e)	1.71	1.75	4.33
Developing countries												
Brazil	3.60(d)	0.48	0.11	0.18	2.44(c)	0.46	0.33	0.35	2.47(e)	1.29	0.70	0.76
Hong Kong	18.60(d)	13.33	8.73	8.67	9.77(c)	7.92	8.04	8.06	10.68(e)	8.31	5.85	5.76
South Korea	19.10(d)	14.13	7.60	7.01	9.76(c)	4.28	3.88	4.01	9.60(e)	3.92	4.13	4.27
(a) SITC Rev. 1 in parentheses. - (b) 1973; grey cotton yarn in bulk (SITC 6513). - (c) 1973. - (d) 1973; men's underwear not knit (SITC Rev. 1: 84113). - (e) 1973; underwear knit nonelastic (SITC Rev. 1: 84143).												

Source: As for Table 13.

induced distortions). The strong position of South European countries indicates that an abundant endowment with labour is not, however, the only possible source of competitiveness in the two industries.

Some important differences exist between the individual countries in each group as well as with respect to changes in EPRs over time. Brazil's performance was broadly comparable to that of Hong Kong and South Korea in at least a few textile products, whereas clothing only played a small, and sharply diminishing role in Brazil's manufactured exports. In that respect Brazil resembled the advanced industrialized countries more closely than Hong Kong and South Korea, where clothing exports remained eminently important in spite of some fall in EPRs. The data in Table 15 also confirm the conclusion drawn in Section III.a that Brazil was most competitive in cotton yarns and fabrics, special textiles, and textile manufactures (SITC Rev. 2: 658).

Among South European countries, Italy maintained or even improved its competitive position in both textiles and clothing. Spain's EPRs in textiles remained by and large unchanged at values close to unity, but were mostly below 1 for clothing exports. Yugoslavia's performance deteriorated in yarns and fabrics but improved sharply in clothing. This is probably a consequence of increased outward processing for West European, and particularly West German clothing firms. In the group of advanced industrialized countries Japan displayed falling EPRs across all product categories. This development reflected rapid economic growth in Japan throughout the period, accompanied by a shift in the structure of Japanese manufacturing from labour-intensive towards physical-capital-intensive and increasingly towards human-capital-intensive industries. By contrast, both the US and West Germany by and large maintained or even improved upon their relatively modest positions. Two sets of explanations, not mutually exclusive, can be suggested: On the one hand, structural change has been slowed down by the protectionism of industrialized countries against textile and clothing imports from developing countries (cf. Section V.1.b). On the other hand, the textile industry especially in West Germany has specialized on high-quality product varieties since the late 1970's. Hence, intra-industry trade, particularly with other industrialized countries, has gained in importance.

EPRs for leather and footwear (Table 16) are also inversely correlated with per-capita income levels, although deviations from this

pattern in some countries are considerable. In the advanced industrialized countries EPRs are usually below unity and relatively stable. The only exception is Japan where EPRs declined sharply from their fairly high 1970 values (again as a result of structural change in Japanese manufacturing industry). EPRs in South European countries were generally substantially greater than unity. Brazil registered strong improvements in leather manufactures and footwear, while the increase in the EPRs for travel goods during the 1970s was reverted in subsequent years. South Korea's performance improved markedly in travel goods and footwear. Hong Kong showed very high EPRs in travel goods (in the order of 8), while in most other products its performance was modest.

d. Summary

Since 1970 developing countries, particularly a relatively small group of NICs, have improved their international competitiveness in the textile, clothing, leather, and footwear industries considerably. Their gains correspond to losses in competitiveness experienced by advanced industrialized countries. Less advanced industrialized countries in Southern Europe continue to enjoy a substantial competitive advantage in many product groups, and even some industrialized countries remain important exporters of certain products. This pattern of competitive advantage suggests that apart from the price of the final product (and, hence, cost advantages) other factors such as product differentiation and industrial organization also play a significant role in determining the international division of labour in the textile, clothing, leather, and footwear industries.

Brazil's competitiveness in textiles and, especially, clothing is markedly lower than that of South-East Asian NICs, such as South Korea, Hong Kong, and Taiwan. By contrast, Brazil is highly competitive in leather and footwear exports, similar to other NICs as well as South European countries.

Table 16 - Export Performance Ratios for Leather, Leather Products, and Footwear in Selected Countries, 1970-1986

	1970	1980	1985	1986	1970	1980	1985	1986	1970	1980	1985	1986
	leather (SITC Rev. 1: 611)				leather manufactures (SITC Rev. 1: 612)				parts of footwear (SITC Rev. 1: 6123)			
Advanced industrialized countries												
US	0.33	0.58	0.49	0.55	0.34	0.44	0.81	0.76	na	0.35	0.80	0.81
West Germany	0.56	0.45	0.51	0.50	0.97	0.73	0.64	0.64	na	0.72	0.64	0.67
Japan	0.23	0.56	0.37	0.34	1.00	0.10	0.10	0.08	na	0.03	0.08	0.06
Less advanced industrialized countries in Europe												
Italy	1.18	2.20	3.30	3.35	2.30	3.46	3.17	2.80	na	4.17	3.73	3.48
Spain	1.41	2.07	1.74	1.52	5.46	3.07	2.19	2.02	na	3.13	2.48	2.44
Yugoslavia	3.31	1.23	0.89	1.07	1.74	2.37	1.39	7.85	na	2.59	1.50	na
Developing countries												
Brazil	8.97	4.00	2.58	3.48	2.18	3.43	4.83	7.01	na	3.53	5.48	8.73
Hong Kong	0.06	0.44	0.66	0.91	0.55	0.58	0.52	0.64	na	0.45	0.47	0.71
South Korea	0.02	0.15	0.10	0.22	0.61	2.36	1.54	1.84	na	2.56	1.68	2.02
	travel goods (SITC Rev. 1: 831)				footwear (SITC Rev. 1: 851)				footwear, leather (SITC Rev. 1: 85102)			
Advanced industrialized countries												
US	0.21	0.30	0.13	0.11	0.04	0.11	0.09	0.12	0.00(a)	0.06	0.03	0.04
West Germany	0.80	0.45	0.43	0.40	0.28	0.28	0.29	0.27	0.28(a)	0.30	0.31	0.29
Japan	1.38	0.24	0.17	0.11	0.78	0.05	0.03	0.02	0.10(a)	0.04	0.02	0.01
Less advanced industrialized countries in Europe												
Italy	3.25	3.92	3.53	3.41	6.29	5.94	5.38	5.46	6.38(a)	5.89	5.31	5.51
Spain	4.32	1.27	1.03	1.00	8.34	4.03	4.71	4.45	11.51(a)	4.31	4.97	4.90
Yugoslavia	2.56	2.92	0.81	0.62	5.76	7.84	7.80	3.07	8.41(a)	8.81	8.28	8.20
Developing countries												
Brazil	0.13	2.25	0.92	1.04	2.15	5.53	7.47	9.37	10.66(a)	6.40	8.35	10.83
Hong Kong	7.87	9.21	8.01	7.88	2.29	1.00	0.88	0.93	0.67(a)	0.55	0.60	0.71
South Korea	2.57	8.15	7.74	8.25	2.99	5.99	5.34	6.25	3.26(a)	6.09	5.63	6.90

(a) 1973.

Source: As for Table 13.

2. An International Comparison of Production Costs

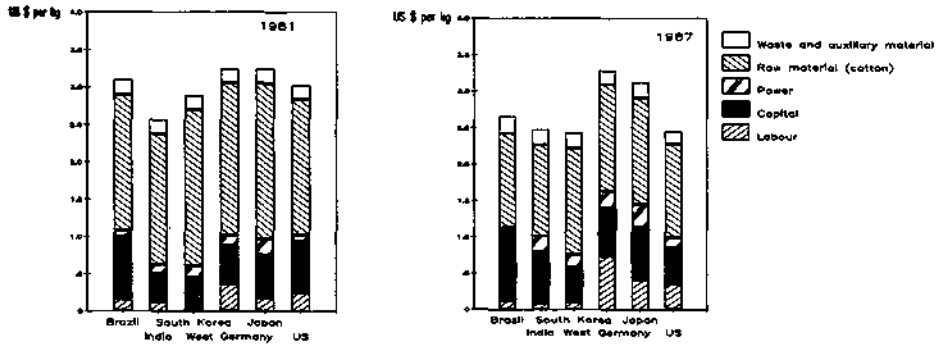
A country's international competitiveness in a particular industry depends, among other things, on its production costs per unit of output relative to other producer countries. However, a direct comparison of total unit costs at a given point in time may be misleading if considered in isolation. Firstly, relative production costs are affected by exchange rate fluctuations. To eliminate these would require coherent time series that are often not available. Secondly, a producer's competitive strength in a particular market depends also on transport and marketing costs and, even more importantly, on the existence of trade barriers. These costs differ considerably between different producer countries as well as export markets and cannot be analysed exhaustively in this study. Therefore, this section focuses on the development of the per-unit costs of important inputs, which should permit an analysis of shifts in competitiveness (rather than relative positions at a given point in time). Finally, it should be born in mind that factor prices and productivities in a particular country reflect not only factor endowments but also the impact of economic policies. Therefore, economic policies in Brazil that affect input markets are analysed in Section IV.3.

a. The Structure of Total Costs

a. Textiles and Clothing

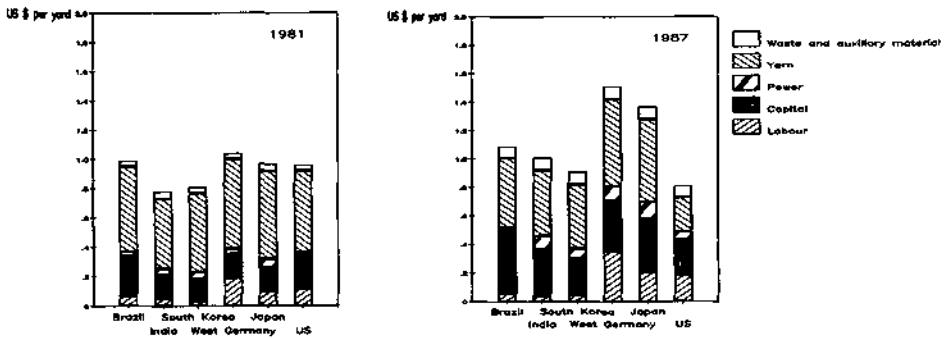
The International Textile Manufacturers Federation (ITMF) publishes a biennial survey of spinning and weaving costs per unit of output in six important producer countries including Brazil; data for 1981 and 1987 are reported in Figures 1 and 2 and Tables A7 and A8. When interpreting this information the problem of exchange rate fluctuations has to be taken into account. This probably explains a large part of the differences in total production costs between 1981 and 1987, and especially the more favourable position of the US in 1987. The ITMF estimates also assume the use of identical machinery across countries. While this assumption helps to bring out clearly the impact of different input prices

Figure 1 - The Structure of Yarn Production Costs in Selected Countries, 1981 and 1987



Source: Table A7.

Figure 2 - The Structure of Fabric Production Costs in Selected Countries, 1981 and 1987



Source: Table A8.

on competitiveness, it may obscure the beneficial effect of the use of relatively more labour-intensive techniques in developing countries.

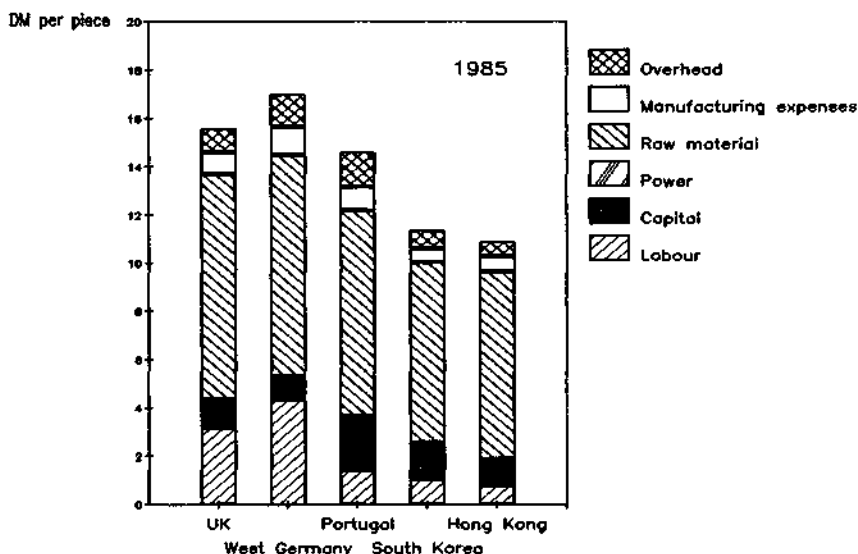
Figures 1 and 2 demonstrate that total production costs for both yarn and fabric in Brazil are distinctly higher than in India and South Korea (the other two developing countries in the sample). In 1981 Brazil's position was fairly similar to that of industrialized countries, while in 1987 production costs in Brazil were higher than in the US but lower than in West Germany and Japan. High production costs in Brazil are mainly the result of exorbitant capital costs, which, in turn, stem from very high real interest rates.¹ In relation to the industrialized countries, relatively low unit labour costs compensated for some of this disadvantage, especially in 1987. The same is true for the low cost of cotton in relation to those countries without a local supply (South Korea, West Germany, Japan). Overall, however, high unit capital costs constitute the major handicap that the Brazilian textile industry has to overcome if it is to become more competitive in relation not only to its Asian competitors but also to the US textile industry.

In all countries the share of unit labour costs in total unit costs is relatively low, especially in the spinning subsector (cf. Tables A7 and A8). Nonetheless, low unit labour costs represent an important source of competitive advantage in the textile industry as all other cost categories generally do not differ substantially across countries (high capital costs in Brazil being one notable exception).

The available data on clothing production costs unfortunately do not include Brazil (Figure 3). They demonstrate, however, that low labour costs constitute the major source of competitive advantage for developing countries. This applies not only to direct unit labour costs, but also to the low price of fabric in countries such as South Korea and Hong Kong with low labour costs in the textile industry. At the same time the example of Portugal shows that high capital costs may exert a negative influence on overall competitiveness even in a labour-intensive product line such as cotton shirts. Therefore, the very high interest rates in

¹ The ITMF calculations for 1981 are based on the following interest rates (1987 figures in parentheses): Brazil 30 (28.0) per cent, India 16 (18.0) per cent, South Korea 18 (11.5) per cent, West Germany 11 (6.7) per cent, Japan 10 (5.8) per cent, US 20 (7.5) per cent.

Figure 3 - The Structure of Clothing Production Costs (Cotton Shirt) in Selected Countries, 1985



Source: Table A9.

Brazil are bound to impair not only the competitiveness of the Brazilian textile industry but also that of clothing production.¹

β. Leather and Footwear

The available information on production costs in the leather and footwear industries is much less comprehensive than for the textile and clothing industries. Table 17 presents data on the shares of individual inputs in total costs for the Brazilian leather industry in the mid-1980s and in early 1988. It is impossible to determine whether the limited changes during this period reflect a long-term trend or rather short-term fluctuations. At any rate the figures demonstrate the predominance of raw and auxiliary materials, which account for about 70 per cent of production costs (net of capital costs). By contrast, labour costs play a

¹ It is assumed that the impact of high real interest rates cannot fully be compensated for through substitution of labour for capital.

Table 17 - The Structure of Production Costs in the Brazilian Leather Industry, 1984/85 and 1988 (light leather; per cent) (a)

	1984/85(b)	1988(c)
Labour (direct)	7.1	4.6
Energy	} 3.6	2.6
Manufacturing expenses		3.0
Raw material (hides)		43.7
Auxiliary material	23.0	26.3
Indirect manufacturing costs(d)	13.2	13.7
Administrative overhead	4.6	6.1
Subtotal	100.0	100.0
Profit (equivalent to capital costs)	na	18.6
Total	na	118.6

(a) Light Leather. - (b) Average of November 1984, February and August 1985 values. - (c) February. - (d) Including indirect labour and social charges on all labour.

Source: Bins Luce et al. [1986; 1984/85 data]; information furnished by CIBC (1988 data).

much smaller role, even if one takes into account that about one half of "indirect manufacturing costs" consist of social charges on direct labour. In 1988 planned profits, which may be looked upon as a proxy for capital costs, were about 50 per cent higher than direct labour costs including social charges.¹

Data on the structure of footwear production costs are available for Brazil and Canada (Table 18). By and large, the shares of individual inputs in total costs are fairly similar, with raw materials accounting for about one half, labour costs for about one fourth, and overhead and profits for the remainder. The available data, however scant, allow it to be concluded that Brazil's competitiveness in leather and footwear depends crucially not only on relative labour costs, but also on financial charges and the price of raw materials.

¹ Manufacturers consulted in early 1988 indicated a somewhat higher share of labour costs and a lower share of planned profits.

Table 18 - The Structure of Footwear Production Costs in Canada and Brazil, 1974, 1982, and 1988

	Canada(a)		Brazil(b)
	1974	1982	1988
Labour	26.1	23.4	20-25
Energy	0.5	0.7	.(c)
Leather	} 50.9	} 47.2	25-30
Other material			25
Administrative overhead (including marketing and distribution)	} 22.5	} 28.8	15
Profit(d)			10
Sales price	100.0	100.0	100
(a) Historic cost data. - (b) Manufacturer's estimate. - (c) Included in other material. - (d) Proxy for capital costs.			

Source: Canadian Import Tribunal (1985, p. 112); information furnished by Brazilian footwear producers.

b. Unit Labour Costs

It has been shown in Section III.2.a that relatively low unit labour costs, compared to industrialized countries, represent Brazil's most important source of competitive advantage in labour-intensive industries. Therefore, this section investigates whether Brazil's deteriorating competitiveness in textiles and clothing and improving performance in leather and footwear since the early 1970s have been related to changes in unit labour costs.

By definition, unit labour costs are equal to the ratio of the hourly wage rate and average labour productivity (output per employee hour). Equivalently, the growth rate of unit labour costs equals the difference between the growth rates of wages and productivity. According to the data presented in Section III.2.a the low unit labour costs in the Brazilian textile industry were the result of relatively low wage rates for skilled, semi-skilled and unskilled labour, combined with average labour

productivity not far below that of the industrialized countries.¹ Similarly comprehensive data are not available for the remaining industries. Therefore, the growth rates of unit labour costs, real wages, and labour productivity in Brazil since 1963 are calculated from general industrial statistics and compared to other important producer countries. In contrast to the international cost comparisons reported in Section III.2.a, which assume identical machinery and output across countries, this analysis utilizes historical cost data.

Table 19 presents estimates of unit labour cost and productivity trends along with a simple measure of labour intensity (share of wages in value added). Because of the very strong cyclical fluctuations in these variables only estimates that are significantly different from zero are considered. In addition, Table 19 reports changes in national price levels relative to the US because the international competitiveness of a particular industry is affected by a real appreciation or depreciation of the domestic currency. A rising national price level implies a real appreciation, and vice versa. The growth of labour productivity is measured relative to the number of employees because labour input data in terms of employee hours are not available.

Brazil's general position in unit labour costs relative to its competitors (i.e. measured in US dollars) has been favourably affected by the real depreciation of the Cruzeiro at an average annual rate of 2.7 per cent since 1973. This should have helped to compensate for the increase in unit labour costs in the Brazilian footwear industry (2.9 per cent annually), and should have further strengthened the position of the other three industries where unit labour costs measured in national currency declined or remained more or less unchanged. A comparison of unit labour costs (in national currency) with labour productivity trends

¹ Setting labour productivity in West Germany equal to 100, the figures for the remaining countries were as follows: the US: 115; Japan: 110; Brazil: 80; South Korea: 85; India 30. - Data received from one major textile manufacturer indicate that Brazil's productivity performance in the clothing industry has been rather similar. The "world standard" for the production time of a T-shirt was 2 minutes and for a pair of Jeans 12 minutes, using automatic machines. The figures for Brazil were as follows: large companies: 2.15 and 19 minutes, respectively; medium-sized companies: 3.5 and 25 minutes; small companies: 5 and 35 minutes. By now hourly wage rates in Brazil are lower than in South-East Asian NICs such as Hong Kong and also South Korea [Anson, Simpson, 1988, Table 2.28; Editora Tama Ltda., 1987, p. 7].

Table 19 - Labour Cost Trends in Labour-Intensive Industries in Selected Countries, 1963-1986 (average annual growth rates in per cent) (a)

	Labour productivity		Labour intensity(b)		Unit labour cost(c)		National price level (GDP) relative to US	
	1963/72	1973/86	1963/72	1973/86	1963/72	1973/86	1963/72	1973/85
Textiles (ISIC 321)								
US	3.8***	2.7***	-0.4*	-0.8***	0.3	-0.9***	-	-
West Germany	5.2***	3.2***	2.1***	-0.1	2.0***	-1.4***	1.6**	-3.2**
Japan	9.9***	3.0***	0.4	0.7*	2.5***	1.5***	2.6***	-0.1
Italy(d,e)	3.5**	5.6***	1.0	-0.1	1.9	-0.8	0.5	-1.6**
Spain(e)	5.4***	2.5***	1.3	-1.3	1.8*	-0.6	1.3	-1.9
Yugoslavia	1.6***	1.6***	6.2***	-2.5***	na	-1.7***	na	na
Brazil(e)	3.5***	3.2***	-1.4	-3.6***	-1.8	-3.8***	1.4	-2.7**
Hong Kong(f)	-3.3***	1.9**	na	1.1*	na	-0.4	0.6	-2.6***
South Korea(f)	14.9***	8.5***	-0.5	1.3**	1.7	1.7**	1.5	1.9*
Thailand(g)	na	-6.4***	na	na	na	na	-0.9*	-0.5
Philippines(h)	-4.3**	2.9	-2.3	2.6	-2.6	1.6	-3.0**	-0.2
Clothing (ISIC 322)								
US	1.7***	2.4***	-1.0***	-1.5***	0.2	-1.2***	-	-
West Germany	1.8***	2.6***	4.2***	-1.9***	2.3***	-1.5***	1.6**	-3.2**
Japan	2.7**	-1.0**	0.8**	1.1***	3.2***	2.1***	2.6***	-0.1
Italy(d,e)	-5.2**	3.9***	2.9**	0.0	4.8**	-2.5***	0.5	-1.6**
Spain(e)	-4.4***	-0.5	3.3***	-2.5***	4.9***	-1.3	1.3	-1.9
Yugoslavia	2.9**	-2.3***	6.4***	-1.3***	na	0.8*	na	na
Brazil(e)	na	-3.5***	na	-3.0***	na	0.2	1.4	-2.7**
Hong Kong(f)	4.7***	0.4	na	1.3**	na	1.3***	0.6	-2.6***
South Korea(f)	-2.1	6.3***	0.8	1.4**	0.0	4.1***	1.5	1.9*
Thailand(g)	na	-10.7***	na	na	na	na	-0.9*	-0.5
Philippines(h)	4.4	1.7	2.9**	-2.1	5.1***	-1.6	-3.0**	-0.2
Leather (ISIC 323)								
US	1.5***	2.0***	-0.6**	-0.7**	0.2	-1.2***	-	-
West Germany	4.2***	2.1***	-0.6	0.5	2.5***	-2.7***	1.6**	-3.2**
Japan	6.8***	-0.6*	0.3	0.6**	1.6***	1.4***	2.6***	-0.1
Italy(d,e)	2.3	1.7*	0.8	-0.4	-1.1	0.2	0.5	-1.6**
Spain(e)	4.8**	8.4***	-3.5***	0.1	-1.6*	-0.4	1.3	-1.9
Yugoslavia	-0.6	3.1***	2.6*	-3.7***	na	-2.8***	na	na
Brazil(e)	3.0***	-0.5	-2.4	-3.9**	-3.4*	-0.3	1.4	-2.7**
Hong Kong(f)	-12.2**	1.0	na	0.7	na	-0.9	0.6	-2.6***
South Korea(f)	7.5	10.5***	-3.9*	3.9***	1.6	1.7**	1.5	1.9*
Thailand(g)	na	27.0***	na	na	na	na	-0.9*	-0.5
Philippines(h)	-0.5	2.0	-2.5	3.6	-1.2	2.9	-3.0**	-0.2

Table 19 continued

	Labour productivity		Labour intensity(b)		Unit labour cost(c)		National price level (GDP) relative to US	
	1963/72	1973/86	1963/72	1973/86	1963/72	1973/86	1963/72	1973/85
Footwear (ISIC 324)								
US	1.5***	0.5	-1.0***	-1.7***	-0.5***	-1.8***	-	-
West Germany	1.9***	0.5**	5.3***	0.6*	1.6***	-2.9***	1.6**	-3.2**
Japan	9.5***	-0.2	0.8	0.9**	0.9	0.4	2.6***	-0.1
Italy(d,e)	1.8	1.1	0.9**	0.9	-0.8	1.7*	0.5	-1.6**
Spain(e)	5.4***	7.5***	2.7***	-6.0***	1.4***	-4.8***	1.3	-1.9
Yugoslavia	1.6**	-2.7***	4.8***	-1.7**	na	-1.6***	na	na
Brazil(e)	na	-7.8***	na	-3.0***	na	2.9**	1.4	-2.7**
Hong Kong(f)	5.4**	-4.9***	na	2.3***	na	0.7	0.6	-2.6***
South Korea(f)	4.3**	-1.0	-3.3	0.3	4.6**	0.7	1.5	1.9*
Thailand(g)	na	18.7***	na	na	na	na	-0.9*	-0.5
Philippines(h)	7.0	9.3**	0.1	-6.2	1.3	-6.1	-3.0**	-0.2

(a) OLS estimates of semi-logarithmic model. - (b) Wage share in value added. - (c) Wage share in value of production. - (d) 1962/72. - (e) 1973/84. - (f) 1973/85. - (g) 1970/84. - (h) 1967 na; 1973/82.
 *** (**; *) Significant at the 1 (5; 10) per cent level.

Source: Heston, Summers [1988, PENN World Tables IV]; UNIDO [1988]; own calculations.

indicates that there has been no strong upward pressure on real wage rates in Brazil.¹

Brazil's experience contrasts with that of South Korea where unit labour costs increased significantly after 1973 (except in the footwear industry). At the same time the national currency appreciated in real terms. Together with strong productivity growth (e.g. 14.9 per cent annually before and 8.5 per cent after 1973 in the textile industry) this points to significant growth in real wage rates. After two decades of rapid economic development South Korea's competitiveness in labour-intensive industries is now apparently coming under pressure from real wage increases that can only partly be compensated for by productivity

¹ The estimated productivity decline in the footwear industry from between 1973 and 1984 (-7.8 per cent) is probably exaggerated because output in this industry is measured simply by the number of pairs; hence possible quality improvements are not taken into account. A less pronounced decline has been calculated from a separate data set for the footwear industry in the State of Rio Grande do Sul [ACI-NH, various issues].

growth [cf. also Mody, Wheeler, 1987]. Fast productivity growth is also evident in Thailand (in the leather and footwear industries) and in the Philippine footwear industry since 1973. It is plausible that industries in the early stages of entering the world market undergo organizational and capital investment that increase productivity significantly, while real wages increase only modestly - as in the Philippine footwear industry [cf. also Morawetz, 1980 on the clothing industry in Columbia].

In South European countries the performance of the Spanish footwear industry stands out with unit labour costs falling at an annual average rate of 4.8 per cent after 1973 while labour productivity rose at 7.5 per cent per year. Apparently this was achieved through considerable capital investment, given the strong decline in the share of labour in value added. Unit labour costs in Yugoslavia also declined after 1973, except for the clothing industry. This development probably reflects the country's increasing attractiveness as a location for outward processing by West European firms. The figures for both West Germany and Japan indicate significant productivity growth along with increasing unit labour costs before 1972. The two countries' competitiveness was further impaired by the appreciation of their currencies. In West Germany this was followed by a period of restructuring with falling unit labour costs and continuing productivity growth, whereas in Japan unit labour costs continued to rise and productivity growth slowed down considerably. This modest performance was probably sustained through the protection of the Japanese domestic markets for labour-intensive products.

The interpretation of the figures in Table 19 is complicated by the fact that they reflect changes in competitiveness at the same time as adjustment to such changes. For example, falling unit labour costs may reflect strong productivity growth with modest real wage increases for a given product mix (such as in the case of new exporters), or specialization in less labour-intensive product lines with little change in wages or productivity (e.g. in the case of restructuring in advanced industrialized countries). However, the absence of significant unit labour cost growth in the Brazilian textile, clothing, and leather industries should have had a favourable impact on Brazil's international competitiveness, because unit labour costs in other producer countries rose substantially. Since at the same time productivity in Brazil grew only slowly or even declined, real wage pressure cannot be held responsible for the coun-

try's modest export performance in textiles and clothing. In the Brazilian footwear industry output per worker (measured by the number of pairs) declined faster than real wage rates, which led to an increase in unit labour costs per pair of footwear. However, this was probably compensated for by higher quality; otherwise the strong growth of Brazilian footwear exports could not have occurred.

c. Real Interest Rates

It has been shown in Section III.2.a that per-unit capital costs in the textile industry and, by implication, in labour-intensive industries in Brazil generally are rather high compared to those of other producer countries. It has also been found that very high real interest rates in Brazil have a major impact on capital costs.¹ This section surveys the development and structure of real interest rates in Brazil in an international perspective in order to obtain a more comprehensive view of how they affect the competitive position of labour-intensive industries.²

A firm requires both long-term (investment) and short-term (working) capital, which it may obtain from either external (credit) or internal sources (equity). Hence, the price of capital relevant to the firm is a weighted average of interest rates for long-term and short-term credit as well as the opportunity cost of equity. The cost of equity is represented by the rate of return on other financial or real investments.

Regarding long-term capital requirements, practically the only source of investment credit for manufacturing industries in Brazil is the BNDES system of state development banks. BNDES credit is allocated in line with the prevailing industrial policy, with interest rates varying

¹ Note that per-unit capital costs are also affected by the average productivity of capital. One important determinant of capital productivity (the price of machinery in Brazil compared to that in the world market) depends largely on policy decisions and is analysed in Section IV.3.b.

² Brazil's position in terms of per-unit capital costs must have improved since the early 1970s because of the real depreciation of the Brazilian currency vis-à-vis the US dollar (Table 19). Figures 1 and 2 demonstrate, however, that as late as 1987 Brazil's position was still very unfavourable.

widely according to industry and the nature of the investment. The available data indicate that disbursements by the BNDES system to the textile industry peaked at 9 per cent of total disbursements to industry in 1972.¹ Thereafter the share of the textile industry was quickly reduced to less than 3 per cent in 1974 and has remained very low since then. Apparently the shares of other labour-intensive industries in BNDES credit disbursements were similarly small in relation to their shares in manufacturing value added. This indicates that since the mid-1970s "traditional" labour-intensive industries have been discriminated against in the allocation of investment credit.² This must have harmed the international competitiveness particularly of the relatively fixed capital-intensive branches such as leather and textiles (Table 20).

Regarding the provision of working capital no such direct discrimination against labour-intensive industries appears to have occurred [Dezséri, Sell, 1989, Table 8]. However, Table 21 demonstrates that the real interest rate for short-term credit in Brazil was very high in relation to all other countries in the sample, industrialized as well as developing. In addition, it fluctuated more widely than elsewhere. The time series for real interest rates on working capital and discount rates in Brazil from Cenários follow more or less the same pattern as the series from International Financial Statistics. It is difficult to assess the impact of subsidized rates that banks were obliged to grant to small and medium-sized enterprises (Resolution 328). Given the relatively large share of such firms in labour-intensive industries, compared to total manufacturing, these industries might have benefitted disproportionately. However, Tyler [1981, pp. 99 f.] concludes that subsidized working capital credit went predominantly to firms slightly below the maximum size allowed. Typically, such firms would be obliged to buy other banking services at non-subsidized prices (reciprocity), which increases the effective cost of working capital credit. Therefore, the cost of working

¹ Including extractive industries and construction [Dezséri, Sell, 1989, Table 6].

² One interviewee stated that after import substitution in the textile industry had been completed in the mid-1970s, the domestic market was effectively closed to foreign competitors (with little regard for efficiency considerations), and BNDES credit was redirected to "modern" industries where import substitution was still in progress.

Table 20 - Materials and Fixed Capital Intensity of Selected Manufacturing Industries in Brazil, 1975-1984 (a)

	Raw materials and intermediate goods			Raw materials, intermediate and finished goods			Fixed capital (buildings, machinery equipment, transport material)	
	1975	1980	1984	1975	1980	1984	1975	1980
Leather	0.41	0.44	0.30	0.56	0.61	0.42	0.58	0.72
Textiles	0.31	0.26	0.21	0.49	0.40	0.33	0.76	0.50
Clothing, footwear	0.31	0.24	0.32	0.42	0.33	0.41	0.30	0.26
Metallurgy	0.28	0.25	0.25	0.38	0.34	0.36	0.76	0.79
Transport, material	0.59	0.41	0.28	0.66	0.51	0.34	0.65	0.39
Mechanical engineering	0.37	0.30	0.31	0.46	0.37	0.38	0.49	0.54
Electrical engineering	0.36	0.32	0.30	0.44	0.41	0.38	0.33	0.29
Total manufacturing	0.28	0.25	0.23	0.39	0.37	0.36	0.34	0.59

(a) Ratio of stocks to value added.

Source: IBGE [b, 1975; 1980; c, 1984]; own calculations.

capital to labour-intensive industries was probably not reduced disproportionately through such interest rate subsidies.

The fluctuations in short-term real interest rates become even more obvious when one considers (annualized) monthly rates instead of annual averages (Table A10). Changes of more than 20 percentage points over a twelve-month period were fairly common in the 1980s.

The impact of high and volatile short-term interest rates on the competitiveness of labour-intensive industries in Brazil depends on whether these industries are relatively intensive users of short-term capital. It is plausible to assume that working capital intensity is highly correlated with materials intensity, i.e. the need to carry inventories of raw materials, intermediate, and finished products. In the Brazilian leather industry the ratio of the value of the stock of raw materials, intermediate, and finished goods to value added exceeded the corresponding figure for total manufacturing (Table 20). In the textile in-

Table 21 - Real Interest Rates (a) for Short-Term Credit in Selected Countries, 1973-1988 (per cent)

8

	US	West Germany	Japan(b)	Italy	Portugal	Spain	South Korea	Thai- land	Brazil(c)	Brazil: other short-term rates (Source: Cenários)		
										working capital	discount notes	small and medium sized enterprises
1973	-4.2	na	-16.9	na	na	na	na	na	15.5	10.6	9.8	-3.8
1974	-5.7	na	-6.8	na	na	na	na	na	2.6	7.0	0.0	-5.1
1975	2.4	na	8.1	na	na	na	na	na	8.3	4.1	10.0	-12.6
1976	2.0	na	2.3	na	na	na	na	na	4.7	4.4	8.0	-15.2
1977	0.6	na	9.2	na	na	na	na	4.5	14.9	16.8	19.1	-12.1
1978	-0.4	5.2	8.7	5.4	na	1.0	na	8.8	20.9	18.4	19.8	-18.6
1979	-1.4	2.2	-9.5	-4.7	na	-0.4	na	-2.5	3.7	0.1	4.6	-37.6
1980	2.5	5.1	-0.8	0.2	4.2	1.0	-15.2	1.6	-10.5	-13.4	-1.8	-38.9
1981	11.4	6.4	6.4	0.2	-2.9	0.1	5.3	9.8	23.9	25.7	34.5	-22.6
1982	12.0	9.1	6.3	3.4	4.4	2.8	8.2	17.6	30.3	24.6	60.7	-26.2
1983	8.0	7.8	9.5	10.6	-7.4	-0.0	9.7	14.9	17.9	13.4	20.9	-18.5
1984	9.6	7.2	6.2	12.6	5.3	7.1	7.9	21.9	38.5	36.4	45.4	37.3
1985	8.2	8.0	11.9	10.1	6.8	5.8	8.0	16.5	23.6	32.1	86.5	15.0
1986	10.4	12.3	15.8	14.4	na	9.3	11.9	16.8	-1.8	6.4	17.3	6.2
1987	3.7	7.8	6.3	8.2	na	12.6	5.3	6.4	28.0	30.8	64.9	6.8
1988	4.5	6.4	na	na	na	7.6	5.5	na	14.1	9.3	34.2	-53.3

(a) Nominal rates deflated by weighted average of wholesale (2/3) and consumer price index (1/3). - (b) Nominal rate deflated by wholesale price index. - (c) Nominal rate deflated by general price index, total supply [Conjuntura Económica, d].

Source: Cenários [various issues]; IMF (International Financial Statistics Data Tape); own calculations.

dustry that ratio declined to slightly below the manufacturing average between 1975 and 1984. Materials intensity in the clothing and footwear industries was above the manufacturing average both in 1975 and 1984, and only slightly below average in 1980. Hence, it is concluded that the relatively high cost of short-term credit has harmed the international competitiveness especially of the leather, clothing, and footwear industries relative to other manufacturing sectors in Brazil.

Finally, the high interest rates for bank credit in Brazil suggest that financing investment or working capital out of equity might have involved a high opportunity cost in terms of the rate of return on alternative financial investments. However, real interest rates for financial investments in Brazil were very low compared to those in other producer countries, and more often negative than positive (Table 21). This applies also to the ORTN/OTN treasury bond that is used, among other things, for the indexation of passbook saving accounts. Of the financial investments listed in Table 22 only the parallel US dollar market appears to have offered some protection against inflation. Hence, for most of the period of observation financial investments were less attractive than real investment, e.g. retaining profits to replace expensive short-term credit with equity.

This raises the question of how the overall competitiveness of labour-intensive industries in Brazil was affected by discrimination in the allocation of long-term credit and high real interest rates for working capital on the one hand, and low rates of return for financial investments on the other. It is plausible to assume that the limited attractiveness of financial investments benefitted all industries to the extent of their total physical capital intensity. However, there are strong indications that the high cost and limited availability of credit affected labour-intensive industries more strongly than other branches of manufacturing.¹ Real interest rates in Brazil are kept high by huge public sector borrowing requirements as well as high inflation rates. These, in turn,

¹ This conclusion is also supported by the fact that a considerable share of new capacity in the textile industry, which is relatively fixed capital intensive, is located in north-eastern Brazil. Capital costs in this region are reduced through various incentive schemes. Low wages alone were not sufficient to attract investment, as can be seen from the absence of a similar move by the relatively more labour-intensive clothing and footwear industries (cf. Section V.2.b).

Table 22 - Real Interest Rates (a) for Treasury Bills and Other Financial Investments in Selected Countries, 1973-1988 (per cent)

	US	West Germany	Italy	Portugal	Spain	Thailand	Brazil(b)	Brazil: other short-term investments (Source: Cenários)		
								OTN/ORTN(b)	time deposits(c)	parallel US \$ market
1973	-5.1	na	na	na	na	na	-1.7	-2.3	0.2	-9.5
1974	-8.2	na	na	na	na	na	-13.4	-0.9	-1.4	-15.0
1975	0.5	1.8	na	na	na	na	-4.1	-4.0	-1.8	19.6
1976	0.2	1.2	na	na	na	na	-6.1	-6.2	-7.0	-15.5
1977	-0.9	1.7	na	na	na	-3.3	-3.2	-6.3	5.2	-5.7
1978	-2.1	1.6	na	na	0.5	1.3	-1.4	-3.2	1.3	-6.5
1979	-3.7	-0.6	na	na	-0.4	-9.0	-29.4	-16.9	-17.6	5.5
1980	-0.7	1.2	na	-1.2	-0.0	-6.0	-11.6	-28.3	-27.7	-33.0
1981	6.9	2.6	1.0	-7.7	0.5	3.0	2.4	0.2	1.0	19.5
1982	8.0	3.9	5.9	-2.7	3.4	10.3	9.1	-1.0	-2.5	30.6
1983	5.9	3.5	6.6	-11.8	4.2	6.8	-9.5	-17.5	-21.9	5.7
1984	7.1	3.1	6.3	0.4	4.2	12.9	na	-2.6	0.9	-11.6
1985	5.8	3.4	6.1	2.8	3.3	8.7	na	-4.7	11.6	24.1
1986	7.9	7.2	11.3	na	5.8	6.6	na	-8.7	-6.8	5.4
1987	1.4	2.8	5.5	na	7.7	-4.2	na	-4.7	-8.2	-26.2
1988	1.9	2.0	na	na	6.1	na	na	-19.5	-18.8	25.7

(a) Nominal rates deflated by weighted average of wholesale (2/3) and consumer price index (1/3). - (b) Nominal rate deflated by general price index, total supply [Conjuntura Econômica, d]. - (c) Net of income tax.

Source: As for Table 21.

are caused largely by central bank financing of a considerable portion of the government deficit. Hence, high capital costs in labour-intensive industries in Brazil, and, by implication, reduced competitiveness, were the result of both direct policy discrimination and an unstable macro-economic policy environment.

3. Brazil's Performance in Terms of Price and Other Parameters of Competitive Behaviour

The output of the labour-intensive industries under consideration, and particularly of the clothing and footwear industries, consists of differentiated products. Hence, the overall competitive position of a firm

or of a producer country depends not only on per-unit production costs, but also on performance in non-price attributes such as quality, design, or delivery time. An unfavourable position in terms of per-unit production costs might, therefore, be compensated for by a favourable performance in terms of non-price attributes. In order to test this hypothesis this section compares unit values for US imports from a variety of producer countries. It is plausible to assume that in a relatively homogeneous market such as the US price differences can only be sustained if they reflect differences in non-price attributes. Hence, relatively low import unit values for a particular country indicate competitive strength in low-quality, low-cost varieties, and vice versa.

Table 23 presents US import unit values (percentage deviations from the average) for textile and clothing products along with the import shares of the individual producer countries. Although only products have been selected where Brazil accounts for a significant proportion of US imports, the country's share is usually below 5 per cent. Unit values differ substantially across countries and over time. This points to considerable product heterogeneity within the highly aggregated classifications that have been selected.

In the case of yarns and fabrics there is no evidence that Brazil has been able to obtain significantly higher product prices than other developing countries, and thus compensate for higher production costs. Brazil's performance in non-price attributes is probably fairly similar to South Korea's, where production is cheaper (cf. Section III.2.a). By contrast, unit values for US imports of home textiles from Brazil exceeded the average substantially. Nevertheless, Brazilian producers held a significant share of the US import market. Hence, they could obviously compensate for relatively high costs with superior quality, compared with countries like India and Taiwan for which unit values were far lower. Unit values of clothing imports from Brazil tended to be lower than for other developing countries, especially in 1985. Nevertheless, Brazil's import market share remained very small. Brazilian clothing producers were probably unable to supply goods of sufficient quality even at a relatively low price.

Table 24 lists the percentage deviations from average import unit values for leather, handbags (as an example of leather goods), and footwear. US leather imports from Brazil obtained unit values similar to

Table 23 - Product Differentiation in US Imports of Textiles and Clothing in Selected Countries, 1970-1985

	Percentage deviations from average import unit value				Percentage shares in total import value			
	1970 (a)	1975 (b)	1980 (b)	1985 (b)	1970 (a)	1975 (b)	1980 (b)	1985 (b)
Yarns and fabrics(c)								
Brazil	0.4	-11.3	44.6	19.3	1.0	1.6	1.7	5.3
West Germany	110.0	110.5	99.7	61.8	5.6	2.8	1.3	2.0
Japan	4.0	-0.3	18.6	18.1	40.9	24.7	16.8	22.0
Italy	20.5	10.0	-5.9	7.1	14.5	9.7	34.5	18.6
Hong Kong	-16.4	-8.6	-12.0	22.3	7.2	5.8	1.4	11.9
South Korea	1.5	-12.0	32.5	15.8	0.9	1.6	3.1	9.2
Taiwan	-44.4	-50.1	-32.7	-19.6	1.7	1.7	1.6	11.0
India	-22.9	2.7	-28.2	-0.5	4.1	8.9	3.7	5.4
Home textiles(d)								
Brazil	167.8	138.9	367.9	193.1	4.2	18.6	11.3	13.3
West Germany	51.7	949.4	-	85.3	0.3	0.1	-	2.3
Japan	10.1	-7.8	51.3	132.6	35.5	1.8	0.4	1.1
Italy	123.7	1452.4	463.8	211.2	0.6	0.2	0.9	1.0
Hong Kong	-5.3	40.4	5.3	54.9	5.9	22.4	9.5	4.1
South Korea	-42.3	47.3	146.8	197.1	1.5	5.7	3.7	1.2
Taiwan	23.1	26.0	33.5	18.5	30.5	4.3	7.3	10.5
India	-33.2	-27.4	-33.5	-46.5	8.6	11.3	10.6	4.2
Clothing(e)								
Brazil	9.2	-18.3	46.0	-20.9	0.0	0.4	0.3	1.1
West Germany	279.4	108.6	88.8	176.8	0.8	0.2	0.0	0.3
Japan	1.3	-19.2	18.7	22.1	30.3	4.2	4.0	4.4
Italy	390.4	119.7	228.7	102.6	2.0	1.6	0.8	2.4
Hong Kong	-2.3	4.1	15.1	19.9	35.1	32.2	33.4	22.0
South Korea	-12.3	-5.4	-5.5	19.3	3.0	16.7	10.2	10.0
Taiwan	-18.1	6.9	6.3	15.7	11.7	23.5	21.8	16.8
India	47.8	2.8	-4.3	-22.5	0.7	6.5	5.3	4.0
(a) Customs value. - (b) Cif value. - (c) Schedule A: 6510410, 6511010, 6513060, 6513090, 6521999, 6522999, 6534810, 6542940, 6542970; 1975: 6510400, 6511010, 6510160, 6510190, 6521595, 6522597, 6535220, 6542940, 6542970; 1970: 6510400, 6511100, 6511600, 6510160, 6510190, 6521595, 6522597, 6535220, 6542940, 6542970. - (d) Schedule A: 6584010, 6584068; 1970/75: 6589110, 6569168. - (e) Schedule A: 8423200, 8423300, 8431225, 8433200, 8437032, 8437035, 8437061, 8455036, 8455048, 8455049, 8468040; 1970/75: 8411142, 8411146, 8414449, 8411522, 8411542, 8411532, 8411535, 8455036, 8411562, 8414447, 8414350.								

Source: U.S. Department of Commerce [various issues]; own calculations.

Table 24 - Product Differentiation in US Imports of Leather and Footwear in Selected Countries, 1970-1985

	Percentage deviations from average import unit value				Percentage shares in total import value			
	1970 (a)	1975 (b)	1980 (b)	1985 (b)	1970 (a)	1975 (b)	1980 (b)	1985 (b)
Leather(c)								
Brazil	-14.5	10.6	-5.7	-21.3	10.0	14.2	6.5	6.7
West Germany	15.8	111.5	-	5.4	5.3	0.6	-	0.8
Japan	-43.2	0.3	48.8	47.4	2.7	0.2	0.4	3.2
Italy	98.4	96.6	77.1	41.2	1.9	1.9	1.7	7.7
Spain	-19.3	1.4	71.2	63.5	0.8	0.0	0.2	4.3
Hong Kong	-	-37.5	66.5	-	-	0.0	0.1	-
South Korea	-	3.8	56.7	-1.2	-	0.1	0.3	0.1
Taiwan	-	86.4	-	36.0	-	0.0	-	1.5
Argentina	-17.2	-6.5	-3.9	-12.4	17.5	45.0	64.1	49.4
India	40.9	18.2	-9.2	-6.3	0.0	7.9	0.5	1.8
Handbags(d)								
Brazil	10.4	-1.6	24.4	-23.3	0.1	13.7	3.6	3.2
West Germany	78.0	597.7	947.9	234.1	0.6	0.3	0.5	0.4
Japan	-34.1	-22.1	10.3	38.8	1.7	1.2	0.5	0.7
Italy	157.5	209.4	311.4	128.6	30.6	17.7	25.0	27.0
Spain	-26.2	-10.1	48.0	111.6	17.9	4.9	1.5	1.2
Hong Kong	-52.8	-44.4	-37.0	-22.6	19.0	10.8	23.3	11.2
South Korea	-	-15.4	-13.3	-7.6	-	4.0	21.2	33.7
Taiwan	-52.7	-61.1	-57.2	-54.0	0.0	0.7	1.0	1.8
Argentina	-32.9	83.0	227.5	40.5	0.4	0.2	0.2	0.1
India	-33.6	-32.8	-95.3	-47.9	0.1	7.5	1.8	2.1
Footwear: rubber, plastic, athletic(e)								
Brazil	2.5	-5.1	-30.0	-31.9	0.0	0.1	0.0	0.3
West Germany	158.2	47.0	128.3	226.1	29.7	7.6	1.2	0.3
Japan	-43.9	6.3	43.8	42.9	13.4	2.2	2.0	0.4
Italy	80.0	142.3	136.3	149.9	10.7	13.7	10.3	3.7
Spain	6.1	127.5	69.6	54.0	0.9	5.3	0.6	0.2
Hong Kong	-82.1	-68.9	-60.3	-65.8	0.8	0.9	1.0	0.7
South Korea	-51.0	-44.4	-15.1	-3.6	0.1	12.3	35.4	43.4
Taiwan	-70.5	-39.0	-8.7	-4.2	2.7	17.3	30.9	42.0
Argentina	-	0.0	-	-	-	0.0	-	-
India	-6.3	-	-31.9	-	0.0	-	0.0	-

Table 24 continued

	Percentage deviations from average import unit value				Percentage shares in total import value			
	1970 (a)	1975 (b)	1980 (b)	1985 (b)	1970 (a)	1975 (b)	1980 (b)	1985 (b)
Leather shoes								
Brazil	-29.0	-6.3	-17.1	-14.9	1.6	18.0	24.3	33.6
West Germany	120.6	102.7	50.2	48.6	0.6	0.2	0.4	0.4
Japan	-18.4	-17.8	3.9	-28.2	0.4	0.2	0.0	0.1
Italy	-2.0	13.8	47.1	34.1	66.8	36.9	37.7	29.4
Spain	9.9	14.5	0.9	16.8	17.5	26.6	14.0	14.6
Hong Kong	-11.5	-38.3	-4.9	28.2	0.1	0.1	1.0	2.1
South Korea	-36.7	-37.8	-20.0	-22.2	0.1	2.7	1.9	4.0
Taiwan	-60.0	-43.7	-22.9	-17.0	0.0	1.9	3.2	7.7
Argentina	48.7	11.7	6.6	-5.2	0.1	0.7	0.1	0.1
India	-56.5	-62.4	-37.3	-6.6	0.6	0.9	1.5	0.7

(a) Customs Value. - (b) Cif value. - (c) Schedule A: 6114025, 6114045, 6114065; 1970/75: 6114020, 6114040, 6114060. - (d) Schedule A: 8310510; 1970/75: 8310015. - (e) Schedule A: 8510190, 8510242. - (f) Schedule A: 8510243, 8510246, 8510248.

Source: As for Table 23.

those from Argentina, the main source of US imports. Import unit values for leather footwear from Brazil were higher than for South Korea and Taiwan. Nevertheless, Brazil accounted for a larger share of US imports than its two South-East Asian rivals. The competitive positions of the three countries in non-leather footwear were exactly reversed: Brazil's share of the US import market was negligible in spite of low prices. Therefore, it is concluded that Brazil was fairly competitive, compared with other developing countries, in terms of the quality of its leather footwear exports. Among industrialized countries, Italian producers maintained a substantial market share in spite of rather high prices, indicating superior product quality. Their position was quite similar in US imports of handbags.

The findings in this section support the hypothesis that some sub-sectors of labour-intensive industries in Brazil, especially leather footwear and home textiles, were able to compensate for relatively high production costs (compared with other developing countries) through a good

performance in non-price attributes. These sectors obtained relatively high export unit values, and at the same time showed a favourable export performance. Unit values of US imports from Brazil for the remaining sectors (yarns, fabrics; clothing; handbags) were generally similar to those for other developing countries. The modest export performance of these industries suggests that product quality was insufficient. If production costs in these sectors cannot be reduced, their international competitiveness can only be strengthened if their performance in non-price attributes is improved sufficiently to justify a higher product price.

IV. Determinants of Brazil's Competitiveness in Labour-Intensive Industries

1. Brazil's Comparative Advantage in Labour-Intensive Industries

a. Theoretical Considerations

There exists an extensive body of literature, both at the theoretical and the empirical level, on the determinants of the direction and quantity of trade between countries. This section briefly discusses the approaches on which the subsequent analysis of Brazil's comparative advantage in labour-intensive industries is based.

Trade theories may be distinguished by the assumptions they make about the countries involved in trade. "Heckscher-Ohlin"-type theories assume that the relative endowment with factors of production differs between countries while production functions are identical. In that case each country will export goods that make relatively intensive use of those factors with which it is relatively well-endowed. Heckscher-Ohlin-type theories can explain trade in manufactures between countries at different stages of economic development. Developing countries are characterized by a relatively small endowment with both human and physical capital relative to unskilled labour, while the reverse is true of industrialized countries. Hence, developing countries can be expected to export relatively labour-intensive manufactures to industrialized countries, and import relatively capital-intensive products.

The product cycle theory (cf. the Introduction to this study) has refined the original Heckscher-Ohlin approach by distinguishing between NICs and less advanced developing countries. NICs are assumed to have built up a relatively skilled labour force but still lack highly skilled labour. In contrast to traditional Heckscher-Ohlin theory, which assumes that factors of production are perfectly mobile between sectors within each country but completely immobile between countries, product cycle theory assumes that physical capital is internationally transferable. Given the possibility of importing physical capital from abroad, human capital becomes the scarcest factor of production in NICs. Therefore, the product composition of the exports of NICs is expected to shift from labour-intensive to standardized (product cycle) industrial goods. At the same

time NICs should import human-capital-intensive products from industrialized countries and very labour-intensive manufactures from less advanced developing countries.

This implication of the product cycle theory is compatible with models of "technology-gap"-induced trade [for an overview cf. Krugman, 1985]. These models distinguish between countries at the "technological frontier" and technological "followers". Countries at the technological frontier enjoy a comparative advantage in research and development activities as such, and also in goods where production is closely linked to ongoing research and development. As soon as the manufacture of such goods ceases to require a close link between manufacturing operations and research and development, comparative advantage in these goods may shift towards less advanced countries.¹

Numerous empirical studies have been undertaken to test the explanatory power of Heckscher-Ohlin-type trade theory.² It has been found that the resource endowments of countries together with the factor intensities of traded products play an important role in shaping the direction of trade. However, they do not represent its only determinant. Trade policy interventions, both in the form of protection for domestic industries and of export subsidies, are an obvious source of possible deviations between actual trade patterns and those predicted by Heckscher-Ohlin theory.

Besides, Heckscher-Ohlin theory has little to say about the sources of trade between countries with similar factor endowments. Trade in manufactures between industrialized countries, and increasingly between NICs and industrialized countries, consists largely of differentiated products. Economies of scale in the production of each variety render it necessary for firms (and countries) to specialize in particular product lines. Especially in the case of traditional consumer goods (such as clothing and footwear) the conventional notion of what characterizes an economic good needs to be modified (cf. Section III.3). Frequently functional attributes or even the product price are not the only determinants

¹ An example of such a process is provided by the shifts in the location of the production of electronic calculators [Majundar, 1987].

² Cf. for example Fels [1972] on trade in manufactures between West Germany and developing countries; Sautter [1984] and Leamer [1984] on total trade by large samples of countries.

of a producer's competitiveness. Guaranteed delivery at a certain date, fashionable design, and marketing measures such as advertising and branding may be of similar importance. This may represent a problem for producers from NICs or less developed countries who do not have an intimate knowledge of market conditions, or face high initial costs when setting up a marketing organization in industrialized countries [Tharakan et al., 1978]. As long as the advantage of developing countries lies primarily in manufacturing as such (rather than design or marketing), an expansion of exports would be facilitated by cooperation with producer firms or distributors in industrialized countries.

Sections IV.1.b and c investigate whether the performance of the textile, clothing, leather, and footwear industries in Brazil can be explained with reference to the factor intensities of these industries together with Brazil's factor endowment (i.e. the role played by comparative advantage).¹ Sections IV.2 and 3 discuss the impact of government policy, and Section IV.4 analyses the role of product differentiation and industrial organization and provides an explanation of the export performance of the industries being studied.

b. Specialization in Labour-Intensive Industries and Factor Endowments: A Cross-Country Econometric Analysis

This section provides an empirical test of the hypothesis that countries with an abundant endowment of low-skilled labour tend to have a competitive advantage in the textile, clothing, leather, and footwear industries. Two measures of specialization (share in manufacturing value added (VA); EPR) are regressed on factor endowments in a cross-country analysis. The hypothesis will be accepted if factor endowments are found to have significant explanatory power with respect to the actual pattern of specialization. Conversely, low explanatory power of the model will be taken to imply that product differentiation (which can-

¹ The Domestic Resource Cost concept attempts to measure directly the efficiency of resource use in industries that operate in a highly distorted economic environment. Appendix D reviews several studies of the manufacturing sector in Brazil that apply this concept. It is concluded, however, that the results are not only inconclusive but also highly distorted by policy-induced inefficiencies in some industries.

not be picked up by the available data), government policies, different technologies across countries, and other factors that invalidate the use of the applied model need to be analysed further.¹ This procedure assumes that the actual pattern of specialization is not so distorted that genuine locational advantages no longer have any influence on it. The fact that structural change in world trade of labour-intensive products during the past two decades has led to significant changes in the direction and quantity of trade, in spite of many policy measures retarding it, lends a degree of credibility to this assumption. Large deviations of individual countries from the predicted pattern of specialization can therefore be taken to reflect the impact of government policies or other specific locational factors.

Table 25 presents the results of the cross-country regressions. Of the two measures of specialization that have been employed alternatively as dependent variables, the share of each industry in manufacturing value added reflects production for export as well as for the domestic market. Therefore, it corresponds closely to the Heckscher-Ohlin approach which derives trade flows from the structure of specialization in production. However, this measure may be influenced strongly by policy interventions such as the protection and subsidization of domestic production. Therefore, EPRs have been used alternatively on the assumption that export subsidization (in excess of what is required to compensate for import protection) is less widespread than protectionism. The explanatory variables have been adapted from Leamer [1984] where they are available only for the year 1975. To test for possible non-linearities in the relationships between dependent and explanatory variables, a quadratic model has also been estimated, adding the square value of each explanatory variable on the right hand side of the equations.

The general conclusion from Table 25 is that factor endowments explain a substantial share of inter-country variations in specialization in

¹ In interpreting the findings it also has to be taken into account that Heckscher-Ohlin trade theory predicts only that labour-abundant countries export labour-intensive products. No more precise conclusions can be derived concerning the composition of exports in terms of individual labour-intensive commodities. Formally speaking, the Heckscher-Ohlin model becomes indeterminate in terms of individual goods if there are more goods than factors of production [Leamer, 1984, pp. 16 ff.].

Table 25 - Specialization in Labour-Intensive Industries, 1975: Cross-Country OLS Regression Results

Dependent variables	No. of observations	Linear model						Quadratic model				Chow test F	
		Explanatory variables (β -coefficients)			Test statistics								
		LAB1	LAB3	CAP	SE	F	R ²	\bar{R}^2	SE	F	R ²		\bar{R}^2
VA 321 (textiles)	40	-0.05 (-0.24)	0.54*** (3.38)	-0.20 (-0.87)	5.4	14.71***	0.54	0.51	5.3	8.16***	0.59	0.52	1.28
VA 322 (clothing)	40	0.30 (1.03)	-0.57*** (-2.75)	-0.75** (-2.52)	4.6	3.57**	0.22	0.16	4.7	1.89	0.25	0.12	0.40
VA 323 (leather, leather goods)	40	-0.05 (-0.17)	-0.44** (-2.13)	-0.64** (-2.19)	0.4	3.68**	0.24	0.18	0.4	2.00*	0.26	0.13	0.33
VA 324 (footwear)	40	-0.09 (-0.30)	-0.28 (-1.24)	-0.38 (-1.20)	1.0	1.51	0.11	0.04	1.0	0.90	0.14	-0.02	0.36
EPR 65 (textiles)	35	-0.04 (-0.25)	0.80*** (5.96)	-0.02 (-0.10)	1.0	27.04***	0.72	0.69	1.0	16.19***	0.77	0.72	2.23
EPR 651-3 (yarns and fabrics)	28	-0.01 (-0.05)	0.82*** (5.72)	-0.06 (-0.32)	1.1	28.22***	0.77	0.74	1.1	15.29***	0.81	0.75	1.31
EPR 841 (clothing)	36	-0.20 (0.67)	-0.10 (-0.45)	-0.74** (-2.47)	3.8	4.13**	0.27	0.21	3.8	2.36*	0.32	0.18	0.70
EPR 611 (leather)	27	0.27 (1.03)	0.95*** (4.72)	0.11 (0.41)	35.9	9.19***	0.54	0.48	31.0	7.96***	0.69	0.61	3.67**
EPR 612 (basic leather manufactures)	28	-0.47 (-1.61)	-0.06 (-0.23)	-0.16 (-0.50)	1.4	4.80**	0.32	0.24	1.5	1.85	0.33	0.15	0.11
EPR 931 (travel goods)	28	-0.13 (-0.44)	-0.22 (-1.00)	-0.65** (-2.09)	4.2	5.51***	0.38	0.33	3.7	5.41***	0.60	0.49	3.59**
EPR 951 (footwear)	29	-0.31 (-0.94)	0.09 (0.38)	-0.16 (-0.46)	2.7	3.26**	0.27	0.19	2.8	1.72	0.31	0.13	0.16

SE = Standard error; *** (**; *) Significant at the 1 (5; 10) per cent level; two-tailed test.

VA Share of ISIC industry in manufacturing value added in respective country; from UNIDO [1986a].
EPR Export performance ratio for SITC Rev. I category; calculated from data in UN [b].
LAB Share of category of employees (1: professional, technical, and related; 3: illiterate as a proxy for low skills) in labour.
1,3 force; calculated from Leamer [1984, Appendix B].
CAP Physical capital per member of the labour force; calculated from *ibid.*

Source: Own calculations.

labour-intensive industries. This is demonstrated by statistically significant values of the F statistic in all but one equations. However, the coefficients of determination (R^2 , or \bar{R}^2 adjusted for degrees of freedom) vary widely. The explanatory power is greatest for the textile industry, both in terms of the VA and the EPR variable. The significantly positive coefficient for the LAB3 variable indicates that countries with a relatively large endowment of unskilled labour tend to enjoy a competitive advantage in textile production.

Less firm conclusions can be drawn regarding the clothing industry, given that the regressions explain only about one fourth of the variation in the dependent variables. Competitiveness in clothing production appears to be negatively related to the accumulated physical capital stock. Since physical capital is internationally mobile this finding is difficult to interpret. The accumulated capital stock may be looked upon as a proxy for a country's capacity of absorbing, i.e. efficiently employing physical capital. A country's absorptive capacity depends on a variety of factors such as management capability, the availability of physical infrastructure, etc. which may not be picked up by the LAB1 (human capital) explanatory variable. In that sense it is plausible that countries whose absorptive capacity for physical capital is limited enjoy some competitive advantage in clothing production (which is very labour intensive; cf. Section IV.1.c).¹

The quality of the results for the leather and footwear industries is mixed. The explanatory power of factor endowments with respect to the VA dependent variables is low, especially for footwear (VA 324). However, when the leather and leather products complex is disaggregated according to its main product groups (EPRs 611, 612, and 831, respectively), the quality of the estimates as measured by the coefficients of determination is improved considerably. A Chow test indicates that in the case of the EPRs for leather and travel goods the use of the quadratic model further increases the explanatory power of the regressions. It can be concluded from the estimated equations with EPR dependent variables that a relatively abundant endowment with unskilled labour (LAB3) improves competitiveness in leather production.

Countries with a low absorptive capacity for physical capital are found to enjoy a competitive advantage in travel goods. However, factor endowments explain less than a third of inter-country differences in specialization in footwear (EPR 851)² and basic leather manufactures (EPR 612). Negative coefficients with respect to the two capital endowment

¹ The negative coefficient attached to LAB3 in the case of the VA322 dependent variable probably results from collinearity between LAB3 and CAP.

² The equation for VA 324 is not considered because its overall explanatory power is very small (the F-statistic indicates that the hypothesis that all coefficients are jointly zero cannot be rejected).

variables (LAB1, CAP) indicate that countries with little human capital and a low absorptive capacity for physical capital had some competitive advantage in these products.

It is difficult to explain why the pattern of specialization in the textile and leather industries is more closely related to factor endowments than in the case of clothing and footwear. As has been pointed out above, our regressions suffer from a conceptual shortcoming in that they focus on the performance of individual industries rather than on the group of labour-intensive products as a whole. However, Leamer [1984, p. 163; same data for the explanatory variables] and Sautter [1984, p. 14] arrive at remarkably similar results for their trade aggregates of standardized capital-intensive products (including textiles) and labour-intensive products (including clothing). Hence, the underlying conceptual problem is not the source of the discrepancy. Product heterogeneity in clothing and footwear is greater than in textiles and leather. Although producers in developing countries should have a genuine comparative advantage in manufacturing operations in all four industries, they probably find it more difficult to market differentiated products (clothing, footwear) than relatively standardized goods.

In our estimates so far both a positive coefficient of the LAB3 variable (endowment with illiterate as a proxy for unskilled labour) and a negative coefficient for physical capital intensity (CAP; as a proxy for absorptive capacity) have been taken to indicate that a large endowment with low-skilled labour is a source of competitive advantage. This is justified because of the multicollinearity between these explanatory variables. In order to provide a less ambiguous test of the importance of low-skilled labour, alternative estimates have been carried out with the same dependent variables and real per capita GDP as the only explanatory variable (Table A11). Real per capita GDP may be thought of as a flow measure of a country's total, human and physical, capital endowment relative to unskilled labour. The coefficients for the capital endowment variable are all negative, indicating that in all the selected industries labour abundance leads to competitive advantage. Again the explanatory power of the regressions for the textile industry is higher than for the remaining sectors. However, the coefficients of determination for the real income regressions are smaller than for the factor endowment model.

Finally, Table 26 compares the actual and the predicted pattern of specialization in the textile, clothing, leather, and footwear industries for selected producer countries. A relatively large deviation between the actual and the predicted value of the dependent variable, measured in terms of the standard error of the regression, indicates that special national features, such as policy interventions, location relative to important markets, or the availability of raw materials, exert a significant influence.

In the textile and clothing industries (VA 321, EPR 65, EPR 651-3; VA 322, EPR 841) Brazil's performance falls short of the predicted or "normal" pattern. The divergence is greater when EPRs are used as dependent variables rather than shares in manufacturing value added, especially for the clothing industry (-0.95 versus -0.02). This probably reflects the fact that barriers to imports allow firms to survive in the domestic market regardless of their efficiency. Brazil's specialization in leather, basic leather manufactures and travel goods more or less follows the "normal" pattern. Its EPR in footwear is higher (+1.51) than would be expected on the basis of its factor endowment. All these observations relate to the year 1975. Since then the EPRs for many product categories of the textile and clothing industries have declined (Table 15), while those for leather and basic leather goods have remained more or less stable and the footwear industry has maintained its pre-eminent position (Table 16). Therefore, the observed pattern of "sub-normal" specialization in textiles and clothing and "above-normal" concentration on footwear has probably continued after 1975.

Among Brazil's competitors Hong Kong and South Korea have specialized in textiles and clothing to a far higher degree than predicted by the model.¹ Other countries with a greater-than-normal weight of textiles and/or clothing in manufactured exports are Greece, Turkey, Chile, Columbia, and Egypt. Similarly, exports of leather, leather products, and/or footwear in Italy, Spain, Yugoslavia, and Columbia are higher than predicted by the model. In advanced industrialized countries the

¹ The contrast between the values for the VA 321 variable on the one hand and the EPR 65 and EPR 651-3 variables on the other probably reflects indirect exports of textiles from South Korea and Hong Kong in the form of clothing.

Table 26 - Actual versus "Normal" Specialization in Labour-Intensive Industries in Selected Countries, 1975
(a)

	Textiles (VA 321)	Clothing (VA 322)	Leather, leather goods (VA 323)	Textiles (EPR 65)	Yarns and fabrics (EPR 651-3)	Clothing (EPR 841)	Leather (EPR 611)	Leather manufactures (EPR 612)	Travel goods (EPR 831)	Footwear (EPR 851)
Advanced industrialized countries										
France	0.29	-0.08	0.51	0.22	0.32	0.10	-0.07	0.03	0.38	0.08
West Germany	-0.13	-0.03	0.16	0.08	0.21	-0.00	-0.19	-0.16	0.35	-0.42
Japan	0.05	-0.47	-0.91	0.20	0.46	-0.43	0.02	-1.26	-0.24	-0.94
Sweden	-0.10	-0.29	-0.18	-0.19	-0.15	0.11	0.67	0.39	-0.16	0.28
UK	-0.14	-1.05	-0.92	0.09	0.02	-0.99	-0.36	-0.25	-0.99	-0.51
US	-0.18	-0.39	-0.62	-0.20	-0.18	-0.49	-0.15	-0.37	0.04	-0.36
Southern Europe										
Greece	0.96	0.08	1.31	0.96	0.61	-0.06	0.29	-1.06	-0.74	0.90
Italy	0.02	-0.32	-0.30	0.13	0.33	-0.29	0.06	1.25	0.27	1.06
Portugal	0.76	0.05	-0.23	0.69	-0.31	0.24	0.12	0.15	-1.24	-0.72
Spain	-0.17	-0.12	1.94	-0.55	-0.56	-0.45	0.45	1.49	0.02	2.06
Turkey	0.02	0.03	-0.24	1.07	0.34	0.69	na	na	na	na
Yugoslavia	-0.05	-0.78	1.17	-0.83	-0.90	-1.09	-0.20	0.63	-2.24	1.36
MICs										
Brazil	-1.33	-0.02	-0.23	-1.40	-1.65	-0.95	-0.36	-0.23	-0.21	1.51
Chile	-0.75	-0.95	0.09	1.07	na	-1.23	0.61	na	na	na
Colombia	0.76	-0.29	0.52	0.97	1.15	0.68	0.15	3.32	1.38	-0.79
Hong Kong	2.49	3.88	-1.31	0.30	0.29	1.72	0.41	-1.42	-0.05	-1.01
South Korea	1.09	0.23	1.60	-0.25	-0.21	0.96	na	-0.37	0.10	0.12
Mexico	-0.75	-0.57	-0.61	-0.29	-0.43	-1.15	na	na	na	-0.91
Singapore	-1.21	0.03	-1.04	-1.21	-1.15	-0.41	na	-1.07	0.34	-0.79
Developing countries										
Egypt	2.41	0.23	0.11	2.33	3.11	-0.13	na	0.19	1.12	1.36
India	-0.10	0.31	0.52	-0.79	-2.09	-0.41	-3.33	-0.47	-0.97	-1.50
Philippines	-0.17	-1.29	-2.02	-0.27	na	-0.53	na	na	2.39	-0.99
Sri Lanka	1.35	-0.41	0.29	na	na	-0.13	na	na	na	na
(a) Differences between actual values and the pattern predicted by cross-country regressions, measured in standard errors of the regressions.										

Source: Own calculations based on regression results reported in Table 25.

degree of specialization in labour-intensive industries is either in line with or below the pattern predicted by factor endowments.

Hence, Brazil is not exceptional in specializing only in one complex (leather and footwear) rather than in a wider spectrum of labour-intensive industries. However, given the extensive production of textiles and clothing for the domestic market, the local availability of raw materials (especially cotton), and wide-spread underemployment of unskilled labour, the low weight of textiles and clothing in Brazilian manufactured exports can hardly be explained by a shift in comparative advantage towards more capital-intensive manufactures. Besides, Brazil still has a smaller endowment with human capital and a lower physical capital stock (and, by implication, lower absorptive capacity) than other important textile and clothing exporters among NICs as well as less advanced industrialized countries in Southern Europe (Table A12). Therefore, the difference between the performance of the textile and clothing industries on the one hand, and the leather and footwear complex on the other, needs to be explained in terms of differences in incentives for production and exports in each sector.

c. Factor Intensities in the Textile, Clothing, Leather, and Footwear Industries: An International Comparison

In the previous section the competitive advantage of individual producer countries in the textile, clothing, leather, and footwear industries has been related to their factor endowments. That analysis has been based on the assumption that the factor intensities of these industries do not vary substantially across countries. Then the problem of international specialization for each country consists in choosing the right industry mix in line with its factor endowments. However, if techniques with widely varying factor intensities could be utilized efficiently side by side in accordance with different relative factor prices, then the notion that a particular endowment leads to a comparative advantage in a particular industry would no longer be operational.¹

¹ "Technique" refers to one particular combination of factors of production, implying a certain factor intensity. By contrast, "technology" denotes the whole set of efficient combinations of factors of production

Therefore, this section compares factor intensities in the textile, clothing, leather, and footwear industries in various countries in order to test the validity of the assumption that the techniques of production do not diverge greatly between countries. Table 27 presents Lary measures of capital intensity for the textile, clothing, leather, and footwear industries in selected producer countries. Total capital intensity in an industry is proxied by value added per employee relative to the corresponding figure for total manufacturing. Similarly, physical and human capital intensity are proxied by non-wage valued added and wages per employee, respectively.¹

Total capital intensity in the selected industries is relatively low in all countries. Hence, these industries are appropriately classified as labour-intensive. Low overall capital intensity is mainly a consequence of low wages (i.e. low human capital intensity). By contrast, physical capital intensity is usually close to the average of total manufacturing. In most countries the textile and leather industries are more capital intensive than the clothing and footwear sectors, mainly because human capital intensity in the former industries is higher. With a few exceptions, inter-country differences in the capital intensity of a particular industry are fairly small. The variations in the physical capital intensity of the leather and leather goods industry probably stem from the fact that this ISIC category lumps together the tanning industry (which is relatively capital intensive) and the leather manufactures and travel goods industry (which is relatively labour-intensive; cf. Table A13). The high physical capital intensity of the West German clothing industry, especially in 1982-1984, probably indicates that this sector has specialized in relatively capital-intensive product lines and stages of the manufacturing process (with extensive subcontracting of more labour-intensive operations to firms in low-wage countries, e.g. in Southern Europe). How-

available at a certain point in time, and may be described by a production function. In pure Heckscher-Ohlin theory the use of identical techniques across countries results from the equalization of factor prices through trade. Since in reality full factor price equalization does not occur, the evidence on the international standardization of technology is analysed in this section.

¹ Cf. Appendix E for a comment on the methodology of measuring factor intensities.

Table 27 - Factor Intensities in Selected Labour-Intensive Industries: An International Comparison, 1973/75 and 1981/84 (a)

	Total capital intensity(b)		Physical capital intensity(c)		Human capital intensity(d)	
	1973/75	1982/84	1973/75	1982/84	1973/75	1982/85
Textiles (ISIC 321)						
Brazil	0.71 (18)	0.75 (17)	1.01 (13)	1.02 (11)	0.75 (18)	0.75 (17)
US	0.61 (21)	0.61 (20)	0.89 (19)	0.91 (19)	0.74 (21)	0.72 (21)
West Germany	0.72 (20)	0.69 (22)	0.88 (17)	0.83 (20)	0.83 (20)	0.82 (20)
Japan	0.65 (20)	0.60 (20)	0.94 (18)	0.92 (17)	0.76 (22)	0.74 (23)
Italy	0.71 (22)	0.79 (22)	0.93 (20)	0.96 (17)	0.81 (18)	0.85 (19)
Spain	0.72 (17)	0.81 (19)	1.18 (10)	1.02 (8)	0.66 (22)	0.81 (20)
South Korea	0.74 (16)	0.69 (16)	1.01 (13)	0.99 (12)	0.85 (16)	0.80 (20)
India	0.72 (14)	0.76 (15)	0.81 (19)	0.82 (20)	0.95 (13)	0.93 (15)
Clothing (ISIC 322)						
Brazil	0.52 (23)	0.48 (23)	0.97 (17)	0.97 (18)	0.62 (23)	0.58 (24)
US	0.47 (24)	0.45 (24)	0.87 (21)	0.91 (18)	0.58 (24)	0.54 (24)
West Germany	0.61 (23)	0.72 (21)	0.96 (14)	1.16 (6)	0.67 (24)	0.65 (24)
Japan	0.41 (24)	0.35 (24)	0.85 (24)	0.78 (24)	0.55 (24)	0.51 (24)
Italy	0.56 (23)	0.64 (23)	0.87 (24)	0.91 (22)	0.68 (23)	0.75 (23)
Spain	0.61 (23)	0.68 (23)	0.98 (14)	1.00 (12)	0.67 (21)	0.69 (24)
South Korea	0.46 (22)	0.49 (23)	0.90 (18)	0.90 (19)	0.66 (23)	0.67 (24)
India	0.48 (21)	0.58 (20)	0.77 (20)	0.97 (17)	0.65 (21)	0.62 (22)
Leather, leather goods (ISIC 323)						
Brazil	0.61 (20)	0.61 (19)	0.97 (16)	0.98 (17)	0.72 (20)	0.73 (18)
US	0.59 (22)	0.58 (22)	0.86 (22)	0.93 (17)	0.73 (22)	0.68 (22)
West Germany	0.86 (16)	0.88 (19)	1.24 (4)	1.26 (3)	0.73 (23)	0.73 (23)
Japan	0.72 (17)	0.62 (19)	0.95 (13)	0.91 (18)	0.83 (16)	0.77 (21)
Italy	0.77 (18)	0.95 (14)	1.02 (10)	1.06 (7)	0.76 (21)	0.86 (18)
Spain	1.04 (10)	0.77 (20)	1.25 (8)	0.92 (21)	0.91 (16)	0.86 (17)
South Korea	1.03 (10)	0.75 (14)	1.12 (4)	1.03 (9)	0.86 (14)	0.81 (19)
India	0.69 (17)	0.71 (18)	1.07 (10)	1.04 (12)	0.70 (18)	0.71 (18)

Table 27 continued

	Total capital intensity(b)		Physical capital intensity(c)		Human capital intensity(d)	
	1973/75	1982/84	1973/75	1982/84	1973/75	1982/85
Footwear (ISIC 324)						
Brazil	0.41 (24)	0.48 (24)	0.88 (23)	0.96 (19)	0.62 (22)	0.60 (22)
US	0.50 (23)	0.51 (23)	0.87 (20)	0.95 (15)	0.62 (23)	0.58 (23)
West Germany	0.66 (22)	0.66 (23)	0.94 (15)	0.87 (17)	0.73 (22)	0.76 (22)
Japan	0.65 (21)	0.59 (23)	0.88 (22)	0.87 (22)	0.83 (17)	0.78 (20)
Italy	0.54 (24)	0.63 (24)	0.93 (21)	0.92 (21)	0.61 (24)	0.73 (24)
Spain	0.71 (20)	0.67 (24)	0.51 (22)	0.93 (18)	1.05 (11)	0.75 (22)
South Korea	0.53 (20)	0.48 (24)	0.84 (22)	0.80 (24)	0.84 (17)	0.75 (23)
India	0.68 (18)	0.72 (17)	0.51 (24)	0.61 (24)	1.14 (9)	1.03 (12)

(a) Relative to manufacturing sector average (rank among 24 manufacturing industries in parentheses). - (b) Value added per employee. - (c) Non-wage value added per employee. - (d) Wages per employee.

Source: UNIDO [1986a].

ever, even the figure for West Germany (1.16) is not much higher than the manufacturing average, and in most other countries it is not far below it. Therefore, one may conclude that the techniques of production in the textile, clothing, leather, and footwear industries do not diverge substantially across countries.

In addition it is concluded that with relatively low skill levels and only moderate physical capital requirements these industries match Brazil's factor endowments rather well (cf. Table A12). It has also been investigated whether the differences in the export performance of labour-intensive industries are related to different factor intensities in their sub-branches (Table A13). As expected, some sub-sectors with a very favourable export performance (cf. Tables 3 and 6) are also particularly labour-intensive (e.g. leather footwear in contrast to non-leather footwear, or knitwear in contrast to spinning and weaving). However, all important sub-branches of labour-intensive industries (Table A1) are less capital intensive than total manufacturing. Therefore, different factor intensities at the sub-sectoral level alone do not contribute much to an explanation of the differences in export performance.

2. Trade and Exchange Rate Policies

a. Basic Considerations

The protection of an industry through tariffs or non-tariff barriers raises the domestic prices of its output relative to the price level in the world market. Hence, domestic sales become relatively more profitable than exports (provided that input prices are the same regardless of the destination of output). To compensate for the resulting disincentive to exporting, subsidies are often granted that raise export revenues above the world market price. In that case the anti (or pro-)export bias of the incentive structure faced by the industry depends on the net effect of protection and export incentives. However, the impact of trade policy on an industry depends not only on the degree of protection given to its final product (i.e. nominal protection). With a given rate of nominal protection, the increase in value added compared to the situation under free trade (i.e. effective protection) depends on the protection of the inputs used by the industry.

High effective protection may coincide with any combination of the following factors [Bergsman, 1970, p. 262; 1974, p. 411]:

- allocative inefficiency: production costs are high because the country does not enjoy a comparative advantage in the protected industry;
- X-inefficiency: production costs are high because cost-saving efforts are relaxed as a result of reduced competitive pressure;
- monopoly returns: production costs are low, but limited competition from either foreign or domestic firms permits relatively high profits or wages to be realized.

The ability of a protected industry, or of an individual firm within a protected industry, to compete effectively in the world market depends on which factor predominates. In the case of allocative inefficiency (i.e. comparative disadvantage) the industry can exist only as a result of high effective protection. Its export performance depends on whether its nominal protection is compensated for by export subsidies that render exports profitable in spite of unavoidable high production costs. As it has been found that Brazil possesses a comparative advantage in labour-intensive industries, this case of allocative inefficiency should be of little relevance to this study.

Hence, any effective protection enjoyed by labour-intensive industries in Brazil should reflect largely a combination of (avoidable) high production costs, i.e. X-inefficiency, and monopoly returns. Under such circumstances efficient firms may find it attractive to export even though the export price only covers normal costs rather than a monopoly rent. Such efficient firms may well co-exist with X-inefficient firms that produce predominantly for the protected domestic market.¹

In this study the focus is primarily on the protection of labour-intensive industries relative to total manufacturing. If the rate of protection for an industry is higher than for total manufacturing, this is taken as evidence that this industry has been favoured by trade policy, and vice versa. However, the extent of inefficiency or monopoly rents and, hence, the actual or potential competitiveness of an industry depend on the level of protection relative to the free trade situation. This raises a serious methodological problem: if the rate of protection is calculated with reference to the prevailing official exchange rate, the level of protection is inevitably overestimated because barriers to imports lead to an overvaluation of the domestic currency. Therefore, the exchange rate that would prevail under free trade, i.e. the shadow exchange rate, should be used in the calculation of protection. Unfortunately, this rate is difficult to estimate empirically, especially in a highly distorted economy such as Brazil. The estimates of net effective protection and net export promotion (i.e. net of exchange rate overvaluation) that will be reported in Section IV.2.c, therefore, represent only approximations.

A more narrow definition of exchange rate overvaluation compares the development of the nominal exchange rate with the change in relative price levels. The domestic currency is said to be overvalued if domestic inflation exceeds international inflation by more than the rate at which the domestic currency is devalued. With a given structure of protection and export promotion, changes in the real exchange rate, thus defined, represent the main source of changes in the relative incentives for domestic sales versus exports. The impact of exchange rate policy on Brazil's labour-intensive exports (i.e. the role of changes in the real exchange rate) is explored in Section IV.2.d.

¹ A dualistic firm structure along these lines is found in the Brazilian textile industry (cf. Section IV.4.b).

b. The Institutional Framework

The Brazilian system of protection and export promotion for manufacturing industry has received considerable attention in the literature.¹ Therefore, this section is limited to a brief review of the institutional framework of trade policy in Brazil. In addition, it describes the analytical concepts used to measure the impact of the various policy instruments (Synoptical Table 1).

During the period under consideration the taxation of imports consisted of tariffs, narrowly defined (II-import tax), as well as various additional duties such as the Financial Operations Tax (IOF), the Port Improvement Tax (TMP), etc. In addition, value added taxes (IPI-Industrialized Products Tax; ICM-Tax on the Commercialization of Manufactures) were payable not only on the cif value of imports but also on the amount of the nominal tariff and partly of other taxes. To give an example, the domestic price of a machine with a nominal tariff rate of 45 per cent exceeded the world market price (i.e. the fob price of imports) by about 122 per cent in the mid-1980s. Value added taxes on the fob value of imports contributed 23 percentage points to the extra cost [Sato, 1985, pp. 14 f.]. However, since the rates of non-tariff duties and taxes were fairly similar across manufacturing industries, tariff rates are probably the main determinant of the inter-industry distribution of legal protection.

A further complication arises because most imports were carried out under special regimes that allowed for preferential tariff rates or even exemptions. Therefore, actual tariff collections were much lower than legal tariff rates suggest [Guimarães, 1989, Table 1]. On the other hand, a wide variety of non-tariff barriers have been created since the mid-1970s which not only increase the level of protection but also affect its structure. For example, by 1984 imports of more than 90 per cent of all textile and clothing products had been suspended [Table 28; Guimarães et al., 1987, Table 2].

¹ Balassa [1979] gives an overview over the evolution of the system in the context of Brazil's economic development since the early 1960s. Tyler [1976, pp. 204 ff.] presents an exhaustive description. Other sources are cited below.

Synoptical Table 1 - A Framework for an Analysis of Protection and Export Promotion in Brazil

Important policy instruments	Brief description	Analytical concepts	
Protection from imports			Other concepts:
Tariffs (import duties and taxes)		Legal tariff	- Implicit protection: divergence of domestic price plus production subsidy from the international price;
- ordinary rates - preferential rates, exemptions	Relevant mainly for imported machinery for "priority" industries and imported inputs for manufactured exports	Actual average tariff (total tariff revenue divided by import value)	
Quotas/prohibitions	Applications of the "Law of Similars" for all incentivized purchases of machinery		- Effective protection (promotion): percentage change in value added as a result of protection/promotion in output and input markets; exceeds nominal (i.e. output market) protection if inputs are less protected than output, and vice versa;
Export incentives			
Fiscal			Anti-export bias: implicit tariff minus export subsidies
- Crédito Prémio	Tax credit linked to the fob value of exports		- Net protection/promotion: adjustment of measures of protection/promotion for currency over-valuation
- Income tax reductions	Exemptions from the income tax for part of the profit from non-primary exports		
- Duty (and taxes) drawbacks on imported inputs (and close substitutes)	Taxes rebated or exempted: II (import duty), IPI (federal industrial products tax), ICM (state value-added tax), TPM (port improvement tax), AFRMM (tax for the renovation of the merchant marine)	Ad valorem equivalent (percentage of fob export value); the "real" value of a subsidy in a highly inflationary environment may depend on a variety of factors such as the timing of payments, etc.	
- BEFIEX (CIEX)	Enterprise-specific incentive packages in return for long-term export commitment; duty and tax reductions on imported machinery and intermediate inputs; guaranteed access to other subsidies independent of changes in legislation (CIEX: similar for small firms)		
Financial			
- FINEX	Financing of manufactured exports in the pre-shipment and post-shipment stages		
- (Central Bank) Resolution 674	Supply of working capital to firms producing manufactured exports		

Source: Compiled from World Bank [1983, Ch. 6-8].

As the Synoptical Table 1 indicates, the combined impact of tariffs and non-tariff barriers may be measured by comparing the domestic price

Table 28 - Preferential Tariffs and Selected Non-Tariff Barriers for Selected Manufacturing Industries in Brazil, 1975-1984 (per cent) (a)

	Quota with preferential tariff or exemption			Reference price or similar			Import suspended or previous authorization required		
	1975	1980	1984	1975	1980	1984	1975	1980	1984
Leather, leather products	-	7.4	-	-	-	-	-	10.3	19.1
Textiles	-	0.5	-	0.5	2.6	2.6	-	61.5	96.7
Clothing, footwear	-	-	-	-	-	-	-	65.3	90.5
Metallurgy	0.1	0.5	0.1	2.1	6.1	6.1	25.7	35.1	39.1
Transport equipment	-	-	-	0.4	7.0	7.0	-	22.0	53.7
Mechanical engineering	-	-	-	0.1	8.1	8.1	0.2	5.0	25.4
Electrical engineering	-	-	-	2.0	5.0	5.0	-	14.5	85.5
All manufacturing	0.4	0.8	0.3	0.9	4.0	4.0	2.2	15.5	50.4

(a) Percentage shares of products affected at the 8-digit-level of NBM.

Source: Guimarães et al. [1987, Table 2]; own calculations.

to the price in the world market (implicit tariff). In the case of Brazil implicit protection cannot normally be divided into the effect of tariffs on the one hand and that of non-tariff barriers on the other, because legal tariff rates usually exceed implicit tariffs (i.e. legal tariffs are partly redundant; Guimarães [1989, Table A1]). The major drawback of the use of implicit tariffs lies in their data requirements: pairs of domestic and international prices have to be obtained for a very considerable number of products. In the case of Brazil such data are only available for 1980 and 1985, which makes it difficult to analyse the impact of tariff policies over a longer period.

Export incentives for manufactures in Brazil have also been the subject of a large number of empirical studies.¹ The most important fiscal incentives are the drawback of import and value added taxes on imported inputs and close domestic substitutes, the value added tax credit (*crédito prêmio*; actually a straightforward subsidy), and the partial exemption from the income tax of profits from exports (Synoptical Table 1). Table 29 shows that the value of drawbacks has remained at around 10 per cent of the value of manufactured exports since the early 1970s, while the value added tax credit has fluctuated widely: it amounted to 16 per cent of the value of exports in 1973, was practically abolished in 1980 and subsequently revived, and is now again being phased out. The reduction of the income tax on profits from manufactured exports amounted to about 2 per cent of export value.

Instead of relying on these generally available incentives, individual firms could also negotiate their own incentive package in return for a definite commitment to export a certain share of their output (BEFIEEX agreements). Such contracts would normally be concluded for periods of up to 10 years and allow for duty-free imports of machinery in addition to guaranteed access to all other incentives in operation when the contract was concluded. Especially in the beginning of the program the discretionary power of the authorities was considerable. Therefore, large firms, particularly from the transport equipment sector, benefitted disproportionately from the BEFIEEX program: the share of transport equipment in total BEFIEEX exports was 100 per cent in 1974, 72 per cent in 1980, and 45 per cent in 1985. The sectoral distribution of the number of new contracts (Table 30) suggests that during the 1970s textile exporters also benefitted from the BEFIEEX program, whereas footwear exporters have participated significantly only since 1980. Since about 1983 the drawback rate in BEFIEEX programs (relative to incentivised exports) has fallen to a value similar to that of the general drawback incentive (Table 29). Probably the program has now lost most of its exceptional

¹ The institutional framework is described concisely by Tyler [1976, pp. 204 ff.]. The most recent and comprehensive estimate of the value of incentives at the aggregate level from 1969 through 1985 is that by Baumann and Moreira [1987]. The sectoral distribution of incentives is discussed in the following section.

Table 29 - Selected Incentive Rates for Manufactured Exports in Brazil, 1969-1985 (per cent of fob export value)

	Draw-back	Crédito prêmio	Income tax reduction	BEFIEEX(a)		Financing before/after shipment	
				relative to all manufactured exports	relative to incentivised exports		
1969	4.0	6.7	na	na	na	4.1	na
1970	4.0	13.5	na	na	na	6.6	0.9
1971	4.0	13.1	1.3	na	na	6.8	1.0
1972	4.9	15.4	1.3	na	na	6.5	1.7
1973	7.2	16.2	1.3	na	na	4.9	1.6
1974	12.6	12.0	1.8	na	na	4.9	1.3
1975	8.3	12.1	1.7	na	na	10.1	1.5
1976	11.8	11.7	1.3	na	na	14.6	1.3
1977	12.6	12.4	1.5	na	na	16.3	3.3
1978	9.1	12.8	1.8	na	na	13.2	3.9
1979	10.5	12.8	2.1	na	na	11.7	2.2
1980	9.0	0.1	1.9	4.7	23.7	5.5	3.5
1981	9.4	6.5	1.8	7.6	35.0	13.9	4.9
1982	10.3	9.1	1.5	5.0	22.1	17.4	4.3
1983	8.6	7.8	1.6	2.9	11.2	8.5	0.8
1984	9.1	7.8	1.6	2.6	10.3	1.7	1.0
1985	9.1	1.4	1.6	2.6	7.4	2.0	1.7

(a) Incentive rates are for import duty and tax exemptions only, and do not include value-added tax credits or income tax reductions contained in BEFIEEX contracts.

Source: Baumann, Moreira [1987, Table 1]; Guimarães [1989, Table 6].

character, and the incentives offered are no longer grossly out of line with the incentives generally available to exporters.

The estimated financial subsidy rates depend crucially on the interest rate chosen as a point of reference. With the extensive capital market distortions in Brazil that choice is somewhat arbitrary. Baumann and Moreira [1987, p. 481] have used the rate for 360-day consumer credit, while Baumann and Braga [1985; 1988; estimates for 1982 and 1983] have chosen alternatively the cost of government borrowing and the prevailing bank rate for advance on exchange contracts. The World

Table 30 - Number of BEFIEX Contracts Concluded for Selected Manufacturing Industries in Brazil, 1972-1985

	1972-1980	1980-1985
Leather, leather products	-	-
Textiles	18	28
Clothing, footwear	4	36
Metallurgy	6	24
Transport equipment	20	31
Mechanical engineering	6	28
Electrical engineering	6	13
All manufacturing	89	227

Source: Guimarães [1989, Table 8].

Bank [1983, p. 63] has applied a uniform real rate of 10 per cent as a proxy for the market rate in their estimates for 1980/1981. Although the differences in the estimated incentive rates are very large, there is no obvious case for preferring one set of estimates over the others. It must be concluded that these estimates are subject to a considerable margin of error and, therefore, should be interpreted rather cautiously. Among the financial incentives, subsidized credit lines in the pre-shipment stage were clearly more important than post-shipment credit (Table 29). Subsidy rates fluctuated widely but have declined since 1982 similar to most fiscal incentives. Hence, the only important incentive remaining in 1985 was the drawback of taxes on imported inputs and (as part of the BEFIEX program) on imported machinery.

c. Protection and Export Promotion Rates

Empirical estimates of protection rates in Brazil are available for various years since the mid-1960s.¹ However, the methodologies used differ so much as to render comparisons rather difficult. Except for 1980/81 [Tyler, 1983] and 1985 [Kume, 1988] all estimates are based

¹ Braga et al. [1987, Table 1.1] present an overview over the more important studies.

either on legal or actual tariff rates [published studies include Tyler, 1980, and Braga and Guimarães, 1982]. In the presence of both widespread tariff redundancy and non-tariff barriers such estimates cannot convey a realistic picture of the level and sectoral dispersion of protection. Therefore, this section presents protection estimates based on legal tariffs only for 1967, when a tariff reform had largely eliminated redundancy and non-tariff barriers were less important than in the 1970s and 1980s [World Bank, 1983, pp. 70 ff.]. These estimates are compared to implicit tariff calculations for 1980/81 and 1985 (Table 31).

Nominal tariffs for labour-intensive industries generally exceeded the average for all manufacturing as well as the protection of two typical physical-capital-intensive industries (metallurgy and transport equipment). Among labour-intensive industries, downstream activities (clothing, footwear) tended to be more protected than the processing of raw materials (leather, fibre processing). In 1980 and 1985 human-capital-intensive industries also enjoyed relatively high protection. As implicit tariff calculations are available only for 1980/81 and 1985, it is not clear whether the relatively low values for labour-intensive industries in 1980/81 reflect a substantial shift in policy. Tyler himself emphasizes [1983, p. 552] that the 1980/81 period was untypical because of proliferating credit subsidies, especially to agriculture, increasing price controls, and a growing overvaluation of the Cruzeiro. Estimates by Guimarães [1989, Tables 3, A1] for 1985, which are based on the same price data as Kume's figures, show lower values especially for the textile industry. However, Guimarães's figures, too, support the conclusion that in 1985 labour-intensive industries enjoyed relatively high rates of protection in their output markets.

Regarding effective protection the evidence on the position of labour-intensive industries is also somewhat conflicting. The textile as well as the clothing and footwear industries enjoyed relatively high rates of net effective protection in 1967 and 1985, whereas the 1980/81 figures are fairly close to the average for all manufacturing. The leather and leather products industry showed rates of protection not far from (1967, 1985) or even below (1980/81) the average for all manufacturing. Other estimates [Guimarães, 1989, Tables 5, A2; Braga et al., 1987, Tables 5.1, D.7] also support the conclusion that in 1985 the effective pro-

Table 31 - Protection and Export Incentive Rates for Selected Manufacturing Industries in Brazil, 1967-1985

	Nominal tariffs			Nominal export incentives			Nominal anti-export bias		Net effective protection			Net effective export promotion	
	1967	1980/81	1985	1975(a)	1981	1985	1980/81	1985	1967	1980/81(b)	1985(c)	1975(d,a)	1981(e)
	legal	implicit		Pastore et al., 1978, Table 8	Tyler, Tables 4, A2	Gui- marães, Table 14			Bergs- man, Table 3.5	Tyler, Tables 1, A1	Kume, Tables 5, A3	Pastore, et al., 1979, pp. 51 ff.	Tyler, Tables 4, A2
	Bergs- man, Table 3.3	Tyler, Tables 1, A1	Kume, Tables 3, A3										
Leather, leather products	66	10.0	26.9	20.6	22.8	6.8	-12.8	20.1	62	-4.2	23.7	5.9	3.3
Textiles	81	20.6	60.4	30.0	25.2	9.5	-4.6	50.9	130	15.1	125.6	14.5	15.0
Processing of natural fibres	na	-5.0	35.6	-5.0	-6.1	na	1.1	na	na	2.1	404.0	-16.2	14.2
Yarns, fabrics, natural	na	21.7	69.8	45.5	25.7	na	-4.0	na	na	28.0	152.4	51.4	8.1
Yarns, fabrics, artificial	na	15.3	78.5	49.7	28.8	na	-13.5	na	na	-2.1	99.6	52.4	24.1
Knit goods	na	} 26.0	45.1	} 50.8	} 27.3	} 27.3	} -1.3	} -1.3	} -1.3	} 16.3	23.5	} -17.7	} 9.8
Other textiles	na		55.6								na		
Clothing, footwear	103	24.2	92.7	32.2	26.3	13.7	-2.1	79.0	112	23.5	164.4	14.0	15.9
Clothing	na	23.1	106.2	37.4	25.4	na	-2.3	na	na	19.3	196.8	15.1	12.1
Footwear	na	27.5	67.2	30.6	28.8	na	-1.3	na	na	35.0	102.9	13.1	26.3

Table 31 continued

	Nominal tariffs			Nominal export incentives			Nominal anti-export bias		Net effective protection			Net effective export promotion	
	1967	1980/81	1985	1975(a)	1981	1985	1980/81	1985	1967	1980/81(b)	1985(c)	1975(d,a)	1981(e)
	legal	implicit											
	Bergsman, Table 3.3	Tyler, Tables 1, A1	Kume, Tables 3, A3										
Metallurgy	34	3.0	24.7	25.3	20.1	8.0	-17.1	16.7	19	12.9	44.8	0.0	29.7
Transport equipment	57	-16.7	9.2	32.3	23.7	30.6	-40.4	-21.4	53	-21.3	-9.8	20.9	17.1
Mechanical engineering	34	24.0	17.3	31.8	25.6	11.8	-1.6	5.5	16	62.7	14.0	14.3	14.8
Industrial machinery	na	29.5	22.4	34.5	25.5		4.0	na	na	61.3	21.4	18.2	12.3
Electrical engineering	57	45.2	44.5	27.0	25.4	19.0	19.8	25.5	73	95.0	48.5	9.6	8.1
Electronic material	na	96.4	91.1	20.0	na	na	na	na	na	177.2	130.1	-3.9	na
All manufacturing	48	11.9	16.4	17.7	19.3	8.3	-7.4	8.1	52	23.2	29.2	7.4	13.6

(a) 1975 exports have been used in the calculation of industry averages from sectoral incentive rates. - (b) Including domestic production subsidies. - (c) Following Guimarães [1989, p. 43] it is assumed that the shadow exchange rate in 1985 was equal to the official rate. - (d) Following Savasini [1983, p. 76] the shadow exchange rate in 1975 has been assumed to be 27.5 per cent higher than the actual rate. In contrast to the estimates of nominal incentives in 1975 the estimates of effective promotion take into account drawbacks of import taxes on imported inputs. - (e) Tyler's Tables 4 and A2 apparently suffer from printing errors. This column has been calculated from Tyler's estimate of (gross) effective export promotion by applying Tyler's estimate of a shadow exchange rate 18.8 per cent higher than the actual rate.

Source: Bergsman [1970]; Guimarães [1989]; Kume [1988]; Pastore et al. [1978; 1979]; Tyler [1983]; own calculations.

tection of the textile, clothing, and footwear industries was higher than the manufacturing average.

This raises the question of whether the relatively low net effective protection rates for the textile and clothing industries measured in 1980/81 prevailed for a significant period of time. At first it must be recalled that Tyler's effective protection estimates as reported in Table 31 include domestic production subsidies in addition to implicit tariffs. Tyler does not report effective implicit tariffs (excluding subsidies for production) in 1980/81. However, domestic production subsidies played a relatively limited role in the leather, textile, clothing and footwear industries: nominal implicit protection (including subsidies) exceeded nominal implicit tariffs only by between 5.6 and 6.5 percentage points [Tyler, 1983, Tables 1, A1], whereas the corresponding figure for all manufacturing was 12.6 per cent. Hence, the low rates of effective protection in 1980/81 probably reflect to a large extent low production subsidies rather than low protection through trade policy instruments.

Besides, there is abundant evidence of widespread inefficiency, sustained by high rates of effective protection, in the Brazilian textile industry in the 1960s and early 1970s [Bergsman, 1970, pp. 135 ff.; Tyler, 1976, p. 109]. By all accounts, technical and organizational inefficiency in the majority of firms was not reduced substantially through the BNDES-sponsored investment program in the first half of the 1970s. In the second half of the 1980s widespread inefficiency was still considered one of the main obstacles to greater competitiveness of the industry. It is difficult to see how such inefficiency could have been sustained in the absence of a sufficiently high level of effective protection.¹ Therefore, we conclude that the effective protection of the textile and clothing industries was relatively high at least in the early 1970s and mid-1980s, and even around 1980 was high enough to sustain substantial inefficiency in many firms.

¹ Additional evidence comes from estimates of effective protection based on legal tariffs or actual tariff collection rates [cf. the survey table in Guimarães, da Costa, 1987, Table 5). Eight estimates from three different sources for various years between 1973 and 1980 indicate that the textile industry ranked third to seventh among the 21 manufacturing industries of the IBGE 2-digit classification. Hence, the effective protection of the textile industry was higher than the median rates (though not necessarily the average) for all 21 manufacturing industries.

The footwear industry also enjoyed high effective protection relative to the manufacturing average, although in 1985 it was less protected than, for example, the clothing industry. By contrast, the effective protection of the leather and leather goods industry was close to or below the figure for all manufacturing.

The effective protection figures in Table 31 do not include the depreciation of machinery among the inputs. However, the prices for industrial machinery in Brazil were higher than in the world market due to the protection of the domestic mechanical engineering industry. The impact of higher prices for machinery on the effective protection of labour-intensive industries may be assessed on the basis of the implicit nominal tariff for the industrial machinery subsector. In 1980/81 the implicit tariff for industrial machinery was slightly higher than for labour-intensive products, whereas in 1985 it was rather lower. Hence, the effective protection of labour-intensive industries may not be overestimated greatly because depreciation is neglected. This conclusion requires two qualifications, however. Firstly, the implicit tariff for industrial machinery represents an average over a wide variety of products. The 1985 database includes only four pairs of international and domestic prices for textile and clothing machinery, for which implicit tariffs are substantially higher than the average. Secondly, the database was constructed from information provided by Brazilian manufacturers, who presumably produce less sophisticated types of machinery. If the implicit tariff for electronic material (more than 90 per cent in both 1980/81 and 1985) can be taken as indicative of the protection of technologically advanced products, the effective protection of subsectors that require sophisticated machinery (such as weaving) is probably overestimated if depreciation is not taken into account.

From the manufacturer's point of view, the implicit nominal tariff represents approximately the difference between the price received for sales in the domestic market and the export price, provided that the fob price of exports (as in the 1985 database) rather than the cif price of imports (as in the 1980/81 database) is used in the implicit tariff calculations. In the latter case the anti-export bias of trade policy is underestimated. The profitability of exports relative to domestic sales is improved by export incentives (typically calculated as a percentage of the fob export value) that raise revenue from export sales above the fob

export price. Table 31 presents the available data on the sectoral distribution of nominal export incentives in 1975, 1981, and 1985. Incentive rates for labour-intensive industries exceeded the average for all manufacturing in all three years. However, inter-industry differences have apparently declined since the incentive system was set up in the first half of the 1970s.¹

The relative attractiveness of domestic versus export sales can be summarized in the (nominal) anti-export bias, which is calculated as the difference between the nominal implicit tariff and the nominal export subsidy. The figures for 1980/81 show a small pro-export bias (i.e. negative anti-export bias) for labour-intensive industries as well as for all manufacturing. By contrast, in 1985 there existed a modest anti-export bias for all manufacturing and a substantial anti-export bias for labour-intensive industries. As it has been concluded that the implicit tariff estimates for 1980/81 (based on cif rather than fob prices) are untypically low, the anti-export bias for 1981 is probably underestimated. The anti-export bias in 1985 is probably untypically high because after 1982 nominal export incentives declined considerably with the phasing out of the value-added tax credit (*crédito prêmio*) and a similar reduction in financial incentives (Table 29). Therefore, it may be concluded that since 1967 labour-intensive industries have faced at least a modest anti-export bias. Together with high effective protection this helps to explain their (overall) lackluster export performance.²

It should be noted that even in the presence of a nominal anti-export bias the profitability of exports may still be higher than it would be under free trade. The change in value added due to nominal export incentives and the protection of inputs, compared to the situation under free trade, is referred to as effective export promotion. The figures for net effective export promotion in 1975 and 1981 demonstrate that even after adjustment for the overvaluation of the Cruzeiro, most labour-

¹ Although these estimates include only the more important incentives, the sectoral distribution is probably not grossly distorted. Besides, coverage in 1985 is more complete than in 1975, which supports the conclusion that sectoral differences are now small.

² In a marked contrast, the metallurgical and transport equipment industries with their relative small anti-export bias have shown fast export growth especially since the late 1970s.

intensive exports were effectively subsidized (Table 31). Therefore, moderately inefficient firms may still have been viable exporters during the 1970s. Although no estimates are available for the post-1981 period, the sharp reduction in nominal incentives since 1982 must have reduced the effective promotion of exports. To the extent to which the remaining nominal incentives only compensate for the protection of inputs, they do not constitute a subsidy for exports, and therefore provide no logical basis for the protectionism of importing countries.

d. Exchange Rate Policy and Footwear Exports: An Exploratory Econometric Analysis

Since the late 1960s Brazil has frequently experienced very high rates of inflation. At the same time the exchange rate regime was semi-flexible at best, and for extended periods there existed an outright peg to the US dollar. Therefore, the real exchange rate, defined as the nominal rate adjusted for the inflation differential between Brazil and its trading partners, has fluctuated considerably.¹ Such fluctuations directly affect the relative profitability of exports versus sales in the domestic market. Empirical studies of the development of Brazilian manufactured exports have usually identified the real exchange rate as one important determinant [Braga, Markwald, 1983, Table 1]. However, a significant relationship could not be established at the sectoral level for automobile and steel exports [Fischer, Nunnenkamp et al., 1988, pp. 110 ff., 228 ff.]. It was concluded that exports by these industries grew largely because of declining domestic demand and, hence, idle capacity in the early 1980s.

This section analyses the impact of changes in the real exchange rate on footwear exports from Brazil. This sector has been selected because it is the most export-oriented of the four industries covered by this study. The specification of the export supply function is fairly similar to those employed in the studies summarized by Braga and Markwald [1983, Table 1]. The dependent variable is the logarithm of nominal ex-

¹ Cf. Fasano-Filho et al. [1987, Table 12] for a summary of real exchange rate indices.

port values in US dollar, deflated by the US wholesale price index for footwear (XRFW). The explanatory variables include the real exchange rate, domestic demand (DD; an index of real GDP divided by an index of leather footwear output [cf. Paredes, 1987]), and a time trend (T). Data on leather footwear production are only available from 1974 to 1987 (Table 5). With the number of degrees of freedom thus limited, reliable tests of the impact of additional variables (real exchange rate variability, export subsidies) could not be carried out. Two versions of the real exchange rate have been used: firstly, the nominal rate (Cruzeiros per US dollar) multiplied by the ratio of US and Brazilian wholesale price indices for footwear (RERFW), secondly, the nominal rate multiplied by the ratio of US and Brazilian wholesale price indices for all products (as an indicator of the effect of exchange rate policy in general),¹ with the relative prices of footwear in Brazil and the US included as separate independent variables. The second version did not add significantly to the explanatory power of the first (F-test), and is, therefore, not reported. All variables except the time trend were used in logarithmic form. The following estimate was obtained:

$$\begin{aligned}
 [1] \ln XRFW &= -54.58 + 0.19 \ln RERFW + 0.42^{**} \ln RERFW_{-1} \\
 &\quad - 1.23^{**} \ln DD + 0.032T \\
 SE &= 0.097 \quad \bar{R}^2 = 0.969 \quad D.W. = 2.04 \\
 \text{degrees of freedom} &= 9 \\
 \ln RERFW_{-1} &= \ln RELFW \text{ lagged one period} \\
 &^{**} \text{ Significant at the 5 per cent level}
 \end{aligned}$$

This estimate confirms the hypothesis that fluctuations in the real exchange rate for footwear had a significant impact on footwear exports. It underlines the importance of maintaining an exchange rate regime that is sufficiently flexible to prevent an overvaluation of the Cruzado.²

¹ The real exchange rate is calculated in relation to the US dollar rather than a basket of currencies because firstly, the Cruzeiro was pegged to the dollar, and secondly, the US received the lion's share of footwear exports from Brazil.

² The importance of the real exchange rate is also emphasized frequently by the footwear producers themselves [cf. e.g. ADICAL, 1988; 1989].

Exchange rate policy may also affect the destination of exports. With the Cruzeiro pegged to the US dollar, the fluctuations in the real exchange rates between European currencies and the US were translated fully into shifts in the relative profitability of Brazilian exports to Europe versus the US. Thus it is to be expected that the marked depreciation of European currencies versus the US dollar in the first half of the 1980s, for example, had a detrimental effect on Brazilian footwear exports to Europe and, therefore, on the diversification of footwear exports away from the US market.¹

This hypothesis has been tested with respect to the destination of 1973 to 1987 footwear exports from the state of Rio Grande do Sul, measured in physical terms (number of pairs). The shares of the US, the UK, West Germany, and France (SUS, SUK, SWG, SF) are related to the respective real exchange rates (wholesale price index of European country divided by the product of the US wholesale price index and the nominal exchange rate of European currency to the US dollar). The results are reported in Table 32. As the specification is of an "ad hoc" character rather than based on a full structural model, two functional forms (simple linear and logarithmic) have been estimated. Except in the case of France more than half of the variation in the dependent variables is explained by exchange rate fluctuations. Hence, the hypothesis is confirmed that real exchange rate fluctuations between the European currencies and the US dollar had a negative impact on the regional diversification of footwear exports from Brazil.²

This raises the question of whether a peg of the Cruzado to a basket of currencies or a freely floating exchange rate rather than the present peg to the US dollar could alleviate this problem. As long as trade with the US (and with countries whose currencies are pegged to the US dollar) occupies a preeminent position in Brazil's foreign trade, a different exchange rate regime would probably only have a very limited effect. To assess the implications of such a policy change fully would be

¹ The destination of footwear exports from Brazil, in particular the excessive reliance on the US market and the desirability of export market diversification, are discussed in Section V. 1. b. β .

² The US share in footwear exports from Rio Grande do Sul declined from 91 per cent in 1973 to 62 per cent in 1980 but increased again to 91 per cent in 1985. In 1987 it was still at 83 per cent.

Table 32 - Real Exchange Rates and the Destination of Footwear Exports from Rio Grande do Sul, 1973-1987: Regression Results

Dependent variable	Independent variables				Test statistics			
	constant	RERUK	RERWG	RERF	degrees of freedom	SE	\bar{R}^2	D.W.
SUS	140.7***	-.446**	-.750*	.414	9	4.8	.744	2.42
SUK	-19.1***	.299***			12	2.7	.592	.53
SWG	-8.27***		.135***		12	1.5	.552	.79
SF	-.554			.028*	10	.75	.191	1.19
all variables in logarithmic form								
SUS	8.11***	-.540**	-.750	-.433	9	.061	.755	2.42
SUK	-15.2***	3.81***			12	.442	.539	.38
SWG	-20.9***		4.92***		12	.453	.751	1.02
SF	-7.92**			1.90**	10	.456	.369	1.02
*** (**; *) Significant at the 1 (5; 10) per cent level.								
Data sources: ACI-NH [1987]; IMF (International Financial Statistics).								

Source: Own calculations.

beyond the scope of this study. It is nevertheless an issue of considerable importance for all developing countries and merits further research.

3. Policies Affecting Input Markets

a. Labour Market Policies

Labour market policies may affect the international competitiveness of labour-intensive industries in two ways. On the one hand, they may increase the cost of labour in general relative to other factors of production. This occurs, for example, when wage supplements are increased. On the other hand, the structure of wages may be altered, e.g. through minimum wage policies which raise the wage of unskilled relative to skilled labour. This section assesses the impact of both types of policies on labour-intensive industries in Brazil.¹

¹ Cf. Spinanger [1988] for a more extensive description of Brazilian labour market policies.

Regarding the evolution of wage supplements, data available from Picht [1987, Table A3] indicate that between 1975 and 1985 indirect relative to direct labour costs in Brazilian manufacturing industry were subject only to minor changes. The same applies to other important producer countries such as Hong Kong, South Korea, Japan, and the US. West Germany registered a strong increase (from 56 per cent in 1975 to 77 per cent in 1985), while in Spain indirect wages declined from 51 to 40 per cent of direct wages. Hence, there is no evidence that until the mid-1980s Brazil's competitiveness in labour-intensive industries was negatively affected by policies that raised labour costs in general.

However, Brazil's new constitution, which was adopted in October 1988, contains a variety of clauses that may lead to increases in labour costs, especially in the industries under analysis. Estimates by Conjuntura Econômica [b, p. 40; c, p. 39] indicate that for total manufacturing the shorter working week, extended maternal leave, child care facilities, longer holidays, more restrictive provisions for lay-off, unemployment insurance, etc. raise indirect labour costs from 92 per cent so far to 123 per cent of direct wages. Hence, these provisions in the new constitution could ultimately increase total labour costs in manufacturing by 17 per cent. Unpublished data from FIESP indicate that in the textile and footwear industries, where working hours are still relatively long (44 to 48 hours per week in early 1988), the reduction in the working week will have a more pronounced effect on effective wages than in total manufacturing. It would increase labour costs by 14 and 23 per cent of direct wages instead of 11 per cent for all manufacturing. If these cost increases are not compensated for in other areas, such as through increased productivity or a fall in real wages due to inflation, Brazil's competitiveness in labour-intensive industries could be harmed in the future.

The impact of minimum wage policies on labour costs at any one point in time can only be determined in relation to the equilibrium wage rate for unskilled labour, which is difficult to estimate due to conceptual as well as data problems. Therefore, this analysis is restricted to the impact of changes in the real minimum wage. It is examined whether the minimum wage has risen relative to the average wage in each industry (or, inversely, whether the average wage has declined as a multiple of the minimum wage). By rendering unskilled labour relatively more ex-

pensive this would have constituted an incentive (*ceteris paribus*) for labour-saving rationalization. Table 33 demonstrates that no such development occurred during the 1972-1984 period for which data on the average wage per employee are available. On the contrary, the average wage per employee (including supplements) as a multiple of the minimum wage tended to increase in all four industries under consideration. Hence, no evidence is found that rises in the minimum wage since the early 1970s have seriously distorted the wage structure and thereby harmed economic activities that rely extensively on unskilled labour.¹

b. Machinery

It has been concluded in Section III.2.a that capital costs in the Brazilian textile industry substantially exceeded those in other producer countries. To a large extent this has been found to be a consequence of

Table 33 - Average Wages per Employee in Labour-Intensive Industries as a Multiple of the Minimum Wage in Brazil, 1972-1984

	Textiles	Clothing	Leather	Footwear
1972	2.1	1.7	2.1	1.7
1973	2.1	1.7	2.0	1.8
1974	2.3	2.0	2.2	2.0
1975	2.6	2.2	2.6	2.2
1976	2.4	2.1	2.1	1.9
1977	2.2	1.9	2.2	2.0
1978	2.3	1.9	2.3	2.0
1979	2.5	2.0	2.6	2.0
1980	2.4	1.7	2.1	1.9
1981	2.6	na	2.4	na
1982	2.8	1.9	2.5	2.0
1983	2.9	2.2	2.5	1.9
1984	2.7	1.9	2.6	2.1

Source: Conjuntura Econômica [d]; IBGE [c, 1981-1984]; UNIDO [1988]; own calculations.

¹ This conclusion is supported by rather detailed information on the structure of wages paid by a large (and very successful) integrated textile and clothing producer. In that company wages as a multiple of the minimum wage have grown substantially since 1970 for employees of all skill levels.

high real interest rates. However, it has been shown in Section IV.2.c that the prices for machinery in Brazil, particularly for technologically sophisticated equipment, were also much higher than in the world market. This section investigates whether the international competitiveness of labour-intensive industries in Brazil was harmed because they faced relative high prices for equipment, or because they used machinery that was technologically out of date.¹

The prices of machinery in Brazil were driven up by the protection of the domestic mechanical engineering industry: Imports of equipment that could be produced locally were prohibited with little regard for costs (law of similars). Various duties and taxes raised the price of all other imported machinery far above the world market level. In principle, this policy must have affected the purchase of machinery by all branches of manufacturing. Hence, it should have harmed predominantly the competitiveness of fixed capital-intensive rather than labour-intensive industries. Of the industries under consideration the textile industry should have suffered most, given its relatively high physical capital intensity.

However, extensive exemptions from import duties and even from the application of the law of similars were available to priority sectors (such as basic industries in the 1970s), to exporting firms, or to firms investing in north-eastern Brazil. Concerning labour-intensive industries only the footwear industry was apparently included in the list of priority sectors issued by the Industrial Development Council since the mid-1970s [Tyler, 1981, p. 41; USITC, 1985, p. 67].² Many leather and footwear producers as well as some textile firms have apparently benefitted from the rule that allows roughly 10 per cent of each year's increase in export revenues over the previous year to be used for the importation of equipment (with few restrictions). In addition, a large proportion of new capacity in the textile industry has been set up in the north-east since the mid-1970s. Overall, it is nevertheless plausible to conclude at this

¹ Technological backwardness may have arisen because finance for investment in modern machinery was both scarce and expensive (Section III.2.c).

² In an interview with the author the owner of a large tannery stated that the tanning sector, as a major supplier of the export-oriented footwear industry, was often able to import equipment at reasonable conditions.

point that the protection of domestic machinery production has probably harmed the international competitiveness of those labour-intensive sectors that were relatively fixed capital intensive, or initially oriented mainly towards the domestic market (i.e. the textile and clothing industries).

The domestic machinery industry in Brazil will tend to be more efficient if the machinery to be produced is relatively unsophisticated and technology easy to acquire, and if the domestic market is large enough to realize economies of scale. The international competitiveness of domestic machinery production may be assessed by comparing Brazilian exports and imports of textile, clothing, leather, and footwear machinery. Even if demand in Brazil is biased towards relatively unsophisticated machinery, compared to industrialized countries, it is plausible to assume that an efficient machinery industry should be able to export to countries with similar factor price relations (such as in Latin America). Table 34 shows that exports of only a few types of machinery (industrial washing and dyeing machines, industrial sewing machines, footwear machines) were significant compared with imports in the mid-1980s. Supplementary information [Eubel, 1986] indicates that in the area of leather working machinery Brazil imported mainly large splitting machines, which until recently were not produced domestically at all and, therefore, faced less stringent import barriers. Therefore, Brazilian production of the remaining types of leather machinery is likely to have been reasonably efficient, given that exports were of significant value. Exports of spinning and weaving machinery remained very small compared to imports, suggesting a lack of competitiveness [cf. also Janowitz, 1988, p. 146].¹ To summarize, these data indicate that the domestic machinery industry in Brazil was most inefficient in the area of spinning and weaving machinery, whereas domestic production of footwear and leather working equipment was either of acceptable standard, or was replaced by imports.

Little quantitative information exists on the state of technology in labour-intensive industries in Brazil, rendering it difficult to assess the

¹ In part this may have been a result of low scale efficiency. One expert indicated that there are currently four firms in Brazil, each producing a few hundred automatic looms annually, whereas the international standard is between 1000 and 2000 per year, and the world market leader produces about 6000.

Table 34 - International Trade in Machinery for the Textile, Clothing, Leather, and Footwear Industries in Brazil, 1971-1987

	Textile machinery				Sewing machines for industrial use		Leather working machinery	Footwear machinery
	spindles	looms	parts, accessories	finishing (washing, dyeing; except for domestic use)	for fabrics	for leather		
	84.36	84.37	84.38	parts of 84.40	parts of 84.41	84.41.03	parts of 84.42	84.42.04
1971	0.1	0.7	1.0	0.8	0.5	0.0	0.0	na
1972	na	na	na	na	na	na	na	na
1973	0.5	0.4	1.7	0.7	1.4	0.0	0.0	na
1974	1.2	1.2	3.3	0.6	1.8	0.0	0.1	0.0
1975	1.5	1.0	2.1	0.8	1.7	0.0	0.1	0.0
1976	1.4	0.4	1.5	1.7	2.3	0.0	0.2	0.1
1977	2.5	0.8	0.9	2.3	4.2	0.1	0.9	0.3
1978	na	na	na	na	na	na	na	na
1979	3.1	0.6	1.9	1.5	6.6	0.0	0.6	0.2
1980	5.4	1.2	3.5	1.8	11.1	0.2	0.7	0.1
1981	5.2	2.0	3.9	5.5	10.4	0.1	0.9	0.3
1982	4.6	0.6	3.0	1.3	9.0	0.1	0.9	0.4
1983	1.5	0.1	2.3	1.4	9.4	0.1	0.2	0.5
1984	4.4	1.1	2.9	2.0	12.4	0.2	0.2	0.5
1985	4.7	2.0	2.1	2.4	9.9	0.1	0.2	0.4
1986	1.0	0.5	1.9	12.4	10.2	0.3	0.4	0.6
1987	1.0	0.4	2.6	5.1	11.9	0.3	0.6	0.7
	imports NBM(a)							
	84.36	84.37	84.38	parts of 84.40	parts of 84.41	84.41.03	parts of 84.42	84.42.04
1971	35.3	17.8	14.3	6.6	6.5	1.1	1.7	0.1
1972	na	na	na	na	na	na	na	na
1973	55.0	46.2	21.9	10.4	14.2	1.6	5.2	0.3
1974	76.3	53.5	32.0	16.3	19.3	3.4	4.1	3.1
1975	101.5	65.3	35.8	17.4	19.3	2.5	4.8	1.2
1976	64.9	43.3	25.4	7.0	19.0	2.4	3.6	0.9
1977	na	na	na	na	na	na	na	na
1978	46.2	12.1	28.7	4.1	27.5	2.6	3.1	0.8
1979	43.6	23.3	37.3	5.9	31.6	2.7	3.1	1.4
1980	48.4	43.3	42.4	6.3	28.3	2.9	3.4	2.2
1981	25.9	34.5	27.6	5.0	15.4	2.9	2.1	1.2
1982	18.7	29.2	22.3	na	na	na	na	na
1983	4.1	16.6	15.1	1.5	11.4	1.3	0.8	0.7
1984	2.1	5.8	14.1	1.3	7.0	2.9	0.7	0.5
1985	17.9	19.3	21.9	1.4	11.4	3.8	1.2	1.1
1986	35.3	36.2	31.5	2.7	26.1	4.9	3.1	1.2
1987	36.6	58.2	43.3	4.5	24.2	4.3	7.7	1.7

(a) fob, mill. US \$.

Source: Banco do Brazil/CACEX [a, various issues]; Ministerio de Fazenda [various issues].

impact of the protection of domestic machinery production. Internationally comparable data are only available on the technological standard of the Brazilian textile industry. The focus is on the production of cotton yarns and fabrics (including similar synthetic fibres) because they constitute the lion's share of output in Brazil. The most important innovations in textile machinery in recent years have led to the creation of two new types of equipment: open-end rotors in spinning, and shuttle-less looms in weaving are replacing traditional equipment in various applications. Hence, the shares of rotors in spinning capacity, and of shuttle-less in total looms may be looked upon as indicators of the technological standard of an industry (Table 35).

However, in many applications conventional spindles still compete effectively with open-end rotors [Toyne et al., 1984, p. 38]. Therefore, the share of spinning capacity that is less than ten years old is used as an alternative indicator of the degree of modernization. This indicator is subject to some uncertainties because the available data for spinning machinery shipments do not cover all machinery manufacturers. However, the share of open-end rotors and the age structure of machinery together should provide a realistic picture of the technological standard of the spinning industry in Brazil (Table 35).

The share of modern machinery in 1986 spinning capacity in Brazil was lower than in Hong Kong, but almost as high as in West Germany and higher than in the remaining industrialized countries in the sample. The low values for this group coincide with the deteriorating competitiveness of yarn exports from industrialized countries (Table 13). New spinning capacity (cumulative shipments) in Brazil used mostly conventional technology, with open-end rotors accounting for only 4.0 per cent of capacity in 1986 (versus 42.0 per cent in Hong Kong and 16.7 per cent in West Germany). The adoption of shuttle-less looms in Brazil also progressed slowly. They represented only 4.7 per cent of all looms in Brazil in 1986, compared to 32.2 per cent in Hong Kong and 55.0 per cent in West Germany. Even in "new" capacity (cumulative shipments 1977/86) shuttle-less looms accounted for only 36.4 per cent in Brazil, compared to, for instance, 90.3 per cent in Hong Kong.

These data suggest that Brazil adopted new textile production technologies more slowly than other NICs, especially Hong Kong and Taiwan. Since new types of equipment normally had to be imported, this is prob-

Table 35 - Adoption of Major Technological Innovations in the Textile Industry in Selected Countries, 1977-1986

	Spinning				Weaving		
	share of open-end rotors in spinning capacity(a)			degree of modernization: share of cumulative shipments 1977-1986 in 1986 capacity(b)	share of shuttle-less looms in total looms		
	1977 (a)	1986 (a)	cumulative shipments 1977-1986		1977	1986	cumulative shipments 1977-1986
US	3.1	8.7	68.9	11.5	9.8	43.5	93.3
West Germany	4.9	16.7	50.7	33.4	na	55.0	94.7
Japan	5.4	6.4	15.5	13.7	3.4	14.0	65.1
Italy	4.3	9.4	26.1	53.7	7.9	51.5	96.8
Spain	10.2	9.8	42.7	23.4	na	30.2	88.6
Portugal	1.6	4.8	19.0	24.0	na	27.7	85.1
Turkey	1.0	6.2	28.5	21.6	2.0	9.6	65.2
Brazil	1.7	4.0	9.0	31.0	0.8	4.7	36.4
South Korea	1.3	2.9	6.5	41.0	0.7	12.3	19.9
Hong Kong	17.6	42.0	81.5	94.7	1.3	32.2	90.3
Taiwan	2.9	7.6	24.5	30.2	2.7	30.6	67.0
Thailand	0.3	1.8	10.9	16.9	0.3	1.2	25.3
China	na	1.5	57.9	2.1	na	1.4	91.1
Pakistan	1.0	2.6	18.2	16.7	0.2	15.2	13.7
Egypt	na	2.9	13.1	37.6	na	5.7	28.1

(a) Year end. - (b) One rotor is taken to correspond to three conventional spindles [Toyne et al., 1984, Table 5.18].

Source: ITMF [a, Vol. 21, 1978; 30, 1987; c, Vol. 3, 1987].

ably a consequence of the protection of the domestic machinery industry. The age structure of machinery was also relatively unfavourable,¹ probably reflecting sharply reduced investment in the textile industry since the mid-1970s [cf. Table 36 below; Knight, 1988, p. 9; Cortopassi, 1987,

¹ Internationally comparable data are only available for spinning machinery. However, this conclusion should apply even more strongly to the weaving sector. Trade estimates indicate that of the roughly 160000 looms in Brazil about 130000 are more than 10 years old. Of these, many are non-automatic looms, which may safely be described as obsolete.

p. 112]. Technological backwardness was more pronounced in the weaving subsector than in spinning.

Production technology in the leather and footwear industries in Brazil was probably more up to date than in the textile industry. According to an opinion survey conducted by the Centre of Industrial Studies of the Getúlio Vargas Foundation in October 1987, textile firms accounting for 72 per cent of the turnover of the sample considered their branch technologically backward in relation to industrialized countries [Gonçalves de Oliveira, 1988]. In the clothing and footwear industry combined that share was 50 per cent; however, in the footwear industry alone it was only 26 per cent and 24 per cent in the leather and leather goods industry. The corresponding figure for all manufacturing industries was 39 per cent.

The results of such an opinion poll are obviously subject to numerous uncertainties and, therefore, do not represent a precise description of the state of technology. However, the very wide difference between the figures for the textile and clothing industries on the one hand, and leather and footwear on the other, can be taken as evidence that in the former industries production technology is significantly more backward than in leather and footwear.¹ These industries are also those where the impact of the protection of domestic machinery producers has been found to have been less harmful, and they were more successful exporters than the textile and clothing sectors. Hence, the use of up-to-date machinery and adoption of new technology were probably preconditions for international competitiveness.

The technological backwardness of large parts of the Brazilian textile industry may be traced to the investment pattern of the last twenty years (Table 36). From 1966 through 1975 the textile industry accounted for more than 7 per cent of total investment in manufacturing industry; in 1976 that share dropped to less than 5 per cent, and fell even further until 1983 (1.6 per cent). Similarly, gross fixed capital formation by the textile industry in real terms rose continuously until 1975 and declined steeply afterwards. This fall in investment at a time of im-

¹ This conclusion is also supported by fragmentary evidence on the age structure of textile machinery in the state of Minas Gerais [CNIT, 1986, Appendix 5, Table 2] and of footwear machinery in the state of Rio Grande do Sul [BRDE, 1977, Table 71].

Table 36 - Gross Fixed Capital Formation in Labour-Intensive Industries in Brazil, 1965-1984

	Gross fixed capital formation in 1977 prices(a)				Shares in total manufacturing(b)		
	leather	textiles	clothing, footwear	total manu- facturing	leather	textiles	clothing, footwear
	mill. Cr\$				per cent		
1965	139	1096	261	16770	0.8	6.5	1.6
1966	101	1291	304	18103	0.6	7.1	1.7
1967	102	1492	284	17272	0.6	8.6	1.7
1968	123	2098	385	22277	0.6	9.4	1.7
1969	122	2231	694	26178	0.5	8.5	2.7
1970	177	3883	690	35163	0.5	11.0	2.0
1971	172	3825	631	42898	0.4	8.9	1.5
1972	243	5262	850	61300	0.4	8.6	1.4
1973	363	6353	1822	75472	0.5	8.4	2.4
1974	377	6830	1665	87493	0.4	7.8	1.9
1975	535	6234	1785	86479	0.6	7.2	2.1
1976	416	5589	2202	112105	0.4	5.0	2.0
1977	458	3942	1731	107587	0.4	3.7	1.6
1978	512	3941	2273	105928	0.5	3.7	2.2
1979	484	4642	2396	99715	0.5	4.7	2.4
1980	407	4593	2108	88459	0.5	5.2	2.4
1981	564	3508	2271	73323	0.8	4.8	3.1
1982	410	2309	1727	84485	0.5	2.7	2.0
1983	315	1724	2254	109637	0.3	1.6	2.1
1984	420	7861(c)	2913	84957	0.5	9.3(c)	3.4

(a) Deflator: wholesale price index/total supply (IPA/OG). - (b) Current prices. - (c) The 1984 value for textiles given by IBGE [c, 1984] is likely to be vastly overstated; Cortopassi [1988, p. 98] reports a fall in investment in machinery and equipment between 1983 and 1984.

Source: Conjuntura Econômica [d]; IBGE [b, 1970; c, 1981-1984]; UNIDO [1988]; own calculations.

portant technological innovations in the world textile industry explains the obsolescence of large parts of the Brazilian textile industry.¹ By contrast, investment in the leather and the clothing and footwear indus-

¹ This point is also made by Knight [1988, p. 8] and BNDES [1986, p. 31].

tries has followed a more stable pattern, in spite of some fluctuations. This confirms the conclusion drawn from the opinion survey cited above that in these industries (with the possible exception of clothing) technology is more up to date than in textiles.

To summarize the findings of this section, the favourable export performance of the Brazilian leather and footwear complex is reflected in a generally up-to-date stock of machinery. Obsolete equipment in large subsectors of the textile industry is in part responsible for the limited international competitiveness of the Brazilian textile and clothing industries. Restrictions on machinery imports and a lack of investment have caused most harm where fixed capital intensity is greatest, where technology is most sophisticated (spinning and weaving), and where export earnings which could have been used for the import of machinery have been small.

It is noteworthy that South Korea's performance in the adoption of innovations in textile technology was not very different from Brazil's. However, spinning machinery in that country was largely of more recent vintage than in Brazil, and the same was probably true for the weaving sector. The fact that South Korea has remained a very competitive textile exporter demonstrates that Brazil's more modest performance may have been caused mainly by the unfavourable age structure of equipment and lack of investment, rather than the slow adoption of technological innovations.

c. Raw Materials

The impact of economic policy on the prices of raw materials is reflected in the estimates of implicit effective protection presented in Section IV.2.c. Since such data are only available for 1980 and 1985, this section discusses the role of policy interventions in the markets for cotton and cattle hides in greater detail.

The production and marketing of cotton in Brazil is regulated by a variety of policy instruments, mainly subsidized credit lines and minimum prices [Duran et al., 1981a, pp. 28 ff.]. Table 37 shows that the price of cotton in Brazil has fluctuated considerably in relation to the price in the US, which is regarded as a proxy for the world market price. Al-

Table 37 - The Development of Raw Material Prices in Brazil Relative to the US, 1969-1988 (1977 = 1000)

	Cotton(a)	Hides and skins(b)
1969	na	1.08
1970	0.85	1.46
1971	0.96	1.40
1972	0.76	0.86
1973	0.61	1.06
1974	0.85	1.45
1975	1.00	1.34
1976	1.05	1.07
1977	1.00	1.00
1978	1.02	0.88
1979	1.05	0.91
1980	0.88	1.11
1981	0.99	1.08
1982	1.04	1.39
1983	1.19	1.37
1984	1.17	1.63
1985	0.99	0.92
1986	1.16	1.37
1987	na	1.06
1988	na	1.23

(a) Ratio of producer price index in Brazil, deflated by wholesale price index, and average price index in US (10 markets), deflated by US wholesale price index. - (b) Ratio of wholesale price index for leather in Brazil, deflated by general wholesale price index, and price index in Chicago, deflated by US wholesale price index. It is assumed that changes in the price of leather in Brazil reflect mainly changes in the price of raw hides.

Source: Conjuntura Econômica [d]; IMF, International Financial Statistics, various issues; own calculations.

though these fluctuations render it difficult to identify a long-term trend, it can be stated with some confidence that the ratio of the price in Brazil to that in the US has increased moderately between the first half of the 1970s and the mid-1980s.

No information is available on the level (as opposed to the development) of cotton prices in Brazil relative to the world market. However, exports of raw cotton over the years were considerable (Table 3), and firms exporting textiles could import cotton (in principle, at least)

through the drawback scheme. Hence, the modest international competitiveness of the Brazilian textile and clothing industries was probably not caused by high domestic prices for cotton.¹

The fluctuations in the price of raw hides in Brazil relative to the US (Tables 37 and A14) were more pronounced than in the case of cotton. No long-term trend can be identified. Between 1970 and 1976 and again after 1981 the relative price was rather high compared to the period in between. The availability of raw hides depends primarily on meat consumption, whose development, in turn, depends on disposable income. Since 1973 there have been frequent complaints, especially by the footwear industry, about the scarcity of leather in Brazil due to a lack of raw material [FUNCEX, 1984]. As a result, export quotas for leather were enforced for extended periods. In recent years these restrictions affected mainly leather wet blue, while exports of semi-finished or finished leather were left unregulated. Also since the mid-1980s leather imports have been allowed to increase substantially (Table 4).

Only very limited information is available on the price level in Brazil relative to the US because of differences in the quality of hides. In the first quarter of 1987 the price level in Brazil was probably rather close to that in the US, after exceeding it marginally in 1986 (data provided by AICSUL). Given the evolution of the relative price between Brazil and the US (Tables 37 and A14), it can be concluded that until about 1982 the footwear industry in Brazil frequently benefitted from a relatively low domestic price for leather (assuming that changes in the price of raw hides were the main determinant of variations in the price of leather). Since the mid-1980s, however, the price of leather in Brazil has probably fluctuated around a level fairly close to the price in the US. There is no indication that footwear exports from Brazil suffered as a result.

This experience suggests that a full liberalization of Brazil's foreign trade in hides and leather could resolve the frequent frictions between the representatives of the footwear and leather industry, the former lobbying for a liberal handling of leather imports and restrictions on exports, and the latter demanding the opposite. Unrestricted imports of

¹ This conclusion is supported by the international comparison of yarn production costs presented in Figure 1 and Table A14.

leather would ensure the international competitiveness of the footwear industry, all the more so as its main competitors (South Korea and Taiwan) depend on the world market for a significant proportion of their raw material supply (Table 9) and, consequently, would face the same raw material price. On the other hand, unrestricted exports of leather from Brazil would ensure that the profitability of the tanning industry and, hence, investment in necessary modernization do not suffer from artificially depressed domestic prices. The steps towards a more liberal import regime and less restrictive export quotas undertaken in recent years are, therefore, well-advised.

4. An Explanation of the Export Performance of Labour-Intensive Industries in Brazil

In the previous three sections the role of various determinants of the international competitiveness of labour-intensive industries in Brazil has been analysed. In Section IV.1 it has been concluded that Brazil has a comparative advantage in labour-intensive manufacturing activities. However, trade and exchange rate policies as well as regulations affecting input markets have frequently discriminated against labour-intensive industries (Sections IV.2 and 3). Although the textile industry was hit hardest, the policy environment for the remaining industries must also be described as unfavourable. This explains in large measure the modest export performance of the textile and clothing industries. However, the question remains to be answered of how the leather and footwear industries could become successful exporters in spite of adverse political conditions.

It has already been emphasized that the competitive strength of firms producing differentiated goods depends crucially on their performance in non-price attributes such as quality, design, speed of delivery, etc. (Section III.3). Successful exporting, therefore, requires an intimate knowledge of the market to be served, considerable managerial ability, and sophisticated logistics. Hence, the differences in export performance between the textile and clothing industries on the one hand and the leather and footwear complex on the other may be related to the firm structure or other industry-specific factors that determine performance

in the non-price parameters of competitive behaviour. This hypothesis is investigated in this section.¹

a. Firm-Level Determinants of Export Behaviour

The determinants of the export behaviour of individual firms in Brazil have been analysed extensively by UN/ECLAC [1985]. This study is based on 1978 data from 12435 firms of which 3345 registered at least some exports.² Two separate questions are addressed:

- Which parameters determine the probability for a given firm to export (i.e. the number of exporters in an industry)?
- Once a firm has begun to export, which factors determine the share of exports in its total sales (i.e. the extent to which exporting firms concentrate on the export market)?

The study finds [ibid. pp. 31 ff.] that the probability for a given manufacturing firm to export is greater

- for larger firms (in terms of total sales) because of the fixed cost of entry into the export market;
- for firms with low capital intensity (Lary measures of total, human, and physical capital intensity), presumably due to Brazil's comparative advantage in labour-intensive products;
- for firms with high advertising expenditures relative to domestic sales; these indicate a high degree of product differentiation, which may be associated with monopolistic competition and excess capacity;
- for firms with foreign licensing or capital.

¹ Of course price competitiveness may also be related to characteristics such as firm size, e.g. in the presence of economies of scale. However, no evidence has been found that Brazilian firms are significantly smaller than the minimum efficient scale in the textile, clothing, leather, and footwear industries.

² Unfortunately such an analysis of firm behaviour is available only for one year (1978). It is, therefore, impossible to determine whether the export behaviour of firms has changed as a result of the rapid growth of manufactured exports from Brazil since the late 1960s. The year 1978 lies approximately in the middle of the period that is analysed in this study (late 1960s to late 1980s). The export behaviour of firms in that year may, therefore, be considered representative of the whole period.

Separate logit regressions with the same explanatory variables have been run for firms in each industry. With respect to labour-intensive industries it has been found that

- the probability of exporting increases substantially with total sales in all four industries (textiles, clothing, leather, and footwear);
- advertising plays an important role in textiles and clothing but not in footwear;
- capital intensity has a strong negative impact on the probability of exporting only in the footwear industry.

The following factors are found to improve export performance, i.e. the share of exports in the total sales of exporting firms (OLS regressions; UN/ECLAC [1985, pp. 43 ff.]):

- low (!) domestic sales and (to a lesser extent) a high number of establishments per firm; the implication is that small firms and those with diversified activities need to export a large share of their output in order to cover the cost of export marketing;
- high (!) physical capital intensity;
- high advertising expenditures relative to domestic sales;
- high export subsidies and a low implicit tariff;
- a low degree of vertical integration, presumably because firms concentrate on what they can do most efficiently;
- foreign licenses or capital.

On the basis of these results as well as the findings presented in Sections IV.1, IV.2, and IV.3, the following two paragraphs provide an explanation of the export performance of the textile, clothing, leather, and footwear industries in Brazil.

b. Conclusions: Textiles and Clothing

It has been found in Section III.1 that the overall export performance of the Brazilian textile industry was relatively modest. The sample data [UN/ECLAC, 1985] suggest that this reflected a high inclination to export (43.9 per cent of textile companies were exporters, compared to 26.9 per cent in total manufacturing) together with a low share of exports in exporters' total sales (14.8 per cent versus 15.3 for total manufacturing; Table 38).

Table 38 - Firm-Level Determinants of the Export Performance of Labour-Intensive Industries in Brazil, 1978

	Textiles	Clothing	Leather	Footwear	All manu- facturing
Sample size	859	639	594	272	12435
Share of exporters in sample					
Total	43.9	16.3	21.7	50.0	26.9
By size class(a)					
I	-	-	0.5	-	0.6
II	-	8.0	1.3	-	2.1
III	5.0	2.0	6.9	8.3	4.2
IV	13.3	6.2	21.4	25.0	7.4
V	12.4	10.6	20.6	36.2	14.9
VI	26.8	20.9	56.4	64.5	25.9
VII	48.4	27.8	92.1	69.4	39.8
VIII	74.9	47.7	94.1	81.8	61.9
Exporters					
Exports/sales ratio (mean)	14.8	11.4	23.6	45.2	15.3
Spearman rank corre- lation coefficients:					
Exports and domestic sales	0.27***	0.22**	0.36***	-0.17	0.30***
Export share and total sales	0.07	-0.03	0.14	-0.01	-0.02
Export share and domestic sales	-0.17***	-0.22**	-0.19**	-0.67***	-0.23***
*** (**) Significant at the 1 (5) per cent level.					
(a) Size classes (sales in mill. Cr\$): I: < 2; II: 2-4; III: 4-8; IV: 8-12; V: 12-25; VI: 25-50; VII: 50-100; VIII: > 100 (1978 average exchange rate: 18 Cr\$/US \$).					

Source: UN/ECLAC [1985, pp. 19 ff.].

The high inclination to export can be explained by the very large average size of the textile firms in the sample compared to total manufacturing [UN/ECLAC, 1985, pp. 77 f.]¹, and to a lesser extent by for-

¹ Since the sample includes only 859 of the probably almost 5000 textile companies that existed in the late 1970s, the question arises as to whether the sample was representative of the whole industry. According to the data for 1981 reported in Table A16, large firms in

ign participation in the industry (Table A15). The low share of exports in the total sales of exporting firms reflects the fact that, from the point of view of textile producers, exports and domestic sales were complementary. There is a positive rank correlation between exports and domestic sales, but a weak negative rank correlation between the export share and domestic sales (Table 38).¹ The small average export share (14.8 per cent) suggests that even most exporting firms were still predominantly inward-oriented. Entry into the export market probably presented few difficulties for the relatively large textile producers, but exports were apparently not profitable enough for output to be turned away from the domestic market.

Regarding the clothing industry, the sample data suggest that its unfavourable export performance was the result both of a low inclination to export (share of exporters in sample firms: 16.3 per cent), and a low share of exports in the turnover of exporting firms (11.4 per cent). The

the textile industry accounted for a larger share of the number of firms and turnover than in clothing, leather, and footwear. However, the share of large textile companies in the turnover of all large manufacturers (6.9 per cent) hardly differed from the share of textiles in total manufacturing turnover (7.0). This suggests that the average turnover per firm in the textile industry was not dramatically higher than in total manufacturing. Therefore, the underrepresentation of small firms in the sample [UN/ECLAC, 1985, p. 61] probably leads to an overestimation of firm size in the textile industry relative to total manufacturing. - Similarly, the share of exporters in the sample is probably much higher than in the industry as a whole. One interviewee stated that in the second half of the 1980s only about 100 out of a total of 5000 textile companies were strongly and permanently involved in export markets, and a further 100 were occasional exporter. Even if this is an understatement, the share of exporters in 1978 should not have exceeded 40 per cent. Apparently the small, dynamic, and export-oriented segment of the textile industry, typified by companies in the state of Santa Catarina [Tavares de Araujo, 1976, p. 24], was overrepresented in the sample, compared to the large number of traditional, relatively inefficient, inward-oriented companies that still dominate the industry. Nevertheless, it can be concluded that textile companies are on average larger than firms in other labour-intensive industries, and, therefore, should face less difficulty in bearing the fixed costs of entry into export markets.

¹ The OLS regressions (Section IV.4.a) that control for the impact of various other explanatory variables estimate the industry-specific elasticity of the export share with respect to domestic sales as negative but greater than -1: firms with high domestic sales exported a lower proportion of their output than firms with low domestic sales, but not necessarily less in absolute terms.

low share of exporters in the sample reflects mainly the small size of the average clothing firm, with sales almost one third lower than the average for all manufacturing [UN/ECLAC, 1985, p. 77]. The data reported in Table A15 confirm the great weight of small and medium-sized firms in the clothing industry. The relatively small share of exports in total sales even of exporting firms suggests that clothing (like textile) producers were predominantly oriented towards the domestic market. Hence, the anti-export bias and policy discrimination faced by the textile and clothing industries were responsible for the modest export performance of the sector in spite of Brazil's comparative advantage in labour-intensive industries.

This inward orientation is paralleled by other manufacturing industries. Research on the export behaviour of Brazilian manufacturers from a business administration point of view has found that Brazilian firms typically "do not export" in the sense of consciously marketing their products abroad. Rather they accept orders from abroad and process them through their domestic marketing and distribution channels [Cardoso, Figueiredo, 1981, p. 18; Almeida, 1983, pp. 30, 32]. Few such orders have obviously been received by the textile and clothing industries. The few reported examples of highly efficient, medium-sized firms in the knitwear and home textiles subsectors that export more than a third of their output are clearly an exception. Apparently only a few firms are efficient enough to be able to compete internationally, and specialized enough to benefit from economies of scale in their particular product variety.

c. Conclusions: Leather and Footwear

The export performance of the leather industry has been described in Section III.1 as relatively favourable. According to the sample data it reflected both a higher than average inclination to export, except on the part of rather small firms (Table 38), and a relatively large export share in exporters' total sales. The small firms with a low inclination to export probably produced mostly leather goods (rather than leather) of which Brazil is not a significant exporter. Besides, indirect leather exports in the form of exported footwear, which accounted for more than one third

of domestic leather production in the mid-1980s, must also have been considerable in the late 1970s. Therefore, the data reported in Table 38 probably even underestimate the export orientation of the leather industry.

The exceptional export performance of the footwear industry reflected both a high inclination to export (50.0 per cent) and a high export share in exporters' sales (45.2 per cent). The logit regressions [UN/ECLAC, 1985, Table 11] do not fully explain the high inclination to export: The calculated probability that the average footwear firm is an exporter (based on the various reported regressions) is considerably smaller than the share of exporters in the sample. The importance of industry-specific factors for the high inclination to export is also demonstrated by a comparison with the clothing industry. Although the values of the explanatory variables for the average firm in each industry do not differ widely, the share of exporters in the clothing industry was much lower, and is predicted fairly correctly by the logit regression model [ibid., Equations 01 and 04].

The export behaviour of footwear exporters also differed from the other labour-intensive industries as well as from total manufacturing. There is a strong negative rank correlation between the export share and domestic sales (Table 38). According to the OLS regression (Section IV.4.a) the elasticity of the export share with respect to domestic sales is lower than -1: Firms with high domestic sales exported less (in absolute terms) than firms with low domestic sales, and vice versa. It can be concluded that footwear producers tended to concentrate on either the export or the domestic market.

This raises the question of how the leather and footwear industries were able to overcome the barriers to entry into the export market in spite of the predominance of small and medium-sized firms. Since the leather industry has grown largely in response to the growth of leather footwear production (and exports), the focus will be on the latter sector. In addition, it has to be explained why many footwear producers obviously found it profitable to concentrate on export sales in spite of the protection of the domestic market.

There are strong indications that external demand played an important role in fostering footwear exports from Brazil. In the late 1960s US footwear importers began to search for new sources of supply, since

traditional exporters such as Italy and Spain could not satisfy all the demand. These importers were often chains of department stores that provided the designs to be produced and performed all marketing and distribution functions in the US themselves [Almeida, 1983, pp. 29 f.; 1986, p. 3]. Thus the Brazilian footwear producers were free to concentrate on manufacturing (narrowly defined) where they had a comparative advantage. Especially in the initial phase of export growth, the US importers also provided assistance in the fields of training, production engineering, quality control, etc., complementing skills that were particularly scarce in Brazil at the time. From the point of view of Brazilian footwear producers the distribution channels for exports were the same as for the domestic market, with the US importers taking on all the extra tasks [ibid., 1983, p. 30].

Today a number of large Brazilian firms design their own models and have set up their own marketing strategies and distribution networks, especially for their exports to Europe. However, it has been estimated that in the second half of the 1980s 85 per cent of Brazilian footwear exports to the US were still marketed by US importers.¹

These demand factors could not have induced strong export growth in Brazil's footwear industry without favourable supply conditions. Most footwear exports come from the Vale dos Sinos region in the southern state of Rio Grande do Sul. The following factors were probably instrumental for the successful entry into the export market in the late 1960s:

- Because of a long tradition of leather and footwear manufacture [Santos, 1989, pp. 4 ff.] there was a sufficient labour supply with the necessary technical skills; at the same time wages in this fairly rural area (at the time) were relatively low.
- Geographical distance to the main domestic markets in south-eastern Brazil together with strong competition from regional producers there (Table 39) precluded output growth directed towards the domestic market. In addition, weak domestic demand in the late 1960s created

¹ The role of foreign importers in the development of Brazilian footwear exports parallels the experience of the South Korean and Taiwanese footwear industries [Levy, 1988, pp. 4 ff.]. The development of marketing and design capabilities in the Brazilian footwear industry conforms rather closely to the stages of export marketing described by Wortzel and Wortzel [1981].

some interest in the possibility of exporting [Almeida, 1983, p. 29; Santos, 1989, pp. 6 f.].

- In 1963 an annual trade fair (FENAC), the first in Brazil, was established in Novo Hamburgo, the main town of the Vale dos Sinos. This fair provided an important focus for the domestic marketing efforts of regional producers as well as a starting point for foreign importers researching the export potential of the industry.
- Footwear production needed reliable supplies not only of leather but also of a wide variety of machinery and other intermediate products and raw materials (e.g. glue, thread, rubber soles, etc.). Increasingly close co-operation was required between the producers of all these goods. The long tradition of leather and footwear manufacture meant that many suppliers were concentrated in the area. Today the Vale dos Sinos (or, more precisely, the area within 50 kilometres of Novo Hamburgo) is the second largest agglomeration of footwear-related industries in the world (the largest being located in Taiwan).¹

Hence, the conditions for exports of leather footwear in the Vale dos Sinos were more favourable than elsewhere in Brazil. Production around the town of Franca in São Paulo state, for example, was much smaller, was located closer to the centres of domestic demand (São Paulo and Rio de Janeiro metropolitan regions), and was concentrated on men's shoes (rather than ladies' footwear as demanded predominantly by US importers). Conditions for producing conventional leather footwear were also more favourable than for athletic or other non-leather footwear, which were beginning to be produced in South-East Asia at roughly the same time. The skills and raw materials required to produce leather of reasonable quality were locally available, while the importation or domestic production of synthetic materials would have been difficult and expensive. Besides, the skills required for the production of leather footwear are apparently scarcer globally than those needed, for example, in clothing production. This hypothesis is supported by the concentration ratios in international trade (Table A17) which are considerably higher for footwear than for the more important categories of clothing exports (outerwear not knit, undergarments knitted).

¹ Cf. Banco do Brasil/CACEX [b, Table 2], on the geographical distribution of footwear-related firms in Brazil.

Table 39 - Regional Distribution of Footwear Output and Exports, Brazil, 1958-1987 (per cent)

	Output					Exports	
	1958	1965	1974	1979	1987	1976	1987
São Paulo	46	45	47	31	na	18.1	na
Rio Grande do Sul	25	29	25	31	31.4	76.4	76.7
Guanabara/Rio de Janeiro	11	12	2	1	na	0.5	na
Minas Gerais	7	7	3	10	na	2.1	na
Pernambuco	3	2	5	8	na	0.0	na
Ceará	na	na	7	9	na	0.1	na
Others	8	5	12	11	68.6	2.8	23.3

Source: Conjuntura Econômica [a, p. 49; IBGE [c]; VIGA [1980, Table 45]; unpublished data provided by ACI-NH.

In the terms of UN/ECLAC [1985] the above observations indicate that the barriers to entry into export markets were relatively low even for small Brazilian footwear manufacturers. Hence, their inclination to export was higher than could be expected on the grounds of their small size. Once these firms had found that they could profitably export they were prepared to dedicate a considerable portion of their productive capacity to the export market (cf. the export share in leather footwear output, Table 5). Many small firms even concentrated exclusively on exports, as relatively large orders placed by foreign importers permitted a satisfactory degree of capacity utilization. However, footwear exports have remained limited to a small region where advantages of agglomeration, the availability of relatively scarce skills, and favourable demand conditions together prevailed over the effects of an unfavourable policy environment.

V. Prospects

1. Demand for Labour-Intensive Products

a. Income Elasticities

The competitive behaviour of firms is influenced substantially by changes in the size of their markets. With rapid growth of demand the emphasis is likely to be on expanding output, whereas in a stagnating market the emphasis will shift to maintaining and increasing market shares through product differentiation, identification of market niches, etc. Such strategies may have widely different implications for production technology and industrial organization.

Apart from population growth and changes in the age structure of the population, income growth is the most important determinant of demand in the short to medium term. Therefore, this section evaluates the income elasticities of demand for labour-intensive products. The focus is on consumer demand for clothing and footwear, which constitute the major end uses of textiles and leather. It is assumed that a close link exists between demand for intermediate inputs and final products. Raw material consumption per unit of output may of course be reduced through a more efficient utilization of fabrics and leather, e.g. with electronic nesting and cutting devices. However, this process should take place only gradually and its impact will probably be limited (cf. Section V.2.a).

Income elasticities for textile manufactures and footwear are estimated from cross-country data with apparent consumption per head in physical terms as the dependent variable (fibre weight and pairs of footwear; cf. Tables 5 and 7).¹ Hence, changes in product quality over time

¹ Various conceptual and data problems related to the estimation of demand elasticities for textiles and clothing are extensively discussed in GATT [1984, Vol. I, pp. 30 ff.]. It has also been attempted to estimate income and price elasticities from time-series data for Brazil. However, the available data on the relative prices of textiles and clothing as well as footwear show rather improbable values. According to the indices published by Conjuntura Económica, the general wholesale price index rose three times as fast as the price index for textiles and clothing between 1970 and 1987, and six times as fast as the price index for footwear. These dramatic changes probably reflect largely

are not accounted for by the data.¹

The cross-country approach will cause the income elasticity particularly of clothing demand to be overestimated to the extent to which higher textile fibre consumption in rich countries reflects a relatively cold climate rather than high per-capita income levels. As the estimates relate to a very wide range of income levels and different consumption habits, they should be regarded as relevant mainly in the long run.

The estimated demand functions are specified to include slope and intercept dummies in order to test for possible differences in elasticities between industrialized and developing countries (according to the distinction made in the FAO publications from which the data on consumption are taken):

$$[1] \quad \log ACON = f(\log RGDP; D \cdot \log RGDP; D; \text{constant})$$

where

ACON = apparent consumption per capita
 RGDP = Preal per capita GDP
 D = dummy variable: 1 for developed country

The results are reported in Table 40. Regarding per capita fibre consumption, the hypothesis that the demand function does not differ between industrialized and developing countries (i.e. that the slope and intercept dummies are jointly zero) cannot be rejected for any of the three dependent variables (at the 90 per cent confidence level; $\alpha = 0.10$). Therefore, the following discussion is based on the equations without dummies.

With an income elasticity of 0.9, per capita consumption of textile manufactures can be expected to rise almost as fast as per capita real income. Besides, total fibre consumption should increase at the same rate

changes in the product samples upon which the price indices are based. Therefore, price elasticities could not be estimated reliably. Income elasticities took values above unity irrespective of how the demand function was specified.

¹ Estimates of income elasticities based on cross-country comparisons of real expenditures [Kravis et al., 1982, Ch. 9] are reported further below.

Table 40 - Income Elasticities of Per Capita Consumption of Textile Fibres and Footwear, 1982-1984: Cross-Country Regression Results

	Income elasticity	Slope dummy (developed country)	Number of observations	SE	F	R ²	Chow test(a) F
	kg per head(b)						
Fibre consumption							
All fibres	0.90*** (25.72)	-	119	0.43	161.70***	0.85	-
Cotton	0.68*** (14.84)	-	119	0.58	209.78***	0.64	-
Synthetic fibres	1.17*** (25.91)	-	116	0.54	651.05***	0.85	-
All fibres	0.86*** (18.56)	-0.29 (-1.23)	119	0.42	226.36***	0.86	2.16
Cotton	0.64*** (10.12)	-0.01 (-0.04)	119	0.58	69.68***	0.65	0.52
Synthetic fibres	1.19*** (19.76)	-0.45 (-1.53)	116	0.54	225.18***	0.86	1.18
	pairs per head						
Footwear							
All types (1984)	0.86*** (12.09)	-	52	0.36	146.28***	0.75	-
All types (1984)	1.05*** (8.76)	-0.52** (-2.47)	52	0.34	54.87***	0.77	3.08**
Leather (1983)	0.86*** (10.72)	-	93	0.79	114.87***	0.56	-
Leather (1983)	0.67*** (5.53)	-0.19 (-0.44)	93	0.77	41.94***	0.59	2.98*
SE = Standard error; t-values in parentheses; *** (**; *) Significant at the 1 (5; 10) per cent level; two-tailed test.							
(a) Test of the null hypothesis that the intercept and the slope dummy are jointly zero. - (b) 1982.							
Data sources: Fibre consumption - FAO [a, 1985] Leather footwear - FAO [b, 1986] Footwear, all types - SATRA [1986] Real income - Heston, Summers [1988, PENN World Tables IV].							

Source: Own calculations.

as the population (apart from changes in the age or income distribution). Hence, world demand for clothing and related manufactures, even in physical terms, can be expected to grow at almost the same pace as total world income, with a large part of the increase in developing countries with rapid population growth. It follows that the Brazilian textile and clothing industries can count as a growing domestic market, provided that per capita real incomes remain at least stable.

As regards exports, demand growth in the industrialized countries, which constitute Brazil's most important customers (cf. Table 43, Section V.1.b), will be limited by per capita income growth which has been modest in recent years. In addition, Table 40 shows that the income elasticity of cotton consumption (0.68) is markedly lower than that of synthetic fibres (1.17), reflecting the higher share of the latter in industrialized country consumption (cf. Section II.3.a, Table 7). Hence, with rising per-capita incomes, demand for manufactures of synthetic fibres should grow faster than demand for natural fibres, especially cotton. The high income elasticity of synthetic fibre consumption reflects the growing importance of higher-quality yarns and fabrics consisting of a mix of fibres (cotton-polyester, wool-polyacryl), rather than one-to-one substitution of synthetic for natural fibres. The processing of fibre mixes is technologically more demanding and requires more careful preparation of natural fibre inputs. Hence, the future export performance of the Brazilian textile and clothing industries depends inter alia on whether they can modernize sufficiently to face the shift of demand towards synthetic fibres.

Footwear demand in industrialized countries (income elasticity of 0.53 for all types of footwear, and 0.48 for leather footwear) is less income elastic than in the developing world (1.05 and 0.67). Besides, demand for non-leather footwear (included in "all types") is more income-elastic than demand for leather footwear. Currently, footwear exports from Brazil are heavily concentrated on leather footwear on the one hand, and industrialized country markets on the other (cf. Tables 6 and 46). Therefore, total demand in the industry's present export markets is unlikely to grow dramatically. If the industry is to continue to expand its exports, it will either have to win market shares at the expense of its competitors, or diversify into non-leather footwear.

So far demand has been analysed purely in terms of physical quantities. Since clothing and footwear are highly differentiated products, however, an increase in income may lead not only to an increase in the quantity demanded but may also cause demand to shift towards high-price varieties. In that case real expenditures would rise faster than physical consumption.

A cross-section analysis of real expenditure data from 34 countries covered by the World Bank's International Comparisons Project, estimates the income elasticity of total clothing and footwear expenditures at close to unity (Table 41; cf. also ILO [1987, Table 3]).¹ This figure is only slightly higher than our own estimates based on fibre consumption (Table 40). However, the income elasticities of most sub-categories of clothing as well as household textiles are much higher than 1, whereas the corresponding figure for clothing materials is only 0.21 (yarns and fabrics processed and consumed within the same household). Clothing materials account for a large share of total clothing consumption in many poor developing countries, but lose importance at higher income levels. Hence, in those countries where clothing materials still constitute a large proportion of clothing expenditures, per-capita demand for clothing products can be expected to increase considerably faster than per-capita income. Demand growth in areas where final products already constitute the major part of clothing expenditures (such as in the industrialized countries) should be roughly proportionate to income growth, given the overall income elasticity of close to 1.

Cross-country income elasticities for footwear expenditures are considerably higher (1.22 for all footwear) than estimates based on physical consumption. Hence, income growth tends to lead to a shift in demand towards higher-quality footwear. Consequently, the future export performance of the Brazilian footwear industry will depend on whether producers can meet more demanding specifications.

¹ Kravis et al. [1982, Tables 9-3, 9-4, 9-5] also report own-price elasticities which are usually negative (as expected) but statistically insignificant. Also price elasticities are found to be more sensitive to the specification of the estimated model than income elasticities [*ibid.*, p. 371]. GATT [1984, p. 168, especially footnote 5] cites further studies suggesting that price elasticities are low at least in European countries, and that estimates, furthermore, are highly sensitive to specification.

Table 41 - Income Elasticities of Real Expenditure on Clothing and Footwear, 1975: Cross-Country Regression Results

	Income elasticity		Income elasticity
Clothing, footwear	1.04	Footwear	1.22
Clothing	1.02	Men's	1.10
Clothing materials	0.21	Women's	1.42
Men's	1.27	Children's	1.24
Women's	1.52	Repairs	1.12
Children's	1.57	Floor coverings	2.30
Men's, boys' underwear	1.92	Household textiles	1.58
Women's, girls' underwear	1.97		
Other	1.59		
Clothing repair, rental	1.13		

Source: Kravis et al. [1982, Tables 9-3, 9-4, 9-5].

Such cross-country estimates of income elasticities are relevant mainly for the long run. Time series of deflated clothing and footwear as well as total consumer expenditures from 1963 to 1982 are available for 26 countries and provide some clues as to the behaviour of demand in the short-to-medium term (Table 42). The growth of clothing and footwear expenditures exceeded that of total expenditures substantially in some countries (the US, Canada, the UK, Sweden), but lagged behind it in others (particularly the remaining EC countries). In all industrialized countries together clothing and footwear expenditures grew only slightly less than total consumer expenditure [GATT, 1984, Table 29]. At the same time the relative prices of clothing and footwear fell considerably in most countries, and rose only slightly in the remaining ones. The real growth of clothing and footwear expenditures in industrialized countries, therefore, must have resulted at least in part from falling relative prices (demand for whole product categories is normally own-price elastic). Hence, the income elasticity of clothing and footwear demand must have been equal to or below unity for this group of countries.¹ This figure is again roughly in line with our own cross-country estimates, and is supported by the fact that elasticity values around or below unity have also

¹ Since price data for the South European and developing countries in Table 42 are not readily available, a similar conclusion cannot be drawn for this group.

Table 42 - Deflated Expenditure on Clothing and Footwear and Total Consumer Expenditure in Selected Countries, 1963-1982

	Clothing, footwear			Total		
	1963/73	1973/82	1963/82	1963/73	1973/82	1963/82
US	4.1	4.0	4.1	4.4	2.6	3.5
Canada	4.6	5.5(b)	5.0(c)	5.6	2.8	4.3
Japan	6.9	0.3	3.7	8.7	3.0	6.0
EC (9)	3.9	0.9	2.5	4.5	2.2	3.4
Belgium	3.8	1.7(b)	2.9(c)	4.6	1.9	3.3
France	3.7	1.3	2.6	5.2	3.4	4.3
Italy	4.5	0.8	2.7	5.0	2.1	3.6
Netherlands	2.3	-0.2(b)	1.2(c)	4.9	2.0	3.5
UK	3.1	2.5	2.8	2.9	1.1	2.0
West Germany	4.5	-0.1	2.3	4.8	1.8	3.4
Austria	6.2	2.5	1.2	4.6	2.5	3.6
Finland	3.2	-1.5(b)	1.1(c)	4.7	2.4	3.6
Norway	2.1	1.6	1.9	3.5	3.2	3.4
Sweden	2.1	4.4	3.2	3.1	1.4	2.3
Switzerland	2.6	-1.7	0.5	4.2	0.8	2.6
Australia	4.0	0.8	2.5	4.9	2.7	3.9
Greece	10.6	0.9(d)	6.5(e)	7.3	3.6(d)	5.8(e)
India	-	6.7(d)	6.7(d)	-	3.4(d)	3.4(d)
Israel	-	3.5(d)	3.5(d)	-	4.0(d)	4.0(d)
Mexico	-	4.6(d)	4.6(d)	-	5.7(d)	5.7(d)
Singapore	-	7.3(d)	7.3(d)	-	7.5(d)	7.5(d)
South Korea	10.1	4.0(f)	7.8(g)	8.6	7.6(f)	8.2(g)
Spain	5.2	0.6(f)	3.5(g)	6.3	2.6(d)	4.8(e)
Thailand	-	6.8(d)	6.8(d)	-	6.6(d)	6.6(d)

(a) Average annual growth rates. - (b) 1973/81. - (c) 1963/81. - (d) 1973/80. - (e) 1963/80. - (f) 1973/79. - (g) 1963/79.

Source: GATT [1984, Table A2]; own calculations.

been obtained by a number of econometric time series studies [ILO, 1987, p. 3].

The following conclusions can be drawn from the evidence on income elasticities regarding future demand for clothing and footwear:

- In most industrialized countries per-capita demand in terms of real expenditures will grow at a slightly slower pace than real income. Since income growth will probably be modest and the population will increase only slowly, the clothing and footwear markets in industri-

alized countries may be described as "stagnating" markets. Besides, a large part of any increase in real expenditures will go towards higher quality rather than greater quantity.

- In developing countries continuing population growth will lead to significant additional demand. Real income growth will contribute to demand expansion, particularly where it is sufficient to induce and sustain a structural shift in demand, such as from clothing materials to final products, or from traditional to fashion-oriented clothing [ILO, 1987, pp. 4 f.].

So far Brazil's textile, clothing, and footwear exports have been concentrated on (stagnating) industrialized country markets. Future export performance there depends on whether the competitiveness of labour-intensive industries in Brazil will be sufficient to maintain or expand their market shares. Brazilian exports of labour-intensive products to developing countries will probably not increase dramatically although in recent years some developing countries have experienced growing national incomes and, consequently, an expansion of demand for clothing and footwear. These countries, especially first and second-generation NICs in Asia, typically have their own highly competitive textile, clothing, and footwear industries.

Improved competitiveness, however, may be of little use if protectionism by importing industrialized countries creates additional barriers to trade. The extent to which protectionism has affected labour-intensive exports from Brazil is assessed in the following section.

b. Importing Country Protectionism

Exports of textiles, clothing, and footwear from developing countries encounter a wide variety of import restrictions by industrialized countries.¹ This section analyses how Brazil's labour-intensive exports have been affected by such protectionism. Against this background the likely future impact of importing-country protectionism on labour-intensive industries in Brazil will be discussed.

¹ In the case of Brazil these sectors have been affected more frequently than most other manufacturing industries by non-tariff barriers on the part of industrialized countries [Valls Pereira, 1989, pp. 34 ff.]

a. *Textiles and Clothing*

Since the late 1950s textile and clothing exports from developing to industrialized countries (the former including, at the time, Japan) have grown substantially. The increased competitive pressure on textile and clothing industries in industrialized countries led to demands for protection, typically import quotas, to prevent a "disruption" of markets by imports. Such measures, however, were incompatible with the principles of GATT, of which most countries involved were members. Therefore, a succession of multilateral agreements have been concluded under GATT auspices that define the conditions under which restrictions on the volume of textile and clothing imports may be introduced (Short/Long Term Agreements on Cotton Textiles, Multi-Fibre Agreements (MFA) I through IV). At the same time an "orderly" growth of the market shares of controlled imports was to be assured by the rule that import quotas should rise annually by a percentage that would normally exceed the growth rate of demand for textiles and clothing. Over time, however, the coverage of the agreements in terms of fibres and products has expanded while the permitted growth rates of imports have declined. Within the framework of the multilateral agreements bilateral contracts have been concluded that specify the exact quotas, control procedures, flexibility permitted in the case that some quotas are not fully taken up while others are oversubscribed, etc.¹

The extent to which Brazilian textile and clothing exports have been held back by protectionism depends first of all on the destination of Brazil's exports (which may, of course, itself be influenced by protectionism). Table 43 demonstrates that (importing) industrialized member countries of the MFA (the US, Canada, the EC, other West European countries) received more than one half of Brazil's exports by value in 1975 and almost two thirds in 1985.² The share of the US alone more

¹ The workings of the agreements and their impact on both exporting and importing countries are exhaustively described elsewhere [GATT, 1984, especially Ch. 3; Cline, 1987, especially Ch. 6; Wolf et al., 1984; Jacobs, 1987; Giesse, Lewin, 1987; Neundörfer, 1987; Spinanger, Zietz, 1985].

² The data for the two years are not directly comparable because the 1975 figures are incomplete.

Table 43 - Textile and Clothing Exports from Brazil by Destination, 1975-1985

	1975		1979		1984		1985	
	mill. US \$	per cent	mill. US \$	per cent	mill. US \$	per cent	mill. US \$	per cent
US	46.7	12.3	87.1	11.5	245.4	21.7	229.0	25.9
Canada	15.4	4.1	14.2	1.9	53.7	4.7	55.8	6.3
Latin America	na	na	na	na	153.5	13.6	126.0	14.3
Paraguay	29.0	7.7	48.1	6.3	(40.8)	(3.6)	(40.4)	(4.6)
Bolivia	27.7	7.3	22.3	3.0	na	na	(26.4)	(3.0)
Chile	2.0	0.5	23.1	3.0	na	na	(15.3)	(1.7)
EC (10)	na	na	na	na	286.5	25.3	249.2	28.2
West Germany	74.0	19.5	123.5	16.3	(128.2)	(11.3)	(100.6)	(11.4)
Italy	16.7	4.4	57.9	7.7	(49.0)	(4.3)	(41.5)	(4.7)
Netherlands	13.7	3.6	18.7	2.5	na	na	(21.1)	(2.4)
France	3.3	0.9	23.8	3.1	na	na	(19.9)	(2.2)
UK	5.0	1.3	23.2	3.1	na	na	(18.3)	(2.1)
Belgium/ Luxembourg	16.8	4.4	20.3	2.7	na	na	(16.1)	(1.8)
Other Western Europe	na	na	na	na	67.6	6.0	46.2	5.2
Switzerland	15.1	4.0	13.5	1.8	na	na	(15.2)	(1.7)
Eastern Europe	na	na	na	na	107.6	9.5	63.4	7.2
Poland	9.6	2.5	25.2	3.3	(39.8)	(3.5)	(20.4)	(2.3)
Japan	14.2	3.8	28.4	3.8	46.7	4.1	34.7	3.9
Others	89.4	23.7	227.4	30.0	169.9	5.1	77.9	9.0
Total	378.6	100.0	756.7	100.0	1130.9	100.0	882.2	100.0

Source: Duran et al. [1981a, Table II.16]; Editora Tama Ltda. [1987]; SIFTG/ATESP [1988, Table 2].

than doubled to 25.9 per cent, whereas West Germany, which was Brazil's largest customer in 1975 (19.5 per cent of nominal export value), played a much reduced role in 1985 (11.4 per cent). Such changes in the destination of exports within the group of MFA importers probably reflect in part exchange rate fluctuations between the European currencies and the US dollar (cf. the econometric analysis of the destination of footwear exports in Section IV.2.d). In spite of the existing protectionist measures, the combined share of MFA importers in Brazil's ex-

ports has thus remained high or even increased at a time when Brazilian exports grew not only in value but also in volume terms (cf. Tables 2 and 3; MFA quotas are fixed in physical quantities). Hence, protectionism by importing countries in the past has left room for a significant increase in textile and clothing exports from Brazil.

A similar conclusion can be drawn from information on the extent to which Brazil filled its export quotas to the US and the EC. In the case of the US (Table 44) only a small percentage of trade was covered by quotas at all in 1979 and 1982, and the average quota utilization rates were far below 50 per cent. Brazil was clearly less affected by US protectionism than Asian or East European countries.

Brazil's bilateral agreements with the EC were apparently more restrictive (Table 45). More than two thirds of Brazil's textile and clothing exports to the EC were regulated by quotas in 1979 and 1982, compared to more than 90 per cent for Hong Kong and South Korea. However, quotas for Brazil covered only between 11 and 13 product categories versus between 41 and 48 for the two South-East Asian countries. The simple averages of quota utilization rates for Brazil were also relatively low, while the trade-weighted averages were similar to those for the various Asian countries. Since a few quotas had utilization rates of more than 90 per cent, it is concluded that Brazil faced fairly tight restrictions in its major export products in trade with the EC (yarns and certain fabrics [Ferro, s.a., Table 2.9]). Future export growth in these categories to the EC may, therefore, be severely restricted. However, Brazil should still be able to expand its exports of a wide variety of clothing products that are currently not effectively limited.¹

Modest economic growth rates and the relatively low income elasticity of clothing demand in industrialized countries (cf. the previous section) imply that clothing consumption there is unlikely to grow rapidly, especially in volume terms. With rising per-capita income levels, competition in terms of fashion, quality, etc. will probably intensify. Since MFA import quotas are fixed in volume terms, Brazil's ability to diversify its exports and compete more effectively in higher-value added (e.g. clothing) products should not be affected by protectionist measures in

¹ In the first half of 1989 clothing producers in Brazil filled less than 10 per cent of their EC import quota (Gazeta Mercantil, Weekly English Edition, August 14, 1989, p. 12).

Table 44 - US Bilateral Agreements under the MFA with Selected Suppliers, 1979 and 1982

	Quotas(a)		Share of total textiles and clothing trade under quota(b)			
	1979	1982	1979	1982		
	number		per cent			
Brazil(c)	18	4	26.8	12.2		
Hong Kong	28	26	73.9	75.7		
India	4	4	37.4	37.9		
South Korea	21	32	71.9	76.4		
Thailand	13	14	70.5	71.8		
Poland	36	23	49.4	64.9		
Romania	4	6	22.6	39.5		
	quota utilization					
	quotas filled over 90 per cent		average quota utilization rates			
			simple average		trade-weighted average	
	1979	1982	1979	1982	1979	1982
	number		per cent			
Brazil(c)	1	-	23.1	39.8	35.2	43.3
Hong Kong	14	20	83.4	90.8	93.1	100.0
India	1	1	70.9	80.9	93.6	75.3
South Korea	10	20	77.1	87.3	85.3	96.2
Thailand	5	4	70.2	77.3	80.9	83.2
Poland	2	2	20.2	24.2	74.2	60.5
Romania	1	3	68.3	64.4	74.4	84.9
	(a) Including specific and agreed limits. - (b) Including non-MFA trade. - (c) Agreement years do not correspond to calendar years.					

Source: GATT [1984, Table 3.14].

accordance with MFA rules. Brazil's bilateral agreements with the US apparently leave room for some export growth even in volume terms.

Clothing demand in developing countries with fast-growing populations or per-capita incomes will grow even in physical terms. Whether

Table 45 - EC Bilateral Agreements under the MFA with Selected Suppliers, 1979-1991

	Quotas(a)				Share of total textiles and clothing trade under quota(b)			
	MFA II		MFA III	MFA IV				
	1979	1982(c)	1983/86	1987/91	1979	1982		
	number				per cent			
Brazil	13	13	11	8	69.2	75.2		
Hong Kong	42	46	41	28	92.3	94.7		
India	14	14	14	10	57.6	40.8		
South Korea	44	48	46	41	89.4	95.1		
Thailand	8	11	14	15	55.4	63.3		
Czechoslovakia	na	41	39	37	na	79.3		
Hungary	33	33	32	26	61.2	60.2		
Poland	30	31	31	24	67.8	65.6		
Romania	31	32	31	28	76.5	72.6		
	quota utilization							
	quotas filled over 90 per cent			average quota utilization rates				
				simple average			trade-weighted average	
	1979	1982	1985	1979	1982	1985	1979	1982
	number			per cent				
Brazil	3	1	1	61.7	43.3	40.5	78.6	86.6
Hong Kong	11	4	na	68.2	52.6	na	90.8	79.0
India	3	3	na	66.8	51.6	na	77.4	69.6
South Korea	14	10	na	75.0	61.7	na	91.3	89.4
Thailand	2	3	na	81.6	74.6	na	89.3	82.5
Czechoslovakia	na	10	na	na	64.2	na	na	78.7
Hungary	4	1	na	54.7	32.5	na	71.4	43.2
Poland	5	1	na	68.2	32.9	na	69.1	35.0
Romania	5	5	na	57.0	50.0	na	76.0	73.4
(a) Excluding regional quotas. - (b) Including non-MFA products. - (c) Bilateral agreements between the EC and exporters on the basis of MFA II were in force through December 31, 1982.								

Source: EC [1983; 1986]; Ferro [s.a., Table 2.9]; GATT [1984, Table 3.15].

Brazilian producers can make any inroads into these markets will depend, among other things, on whether the very high rates of protection in these countries [GATT, 1984, Vol. I, pp. 121 ff.] are reduced.

β. Footwear

Footwear exports from Brazil are heavily concentrated on the US market (Table 46), which has accounted for between 67 and 91 per cent of export value since 1971. Exports to various West European countries make up most of the rest, with the UK as the largest individual customer. The focus of this section is, therefore, on protectionist measures by the US because these probably exert the most significant impact on Brazilian footwear exports.

In industrialized countries protectionism against footwear imports from developing countries has usually taken the form of export quotas as part of bilateral "Voluntary Export Restraint" or "Orderly Marketing Agreements".¹ The exporters affected by quantitative restrictions (mostly South Korea and Taiwan) typically responded by upgrading quality (and, hence, average price). At the same time non-controlled exporters increased their share of the low-price segment of the market [Chang, 1984; Pearson, 1983, Ch. 4]. Because of the opportunities for circumvention such quantitative restrictions only slowed down but did not halt structural change in the world footwear industry [Bark, Melo, 1987, pp. 22 f.].

By contrast, Brazil faced restrictions affecting mainly the price rather than the volume of its footwear exports. "Voluntary Export Price Restrictions" regulated exports to the EC in 1981, and have been maintained since then in the case of the UK. More importantly, US imports of Brazilian footwear were subject to countervailing duties from 1974 to 1983, which were supposed to compensate for the effect of various export subsidies granted to Brazilian exporters [Jeong, 1987, pp. 250 ff.]. These subsidies were calculated as 12.3 per cent of the fob price for firms with an export share in total output of 40 per cent or less, and

¹ In addition, some industrialized countries maintained relatively high import tariffs in 1983 (Australia: 27.8 per cent, Canada: 23.4 per cent; [Bark, Melo, 1987, Table 1]).

Table 46 - Footwear Exports from Brazil by Destination, 1971-1986

	1971		1975		1979		1985		1986(a)		
	mill. US \$	per cent	mill. US \$	per cent	mill. US \$	per cent	mill. US \$	per cent	mill. US \$	per cent	unit value (US \$ pair)
US	26.6	90.8	132.7	80.3	234.7	66.8	790.1	87.1	749.0	73.4	8.3
Canada	1.6	5.4	6.5	3.7	9.1	2.6	25.2	2.8	38.0	3.7	9.5
Bolivia	na	na	na	na	na	na	8.4	0.9	12.7	1.2	3.1
UK	0.3	1.1	5.9	3.6	36.6	11.3	35.4	3.9	73.5	7.2	9.5
West Germany	-	-	4.0	2.4	19.7	5.6	3.6	0.4	36.6	3.6	11.5
Netherlands	-	-	1.8	1.1	13.2	3.8	0.7	0.1	15.2	1.5	8.9
France	-	-	2.9	1.7	4.6	1.3	7.4	0.8	33.0	3.2	9.1
Denmark	-	-	1.4	0.9	9.8	2.8	0.7	0.1	6.3	0.6	10.7
Australia	-	-	1.8	1.1	6.9	2.0	8.8	1.0	6.8	0.7	7.4
Others	0.8	2.7	8.1	5.2	16.8	3.8	47.1	2.9	48.7	4.9	4.3
Total	29.3	100.0	165.2	100.0	351.4	100.0	907.4	100.0	1019.8(a)	100.0	8.0

(a) January through October.

Source: Duran et al. [1981a, Table II.9]; Banco do Brasil/CACEX data provided by ACI-NH.

4.8 per cent for firms with exports of more than 40 per cent of output. Later an administrative review by the US Commerce Department found that the countervailable subsidies amounted to 4.8 per cent in December 1979 and to 3.5 per cent in 1980. The reintroduction of the IPI tax credit in Brazil in 1981 led to an increasing threat of new protective measures by the US, which the Brazilian government headed off by levying an export tax of 8 per cent of the fob value on exports of footwear as well as textiles, garments, leather goods, plastic and rubber products [Jeong, 1987, p. 257]. By August 1986 that tax had been reduced to 2.2 per cent in line with the decline of export incentives (cf. Section IV.2.b; Banco do Brasil/CACEX [1986]). According to Jeong [1987, p. 287] the countervailing duties between 1974 and 1983 cost Brazil 3.2 bill. US dollar (1982 prices) in footwear export revenue - roughly 3 times the annual average export value in the mid-1980s. Only to a very small extent that loss was compensated for by Brazil's gains as a result of the import quotas on Taiwanese and South Korean imports.

In recent years the threat of restrictions on footwear exports from Brazil to the US has stemmed mainly from trade policy disputes between the two governments, such as over the lack of patent protection for

pharmaceutical products in Brazil or the "market reserve" for data processing equipment. Although few specific measures have materialized so far, the threat of a "punitive" surcharge of close to 100 per cent is bound to create uncertainty over the future ability of Brazilian producers to export footwear to the US market at a competitive price. This problem is exacerbated by the fact that Brazilian footwear firms are almost exclusively nationally owned and, therefore, have little bargaining power with the US government. By contrast, industries such as motor vehicles with strong US multinational involvement can defend their interests more effectively when the products to be covered by sanctions are determined by the US government.

Therefore, it is concluded that US protectionism in the form of countervailing duties, and the threat of trade sanctions have prevented an even faster growth of footwear exports from Brazil. One conceivable response by the industry is to diversify its export markets. In Western Europe, for example, Brazil has a lower market share and is, therefore, less susceptible to protectionist measures. Similarly, recent efforts to open up new export markets such as Japan or the USSR are well advised. The necessary investment in marketing and distribution channels (cf. Section IV.4.c) would probably be recovered quickly through renewed export growth and greater independence from North American importers who now frequently enjoy a substantial degree of monopoly power vis-à-vis Brazilian footwear producers.

From the Brazilian government's point of view, politically motivated trade sanctions against Brazilian exports increase the cost of domestic protectionist policies such as the market reserve for information technology. This policy has already harmed the competitiveness of manufacturing industry in Brazil severely by increasing the cost of urgently required high-technology inputs and equipment [Corsepius, Schipke, 1989]. In the light of possible retaliation a reconsideration of Brazil's own protectionism becomes even more urgent.

2. Supply Conditions

a. Technological Progress and Brazil's Future Competitive Position in Labour-Intensive Industries

Technological progress may involve either the development of new products or improvements in the production processes for established products. In the past both, product and process innovations had a major impact on labour-intensive industries worldwide. Among product innovations, the introduction of synthetic materials as an alternative to the use of natural raw materials (natural fibres, leather) featured prominently. Process innovations played an important role for example in the textile industry, where open-end spinning rotors and shuttle-less looms reduced the labour, building space, and time requirements of manufacturing operations. Besides, international transport costs declined as a result of larger ships, containerization, and larger and more fuel-efficient planes.

These trends will probably continue in the future. In addition, a major impulse for technological progress will come through the application of microelectronic technology. Its introduction will transform various stages of the manufacturing process (e.g. use of computer-aided design (CAD)/computer-aided manufacturing (CAM) systems, automatic machinery). In addition, the increased flexibility obtained through the use of microelectronics will also affect relevant product specifications, e.g. through shorter delivery times and the possibility of reorders at short notice [Dahlman, 1989].

Product and process innovations of a profound nature may alter the factor requirements of manufacturing operations and, hence, the comparative advantages of developing versus industrialized countries. It has even been hypothesized that higher capital intensity and greatly reduced unskilled labour requirements might lead to a trade reversal in labour intensive industries, i.e. the substitution of domestically produced goods for imports from developing countries in industrialized country consumption [Jungnickel, 1988; Hoffman, Rush, 1988, pp. 186 ff.]. In order to test this hypothesis the likely direction and extent of future technological change in labour-intensive industries and their impact on Brazil are assessed in this section. Since the individual industries are affected by

the various types of innovation to different degrees, the prospects for the textile and clothing as well as the leather and footwear complex are discussed separately in the following Sections α . and β . Subsequently the more general preconditions for a trade reversal are explored in Section γ .

a. Technological Progress and Factor Intensities in the Textile and Clothing Industries

Technological change in the textiles and clothing complex in the foreseeable future will be substantial; innovations affecting processes and products will be closely interwoven. The major trend is towards more flexible manufacturing systems and greater integration of the individual stages of the manufacturing process. In the clothing industry CAD/CAM systems at the preassembly stage and electronic monitoring of material flows throughout the sector will greatly reduce lead times (cf. Synoptical Table 2 and Mody and Wheeler [1987, esp. pp. 1277 f.]). Shorter lead times and the possibility of reordering at short notice (quick response) enable retailers to hold down inventories, thereby reducing working capital costs, and to avoid mark-downs on unsold stock. These occur frequently when fashion-oriented articles have to be ordered a long time in advance. Therefore, a successfully implemented system of "quick response" will permit clothing manufacturers to obtain higher product prices that may compensate for disadvantages e.g. in manufacturing costs.

The implications of "quick response" extend backwards from the clothing to the textile industry as clothing producers will demand shorter delivery times from their fabric suppliers. Greater flexibility especially in the finishing of fabrics and tighter control of material flows (just-in-time delivery of inputs) require the use of electronic monitoring systems. Besides, more sophisticated textile machinery will permit the development of new blends of synthetic and natural fibres as well as new types of fabric.

Links between the retail network and clothing manufacturers will also intensify as electronic data transmission at both the national and the international level becomes faster and cheaper. Benneton is often cited

Synoptical Table 2 - Major Innovations in Textile and Clothing Manufacturing Technology by Stage of Production

Stage of production	Developments in technology
Textiles Opening, cleaning (cotton)	Microprocessor-controlled and automated equipment to assure homogeneous blending and optimize fibre quality; especially important for blends with man-made fibres
Carding	Higher-capacity cards through faster operation with electronic controls
Combing, drawing, roving	Combing becomes more important as demand grows for fibre blends, and for higher-quality and finer yarns; innovations mostly in the form of higher operating speeds
Yarn spinning	Open-end spinning now accepted as an alternative to ring spinning for medium and coarse yarn counts; future improvements mainly through higher operating speeds
Weaving	Continuing improvements (speed, versatility) to various types of shuttle-less looms; electronic controls and monitoring to reduce down times of machinery and rationalize the flow of materials
Wet processing (dyeing, finishing)	Incremental innovations aimed at reducing energy and water requirements
Clothing Designing, pattern making, grading, nesting, marking	CAD systems permit major reductions in lead times, skilled labour requirements, and fabric wastage
Cutting	Automated cutting machinery may be linked to CAD system
Sewing	Programmable sewing machines for specialized operations increase labour productivity substantially; however, use of sewing robots unlikely in the foreseeable future as mechanic handling of limp fabrics presents major problems

Source: Hoffman, Rush [1988, Ch. 4-6]; ILO [1987, Ch. III]; Toyne et al. [1984, Ch. 3]; own compilation.

as an example of a firm that uses a comprehensive sales information system to combine orders from a vast number of retail outlets and transmit them directly to manufacturers. Thus economies due to larger order lots can be realized, while stocks are kept low throughout the distribution system through effective monitoring and short lead times for reorders. Similar strategies are also being used by various retail chains in the US (Business Week, November 7, 1988, pp. 24 ff.).

The impact of technological change on the competitive position of individual supplier countries depends primarily on how the factor intensities of the various operations are affected. Table 47 summarizes the changes in factor intensities according to the "Textile Plan 2000" elaborated by the Brazilian textile industry. The Plan lists alternative configurations of machinery with identical capacity and output quality (conventional versus advanced/innovative technology) along with input requirements.

In all areas the number of operating staff (i.e. unskilled or semi-skilled labour) would be reduced substantially through the use of modern

Table 47 - Changes in Factor Requirements through the Use of Advanced Technology in Brazil (per cent) (a)

	Machinery	Building space	Operating staff	Textile mechanics
Preparation and yarn spinning (Ne 12) Ring spindles	+18.3	+1.3	-5.3	0.0
Open-end rotors	+17.4	+5.0	-33.3	0.0
Looms (7 models, same fabric types)	+100.7/ +324.8(b)	-49.4/ +2.7(b)	-45.5/ -27.3(b)	-33.3/ -11.1(b)
Knitting machines (4 models, different fabric types)	-47.7/ -10.1(b)	-17.8/ +46.2(b)	-34.0/ 0.0(b)	-20.0/ 0.0(b)

(a) Textile Plan 2000. The fob prices of imported equipment have been multiplied by 1.16 to account for the fact that prices for domestically produced equipment are inclusive of ICM. - (b) Depending on type of equipment.

Source: CNIT [1986, Appendix 5]; own calculations.

machinery. The number of textile mechanics (skilled labour) is projected to decline only in weaving and for certain types of knitting machinery. Capital requirements (prices of machinery, space) would increase modestly in the area of spinning. Modern looms are far more expensive than traditional ones but tend to require less space. Modern knitting machinery is less expensive than the traditional one but requires more space in most cases.

In interpreting this information it has to be taken into account, however, that the prices for conventional equipment refer to Brazilian-made machinery, whereas those for modern equipment are in some cases fob import prices¹ (especially for all knitting machinery and certain looms). If the impact of protection on the prices of domestically produced machinery could be accounted for correctly, the physical capital intensity of modern technology would rise higher than the figures in Table 47 indicate. On the other hand, the data in Table 47 do not include peripheral activities such as in-plant transport, where a wider range of techniques (including labour-intensive ones) will probably remain feasible. Therefore, the changes in factor intensities for the whole textile industry are probably not as great as in the core processes listed in Table 47.

Bearing these caveats in mind, it may be concluded that the Brazilian textile industry will become substantially more physical-capital intensive (relative to unskilled labour) if actual technology adoption follows the pattern laid out in the Plan. Skilled labour requirements will decline less sharply, and demand for highly qualified maintenance staff as well as production engineers (not included in the Textile Plan) will probably increase.

The situation is different in the clothing industry where innovations have so far been adopted mostly at the pre-assembly stage. Here, higher physical capital-requirements coincide with a substantially reduced need for certain skills. However, the available innovations at the sewing stage will increasingly substitute physical capital for skilled labour: Hoffman and Rush [1988, Table 5.3] report increases in labour productivity of 60 per cent (median for various operations) for dedicated machines, 55 per

¹ Plus 16 per cent ICM to make the figures comparable to fob factory prices of domestically produced equipment that include ICM.

cent for pre-programmed convertible machines, and 25 per cent for programmable conventional machines.¹

As regards the impact of new technologies on Brazil's comparative advantage in textiles and clothing production, the role of higher physical capital requirements needs to be distinguished from that of changes in skill intensity. Physical capital is in principle internationally mobile, and capital imports could be attracted in a suitable overall policy environment. Therefore, the domestic availability of physical capital need not represent a bottleneck for the development of these industries. Besides, a modest bias towards labour-saving innovations probably does not impair Brazil's comparative advantage since the wage level for unskilled labour is already high in relation to other developing countries.

The question remains of whether technological progress would raise the human capital intensity of textile and clothing production (or some sub-sectors) so much that Brazil's comparative advantage would be impaired. On the one hand, the increasing application of microelectronic technology will require new qualifications on the part of maintenance staff for machines, designers in the clothing industry working with CAD systems, production engineers throughout the sector, etc. In addition, "quick response" will place greater demands on management capabilities in the area of logistics. Evidence from the Brazilian machine tool industry [Wogart, 1989, pp. 53 f.], which is also undergoing rapid technological change due to the introduction of microelectronics, suggests that with appropriate training programs a sufficient supply of such skills can be ensured. Tax breaks for training expenditures incurred by firms create favourable conditions for the financing of such programs.

On the other hand, the use of electronic equipment will reduce or even eliminate the need for certain skills which require a profound vocational training or a long professional experience, such as in designing, grading, and nesting. Training times for semi-skilled labour in many sewing operations will also be reduced substantially [Hoffman, Rush, 1988, Table 5.4]. Such human capital savings compensate in part for higher skill requirements through the use of electronic technology. We conclude from the available evidence that in the foreseeable future the

¹ Similar savings have been calculated by Mody and Wheeler [1987, Table 5].

comparative advantage of Brazil in textile and clothing production will not be eroded through greater human capital intensity as a result of technological progress. One caveat must be made, however: In recent years investment in new equipment in the textile and clothing industries has been far below the level that would be needed to restore and sustain the international competitiveness of these industries (cf. Section IV.3.b). Unless discrimination against the textile and clothing industries in the allocation of investment credit is completely eliminated, the prospects for future competitiveness are bleak. Recent steps towards the formulation of an industrial policy for the sector, involving easier access to investment credit as well as technologically up-to-date machinery, are well advised. However, they represent only a second-best alternative to the allocation of investment credit to all sectors on a non-subsidized, non-discriminatory basis. Similarly, a generalized and permanent liberalization of machinery imports would have a more lasting effect on the competitive position of the textile and clothing industries in Brazil than a special regime of an essentially temporary nature.

B. Technological Progress and Factor Intensities in the Leather and Footwear Industries

As in the textile and clothing industries, the adoption of "quick response" strategies represents the driving force behind the technological transformations in the leather and footwear complex. Many innovations are similar to those in textile and clothing production. Throughout the sector electronic monitoring of material flows, "just-in-time" delivery of inputs, and more flexible production planning will increasingly be used [Amrein, 1988; Toosbuy, 1988]. CAD systems further reduce lead times in the footwear industry [Geib, 1988, pp. 29 f.]. The use of automatic equipment such as computer-numerically-controlled (CNC) machinery [Geib, 1989; U.S. Department of Labor, 1986, Table 2], as well as electronic monitoring and process control in tanneries will increase the flexibility of production.

Regarding the application of computer-aided manufacturing systems, some differences exist between the clothing and footwear industries with respect to the feasibility of automation. Leather, unlike textile fabrics,

invariably has natural defects. Optical sensors capable of detecting flaws in the material will only become economically viable in the medium term. Until then the nesting of patterns, even when supported by electronic data processing equipment, will remain an interactive process performed individually for each piece of leather.¹ Hence, the integration of pre-assembly operations in footwear production is more difficult to achieve than in the clothing industry.

On the other hand, many of the components that are assembled into a shoe can be handled mechanically (in contrast to limp fabrics). Hence, robotization in assembly will progress faster than in the clothing industry [Geib, 1988, pp. 34 f.]. Robots will not only serve to replace labour, but, as in other industries,² their use will improve product quality, or they will be employed in hazardous environments.

There are indications that the possibility of robotization in final assembly will slow down the erosion of the comparative advantage of industrialized countries in that activity. However, the assembly of footwear uppers, which involves sewing operations on soft materials (leather or synthetics), will probably resist robotization to a large extent and remain labour-intensive. Accordingly, several firms in Denmark and West Germany are reported to import prefabricated uppers from low-wage countries and assemble them in their home countries [Toosbuy, 1988, p. 21]. Overall, however, assembly in high-wage countries will probably be limited to the upper market segment.

Conversely, exports of leather footwear uppers from Brazil have grown much faster since 1975 than total footwear exports (Table 16). This is probably a reflection of the limited ability of many Brazilian footwear firms to produce high-quality shoes with synthetic soles. Apart from the low quality of synthetic inputs available in Brazil, footwear producers have apparently found it difficult to overcome the technological problems involved in linking leather and synthetic materials. The resolution of these problems will become even more urgent if Brazil is to increase its exports of tennis shoes.

¹ Cf. Ferreira [1988, p. 56]; Geib [1988, p. 32]; *Tecnicouro* (Vol. 10, No. 6, 1988, pp. 16 f.).

² Cf. Fischer, Nunnenkamp et al. [1988, pp. 148 ff.] on the automobile industry in Brazil.

Overall, the skill requirements in the Brazilian footwear industry will probably grow steadily as firms adopt quick response strategies and automated machinery in certain operations. Besides, activities such as design where technological progress (CAD systems) reduces the need for skilled labour are often performed outside Brazil. Yet, many operations will remain labour-intensive, and where automation involves mainly handling of materials, less capital-intensive techniques will probably remain feasible. However, second-generation NICs with very low wage levels such as Thailand, Indonesia, and the Philippines are now entering the market for low-cost footwear with help from established firms in Taiwan and South Korea (Tecnicoiro, Vol. 10, No. 8, 1988, p. 17). Hence, Brazilian producers will come under pressure to shift the composition of output towards more sophisticated products and modernize equipment and the organization of production accordingly. That pressure will be increased further if dependence on the US as the largest export market is to be reduced, because quality demands in the European market (the main alternative) are rather more stringent than in the US.

This raises the question of whether vocational training is sufficient to sustain steady technological change in the industry. There is evidence that the existing training programs at least in the state of Rio Grande do Sul are insufficient with respect to both quantity, i.e. the number of employees that participate, and quality (out-of-date curricula, etc.; *ibid.*, No. 7, 1988, pp. 24 f.). The rate of labour turnover in Brazil is also reported to be very high compared to other footwear-producing countries, which precludes the possibility that learning by doing might substitute for formal training at a large scale. Hence, without greater investment in skill formation it is doubtful whether the Brazilian footwear industry can further improve or even only maintain its present export performance.

7. Microelectronics and the International Division of Labour: The Empirical Evidence

The two preceding sections have demonstrated that the application of microelectronic technology in the textile and clothing as well as the leather and footwear complex, above all else, will lead to substantially

greater flexibility and shorter lead times in production. Consequently, the competitiveness of individual producer countries will depend on whether they can assimilate, at least selectively, the new technology. It has been shown that coping with the concomitant changes in factor intensities should not be beyond the reach of many developing producer countries including Brazil. New skills are to a significant extent only replacing old skills, and many operations will either remain unskilled labour intensive (sewing of limp materials) or can be performed adequately at different levels of mechanization (materials handling).

These considerations suggest that technological progress will not lead to a general worsening of the competitive position of developing versus industrialized countries and, hence, not to a "reversal" of trade between the two country groups. This does not exclude the possibility that in particular product lines production may "return" from developing to industrialized countries, or that the decline of particular sectors in industrialized countries may be slowed down or even halted. To test this hypothesis this section reviews the empirical evidence on a possible relocation of labour-intensive industries from developing to industrialized countries due to technological innovations.

The most comprehensive study so far in this respect is Jungnickel [1988]. First, he concludes that there is no sign that West German manufactured imports from or direct investment in developing countries have declined because the competitiveness of domestic production was enhanced through technological innovations. Secondly, he examines in detail the experiences of a sample of 215 firms belonging to industries where at least some stages of production are highly labour-intensive, including various sub-branches of the textile, clothing, and footwear industries. In the area of knitwear, a significant, technology-related relocation of production back to West Germany by a few firms occurred between 1982 and 1986, but was more than compensated for by growing imports of other firms. This is interpreted by Jungnickel as an indication that production in West Germany is increasingly being concentrated on the upper market segment, rather than as a sign of an incipient trade reversal. In the clothing and footwear industries, there was an even stronger tendency towards a continuing (net) shift of production to low-wage countries. Only some footwear producers felt that in the more

distant future increased automation might strengthen domestic production.

Hoffman and Rush [1988, pp. 186 ff.] also report a number of instances where clothing firms in industrialized countries have improved their competitive position through the use of innovative technologies. They, too, conclude that so far these changes have been insignificant compared to the volume of clothing exports from developing to industrialized countries. They foresee more substantial changes only in the long run, when material-handling problems are finally mastered. To summarize, the evidence is consistent with our conclusion that a dramatic deterioration of the position of developing countries in general will probably not occur in the foreseeable future.

However, individual developing countries may be affected differently. Firstly, the importance of skill formation has already been emphasized. The extent of education and training aimed at enabling people to utilize, adapt, and diffuse new technologies will be crucial for a country's future international competitiveness even in labour-intensive industries.

Secondly, "quick response" tends to favour geographical proximity between producer and consumer countries, as it requires fast and very reliable transport.¹ This may place Brazil at an increasing disadvantage since the most important sea traffic lanes pass by the country, and the monopolization of sea traffic to and from Brazil is keeping freight rates at an elevated level [Motta Veiga, 1985]. Frequent stoppages at already crowded ports in Brazil also render the adoption of quick response difficult.

Thirdly, political obstacles in developing countries may slow down the adoption of new technologies. In Brazil, the market reserve for data processing equipment has raised the price of electronic components and computer hardware to roughly double the world market level [Corsepius, Schipke, 1989]. Similar though less severe restrictions exist in the market for software. Since in practice the electronic control of production planning and material flows is an important precondition for the successful adoption of "quick response", the market reserve represents a

¹ Technological progress will probably continue to reduce the cost of international and intercontinental data transmission so that the importance of geographical proximity for production planning will decline.

major barrier to its introduction - especially for small and medium-sized firms such as in the clothing and footwear industries. Hence, the major threat to the competitive position of labour-intensive industries in Brazil may come not from technological progress as such, but rather from political obstacles to the adoption of innovations. The negative impact of discrimination against labour-intensive industries in the allocation of investment credit in Brazil has already been emphasized.

Finally, the improved competitive position of some textile and clothing producers in industrialized countries depends crucially on protection against imports from developing countries (Business Week, November 7, 1988, pp. 25 f.). Given current relative production costs, protectionism, rather than technological change, is the greatest obstacle to higher exports of labour-intensive products from developing countries [Hoffman, Rush, 1988, pp. 192 ff.]. A return to GATT rules in textile and clothing trade, and an end to bilateral trade restrictions such as those faced by Brazilian footwear exports, could easily more than compensate for any loss of competitiveness that developing countries may experience as a result of labour-saving technological progress. The bargaining power of the Brazilian government in pressing for lower tariffs and more liberal quotas would be improved greatly if Brazil's own protection of its manufacturing sector was reduced.

b. The Domestic Labour Supply

In some South-East Asian NICs a rapid growth of real wages has recently eroded the competitive position of labour-intensive industries [Mody, Wheeler, 1987; Hoffman, Rush, 1988, pp. 208 ff.]. This raises the question of whether a similar development will occur in Brazil in the foreseeable future. There are indications that the fast growth of labour-intensive industries in some locations, such as footwear in the Vale dos Sinos and textiles in some parts of Santa Catarina, is beginning to lead to regional labour shortages. On the other hand, the lack of employment opportunities in north-eastern Brazil continues to lead to emigration from the region, while wages for unskilled labour in the northeast remain below those in the south-east and south of the country. This section investigates whether the competitiveness of labour-intensive industries in

Brazil could be enhanced through a shift of production towards the north-east, and under which conditions such a shift would occur.

Since 1970 the north-east has become more important as a location for labour-intensive industries (Table 48). Its shares in the value added of labour-intensive as well as all manufacturing industries in Brazil grew significantly between 1970 and 1980.¹ The increase was most pronounced in the textile industry (from 8.0 per cent of national value added in 1970 to 13.7 per cent in 1980). By contrast, the growth of value added in the north-eastern leather, clothing, and footwear industries relative to the rest of the country remained modest. Only in the textile industry did the share of value added in the north-east exceed significantly the region's share in total manufacturing value added (13.7 versus 8.1 per cent in 1980).

As the textile industry is relatively physical capital intensive, this finding suggests that low wages in the north-east made only a small contribution to the growth of industry in the region. The driving force behind the marked growth of the textile industry in the north-east were the various incentives offered by federal and state governments to induce industrial investment in the region [Edwards, 1983, pp. 499 ff.]. Since the late 1960s, the most important scheme at the federal level has been the FINOR program that grants substantial income tax exemptions to any investor who provides equity financing for the establishment, expansion, or modernization of industry in the north-east (Magalhães, 1983, pp. 46 ff.). In addition, enterprises are exempted from corporate income tax payments during the first 10 to 15 years of operation in the north-east, and may also enjoy value added and export tax reductions [Soares, Enders, 1984, p. 116].

These incentives are biased, firstly, in favour of large and medium-sized firms compared to small firms [*ibid.*, pp. 121 f.]. Secondly, since they subsidize the cost of capital (both for fixed investment and working capital), they benefit relatively capital-intensive industries dispropor-

¹ The figures for 1984 (the latest year for which this information is available) are not strictly comparable to the previous years because they do not include small establishments (which in the north-east probably account for a larger share of value added and employment than elsewhere in Brazil). However, the growth of the share of the north-east in value added apparently continued in the first half of the 1980s.

Table 48 - The Regional Distribution of Employment and Value Added in Brazil's Labour-Intensive Industries, 1970-1984

	Leather, leather goods				Textiles				Clothing, footwear				All manufacturing			
	1970	1975	1980	1984(a)	1970	1975	1980	1984(a)	1970	1975	1980	1984(a)	1970	1975	1980	1984(a)
Value added	per cent of national total															
North-east	5.9	7.0	8.5	9.2	8.0	13.0	13.7	14.8	6.3	8.2	8.8	7.9	5.7	6.6	8.1	8.8
Ceará	0.4	1.2	1.7	1.6	1.6	2.9	3.1	4.0	1.2	1.8	2.5	2.4	0.7	0.8	0.9	1.0
Rio Grande do Norte	1.1	0.9	0.7	0.6	0.4	1.2	1.2	1.2	1.8	1.9	1.9	1.4	0.2	0.3	0.3	0.3
Paraíba	0.8	1.0	0.9	1.3	1.1	2.5	1.8	2.5	0.1	0.5	0.4	0.2	0.3	0.4	0.4	0.4
Pernambuco	1.8	1.8	1.7	1.9	2.9	3.8	3.2	3.6	2.2	2.6	2.5	2.7	2.2	2.2	2.0	2.1
Bahia	1.4	1.9	2.2	3.0	0.7	1.1	2.9	1.6	0.6	0.7	0.7	0.5	1.5	2.1	3.5	3.8
South-east	52.0	47.2	42.6	31.0	80.1	75.1	69.9	68.2	74.8	64.8	59.7	50.5	80.7	76.3	72.6	71.5
Minas Gerais	6.6	5.9	6.0	5.0	6.5	8.0	8.1	8.6	2.6	3.5	4.5	4.1	6.5	6.3	7.7	8.4
Espírito Santo	0.2	0.3	0.3	0.0	0.2	0.3	0.4	0.4	0.2	0.5	0.7	0.9	0.5	0.6	0.9	0.9
Rio de Janeiro	17.3	14.7	8.9	4.7	15.6	10.3	7.8	6.6	15.4	12.8	12.1	8.5	15.7	13.5	10.6	8.3
São Paulo	27.9	26.3	27.6	21.3	61.7	56.5	53.7	52.6	56.7	48.1	42.4	37.0	58.1	55.9	53.4	53.9
South	39.5	44.6	46.7	56.6	10.5	10.2	13.7	14.7	18.3	25.1	30.7	41.1	12.0	14.7	15.8	16.3
Paraná	4.0	3.0	3.8	4.8	2.8	2.9	3.0	3.1	0.5	0.8	1.1	1.0	3.1	4.0	4.3	4.2
Santa Catarina	2.3	2.2	2.3	2.1	5.1	4.1	7.4	9.0	0.9	9.1	10.6	7.5	2.6	3.3	4.1	3.9
Rio Grande do Sul	33.2	39.4	40.7	49.7	2.5	3.3	3.3	2.6	16.9	15.1	19.0	32.6	6.3	7.5	7.3	8.2
Other regions	2.6	1.2	2.2	3.2	1.4	1.7	2.7	2.4	0.6	1.9	0.9	0.5	1.6	2.3	3.6	3.4
	mill. CR\$(b)															
Brazil	1919	3283	4130	6466	27789	38410	56789	41802	9955	23677	42957	35746	297472	626056	887288	734427

Table 48 continued

	Leather, leather goods				Textiles				Clothing, footwear				All manufacturing			
	1970	1975	1980	1984(a)	1970	1975	1980	1984(a)	1970	1975	1980	1984(a)	1970	1975	1980	1984(a)
Employment	per cent of national total															
North-east	11.7	9.9	10.5	8.2	11.2	13.4	14.7	13.4	8.0	8.9	10.1	7.5	10.0	10.1	10.9	9.3
Ceará	1.1	1.9	2.1	1.8	1.6	2.6	2.9	3.0	1.6	2.4	3.0	2.6	1.4	1.7	1.9	1.7
Rio Grande do Norte	1.5	1.2	0.8	0.9	0.3	0.8	1.3	1.4	1.3	2.2	2.1	1.3	0.5	0.6	0.8	0.6
Paraíba	1.1	1.1	1.3	1.0	1.4	2.0	2.6	2.1	0.5	0.6	0.5	0.4	0.7	0.8	0.8	0.6
Pernambuco	3.1	2.7	2.2	1.7	4.3	4.7	4.1	3.3	3.0	2.2	2.8	1.9	3.4	3.0	2.7	2.3
Bahia	3.1	2.1	2.4	1.9	1.1	1.2	1.7	1.5	0.9	0.9	0.9	0.8	2.2	2.3	2.6	2.3
South-east	48.8	46.3	43.9	33.6	76.3	73.6	68.1	69.8	67.8	62.4	60.8	50.9	70.4	67.7	65.0	65.1
Minas Gerais	8.9	7.6	5.9	6.0	9.5	9.8	9.2	10.9	4.3	5.2	6.5	5.2	7.1	7.4	7.9	7.4
Espírito Santo	0.4	0.5	0.5	0.0	0.4	0.3	0.4	0.3	0.4	0.7	1.0	1.0	0.8	1.0	1.0	1.0
Rio de Janeiro	12.0	12.2	9.4	5.5	12.5	10.4	9.0	7.8	15.3	13.9	10.7	8.1	13.5	11.9	9.7	9.2
São Paulo	27.5	26.0	28.1	22.1	54.1	53.1	49.4	50.7	47.8	42.7	42.6	36.7	48.9	47.6	46.3	47.5
South	36.9	42.1	43.2	55.7	10.5	11.0	15.2	15.2	23.2	27.4	27.9	40.7	16.8	18.7	19.4	21.7
Paraná	4.5	3.3	4.8	5.5	1.3	1.8	1.9	2.6	0.9	1.1	1.7	1.5	4.3	4.5	4.7	4.7
Santa Catarina	2.8	2.3	2.2	2.5	6.4	5.5	9.3	8.3	1.7	7.1	6.3	5.9	4.3	4.8	5.4	5.6
Rio Grande do Sul	29.6	36.5	36.1	47.7	2.8	3.8	4.0	4.3	20.7	19.2	20.0	33.4	8.3	9.4	9.3	11.3
Other regions	2.6	1.7	2.4	2.5	2.0	2.0	2.0	1.7	1.0	1.3	1.2	0.8	2.8	3.5	4.7	3.9
	1000															
Brazil	26.4	36.2	42.2	46.1	342.8	333.8	377.6	276.4	164.5	302.2	459.9	524.2	2634.6	3816.5	4918.2	4140.4
(a) Covers establishments with 5 or more employees only. - (b) 1977 prices.																

Source: IBGE [b; c, 1984].

tionately [Edwards, 1983, p. 507].¹ Both of these biases work in favour of the textile industry compared to the clothing, leather, and footwear industries. Moreover, the states of Piauí, Rio Grande do Norte, and Ceará offered additional subsidies specifically for the textile industry [ibid., pp. 500 f.]. Therefore, it is concluded that the growth of value added in the north-eastern textile industry occurred in response to government incentives rather than increasing wages or labour shortages in traditional producer areas.

Besides, the employment effect of output growth in north-eastern manufacturing has remained rather modest. In all four categories listed in Table 48, the wide divergence between the shares of the north-east in value added and employment in 1970 had narrowed considerably by 1980. Hence, average labour productivity in the north-east (measured by value added per employee) and, by implication, production technology, are approaching the standard that prevails in the rest of the country. This can be taken as an indication of a tendency towards greater integration between industry in the north-east and elsewhere in Brazil. In the field of industrial organization, increased integration is reflected by the growing number of "branch plants" relative to "indigenous" enterprises in the north-east [Edwards, 1983, pp. 503 ff.].

To the extent to which this development represents a transfer of technological and managerial know-how from the more advanced regions of Brazil to the north-east, it should increase the competitiveness of north-eastern industry and, hence, lay the foundations for future growth of output and employment. However, it also indicates that the structure of industry in the north-east does not reflect the particular factor endowment of the region with abundant unskilled and semi-skilled labour. To a large extent this is probably a consequence of the bias of regional policies in favour of large firms and relatively capital-intensive industries. The locational advantages of the north-east in themselves (apart from abundant labour, e.g. the growing availability of raw materials: yarns and fabrics for the clothing industry, and leather for footwear production) have been insufficient to induce a major shift in the location of particularly labour-intensive industries. Besides, the value of

¹ These conclusions are supported by an exhaustive unpublished analysis of the regional incentive schemes in Brazil made available to the author.

tax incentives (for production in the north-east) is limited if firms currently operate largely in the shadow economy such as is common in the clothing industry [Chadad, 1986, p. 30].

This raises the question of whether the incipient labour shortages in southern Brazil will lead to a more pronounced relocation of production in the future than has occurred in the past. In the textile industry a large percentage of new capacity is now located in the north-east (Gazeta Mercantil, English Weekly Edition, March 13, 1989, p. 9). It is impossible, however, to distinguish the combined impact of regional incentives, the local availability of raw materials, and access to well-maintained ports from the role played by an abundant labour supply. Increased production of textiles could also improve the competitive position of the local clothing industry. However, this presupposes a greater integration of textile branch plants into the local economy than in the past, when the lion's share of output from new textile mills was destined for markets outside the region [Edwards, 1983, p. 507]. The proposed establishment of two large finishing and dyeing plants, in addition to a variety of spinning and weaving mills, points to greater vertical integration within the region.

The prospects for the growth of footwear production in the north-east are somewhat brighter, largely because of the fast increase in footwear output in Brazil due to exports. New producing centres, involving a significant number of indigenous firms, now exist in a number of north-eastern cities. As an illustration, in recent years footwear output in physical terms in the state of Ceará has risen to about 10 per cent of output in the main producer state, Rio Grande do Sul [Capelo, 1987]. Table 48 shows that the clothing and footwear industries in Ceará increased their share in national value added from 1.2 per cent in 1970 to 2.5 per cent in 1980, together with a strong rise in employment. Although production is still destined mostly for the domestic market, the north-east should also be a feasible location for export production, given the proximity of its urban areas to seaports, and the smaller distance to the US, Brazil's main export market.

Production for export would probably require an infusion of managerial and technological know-how as well as physical capital, because operations would have to be mechanized sufficiently to maintain quality standards in spite of the low skill level of the labour force. There are

now indications that some firms based in the state of São Paulo will open branch plants in the north-east. Eventually a division of labour might evolve in which the north-eastern plants specialize in the production of low-skill, low-quality footwear or particularly labour-intensive operations, whereas more sophisticated varieties are manufactured in regions with a higher wage level such as the state of São Paulo.

So far, however, there has been no sign of a significant move to the north-east from the state of Rio Grande do Sul, from where most footwear exports originate. The regional labour supply there has until now been replenished from the agricultural interior of the state where the shift to soybean production has reduced employment opportunities. On the one hand, this process took the form of migration to the Vale dos Sinos [Cotanda, Sartori, 1987; Silva, 1984]. On the other hand, output growth took place increasingly outside the traditional locations; for example, the share of Novo Hamburgo, the centre of the Vale dos Sinos, fell from 34 per cent of footwear output (number of pairs) in the state in 1976 to 24 per cent in 1984 [ACI-NH, various issues]. The shift in value added has probably been even greater because factories make increasing use of a putting-out system whereby particularly labour-intensive operations are performed by homeworkers in the interior of the state on a piece-wage basis. Apart from considerable flexibility this system offers producers the advantages of little fixed investment in building etc., and payment according to productivity which is illegal in the case of regular employees.

Besides, especially the many small producers in the Vale dos Sinos benefit from the agglomeration of the footwear industry and its suppliers in the area. The previous section has shown that in the medium to long run technological change in the footwear industry will raise skill intensity and reduce unskilled labour requirements. Firms that choose to modernize and concentrate on higher-quality products will have little incentive to move any but the most labour-intensive operations to the north-east. However, the geographic distance between Rio Grande do Sul and the north-eastern states raises some doubts as to whether the integration of north-eastern branch plants into a quick-response production system based in the south-east would be practical.

To summarize, the importance of the north-east as a location for labour-intensive industries will probably continue to grow slowly, es-

pecially for the textile industry. As long as the marginalization of small firms through the regional incentive programs is not rectified, however, the abundant labour supply in the region will not be translated into improved competitiveness for the particularly labour-intensive clothing and footwear industries, and the concomitant potential for employment creation will not be realized.

VI. Summary and Conclusions

The labour-intensive industries covered by this study (textiles, clothing, leather, and footwear) represent an important source of employment and export earnings in Brazil. Since the opening-up of the Brazilian economy in the late 1960s they have provided roughly one out of five jobs in the manufacturing sector, and contributed more than 10 per cent to manufacturing value added. Labour-intensive exports since then have grown less rapidly than other manufactured exports, but still accounted for almost 20 per cent of total manufactured exports from Brazil in the mid-1980s.

Within this group of industries the relative importance of the textile sector has declined steadily. In the mid-1980s textiles represented only 7 per cent of manufacturing employment versus 15 per cent in 1967; during the same period textile exports as a proportion of total manufactured exports declined from 38 to 6 per cent. The fast growth of the footwear industry compensated for most of the relative decline of textile employment. However, even the rapid rise of footwear exports from almost nil in 1967 to 8 per cent of manufactured exports in 1985 was not sufficient to prevent the combined share of labour-intensive exports from falling sharply. Exports of leather, leather goods, and clothing remained small throughout this period.

Compared with other NICs such as Hong Kong and South Korea, labour-intensive industries in Brazil were internationally competitive only in a very small number of products, such as yarns, basic cotton fabrics, special textile products, leather, and leather footwear. More sophisticated fabrics, clothing, and non-leather footwear are notably absent from this list. In itself this is not a surprising phenomenon in a NIC, as it may reflect a shift of comparative advantage towards less labour-intensive products. However, the fast growth of the very labour-intensive leather footwear industry contradicts this hypothesis. In addition, cross-country regressions linking the shares of labour-intensive industries in manufacturing value added and exports to factor endowments confirm that the Brazilian textile and clothing industries produce and export less than could be expected given the country's factor endowment.

This discrepancy between Brazil's comparative advantage in labour-intensive manufactures and the modest export performance of its textile, clothing, and non-leather footwear industries suggests that economic policies had a detrimental impact on the international competitiveness of these industries. At the same time the very favourable performance of the leather footwear industry calls for an explanation in terms of how incentives for investment and exports differed from other labour-intensive industries.

This study has identified several areas where economic policies result in an incentive structure that is out of line with Brazil's comparative advantages. Firstly, labour-intensive industries have been discriminated against as regards the allocation of investment credit, for which practically the only source is BNDES. This has hurt particularly the relatively fixed-capital-intensive textile industry, where fixed investment since the mid-1970s has been far below the level necessary for the industry to remain technologically competitive. Real interest rates for working capital in Brazil were far higher than in competing producer countries, mainly as a result of the government's excessive reliance on short-term borrowing. As all four industries covered by this study are more materials-intensive than total manufacturing, the high cost of working capital has negatively affected their competitiveness.

Secondly, in the area of labour market regulations, the prohibition of paying wages linked to productivity has played a particularly harmful role. It affects the competitiveness especially of those sectors where the pace of work is not determined by machinery but depends on the dedication of the individual worker (such as on an assembly line). Such operations are found mostly in the clothing industry but also in footwear production where the handling of materials is involved. With little incentive for the individual worker to improve his or her productivity, average wages are bound to remain low, while job dissatisfaction, labour turnover and, consequently, expenses for training new staff may rise (as in the footwear industry in southern Brazil). The increases in indirect labour costs and the shorter working week prescribed by Brazil's new constitution will also weaken the competitiveness of labour-intensive industries unless they are compensated for by a decline in real wage rates.

Trade policy has had a two-fold impact. On the output side, the protection of the textile, clothing, and non-leather footwear industries through tariffs and other barriers was considerably higher than for total manufacturing. As the domestic markets were shielded almost completely from imports, incentives to improve efficiency were markedly reduced. The available export incentives were not sufficient to eliminate the anti-export bias that resulted from protection. By contrast, the protection of the leather and leather footwear industries was closer to the manufacturing average, with a correspondingly smaller nominal anti-export bias. Lower protection thus contributes to the explanation of the more favourable export performance of these industries.

On the input side, the protection of the domestic machinery industry through high tariffs and an import licensing system made it very difficult to acquire sophisticated equipment at a competitive price. This represented a problem especially for the weaving subsector of the textile industry, because until recently shuttleless looms were not at all produced in Brazil. Domestically produced machinery for the leather and footwear industry, however, was mostly of satisfactory quality. The quality of locally available synthetic inputs for the footwear industry (such as rubber or plastic soles) presented significant problems at least until very recently. This helps to explain why exports of non-leather footwear remained relatively small.

Exchange rate policy in Brazil underwent frequent changes which caused significant fluctuations in the real exchange rate. Extended periods when the domestic currency was devalued on a discretionary basis (rather than according to a crawling-peg rule) meant considerable uncertainty for exporters, as the devaluation was often "too little too late".

Hence, the general economic policy environment in Brazil was not particularly conducive to manufactured exports in general, or to labour-intensive exports in particular (except for those industries that benefited disproportionately from export subsidies, or were subject to maximum prices in the domestic market). In the case of the leather footwear industry several additional factors, peculiar to that industry, combined to make exports nonetheless attractive to producers. Firstly, the lion's share of exports comes from the southern state of Rio Grande do Sul,

which is geographically distant from the centers of domestic consumption in south-eastern Brazil. Secondly, when US importers of leather footwear began to look for new sources of supply in the late 1960s, they encountered a large number of small footwear producers, often family firms, with substantial leather-working skills and a tradition of crafts-based workmanship. These small firms were able to expand output quickly and adapt the production process to the importers' requirements. In turn, importers provided extensive support with bureaucratic procedures related to exports, export financing, production planning, quality control, and also took over the functions of design and marketing. This allowed Brazilian firms to concentrate on manufacturing, narrowly defined where they had a comparative advantage. Thirdly, the state of Rio Grande do Sul offered an ample supply of unskilled labour and a low wage level, since there were almost no other industries competing for staff. Fourthly, as a cattle-growing region Rio Grande do Sul had a large supply of hides and a well-established leather tanning industry that was already a significant exporter of leather. In the late 1960s such a combination of locational advantages apparently existed only rarely in potential producer countries in the developing world, particularly as regards the availability of leatherworking skills and small, adaptable firms.

The success of the Brazilian leather footwear industry in the world market allows several conclusions to be drawn as to which policy changes are most urgently required in order to bring economic incentives for investment and exports in labour-intensive industries into line with Brazil's comparative advantage.

Firstly, lower protection against imports through tariffs and non-tariff barriers would increase efficiency and, hence, improve international competitiveness, apart from leading to gains in consumer welfare. Besides, continued protection of traditional industries such as textiles, clothing, leather, and footwear clearly cannot be justified by the infant industry argument.

Secondly, a reduction and eventual abolition of protection in product markets requires that the affected industries should be given access to raw materials and machinery at internationally competitive prices and quality. If it is believed that the domestic production of machinery or

certain raw materials creates important external effects, then these industries should be supported though direct subsidies rather than import protection.

At the same time, thirdly, the discrimination against labour-intensive industries in factor markets should be abolished. In particular, investment credit should be allocated between industries on an equal, non-subsidized basis. This would enable the textile and clothing industries to modernize machinery as is urgently required.

Given the very high level of protection currently enjoyed by the textile and clothing industries, its elimination would be bound to lead to substantial structural change. Therefore, protection (as well as export subsidies) should be reduced gradually. As a first step it has been suggested that all non-tariff barriers should be transformed into tariffs, and that tariff redundancy should be eliminated. This first step would not actually affect the level of protection except by making regulations more transparent. As it would involve a rather sweeping elimination of red tape, however, it would lend credibility to the reform. During a second stage the dispersion of protection should be reduced step by step by cutting tariffs most sharply in the most highly protected industries (such as textiles and clothing). In this context the focus should be on reducing the effective rather than nominal protection of individual industries [Amelung, Sell, 1989]. The allocation of investment credit should be reformed immediately in order to avoid any future misallocation of investment capital.

The New Industrial Policy recently adopted by the Brazilian government goes some way towards putting into practice such reforms. However, it is far from clear whether the enlarged supply of investment capital by BNDES to some labour-intensive industries is sufficient to eliminate discrimination. At least, there is no sign that commercial instead of political criteria will henceforth be applied exclusively for credit allocation. As long as political criteria prevail, it will be difficult for industries consisting predominantly of small firms, such as clothing, leather, and footwear, to defend their legitimate interests against sectors comprised of large firms or state monopolies. Regarding the tariff reductions that have been instituted so far, their effect is difficult to assess because non-tariff barriers have remained largely untouched. Also tariff

reductions on consumer goods have apparently lagged behind those for intermediate goods and machinery. Hence, it is doubtful whether they go far enough to put significant pressure on inefficient firms to become internationally competitive.

Apart from these specific policy reforms, labour-intensive industries would also benefit greatly from a more stable macroeconomic environment with a substantial reduction of the public sector deficit and inflation. Such stabilization constitutes a precondition for bringing real interest rates for working capital down to a level comparable to Brazil's competitors. Reduced inflationary pressures would also make it easier to keep the real exchange rate constant as the need for nominal devaluations would decrease.

Labour market policy is well advised to take into account the fact that higher real wages can only be sustained through higher productivity. In many operations productivity is determined by the pace of work of the individual worker. Here it should be possible to pay part of the wage on a piece rate basis. With stronger incentives to improve the pace and quality of work, productivity as well as wages should rise. If real labour costs are raised through policy measures without regard to productivity, this will tend to lead to the substitution of capital for labour with a loss of employment opportunities. This would be highly undesirable given the widespread underemployment and artificially inflated service sector in Brazil.

Such an improvement in the general policy environment becomes all the more important as the introduction of electronic technology in labour-intensive industries presents major challenges. In the medium term labour-intensive industries in Brazil will have to adopt quick-response systems in close co-operation with retail networks in consumer countries. Otherwise they will probably not be able to cope with intensified competition from industrialized country industries in high-quality, high fashion market segments on the one hand, and from less advanced, very low-wage developing countries in low-to-medium-quality products on the other.

The adoption of quick response strategies requires, firstly, the use of electronically controlled equipment in various manufacturing operations and administrative functions. In Brazil the market reserve for informa-

tion technology has raised the prices not only of computers, peripherals, and software, but also of electronic controls for machinery to roughly twice the world market level. If this policy is not reversed, it will constitute a very grave threat to the future competitiveness of labour-intensive industries in Brazil.

Secondly, the introduction of quick response requires the formation of new skills for the operation and maintenance of sophisticated electronic equipment. Overall skill intensity will probably not grow dramatically since some traditional skills will become redundant. Quick response will also place greater demands on the efficiency of business administration in general, and production engineering in particular. Current efforts for training and retraining staff, especially at the medium level, are probably not sufficient. Both firms and the government, which operates most schools and universities, need to increase their investment in human resources now in order to ensure the competitiveness of Brazilian industry in the future.

Such efforts to improve skill formation are all the more urgent as Brazil will probably not be able to benefit from any favourable developments on the demand side. Consumption of clothing and footwear in industrialized countries, Brazil's main customers, will grow only slowly. In addition, there is the danger that protectionism, particularly against textile and clothing exports from the developing world, will continue. Although in the case of Brazil a considerable increase in textile and clothing exports will still be feasible, protectionism requires more diversification across countries and products than would otherwise be desirable. The need for diversification is most acute in the footwear industry. In the long run exports can only continue to grow if producers place greater emphasis on marketing Brazilian footwear outside the US, particularly in Western Europe. An upgrading of exports, which would minimize the impact of strictly quantitative restrictions on Brazilian producers, will place greater demands on the skill level of the work force, and thus depends on sufficient skill formation.

To summarize, this study has shown that within an appropriate policy framework labour-intensive industries in Brazil could maintain or even increase their contribution to the country's manufactured exports, and in addition continue to provide urgently needed employment opport-

unities at relatively low skill levels. The competitiveness of first-generation NICs (Taiwan, South Korea, Hong Kong) in labour-intensive industries is now declining as a result of their rapid economic development. Policy reforms in Brazil in the near future could create conditions under which more Brazilian producers can enter and establish themselves in world market segments where they can defend their positions against competitors from both industrialized countries and second-generation NICs. Without a more stable and less distorted policy environment, however, this opportunity will almost certainly be missed.

Appendices

I. Tables

Table A1 - Employment and Value Added in Sub-Branches of Labour-Intensive Industries in Brazil, 1970-1984

	Employment (end of year)				Value added				Average size of establishment			
	1970	1975	1980	1984(a)	1970	1975	1980	1984(a)	1970	1975	1980	1984(a)
	1000				bill. Cr\$				number of employees			
Leather, leather goods (IBGE 19)	26.4	36.2	42.2	46.1	0.3	1.6	18.3	1032.5	13	23	26	74
	per cent											
Preparation of hides (drying, salting)	0.8	0.8	3.2	na	1.1	1.8	4.5	na	8	5	12	na
Tanning	71.0	66.8	59.1	na	79.0	74.2	69.0	na	23	33	36	na
Saddlery etc.	7.0	4.3	4.4	na	2.9	3.2	2.9	na	2	4	5	na
Travel good, handbags, etc.	10.3	17.9	20.1	na	7.3	13.9	14.1	na	12	28	39	na
Other leather manufactures (mainly for industrial use)	10.2	10.2	13.3	na	8.2	6.9	9.5	na	13	34	24	na
	1000				bill. Cr\$							
Textiles (IBGE 24)	342.8	333.8	377.6	276.4	5.0	18.8	251.5	6675.0	65	54	62	73

Table A1 continued

	Employment (end of year)				Value added				Average size of establishment			
	1970	1975	1980	1984(a)	1970	1975	1980	1984(a)	1970	1975	1980	1984(a)
				per cent					number of employees			
Preparation of textile fibres	3.4	4.8	5.4	5.6	8.8	11.6	8.8	10.7	18	25	28	31
of which:												
Cotton	1.9	2.6	2.4	na	7.7	9.7	7.1	na	15	23	26	na
Spinning and weaving	60.6	62.9	58.6	58.4	56.4	54.4	57.3	58.2	115	91	109	117
of which:												
Spinning	13.1	28.6	27.5	na	11.0	19.7	21.0	na	273	219	246	na
Spinning and weaving(b)	28.3	2.1	1.6	na	23.6	1.2	3.6	na	516	275	48	na
Weaving	17.4	29.4	27.3	na	18.2	30.3	29.5	na	42	54	71	na
Cotton	36.2	36.1	33.6	na	27.7	25.8	30.9	na	234	146	157	na
Artificial or synthetic fibres	7.8	19.4	18.8	19.9	9.4	21.9	20.1	21.2	340	50	66	75
Knit fabrics, and knitwear	12.7	9.5	10.9	12.5	11.5	7.3	5.9	6.2	25	20	30	45
Passementerie, trimmings	2.4	3.0	2.6		1.8	2.4	1.9		55	49	42	
Special fabrics (felt, etc.)	1.4	1.5	1.5	23.4	2.3	2.7	2.7	24.9	82	68	80	56
Finishing of yarns or fabrics	5.7	10.2	10.4		7.9	12.6	10.0		71	64	80	
Various textile manufactures produced in spinning and weaving mills	13.7	8.1	10.5		11.3	9.0	13.3		74	34	35	
of which:												
Ropes etc.	1.5	0.7	1.0	na	0.9	0.6	0.6	na	15	14	31	na
Sacks of woven fabrics	6.0	2.3	1.8	na	3.8	2.1	2.3	na	196	98	98	na
Carpets	1.2	1.1	1.5	na	1.5	2.4	2.5	na	61	40	40	na
Domestic textiles	4.0	2.5	4.5	na	3.4	3.0	6.3	na	149	90	46	na
Impermeable fabrics and special finishing	1.0	0.4	0.5	na	1.6	0.6	0.9	na	377	89	96	na
		1000			bill. Cr\$							
Clothing and footwear (IBGE 25)	164.5	302.2	459.9	524.2	1.8	11.6	190.3	5707.9	19	27	30	54

Table A1 continued

	Employment (end of year)				Value added				Average size of establishment			
	1970	1975	1980	1984(a)	1970	1975	1980	1984(a)	1970	1975	1980	1984(a)
	per cent								number of employees			
Clothing	47.3	52.0	55.0	52.5	50.8	53.1	58.2	55.0	22	31	31	38
of which:												
Underwear, adults (including shirts, blouses, etc.)	17.3	16.5	16.3	na	18.1	17.5	23.0	na	29	40	52	na
Outer garments, adults	26.0	21.6	25.3	na	28.7	23.8	25.8	na	21	28	29	na
Children's clothing	2.2	5.0	5.5	na	2.0	4.9	4.6	na	10	23	22	na
Hats	1.4	0.8	0.6	na	1.5	0.8	0.5	na	14	14	18	na
Footwear,	43.3	34.3	34.2	47.5	37.0	27.5	31.9	45.0	18	25	31	97
of which:												
Shoes	38.9	27.0	27.3	na	33.1	20.2	21.7	na	20	27	29	na
Leather	36.4	26.3	26.2	na	27.4	19.0	20.4	na	19	27	28	na
Sport (any material)	0.5	1.9	3.2	na	0.8	3.5	5.7	na	33	208	264	na
Sandals, etc.	3.6	5.0	2.9	na	2.8	3.6	4.0	na	9	15	23	na
Leather	2.1	4.4	0.8	na	1.6	3.2	0.5	na	8	16	12	na
Parts of shoes	na	4.2	0.2	na	na	4.2	0.1	na	na	19	36	na
Clothing accessories, domestic tex- tiles, etc., except those produced in spinning or weaving mills	8.0	9.7	6.6	na	10.7	15.1	6.2	na	14	22	20	na
of which:												
Domestic textiles	1.2	3.0	1.1	na	2.2	6.5	1.6	na	16	22	14	na
Professional and security clothing	na	3.1	3.1	na	na	3.4	2.8	na	na	30	35	na
Various finishing processes	na	0.2	0.5	na	na	0.1	0.3	na	na	14	19	na
(a) 1984 figures relate only to establishments with 5 or more employees. - (b) Establishments where both spinning and weaving operations take place.												

Source: IBGE [b; c]; own calculations.

Table A2 - Fibre Consumption by the Brazilian Textile Industry, 1965-1987

	Total mill consumption	Natural fibres					Artificial fibres		Synthetic fibres			
		total	cotton	jute	wool	flax, ramie	total	viscose	total	nylon	polyester	acrylic
	1000 t	per cent										
1965	416	87.3	64.9	17.9	1.9	2.5	9.2	7.8	3.5	2.5	0.9	0.0
1970	517	78.3	56.3	14.8	2.7	4.4	9.8	8.1	11.9	5.6	4.4	1.7
1971	539	74.0	55.0	11.6	2.9	4.5	10.8	9.1	15.2	5.7	6.9	1.9
1972	604	73.7	53.8	13.1	2.5	4.3	8.7	7.2	17.6	6.5	8.0	2.4
1973	722	71.9	52.5	14.7	1.8	2.9	8.4	7.1	19.6	6.5	8.8	2.5
1974	752	69.5	52.8	12.6	1.5	2.7	8.2	7.0	22.3	7.7	9.9	2.8
1975	768	72.3	54.7	14.0	1.2	2.4	6.4	5.5	21.3	7.9	8.8	2.1
1976	843	70.4	55.5	11.4	1.7	1.8	6.4	5.6	23.2	8.1	10.1	2.4
1977	827	68.0	54.7	10.3	1.3	1.6	6.0	5.2	26.0	9.2	10.5	2.3
1978	878	69.2	58.1	8.5	1.6	1.0	5.2	4.7	25.6	8.4	10.5	2.1
1979	951	71.8	58.1	10.3	1.7	1.7	5.1	4.8	23.1	8.7	11.7	2.7
1980	1008	71.3	56.8	10.9	1.8	1.8	4.8	4.4	23.8	9.0	12.0	2.8
1981	912	75.3	61.6	10.3	1.8	1.5	4.6	4.3	20.1	7.7	9.8	2.6
1982	928	74.7	62.6	9.3	1.9	1.0	4.5	4.2	20.8	7.5	10.8	2.5
1983	844	76.2	65.9	7.5	1.6	1.2	3.8	3.6	20.1	7.2	10.6	2.2
1984	862	76.8	64.4	9.1	1.7	1.5	4.2	4.0	19.0	6.5	10.5	2.0
1985	979	76.4	64.5	9.0	1.5	1.4	3.9	3.6	19.7	6.3	11.0	2.4
1986	1133	75.2	65.0	7.8	1.2	1.2	3.8	3.5	21.0	7.5	11.1	2.3
1987	1196	75.9	64.8	8.3	1.2	1.6	3.6	3.4	20.5	6.8	11.4	2.3

Source: SIFTG/ATESP [1987; 1988]; own calculations.

Table A3 - Production, International Trade, and Apparent Consumption of Cotton Products in Selected Countries, 1974 and 1984

	Consumption by textile industry		Exports			
			yarns and fabrics		clothing and other manufactures	
	1974	1984	1974	1984	1974	1984
	per cent of world total					
Developed Countries	47.8	40.5	48.5	36.7	57.2	41.7
North America	12.0	8.5	6.9	1.3	7.9	3.2
EC (10)	7.4	5.9	22.6	22.1	29.5	21.3
France	1.7	1.1	4.2	3.3	4.2	2.3
Italy	1.5	1.7	3.0	3.0	3.5	5.4
UK	0.9	0.3	2.3	1.0	4.5	1.8
West Germany	1.8	1.4	4.6	6.7	4.6	3.5
Other Western Europe	3.2	3.2	7.7	6.2	9.5	8.5
Spain	0.9	0.7	1.2	1.2	1.1	0.5
Yugoslavia	0.7	0.8	1.2	0.8	0.9	0.9
USSR, Eastern Europe	18.9	17.5	7.5	4.2	4.7	6.3
Oceania(b)	0.2	0.1	0.1	0.0	0.6	0.1
Other(c)	6.1	5.2	3.7	2.9	4.9	2.3
Japan	5.5	4.7	3.5	2.6	4.6	1.5
Developing Countries	52.2	59.5	51.5	63.3	42.8	58.3
Africa	1.7	2.0	1.2	1.4	1.2	2.0
Latin America	7.3	6.8	8.0	7.1	4.0	1.6
Mexico	1.4	0.8	2.1	0.1	0.7	0.1
Brazil	3.0	3.7	3.1	5.2	1.2	0.8
Near East	4.7	5.7	5.5	8.0	2.0	4.3
Egypt	1.7	1.8	3.3	2.9	0.3	0.2
Turkey	1.8	2.6	2.0	4.6	1.1	2.9
Far East	17.2	19.2	24.3	25.0	33.9	41.7
Hong Kong	1.4	1.1	6.6	7.7	15.5	20.2
India	9.6	9.8	4.1	2.8	7.1	6.2
Pakistan	2.8	3.3	7.9	8.2	2.3	5.0
South Korea	1.2	2.4	3.3	4.0	3.9	3.9
Asian CPEs	21.4	25.8	12.4	21.8	1.6	8.8
China(d)	20.9	25.1	12.4	21.8	1.6	8.5
Oceania	0.0	0.0	0.0	0.0	0.0	0.0
	1000 t					
World	13090.8	15140.4	1531.3	2772.3	784.8	1593.8

Table A3 continued

Imports				Availability for domestic consumption(a)		Availability per head	
yarns and fabrics		clothing and other manufactures					
1974	1984	1974	1984	1974	1984	1974	1984
per cent of world total				kg			
73.1	74.9	78.3	80.7	53.2	53.1	6.3	6.6
10.5	10.9	23.3	25.5	13.8	13.4	7.8	7.7
37.2	38.8	35.6	37.8	10.3	11.2	5.2	6.1
5.9	5.8	3.2	5.6	1.9	2.0	4.9	5.4
5.4	7.7	3.6	1.7	1.8	2.1	4.4	5.5
7.0	6.6	7.1	5.8	1.8	1.9	4.4	5.0
8.5	9.3	10.3	15.8	2.9	3.5	6.2	8.6
8.0	5.5	8.9	8.2	3.3	3.0	4.5	4.3
0.6	0.2	0.6	0.3	0.8	0.5	2.9	1.8
0.7	0.5	0.7	0.2	0.7	0.7	4.1	4.4
7.2	6.6	1.5	3.3	18.3	17.8	6.8	6.8
5.8	3.1	2.7	1.6	1.2	0.9	9.6	7.3
4.5	10.0	6.1	4.3	6.4	6.9	6.0	6.4
3.8	9.1	4.6	3.3	5.6	6.2	6.7	7.7
26.9	25.1	21.7	19.3	46.8	46.9	2.2	2.0
7.1	3.6	4.6	1.4	2.8	2.3	1.2	0.8
3.1	1.4	2.5	1.6	6.5	5.7	2.8	2.2
0.0	0.0	0.2	0.1	1.0	0.8	2.4	1.5
0.0	0.0	0.1	0.0	2.5	2.6	3.1	2.9
3.9	1.4	5.0	5.8	4.7	4.6	3.5	3.1
0.1	0.0	0.0	0.0	1.2	1.2	4.5	4.0
0.0	0.0	0.0	0.1	1.4	1.3	4.8	4.1
12.4	17.4	6.4	9.8	13.3	13.5	1.6	1.5
6.4	12.7	2.4	7.4	0.4	0.3	12.1	7.8
0.0	0.0	0.0	0.0	8.4	8.6	1.8	1.7
0.0	0.0	0.1	0.0	1.5	1.0	2.8	1.5
0.4	0.5	0.4	0.0	0.6	1.1	2.2	4.2
0.4	1.1	3.2	0.4	19.6	20.7	2.7	2.7
0.4	0.4	0.1	0.0	18.9	19.8	2.8	2.8
0.2	0.1	0.3	0.2	0.1	0.1	1.9	1.6
1000 t							
1578.6	2521.9	934.8	1663.9	13330.8	14942.1	3.4(e)	3.2(e)
(a) Fibre equivalent. - (b) Australia, New Zealand. - (c) Israel, Japan, South Africa. - (d) People's Republic, Taiwan. - (e) World average.							

Source: FAO [a, 1983; 1987]; own calculations.

Table A4 - Production, International Trade, and Apparent Consumption of Artificial Fibres in Selected Countries, 1974 and 1984

	Consumption by textile industry		Exports			
			spun yarns and fabrics		clothing and other manufactures	
	1974	1984	1974	1984	1974	1984
	per cent of world total					
Developed Countries	81.2	70.3	89.2	69.3	73.0	45.0
North America	15.2	9.2	11.1	3.0	6.4	8.0
EC (10)	18.6	10.7	53.5	42.0	34.1	19.6
France	3.0	1.3	4.9	4.7	11.0	1.2
Italy	3.4	2.6	7.0	9.7	4.8	3.7
UK	4.4	2.7	4.1	3.3	4.1	2.3
West Germany	5.0	2.5	15.1	13.0	8.1	4.3
Other Western Europe	6.4	6.0	10.9	12.6	16.7	4.8
Spain	2.0	1.7	2.0	0.8	3.0	1.4
Yugoslavia	1.4	1.7	0.6	1.7	1.0	0.5
USSR, Eastern Europe	29.8	36.8	5.8	4.2	1.4	10.2
Oceania(b)	0.7	0.4	0.0	0.0	0.1	0.0
Other(c)	10.6	7.2	7.9	7.4	14.4	2.4
Japan	9.4	6.6	7.9	7.3	14.4	2.2
Developing Countries	18.8	29.7	10.8	30.7	27.0	55.0
Africa	1.3	1.3	1.3	1.1	0.3	0.9
Latin America	4.2	3.2	1.2	0.2	2.8	1.1
Mexico	0.8	0.6	0.0	0.0	0.3	0.1
Brazil	1.6	1.0	0.9	0.1	1.7	0.8
Near East	3.2	4.0	0.8	3.5	0.3	0.4
Egypt	0.2	0.6	0.0	0.0	0.0	0.0
Turkey	0.8	0.8	0.0	2.0	0.1	0.2
Far East	5.5	9.8	3.4	6.9	10.9	11.9
Hong Kong	0.1	0.1	1.1	1.7	1.9	6.0
India	3.8	4.8	1.2	0.5	0.3	0.8
Pakistan	0.4	0.7	0.0	0.0	0.0	0.2
South Korea	0.5	1.3	0.6	4.2	7.8	1.3
Asian CPEs	4.7	11.4	4.2	18.9	12.8	40.6
China(d)	4.7	11.2	4.2	18.9	12.8	40.6
Oceania	0.0	0.0	0.0	0.0	0.0	0.0
	1000 t					
World	3567.6	3254.9	294.2	273.7	190.3	313.6

Table A4 continued

Imports				Availability for domestic consumption(a)		Availability per head	
spun yarns and fabrics		clothing and other manufactures					
1974	1984	1974	1984	1974	1984	1974	1984
per cent of world total				kg			
73.6	71.5	82.2	71.7	80.3	73.4	2.6	1.9
6.9	5.4	26.0	37.3	16.0	12.3	2.4	1.5
46.6	52.7	32.2	22.8	18.1	11.7	2.4	1.4
7.5	9.0	12.4	3.7	3.4	1.9	2.3	1.1
5.0	11.1	1.8	1.3	3.1	2.5	2.0	1.4
5.4	6.6	1.7	3.6	4.4	3.1	2.8	1.8
10.8	11.4	9.4	8.0	4.7	2.7	2.8	1.4
10.6	7.7	12.5	6.3	6.2	5.7	2.3	1.8
0.9	0.5	0.2	0.4	1.7	1.6	1.8	1.3
0.8	1.0	0.0	0.0	1.4	1.6	2.3	2.3
1.8	2.1	0.0	0.6	29.0	36.1	2.9	3.0
3.5	1.4	1.2	2.4	1.1	0.8	2.3	1.3
4.1	2.2	10.2	2.2	10.0	6.8	2.5	1.4
1.3	0.5	10.0	1.9	8.5	6.0	2.8	1.6
26.4	28.5	17.8	28.3	19.7	26.6	0.2	0.2
6.0	4.4	3.1	2.5	1.9	1.7	0.2	0.1
5.1	4.0	3.9	2.7	4.6	3.7	0.5	0.3
0.2	0.1	1.4	0.3	0.9	0.6	0.5	0.3
1.5	0.0	0.1	0.0	1.6	1.0	0.5	0.2
7.6	4.6	6.8	14.9	4.2	5.5	0.9	0.8
0.0	0.5	0.2	4.7	0.2	1.0	0.2	0.7
0.0	0.0	0.0	0.0	0.8	0.6	0.7	0.4
7.1	13.8	2.4	7.9	5.3	10.0	0.2	0.2
2.8	8.4	0.5	4.3	0.2	0.4	1.4	2.5
0.0	0.4	0.0	0.1	3.6	4.8	0.2	0.2
0.0	0.0	0.0	0.0	0.4	0.7	0.2	0.2
0.6	0.6	0.1	0.1	0.0	0.8	0.0	0.7
0.5	1.3	1.7	0.3	3.7	5.6	0.1	0.2
0.5	1.3	0.2	0.1	3.5	5.4	0.1	0.2
0.2	0.4	0.0	0.0	0.0	0.0	0.2	0.3
1000 t							
314.9	263.8	201.8	272.4	3602.9	3200.4	0.9(e)	0.7(e)
(a) Fibre equivalent. - (b) Australia, New Zealand. - (c) Israel, Japan, South Africa. - (d) People's Republic, Taiwan. - (e) World average.							

Source: As for Table A3.

Table A5 - Production, International Trade, and Apparent Consumption of Synthetic Fibres in Selected Countries, 1974 and 1984

	Consumption by textile industry		Exports			
			spun yarns and fabrics		clothing and other manufactures	
	1974	1984	1974	1984	1974	1984
	per cent of world total					
Developed Countries	82.1	65.4	84.1	55.1	72.1	45.5
North America	35.0	24.6	6.5	2.4	10.8	7.0
EC (10)	20.0	13.4	43.2	29.6	52.6	23.5
France	3.3	1.8	6.2	3.7	6.5	2.0
Italy	3.6	3.4	8.5	8.8	7.6	5.1
UK	4.9	2.3	4.3	1.6	6.4	2.1
West Germany	5.6	3.6	13.7	8.1	15.9	3.8
Other Western Europe	5.5	4.3	7.2	7.8	5.1	6.4
Spain	2.0	2.0	1.0	3.3	0.6	2.4
Yugoslavia	0.8	0.9	0.2	0.5	0.4	0.7
USSR, Eastern Europe	10.4	11.9	0.3	0.5	1.1	4.0
Oceania(b)	0.9	0.5	0.1	0.1	0.3	0.1
Other(c)	10.3	10.6	26.7	14.7	2.2	4.5
Japan	9.2	9.4	26.6	14.4	2.2	3.7
Developing Countries	17.9	34.6	15.9	44.9	27.9	54.5
Africa	0.7	0.8	0.2	0.3	0.3	0.9
Latin America	5.8	5.6	0.9	1.9	0.8	0.6
Mexico	1.8	1.9	0.0	0.2	0.0	0.1
Brazil	1.9	1.6	0.4	1.3	0.5	0.2
Near East	1.7	2.6	0.1	2.1	0.3	1.4
Egypt	0.0	0.3	0.0	0.0	0.0	0.1
Turkey	0.8	1.3	0.0	1.7	0.0	0.7
Far East	5.8	11.1	8.0	25.5	19.4	33.4
Hong Kong	0.5	0.4	3.1	7.4	8.2	10.7
India	0.4	1.5	0.1	0.1	0.0	0.1
Pakistan	0.2	0.5	0.1	0.2	0.0	0.2
South Korea	2.4	5.7	3.1	11.8	7.7	12.6
Asian CPEs	3.8	14.5	6.7	15.2	7.1	18.3
China(d)	3.8	14.5	6.7	15.2	7.1	18.3
Oceania	0.0	0.0	0.0	0.0	0.0	0.0
	1000 t					
World	7483	11859	1091	1833	869	1699

Table A5 continued

Imports				Availability for domestic consumption(a)		Availability per head	
spun yarns and fabrics		clothing and other manufactures					
1974	1984	1974	1984	1974	1984	1974	1984
per cent of world total				kg			
69.2	60.7	86.9	75.1	81.9	71.2	5.3	6.8
6.0	8.4	13.4	28.1	36.1	29.5	11.1	12.9
39.3	34.5	53.1	29.1	18.7	14.5	5.1	6.1
5.9	6.0	6.5	4.9	3.2	2.6	4.4	5.3
2.6	2.2	2.3	0.9	2.0	1.7	2.6	3.4
6.6	9.0	7.1	5.9	5.3	4.0	6.9	8.1
10.4	6.8	22.9	10.0	5.8	4.2	6.7	7.8
10.3	5.8	10.8	7.0	6.6	4.0	5.0	4.4
0.9	0.2	0.3	0.3	2.0	1.2	4.2	3.7
1.4	0.7	1.2	0.4	1.1	0.8	3.7	4.1
4.4	2.8	0.4	4.8	11.2	12.7	2.2	3.7
4.7	5.4	4.9	2.6	2.1	1.7	9.4	10.1
4.5	3.9	4.4	3.5	7.2	8.9	3.7	6.3
2.6	2.2	3.1	2.8	5.7	7.5	3.7	7.1
30.8	39.3	13.1	24.9	18.1	28.8	0.5	0.9
4.4	4.4	2.1	1.2	1.6	1.5	0.4	0.4
3.4	2.5	3.1	3.3	6.6	6.3	1.5	1.8
0.2	0.1	0.4	0.1	1.9	1.9	2.4	2.9
0.6	0.0	0.6	0.0	2.0	1.4	1.4	1.2
4.9	8.8	2.9	10.8	2.8	5.0	1.1	2.6
0.0	0.4	0.2	0.1	0.1	0.4	0.1	1.0
0.4	0.1	0.0	0.0	0.9	1.0	1.7	2.3
17.3	22.6	4.0	9.2	5.0	6.4	0.3	0.5
7.3	12.6	0.8	6.0	0.1	0.1	1.0	2.9
0.0	0.0	0.0	0.0	0.4	1.5	0.0	0.2
0.2	0.0	0.0	0.1	0.2	0.4	0.2	0.5
2.3	1.7	0.3	0.1	1.8	2.1	3.7	6.1
0.8	0.8	1.0	0.3	2.1	9.6	0.2	1.0
0.8	0.7	0.8	0.1	2.1	9.5	0.2	1.0
0.1	0.1	0.2	0.1	0.0	0.0	0.7	0.5
1000 t							
975	1535	772	1609	7251	11442	1.8(e)	2.4(e)
(a) Fibre equivalent. - (b) Australia, New Zealand. - (c) Israel, Japan, South Africa. - (d) People's Republic, Taiwan. - (e) World average.							

Source: As for Table A3.

Table A6 - Output and International Trade of Bovine Hides and Skins in Selected Countries, 1970-1985

	Livestock		Slaughter rate (a)		Hides and skins, wet salted weight					
					production		exports		imports	
	1972	1985	1972	1985	1970	1985	1970	1985	1970	1985
	per cent of world total		per cent		per cent of world total					
Developed Countries	33.1	30.3	33.2	34.8	62.1	62.1	74.0	93.0	89.6	74.1
North America	10.5	8.7	33.3	36.3	23.2	21.6	36.1	44.4	3.2	2.7
US	9.5	7.9	33.3	36.4	21.3	19.7	31.9	39.2	0.8	1.4
Western Europe	7.6	7.1	34.2	38.1	18.1	18.3	27.6	39.6	48.6	45.9
France	1.8	1.7	32.2	33.0	3.8	3.5	5.9	9.7	2.7	1.3
Italy	0.7	0.7	55.4	56.5	3.0	3.1	1.0	1.6	17.2	22.3
Spain	0.3	0.4	35.3	35.9	0.8	0.9	0.0	0.2	3.9	3.0
UK	1.1	0.9	26.6	33.1	2.2	2.1	2.0	5.6	3.6	1.9
West Germany	1.1	1.1	35.9	36.3	3.0	3.3	5.3	7.0	5.9	3.7
Yugoslavia	0.4	0.4	32.6	45.8	0.7	0.8	0.1	0.0	2.8	2.6
USSR, Eastern Europe	10.8	11.1	35.3	32.8	15.6	16.4	0.6	1.3	19.9	12.5
USSR	8.3	8.7	36.3	32.7	11.3	12.2	0.4	1.2	6.2	0.8
Czechoslovakia	0.4	0.4	34.5	35.0	0.7	0.8	na	na	3.3	4.7
Poland	0.9	0.8	34.9	38.9	1.7	1.4	0.2	0.1	3.2	2.5
Romania	0.4	0.5	28.9	25.7	0.6	0.6	na	na	3.3	2.0
Oceania	2.9	2.2	26.1	32.2	3.4	3.7	7.9	6.8	0.0	0.0
Other(b)	1.2	1.2	24.1	26.5	1.9	2.1	1.7	0.9	17.8	12.6
Japan	0.3	0.3	33.4	34.1	0.9	1.0	0.0	0.0	17.0	12.6
Developing Countries	66.9	69.7	12.9	12.9	37.9	37.9	26.0	7.0	10.4	26.0
Latin America	19.1	21.8	14.5	13.8	16.8	17.0	18.1	1.4	5.3	5.0
Argentina	4.2	3.9	19.1	25.2	6.1	5.6	13.5	0.4	0.0	0.0
Brazil	6.7	9.3	13.1	8.3	4.5	4.4	3.2	0.1	0.1	0.0
Mexico	2.1	2.3	9.9	14.9	1.2	1.9	na	na	4.0	4.3
Uruguay	0.7	0.7	14.0	17.0	0.9	0.7	0.2	0.2	na	0.3
Africa	10.2	9.9	8.8	10.1	3.4	3.8	5.1	2.6	0.4	0.6
Near East(c)	3.7	4.0	15.9	21.7	2.5	3.7	0.8	1.3	1.7	2.3
Far East	27.1	27.2	13.1	13.3	10.5	11.2	1.8	1.5	2.3	11.9
Hong Kong	0.0	0.0	-	-	0.1	0.1	0.1	0.6	1.0	0.7
India	19.1	19.4	13.2	13.1	7.0	7.3	0.0	0.0	0.3	0.1
South Korea	0.1	0.2	15.6	30.2	0.1	0.2	0.0	0.0	0.8	10.4
Pakistan	2.0	2.1	17.2	17.9	0.9	1.1	0.0	0.0	0.0	0.1
Asian CPEs(d)	6.8	6.6	12.2	7.2	4.6	2.2	0.2	0.1	0.8	6.1
	mill. heads				1000 t					
World	1237	1397	19.6(e)	19.5(e)	4269	4884	1209	1693	1297	1752
(a) Number of cattle slaughtered as percentage of livestock. - (b) South Africa, Israel, Japan. - (c) Including Egypt, Libya, Sudan. - (d) China (People's Republic, Taiwan), Mongolia. - (e) World average.										

Source: FAO [b]; own calculations.

Table A7 - The Structure of Yarn Production Costs in Selected Countries, 1981 and 1987

	Brazil		India		South Korea		West Germany		Japan		US	
	US \$ (a)	per cent	US \$ (a)	per cent	US \$ (a)	per cent	US \$ (a)	per cent	US \$ (a)	per cent	US \$ (a)	per cent
1981												
Labour	0.16	5.2	0.12	4.6	0.06	2.2	0.37	11.3	0.18	5.6	0.25	8.1
Capital	0.85	27.5	0.39	15.1	0.39	13.6	0.51	15.8	0.58	17.9	0.70	23.1
Power	0.08	2.6	0.12	4.6	0.16	5.5	0.14	4.3	0.21	6.4	0.08	2.5
Raw material (cotton)	1.81	58.4	1.75	68.3	2.09	72.2	2.04	62.7	2.08	64.0	1.81	59.9
Waste and auxiliary material	0.20	6.4	0.19	7.4	0.19	6.5	0.19	5.9	0.20	6.2	0.19	6.4
Total	3.11	100.0	2.56	100.0	2.89	100.0	3.25	100.0	3.24	100.0	3.02	100.0
1987												
Labour	0.12	4.5	0.09	3.8	0.11	4.7	0.74	22.5	0.41	13.0	0.36	14.7
Capital	0.97	36.5	0.71	28.5	0.48	19.7	0.66	20.1	0.74	23.6	0.50	20.2
Power	0.04	1.4	0.22	9.0	0.17	6.9	0.28	7.3	0.31	9.9	0.14	5.5
Raw material (cotton)	1.30	49.0	1.25	50.5	1.47	60.2	1.46	44.2	1.45	46.4	1.28	52.3
Waste and auxiliary material	0.23	8.6	0.21	8.3	0.21	8.5	0.19	5.9	0.22	7.1	0.18	7.3
Total	2.65	100.0	2.48	100.0	2.44	100.0	3.29	100.0	3.13	100.0	2.45	100.0

(a) Per kg of yarn.

Source: Anson, Simpson [1988, Tables 2.26, 2.27]; ITMF [b, p. 23; 1981 data].

Table A8 - The Structure of Fabrics Production Costs in Selected Countries, 1981 and 1987

	Brazil		India		South Korea		West Germany		Japan		US	
	US \$ (a)	per cent	US \$ (a)	per cent	US \$ (a)	per cent	US \$ (a)	per cent	US \$ (a)	per cent	US \$ (a)	per cent
1981												
Labour	0.07	6.8	0.05	5.9	0.03	3.7	0.39	18.1	0.10	10.2	0.12	12.5
Capital	0.27	27.7	0.16	20.8	0.15	19.0	0.16	15.7	0.16	16.3	0.22	22.8
Power	0.03	2.7	0.04	5.4	0.05	6.6	0.04	4.0	0.06	6.4	0.02	2.1
Yarn manufacturing and raw material (cotton)	0.58	58.9	0.48	61.1	0.54	66.1	0.61	58.6	0.60	62.2	0.56	58.1
Waste and auxiliary material	0.04	3.9	0.05	6.8	0.04	4.9	0.04	3.6	0.05	4.8	0.04	4.4
Total	0.98	100.0	0.78	100.0	0.81	100.0	1.05	100.0	0.97	100.0	0.97	100.0
1987												
Labour	0.06	5.1	0.04	4.3	0.05	5.4	0.35	23.1	0.21	15.1	0.19	23.8
Capital	0.44	40.9	0.33	32.5	0.25	27.0	0.36	23.9	0.37	27.1	0.24	30.0
Power	0.02	1.6	0.09	8.9	0.07	7.5	0.10	6.6	0.12	8.8	0.06	7.0
Yarn manufacturing and raw material (cotton)	0.49	45.2	0.46	45.5	0.45	50.1	0.61	40.4	0.58	42.5	0.24	29.8
Waste and auxiliary material	0.08	7.2	0.09	8.8	0.09	9.9	0.09	5.9	0.09	6.5	0.08	9.4
Total	1.08	100.0	1.01	100.0	0.91	100.0	1.52	100.0	1.37	100.0	0.80	100.0

(a) US \$ per yard of fabric.

Source: As for Table A7.

Table A9 - Clothing Production Costs for Cotton Shirts, 1985

	Hong Kong		South Korea		Portugal		UK		West Germany	
	DM (a)	per cent	DM (a)	per cent	DM (a)	per cent	DM (a)	per cent	DM (a)	per cent
Labour	0.80	7.3	1.05	9.2	1.43	9.8	3.21	20.6	4.36	25.6
Capital (financial)	0.95	8.7	1.38	12.1	2.15	14.7	1.06	6.8	0.85	5.0
Power	0.15	1.4	0.15	1.3	0.10	0.7	0.11	0.7	0.12	0.7
Raw materials	7.78	71.2	7.48	65.7	8.53	58.3	9.34	59.8	9.19	54.0
Manufacturing expenses	0.63	5.8	0.55	4.8	0.98	6.7	0.91	5.8	1.15	6.8
Subtotal	10.31	94.3	10.61	93.2	13.19	90.2	14.63	93.7	15.67	92.1
Overhead	0.62	5.7	0.77	6.8	1.44	9.8	0.99	6.3	1.35	7.9
Total	10.93	100.0	11.38	100.0	14.63	100.0	15.62	100.0	17.02	100.0

(a) DM per piece.

Source: Anson, Simpson [1988, Table 2.30].

Table A10 - Short-Term (a) Real Interest Rates (effective credit costs, annualized, monthly averages) in Brazil, 1980-1988

	1980	1981	1982	1983	1984	1985	1986	1987	1988
January	-11.3	6.7	14.3	11.9	35.1	58.0	18.6	-14.1	16.8
February	-14.9	12.2	13.3	12.4	35.0	54.4	18.8	58.7	16.8
March	-16.8	23.4	19.4	8.7	34.9	38.9	23.4	-4.4	18.8
April	-14.8	28.9	27.8	4.6	29.5	39.9	15.1	16.6	16.7
May	-17.5	29.0	29.2	-1.0	31.9	29.4	12.3	-3.3	16.7
June	-19.6	31.2	29.3	-3.0	31.9	20.8	16.4	22.9	16.7
July	-19.7	32.8	36.6	0.9	28.9	18.5	15.1	97.9	16.7
August	-9.8	30.9	34.5	9.0	30.9	18.7	16.2	55.3	19.8
September	-9.7	29.0	33.0	16.8	32.0	31.6	21.3	45.5	23.8
October	-15.8	29.6	24.7	27.8	30.0	28.7	1.8	28.9	21.8
November	-10.0	28.1	15.5	37.1	52.2	25.3	-36.7	33.0	21.4
December	-0.8	26.2	14.8	35.3	55.1	20.9	-43.8	32.0	-90.2

(a) Credit terms - until February 1986: 180 days; March 1986 through January 1987: 90 days; from February 1987: 60 days.

Source: Data provided by the Financial Director of a large private firm with national capital.

Table A11 - Specialization in Labour-Intensive Industries: Cross-Country Regression Results with Real GDP as an Independent Variable, 1975

Dependent variable	RGDP1 β_1 -coefficient	Linear model				Quadratic model			
		test statistics							
		SE	F	R ²	\bar{R}^2	SE	F	R ²	\bar{R}^2
VA 321 (textiles)	-0.65*** (-5.36)	5.9	28.72***	0.42	0.41	5.7	16.94**	0.47	0.44
VA 322 (clothing)	-0.03 (-0.16)	5.0	0.2	0.00	-0.03	4.8	2.28	0.11	0.06
VA 323 (leather, leather products)	-0.35** (-2.34)	0.4	5.49**	0.12	0.10	0.4	4.62**	0.20	0.15
VA 324 (footwear)	-0.27* (-1.77)	1.0	3.12*	0.07	0.05	1.0	1.94	0.09	0.05
PR 65 (textiles)	-0.66*** (-5.19)	1.4	26.88***	0.44	0.43	1.3	18.09***	0.52	0.49
EPR 651-3 (yarns and fabrics)	-0.77*** (-6.36)	1.4	40.50***	0.60	0.59	1.2	37.00***	0.74	0.72
EPR 841 (clothing)	-0.51*** (-3.54)	3.7	12.55***	0.26	0.24	3.7	6.14***	0.27	0.22
EPR 611 (leather)	-0.41** (-2.30)	46.0	5.27**	0.17	0.14	41.0	7.25***	0.37	0.32
EPR 612 (basic leather manu- factures)	-0.48*** (-2.84)	1.4	8.06***	0.23	0.20	1.5	3.94**	0.23	0.17
EPR 831 (travel goods)	-0.63*** (-4.19)	4.1	17.54***	0.39	0.37	4.0	10.15***	0.44	0.40
EPR 851 (footwear)	-0.51*** (-3.13)	2.6	9.81***	0.26	0.23	2.6	5.09**	0.27	0.22

SE = Standard error. - *** (**; *) Significant at the 1 (5; 10) per cent level; two-tailed test.
 Data explanations and sources:
 VA Share of ISIC industry in manufacturing value added in respective country; from UNIDO [1986a].
 EPR Export performance ratio for SITC Rev. I category; calculated from data in UN [b].
 RGDP1 Real GDP per head; from Heston, Summers [1988, PENN World Tables IV].

Source: Own calculations.

Table A12 - Factor Endowments in Selected Countries, 1975

	Share of professional, technical, and related staff in labour force	Share of illiterate staff in labour force	Physical capital per member of labour force	Real per capital GDP (calculated at purchasing power parities)
	per cent		US \$ 100	
Advanced industrialized countries				
France	14.4	0.6	122	82
Japan	7.8	0.9	84	64
Sweden	19.2	0.6	145	82
UK	12.8	0.6	60	69
US	14.4	0.4	100	100
West Germany	12.1	0.6	118	79
South European countries				
Greece	6.5	17.2	43	37
Italy	8.0	4.4	64	56
Portugal	4.0	32.9	24	30
Spain	6.3	7.9	64	54
Turkey	3.9	52.0	11	22
Yugoslavia	9.2	15.3	15	36
NICs				
Brazil	5.7	36.1	17	25
Chile	5.1	16.0	17	29
Colombia	5.6	27.0	10	21
Hong Kong	5.2	10.0	24	44
Mexico	6.0	21.5	15	35
Singapore	9.5	20.0	61	41
South Korea	3.1	28.0	9	18
Developing countries				
Egypt	6.3	68.4	5	8
India	3.1	68.9	2	6
Philippines	5.7	12.9	7	13
Sri Lanka	3.9	22.3	2	9

Source: Heston, Summers [1988, PENN World Tables IV]; Leamer [1984, Appendix B].

Table A13 - Capital Intensity in Sub-Branches of Labour-Intensive Industries in Brazil, 1970-1984

	Overall capital intensity(a)				Physical capital intensity(b)				Human capital intensity(c)			
	1970	1975	1980	1984(d)	1970	1975	1980	1984(d)	1970	1975	1980	1984(d)
Leather, leather goods (IBGE 19)	0.64	0.55	0.54	0.79	0.62	0.52	0.52	0.81	0.72	0.71	0.66	0.69
Preparation of hides (drying, salting)	0.88	1.31	0.76	na	0.93	1.49	0.79	na	0.69	0.58	0.63	na
Tanning	0.72	0.61	0.63	na	0.70	0.58	0.60	na	0.78	0.77	0.76	na
Saddlery etc.	0.27	0.42	0.36	na	0.26	0.41	0.33	na	0.29	0.45	0.47	na
Travel good, handbags, etc.	0.46	0.43	0.38	na	0.42	0.39	0.35	na	0.60	0.59	0.51	na
Other leather manufactures (mainly for industrial use)	0.52	0.37	0.39	na	0.46	0.31	0.36	na	0.69	0.63	0.52	na
Textiles (IBGE 24)	0.72	0.70	0.83	0.85	0.69	0.68	0.85	0.87	0.82	0.77	0.77	0.73
Preparation of textile fibres	1.87	1.68	1.35	1.62	2.15	1.90	1.50	1.78	0.94	0.78	0.70	0.70
of which:												
Cotton	2.84	2.57	2.43	na	3.35	2.98	2.81	na	1.11	0.87	0.81	na
Spinning and weaving,	0.67	0.61	0.82	0.85	0.62	0.57	0.82	0.87	0.82	0.76	0.79	0.75
of which:												
Spinning	0.60	0.48	0.64	na	0.54	0.43	0.60	na	0.81	0.71	0.80	na
Spinning and weaving(e)	0.60	0.41	1.86	na	0.54	0.36	2.11	na	0.79	0.60	0.81	na
Weaving	0.75	0.72	0.90	na	0.71	0.70	0.92	na	0.88	0.81	0.81	na
Cotton	0.55	0.50	0.77	na	0.66	0.45	0.77	na	0.74	0.70	0.77	na
Artif. or synth. fibres	0.86	0.79	0.89	0.91	0.80	0.77	0.90	0.93	1.06	0.88	0.84	0.78
Knit fabrics, knitwear	0.65	0.54	0.45	0.42	0.61	0.50	0.42	0.39	0.77	0.70	0.61	0.59

Table A13 continued

	Overall capital intensity(a)				Physical capital intensity(b)				Human capital intensity(c)			
	1970	1975	1980	1984(d)	1970	1975	1980	1984(d)	1970	1975	1980	1984(d)
Passementerie, trimmings	0.52	0.55	0.61	} 0.91	0.44	0.49	0.58	} 0.93	0.79	0.80	0.76	} 0.78
Special fabrics (felt, etc.)	1.17	1.30	1.45		1.17	1.36	1.51		1.16	1.02	1.16	
Finishing of yarns or fabrics	0.99	0.86	0.80		0.98	0.84	0.76		1.04	0.97	0.98	
Various textile manufactures produced in spinning and weaving mills of which	0.59	0.78	1.06		0.55	0.82	1.16		0.73	0.65	0.62	
Ropes etc.	0.44	0.53	0.49	na	0.42	0.51	0.49	na	0.49	0.60	0.52	na
Sacks of woven fabrics	0.46	0.61	1.07	na	0.41	0.61	1.20	na	0.61	0.64	0.54	na
Carpets	0.88	1.60	1.36	na	0.85	1.75	1.50	na	0.96	0.98	0.76	na
Domestic textiles	0.61	0.83	1.15	na	0.55	0.88	1.27	na	0.81	0.66	0.65	na
Impermeable fabrics and special finishing	1.19	1.06	1.47	na	1.20	1.11	1.56	na	1.14	0.83	1.08	na
Clothing and footwear (IBGE 25)	0.54	0.48	0.52	0.38	0.50	0.45	0.52	0.36	0.64	0.61	0.53	0.54
Clothing of which:	0.58	0.49	0.55	0.40	0.55	0.46	0.56	0.38	0.67	0.61	0.51	0.52
Underwear, adults (incl. shirts, blouses, etc.)	0.56	0.51	0.73	na	0.54	0.49	0.77	na	0.64	0.60	0.54	na
Outer garments, adults	0.59	0.53	0.53	na	0.56	0.49	0.53	na	0.70	0.68	0.53	na
Children's clothing	0.50	0.47	0.43	na	0.47	0.44	0.42	na	0.60	0.56	0.47	na

Table A13 continued

	Overall capital intensity(a)				Physical capital intensity(b)				Human capital intensity(c)			
	1970	1975	1980	1984(d)	1970	1975	1980	1984(d)	1970	1975	1980	1984(d)
Hats	0.57	0.46	0.40	na	0.54	0.43	0.38	na	0.68	0.59	0.49	na
Footwear, of which:	0.46	0.38	0.48	0.36	0.41	0.33	0.47	0.33	0.62	0.60	0.55	0.57
Shoes	0.46	0.36	0.41	na	0.41	0.30	0.38	na	0.62	0.59	0.53	na
Leather	0.40	0.34	0.40	na	0.34	0.29	0.37	na	0.60	0.58	0.53	na
Sport (any material)	0.83	0.86	0.92	na	0.77	0.85	0.93	na	1.03	0.89	0.84	na
Sandals, etc.	0.42	0.35	0.71	na	0.40	0.30	0.78	na	0.49	0.56	0.42	na
Leather	0.41	0.34	0.36	na	0.39	0.29	0.35	na	0.49	0.57	0.37	na
Parts of shoes	na	0.48	0.36	na	na	0.45	0.31	na	na	0.60	0.59	na
Clothing accessories, domestic textiles, etc., except those produced in spinning or weaving mills of which:	0.72	0.75	0.49	na	0.73	0.85	0.49	na	0.67	0.35	0.50	na
Domestic textiles	0.95	1.04	0.71	na	1.01	1.14	0.77	na	0.73	0.60	0.47	na
Professional and security clothing	na	0.52	0.48	na	na	0.49	0.47	na	na	0.65	0.52	na
Various finishing processes	na	0.38	0.33	na	na	0.30	0.28	na	na	0.72	0.54	na

(a) Value added per employee relative to manufacturing average. - (b) Non-wage value added per employee relative to manufacturing average. - (c) Wages per employee relative to manufacturing average. - (d) 1984 figures relate only to establishments with 5 or more employees. - (e) Establishments where both spinning and weaving operations take place.

Source: IBGE [b; c]; own calculations.

Table A14 - The Development of the Price of Raw Hides and Skins in Brazil Relative to the US, 1977-1988 (1977 = 1000) (a)

	Quarter			
	I	II	III	IV
1977	0.995	0.846	1.096	1.075
1978	0.945	0.912	0.935	1.500
1979	1.372	1.331	1.648	1.460
1980	2.021	1.978	1.605	1.371
1981	1.415	0.802	1.028	0.939
1982	1.080	1.237	1.146	1.061
1983	0.950	1.359	1.902	2.439
1984	2.756	2.437	1.949	2.133
1985	1.726	1.352	1.499	1.492
1986	1.418	1.471	2.347	2.783
1987	1.824	0.846	0.875	0.760
1988	0.823	0.934	1.155	1.303

(a) Ratio of the price index of "couro verde" in Brazil, deflated by the general wholesale price index, to the price index of raw hides and skins in Chicago, deflated by US wholesale price index. It is assumed that changes in the price of "couro verde" reflect mainly changes in the price of raw hides.

Source: Conjuntura Econômica [d]; IMF, International Financial Statistics, various issues; data provided by Sindicato da Indústria do Curtimento de Couros e Peles no Estado de São Paulo; own calculations.

Table A15 - Capital Ownership in Labour-Intensive Industries in Brazil, 1980 (per cent)

	Local	Foreign	Mixed
Textiles (n = 693)	93.8	4.5	1.7
Yarns and fabrics	92.2	6.1	1.7
Knitwear	97.8	1.5	0.7
Passementerie, trimmings	97.1	-	2.9
Special fabrics	85.8	9.5	4.7
Finishing of yarns or fabrics	96.0	-	4.0
Clothing, accessories (n = 689)	98.6	0.2	1.2
Clothing	98.4	0.4	1.2
Accessories	100.0	-	-
Leather, leather goods (n = 164)	98.8	0.6	0.6
Tanning	98.0	1.0	1.0
Travel goods	100.0	-	-
Other manufactures	100.0	-	-
Footwear (n = 271)	99.2	0.4	0.4
Men's, leather	100.0	-	-
Ladies', leather	100.0	-	-
Other, leather	100.0	-	-
Non-leather	93.8	3.1	3.1

Source: CDI [1982; 1983a; 1983b; 1983c].

Table A16 - The Size-Distribution of Firms in Labour-Intensive Industries in Brazil, 1980 and 1981

	Number of firms					Turnover				
	total	'micro'	small	medium	large	total	'micro'	small	medium	large
	per cent of sector									
Textiles (1981)	4901	68.8	15.0	5.7	10.5	100.0	2.3	6.8	7.4	83.5
Yarns and fabrics	1787	61.6	14.4	6.9	17.0	100.0	1.2	3.9	5.5	89.5
Knitwear	1773	81.4	11.9	3.2	3.5	100.0	7.9	16.7	12.5	62.9
Passementerie, trimmings	235	73.2	17.5	2.5	6.8	100.0	8.1	17.5	8.0	66.4
Special fabrics	80	53.7	15.0	13.8	17.5	100.0	2.0	3.5	10.6	83.9
Finishing of yarns or fabrics	141	53.9	19.2	11.3	15.6	100.0	2.2	6.8	11.6	79.4
Clothing, acces- sories (1981)	11192	89.0	7.1	2.4	1.5	100.0	21.7	18.8	15.9	43.6
Clothing	9437	88.9	7.2	2.3	1.6	100.0	21.2	18.6	15.1	45.1
Accessories	639	84.4	9.5	4.2	1.9	100.0	23.0	21.5	25.2	30.3
Leather, leather goods (1980)	1477	80.2	11.5	4.0	4.3	100.0	7.8	14.9	14.5	62.8
Tanning	455	62.4	17.4	9.2	11.0	100.0	3.2	11.1	15.5	70.2
Travel goods	211	82.9	12.3	2.4	2.4	100.0	12.1	21.5	13.0	53.4
Other manufactures	789	89.9	7.9	1.4	0.9	100.0	21.2	24.0	12.1	42.7
Footwear (1981)	3943	86.7	7.4	3.4	2.5	100.0	13.8	15.4	17.7	53.1
	per cent of total manufacturing									
Textiles (1981)	3.6	2.9	6.6	7.3	10.2	7.0	3.8	6.9	7.5	6.9
Yarns and fabrics	1.3	0.9	2.3	3.2	6.0	4.3	1.2	2.4	3.4	4.7
Knitwear	1.3	1.2	1.9	1.5	1.2	0.8	1.5	1.9	1.5	0.6
Passementerie, trimmings	0.2	0.1	0.4	0.2	0.3	0.1	0.2	0.3	0.1	0.1
Special fabrics	0.1	0.0	0.1	0.3	0.0	0.1	0.1	0.1	0.3	0.2
Finishing of yarns or fabrics	0.1	0.1	0.2	0.4	0.4	0.2	0.1	0.2	0.4	0.2
Clothing, acces- sories (1981)	8.2	8.5	7.1	6.9	3.4	2.6	13.1	7.1	6.1	1.4
Clothing	6.9	7.2	6.1	5.7	2.9	2.3	11.1	6.1	5.0	1.2
Accessories	0.5	0.5	0.5	0.7	0.2	0.2	0.9	0.6	0.7	0.1
Leather, leather goods (1980)	1.1	1.0	1.5	1.5	1.3	0.7	1.2	1.5	1.4	0.5
Tanning	0.3	0.2	0.7	1.1	1.0	0.5	0.3	0.7	1.0	0.4
Travel goods	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.0
Other manufactures	0.6	0.6	0.6	0.3	0.1	0.1	0.7	0.5	0.2	0.1
Footwear (1981)	2.9	2.9	2.6	3.5	2.0	1.2	3.9	2.7	3.1	0.8

Source: As for Table A15.

Table A17 - Concentration Ratios (a) for World Market Economy Exports of Labour-Intensive Products, 1970 and 1985

	1970			1985		
	C3	C6	C10	C3	C6	C10
Leather, leather products, and footwear						
Leather	37.2	59.5	78.3	38.4	57.2	74.3
Leather etc. manufactures	42.7	64.4	82.4	39.6	58.2	72.5
Prepared parts of footwear	na	na	na	42.7	63.7	77.6
Travel goods, handbags	54.9	80.4	93.4	61.6	77.6	84.2
Footwear	57.3	73.8	83.9	57.1	75.5	86.3
Footwear leather	62.9	78.1	85.8	58.6	77.2	88.7
Textiles and clothing						
Textile yarns	39.4	63.4	81.9	31.4	49.3	66.6
Cotton yarns	na	na	na	32.3	52.9	73.8
Cotton fabric, woven	31.4	52.7	70.4	35.7	53.8	69.4
Woven man-made fibre fabric				48.6	72.3	85.7
Other woven textile fabric	48.1	70.9	87.7	51.4	68.6	83.9
Knitted etc. fabrics				49.7	71.9	86.8
Lace, ribbon, textile, etc.	49.5	76.7	89.6	38.9	64.3	85.4
Special textiles	40.6	65.8	84.8	39.6	60.7	78.4
Textile articles n.e.s.	31.0	53.1	75.8	22.6	41.3	60.2
Men's outerwear not knit	35.5	59.9	77.7	41.6	56.1	68.1
Women's outerwear not knit	36.6	64.6	83.9	38.7	57.6	69.2
Undergarments not knit	60.7	74.6	84.9	46.7	57.4	66.3
Outerwear knit nonelastic	55.6	74.5	87.0	52.5	66.5	74.6
Undergarments knitted	44.2	62.1	78.1	33.6	50.5	63.5
(a) Sum of shares of 3 (6; 10) largest exporters.						

Source: UN [b].

II. Constant Market Shares Analysis of Trade in Individual Products

The increase (decrease) in a country's total exports of a particular commodity may be divided definitionally into two components that reflect the impact of changes in demand and supply conditions:

$$[1] \quad X_{i.}^1 - X_{i.}^0 = X_{i.}^0 \left[r + \sum_j (r_j - r) X_{ij}^0 \right] + (X_{i.}^1 - X_{i.}^0 - \sum_j r_j X_{ij}^0)$$

where:

$$\begin{aligned} X_{ij}^1 (X_{ij}^0) &= \text{exports from country } i \text{ to country } j \text{ in period } 1 \text{ (0)} \\ r &= \text{growth rate of world exports} \\ r_j &= \text{growth rate of world exports to country } j \\ X_{i.} &= \sum_j X_{ij} \end{aligned}$$

The first term on the right-hand side of Equation [1] represents the increase in country *i*'s exports that would have occurred if these had grown at the same rate as world exports (world trade effect). The second term represents the export increase (decrease) that occurred because country *i*'s exports were initially concentrated on markets *j* with higher- (lower-) than-average growth rates r_j (destination effect). Assuming that these two terms fully reflect the demand-related increase in exports, the third (residual) term represents the sum of all supply factors.

This method may give a distorted impression of changes in competitiveness because production for the domestic market is not taken into account due to lack of data. For example, if domestic demand increases faster than world demand and takes up an increasing share of domestic production, exports may grow only slowly. This may be reflected by a negative supply effect in constant market shares analysis, although no genuine shift of competitive advantage has occurred. Therefore, the findings from constant market share analysis should not be looked at in isolation but should be cross-checked with other indicators of competitive advantage.

The calculations reported in Chapter III are based on trade data for market economies. Imports (exports) include those from (to) CPEs. These data had to be used because coherent data relating to trade among

market economies only were unavailable. For every product a trade matrix with roughly fifteen exporting and importing countries is analysed, representing generally about 90 per cent of world market economy exports and 80 per cent of world market economy imports. The growth rates r (of world demand) and r_j (of country j 's import demand: cf. Equation [1]) relate to total imports, rather imports from market economies only.¹ This may distort the results since the growth rate of imports differed between CPEs and market economies: exports of all textile products (SITC Rev. 2: 65) from market to CPEs grew by 629 per cent from 1970 to 1985 versus 335 per cent for market economy imports from CPEs. Hence, the supply effects calculated for market economies with particularly strong increases in exports to CPEs might be overestimated. However, the share of CPEs in total market economy textile exports was only 6 per cent in 1970 and 8 per cent in 1985 [UN, b]. Similarly, leather and footwear exports from market economies to CPEs were quite small. Therefore, it is assumed that the results of this constant market shares analysis are not grossly distorted because market economy trade with CPEs cannot be dealt with consistently.

Due to restrictions on space only the calculated supply effects are reported in Chapter III. The destination effects generally remain small compared to the world trade and supply effects. The analysis has been carried out for the 1973/85 period to make the findings from this discussion comparable to the remaining indicators of competitiveness.

¹ Strictly speaking the growth rates of world market economy imports excluding the imports of each exporting country under consideration should have been calculated. However, apart from some problems of import data availability, the distortions that arise from using a uniform growth rate for (world) imports are likely to be small compared to the inevitable distortions that result from not taking into account domestic demand. Therefore, a simplified procedure based on a uniform growth rate of world imports has been used.

III. The Methodology of International Comparisons of Unit Labour Cost Trends

Unit labour costs (ULC) are defined as the sum of real wages and salaries including supplements (W_{real}) per physical unit of output (Q):

$$[1] \quad \text{ULC} = W_{\text{real}}/Q$$

The use of a physical unit of output (Q) may not be feasible when highly aggregated industries with differentiated products are analysed. Equation [1] may be transformed such that the value of production in current prices (VP; obtainable from UNIDO [1988]) can be used as a substitute for Q:

$$[2] \quad \text{VP} = Q \cdot P_j$$

$$[3] \quad \text{ULC} = W_n/\text{VP}$$

where:

P_j = price level of the output of industry j

W_n = nominal wages

Note that real wages in the context are calculated on the basis of the price level for the output of the industry under consideration.

For further analysis ULC may be disaggregated as follows:

$$[4] \quad \text{ULC} = (w_n \cdot L) / (Q \cdot P_j)$$

or, equivalently:

$$[5] \quad (W_n/\text{PV}) = (w_n/P_j) (L/Q)$$

where:

w_n = nominal (hourly, etc.) wage rate

L = employment (staff hours, etc.)

Data on the share of wages in the value of production (W_n/PV) and on average labour productivity (L/Q) are available from the UNIDO

Industrial Statistics Database.¹ Hence, the real wage increase as the second constituent element of unit labour costs besides labour productivity can be determined in accordance with Equation [5].

Since both the share of wages in the value of production and average labour productivity are subject to cyclical fluctuations, their annual growth rates α and β are calculated by a simple OLS regression according to the following formula:

$$[6a] \quad \log (W_n/PV)_t = A + \alpha T + u_t$$

$$[6b] \quad \log (L/Q)_t = B + \beta T + u_t$$

By differentiating Equation [5] with respect to time it is easily seen that the annual growth rate of the real wage equals the sum of α and β .

In order to assess the impact of changes in unit labour costs on the international competitiveness of a particular national industry, unit labour costs in the various producer countries need to be measured in a common currency. The relative position of country i may then be expressed in relation e.g. to the US:

$$[7] \quad RULC_{i,us} = \frac{W_{n,i}/Q_i}{W_{n,us}/Q_{us}} \cdot \frac{1}{ER_{i,us}}$$

$$[8] \quad = \frac{W_{n,i}/PV_i}{W_{n,us}/PV_{us}} \cdot \frac{P_{i,i}}{P_{j,us}} \cdot \frac{1}{ER_{i,us}}$$

$$[9] \quad = ULC_i/ULC_{us} \cdot RP_{i,us}$$

where:

- $RULC_{i,us}$ = unit labour costs in country i relative to US
- $ER_{i,us}$ = exchange rate (units of currency i per US \$)
- $RP_{i,us}$ = price level in country i relative to US, converted at the prevailing exchange rate.

¹ Note that average labour productivity can only be calculated per employee rather than per staff hour since coherent time series for the number of hours worked are not available for many countries. In some countries at least, the working week has been reduced significantly during the period of observation (i.e. since the mid-1960s). This leads to an underestimation of productivity growth and, simultaneously, of the real wage increase.

A rise in the relative price level $RP_{i,us}$ is equivalent to a real appreciation of currency i , and vice versa. The change in country i 's relative position in unit labour costs (growth rate of RULC) can now be expressed as the difference between the growth rate of unit labour costs (measured in national currency) in country i and the US, plus the growth rate of the relative price level.

Finally, the question arises whether a similar approach could also be used for a direct international comparison of unit labour costs at a certain point in time, rather than of unit labour cost trends [Picht, 1987, Table 1]. However, such estimates involve considerable conceptual and empirical problems. Firstly, the product composition of output differs substantially across countries: a direct comparison of highly aggregated historic data is, therefore, hardly meaningful. Secondly, it is doubtful whether the available data on the relative price levels of GDP at a given point in time can also be considered representative of particular industries. We believe that these difficulties essentially cannot be resolved. Any estimates are, therefore, subject to a very wide margin of error and, hence, of little practical use.

IV. Domestic Resource Costs of Labour-Intensive Exports from Brazil: Results and Methodological Issues

The domestic resource cost concept is an attempt to measure the efficiency of the use of factors of production in the presence of extensive distortions. In the present context it compares the amount of domestic resources, valued at their social cost (shadow prices), that are required by various industries to earn one unit of foreign currency. In a free market situation this amount would be the same for all industries and equal to the exchange rate; exports would come only from industries in which the country under consideration has a comparative advantage. However, in Brazil a wide variety of distortions exist in factor markets (e.g. credit subsidization), product markets (price controls, protectionism, export subsidization), and the foreign exchange market (currency overvaluation or undervaluation). In such circumstances actual exports may no longer reflect comparative advantage, and a measure of their social costs and benefits is required to assess which industries use domestic resources efficiently.

The domestic resource cost concept makes it possible, firstly, to rank industries by the efficiency of their resource use. Secondly, it provides an absolute measure of efficiency: an industry is considered an efficient exporter if its domestic resource costs per unit of foreign currency generated are lower than or equal to the shadow exchange rate (measured in units of national currency per US dollar). If Brazil has indeed a comparative advantage in labour-intensive industries (as has been concluded above), their domestic resource costs should be low in relation to other manufacturing industries, and should also be lower than the shadow exchange rate.

Table A18 presents the available estimates of the domestic resource costs of labour-intensive exports from Brazil.¹ As the shadow exchange rate is inherently difficult to estimate, all studies use an interval rather than a point estimate. If the domestic resource costs of an industry fall into the interval (indeterminate range), its absolute efficiency (or inefficiency) cannot be assessed. Values below the lower bound of the inde-

¹ The estimates for the year 1970 by Savasini [1975, Table 4.13], which are not included in Table A18, are fairly similar to those by Hersztajn-Moldau [1985] for the same year.

Table A18 - Domestic Resource Costs of Labour-Intensive Exports in Brazil, 1970-1980 (a)

	1970/71(b)	1970/75(c)	1980	
	[Hersztajn-Moldau, 1985]	[Savasini, Kume, 1979](d)	[Hersztajn-Moldau, Pelin, 1986]	
	Assumed social rate of return (per cent)			
	20	18	20	17.6
Leather, leather goods	1.28 (15/21)	1.24 (38.5/56)	1.32 (39/56)	1.18 (50/72)
Textiles	1.36 (6/21)	na	na	na
Processing of textile fibres	na	1.01 (53/56)	1.09 (52.5/56)	1.03 (69/72)
Yarns, fabrics, natural fibres	na (5/56)	1.56 (6.5/56)	1.66 (28/72)	1.37
Yarns, fabrics, artificial or synthetic fibres	na	1.76 (3/56)	1.87 (3/56)	1.52 (9/72)
Knit fabrics	na			1.39 (24/72)
Other textile manufactures	na	1.38 (16/56)	1.45 (19.5/56)	1.46 (16/72)
Clothing, footwear, accessories	1.35 (8/21)	na	na	na
Clothing	na	1.38 (16/56)	1.46 (17/56)	1.42 (21/72)
Footwear	na	1.24 (38.5/56)	1.32 (39/56)	1.40 (23/72)
Median for all manufacturing sectors	1.31	1.31	1.39	1.30
Ratio of shadow exchange rate to market rate (critical values)	1.19/1.31	1.25/1.35		1.14/1.24

(a) Both domestic resource costs and the shadow exchange rate are expressed as a ratio of the prevailing (official) exchange rate. Figures in parentheses indicate the ranking of the subsector and the number of sectors in the sample, e.g. (15/21): 15th out of 21 sectors. - (b) Calculations based on 1970 input-output table and 1971 export incentives. - (c) Calculations based on 1970 input-output table and 1975 export incentives. - (d) Results reprinted in Savasini [1983].

Source: Own compilation.

terminate range indicate efficient resource use, and vice versa. All values are expressed as a ratio of the official exchange rate.

All studies find that exports of leather and processed textile fibres represented an efficient use of resources, with fairly low rankings within the respective samples. According to the estimates by Savasini and Kume [1979] the same applies to the footwear industry (irrespective of the selected social rate of return). All other textile and clothing sub-sectors, however, had fairly high domestic resource costs in relation to other manufacturing industries. Exports of yarns and fabrics, especially of man-made fibres, were particularly inefficient, while the performance of knitwear, other textile manufactures, and clothing was less unfavourable. A comparison of the domestic resource costs of labour-intensive exports with the critical values for the shadow exchange rate (test for absolute efficiency) leads to similar results. Only the leather, fibre processing, and footwear industries have values either between or below the critical values for the shadow exchange rate [footwear only according to Savasini and Kume, 1979].

These results seem to contradict the findings of Section IV.1 where it has been concluded that Brazil has a comparative advantage in all four industries. In order to clarify this apparent contradiction a closer look at the methodology of the available domestic resource cost estimates is required. The focus is on the study by Hersztajn-Moldau and Pelin [1986], as their estimates are the most recent. Besides, Hersztajn-Moldau [1985] and Savasini and Kume [1979] use essentially similar methodologies.

All three studies apply a simplified formula to calculate domestic resource costs. Instead of calculating shadow prices for all inputs, they express domestic resources as the sum of total, direct and indirect, factor requirements. Hence, only the shadow prices for labour and capital have to be estimated. For the purpose of estimation, social factor costs as well as imports are expressed relative to the value of production [Hersztajn-Moldau, Pelin, 1986, Equation 11]:

$$[1] \quad DRC = \frac{\sum \bar{F}_s v_s \cdot Q}{P_{dom} \cdot Q} / \left(\frac{P_{fob}}{P_{dom}} - \frac{m \cdot Q}{P_{dom} \cdot Q} \right)$$

where:

- \bar{f} = factor requirements (direct and indirect) per unit of output
- v = shadow price
- s = factor of production (labour, capital)
- Q = output
- P_{dom} = domestic price
- P_{fob} = export price, converted into domestic currency at the market exchange rate
- m = import requirements (direct and indirect) per unit of output, converted into domestic currency at the market exchange rate

Domestic resource costs, thus defined, may be compared to the ratio of the shadow exchange rate to the market rate for an assessment of the efficiency of exports (Table A18). The problems of estimating the variables on the RHS of Equation [1] are discussed in Hersztajn-Moldau, Pelin [1986]. Three points are worth mentioning that may have a particular bearing on the results.

Firstly, the shadow exchange rate is generally defined as the rate that would prevail in the absence of any government interventions in foreign trade or in international capital movements [Bergsman, 1970, pp. 42 ff.]. By contrast, Hersztajn-Moldau and Pelin [1986, p. 213] apparently estimate the rate that would have kept the balance of payments in equilibrium given the existing restrictions. With that procedure they only account for the overvaluation of the Cruzeiro that occurs because the nominal exchange rate is not adjusted in line with the inflation differential to keep the purchasing power parity constant. Given the extent of government interventions in Brazil, the divergence between the true shadow exchange rate and the prevailing (market) rate in 1980 was probably wider than between 14 and 24 per cent (Table A18). If a higher figure for the shadow exchange rate is used as a benchmark, more export sectors will pass the efficiency test. It may be noted that with the estimates for 1970/71 and 1970/75, the median value of domestic resource costs lies at least in between the critical values for the shadow exchange rate. It is unlikely that in 1980 Brazil's comparative advantage in manufacturing had deteriorated so much that even the median sector was truly inefficient in terms of domestic resource use.

Secondly, Hersztajn-Moldau and Pelin [1986, p. 210] assume that the fob price of exports and the domestic price can only differ if there exists an export subsidy (s):

$$[2] \quad P_{fob} (1+s) = P_{dom}$$

Accordingly they use the nominal export subsidy rate to estimate the price ratio in Equation [1]:

$$[3] \quad P_{fob}/P_{dom} = 1/(1+s)$$

It is plausible to accept this formula as a first approximation for those products that are actually exported.¹ However, it may be misleading if the exports of an industry represent only a small proportion of output, or come from only a few firms with special characteristics, or are heavily concentrated on a limited number of product groups. In such circumstances it is inappropriate to calculate the price ratio in Equation [1] from data that are applicable only to exported products, and at the same time estimate all remaining variables from data that relate to the whole industry. There are in fact many indications that high rates of protection sustained considerable inefficiency in the textile and clothing industries, particularly in the form of avoidable high production costs (Section IV.2). In this respect exporters of textiles and clothing are not representative of their industries (cf. Section IV.4.b). Therefore, textile and clothing exports are probably less inefficient than they appear to be according to the estimates presented in Table A18.

Thirdly, Hersztajn-Moldau and Pelin [1986, pp. 198 f.] calculate social capital costs by multiplying non-wage value added for each industry (as a proportion of the value of production) by the ratio of the social rate of return and the average private rate of return on equity:

$$[4] \quad C_{soc} = (r_{soc}/r_{priv}) C_{priv}$$

¹ It cannot be applied, of course, if firms operate in a protected domestic market where prices are high enough to cover all fixed costs in addition to variable costs. In such circumstances export prices may be set to cover only marginal costs and may, therefore, be lower than domestic prices.

where:

C = non-wage value added as a share of the value of production
 r = rate of return
 soc = social
 priv = private

or, equivalently:

$$[5] C_{\text{soc}} = r_{\text{soc}} (C_{\text{priv}}/r_{\text{priv}})$$

Hersztajn-Moldau and Pelin [1986, p. 199] argue that the use of a uniform private rate of return follows directly from the use of uniform social rate. This argument is not plausible (and, incidentally, is not followed by Savasini and Kume [1979]). The social (or shadow) rate of return on capital is by definition the same for all industries. However, Hersztajn-Moldau and Pelin [1986] use the private rate of return on equity with the purpose of calculating the capital stock (which is then multiplied by the social rate of return to obtain social capital costs). In 1980 the private rate of return on equity differed considerably between industries [ibid., Table 2]. The use of a uniform rate, therefore, leads to an upward bias in the capital costs of those sectors where profitability is above the average, and vice versa. In 1980 profitability in the textile and especially the clothing and footwear industries (19 and 26 per cent) was significantly higher than the rate used in the calculation of capital costs (13 per cent [ibid., p. 202]). Therefore, the domestic resource costs of these exports in 1980 are considerably overestimated.

These methodological comments demonstrate first of all that estimates of the domestic resource costs of exports are subject to a number of serious conceptual and data problems and, hence, uncertainty. Therefore, an assessment of the determinants of the international competitiveness of a particular industry (such as the present study) should not be based on this measure alone.

Secondly, there are strong indications that the domestic resource costs estimates for 1980 are upwardly biased for most sub-branches of the textile as well as for the clothing and footwear industries. Besides, the high values for the textile industry probably reflect the overall inefficiency of this highly protected industry rather than indicate that those exports that did actually take place represented an inefficient use

of resources. However, the estimates demonstrate that great improvements in efficiency are required for the Brazilian textile and clothing industries as a whole to become efficient users of domestic resources and successful exporters based on their comparative advantage.

V. The Measurement of Factor Intensities: A Comment on Methodology

The factor intensity of a particular industry may be measured either by the stocks of factors of production employed, or by the income flows received by factor owners. The stock concept corresponds more closely to the concept of factor endowments of countries. However, its use is often preempted by data problems. While reasonably accurate measures of the stock of physical capital can often be obtained, at least at a fairly high level of aggregation, the measurement of the stock of human capital presents more serious conceptual problems. The shares of various professional groups in total employment by the industry under consideration may provide an approximation (cf. the measures of factor endowments in Table A12). However, they fail to capture those forms of human capital formation that arise not from formal training but from learning by doing. Since these are likely to be of considerable importance in developing countries, stock measures of human capital may lead to underestimates.

One approach of measuring human capital by the flow concept assumes that the difference between the wage actually received by an employee and the wage for an unskilled labourer represents the return on human capital [Fels, 1972, p. 77]. Assuming, in addition, a particular value of the social rate of return of human capital, the human capital stock employed by an industry may be calculated on the basis of easily obtainable data. However, this approach underestimates human capital intensity if minimum wage policies raise the wage rate for unskilled labour above the shadow wage rate. At the same time it is difficult to obtain reliable estimates for the shadow wage for unskilled labour. The prevalence of minimum wage policies in many developing countries, therefore, necessitates the use of more robust measures of human capital intensity.

Lary [1968, pp. 35-40] proposes to use the average wage per employee in an industry relative to the manufacturing sector average. Similarly, non-wage value added per employee relative to total manufacturing may be regarded as an indicator of physical capital intensity [ibid., pp. 40-46]. This approach has the advantage that data can often be found even when information is unavailable to construct more sophisticated measures of capital intensity. However, it leads to unbiased results only

in the absence of factor market distortions that affect some sectors more than others. For example, unionization may have a stronger impact on wages in some sectors than in others or the cyclical variation of profits may affect industries differently or consecutively rather than simultaneously. Then the measured ranking of industries in terms of factor intensity may be different from the "true" ranking as defined by the (immeasurable) stocks of physical or human capital employed. Finally, with any measurement concept capital intensity is expressed relative to (unskilled) labour, which is measured by the stock concept as the number of employees.

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