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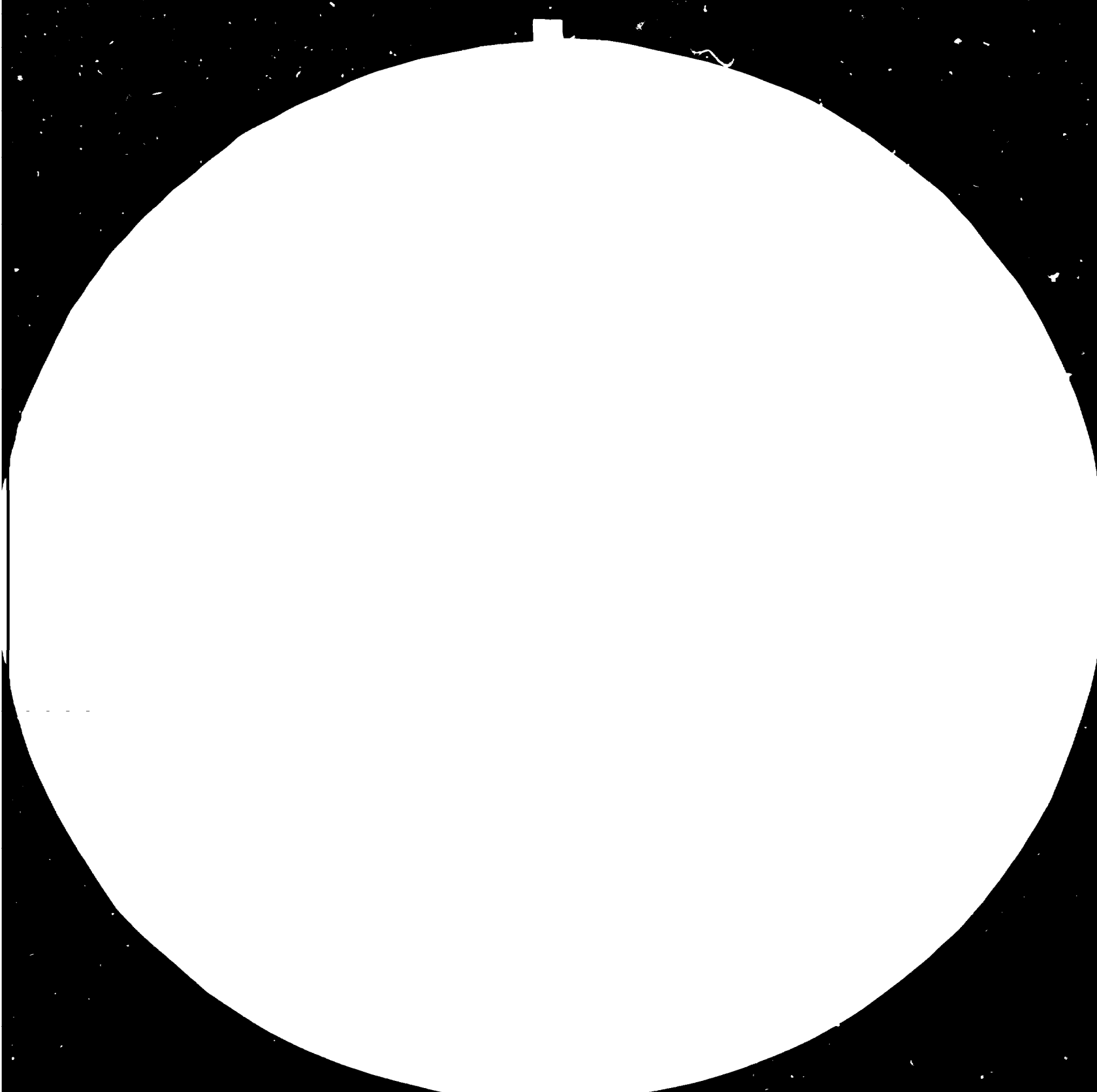

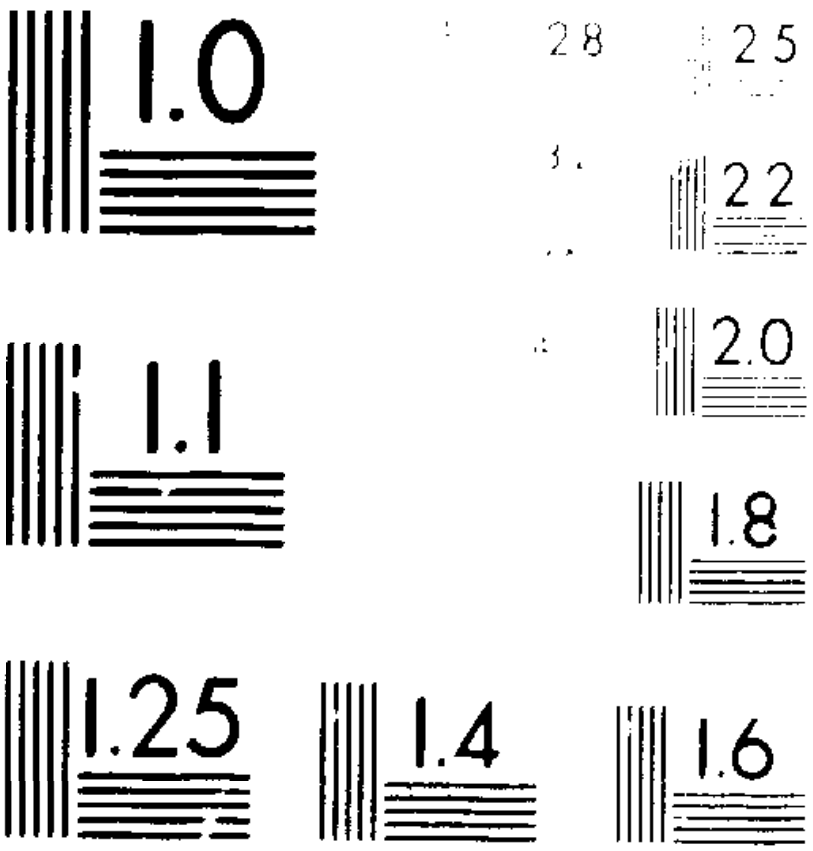

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INDUSTRIAL RESTRUCTURING IN PERU - POLICIES FOR GROWTH AND DEVELOPMENT

Prepared by the

Regional and Country Studies Branch
Division for Industrial Studies

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from: E. Kolm

PREFACE

Within the framework of UNIDO's programme on country surveys and studies, analyses are made of industrial restructuring requirements, prospects and policies of individual developing countries. The aim of the research programme is to provide national policy makers with basic information for the formulation of policies and strategies for industrial development. This follows the general approach adopted for in-depth country studies to link analytical studies closely with the policy making process of developing countries.

Accordingly and in response to a request by the Government of Peru, UNIDO undertook this study, which covers analyses of the overall experience of and prospects for industrial development in Peru and provides a first assessment of the restructuring requirements and prospects of selected industrial sectors.

The study was prepared by the Regional and Country Studies Branch in co-operation with a team of international and national consultants. In support of the study, a field mission was undertaken by UNIDO staff and international consultants in April 1984 to collect data and interview Government officials and representatives from industry, and also to visit a representative sample of industrial enterprises throughout the country.

Subsequently, the findings of the mission were summarized in reports, prepared by the international consultants in co-operation with UNIDO staff at UNIDO Headquarters. These sectoral reports were integrated into this comprehensive draft report, prepared by researchers of the Ibero-America Institute for Economic Research (University of Goettingen, F.R. Germany), in co-operation with UNIDO staff.

This draft project report on "Industrial Restructuring in Peru - Policies for Growth and Development" is submitted to the Government of Peru, to be jointly reviewed during a seminar in Lima, 26-28 November, 1984, so as to permit preparation of the final report.

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I.1. PERUVIAN INDUSTRY AND INDUSTRIAL POLICY

1.1. Past Trends in the Peruvian Manufacturing Sector

1.1.1. The Performance of the Manufacturing Sector between 1970 and 1983.

Between 1970 and 1982, the Peruvian economy grew at an average annual rate of 3.02%.[1] This economic growth was spread unevenly though, between different economic sectors and different sub-periods (see Table 1). The agricultural sector which accounted for 16.8% of GDP in 1970 lost in relative weight throughout the first half of the 70's and has stagnated at a share below 13% up to this date. Nevertheless, in terms of employment, agriculture figures much more prominently with 41% of the labor force in 1981. Utilities have been the smallest sector, but the only one with a clearly rising share in GDP. All the other sectors showed a varying performance during the last decade.

The manufacturing sector has had the largest weight in the Peruvian economy since the early 60's. Based on import substitution, it steadily increased its share until 1976 (26.6% of GDP), but in 1981 it accounted for only 24.1% of economic output and for around 13% of employment.

Comparing Peru with Latin America on the one hand and all developing countries on the other hand, Tables 2 and 3 show that she changed her relative position between 1970 and 1981. Although gross domestic product, manufactured value added, and gross capital formation (all per capita)

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(1) In 1983, the country suffered its most severe recession in recent history. It is estimated that GDP declined about 12% within one year. Although this reflects in part the continuation of the recession beginning in 1982, adverse climatic effects are responsible for a large part of this outcome. (Some estimates attribute five percentage points to natural disasters.) Including 1983 in longer term trend analysis would therefore be misleading.

TABLE 1

STRUCTURE OF GROSS DOMESTIC PRODUCT BY ECONOMIC ACTIVITY, 1970-1982
(Percentages)

Economic Activity	1970	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
Agriculture	16.8	13.8	13.6	12.9	12.9	12.8	12.9	12.9	11.8	12.5	12.7
Mining	7.1	6.9	6.6	5.7	5.9	7.3	8.1	8.4	8.2	7.6	8.1
Manufacturing	24.7	25.4	26.2	26.1	26.6	25.4	24.6	24.6	25.1	24.1	23.4
Food processing	8.9	6.3	7.4	7.1	7.3	6.6	6.4	6.4	6.2	6.0	6.1
Textiles	3.6	3.6	3.5	3.4	3.5	3.0	2.1	3.1	3.0	2.6	2.5
Wood and wood products	0.5	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.4
Paper and paper products	1.1	1.2	1.3	1.2	1.2	1.1	1.0	0.8	1.0	1.0	0.8
Chemical products	3.1	3.9	4.0	4.3	4.5	4.3	4.4	4.3	4.6	4.5	4.6
Non-mineral products	0.8	1.0	1.0	1.0	1.1	1.0	0.9	0.9	1.0	0.9	0.9
Basic metals	2.2	2.1	2.0	1.7	1.8	2.9	3.0	3.2	3.1	2.8	2.7
Metal products	2.2	3.5	3.7	4.0	3.9	3.6	3.0	3.0	3.6	3.5	3.0
Other manufacturing	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2
Handicraft industry	2.2	2.4	2.4	2.4	2.3	2.1	2.1	2.1	2.1	2.1	2.1
Utilities	0.6	0.8	0.8	0.8	0.9	1.0	1.1	1.1	1.1	1.2	1.2
Construction	3.0	3.5	3.9	3.9	3.4	3.4	3.0	3.0	3.5	3.7	3.8
Commerce	12.6	14.0	14.3	15.0	14.3	13.7	13.4	13.6	13.9	14.1	13.6
Transport	5.0	5.5	5.7	6.0	6.2	6.3	6.4	6.5	6.7	6.8	6.8
Services and other activities	30.1	30.2	28.9	29.7	29.4	30.5	30.5	29.8	29.9	30.0	30.4
GDP	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: World Bank (1983), Annex Table I-2.

TABLE 2

INTERNATIONAL COMPARISONS OF ECONOMIC PERFORMANCE

(at 1975 prices)

Measure	Year of Period	Peru	Latin America	Developing countries Total
GDP per capita (US $)	1963	792	802	324
	1970	911	1005	409
	1975	1004	1178	478
	1981	959	1341	533
MVA per capita (US $)	1963	170	172	48
	1970	218	241	68
	1975	250	297	85
	1981	234	332	101
Total exports/GDP (percent)	1963	21.34	19.26	23.52
	1970	18.74	18.07	26.59
	1975	10.84	12.99	23.44
	1981	12.19	13.89	23.30
Total imports/GDP (percent)	1963	16.95	13.43	16.61
	1970	18.01	14.59	17.80
	1975	19.49	15.80	22.40
	1981	19.77	16.47	26.68
Gross capital formation per capita (US $)	1963	124	144	53
	1970	115	214	78
	1975	197	292	116
	1981	160	326	137

Source: Statistics and Survey Unit, UNIDO. Based on data supplied by the UN Statistical Office, with estimates by the UNIDO Secretariat.

TABLE 3

COMPARATIVE GROWTH RATES BY ECONOMIC SECTOR

(At 1975 Prices)

Sectors	Period	Peru	Latin America	Developing countries Total
Agriculture	1963-1970	3.74	3.01	2.37
	1970-1981	0.30	3.74	2.74
	1975-1981	0.99	3.71	2.63
Mining & quarrying	1963-1970	3.42	3.53	9.61
	1970-1981	4.66	-0.84	0.88
	1975-1981	7.76	3.18	-1.54
Manufacturi[illegible]	1963-1970	6.15	7.45	7.37
	1970-1981	2.90	5.81	6.52
	1975-1981	0.99	4.81	5.75
Utilities	1963-1970	7.24	9.72	9.34
	1970-1981	9.09	9.10	9.41
	1975-1981	7.85	9.00	9.25
Construction	1963-1970	0.77	6.51	5.99
	1970-1981	3.46	6.26	7.96
	1975-1981	0.31	5.42	5.68
Services	1963-1970	4.28	6.17	5.93
	1970-1981	3.69	5.95	6.63
	1975-1981	1.80	5.29	5.87
Growth of GDP per capita (%)	1963-1970	1.58	3.03	3.13
	1970-1981	0.33	2.75	2.67
	1970-1975	1.88	3.48	3.34
	1975-1981	-0.92	2.39	1.94
Growth of MVA per capita (%)	1963-1970	3.22	4.58	4.71
	1970-1981	0.16	3.17	3.96
	1970-1975	2.78	4.69	4.81
	1975-1981	-1.72	2.23	3.23

Source: Statistics and Survey Unit, UNIDO.
Based on data supplied by the UN Statistical Office, with estimates by the UNIDO Secretariat.

have consistently been below the average for Latin America, but above that for developing countries in absolute terms, their growth has been slower in Peru than in either of the two reference groups between 1970 and 1981. The Peruvian manufacturing sector grew faster than agriculture during the 60's as well as the 70's, but the performance of both has been disappointing when compared to Latin America and other developing countries.

With respect to the sectoral structure in comparative terms two interesting features emerge. Firstly, Peru has a relatively small agricultural sector but a comparatively high share of industries in GDP. The 41% share of industry in Peru's GDP in 1981 is even greater than that of the most advanced newly industrializing countries. Even when the mining sector is omitted, Peru's share in GDP of 25% is about the average of its reference group and comes close to the respective share of such countries as Korea (28%), Brazil (27%), and Israel (26%).(1) These data seem to put Peru in line with some of the most advanced developing countries. They have to be seen, however, in a somewhat different light, if a second aspect is taken into consideration: the relative national performance of this sector. Thus, it can be seen from Table 1 that already in 1970 the share of industry had reached about 24.7%, and after a temporary rise in the mid-70's it fell back to 23.4% in 1982.(2) This is in clear contrast to the usual structural performance of those developing countries whose emphasis on industrialization strategies has met with success.

Analyzing the behavior of the Peruvian industry since 1970 in more detail one can discern two distinct features; firstly, three different periods of economic performance - 1970-76, 1977-80, 1981-84 - and secondly, a structural change within the industrial sector. Industrial output increased at an average annual rate of 5.4% between 1970 and 1976, de-

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(1) See UNIDO (1984:4).

(2) Manufacturing value added as a percentage of GDP had reached 23% already in 1965.

clined in 1977-78, recovered during the following two years, and has been decreasing since 1981. While the economic performance of the industrial sector has been mirroring that of GDP, its up- and down-swings were more pronounced, though. This has been especially noticeable in the present recession where industrial growth turned negative already in 1981 (and GDP only in 1983), and where the decline in output was 17.2% for industry versus 12% for the economy as a whole in 1983 (see Table 4).

Within the manufacturing sector, the consumer goods industries are still dominating today, but they have lost in relative importance constituting 66.4% of manufactured value added in 1971, but only 56% in 1979.(1) In contrast, intermediate goods industries increased their share from 31.2% to 41% in the respective years, while the capital goods industry changed from 2.4% to 3% (with a higher share of 3.8% in 1975, though). The dynamic role of the intermediate goods sector is especially noticeable in the second half of the 70's. While nearly all manufacturing branches exhibited positive growth in the first half of the 70's(2), the consumer goods industries declined at .3% annually between 1975 and 1980, whereas intermediate goods acted as a countercyclical force with positive growth rates of 5.8% per year. It was also mainly intermediate goods industries that kept counteracting the industrial decline since 1980, although by 1983 the recession had become so severe that no manufacturing sector could escape a decrease in output (see Table 5).

1.1.2. The Development of Non-Traditional Exports

The intermediate goods sector was only one of the factors acting against the general slow-down in industrial activity in the second half of the 70's. The other equally important factor was the increase in non-traditional exports (NTX). Although NTX were rising rapidly between

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(1) World Bank (1981:23).

(2) Between 1970 and 1975, consumer goods and intermediate goods grew at an average annual rate of 6.3% and 11.13%, respectively. UNIDO (1983: 140).

TABLE 4

Annual Growth Rates

Year	GDP	Manufacturing	Agriculture
1970-73	3.6	4.5	-2.9
1974	7.5	10.9	5.3
1975	4.5	4.1	-0.07
1976	2.0	4.0	2.4
1977	-	-4.3	-0.09
1978	-0.06	-3.9	0.006
1979	4.1	4.2	4.5
1980	3.8	5.7	-5.4
1981	3.9	-0.02	10.7
1982	0.4	-2.5	2.1
1983	-11.9	-17.2	-8.5

Source: 1970-82: calculated from Table A-1 (based on 1973 soles).
1983: Banco Central de la República. Nota Semanal 9/1984, Marzo 1984, Cuadro 52 (based on 1979 soles).

TABLE 5

INDEX OF PHYSICAL OUTPUT IN THE MANUFACTURING SECTOR

(Annual Percentage Changes)

		1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
311-12	Foodstuff	6.4	1.4	-1.9	-0.3	-4.1	0.0	0.4	-0.5	-2.6	-14.8
313	Beverages	21.3	9.3	11.1	-8.4	-11.0	9.3	10.6	-1.2	2.6	-3.4
314	Tobacco	16.5	1.2	-0.6	-0.8	-8.8	10.0	10.0	7.1	1.5	-12.1
321	Textiles	1.4	1.1	7.6	-11.3	8.8	6.6	-4.8	-0.2	-7.1	-12.5
324	Footwear	10.4	-8.2	25.0	-36.1	-6.2	-5.1	11.5	-8.5	-22.4	-27.3
331	Wood and Cork Prod.	3.1	-5.0	55.5	-7.6	-1.6	-3.8	-8.3	0.6	n.d.	n.d.
341	Paper and Paper Prod.	24.1	-16.4	13.2	5.7	-15.1	-5.5	21.7	-7.3	-27.3	-15.0
351	Industrial Chemicals	15.8	13.0	9.4	8.9	7.6	4.6	5.4	-0.2	8.2	-16.0
352	Other Chemicals	7.0	17.9	9.1	-10.5	2.9	-10.2	18.1	3.2	-1.4	-20.0
352	Petroleum Refineries	8.4	6.0	0.1	0.3	-1.6	16.0	3.0	2.0	1.8	-4.5
355	Rubber Products	2.1	10.5	24.1	-16.6	-13.2	8.0	21.3	-2.3	-4.7	-14.0
356	Plaxtic Products	13.5	8.6	-1.9	-9.8	-8.8	22.4	2.5	9.3	3.4	-28.5
362	Glass Products	5.0	16.0	10.3	-10.3	-20.2	18.5	3.2	0.2	12.4	-17.0
269	Non-Metallic Minerals	23.8	4.2	-8.5	-8.2	-3.2	0.5	12.6	0.8	-10.8	-19.0
171	Iron and Basic Steel	22.4	1.9	-16.3	18.1	6.4	5.9	12.3	-9.6	-20.4	-8.5
372	Non-ferrous Metal	-7.1	-0.1	12.3	77.6	-1.7	16.9	-5.6	-5.4	4.2	-10.0
381	Metal Products	8.0	6.8	-5.3	-5.1	-6.4	-5.2	20.4	-9.3	-5.6	-20.4
383	Electrical Machinery	23.9	20.8	-2.7	-3.3	-10.8	-8.4	17.6	13.1	-20.2	-40.0
384	Transport Equipment	-10.9	22.4	0.6	-34.2	-46.8	13.0	54.6	4.9	-7.1	-60.1
	TOTAL	11.7	4.9	4.7	-3.7	-3.6	3.9	52	-0.1	-2.7	-17.2

Source: calculated from Table A-2.

1972 and 1974 (see Table 6), they started from a very low base, thus not accounting for more than 10% of total exports in 1974. Since the mid- 1970's, however, NTX played an increasingly important role, and by 1980 their participation in total exports had increased to 21%. Fish-meal, textiles, metal-mechanics, chemicals, and steel and iron products constituted the major non-traditional export commodities.

The increase in exports for most of these goods went hand-in-hand with a decline in sales on the internal market. Table 7 shows that between 1976 and 1979, the production directed at the national market steadily decreased for textiles, metal mechanics and chemicals. The index of total production (national sales plus exports), however, increased for chemicals and after 1977 for textiles, too. And although total output declined in the metal mechanic industry, that decline was less pronounced than the drop in the industry's national sales. As a result the share of exports in gross output of those sectors increased during the second half of the 70's. While it is true that the export shares were still relatively low (under 10%) with the exception of textiles, it has to be pointed out that they reached substantially higher values for some companies and subproducts.

Since 1980, NTX have taken a turn downward notwithstanding the temporary increase in 1982. Thus, during the last three years the decline in industrial output has been due to a decrease in sales on the national as well as the international market.

TABLE 6

NON-TRADITIONAL EXPORTS

(Millions of US $)

YEAR	NTX	ANNUAL % CHANGE	FOOD-STUFF	FISH-MEAL	TEX-TILES	METAL MECHANICS	CHEMICALS	IRON & STEEL PRODUCTS	REST*
1970	34.2	—	7.8	7.0	1.3	1.2	6.3	3.1	7.4
1971	30.6	-10.5	7.5	8.4	1.1	0.9	4.2	2.3	6.3
1972	51.6	68.6	10.1	10.1	5.6	1.3	8.1	7.8	7.0
1973	113.0	119.0	25.2	19.4	16.4	4.1	13.0	22.7	13.2
1974	154.3	36.5	20.9	22.0	27.4	10.7	15.4	43.4	14.3
1975	107.5	-30.3	13.1	19.2	13.2	16.6	11.1	26.5	7.5
1976	136.7	27.2	16.6	27.2	30.9	18.4	15.5	14.2	13.8
1977	237.9	74.0	26.1	42.3	62.5	41.8	24.7	18.7	21.9
1978	343.5	44.4	39.3	62.3	102.6	35.7	45.1	34.0	24.3
1979	724.7	110.0	76.1	119.6	178.8	65.5	107.8	75.0	102.1
1980	831.6	14.8	70.4	119.2	230.5	55.2	140.5	80.0	135.9
1981	693.0	-17.7	60.0	106.0	231.0	58.0	80.0	48.0	110.0
1982	762.0	70.0	70.0	98.0	281.0	50.0	65.0	71.0	127.0
1983	555.0	-27.2	56.0	80.0	186.0	43.0	45.0	55.0	90.0

* includes wood and paper, leather products, artesanry, jewelry, gold, silver, non-metalic minerals.

Sources: 1970-80: Schydlowsky (1983:8).
1981: Peru Exporta, No. 95 (Dic. 82-En. 83) p.6.

TABLE 7

PRODUCTION FOR THE NATIONAL AND INTERNATIONAL MARKET

I. Production Directed at National Market

(1975 = 100)

SECTOR	1976	1977	1978	1979	1980
Textiles	102	85	83	79	77
Metal Mechanics	99	84	70	67	83
Chemicals	109	101	98	91	104

Source: Schydlowsky (1983:39, Method B).

II. Index of Physical Output

Textiles (ISIC 321)	107.6	95.4	103.8	110.6	105.4
Chemicals (ISIC 351)	109.4	119.2	128.2	134.1	140.9
Eletr. Mach. (ISIC 383)	97.3	94.1	84.0	76.9	90.4
Metalic Products (ISIC 381)	94.7	89.9	84.1	79.8	96.1

Source: claculated from Table A-1.

III. Exports as a Share of Gross Output

(at current prices)

Textiles	3.1	7.9	14.5	18.3	17.4
Metal Mechanics	1.2	3.5	4.0	6.6	3.9
Chemicals	0.8	1.5	3.5	7.4	7.3

Source: Schydlowsky (1983:37).

1.1.3. Peruvian Manufacturing: A Heterogeneous Sector

The economic trends discussed above only capture that part of Peruvian reality which is based on official data gathered from officially registered companies. In addition to that, however, there exists a whole amalgam of economic activities outside the official-formal economy normally subsumed under the heading 'informal sector'. The size and growth of this informal sector constitutes such an important and integral part of Peruvian economic development, that it will be dealt with in detail in chapter 6 of this document.

Although a large percentage of 'informal' production and employment can be found in the different service sectors, the informal sector is also an important element in manufacturing activities. It is estimated that in 1981 57 % of industrial employment and 21.6 % of industrial value added were accounted for by the informal sector. The latter is especially important in the consumer goods industries with 72.8 % of employment and 37 % of value added of those industries. The informal sector has increased when one compares the 21.6 % of industrial value added in 1981 with an estimated 18.5 % in 1981. To view the informal and formal sectors as two parts of a dual economy would be a serious misconception, though, since - in spite of all differences - there exist well-established relationships between the two sectors, parts of which can only be described as symbiotic.

1.2. Industrial Performance as a Result of Economic Policies and Macroeconomic Developments

1.2.1. General Background

A commonly held view in the literature on Peruvian economic development holds that the (seemingly) successful growth performance before and after 1975 (i.e. 1972-74 and 1978-81) has been interrupted by different accidental events at home and abroad, which ended a promising line of lasting economic recovery. The analysis of Peruvian economic trends in light of the recent growth performance, however, throws some doubt on this line of reasoning, and provokes the hypothesis that the 1970-1982 period has to be rather seen as one of relative stagnation (GDP per capita in real prices hardly indicates any growth) interrupted by two major efforts to escape this dilemma. This hypothesis gains even more validity, if the reference period is extended to the late 60's and the situation in the last two years. Although special events during those years call for very cautious interpretation of the global data, there is a strong indication that on the average the economy had a very poor performance for almost twenty years.

If Peruvian economic development in the last two decades can correctly be interpreted as a process of relative stagnation rather than a discontinuous growth process, any promising industrial policy strategy has to be elaborated within the context of a consistent reformulation of the overall economic policy package. The outline of such a new strategy is beyond the scope of this report. Nevertheless, some general yet crucial points have to be discussed briefly to put the following sectoral studies in perspective.

In 1975-76, increasing rates of inflation and growing scarcity of foreign exchange signaled that the growth process initiated by the government in the early 70's had (to) come to an end. It is now a widely held view that that approach to economic growth necessarily had

to fail because of fundamental inconsistencies on the macro- and micro-economic level [1].

As a result, the substantially higher income per capita of the 1972-74 growth had to be taken back nearly completely in the following years, thus pushing the living standard of the labor force back to the 1970 level. The promoters of the efforts to revitalize the economy in the second half of the 70's correctly recognized that the resources to finance a development strategy such as implemented by their predecessors could not be made available under realistic assumptions, since it would have required sustained foreign financing as well as a reduction of consumption.

Given the limited amount of foreign financing available as well as the growing gap between government income and revenue the autorities were obliged, theoretically speaking, to attack two major problems simultaneously: the savings constraint and the foreign exchange constraint. Both constraints can principally be solved by either lowering the respective expenditure categories or raising savings and export earnings.

The government tried to follow both strategies, and firstly imposed a severe restrictive policy to lower the government deficit and consumption. Secondly, some of the major reform laws of the Velasco period were reformulated with the intention of improving the environment for private capital accumulation. Three of these deserve special mentioning [2]:

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(1) These problems have been discussed at length elsewhere and need not be repeated here. See for example: World Bank (1981), (1983); McClintock and Lowenthal (1983).

(2) For a detailed discussion, see UNIDO (1983).

1. "La Ley de Pequeña Empresa" (February 1, 1976), which broadened the definition of "the small enterprise", thus allowing more firms to avoid workers' participation under the "Comunidad Industrial".

2. The re-formulation of the "Ley de Comunidades Industriales" (February 1, 1977) itself, which limited the percentage of a company's assets that could be held by workers to 33 %.

3. The change of the "Ley de Estabilidad Laboral" (March 24, 1978) aiming at an improvement of employment flexibility.

Thirdly, new policies changed the conditions for the export industries and especially for the non-traditional export sector. The necessary correction of the real exchange rate from 1976 on was accompanied by a substantial broadening of the CERTEX program, increasing the level of subsidization and widening the range of products covered. Although CERTEX had originally been implemented in 1969, its potentially positive effects had initially been conteracted to a large extent by the overvalued exchange rate.

1.2.2. The Key Points of the Concept of Economic Reactivation after 1975

The critical points of a strategy of emergency as implemented after 1975 can be summarized as follows:

1.a) The wage reductions and the cutback of the public sector deficit are aimed at an improvement of the conditions for private capital accumulation, thus initiating a continuous growth and development process. This target will only be met <u>if</u> wage reductions in the private sector are not accompanied by a similar decline in labor productivity, and the cutback in public expenditure is not accompanied by a parallel reduction of government earnings. Since wages and public expenditures are at the same time important demand factors, the problem arises that restrictive policies might lead to a cumulative downswing with productivity and public earnings declining as fast or even faster than labor costs and public expenditure. If such an undesirable outcome cannot be avoided, such short-term policies might effectively hinder the implementation of a promising and viable long-term strategy.

1.b) In 1975, exports had dropped nearly 20% to US $ 1,209.9 millions and the share of non-traditional exports in total exports was only 8.3% (see Table A-3). At the same time imports rose to US $ 2,389.0 millions creating a trade deficit which put a severe foreign exchange constraint on the economy. While it is true that specific factors (like the drastic decline in copper prices) aggravated the balance of payments crisis of 1975, the latter can nevertheless <u>not</u> be attributed solely to a spell of bad luck. Rather, under an economic policy focusing on import substitution and the development of import-intensive industry, a balance of payments crunch is always latent given the volatility of and demand elasticity for primary sector exports.

2. Even if a cumulative downswing can be avoided and the balance of payments problem be solved, an authenthic take-off with lasting

growth rates will only take place, if the corrections implemented during the emergency situation can be maintained during the period of normalization. Thus, extreme burdens imposed on some social groups during the restructuring process might already bear the seeds for future conflicts and reverse a beginning growth process.

3. The emphasis that the autorities of the early revolutionary era put on the role of the state in the development process and even more on the issue of redistribution has to be seen as a "radical break from the previous political-social framework",(1) and as such their reformulation is an important political problem. A political decision to return to a more market oriented economic system has obvious repercussions for the legal framework to be established, because it is especially the outline of this complex system of rules and regulations, which provides the incentives and disincentives for private economic activities. The quality and consistency of such a regulatory framework (part of which is industrial policy - the focus of this report) form the basis for lasting economic recovery. It therefore might not be enough to just mitigate some of the most obvious obstacles to change and growth, if the essential adverse social and economic conditions remain untouched.

It is of crucial importance to recognize that any successful approach to resolve today's problems of the Peruvian economy in general and of its industrial sub-sector in particular, first has to find an answer to the question, how the three critical points outlined above have been handled during the 1976-82 period.

1.2.2.1. Stabilization Policies

As a consequence of the severe austerity measures starting in 1976 the Peruvian economy entered a two-year recessionary period with nearly all relevant economic indicators decreasing in absolute terms. Thus, the index of physical output in the manufacturing industry fell from 122.7 in 1976 to 113.8 in 1978 (see Table A-2). Only four sectors could avoid an absolute decline of its production activities (textiles, industrial

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(1) Sheahan (1983:39).

chemicals, iron and basic steel, non-ferrous metals). This gloomy picture becomes even worse when one only looks at that part of production directed to the national market. Following calculations by Schydlowsky (1983:39) the respective index fell from 103 in 1976 to 83 in 1978, and not one sector could avoid this downward trend. Non-traditional exports which increased strongly during this period have to be regarded as a stabilizing element in the whole downswing process. Without the positive export performance the internal recession would have been even more pronounced.

Nevertheless, the intended correction of the real labor costs had to be paid for with the decline in productivity of around 9.2% between 1975-1979 (see Table 8). During the same period real wages declined even more (12%), so that on a very low level of economic activity the relation between productivity and real wages had improved slightly.

One of the crucial problems for Peru (and most developing economies) is how to stimulate the formation of capital. Independent of the question of which part of total investment should be organized privately and which part by the public sector, it is a fact that <u>if</u> the determination of the consumption structure is subject to private decisions, <u>then</u> changes in investment priorities imposed by public policy planners have to consider the effects on the provision of private consumption goods. The neglect of this almost fundamental connection in the early 70's was one of the most serious conceptual inconsistencies, which brought the economic expansion to a halt in the mid-seventies: on the one hand, the government could not succeed in stimulating private investment demand in spite of heavy subsidization of private capital formation. Instead, the share of private investment declined by about 50% after 1968, so that subsequent investments hardly covered replacement requirements until 1974. (1) Over the length of the period, this necessarily led to an over-aging of private capital equipment and growing bottlenecks in a number of production sectors. On the other hand, public investment activities were predomi-

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(1) See Fitzgerald 1983, Table 3.1.

TABLE 8

GROWTH OF PRODUCTIVITY, REAL WAGES AND RATES OF RETURN BY SECTOR

(Annual Percentage Rates[1])

ISIC	1971 - 75			1975 - 79			1979 - 81[2]		
	Productivity	Wages	Rate of Return	Productivity	Wages	Rate of Return	Productivity	Wages	Rate of Return
31. Food and beverages	3.6	1.6	7.0	-10.3	-3.7	-18.2	-.3	4.2	1.7
32. Textiles and clothing	1.9	-1.1	9.6	-7.7	-7.8	-12.7	-.6	4.2	2.5
33. Wood products	1.6	-1.5	1.5	-15.9	-13.5	-11.3	-6.1	4.2	2.8
34. Paper and printing	3.4	4.7	18.7	-15.0	-13.9	-22.8	10.5	4.2	3.4
35. Chemicals	3.3	7.1	-3.3	-3.2	-13.2	-12.0	5.3	4.2	1.8
36. Non-metallic minerals	0.9	4.9	-11.4	-4.8	-9.4	-8.6	3.8	4.2	2.3
37. Basic metals	-4.6	1.7	20.8	7.4	-17.1	20.3	-3.5	4.2	0.0
38. Metal products	4.7	3.9	8.5	-10.9	-13.1	-15.1	12.4	4.2	4.9
39. Other	7.0	5.4	9.8	-15.3	-13.1	-18.1	6.9	4.2	9.1
All Manufacturing	2.9	2.6	8.7	-9.2	-12.0	2.2	4.2	4.2	1.5

1/ Annual cumulative rates of growth.

2/ The years 1980 and 1981 are estimated.

3/ Estimated by assuming that nominal wages in each sector increased the same as the Indice de Sueldos y Salarios en la Industria Manufacturera, Direccion General de Empleo.

Source: World Bank (1983: Table III-C.2).

nantly dedicated to long-term projects in selected sectors which had been given development priority (oil, fishing industry, mining, and basic industries) and to the improvement of infrastructure. All of these projects were not appropriate to meet growing final demand directly and without a time lag. Under these circumstances and given the foreign exchange constraint and an almost critical consumption level, a strategy relying on the re-orientation towards a greater share of privately organized production activities should put emphasis on facilitating the expansion of these activites through the consolidation of the public sector deficit.(1)

The recovery program starting in 1976 included the reduction of this deficit proposing to limit public expenditure to public savings. However, the government policies failed completely in this respect until 1977, and the positive outcome of the 1978-1980 period turned out to be only a transitory phenomenen (see Table 10). In 1981, the overall public deficit again approached 9% of GDP due to excessive increases in expenditures in goods and services.(2)

Private investment behavior has been the mirror image of that of the public sector deficit. From 1975 to 1978, investment declined absolutely before turning to a three year recovery period, which ended abruptly in 1982. In that year the share of private investment in GDP had again dropped to 9.2% after its peak level of 10.1% one year before. The absolute decline in 1982 is shown for all investment categories (public and private) except for the sub-group "other institutions", which includes public enter-

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(1) It is especially noteworthy that during the first half of the 70's profits had apparently been untouched, despite the fact that private investment had drastically declined. At the same time rising public investment was not financed through higher taxes and therefore had to be financed through deficit spending, so that the public sector deficit rose from 2.2% of GDP of 1971 to 9.3% in 1974 (see Table 9).

(2) Preliminary data for 1982 and 1983 put the government deficit at 8.8% and 12% of GDP, respectively.

TABLE 9

PUBLIC SECTOR OPERATIONS IN RELATION TO GDP, 1971-80

(Percentages)

	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
Central Government										
Current revenue	14.0	13.9	13.6	13.8	14.0	13.4	13.5	14.2	16.6	18.4
Current expenditure	12.5	12.9	13.4	12.6	14.4	14.8	16.9	15.7	13.5	17.3
Current account	1.5	1.0	0.2	1.2	-0.4	-1.4	-3.4	-1.5	3.1	1.1
Capital revenue	-	-	-	-	-	-	-	-	-	-
Investment expenditures	4.2	4.3	3.9	4.1	4.5	4.5	3.5	3.1	3.9	4.8
Overall deficit	-2.7	-3.3	-3.7	-3.9	-4.9	-5.9	-6.9	-4.6	-0.8	-3.7
Total Public Sector										
Current account	2.7	2.5	0.9	2.0	-0.9	0.0	-3.1	-0.5	3.8	0.9
Capital revenue	...	...	...	0.6	0.0	0.0	-	0.0	0.0	0.0
Investment expenditures	4.9	5.3	5.9	8.3	8.4	8.3	6.1	5.2	5.6	6.8
Overall deficit	-2.2	-2.8	-5.0	-5.7	-9.3	-8.3	-9.2	-5.7	-1.7	-5.9

Source: World Bank (1981: 7).

TABLE 10

PERU - CENTRAL GOVERNMENT OPERATIONS, 1974-80

(Millions of Soles)

	1974	1975	1976	1977	1978	1979	Prel. 1980
Current revenue	68,560	87,896	111,397	154,252	263,743	552,230	1,013,400
Tax revenue	59,642	78,879	98,002	138,229	242,322	493,218	880,400
Taxes on net income and profits	19,284	21,504	19,711	27,976	44,210	124,910	293,600
Corporate and individual	(18,700)	(20,468)	(18,487)	(24,580)	(33,774)	(97,446)	(259,200)
Other	(514)	(1,036)	(1,224)	(3,396)	(8,236)	(6,464)	(4,400)
Payroll tax	2,705	3,400	4,209	5,170	8,404	16,971	33,900
Taxes on property	3,186	3,515	6,149	8,938	13,379	24,580	58,000
Real estate	(28)	(--)	(--)	(--)	(--)	(--)	(--)
Corporate net wealth	(1,720)	(1,833)	(2,334)	(5,594)	(6,461)	(11,766)	(23,000)
Property transfers	(1,059)	(1,298)	(1,570)	(1,644)	(2,246)	(3,394)	(10,100)
Other	(379)	(384)	(2,245)	(1,700)	(4,372)	(9,220)	(24,900)
Taxes on goods and services	24,126	32,226	46,851	66,772	121,635	227,262	379,100
General sales taxes	(17,177)	(23,587)	(32,366)	(44,482)	(78,061)	(161,901)	(281,200)
Selective excise tax on goods	(6,949)	(8,639)	(14,485)	(22,290)	(43,574)	(65,361)	(128,900)
Tobacco	/ 1,976/	/ 2,321/	/ 3,015/	/ 4,214/	/ 6,373/	/ 9,607/	/ 16,100/
Petroleum	/ 1,618/	/ 1,729/	/ 6,108/	/10,731/	/25,917/	/ 40,454/	/ 90,700/
Beverages	/ 1,641/	/ 2,308/	/ 2,519/	/ 4,111/	/ 6,768/	/ 8,116/	/ 8,600/
Other	/ 1,714)	/ 2,281/	/ 2,843/	/ 3,234/	/ 4,516/	/ 7,184/	/ 13,500/
Taxes on international trade	11,369	19,973	24,085	35,837	71,001	156,438	281,700
Import duties	(10,276)	(18,159)	(17,952)	(19,658)	(39,073)	(68,249)	(158,300)
Customs charges	/10,071)	/17,917/	/17,712/	/19,335/	/38,375/	/ 47,786/	n.a.
Other charges	/ 205/	/ 242/	/ 240/	/ 323/	/ 698/	/ 20,363/	n.a.
Export taxes	(1,093)	(1,814)	(6,133)	(16,179)	(31,928)	(88,289)	(123,400)
Adjustments for taxes paid with government debentures	- 1,028	- 1,739	- 3,003	- 6,464	-13,807	- 36,243	- 85,900
Nontax revenue	8,781	9,017	13,395	15,823	21,421	58,612	83,000
Property income	2,049	1,430	3,313	4,887	4,036	27,565	41,600
Administrative fees and charges	3,571	3,619	6,014	4,541	8,903	6,621	10,300
Fines and forfeits	288	349	386	1,005	1,541	2,425	
Contributions to government employee pension funds	2,107	2,596	3,138	4,069	5,433	6,592	8,000
Other	903	1,023	544	1,321	1,508	15,410	23,100
Current expenditure	62,444	90,507	122,718	193,092	291,032	448,741	954,300
Expenditure on goods and services	44,825	63,602	87,340	139,334	182,126	251,391	573,900
Wages and salaries	(24,960)	(32,346)	(42,212)	(55,441)	(79,137)	(122,064)	(242,900)
Purchase of goods and services	(5,157)	(5,792)	(6,501)	(6,647)	(10,465)	(25,088)	(37,100)
Military outlays	(15,608)	(25,464)	(38,527)	(77,246)	(92,514)	(104,239)	(293,900)
Interest payments	7,690	9,422	13,178	29,172	71,860	138,151	213,900
Domestic	(4,462)	(4,466)	(5,500)	(13,552)	(32,725)	(61,998)	(92,200)
Foreign	(3,228)	(4,956)	(7,678)	(15,620)	(39,107) 1/	(76,153)	(121,700)
Subsidies and other current transfers	9,929	17,483	22,200	24,586	37,056	59,199	166,200
Transfers to rest of public sector	(4,207)	(10,427)	(10,620)	(11,124)	(16,976)	(24,594)	(60,300)
Decentralized agencies	/ 3,034/	/ 4,569/	/ 5,429/	/ 7,254/	/ 9,947/	/ 18,560/	/ 40,800/
Municipalities	/ 742/	/ 80/	/ 260/	/ 1,622/	/ 2,047/	/ 5,033/	/ 14,500/
State enterprises 2/	/ 431/	/ 5,778/	/ 4,931/	/ 2,248/	/ 4,982/	/ 801/	/ 5,200/
Transfers to private sector	(5,722)	(7,056)	(11,580)	(13,462)	(20,080)	(34,605)	(105,700)
Current account surplus or deficit (-)	6,116	- 2,611	- 11,321	- 39,040	- 27,289	103,489	59,400
Capital expenditure	20,206	27,980	37,640	40,103	57,650	128,556	266,000
Acquisition of fixed capital assets	12,947	15,864	20,370	27,110	42,496	92,364	182,100
Purchase of land and intangible assets	567	520	558	189	157	441	300
Capital transfers	6,692	11,596	16,712	12,804	14,997	35,751	83,600
Decentralized agencies	(571)	(315)	(730)	(356)	(908)	(1,931)	(10,600)
Municipalities	(704)	(304)	(581)	(600)	(117)	(1,374)	
State enterprises 2/	(5,417)	(10,977)	(15,401)	(11,648)	(13,972)	(32,446)	(73,000)
Overall deficit	-14,090	-30,591	- 48,361	- 79,143	- 84,939	- 25,067	206,600

1/ Includes payment of $/.2,271 million on behalf of PETROPERU.
2/ Includes transfers to state-owned financial intermediaries.

Source : World Bank (1981: 177).

prises (see Table 11).

Leaving aside for the moment a detailed discussion of the special circumstances that caused the upward movement of most macro-economic aggregates in the late 70's, one has to see that in 1982, and even more so in 1983, the country found itself confronted with a situation quite similar to that of 1975-76. However this time, the already depressed wages are even less open to further decline (see Table 12 and Graph 1), world market conditions are only slightly improving, and protectionist tendencies - especially in the USA - are rising.

After the re-orientation of economic policy from 1976 on, which was accompanied by a liberalized trade regime, exports rose relative to imports because a) the world market conditions for the most important minerals improved and b) NTX could be stimulated effectively. The growth performance of the latter can surely be taken as an indicator of a growing international orientation of Peruvian entrepreneurs. They were, however, to a large part pushed up by high export subsidies and the vent-for-surplus strategy of firms losing their national market due to declining demand. Therefore, the export growth rates between 1975 and 1980 exaggerate the competitive position of the Peruvian manufacturing sector. High export growth rates did not induce investments industry-wide, because some industries, especially those exporting to the neighboring countries, just tried to improve the utilization of their capacity. Thus, the modern export industry remained only a very weak engine of growth with uncertain future prospects as long as national economic problems could not be solved in a satisfactory way.

1.2.2.2. Adjustment Process and Minimum Social Conditions

The evaluation of the devlopment described above provides the answer to the question, if the consolidation process initiated in 1976 forms a viable basis for a lasting recovery. Neither real wages not the public

TABLE 11

GROSS DOMESTIC PRODUCT BY EXPENDITURE: 1973 - 1982
(Millions of Constant 1970 soles)

	1973	1974	1975[1]	1976[1]	1977	1978	1979	1980	1981	1982
Private Consumption	206,833	226,829	234,655	237,688	232,702	221,237	220,431	230,398	235,966	233,045
Public Consumption	34,784	36,497	41,423	42,838	37,036	39,651	35,448	42,892	41,487	44,433
- Government[2]	29,062	30,540	35,177	37,787	41,566	34,334	29,068	35,647	34,327	37,810
- Other institutions	5,722	5,957	6,246	5,051	5,470	5,317	6,380	7,245	7,160	6,623
Gross Capital Formation	45,497	59,333	65,254	57,942	44,980	39,226	43,961	57 339	71,778	65,846
Gross Fiscal Capital Formation	37,042	48,457	58,254	53,942	43,480	37,726	41,261	55,039	65,378	62,846
- Public	16,130	25,329	28,355	26,740	19,597	16,231	18,520	24,979	30,498	30,757
- Government[3]	7,154	9,599	9,673	9,357	8,252	7,584	9,950	12,352	14,219	11,188
- Other institutions[4]	8,976	15,730	18,682	17,383	11,345	8,647	8,570	12,627	16,279	19,569
- Private	20,912	23,12[illegible]	29,899	27,202	23,883	21,495	24,741	30,060	34,880	32,089
Change in Stocks	8,455	10,876	7,000	4,000	1,500	',500	700	2,300	6,400	3,000
Exports	40,250	37,910	38,059	35,524	41,467	48,961	62,953	58,551	55,661	59,448
Imports	42,980	56,681	65,362	50,433	46,456	35,092	36,955	53,567	58,922	54,377
Gross Domestic Product	284,384	303,879	314,029	323,559	319,729	313,983	325,838	335,613	345,970	348,395

1/ Estimates: National Statistical Institute

2/ Central and local governments. Including: Remunerations of the Social Security System, road maintenance. Excluding: Remunerations of goods and services of strike monopolies.

3/ Central and local governments. Excluding: road maintenance.

4/ Includes: Public enterprises, transfers, social security and other public institutions.

Source: Central Bank, Memoria 1982.

TABLE 12

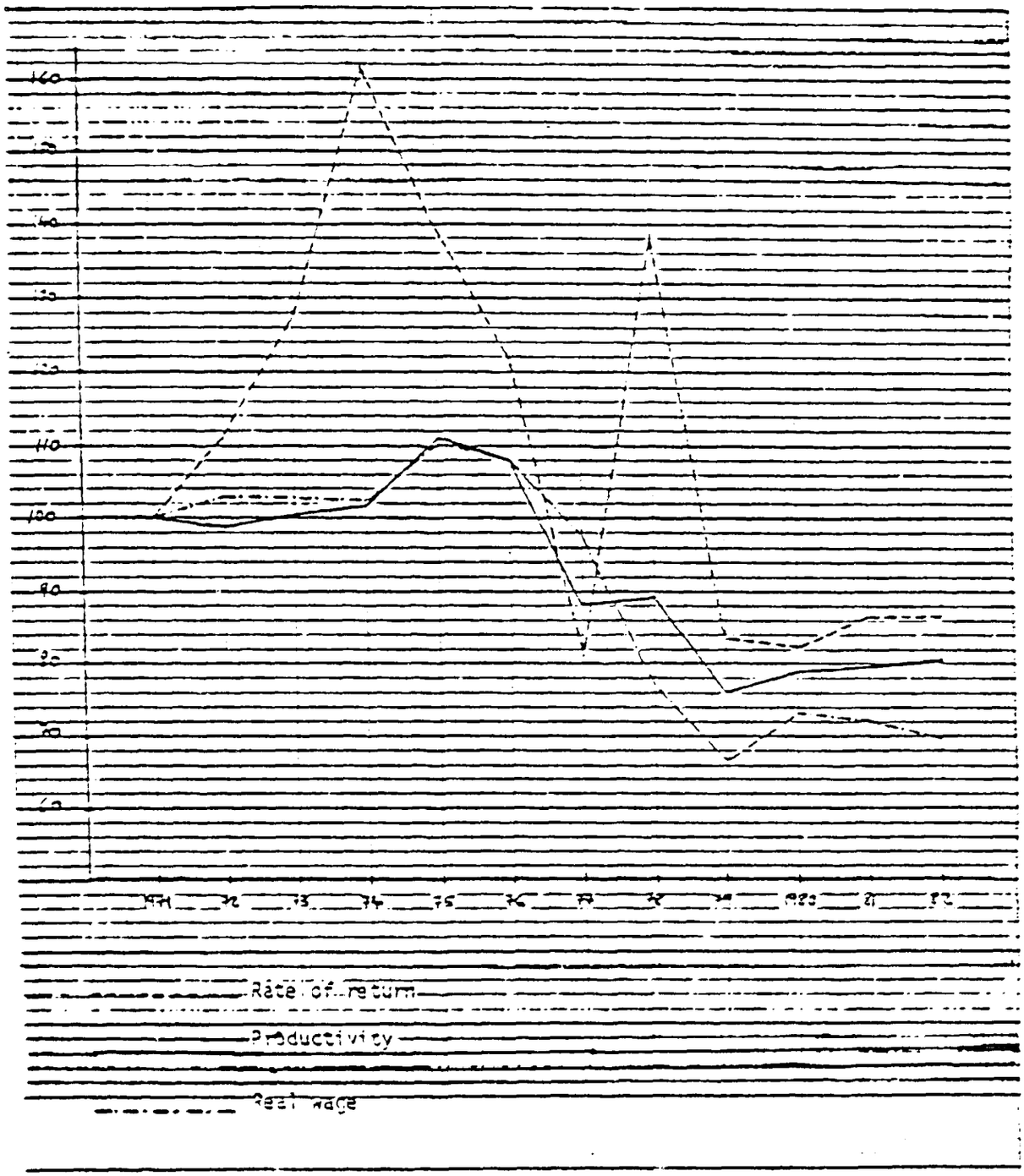
INDEX OF REAL SALARIES AND WAGES
(1973 = 100)

YEAR	WAGES	SALARIES
1973 Dec	100.0	100.0
1974 June	106.5	94.4
1975 Aug	80.6	90.2
1976 June	96.3	92.2
1977 June	73.4	68.4
1978 June	67.1	55.8
1979 June	60.5	50.6
1980 May	74.6	56.5
1981 May	70.7	57.0
1982 May	72.8	64.1
1983 May	69.0	60.6

Source: 1973-80: Abugattas, Luis and Edgar Zamalloa (eds). (1982:222).
1981-83: El Observador Lima, 18 Ag 83.

GRAPH I

Evolution of Productivity, Real Wages and Rates of Return in the Manufacturing Sector a/
(1971 = 100)



a/ For firms employing 5 or more workers.
Source: World Bank (1983: Graph III-C.I).

sector deficit could be restrained for more than a short period of emergency. A consolidation process which pushes down wages in the way it has been done in Peru and which cuts back public expenditure without paying adequate attention to the longer term provisions of elementary public services, (1) is not a viable approach to restructuring. In fact, the maintenance of the public expenditure structure imposed in 1979 proved untenable already one year later, when current expenditure rose by 27.6% in real terms. (2)

1.2.2.3. Industrial Policy

There is no doubt that in recent years it has repeatedly been tried to change the system of incentives to meet the necessities of a market-oriented system. However, there is no easy answer to the question to whether it changed sufficiently to meet the minimal requirements for a smooth functioning of a small open market-oriented economy.

An indirect way to come to a preliminary judgement on this subject may be found, if a short reference is made to the detailed informal sector study presented in Chapter 6. Drawing on the results of this analysis, which reveals the size, the structure and the distinct features of illegal economic activities in Peru, some strong doubts emerge regarding the functionality of the existing industrial development system. From this investigation it may be concluded, that it is not so much the sheer existence of a clandestine production sector nor its increase during recent years of recession, which is so very alarming in Peru. Rather, it is the structure of the sector, its size and the uncontrolled forces stimulating its development. Two main problems have to be emphasized, which clearly indicate the urgency of a fundamental reformulation of the existing system of incentives, if an ongoing erosion of the economic and social framework is to be avoided:

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(1) The consolidation procedure brought per capita expenditure for education, health, and road maintenance far below the average of similar countries. See World Bank (1981:23).

(2) CEPAL (1982: Cuadro 23).

1. The informal sector usually includes different kinds of services, retail merchandise and some other marginal activities. In Peru, however, a substantial part of industrial production is undertaken outside the official economy. The problem of informality becomes almost ambiguous. On the one hand, there is a growing number of involuntary participants (mostly migrants), who would like to enter the modern sector to share the fruits of the legal security system. On the other hand, there are those who voluntarily join the informal sector fleeing from legality to preserve competitive strength. Between both movements a tight net of partially formal (informal) activities has been established.

2. The existence of modern industrial production activities outside the legal system creates a dual market separated by the cost of legality. The greater the part of clandestine production, the greater becomes the pressure on 'formal' producers to escape the legal constraints. In Peru today, the mere size of illegal production activities provides a strong and growing dynamic force for ever more producers to escape the state regulatory system. This self-enforcing dynamic force must be seen as a severe threat to the functioning of the economy.

1.2.3. Conclusion

After a period of economic stagnation of nearly 20 years (in terms of real income per capita as well as sectoral transfromation), Peru has to be characterized as an economy paralyzed by:

- macro-economic conditions adverse to growth,
- growing social imbalances accentuated by unsuccessful stabilization policies after 1975, and
- an inconsistent incentive system which combines allocative signals and distributional tasks in an almost self-destructive way.

From this point of view, it has to be stated that the 1979-1981 growth process rested on an almost fragile set of economic and social conditions. Focusing only on GDP and export growth rates will - under these circumstances - yield a positive picture of the economy that is not justified in view of the real situation. It may be therefore suggested that the liberalization program was introduced too abruptly and came at the wrong time because of at least three factors:

1. The successful performance of the manufactured exports obscured their real competitive position, so that the sudden lowering of CERTEX reduced exports in all those branches which were not yet viable under world market conditions.(1)
2. Since the macro-economic conditions and the growth promoting elements within the national economic framework still had to wait for a definite restructuring, the suddenly growing import competition (legal and illegal) could not be met by import substituting industries.
3. In 1981, the world market suffered its most severe recession since World War II, so that in the short run there was simply no possibility to ease the national adjustment through significant export growth rates.

There appears to be little doubt that Peru will have to face another decade of stagnation if not a conceptionally valid and politically manageable reformulation of the general economic framework can be implemented. (2) An integral part of such a strategy should be an industrial policy package which allows a restructured industry to grow steadily along a constant and predictable set of politically guaranteed rules. In the following chapters some industrial policy options based on these principles will be outlined.

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(1) The appreciation of the real exchange rate between 1979-81 is an additional explanatory factor for the stagnation of NTX in 1981 (see Table 13).

(2) Such a stagnation seems to be already envisioned by some professionals in Peru. The annual growth rate for the period 1985-1900 projected by the Instituto Nacional de Planificación is 2.6% for the economy as a whole and 2.4% for the manufacturing industry. In that case, growth of income per capita would be around zero.

TABLE 13

DEVALUATION AND INFLATION: Percentage Variations

	Devaluation		Inflation		Relative Inflation		
	official	CBME	internal	U.S.A.	external[2]	bilateral[3]	multilateral[4]
Dec.75/Dec.76	52.7		44.8	4.7	6.5	38.2	35.9
Dec.76/Dec.77	81.2		32.4	6.8	12.6	24.0	17.6
Dec.77/Dec.78	55.5		73.7	9.1	13.8	59.2	52.7
Dec.78/Dec.79	28.1	19.6	66.7	13.3	10.8	47.2	50.5
Dec.79/Dec.80	35.8	35.6	60.8	12.4	11.0	43.1	44.9
Dec.80/Dec.81	47.7	47.9	72.7	8.9	2.2	58.5	69.0
Dec.81/Dec.82	90.7	90.1	72.9	5.0	0.8	64.7	71.6
Dec.82/Dec.83	135.5	140.5	125.0	3.0	0.6	118.3	123.6
Jul.80/Jan.84	706.0	733.4	802.4	22.9	4.6	634.2	763.1
Jan.83/Jan.84	126.1	131.2	124.2	4.0	0.1	115.7	124.0
Dec.83/Jan.84	4.0	5.5	7.3	0.3	-0.1	7.0	7.0

1/ Percentage variations comparing average monthly values

2/ Calculated from the inflation rates of the seven mayor trading partners of Peru and the variation of their currencies in relation to the US$

3/ Difference between internal and U.S. inflation rates

4/ Difference between internal and external inflation rates

Source: Central Bank. Nota Semanal No. 9/ 1984. March 1984, 38.

T A B L E A-1

GROSS DOMESTIC PRODUCT BY ECONOMIC ACTIVITY: 1970-1982

(Million of soles at constant 1973 prices)

Economic Activity	1970	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
Agriculture	59,374	54,285	57,173	56,750	58,126	57,580	57,619	60,215	56,855	62,952	64,290
Mining	24,930	26,924	27,927	25,243	26,762	32,909	36,033	39,324	39,477	38,245	40,750
Manufacturing	87,238	99,524	110,401	114,959	119,566	114,469	110,026	114,697	121,275	121,031	118,010
Food processing	31,394	25,604	31,427	31,231	33,062	29,747	28,536	29,935	29,779	29,922	30,994
Textiles	12,518	14,286	14,687	14,936	15,903	13,586	13,981	14,516	14,312	13,239	12,557
Wood & Wood products	1,721	2,265	2,340	2,542	2,723	2,413	2,276	2,176	2,122	1,973	1,997
Paper & Paper products	3,806	4,881	5,304	5,075	5,242	4,858	4,369	3,947	4,737	4,854	4,228
Chemical products	10,788	15,470	17,021	18,979	20,367	19,425	19,534	20,005	22,184	22,517	22,967
Non-minerals products	2,922	4,080	4,416	4,616	4,867	4,460	4,133	4,269	4,645	4,766	4,518
Basic metals	7,632	8,347	8,424	7,714	8,302	13,210	13,213	15,123	14,836	13,931	13,762
Metal products	7,906	13,802	15,463	17,778	17,656	16,223	13,533	13,909	17,270	17,823	15,257
Other manufacturing	888	1,180	1,204	1,367	1,306	1,133	1,047	982	1,070	999	972
Handicraft industry	7,663	9,609	10,115	10,721	10,138	9,414	9,404	9,785	10,320	10,537	10,758
Utilities	2,234	3,007	3,287	3,54μ	4,025	4,537	4,728	5,071	5,347	5,859	6,187
Construction	10,455	13,854	16,655	17,009	17,021	15,107	13,551	14,170	16,833	18,693	19,123
Commerce	44,630	54,805	60,524	66,256	64,151	61,605	60,152	63,269	67024	70,818	68,485
Transport	17,635	21,748	24,232	26,453	28,064	28,347	28,773	30,152	32,443	34,216	34,123
Services and other activities 1/	106,100	118,439	121,734	130,862	132,272	137,184	136,588	139,041	144,572	150,849	153,483
GDP	352,596	392,559	421,933	441,073	449,987	449,738	447,470	465,939	483,826	502,663	504,451

1/ Includes financial services, education, health, public administration and defense.

Source: World Bank (1983), Annex - Table I.1.

TABLE A-2

INDEX OF PHYSICAL OUTPUT IN THE MANUFACTURING INDUSTRY

(1973 = 100)

		1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
311-12	Foodstuff	106.4	107.9	105.8	105.5	101.2	101.2	101.6	101.1	98.5	83.9
313	Beverages	121.3	132.6	147.3	134.9	120.1	131.3	145.2	143.5	147.3	142.3
314	Tobacco	116.5	117.9	117.2	116.3	106.1	116.7	128.4	137.5	139.5	122.6
321	Textiles	101.4	102.5	110.3	97.8	106.4	113.4	108.0	107.9	100.2	87.7
324	Footwear	110.4	101.4	126.7	81.0	76.0	72.1	80.4	73.6	57.1	41.5
331	Wood and Cork Prod.	103.1	97.9	152.2	140.7	138.4	133.2	122.1	122.8	n.d.	n.d.
341	Paper and Paper Prod.	124.1	103.7	117.4	124.1	105.4	99.6	121.2	112.4	81.7	69.4
351	Industrial Chemicals	115.8	130.9	143.2	156.0	167.8	175.5	184.9	184.5	199.6	167.7
352	Other Chemicals	107.0	126.1	137.6	123.1	126.7	113.8	134.4	138.7	136.7	109.4
353	Petroleum Refineries	108.4	114.9	115.0	115.9	114.0	132.2	136.1	138.8	141.3	134.9
355	Rubber Products	102.1	112.8	140.0	116.8	101.4	109.5	132.8	129.8	123.7	106.4
356	Plastic Products	113.5	123.3	121.0	109.2	99.6	121.9	124.9	136.5	141.2	101.0
362	Glass Products	105.0	121.8	134.4	120.6	96.2	114.0	117.6	117.8	132.4	109.9
369	Non-Metallic Minerals	123.8	129.0	127.9	117.4	113.7	114.3	128.7	129.7	115.7	93.7
371	Iron and Basic Steel	122.4	124.7	104.4	123.3	131.2	138.9	156.0	141.0	112.3	102.8
372	Non-ferrous Metal	92.9	92.8	104.2	185.1	182.0	212.8	200.9	190.1	198.1	178.3
381	Metal Products	108.0	115.3	109.2	103.6	97.0	92.0	110.8	100.5	94.9	75.5
383	Electrical Machinery	123.9	149.7	145.7	140.9	125.7	115.1	135.4	153.1	122.1	73.3
384	Transport Equipment	89.1	109.1	109.7	72.2	38.4	43.4	67.1	70.4	65.4	26.1
	T O T A L	111.7	117.2	122.7	118.1	113.8	118.2	124.4	124.3	121.0	100.2

TABLE A-3

PERUVIAN EXPORTS 1970-83

(Millions of U.S.$)

	Total X (1)	Total NTX (2)	Total M (3)	NTX/X (4)
1970	1,034.3	34.2	699	3.3%
1971	889.4	30.6	730	3.4
1972	945.0	51.6	812	5.5
1973	1,111.8	113.0	1,097	10.2
1974	1,503.3	154.3	1,909	10.3
1975	1,209.9	107.5	2,389	8.3
1976	1,359.5	136.7	2,100	10.1
1977	1,725.6	237.9	2,164	13.8
1978	1,940.7	343.5	1,601	17.7
1979	3,491.0	724.7	1,955	20.8
1980	3,898.0	832.0	3,090	21.3
1981	3,249.0	693.0	3,802	21.3
1982	3,230.0	762.0	3,787	23.6
1983	3,015.0	555.0	2,688	18.4

Source: Banco Central de la República, ADEX.

II. SECTORAL ANALYSES

There are different approaches to identify growth sectors in less developed countries. The importance of backward and foreward linkages has been emphasized as well as the relative value added content, geographical proximity and factor endowments. Relative factor endowments are basic to resource-based industrialization strategies and to those approaches which apply traditional trade theory to identify efficient production patterns from the most promising trade schemes. This latter line of reasoning has in fact formed the basis for the industrialization efforts of some of the most successful newly industrializing countries in today's developing world. Recent studies by different authors all come to the conclusion, that those countries which were closest aligned with their comparative advantages and which managed to adapt to changing external and internal conditions without too much delay have been among the fastest growing developing economies in the 60's and 70's. It has to be kept in mind, though, that some of the countries had also carried out a successful agrarian reform and that their distribution income was less unequal than in most Latin American countries.

In view of recent world trade developments there arises some doubt, whether price differences between unskilled labour and capital can adequately explain the highly sophisticated trade relations and its determinations, which are the outcome of growing world wide interdependencies and the increasing impact of technological change on world wide production.

It is exactly technological know-how which has formed one of the main forces to expand intra-industrial trade relations with quasi-identical products produced under increasing returns to scale. These products have been at the core of the most dynamically increasing trade relations between developed countries after WW II and they seem to form a growing part of North-South trade relations in recent years.

As capital and managerial know-how become more and more mobile internationally and the production processes are increasingly open to specialization and regional diversification, technological developments will also have a growing impact on the trade patterns of developing countries. Thus while the obligation for economic policy makers to pay due attention to world economic changes becomes more and more overt, the growing number of variables involved (especially the growing importance of international spill-over effects of technical developments, which in its direction and impact are virtually unforeseeable) make it increasingly difficult to identify a straightforeward development path for a single national economy.

Nevertheless, the growing importance of changes in the international surroundings for national economic policies makes it even more urgent than in the past to evaluate national industrial policies with reference to international markets.

This will be done here in a first step, applying a constant market share analysis to Peruvian non-traditional exports between 1975 to 1980. Despite the fact that a positive sector indication appears to be highly tentative in a rapidly changing world, the identification of relatively successful sectors during this period will throw some light on the Peruvian manufacturing sector and its expansionary export potential. This can be suggested, because during this period the impact of national economic policy remained relatively constant for exporters. Consequently, relative discrimination between industries did not change systematically, so that an above average growth performance of a certain sector will give a first indication of (future) international competitiveness.

In the case of Peru, there is yet another reason to justify the use of past export trends to find industrial sectors of potential interest to economic promotion policies. Stabilization policies after 1975 had - as shown in part I - depressing impact on national

markets. Nearly all industrial subsectors suffered a severe decline due to the declining consumption. Under such circumstances entrepreneurs (as well as public planners) fighting already against growing idle capacity do not find many indications of promising future activities in the national market. An analysis of export performance, especially with respect to the similarly structured markets of the Andean Pact might therefore be a valuable alternative for a meaningful evaluation of the future growth potential of national industrial sectors in a recessionary economy.

The possibility to analyze trade relations within the Andean market separately on a relatively disaggregated level might be used as an approach to identify typical import substituting industries as well, since the Andean market is said to form a regional import substitution area. Growing exports within the integration area might therefore indicate sectors which have been relatively successful in substituting imports from the world market rather than prospering export industries in the usual sense (in the long run and taking into account dynamic economies of scale, both aspects might converge).

Following the CMS analysis three industrial sectors are investigated in great detail: the textile industry, the production of capital goods for the mining industry, and the industry producing power generation and distribution equipment.

These sectors are of some importance to industrial policy in Peru under a variety of aspects. They are by no means, however, the only industrial branches which deserve the attention of industrial policy-makers because of at least 3 reasons, which emanate from the CMS analysis as well as from some dynamic considerations about the developing process:

1. One of the most serious problems for nearly any developing economy is the fact, that industrial efficiency is closely tied to the

existence of an extended agglomeration area which provides cheap and reliable inputs (directly and indirectly) to producers of final consumption goods and to (potential) exporters. The evolution of such an area [1] of favourable conditions for industrialization in turn depends itself critically on the size of the market which is not only determined by the size of the population, but also by the distribution of income.

Only very large economies are able to provide a large market already at an early stage of the development process and on a purely national level. A small segmented economy like the Peruvian one (geographically and ethnologically) is, however, obliged to get into contact with the bigger markets abroad relatively soon and with a relatively broad range of products, simply because this is the only way to arrive at the scale necessary for efficient manufacturing activities and to participate in internationally accumulating knowledge. The sooner the diversification of export industries can be realized, therefore, the better are the preconditions for sustained economic growth for such an economy. As will become clear in part III this is not to advocate an unconditioned free trade experiment. Rather the recommendation is a controlled world market orientation with equal attention to ongoing importsubstitution, whereby protection should only be temporal though.

2. One significant limitation to this approach would be a serious lack of human capital, managerial and engineerical skills and in infrastructure. If these essentials are lacking, no immediate take-off will be possible nor can a successful strategy to stimulate non-traditional exports be implemented directly. All of these bottlenecks are in fact to be found in the developing world and in Peru, too. Comparing indicators of the Peruvian infrastructure, the recent educational advances and the number of

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(1) An area may be a regional as well as a legal zone.

(possibly) underemployed professionals and entrepreneurs in the formal and informal sectors with those of similar economies (income per capita) reveals, however, that Peru is in a relatively advantageous position due to the fact that the extensive public programs initiated since 1970 were aimed predominantly at these sectors. Additionally it has to be emphasized that in 1975 Peru had already finished an extensive import substitution period, and many entrepreneuers gathered experience on foreign markets thereafter. It can be suggested, therefore, that from this point of view there are relatively good preconditions for a sustained recovery in a wide range of industries, if the necessary resources can be activated. This argument gains importance in light of the CMS-analysis which reveals a relatively broad spectrum of fast-growing industrial export sectors.

3. From the sectors selected for detailed analysis here, only the textile sector is of such a quantitative importance as to have a (potentially) dominating impact on the economy as a whole. This implies that even in the case that these three sectors prove to be the most promising in terms of future growth rates, no industrial policy should be encouraged to rely only or predominantly on these sectors.

Taking these considerations into account, it should be clear that the analyses of the three sectors will give important insights for the outline of future industrial policies for these branches. But they should only be seen as providing a preliminary basis for policy action, as long as equally important manufacturing sectors are not included. A consistent economic policy for industrialization will have to check the whole set of sectoral options before it can decide on priorities and before it can determine and evaluate possible side effects of sectoral measures.

After the analysis of the three manufacturing sectors a special problem of the Peruvian economy, the informal sector, is considered.

Though this is not a sectoral analysis in the sense of the branch studies presented before, its utmost importance for understanding the recent developments in the industrial sector justifies this sub-chapter. At the same time this section provides a detailed quantitative basis for important considerations about the role of clandestine production in manufacturing.

2. A CONSTANT MARKET SHARE ANALYSIS

2.1. The Scope of the Analysis

CMS-analysis is a method by which past growth rates of exports can be split numerically, thus revealing a world trade component, a product composition component, a market composition component and a component representing the country's international competitive position. If X^1_{ij} and X^0_{ij} are a country's total exports in periods (1) and (0) in products 'i' to countries 'j', 'r' is the growth rate of world exports, and 'r_i' is the world growth rate of the commodity 'i', then

$$\sum_{ij} (X^{80}_{ij} - X^{75}_{ij}) =$$ (Peru's export growth [1] between 1975-1980)

(1) $\sum_{ij} r \cdot X^{75}_{ij}$ (part of Peruvian export growth which equals world export growth: WORLD MARKET EFFECT)

(2) $+ \sum_{ij} (r_i - r)\, X^{75}_{ij}$ (part of Peruvian export growth due to the fact that the growth rate of world demand for Peruvian exports 'r_i' differs from total world export growth rate 'r': PRODUCT COMPOSITION EFFECT)

(3) $+ \sum_{ij} (r_{ij} - r_i)\, X^{75}_{ij}$ (part of Peruvian export growth due to the fact that the import growth rate of Peruvian trading partners 'j' in products 'i', r_{ij}, differed from world import growth rates in products 'i', r_i: MARKET COMPOSITION EFFECT)

(4) $+ \sum_{ij} (X^{80}_{ij} - X^{75}_{ij} - r_{ij}\, X^{75}_{ij})$ (difference between real Peruvian export growth and the growth components identified by effects (1) to (3). The COMPETITIVENESS EFFECT therefore represents the residual).

This kind of decomposition of trade data reveals detailed structural information hardly to be found elsewhere. It will be used to identify those

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(1) The data do not include the SITC group 0. Its consideration might cause some minor relative deviations which are not decisive for the investigation of industrial exports. It should be kept in mind, however, that the total values differ from the complete data set as usually employed.

industrial activities that have been important to Peruvian economic development in the period under consideration.

There are a number of conceptional difficulties with a CMS-analysis which have been discussed in detail elsewhere [1] and need not be repeated in this paper. Most of them stress the problem of data aggregation and the fact that CMS-coefficients do not show causal relationship. Therefore, the value of a CMS-analysis as an analytical tool crucially depends on a careful interpretation of the findings. Consequently, attention has to be paid to an evaluation of the complex Peruvian economic (and political) situation and its international environment, as outlined in the first chapter.

With this in mind, we can state that export growth in the second half of the seventies was initiated by a two fold shift in economic policy, the correction of the highly overvalued exchange rate and the reduction of trade barriers. This in turn, provided the necessary environment in which the system of selective export promotion (CERTEX) already established in 1969, could have its intended positive impact. (CERTEX was modified in 1976, 1978, 1981, and 1984).

In the period under consideration, CERTEX provided tax refunds of up to 30% on the fob export price of non-traditional products with additional 10% for enterprises outside the Lima/Callao area (decentralization CERTEX). Originally it was applicable to only a limited number of exports, but the extension of coverage since 1971 de facto produced a relatively homogeneous incentive structure: in the second half of the 70's, about 70% of non-traditional exports received an average CERTEX rate of 25% with relatively small deviations of individual rates.

Nevertheless, the highly selective allocational effect of CERTEX[2] becomes obvious, if the effective rate of subsidization (subsidization as a percentage of value added) is taken into consideration. This indicator

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(1) See Banerji, Ranadev (1974).

(2) Although Certex is not the only export incentive, it is the most important one.

of the relative incentive given to a particular industry varies without any change in the CERTEX rate according to the relative value added content of the export product and to changes in relative input prices. As a result two negative effects have to be registered: Firstly, based on internatonal prices effective incentive rates of several hundred percent in export activities with a low value added content and quickly rising input prices (raw materials) occurred. Secondly, as the effective subsidization rate decreases with every rise in the value added content of the final product (normally identical with the continued process of rising sophistication of output) the implementation of more advanced production processes is effectively hindered. This clearly counteracts the intentions of the export promotion policies.

Different sectoral incentive policies might lead to unintended cumulative or neutralizing effects. A very clear example of such policy failure becomes evident when the 17% tax on raw material exports is seen in connection with the CERTEX system. Adding a minor refinement process to crude raw materials enabled producers to switch from taxed to subsidized exports with an effective gain of up to 57% (30% CERTEX, 10% decentralization CERTEX and 17% avoided export tax) on the fob export price.

It can be summarized that for the 1975 - 1980 period the Peruvian export promotion system suffered from an inconsistent structure and excessive effective incentives on particular items due to the refunding system and unforeseen cumulative effects. Furthermore the general level of subsidization seems to have provided too high incentives and might therefore have been counterproductive. Under these circumstances the export development must be seen as somewhat distorted by "subsidy seeking" activities, whose contribution to economic development by competitive exports is at least doubtful. Taking these general qualifications of the Peruvian situation into account we now turn to a detailed discussion of the empirical results of the CMS analysis.

2.2. Sectoral Analyses

The investigation will be carried out in 3 steps:

(1) General outline of Peruvian export performance on a 2-digit (SITC-2) level and identification of sectors of special interest.
(2) Extension to the SITC-3 level for expor s of selected industries and their regional distribution
(3) Analysis of the Peruvian export structure with different countries

2.2.1. Export Performanc- on a 2-Digit Level

In 1975, Peruvian exports amounted to US$ 777,394,000[(1)] in current prices and rose to $2,757,313,000 in 1980, the total change being $1,979,919,000. CMS-component splitting reveals that world market and competitiveness effects combined account for about 93.5% of total change. Leaving aside the world market effect which is not very interesting here, the residual effect becomes prominent. Nearly all of the rise in exports which is not in line with the world export growth rate seems to have been taken place in reponse to changes in the country's overall competitive position. This finding may be explained by major exchange rate adjustments and the reduction of trade barriers accompanied by an increase in export subsidies. Additionally the rise in primary commodity quotations in 1979 stimulated Peruvian exports considerably.

Figure 1

Peru: Trade Performance 1975-1980
(Thousand US $)

Total Change:[1)]		Total 1980:
	Competitiveness Effect	2,757,313 US $
US $ 964,487	46%	
US $ 87,614	Market Composition Effect 4.4%	
		Total 1975:
US $ 42,061	Product Comp. Effect 2.1%	777,394 US $
US $ 955,651	World Market Effect 46.6%	

1) The sum of the components differs slightly from the overall change.

(1) Data do not include SITC group 0.

The weak performance of the product composition effect appears to be indicating that typical Peruvian exports did not meet especially favourable conditions on the world market over the length of the 5 year period. This applies to the market composition effect in a very similar way: on the average, Peruvian products have not been placed in fast growing national markets.

To arrive at a more detailed picture of the trade panorama we have to go beyond the total values and ask which of the export sectors were the most successful contributors to total export growth? On the SITC-2 digit level the sectors which added more than 5% to overall export growth were:

28 Metaliferous Ores and Metal Scrap	16.28%
33 Petroleum and Petro Products	32.93%
65 Textile Yarn, Fabrics etc.	7.51%
68 Non-Ferrous Metals	23.72%
89 Miscellaneous Manufactures	5.13%
	85.56%

These 5 sub-groups out of a total of 44 SITC-2-digit positions account for 85.56% of overall export growth. Three of these (textiles, non-ferrous metals, and misc. manufactures), representing more than 35% of total export growth, include the majority of those non-traditional exports that are at the core of discussions on appropriate industrialization strategies in open developing economies. Therefore a close look at these positions should be helpful. Metaliferous ores (28) and petroleum products (33), though very important within the overall export strategy of Peru, do not belong directly to the industrial manufacturing sector relevant to this investigation. However, close links between raw material extraction and processing do exist in many cases, which can only be discussed meaningfully within the overall context. This justifies further investigation of SITC group 28.

Identifying critical sectors via relative growth contributions can only be seen as a very rough and incomplete indicator of export per-

formance, since the absolute participation of a certain sector does not reveal its growth potential: high percentage rates might be due to quantitatively important though slowly growing industries which might form definite development obstacles. Therefore before proceeding we have to identify all those branches which show a relatively high growth potential, but which due to a relatively low value in 1975 do not yet deliver a quantitatively important contribution to Peruvian export development. In Figure 2 all SITC-2-digit sub-groups with export values ≥ 1,500,000 US $ in 1975 are listed by growth rates. Percentage changes between 1975 - 1980 range from - 100% to +3341%. The average export change has been 255% for the 5 year period, so that all SITC-2-digit sub-groups with growth rates >(<)255% will be called fast (slowly)growing. From Figure 2 all sectors with high growth rates (except 'Crude Fertilizers' (27) and 'Petroleum and Petroleum Products' (33)) are selected for further discussion.

There are, however, a number of fast growing sectors which had virtually no quantative importance in 1975. Nevertheless, their performance might indicate future growth sectors due to favorable production or sales conditions. To include these branches in the final sample we define 'infant export activities' as all sectors reaching a growth performance of more than 1,000% between 1975-1980 and surmounting an export value of US $ 1,500,000 in 1980.

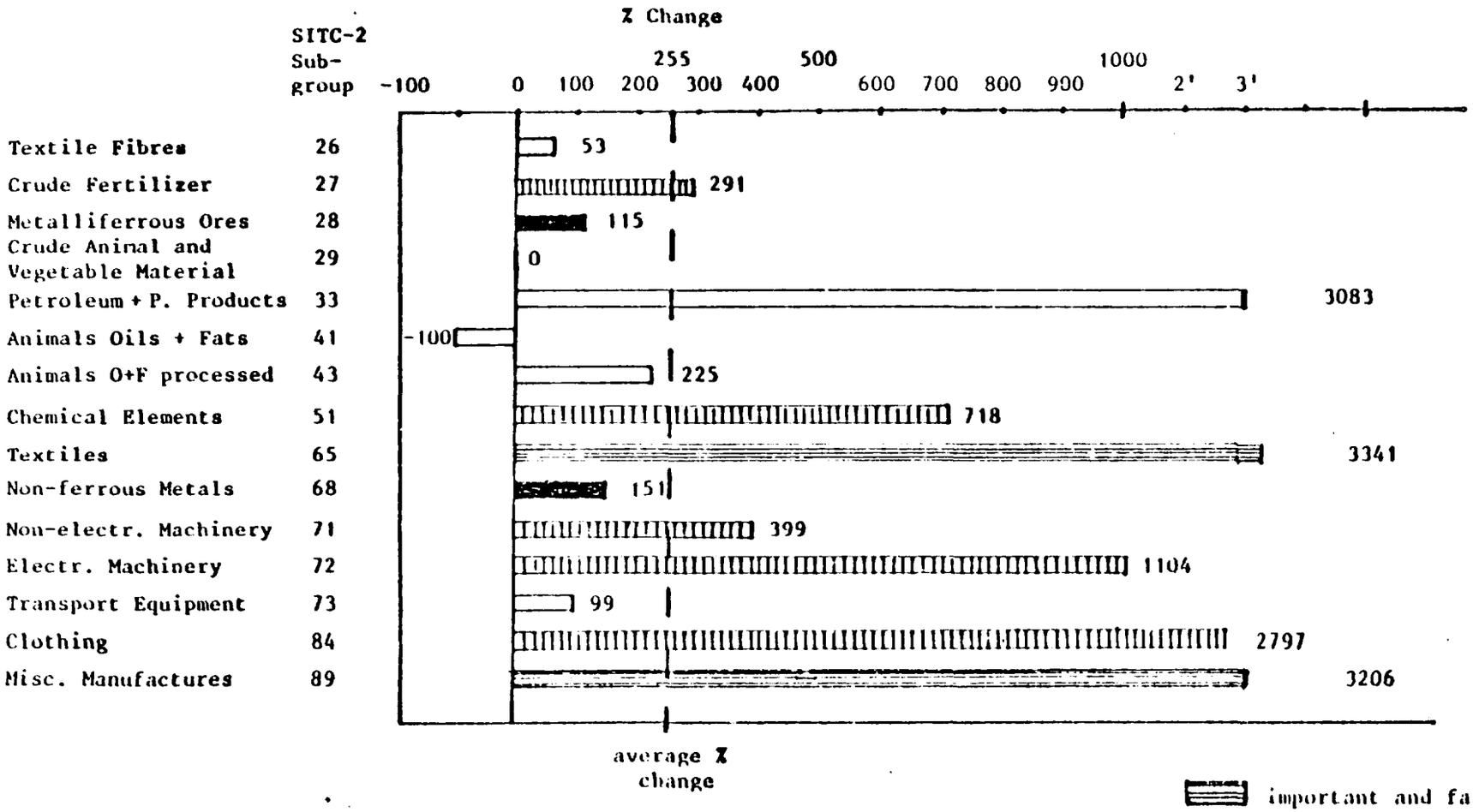
This procedure identifies 15 SITC-2 digit sectors which are to be discussed in more detail:

I. Important and fast growing export sectors:
(sectors adding more that 5% to total export growth and showing growth rates > 255%):
65 Textiles
89 Miscellaneous Manufactures

II. Not (yet) important but fast growing sectors:
(sectors adding less than 5% to total export growth and showing growth rates > 255%):

Figure 2

Growth Performance of SITC-2 Subgroups > 1,500,000 US $ in 1975 (~ 0.2% of total exports in 1975)



Definitions:
- Fast growing = export change > 255%
- Slow growing = export change < 255%
- Important: adding more than 5% to total export growth
- Not yet important: adding less than 5% to total export growth

important and fast growing

not yet important, but fast growing

important, but slow growing

not important and slowly growing

51 Chemical Elements
71 Non-electrical Machinery
72 Electrical Machinery, Apparatus and Appliances
84 Clothing

III. Quantitatively important, but slowly growing sectors:
(sectors adding more than 5% to total export growth but showing growth rates < 255%):

28 Metaliferous Ores
68 Non-ferrous Metals

IV. Infant Export Activities:
(sectors with more than 1,500,000 US $ export value in 1980 and growth rates of more than 1,000% between 1975 - 1980, but insignificant exports in 1975):
55 Essential Oils and Perfume Materials etc.
57 Explosives and Pyrotechnic Products
59 Chemical Materials and Products, n.e.s.
63 Wood and Cork Manufactures (excl. Furniture)
66 Non-metallic Mineral Manufactures, n.e.s.
83 Footwear

2.2.2. Extension to the SITC-3-Digit Level for Selected Industries and Regions

To reach a better understanding of the structure of Peruvian export change we turn to the SITC-3-digit level. Industrially and geographically disaggregated CMS-analysis on this level provides a great amount of detailed information that has to be condensed adequately for our purposes. Two tableaus have been elaborated which will be interpreted simultaneously. (1)

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(1) The tableaus can be found at the end of this chapter

Tableau 1 provides a 47-sector analysis of Peruvian export performance between 1975 and 1980. While absolute values of CMS components do not need further explanation, different coefficients of relative growth rates are to be kept in mind. Thus columns (12), (13), and (14) show the respective CMS-effect of an industry 'i' as % of the absolute change of exports 'i' (relative CMS-effect), while columns (9), (10), and (11) indicate the percentage participation of product group 'i' to total CMS-effect[1] (CMS participation effect).

The world market effect is not very meaningful in sectoral disaggregation and will not be stressed in the following analysis. Given the world market effect, product and market composition effects and the development of Peru's competitive position gain importance. A look at column (14) in Tableau 1 reveals that the competitveness effect is dominating for the majority of the non-traditional export sectors: 37 out of 44 growing sectors show a relative competitiveness effect of more than 50%, thus indicating a nearly uniform reaction to the shift in export policies.

For further information about the structural components of Peruvian export changes, the distribution of export increases in the 47 SITC-3-digit sub-groups to importing countries was investigated (see Tableau 2). Based on trade theory one would expect Peruvian export growth to different country groupings to depend on the type of products exported. Thus raw materials, Ricardo-type goods, should predominantly find trading partners in the industrialized and (to a minor extent) in the newly industrializing countries. Other developing countries, on the other hand, can only be expected to be important trading

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(1) If, for example, in column (10), sector 653 indicates 4.49%, this signifies that this industry added 4.49% to the total market composition effect (= 100%) of all Peruvian exports.

partners, if there really is a potential for South-South trade in Peruvian exports or if special trade policy arrangements, such as the Andean Pact, give (infant industry) protection to production processes not yet viable on the world market. These considerations lead us to differentiate between products going to industrial countries and those going to developing country markets. Then we further divide exports to developing countries in those remaining in Latin America, those (out of Latin American exports) directed to Andean Pact countries, and those being imports of non-Latinamerican developing countries. Thirdly, we will ask, which country is the major importer of the respective product group, if the dominating CMS-effect (apart from world market and competitiveness) is the market composition effect (competition effect), which is indicated in columns (9) - (11) by 1 (0).

Column (13) indicates the kind of trade determinants which are dominating within the respective SITC-3-digit group:

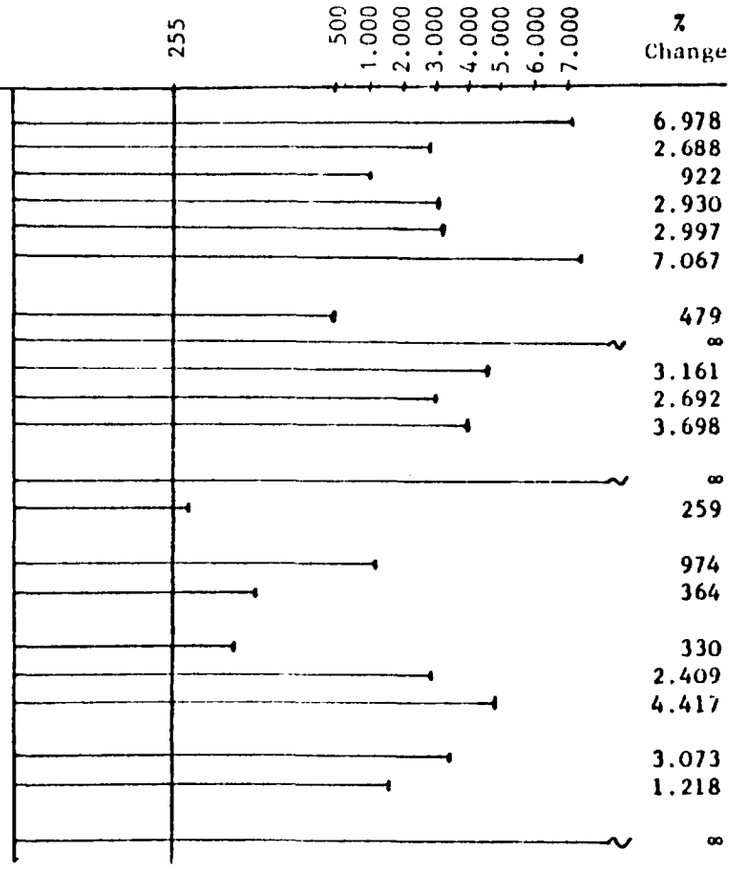
CLS = classical trade determination
HO = dominating factor endowment differentials
SS = South-South trade
REG = strong regional component
AP = predominantly Andean Pact trade

In Figure 3 the dividing line between below and above average export performance is drawn at 255% again. It can be seen that all exports of the subgroups 5, 6 (except 68), 7 and 8, which include the relevant non-traditional production activities, have been relatively fast growing. Even if one takes into consideration that very small total export values in the base period produce exorbitantly high growth rates and are, after all, due to changes which do not reflect economic factors, there is a clear tendency of relatively successful manufacturing exports. This is especially true for subgroups 65, 89 (which also belong to the most important non-traditional export

Figure 3

SITC-3 Export Coefficients

	Sector	Relative Production Composition Effect (> ± 1%)	% Participation to Product Composition (> ± 1%)	Relative Market Composition Effect (> ± 1%)	% Participation to Market Composition (> ± 1%)	Total Exports in 1975 US $	% Change
	651					1.031	6.978
	2					1.523	2.688
	3	- 3		36	4,49	1.185	922
s	5			- 3		195	2.930
materials	6			- 2		401	2.997
	7					65	7.067
	892	- 4		11		466	479
	3	- 4				314	∞
ds	4					46	3.161
wares	7	+ 5	2,30	- 3		775	2.692
	9					52	3.698
	512					15	∞
	3	- 5				1.620	259
	718	- 4				345	974
ical)	9	- 8	- 1,33			1.993	364
parts							
	722	2				1.222	330
	23					265	2.409
	29					155	4.417
	841					1.257	3.073
	2	12				219	1.218
	851					17	∞



to be continued

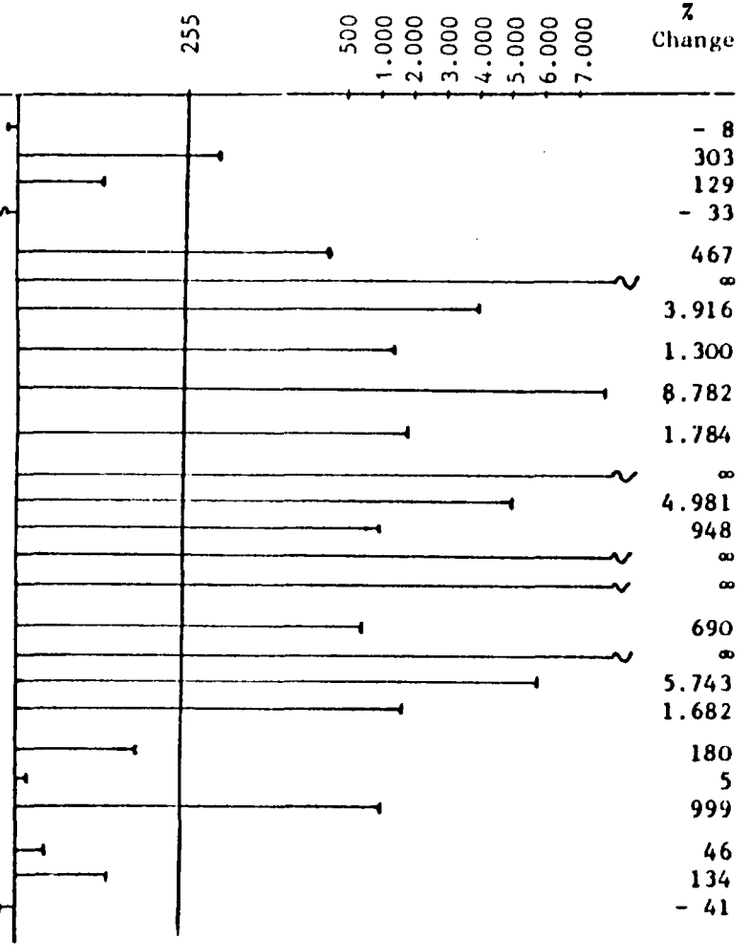
	Sector	Relative Production Composition Effect (> ± 1%)	% Participation to Product Composition (> ± 1%)	Rela Mar Compos Eff (> ±
Textile yarn and threat	651			
Cotton fabrics woven	2			
Textile fabrics other than cotton	3	- 3		3
Special textile fabrics and related products	5			-
Made-up articles, wholly and chiefly of text.materials	6			-
Floor coverings, tapestries etc.	7			
Printed matter	892	- 4		1
Articles of artificial plastic materials	3	- 4		
Preambulators, toys, games and sporting goods	4			
Jewellery and goldsmith's and silversmith's wares	7	+ 5	2,30	-
Manufactured articles	9			
Organic chemicals	512			
Inorganic chemicals	3	- 5		
Machines for special industries	718	- 4		
Machinery and appliances (other than electrical) and machine parts	9	- 8	- 1,33	
Electrical machinery and switch gear	722	2		
Equipment for distributing electricity	23			
Other electr. machines and apparatus	29			
Clothing (except fur)	841			
Fur clothing	2	12		
Footwear	851			

	Sector	Relative Production Composition Effect (> ± 1%)	% Participation to Product Composition (> ± 1%)
Silver, platinum and other metals of the platinum	681	3.068	468,57
Copper, processed group	2	2	21,84
Lead	5	60	47,34
Zine	6	- 319	- 120,43
Essential Oils, perfume and flavour materials	551	- 4	
Perfumery and cosmetics, dentifrices and other toilet	3		
Soaps, cleansing & polishing prep. | prep. (exc. soap)	4		
Propellent powders and other prepared explosives	571	- 3	
Chemical materials and products	599		
Veneers, plywood boards, ...	631		
Lime, cement and fabricated building materials, exc.	661		
Glass glass and clay	4		
Glassware	5	- 2	
Pottery	6		
Pearls and precious and semi precious stones	7		
Wire products (exc. electrical) and fencing grilles	693	- 9	
Tools for use in the hand or in machines	5		
Household equipment of base metals	7		
Manufactures of metal	8		
Wool	262	- 19	- 9,44
Cotton	3	- 1.168	- 75,72
Synth. textiles	6	- 6	- 2,04
Iron ore and concentrates	281	- 159	- 95,83
Ores and concentrates of nonferrous base metals	3	- 14	- 100,16
Silver and platinum ores	5	1.040	15,71

Figure 3

SITC-3 Export Coefficients

	Sector	Relative Production Composition Effect (> ± 1%)	% Participation to Product Composition (> ± 1%)	Relative Market Composition Effect (> ± 1%)	% Participation to Market Composition (> ± 1%)	Total Exports in 1975 US $	% Change
platinum	681	3.068	468,57	- 658	- 49,86	81.287	- 8
group	2	2	21,84	9	49,74	151.230	303
	5	60	47,34	27	10,06	25.529	129
	6	- 319	- 120,43			48.639	- 33
ials	551	- 4				390	467
her toilet	3					3	∞
exc. soap)	4					224	3.916
plosives	571	- 3				986	1.300
	599					243	8.782
	631					400	1.784
als, exc.	661					116	∞
s and clay	4					53	4.981
	5	- 2				260	948
	6					3	∞
ones	7					2	∞
ing grilles	693	- 9				313	690
	5					4	∞
	7					40	5.743
	8					281	1.682
	262	- 19	- 9,44		4,16	11.375	180
	3	- 1.168	- 75,72		- 31,11	59.838	5
	6	- 6	- 2,04		- 2,37	1.512	999
	281	- 159	- 95,83	- 17	- 5,03	55.053	46
metals	3	- 14	- 100,16	17	56,65	222.332	134
	5	1.040	15,71	287	1,50	1.711	- 41



sectors), 59, 63, 66, 69, 84 and 85, which deserve closer examinations. (1)

For all these successful exports product and market composition effects can hardly be found. With the exception of SITC 897 (jewellery and gold- and silversmiths' wares), SITC 722 (electrical power machinery) and 842 (fur clothing), all product composition effects are close to zero or even negative. A positive market composition effect can only be identified for SITC 653 (textile fabrics other than cotton) and 982 (printed matter).

On the other hand, resource-based processing industries founded on the country's mineral resources have not been successful in the international market. Not only the processing sector (SITC 68), but also its own resource base (SITC 28) suffered below average or even negative rates of change (SITC 28). In clear contrast to the CMS component coefficients in the successful sectors, SITC positions 28 and 65 show extraordinarily high and differing values. Since the SITC 28-68 sector sequences, especially the copper extracting and processing chain, are of utmost quantitative importance (SITC 28 and 68 exports amounted to about 87% of total exports in 1975), and also are an integral part of Peru's industrialization strategies, the reasons for this performance must be examined in depth.

Further investigation is also necessary on the important cotton producing/cotton processing chain. Here the relatively successful export performance of the processing sector is in contrast to the slowly growing raw material sector.

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(1) 65 Textiles
89 Misc. Manufactures
59 Chem. Materials
63 Wood and Cork Manufacturing
66 Non-metallic Mineral Manufacturing
69 Manufacturing of Metal
84 Clothing
85 Footwear

Turning to Figure 4 some interesting aspects of regional trade flows can be found. Processed copper (682) and textile products of SITC categories 651, 652 and 657 are exported nearly exclusively to industrialized countries. This is also true for its raw material base (262, 263, 283). There is a relatively small group of 7 industries which export to both industrialized and less developed countries. (1) Some of them have relatively intensive trade contacts with non-Latin American developing countries (lead, chemical materials and products, and glass). Clothing, a very sensitive sector for developing countries, is found in this group, too, which appears to be somewhat surprising and needs further attention.

A third group of 12 SITC-3-digit sectors seems to be open to South-South trade relations, which is emphasized by the fact that more than 89% of all exports in this group go to other developing countries. (2) It is in this group, that Latin American regional trade is relatively important.

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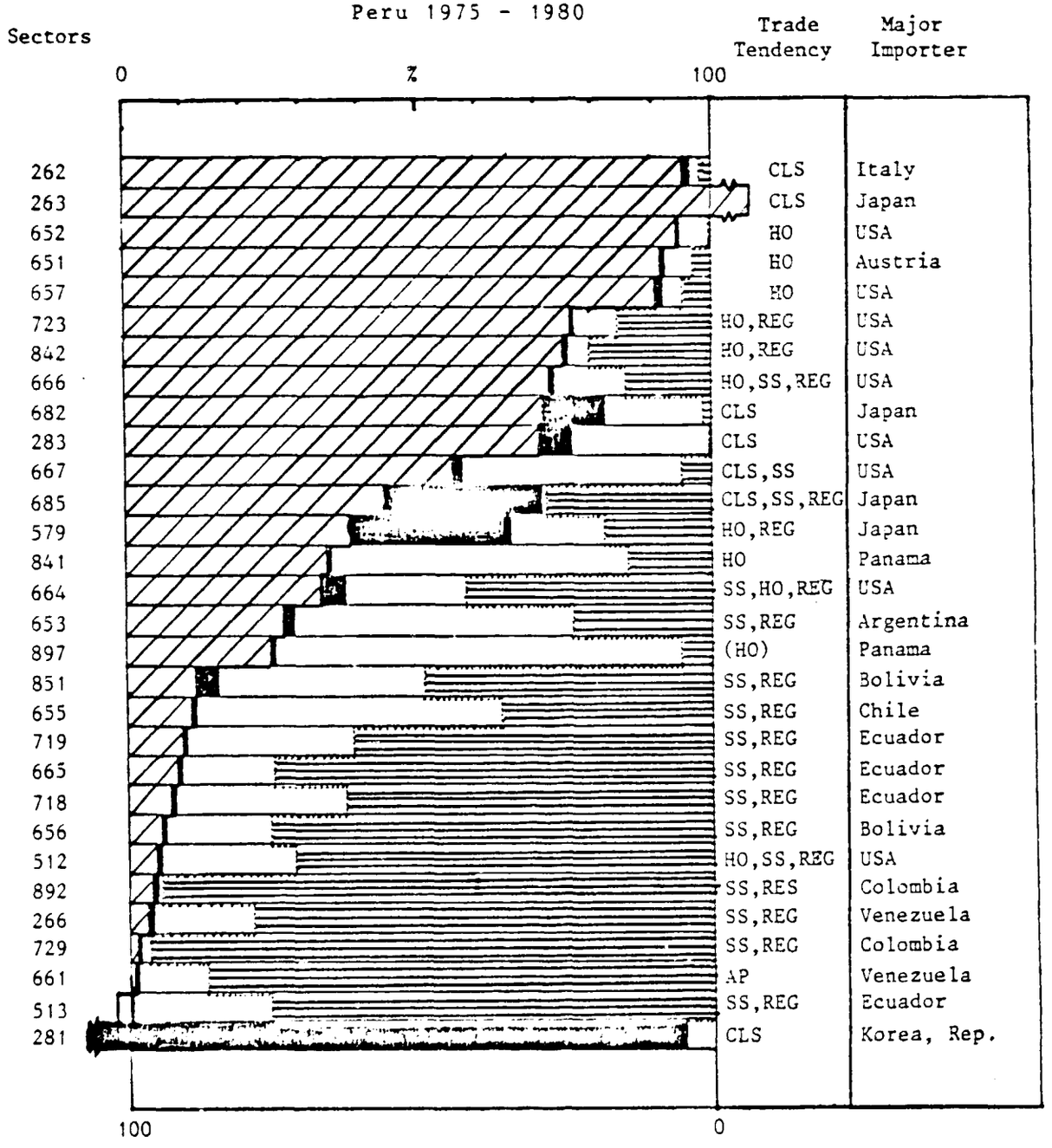
(1) 667 Pearls and Precious Stones
685 Lead
579 Chemical Materials
841 Clothing
664 Glass
653 Textile Fabrics other than Cotton
897 Jewellery and Goldsmith's Wares

(2) 851 Footwear
655 Special Textile Fabrics
719 Machinery
655 Glassware
718 Machines for Spec. Ind.
656 Made-up Articles
512 Organic Chemicals
892 Printed Matter
266 Synthetic Textiles
729 Other Electr. Machines
661 Lima, Cement etc.
513 Inorg. Chemicals

Figure 4

Regional Distribution of Export Growth

Peru 1975 - 1980



Trade with industrialized countries

Developing countries other than Latin America

LA developing countries other than Andean Pact

Andean Pact

CLS = Classical trade

HO = Factor endowment oriented trade

REG = Regional trade (LA)

AP = Andean Pact

SS = South-south trade

2.2.2.1. Textile and Related Industries (Tableau 1)

One of the most important export sectors for nearly any developing economy, which employs foreign trade actively as a contributor to growth, is the textile sector and the related activities in raw material production and ongoing manufacturing. (1) Peru is said to have been an efficient producer of high quality cotton and surely is one of the leading producers of special wool products (llama, alpaca). Nevertheless, only minor growth rates for these products were reached internationally (1975-1980). Negative signs for the product composition and the market composition effects (except in the case of wool) seem to indicate that unfavourable world market conditions could be part of an explanation of this phenomenon. A weak export performance could, however, be the result of unfavourable internal production possibilities (relative discrimination of the agricultural sector) and an incentive structure discriminating against raw material exports.

A look at the processing sector reveals a complex picture. Textile yarn and threat production (651) and woven cotton fabrics (652), the quantitatively most important textile subsectors, evolved dynamically. So did sectors 655, 656 and 657, which are of minor quantitative importance. SITC 653 (textile fabrics other than cotton) evolved relatively slowly within this group, though high above the average export performance. This last result is somewhat surprising, because this industry was favoured by a positive market composition effect.

Textile yarn and threat production has been the most important sector in this subgroup (adding more than 48% to the sector growth) followed by woven cotton fabrics (adding 27,6%). Both products were exported nearly exclusively to industrialized country markets (91,7% and 94,3%), the major importers being Austria (a country that received

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(1) A detailed discussion of this sector is found in chapter 3.

no Peruvian exports at all in 1975) and the USA respectively. The remaining exports to LDCs went nearly all to Chile, Bolivia and Ecuador, thus showing a strong regional appeal. The yet relatively unimportant SITC-group 657 (floor coverings, tapastries etc.) reveals an almost identical regional distribution (with the USA again as the major importer).

On the other hand, textile fabrics other than cotton (653) and - even more pronounced - special textile fabrics and related products (655) and made-up articles (656) are in clear contrast to the above mentioned products as far as export performance is concerned. Their markets are to be found predominantly in Latin America (89.7% and 95.1%). While Argentina has been a potent importer of textile fibres other than cotton (24.7%), the remaining subcategories were exported exclusively to Andean Pact members and Chile. Each of these 3 subgroups uses synthetic material inputs which often are provided by the local chemical industry. While production and export of low quality textile with synthetic fibre content to neighbouring countries might be promising in view of demand considerations, serious competition from South-East Asian producers with advanced production possibilities must be expected in the medium run. In view of the still relatively inefficient production of some parts of synthetics (economies of scale) in Peru, the only real advantage in such production activities should be seen in the geographical proximity of the relevant markets. This may be underlined by the fact, that only for SITC 653 a positive market composition effect can be recognized, while the product composition effects tend to be nearly zero (656) or even negative.

The Perivuan cotton varieties, however, which are traded with developed countries, do not seem to be appropriate as inputs for low quality mass consumption goods, so that an evolution of manufacturing activities in this production sector has to aim at using short staple cotton for mass consumption goods and long staple cotton for exports.

A closely linked industry which will be an important strategic factor, if this line of export activities is to be stimulated, is the clothing industry (841), which enjoyed a remarkable up-swing in the period under consideration. 93% of the export growth of this sector has to be attributed to the competitiveness effect. Product and market composition effects indicate small but positive values. A look at the country distribution of exports reveals a mixed performance. Only 33.2% of export change can be attributed to industrial countries' imports, while 66.8% of total trade increase is due to imports by other Latin American countries. The identification of the most important importing country, however, reveals an interesting fact. Panama is responsible for 43.5% of all Peruvian exports in this subgroup and nearly two thirds of intra-Latin American trade. It seems to be almost sure, that these trade figures are considerably biased because of a large number of fictitious exports.

2.2.2.2. Copper (Tableau 1)

Copper extraction has always been of utmost importance for the Peruvian economy. This is underlined by the fact, that SITC groups 682 (processed copper) and 283 (ores and concentrates of base metals) represented more than 55% of total exports. Their combined growth between 1975 and 1980 accounted for more than 48% of total export increase. Nevertheless, their combined growth rate was only 202% (303% for SITC 682, but only 134% for crude copper), so that in 1980 the share of copper exports in total exports had declined to about 41%. CMS-coefficients are divergent in product composition effects (SITC 282 [iron ore] reveals negative values while those for processed copper are slightly positive), but uniformly positive in market composition. 70.2% of ores and concentrates were exported to industrial countries, one third of them (26.1% of the total) to the USA. The most important LDC-importer was Mexico (21.4%), a Latin American newly industrializing country. This finding coincides with the fact,

that since processed copper is used predominantly in developed countries, products and processing have traditionally been undertaken there, too. The coefficients of SITC 682 show a nearly identical geographical spread of exports of processed copper: 70.8% going to industrialized countries, about 90% of the remaining exports going to newly industrializing countries. In the case of processed copper, Japan replaces the USA as the leading importer, while Brazil emerges as the major Latin American (and newly industrializing country) importer.

The concentration of copper exports to industrial and relatively advanced developing countries may be explained by the fact, that the use of copper as an input for consumer and investment goods is fairly limited for the majority of the developing countries. Thus, if it is true that a producer has to gather a lot of experience on the local market before starting international activities[1], then Peru neither has especially promising local nor international preconditions to use processed copper for more sophisticated manufactures on a larger scale. Actually there is no example of a resource-based strategy founded on non-ferrous metal processing, that proved to be successful in the past. Since resource based industrialization is not necessarily a meaningful development strategy per se, we have to ask further, if stimulation of the first stages of copper processing really is a promising policy target for Peru. It is argued that copper processing is accompanied by a weight reduction of about 65% which allows for a more than 5% gain on processing costs due to diminishing freight costs.[2] There is no such effect, however, if blister is transformed into refined copper. In addition and more importantly in the long run, technical progress seems to be working towards a concentration of extraction, refinement and processing activities at one place, since new and highly efficient continuous metal casting processes ask for integrated production units. On the other hand, these productions need relatively more capital and do not provide very promising impulses via forward linkages and employment creation.

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(1) This point was first raised by Linder and later affirmed by Yamazawa for the case of Japan.

(2) See Radetzky (1976).

These arguments lead to the suggestion that in the long run, Peru can very well be a competitive supplier of copper at different stages of processing. Together with the fact that the copper sector actually is of utmost quantitative significance for Peru's export performance this calls for a very careful evaluation of the future possibilities of the world copper market and its role within national development plans. If national producers keep up with the technological development in this sector, Peru should be able to defend its position as one of the world's leading producers. In this case, however, the provision of adequate investment conditions, rather than inadequate export subsidization of processed copper should be the leading principle of economic policy. Another point to be taken into consideration if unconditioned production expansion plans will be reformulated is the uncertain situation on the world copper market. It has been estimated, that on the basis of the then existing investment plans (1979), Peruvian copper production will increase about 5-5.5% yearly until 1990. Selling this increase on the world market would mean a considerable increase in Peru's world market share even if the extremely high forecasts of the development of world demand for copper would be realized.(1) It appears to be very doubtful that Peru will be able to raise its world market share considerably, while new copper projects (e.g. Philippines)(2) add to world excess supply of copper. Chile, who is the world's most efficient copper producer, is also fighting aggressively for an even stronger position on the world market.(3) It seems that world demand for copper has been overestimated by many observers and by Peruvian (and other) politicians, who decided on the installation of new extracting capacity. This wrong diagnosis must be attributed firstly to the generally too conservative evaluation of the substitution potential in the energy

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(1) For these figures and other valuable comments on the mineral sector, see Dammert, Alfredo, Economía Minera, Lima 1981.

(2) With considerable transport cost advantages on the South-East Asian growth markets including Japan.

(3) See LA Regional Reports, Southern Cone, Sept. 7, 1984.

markets stimulated by rising oil prices (which in turn affected copper-based industries), and secondly, to the economic down-swing in the industrialized countries, which resulted to be far more complex than usual business cycles. Even if the weak growth performance of the industrialized countries can be corrected within due time and thus initiates a new and lasting growth period, the (probably diminished) income elasticity for copper will effectively hinder any expansionary policy that is too ambitious in view of the market conditions. A Peruvian copper policy that is reformulated along these lines may be able to release a considerable amount of financial resources without doing harm to mineral production and export capacity. It should be recognized that any mistaken economic-political strategy in this sensitive sector, e.g. due to an illusionary view of the long run possibilities in this market, can hardly be compensated elsewhere given the quantitative importance of the mining sector.

2.2.2.3. Lead (Tableau 1)

Another possible resource processing chain is based on lead and silver resources. Lead, being the second most important single crude mineral to be found in Peru, shows an even weaker growth performance than copper on the world market. The fact that lead as an input in industrial products is more and more substituted because of the environmental damages attributed to it[1] is well known. It follows without any doubt that this mineral does not meet the conditions for a promising line of industrial development.

There exists, however, a close link between lead and silver extraction, because of the relatively high silver concentration in lead minerals. A lower, but still signigicant silver content is to be found in crude copper and zinc[2], so that the supply of silver appears to be relatively closely linked to the production of (and thus, in the long run, the development of the world demand for) the non-ferrous metals

(1) Only in batteries lead still seems to be irreplaceable.

(2) It is estimated that two thirds of world silver reserves are bound to copper, lead and zinc reserves.

mentioned before. This poses somes special questions, which should be answered in view of the development of Peruvian silver exports. Silver production increased continuously between 1975-1980. This was to be expected, given the production links between silver and non-ferrous metals. Nevertheless, we see negative growth rates for exports of refined silver (SITC 681) despite the fact, that silver prices rose nearly five-fold within the period under consideration. The analysis of CMS-components reveals that this 8% decline of silver exports happened despite a remarkably good performance of the product composition effect (herein the extremely high silver quotations play an important role) and must be attributed mainly to an extremely high negative competition effect. This finding, however, complicates an explanation of the developments of refined silver exports, because the average competitiveness effect was able to explain nearly half of the total Peruvian export performance (see Figure 1). It is therefore advisable to investigate silver processing activities in more detail.

There is virtually no quantitatively important use for silver in Peruvian industrial manufacturing industries, because those kinds of sophisticated investment goods and consumer durables that mainly rely on these inputs, do not yet play an important part in the industrial production pattern of the country (and in many cases are not even existing). On the other hand, Peruvian gold- and silversmiths' wares have been well-known for a long time. In fact, the analysis of the respective SITC-position 897 reveals a remarkable export increase of 2,692%. It shows a high competitiveness effect, which appears to be in complete contrast to the CMS-components of SITC group 681. Here again a simple explanation may be found in the system of export promotion, which provided extremely high and rising real export subsidization for the switch from crude to processed silver exports.

2.2.2.4. Other Manufacturing Industries

Besides these quantitatively important resource-based industrialization schemes, which are apparently overestimated in many developing

countries, though (and is apparently overestimated in the case of copper for Peru), there are a lot of industrial manufacturing activities, that evolved without a national resource base and might therefore indicate with some more certainty specific factor, know-how or market-oriented production possibilities. These kinds of viable industrial sectors could emerge for example,

- if production processes are employed, which allow for the utilization of abundant production factors,
- if infant industry protection is used adequately to create dynamic economies of scale,
- if specific abilities are exploited industrially.

These kinds of activities which industrial policy should encourage are, however, not easily identified. They are at the core of entrepreneurial talent and might be found even within the most disaggregated set of individual production and export data. It will, nevertheless, be important to know which kinds of manufacturing activities had a good performance on international markets on a 3-digit level, because this knowledge might be useful to identify the relevant subsectors within these categories. The following sectors deserve closer attention:

512,513,599,893 (chemical industry and industries using chemical products as inputs)
661 - 666 (cement etc., glass and pottery)
718, 719 (machinery for special industries)
851 (footwear)
892 (printed matter)

Footwear

Of these industries, only footwear production belongs to those classical labor intensive export sectors, that are usually stressed in export promotion strategies. The outstanding growth performance of this sector (exports grew from almost zero in 1975 to US $ 7,897,000

in 1980), and a (slightly) positive product composition effect seem to confirm this view. The regional spread, however, reveals that Peruvian footwear exports nearly exclusively went to Latin American developing countries (84.1%), of which Bolivia alone received about one third. Another important importer in Latin America is Argentina, which has itself been a strong competitor in this sector. While Peruvian performance on the Argentine market will certainly be influenced by political and economic turbulences within the latter country, a very strong regional and Andean Pact bias might be an indicator, that this sector still has to prove its viability on the world market.

Glass and Pottery

Some industries from the SITC-group 66 are closest to position 851 as regards their development potential. This is especially true for sectors 664 (glass), 665 (glassware), and 666 (pottery), all of which started from extremely low levels in 1975 and had above average growth rates. Regional trade flows in the glass industries differ significantly. While 32.9% of exports in subsector 664 (glass) found their way to industrial country markets, only 8.2% of glass ware products did. The LDC-trade in the latter category took place exclusively within Latin America and predominantly (75%) within the Andean Pact. It might be concluded from this distribution of trade flows, that the internationally competitive parts of the glass industry belong to those branches that produce relatively crude industrial inputs, while further elaborated products still had to rely on the protection of the Andean market.

Pottery, quantitatively of even minor importance than the glass industry, faces relatively good conditions on the US market (44%). All three subgroups are of minor importance today. This should not prevent a deeper investigation into the possibilities of these sectors, even if product and market competition effects do not seem to be very encouraging. Firstly, glass and ceramics industries face a relatively strong market for lower quality industrial products as well as for

consumer goods within the region. Secondly, the organization of industrial processing in these sectors seems to be relatively easy and, after all, can very often draw on relatively skilled national human resources. Thirdly, in many cases production might be efficient on a relatively small scale, thus opening up the possibility to encourage the local informal sector effectively. Fourthly, besides these traditional uses of glass and ceramics products, their use in high technology productions seems to be extremely promising today. These arguments taken together indicate that immediate results of adequate incentives and continuous upgrading options in the future make these industries interesting from a dynamic point of view. (1)

Chemicals

Considerable effort has been invested in the development of a chemical industry complex in Peru. These kinds of activities are, however, open to large economy of scale effects which in turn need a market for many companies in this sector. Despite this significant obstacle to efficient production units, regional trade of chemical products evolved dynamically: 96.2% of organic chemical and all of inorganic chemical exports were shipped to Latin American countries (there is a relatively strong market composition effect in inorganic chemicals; organic chemicals show no negative CMS-coefficients). Though 71.5% remained within the Andean Pact (which indicates the influence of high external trade barriers), there seem to be markets for Peruvian chemicals in other Latin American countries, too. Since some other successful non-traditional export sectors are closely linked to the chemical industry, (2) it and its direct and indirect subsectors have grown to considerable importance for the Peruvian export sector regionally.

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(1) These considerations aim at the evaluation of long term growth potentials. Actual export growth rates, however, seem to be overestimating this potential because of severe cyclical influences (vent for surplus).

(2) e.g. 599 (chemical materials), 655-657 (textile sector using synthetic fibre inputs), 893 (plastic materials), which all did fairly well on Latin American markets.

Nevertheless, the organization of this sector has to aim at production units, that allow the exploitation of economies of scale. If the formation of an efficient local industry requires the creation of a national monopoly (as for example in the case of acrylic), only its confrontation with international competitors will guarantee, however, that the resulting cost reductions are adequately passed on to subsequent industries and the general public.

Other (Machinery and Printed Matters)

Two groups of manufacturing activities are left, which do not belong to the industrial sectors usually favoured in LDCs. Machinery for special industries and (corresponding) appliances and parts (718, 719) and printed matters (892), nevertheless, have been successful exporters in the recent past.

The products of groups 718 and 719 usually belong to the most efficient high technology sectors in industrialized countries, in which specific knowledge often forms an insurmountable barrier to entry for less developed countries. Peruvian engineers, however, have been trained in special techniques of mineral extraction processes in mountainous surroundings over a long time period. Additionally, the existence of a relatively important small and medium scale mining industry brings out promising preconditions for the maintanance of a specialized mining equipment industry, which puts emphasis on relatively simple but adapted capital goods. The encouragement of the formation and industrial utilization of these skills might therefore be an important part of economic policy.

Due to the fact that SITC-3-digit information does not capture any specific activity in the highly disaggregated subgroups 718 and 719, the results of the CMS-analysis for these sectors appear to be even more indicative: Both sectors enjoyed considerably high growth rates despite negative product and market composition effects. This

performance must be evaluated in the light of the regional export distribution. 93.1% and 90.2% of these goods were purchased by Latin American trading partners, the single most important countries being Ecuador, Chile, Argentina and Bolivia. Thus, promising markets for Peruvian engineering products will be limited to regional trading partners and the development of the mining industries within these countries (at least in the short run). This is not to say that particular knowledge in some special production lines will be without expansionary possibilities for exports to the rest of the world. Quantitatively, however, these activities will not contribute a significant part to Peruvian export performance in the near future.

Printing matter (892) is another one of those quantitatively unimportant but fast growing production sectors. Again, the potential to expand export activities to reach U.S. and European markets seems to be relatively small in the short run. Regional markets, as can be suggested from the strong positive market composition effect, seem to be promising, however, if the general degree of efficiency will be improved behind the Andean Pact trade barriers (96.1% of the exports remain within this market).

2.2.3. Analysis of the Peruvian Export Structure with Different Countries (Tableau II)

Some additional information can be gathered, when trade data are decomposed to show the structure of the increase of Peruvian exports to different trading partners. Data on the most important Peruvian exports (see Table 14) reveal that 62.8% of export growth goes to industrialized countries and 30.3% to developing countries. About one quarter represents intra-Latin American trade, and nearly 11% are growing internal Andean Pact trade flows, with Ecuador being the most important single trading partner (3.6%). The total increase was accompanied by opposing developments of the competitive position in

different markets. In the most important single market (USA) the positive market composition effect dominated (56.92%), but there still existed a strong competitiveness effect (43.46%). Positive coefficients are also to be stated for Italy and the Netherlands, Brazil, South Korea and Ecuador and Colombia within the Andean Pact. While the competitiveness effect is positive with all other important importers as well, this is not the case with the market competition effect, which is generally negative.

On the basis of this finding it may be suggested, that the underlying trade structures are quite heterogeneous as well. A detailed decomposition of Peruvian exports for each of the partner countries will show, whether definite tendencies of Peruvian trade flows can be discovered (see Tableau III at the end of this report). There are, indeed, some remarkable structural patterns to be seen. Thus, the trade structure with the USA is quite similar to that within the Andean Pact (plus Chile). This fact becomes even more obvious, when US petroleum and petro products are excluded (they account for more than 80% of total Peruvian exports to the USA). On the other hand trade structures with Japan and Europe are essentially shaped by determinants of classical trade and differences in factor endowments.

This outcome is due to the fact, that the four sectors 651 (textile yarn), 652 (woven cotton fabrics), 68 (processed minerals) and 841 (clothing) stand for the majority of European and Japanese imports, but cover only about 30% of exports to the USA. The USA in fact imported a much more diversified bundle of Peruvian exports with emphasis on 657 (floor coverings), 723 (equipment for distributing electricity), 851 (footwear) and group 89 products (miscellaneous manufactures).

Trade relations with the Andean Pact countries and Chile are not based on the products,which are apparently most important in North-South trade relations. Instead, products originating in different manufacturing sectors are exported to the neighbouring countries,

forming a relatively diversified regional submarket, which should not be ignored because of its potential long run dynamic effects on the formation of regional industrial subcenters, even if temporary infant industry protection cannot be avoided.

It is well known in development politics, that there is not much room left between necessary temporary protection of young markets and wasteful subsidization of inadequate production structures. In the case of Peru, a look at trade relations with developing countries outside the Andean Pact reveals, that there are at least some industries that seem to be efficient enough to find (limited) regional markets under world market conditions, if especially tight geographical relations can be relied on (Chile and (probably) Argentina). This situation worsens considerably, if the import performance of the newly industrializing countries is taken as a reference for the determination of the Peruvian position on the world markets. None of the four newly industrializing countries included in this study showed any interest in Peruvian manufactured exports. Their trade structure with Peru therefore was principally the same as the patterns observed in classical North-South trade, which means that (as a rule of thumb) even labor-intensive Peruvian industries are not competitive on the world market, if the most advanced competitors are taken as a reference. It may therefore be suggested that Andean Pact protection as well as the particular Peruvian incentive system, though having significantly contributed to regional trade growth, did hardly lead to a maturation of the stimulated industries.

Relevant composition and competition effects had already been discussed before and will not be discussed again in this context.

TABLE 14

MOST IMPORTANT IMPORTERS OF PERUVIAN GOODS

	Change 1975 - 1980 US $	% of total Increase	Market Composition in %	Competition in %
Industrialized Countries:	1,204,772	62.5		
USA	744,088	38.6	56.92	43.46
Japan	111,948	5.8	-32.43	-8.82
Europe:	348,736	18.2		
Italy	109,596	5.7	8.97	7.48
Belgium	68,577	3.6	-4.41	+3.40
Un.Kingdom	66,683	3.5	-	3.36
FRG	61,828	3.2	-4.86	2.04
Netherl.	42,052	2.2	+6.41	0.94
Developing Countries:	585,579	30.3		
Latin America	484,323	25.2		
Andean Pact	204.685	10.7		
Ecuador	68,751	3.6	52.62	0.92
Bolivia	49,924	2.6	-12.63	5.73
Venezuela	44,266	2.3	-1.19	4.18
Colombia	41,744	2.2	16.69	1.53
Chile	36,623	1.9	-12.49	4.42
Panama	99,428	5.2	-0.70	10.31
Newly Industrializing Countries:	244,843	12.6		
Mexico	78,025	4.0	-7.03	8.45
Brazil	65,562	3.4	3.45	2.98
Yugoslavia	64,331	3.3	-0.07	6.55
Korean.Rep.	36,925	1.9	6.15	3.22
	1,790,351	92.8		

Source: United Nations International Trade Statistics

2.3. The Development Process since 1980

The CMS-analysis in 2.2. relied on data for the period 1975-1980. Since then, a tremendous slow-down in internal and external economic activities took place in Peru. A casual observer might therefore be willing to believe, that the actual situation has already delegated this analysis to economic history. Such an argumentation would be wrong, however, if economic policy perspectives are to be analyzed in due depth. This is so, firstly, because the present problems can only completely be understood, if the structural problems of the economy itself are taken into consideration. Secondly, the evaluation of a successful industrialization strategy should not be influenced too much by cyclical down-swings and extraordinary events, that do not change the country's fundamental economic position (though it cannot be implemented without reference to the actual situation). If about 50% of the economic decline in 1983 can be attributed to unfavourable climatic conditions caused by the re-appearance of "El Niño", this surely raises the question, how Peru can avoid such disasters in the future. It certainly should not have a major impact on industrialization plans, though. A similar problem occurs, if cyclical down-swings on the world market touch a country's own economic position. The question, how to minimize the exposition to world wide cyclical movements can only be dealt with meaningfully, if the country's fundamental position (as opposed to short run bottlenecks) is taken as the reference point. Even if world recessions indicate trend reversals, this problem should be attacked with due respect to the national strategic position rather than to temporary events.

In view of these arguments the 1975-1980 period provides an analysis of Peruvian trade performance (which in its most important implications is as valuable today as it has been some years ago) is especially helpful, if it is used to enable policy makers to avoid short term decisions that fail to coincide with obligatory conditions for successful economic development processes. Thus, the most important features of the structure of the Peruvian manufacturing sector in 1984 might be traced directly to the developments recognized in the second half of the

seventies. Two of them are directly related to decisions aimed at foreign trade oriented strategies.

Firstly, decisions on resource-based industrialization schemes, especially in the copper sector, appear to have been founded on very optimistic views of the long run prospects of primary commodity markets. The lasting decline of copper prices (which admittedly has been especially severe this time) between 1980 and 1982 (from 98.83 US $ / lb to 66.80 US $ / lb) [1] and its stabilization in 1983 on a level far below the costs of any but the very cheapest producers [2] destroyed hopeful suppositions of a Peruvian copper policy aiming at a significantly rising world market share at least in the medium run. Looking at the ongoing capacity augmentations in the mining sector it is not very clear today, if this situation has already been fully taKen into account.

Secondly, the non-selective and costly subsidization of Peruvian exports obviously caused a run on export subsidies rather than the evolution of competitive new export industries.

The reaction of non-traditional exports to the CERTEX reforms in 1981 seems to underline this argument. There is still another strong suggestion that export encouragement in the period under consideration did not give rise to the formation of a competitive export industry: there has virtually been no increase in private capital formation between 1975 (S./29,899 million) and 1980 (S./30,060 million). [3] Leaving aside all substitution processes between private firms, this appears to be a relatively clear indicator that a considerable share of total export growth did not lead to any internal structural transformation. Exports thus were to a large extent just highly subsidized vents for surplus.

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(1) Ministerio de Economía, Finanzas y Comercio y Banco Central de la Reserva del Perú, 1982.

(2) Fluctuations in 1983 ranged from L 950 to L 1,150/t. See: Commodity Report, Jan. 13, 1983, p. 5.

(3) Banco Central de la Reserva, Memoria 1982. Anexo II. The figures on capital formation are given in soles of 1970.

Tableau I·

Peruvian Trade Performance (1975 - 1980) / CMS-Components and

I. IMPORTANT AND FAST GROWING SECTORS

651 Textile yarn and threat
652 Cotton fabrics woven
653 Textile fabrics other than cotton
655 Special textile fabrics and related products
656 Made-up articles, wholly and chiefly of text. materials
657 Floor coverings, tapestries etc.

892 Printed matter
893 Articles of artificial plastic materials
894 Preambulators, toys, games and sporting goods
897 Jewellery and goldsmith's and silversmith's wares
899 Manufactured articles

II. IMPORTANT BUT SLOWLY GROWING SECTORS

681 Silver, platinum and other metals of the platinum group
682 Copper, processed
685 Lead
686 Zinc

281 Iron ore and concentrates
283 Ores and concentrates of nonferrous base metals
285 Silver and platinum ores

Rates of Change for selected SITC-3 Sectors

(1) Exports (1975) US $	(2) Exports (1980) US $	(3) Total Change US $	(4) % Change	(5) World Market Effect (WME)
1.031	72.977	71.946	6.978	1.329
1.523	41.974	40.945	2.688	1.373
1.185	12.113	10.928	922	1.456
195	5.909	5.714	2.930	239
401	12.419	12.018	2.997	493
65	7.132	7.067	10.872	80
466	2.696	2.230	479	573
314	75.450	75.136	23.929	386
46	1.500	1.454	3.161	57
775	21.636	20.861	2.692	953
52	1.975	1.923	3.698	64
81.287	74.646	- 6.641	- 8	99.926
151.230	609.927	458.697	303	185.907
25.259	58.509	32.980	129	31.383
48.639	32.759	- 15.880	- 33	59.792
55.053	80.405	25.352	46	67.677
222.332	519.763	297.431	134	273.313
1.711	1.008	- 703	- 41	2.104

(6) Product mposition Effect (PCE)	(7) Market Composition Effect (MCE)	(8) Composition Effect (CE)	(9) % Participation of SITC Group to total PCE	(10) % Participation of SITC Group to total MCE
2	12	5.512	0	0,01
- 202	668	1.600	- 0,48	0,76
- 3.972	3.643	7.390	- 9,44	4,16
- 31.851	- 27.257	- 12.303	- 75,72	- 31,11
- 857	- 2.076	15.992	- 2,04	- 2,37
- 153	- 437	3.528	- 0,36	- 0,50
- 559	- 249	5.623	- 1,33	- 0,28
66	794	1.670	0,16	0,91
3	900	5.156	0,01	1,03
65	- 15	6.607	0,15	- 0,02
278	609	36.132	0,66	0,69
317	372	1.590	0,75	0,42
- 74	259	1.156	- 0,17	0,30
2	- 6	1.693	0	- 0,01
- 15	- 215	8.726	- 0,03	- 0,25
- 342	- 215	12.161	- 0,81	- 0,25
- 12	- 70	15.250	- 0,03	- 0,08
74	- 53	6.621	0,18	- 0,06
8	1	930	0,02	0

(11) % Participation of SITC Group to total CE	(12) Relative PCE (6) : (3)	(13) Relative MCE (7) : (3)	(14) Relative CE (8) : (3)
0,57	0	0	99
0,17	- 5	16	38
0,77	- 19,4	18	36
- 1,28	- 1.168	- 999	- 451
1,66	- 6	- 14	107
0,37	- 4	- 13	105
0,58	- 8	- 3	78
0,17	2	19	41
0,53	0	14	81
0,68	1	0	96
3,75	1	2	93
0,16	12	14	60
0,12	- 4	14	63
0,18	0	0	100
0,90	0	2	99
1,26	- 3	- 2	95
1,58	0	- 1	71
0,69	1	- 1	93
0,10	1	0	98

Tableau 1- (continued from page 68)

Peruvian Trade Performance (1975 - 1980) / CMS-Components and

III. NOT (YET) IMPORTANT BUT FAST GROWING SECTORS

512 Organic chemicals
513 Inorganic chemicals

262 Wool
263 Cotton
266 Synth. textiles

718 Machines - special industries
719 Machinery and appliances (other than electrical) and machine parts
722 Electrical machinery and switch gear
723 Equipment for distributing electricity
729 Other electr. machines and apparatus

841 Clothing (except fur)
842 Fur clothing

IV. INFANT EXPORTER ACTIVITIES

551 Essential oils, perfume and flavour materials
553 Perfumery and cosmetics, dentifrices and other toilet preparations (except soap)
554 Soaps, cleansing and polishing preparations

571 Propellent powders and other prepared explosives

599 Chemical materials and products

631 Veneers, plywood boards, ...
632 Wood manuf. n.e.s.

Rates of Change for selected SITC-3 Sectors

(1) Exports (1975) US $	(2) Exports (1980) US $	(3) Total Change US $	(4) % Change	(5) World Market Effect (WME)
15	5.530	5.545	∞	19
1.620	5.822	4.202	259	1.992
11.375	31.807	20.432	180	13.984
59.838	62.565	2.727	5	73.559
1.512	16.487	14.975	990	1.859
345	3.707	3.362	974	424
1.993	9.241	7.248	364	2.450
1.222	5.254	4.032	330	1.502
265	6.650	6.385	2.409	326
155	7.002	6.847	4.417	190
1.257	39.880	38.623	3.073	1.546
219	2.897	2.668	1.218	269
390	2.211	1.821	467	480
3	1.696	1.693	∞	4
224	8.996	8.772	3.916	275
986	13.801	12.815	1.300	1.211
243	21.584	21.341	8.782	299
400	7.534	7.134	1.784	491
20	972	952	4.760	25

)	(5) World Market Effect (WME)	(6) Product Composition Effect (PCE)	(7) Market Composition Effect (MCE)	(8) Composition Effect (CE)	(9) % Participation of SITC Group to total PCE
ge					
∞	19	- 346	- 357	71.140	- 0,82
259	1.992	- 382	381	38.846	- 0,91
180	13.984	- 372	3.931	5.845	- 0,88
5	73.559	- 51	- 132	5.789	- 0,12
990	1.859	66	- 209	11.661	0,16
		12	9	6.958	0,03
974	424				
64	2.450	- 93	236	1.515	- 0,22
		119	- 616	75.135	0,28
330	1.502	25	20	1.353	0,06
409	326	969	- 696	19.651	2,30
417	190	- 2	10	1.846	.
073	1.546				
218	269				
		197.086	- 43.685	- 249.868	468,57
		9.188	43.582	254.468	21,84
467	480	19.910	8.813	- 13.252	47,34
		- 50.654	1	- 21.107	- 120,43
∞	4	- 40.308	- 4.406	- 6.740	- 95,83
916	275	- 42.128	49.631	63.469	- 100,16
300	1.211	6.608	1.317	- 10.732	15,71
782	299				
784	491				
760	25				

(10) % Participation of SITC Group to total MCE	(11) % Participation of SITC Group to total CE	(12) Relative PCE (6) : (3)	(13) Relative MCE (7) : (3)	(14) Relative CE (8) : (3)
- 0,41	7,38	- 0,5	- 0,5	99
0,43	4,04	- 1	1	95
4,49	0,61	- 3	36	53
- 0,15	0,60	- 1	- 3	100
- 0,24	1,21	1	- 2	97
0,01	0,72	0	0	98
0,27	0,16	- 4	11	68
- 0,70	7,79	0	- 1	100
0,02	0,14	1	1	93
- 0,79	2,04	5	- 3	94
0,01	0,19	0	1	96
- 49,86	- 25,91	3.068	- 658	- 3.763
49,74	26.38	2	9	55
10,06	- 1,37	60	27	- 40
0	- 2,19	- 319	0	- 133
- 5,03	- 0,70	- 159	- 17	- 27
56,65	6,58	- 14	17	21
1,50	1,11	1.040	287	- 1.527

Tableau 1· (continued from page 69)

Peruvian Trade Performance (1975 - 1980) / CMS-Components and Rates of Change for selected SITC-3 Sectors

		(1) Exports (1975) US $	(2) Exports (1980) US $	(3) Total Change US $	(4) % Change	(5) World Market Effect (WME)
661	Lime, cement and fabricated building materials, except glass and clay	116	31.740	31.624	∞	143
664	Glass	53	2.693	2.640	4.981	65
665	Glassware	260	2.724	2.464	948	320
666	Pottery	3	932	929	∞	4
667	Pearls and precious and semi precious stones	2	3.127	3.125	∞	2
693	Wire products (except electrical) and fencing grilles	313	2.474	2.161	690	384
695	Tools for use in the hand or in machines	4	1.296	1.292	∞	5
697	Household equipment of base metals	40	2.337	2.297	5.743	49
698	Manufactures of metal	281	5.008	4.727	1.682	345
851	Footwear	17	7.897	7.880	∞	21

(6) Product nposition Effect (PCE)	(7) Market Composition Effect (MCE)	(8) Composition Effect (CE)	(9) % Participation of SITC Group to total PCE	(10) % Participation of SITC Group to total MCE
21	402	31.059	0,05	0,46
20	- 44	2.598	0,05	- 0,05
- 39	- 148	2.330	- 0,09	- 0,17
1	0	924	0	.
2	- 0,10	3.128	0,01	.
- 197	- 75	2.049	- 0,47	- 0,09
0	- 6	1.294	- 0,02	- 0,01
15	4	2.228	0,04	0,00
- 41	- 295	4.630	- 0,10	- 0,34
7	- 1	7.702	0,02	0

(11) % Participation of SITC Group to total CE	(12) Relative PCE (6) : (3)	(13) Relative MCE (7) : (3)	(14) Relative CE (8) : (3)
3,22	0	1	98
0,27	1	- 2	98
0,24	- 2	- 6	94
0,10	0	0	100
0,32	0	0	100
0,21	- 9	- 3	95
0,13	.	.	100
0,23	1	.	97
0,48	- 1	- 6	98
0,08	1	.	98

Tableau II

Distribution of Export Increases of Peruvian Products per

Sector		Total Change (0)	Developing Countries (1)	% (1:0)	Latin America (2)
262	Wool	20.538	943 (8.258)	4,6	852 (14)
263	Cotton	2.032	-8.978	-541,0	-17.222
266	Synthetic fibres	14.917	14.592	97,8	14.592
281	Iron ore and concentr.	16.060	23.419	145,8	1.039
283	Ores & conc. of base metals	319.083	94.962	29,8	74.874
285	Silver and platinum ores	-2.224	-26		-35
512	Organic chemicals	5.545	5.339	96,2	5.339
513	Inorganic chemicals	4.058	4.092	101	4.092
599	Chemical materials and prod.	15.467	9.533	61,6	3.229
651	Textile yarn and threat	71.767	5.969	8,3	5.090
652	Cotton fabr. woven	40.769	2.291	5,6	2.291
653	Text.fabr.other than cotton	10.860	7.864	72,4	7.746
655	Spec.tex.fabr. and related	5.781	5.162	89,3	5.162
656	Made-up articles	12.011	11.423	95,1	11.423
657	Floor coverings, tapastr.etc.	7.058	676	9,6	632
661	Lime, cement & fabr.build.mat.	31.624	31.544	99,7	31.544
664	Glass	2.640	1.761	66,7	1.644
665	Glassware	2.464	2.257	91,6	2.257
666	Pottery	929	257	27,7	255
667	Pearls & precious & semip.stones	3.125	1.351	43,2	1.327
681	Silver, platinum and other	-4.471	155		155
682	Copper	439.395	128.113	29,2	79.126
685	Lead	31.239	17.524	56,1	9.143
718	Machines for special ind.	3.362	3.131	93,1	3.131
719	Mach. & appliances (other than electr.) & parts	7.256	6.543	90,2	6.581

Importing Countries

% (2:0)	Andean Pact (3)	% (3:0)	Newly Ind. Countries (4)	%	Industr. Countries (5)	%
4,1	473	2,3	178 (7.288)	1	19.799	95,4
-947,0	932	46,0	-9.948	-591	10.705	527
97,8	11.777	79,0	117	0,8	325	2,1
6,5	-		23.419	145,8	-7.359	-45,8
23,5	-3	0	82.723	25,9	224.122	70,2
	-		-26		2.199	
96,2	3.816	71,5	314	68,8	206	3,7
101	3.135	77,3	373	9,2	-31	-1,0
20,9	2.847	18,4	6.329	40,9	5.987	38,7
7,1	2.614	3,6	1.284	1,8	65.798	91,7
5,6	114	0	403	0,9	38.455	94,3
71,3	2.583	23,8	2.779	25,6	2.992	27,6
89,3	2.065	35,7	17	0	619	10,7
95,1	9.334	77,7	107	0,9	582	4,8
8,9	376	5,3	58	0,8	6.375	90,3
99,7	27.399	86,6	3.325	10,5	78	0,2
62,3	1.109	42,0	287	10,9	869	32,9
91,6	1.849	75,0	7	0	202	8,2
27,5	131	14,1	57	6,1	665	71,6
42,5	191	6,1	24	0,7	1.773	56,7
	-35		-434		-4.624	
18,0	8.369	1,9	115.298	26,2	311.279	70,8
29,3	8.841	28,3	7.947	25,4	13.536	43,3
93,1	2.097	62,4	897	26,7	230	6,8
90,7	4.421	60,9	591	8,1	628	8,7

Land	Major Importer World (6) [2]	%	Land	Major Importer LA (7)	%	Land	Major Importer AP (8)	%
I	10.285 [1] a/	50	CO	455	2,2	CO	455	2,2
JA	5.498 b/	271	UR	1.014	49,9	CO	863	42,5
CO	7.733 b/	51,8	CO	7.733	51,8	CO	7.733	51,8
KOR	22.380 b/	139,5	AR	1.572	9,7		-	-
USA	84.877 b/ c/	26,6	ME	68.185	21,4		-	-
CO	1.911 c/	34,5	CO	1.911	34,5	CO	1.911	34,5
/E	1.494 b/	36,8	VE	1.494	36,8	VE	1.494	36,8
JA	5.479 b/	35,4	VE	1.263	8,2	VE	1.263	8,2
AUS	20.778 b/	29,0	CH	1.258	1,8	BO	1.026	1,4
USA	32.013 a/	78,5	CH	1.544	3,8	EC	97	0
AR	2.707 a/	24,9	AR	2.707	24,9	BO	2.337	21,5
CH	2.924 a/	50,6	CH	2.924	50,6	EC	1.742	33,7
BO	6.305 a/	52,5	BO	6.305	52,5	BO	6.305	52,5
USA	5.508 a/c/	78	BO	294	4,2	BO	294	4,2
EC	26.799 a/	84,7	EC	26.799	84,7	EC	26.799	84,7
USA	781 b/	29,6	EC	390	14,8	EC	390	14,8
EC	1.355 a/	55,0	EC	1.355	55,0	EC	1.355	55,0
USA	409 c/	44,0	AR	57	6,1	VE	49	5,3
USA	1.652 c/	52,9	PA	1.136	36,3	VE	191	6,1
FRG	19.500		UR	546			-	
JA	74.498 b/	17,0	BR	64.981	14,8	VE	5.409	1,2
JA	9.872 b/	31,6	VE	5.912	18,9	VE	5.912	18,9
SC	1.742 b/	51,8	EC	1.742	51,8	EC	1.742	51,8
C	2.289 a/	31,5	EC	2.289	31,5	EC	2.289	31,5

Dominating Effect[2]			Specialization Tendency[3]	Important Trading Partners[4]
World (9)	LA (10)	AP (11)	(12)	(13)
1	0	0	CLS	IL: I,FRG,JA
0	0	1	CLS	IL: JA,PO,UK
0	0	0	SS, REG	EL: LA/CO,EC,VE
0	0	-	CLS	EL: KOR, AR
0	0	-	CLS CLS	IL: USA,NL,B,FRG,JA;NIC: ME
0	0	0	SS, REG	EL: CO,EC,BO,PA,AR
1	1	1	SS, REG	EL: VE,CO,EC,BR,CH
0	0	0	HO, REG, NIC	EL: YU,VE,EC; IL: JA
0	0	0	HO	IL: AUS, FRG, I
0	0	0	HO	IL: USA
1	1	0	SS, REG	EL: AR,BO
0	0	0	SS, REG	EL: CH,EC
0	0	0	SS, REG	EL: BO,CH,CO,EC
1	0	0	HO	IL: USA; EL: BO
1	1	1	SS, REG	EL: EC,ME
0	1	1	SS, HO, REG	IL: USA; EL: EC
0	0	0	SS, REG	EL: EC
1	0	0	HO, SS, REG	EL: AR,VE,PAN; IL: USA
0	0	0	CLS, SS	IL: USA; EL: PAN
0	0	-	(CLS)	IL: JA↓, FRG↑
0	0	0	CLS, HO, NIC	IL: JA,I,UK; EL: BR
1	0	0	CLS, SS, REG	IL: JA,I; EL: VE,KOR,CO
0	0	0	SS, REG	EL: AR,BO; IL: EC
1	1	1	SS, REG	IL: EC; EL: CH, VE

Tableau II (continued from page 71)

Distribution of Export Increases of Peruvian Products per

Sector		Total Change (0)	Developing Countries (1)	% (1:0)	Latin America (2)
722	Electr. power machinery	4.031	4.031	100,0	4.031
723	Equipm.f.distributing electr.	6.385	1.534	24,0	1.534
729	Other electrical machinery	6.847	6.802	99,3	6.802
841	Clothing	38.564	25.750	66,8	25.677
842	Fur clothing	2.514	625	24,9	625
851	Footwear	7.703	6.852	89	6.482
892	Printed matter	2.230	2.176	97,6	2.176
893	Art of artif.plastic materials	75.024	61.865	82,5	61.865
897	Jewellery & Gold- & Silver-smith's wares	20.866	16.016	76,8	16.016

Importing Countries

% (2:0)	Andean Pact (3)	% (3:0)	Newly Ind. Countries (4)	%	Industr. Countries (5)	%
100,0	3.717	92,2	155		-	
24,0	1.071	16,8	13	0	4.851	76
99,3	6.662	97,3	-10	0	45	0,6
66,8	5.502	14,3	2.051	5,3	12.806	33,2
24,9	509	20,2	11	0	1.892	75,3
84,1	3.788	49,2	733	9,5	850	11
97,6	2.142	96,1	-58	-2,6	71	3,2
82,5	867	1,1	145	0	13.155	17,5
76,8	1.190	5,7	34	0	4.840	23,2

Land	Major Importer World (6) [2]	%	Land	Major Importer LA (7)	%	Land	Major Importer AP (8)	%
BO	1.181	29,3	BO	1.181	29,3	BO	1.181	29,3
USA	4.851 b/	76	EC	913	14,3	EC	913	14,3
VE	2.747 b/	40,1	VE	2.747	40,1	VE	2.747	40,1
PAN	16.786 b/	43,5	PAN	16.786	43,5	BO	3.421	8,9
USA	1.750	69,6	VE	437		VE	437	17,4
BO	2.517 c/	32,7	BO	2.517	32,7	BO	2.517	32,7
VE	871 b/	39,1	VE	871	39,1	VE	871	39,1
PAN	60.278 c/	80,3	PAN	60.278	80,3	VE	742	0,9
PAN	14.683 b/	70,4	PAN	14.683	70,4	EC	861	70,4

1) a/ Dominating Importer in 1975
   b/ Not Dominating Importer in 1975
   c/ Not applicable

2) 1 = Dominating Market Composition Effect
   0 = Dominating Competition Effect

3) CLS = Classical Trade Determination
   HO = Factor Endowment oriented Trade Determination
   SS = South-South-Trade
   REG = Intra-regional Trade (AP, LA)

4) IL = Industrial Country
   EL = Less Developed Country

Dominating Effect[2]			Specialization[3]	Important Trading Partners
World (9)	LA (10)	AP (11)	Tendency (12)	(13)
0	0	0	SS, REG	EL: BO,CO,VE,EC
0	1	1	HO, REG	IL: USA; EL: EC
0	0	0	AP-Trade	
0	0	0	(HO)	EL: PAN
1	0	0	HO, REG	IL: USA; EL: VE
0	0	0	SS, REG	IL: USA; EL: BO,CH,EC,AR
0	0	0	SS, REG	
0	0	0	HO	EL: PAN; EL: USA, SWZ
0	0	0	HO	PAN

Tableau III

SELECTED PARTNER MARKETS FOR PERUVIAN EXPORTS

Change in Exports 1975 - 1980

- USA -

Sectors	Absolute Changes US $ (1)	Relative Change (%) (2)	Relative Sector Contribution to total Change (%) (3)	Relative Sector Contribution to total Market Composition Effect (%) (4)	Relative Sector Contribution to total Competition Effect (%) (5)
512	172	-	0,02	0	0,04
3	-378	-56	-0,05	0,46	-0,32
599	82	-	0,01	0	0,02
651	2,178	2,200	0,29	-0,08	0,51
2	32,013	4,606	4,30	0,11	7,46
3	433	1,312	0.06	0	0,10
5					
6	286	160	0,04	0,17	-0,01
7	5,509	-	0,74	0,07	1,29
661					
4	781	-	0,10	0	0,19
5	180	-	0,02	0	0,04
6	409	-	0,05	0	0,10
7	1,652	-	0,22		0,39
681	2,039	5	0,27	13,74	-35,98
2	35,582	96	4,38	102,19	-15,78
5	-1,931	-41	-0,26	10,07	-1,50
718					
9	458	3,270	0,06	0,02	0,10
3	4,951	-	0,65	0	1,16
9					
841	8,517	7,742	1,14	0,06	1,99
2	1,750	1,563	0,24	0,58	0,28
851	703	-	0,09	0	0,17
892					
3	10,714	-	1,44		2,56
4	191	-	0,03	0	0,05
897	2,078	3,247	0,28	0,04	0,45
Important sectors not covered:					
331	525,846	-	71	0	125

Tableau III

SELECTED PARTNER MARKETS FOR PERUVIAN EXPORTS

Change in Exports 1975 - 1980

-Italy-

Sectors	Absolute Changes US $ (1)	Relative Change (%) (2)	Relative Sector Contribution to total Change (%) (3)	Relative Sector Contribution to total Market Composition Effect (%) (4)	Relative Sector Contribution to total Competition Effect (%) (5)
512					
3					
599	166	-	0,15	0	0,23
651	7,756	3,998	7,08	3,04	10,18
2	3,297	921	3,01	5,46	3,49
3	1,680	-	1,53	0,04	2,32
5					
6					
7					
661					
4					
5					
6					
7					
681					
2	69,373	6,370	63,30	8,48	93,34
5	4,453	90	4,06	0,13	-763
718					
9					
722					
3					
9					
841	-264	-49	-0,24	7,36	-2,28
2					
851					
892					
3					
4					
897					
Important sectors not covered:					

Tableau III

SELECTED PARTNER MARKETS FOR PERUVIAN EXPORTS

Change in Exports 1975 - 1980

- United Kingdom -

Sectors	Absolute Changes US $ (1)	Relative Change (%) (2)	Relative Sector Contribution to total Change (%) (3)	Relative Sector Contribution to total Market Composition Effect (%) (4)	Relative Sector Contribution to total Competition Effect (%) (5)
512					
3					
599					
651	1,993	-	2,99	0	6,15
2	158	1,320	0,24	0,02	0,45
3	190	-	0,29	0	0,59
5					
6					
7					
661					
4					
5					
6					
7					
681	654	47	0,98	50,57	-23,54
2	67,968	895	101,93	-57,58	190,73
5					
718					
9					
722					
3					
9					
841	1,601	1,160	2,40	0,09	4,30
2					
851					
892					
3					
4					
897					
Important sectors not covered:					

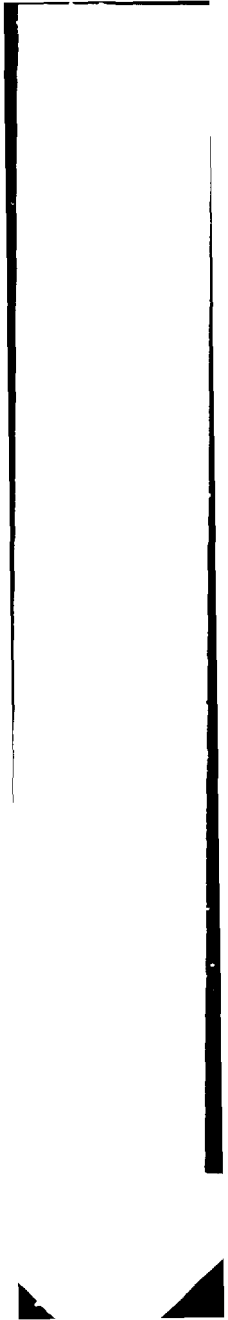
Tableau III

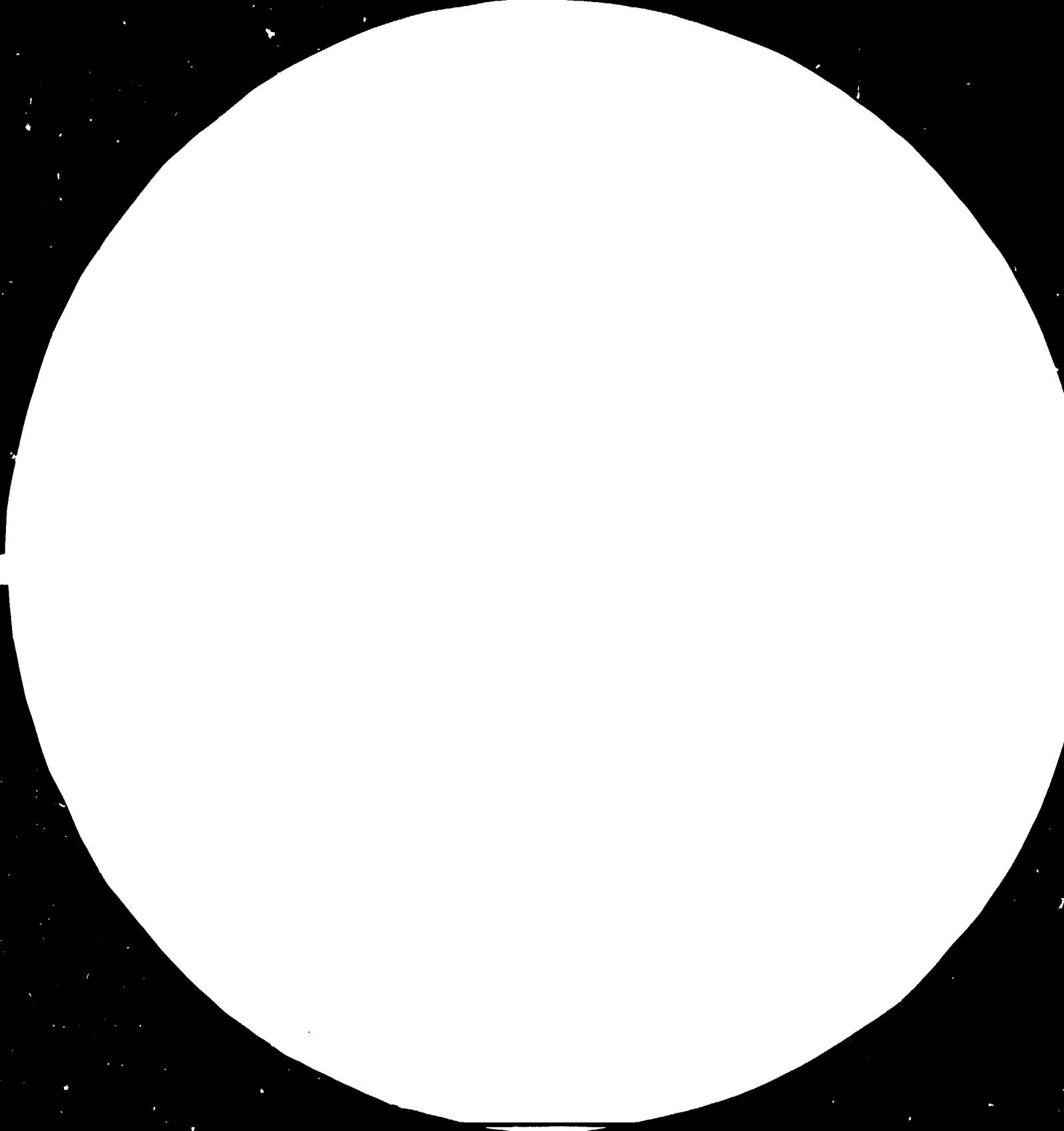
SELECTED PARTNER MARKETS FOR PERUVIAN EXPORTS

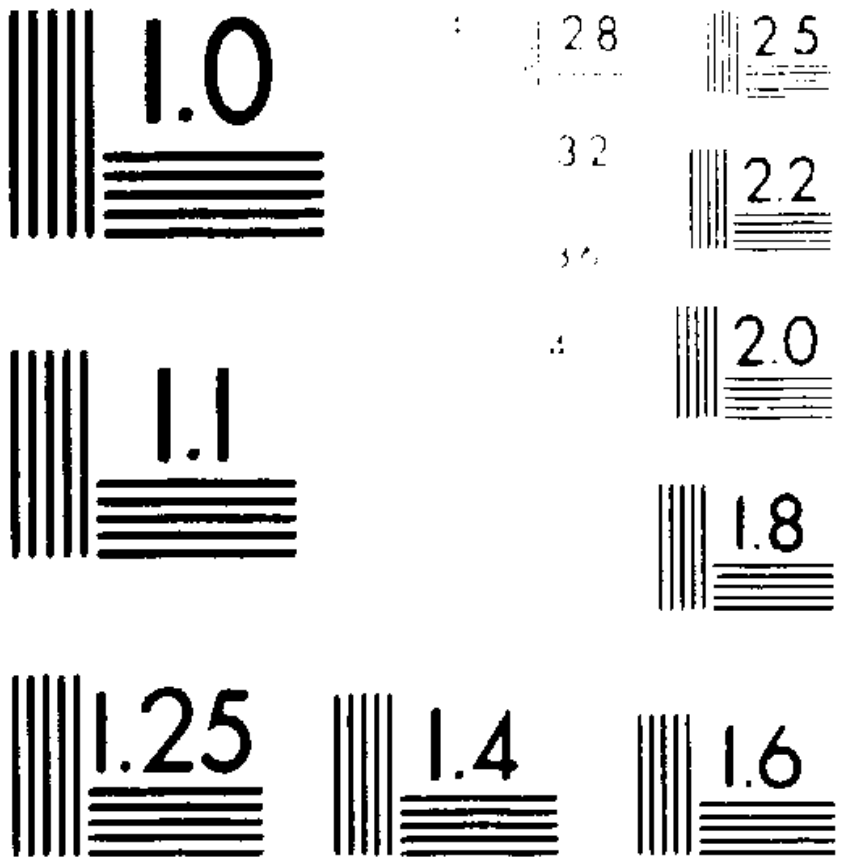
Change in Exports 1975 - 1980

- FRG -

Sectors	Absolute Changes US $ (1)	Relative Change (%) (2)	Relative Sector Contribution to total Change (%) (3)	Relative Sector Contribution to total Market Composition Effect (%) (4)	Relative Sector Contribution to total Competition Effect (%) (5)
512					
3					
599					
651	14,934	7,818	24,15	0,53	74,92
2	1,110	-	1,80	0,01	5,64
3	141	-	0,23	0	0,72
5					
6					
7	186	-	0,30	0	0,91
661					
4					
5					
6					
7					
681	19,500	-	31,54	0	99,13
2	-2,746	-15	-4,44	-77,55	-118,30
5	179	-	0,29	0	0,91
718					
9	182	-	0,29	0,04	0,90
722					
3					
9					
841	743	417	1,20	-0,87	2,65
2					
851					
892					
3	242	-	0,39	0	1,23
4					
897	127	668	0,21	-0,44	0,50
Important sectors not covered:					
283	23,435	441	37,90	11,24	88,62







MICROCOPY RESOLUTION TEST CHART
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Tableau III

SELECTED PARTNER MARKETS FOR PERUVIAN EXPORTS

Change in Exports 1975 - 1980

- Netherlands -

Sectors	Absolute Change US $ (1)	Relative Change (%) (2)	Relative Sector Contribution to total Change (%) (3)	Relative Sector Contribution to total Market Composition Effect (%) (4)	Relative Sector Contribution Competition Competition Effect (%) (5)
512					
3					
599					
651	1,100	-	2,62	-0,02	12,08
2	671	267	1,60	-1,20	5,43
3					
5					
6					
7	117	-	0,28		1,28
661					
4					
5					
6					
7					
681	-798	-100	-1,90	-21,01	-27,96
2	25,044	1,889	59,55	-9,30	263,28
5	1,228	57	2,92	31,70	-53,91
718					
9					
722					
3					
9					
841	239	1,593	0,57	-0,08	2,45
2					
851					
892					
3					
4					
897					
Important sectors not covered'					
283	34,870	1,471	82,91	30,79	338,55

Tableau III

SELECTED PARTNER MARKETS FOR PERUVIAN EXPORTS

Change in Exports 1975 - 1980

- Yugoslavia -

Sectors	Absolute Change US $ (1)	Relative Change (%) (2)	Relative Sector Contribution to total Change (%) (3)	Relative Sector Contribution to total Market Composition Effect (%) (4)	Relative Sector Contribution Competition Competition Effect (%) (5)
512					
3					
599	5,229	-	8,13	0	8,27
651					
2					
3					
5					
6					
7					
661					
4					
5					
6					
7					
681					
2	48,458	-	75,33	0	76,65
5	1,224	-	1,90	0	1,94
718					
9					
722					
3					
9					
841					
2					
851					
892					
3					
4					
897					
Important sectors not covered'					

Tableau III

SELECTED PARTNER MARKETS FOR PERUVIAN EXPORTS

Change in Exports 1975 - 1980

- Korea -

Sectors	Absolute Change US $ (1)	Relative Change (%) (2)	Relative Sector Contribution to total Change (%) (3)	Relative Sector Contribution to total Market Composition Effect (%) (4)	Relative Sector Contribution Competition Competition Effect (%) (5)
512					
3					
599					
651					
2					
3					
5	6,311	-	17,09	0	20,33
6					
7					
661					
4					
5					
6					
7					
681					
2					
5					
718					
9					
722					
3					
9					
841					
2					
851					
892					
3					
4					
897					
Important sectors not covered'					
281	22,380	2,263	60,61	99,95	53,16
283	6,999	-	18,93	0	22,52

Tableau III

SELECTED PARTNER MARKETS FOR PERUVIAN EXPORTS

Change in Exports 1975 - 1980

- Mexico -

Sectors	Absolute Change US $ (1)	Relative Change (%) (2)	Relative Sector Contribution to total Change (%) (3)	Relative Sector Contribution to total Market Composition Effect (%) (4)	Relative Sector Contribution Competition Competition Effect (%) (5)
512					
3					
599					
651					
2					
3					
5					
6					
7					
661	2,824	-	3,62	0	3,47
4					
5					
6					
7					
681					
2	2,405	-	3,08	0	2,95
5					
718					
9	662	-	0,85	-0,05	0,81
722					
3					
9					
841					
2					
851					
892					
3					
4					
897					
Important sectors not covered'					
283	68,185	2,400	87,39	-85,56	87,17

Tableau III

SELECTED PARTNER MARKETS FOR PERUVIAN EXPORTS

Change in Exports 1975 - 1980

- Brazil -

Sectors	Absolute Change US $ (1)	Relative Change (%) (2)	Relative Sector Contribution to total Change (%) (3)	Relative Sector Contribution to total Market Composition Effect (%) (4)	Relative Sector Contribution Competition Competition Effect (%) (5)
512					
3	349	-	0,53	0	1,21
599	139	-	0,21	0	0,48
651					
2					
3					
5					
6					
7					
661	505	-	0,77	0	1,74
4					
5					
6					
7					
681					
2	64,981	387	99,11	20,88	216,32
5	-570	-100	-0,87	-56,54	-0,02
718					
9					
722					
3					
9					
841	370	-	0,56	0	1 ,29
2					
851					
892					
3					
4					
897					
Important sectors not covered'					
686	-7,173	-41,8	10,94	-88,40	-26,86

Tableau III

SELECTED PARTNER MARKETS FOR PERUVIAN EXPORTS

Change in Exports 1975 - 1980

- Panama -

Sectors	Absolute Change US $	Relative Change (%)	Relative Sector Contribution to total Change (%)	Relative Sector Contribution to total Market Composition Effect (%)	Relative Sector Contribution Competition Competition Effect (%)
	(1)	(2)	(3)	(4)	(5)
512					
3					
599					
651					
2					
3					
5					
6					
7					
661					
4					
5					
6					
7					
681					
2					
5					
718					
9					
722					
3					
9					
841					
2					
851					
892					
3	60,278	-	60,62	0	60,61
4					
897	14,684	-	14,77	-4,31	14,76
Important sectors not covered'					

Tableau III

SELECTED PARTNER MARKETS FOR PERUVIAN EXPORTS

Change in Exports 1975 - 1980

- Chile -

Sectors	Absolute Change US $ (1)	Relative Change (%) (2)	Relative Sector Contribution to total Change (%) (3)	Relative Sector Contribution to total Market Composition Effect (%) (4)	Relative Sector Contribution Competition Competition Effect (%) (5)
512	202	-	0,55	0	0,47
3	382	273	1,04	-0,27	0,93
599	198	-	0,54	-,09	0,48
651	1,258	1,165	3,43	-,1,89	3,20
2	1,544	-	4,22	0	3,62
3	1,530	4,250	4,18	-0,63	3,67
5	2,924	4,238	7,98	-1,24	7,01
6	1,455	-	3,97	0	3,41
7					
661	343	-	0,94	0	0,80
4	359	-	0,98	0	0,84
5	405	-	1,11	0	0,95
6					
7					
681					
2	2,025	-	5,53	0	4,74
5	114	29	0,31	-10,65	1,18
718	132	-	0,36	0	0,31
9	1,040	430	2,84	-4,31	3,00
722	179	471	0,49	-0,80	0,51
3	155	-	0,42	0	0,36
9					
841	1,303	-	3,56	-0,13	3,07
2					
851	1,865	-	5,09	0	4,37
892					
3	575	467	1,57	-2,92	1,63
4	248	-	0,68	-0,04	0,58
897					
Important sectors not covered'					
541	2,786	5,928	7,61	-0,84	6,64
554	1,497	-	4,09	-0,22	3,53
735	6,141	-	16,77	0	14,39

Tableau III

SELECTED PARTNER MARKETS FOR PERUVIAN EXPORTS

Change in Exports 1975 - 1980

- Ecuador-

Sectors	Absolute Change US $ (1)	Relative Change (%) (2)	Relative Sector Contribution to total Change (%) (3)	Relative Sector Contribution to total Market Composition Effect (%) (4)	Relative Sector Contribution Competition Competition Effect (%) (5)
512	1,307	-	1,90	0,03	14,36
3	406	133	0,59	0,65	-2,59
599	1,001	1,451	1,46	0,05	10,12
651	999	1,526	1,45	-0,17	11,50
2					
3					
5	1,742	3,287	2,53	0,02	18,94
6	1,158	2,316	1,68	-0,14	13,00
7					
661	26,799	-	38,98	0,92	295,44
4	390	-	0,57	0,02	4,24
5	1,355	560	1,97	-0,31	13,92
6					
7					
681					
2	2,078	217	3,02	2,67	-4,39
5	262	143	0,38	-0,10	-0,65
718	1,742	-	2,53	0,04	19,17
9	2,289	272	3,33	1,28	10,15
722	714	376	1,04	0,41	3,14
3	913	379	1,33	1,95	-3,23
9	1,196	2,135	1,74	0,02	12,34
841	1,826	-	2,66	0,01	20,55
2					
851	1,271	-	1,85		14,31
892	479	504	0,70	-0,06	4,64
3					
4					
897	561	-	1,25	0	9,70
Important sectors not covered'					
554	3,303	2,447	4,80	-0,05	35,69
561	1,663	-	2,42		18,74
673	2,218	-	3,23	-0,01	24,91

Tableau III

SELECTED PARTNER MARKETS FOR PERUVIAN EXPORTS

Change in Exports 1975 - 1980

- Bolivia -

Sectors	Absolute Change US $ (1)	Relative Change (%) (2)	Relative Sector Contribution to total Change (%) (3)	Relative Sector Contribution to total Market Composition Effect (%) (4)	Relative Sector Contribution Competition Competition Effect (%) (5)
512	598	-	1,20		1,08
3					
599	426	1,521	0,85	-0,55	0,82
651	1,026	645	2,05	-2,74	2,14
2					
3	2,337	-	4,68	0	4,23
5	291	-	0,58	-0,05	0,53
6	6,305	6,178	12,63	-2,21	11,60
7	294	-	0,59	-0,13	0,54
661	483	-	0,05	-0,19	0,78
4	371	309	0,74	-0,28	0,69
5					
6					
7					
681					
2	789	537	1,58	-3,04	1,69
5	102	442	0,20	-0,62	0,22
718	264	97	0,53	-4,41	0,97
9	715	274	1,43	-4,60	1,77
722	1,181	606	2,37	-4,09	2,50
3					
9	1,945	-	3,90	-0,12	3,53
841	3,421	-	6,85	-0,03	6,19
2					
851	2,517	-	5,04	0	4,56
892	585	1,828	1,17	-0,59	1,12
3					
4	102	-	0,21	0	0,19
897	150	-	0,30	-0,11	0,28
Important sectors not covered'					
541	1,805	207	3,61	-15,52	4,84
554	3,925	5,032	7,86	-1,53	7,25
673	10,147	7,046	20,33	-2,20	18,63
674	2,263	-	4,53	0	4,10

Tableau III

SELECTED PARTNER MARKETS FOR PERUVIAN EXPORTS

Change in Exports 1975 - 1980

- Venezuela -

Sectors	Absolute Change US $ (1)	Relative Change (%) (2)	Relative Sector Contribution to total Change (%) (3)	Relative Sector Contribution to total Market Composition Effect (%) (4)	Relative Sector Contribution Competition Competition Effect (%) (5)
512	461	-	1,04	0	1,14
3	1,494	1,358	3,37	40,78	2,35
599	1,263	2,005	2,85	0,11	2,95
651	107	-	0,24	-0,03	0,26
2					
3					
5					
6					
7					
661					
4	355	-	0,80	0	0,88
5	398	3,980	0,90	0,44	0,95
6					
7					
681					
2	5,409	566	12 22	-51,44	11,70
5	5,912	-	11,36	0	14,67
718					
9	1,173	1,222	2,65	-0,22	2,69
722	756	220	1,71	31,21	-0,03
3	134	-	0,30	0	0,33
9	2,747	-	6,21	-0,47	6,79
841	223	-	0,50	0	0,55
2	437	2,570	0,99	-3,82	1,07
851	295	-	0,67	0	0,73
892	871	2,722	1,97	3,87	1,98
3	742	-	1,68	-0,01	1,84
4	644	-	1,45	-0,24	1,58
897	179	39	0,41	-1,17	0,63
Important sectors not covered'					
686	2,638	370	596	56,92	4,74
733	2,375	-	5,37	0	5,90

Tableau III

SELECTED PARTNER MARKETS FOR PERUVIAN EXPORTS

Change in Exports 1975 - 1980

- Colombia -

Sectors	Absolute Change US $ (1)	Relative Change (%) (2)	Relative Sector Contribution to total Change (%) (3)	Relative Sector Contribution to total Market Composition Effect (%) (4)	Relative Sector Contribution Competition Competition Effect (%) (5)
512	1,911	-	4,58	0	12,92
3	1,183	519	2,83	-1,37	1,65
599	107		0,26	0	0,72
651	482	-	1,15	0	3,26
2					
3	198	71	0,47	2,46	-2,53
5					
6	1,784	-	4,27	0	12,06
7					
661	173	-	0,42	0	1,17
4					
5					
6					
7					
681					
2					
5	2,565	420	6,14	-2,80	11,81
718					
9	244	567	0,58	0,37	1,00
722	1,066	286	2,55	5,99	-1,96
3					
9	774	1,164	1,85	0,03	4,46
841					
2					
851					
892	207	233	0,50	-0,06	0,84
3					
4					
897					
Important sectors not covered'					
686	2,341	50	5,61	17,11	-6,07

Tableau III

SELECTED PARTNER MARKETS FOR PERUVIAN EXPORTS

Change in Exports 1975 - 1980

- Belgium -

Sectors	Absolute Change US $ (1)	Relative Change (%) (2)	Relative Sector Contribution to total Change (%) (3)	Relative Sector Contribution to total Market Composition Effect (%) (4)	Relative Sector Contribution Competition Competition Effect (%) (5)
512					
3					
599					
651	3,999	-	5,83	0	12,18
2	151	-	0,22	0	0,46
3					
5					
6					
7					
661					
4					
5					
6					
7					
681					
2	12,848	103	18,73	31,79	-17,50
5	-86	-100	-0,13	7,96	-1,72
718					
9					
722					
3					
9					
841	124	-	0,18	-0,03	0,36
2					
851					
892					
3					
4					
897					
Important sectors not covered'					
283	50,849	297	74,15	-100,46	118,94

3. THE PERUVIAN TEXTILE INDUSTRY

In the middle of one of the deepest recessions in Peruvian history, the textile industry has been particularly hard hit. Faced with a decline in sales on the international as well as on the national market it is currently working at an estimated 40 % capacity. This report will analyze the situation of the Peruvian textile industry, identify its major problems, and propose policy recommendations to deal with these problems in the short and long run. The report consists of three main sections: the first one presents an overview of the key characteristics of the textile industry; the second one provides an analysis of the cost structure, productivity, technology used, and international competitiveness; on the basis of these two sections the last part will summarize the major problems confronting the textile industry and discuss different policy options.

3.1. Structure, Performance, and Characteristics of the Textile Industry.

3.1.1. General Characteristics.

The textile complex includes the production of yarns on the basis of man-made and natural fibres, of knitted and woven fabrics, of made-up textile products (all of these are incorporated in ISIC-321) as well as of apparel (ISIC-322). The textile industry is a very important branch of the Peruvian manufacturing sector, not only because it is the second most important sector after food-processing and beverages, but also because it generates strong backward linkages and has become the largest non-traditional export industry.

In 1979, textiles accounted for 11.9 % of manufacturing value added and 12.6 % of employment. Regionally, the industry is highly concentrated with more than 80 % of all production in the Greater Lima area. However, in recent years a tendency towards more decentralization can be discerned, mainly with the establishment of exporting companies near the cotton growing areas. Foreign investment in the textile industry is small and can mainly be found in the production of man-made fibres.

Table 15 indicates that spinning and weaving are the most important subsectors accounting for 52 % of employment and 63 % of gross output of the textile complex. It is noteworthy that the average size of a mill (measured as employment/enterprise) is rather small - 78 employees in 1979, notwithstanding the fact that some companies are substantially larger [(1)]. The garment industry is mainly a small-scale industry with an average size per factory of 18 employees in 1979.

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(1) Nevertheless, in 1977 there were only two firms with more than 1,000 employees: La Union and Cuvisa had 3,179 and 1,324 workers, respectively.

TABLE 15

PERU - TEXTILE

Industry Structure (1979)

Subsector	Code (ISIC)	Number of Enterprises	Employment
Yarns	3211	320	25,136/(52.0%)
Made ups	3212	55	1,488 (3.1%)
Knitted Fabrics	3213	343	6,233 (12.9%)
Rugs, etc.	3214	12	332 (0.7%)
Cords	3215	15	310 (0.6%)
Others	3219	18	306 (0.6%)
Garments	3220	802	14,504 (30.0%)
TOTAL			48,309 (100%)

Source: World Bank (1982: Table 2).

Output (Billion soles)	Value Added (Billion soles)
129.3 (62.5%)	56.7 (66.6&)
4.5 (2.2%)	2.1 (2.5%)
37.3 (18.0%)	13.4 (15.8%)
1.9 (0.9%)	0.4 (0.5%)
2.6 (12.%)	0.9 (1.0%)
1.2 (0.6%)	0.5 (0.5%)
30.2 (14.6%)	11.2 (13.1%)
207.0 (100%)	85.2 (100%)

The production of textiles (ISIC-321) exhibited a varying performance during most of the seventies (see Table 16). It has been declining in absolute terms though, ever since the peak production in 1979. On a more disaggregated level, we see that spinning and weaving (ISIC-3211, registered strong growth in the second half of the 70's, whereas knitting (ISIC-3213) as well as apparel production (ISIC-322) drastically declined between 1975 and 1979. However, it is clear that the decline in output of officially registered companies has gone hand in hand with an increase of garment production in the informal sector. Since another report in this document analyzes the informal sector in great detail, it will not be further discussed here. Suffice it to say, though, that the informal sector is especially important in the clothing industry. Employment therein is estimated at 12,600 workers in 1981 vis-à-vis 10,832 workers in the formal sector.

TABLE 16

INDEX OF REAL OUTPUT IN THE TEXTILE INDUSTRY
(1973 = 100)

Year/ISIC	321	322	3211	3213
1970	88.7	78.4	84.5	101.7
1971	101.5	90.1	98.7	105.2
1972	98.5	101.1	95.9	107.7
1973	100.0	100.0	100.0	100.0
1974	101.4	111.7	102.3	98.3
1975	103.5	110.8	101.8	105.4
1976	110.3	102.5	113.3	96.5
1977	97.8	92.2	103.2	75.8
1978	106.4	73.4	117.5	59.6
1979	113.4	68.2	125.4	61.2
1980	108.0	N.A.	N.A.	N.A.
1981	107.9	N.A.	N.A.	N.A.
1982	100.2	N.A.	N.A.	N.A.
1983	87.7	N.A.	N.A.	N.A.

N.A. not Available

Source: Abugattas and Zamalloa (1982) and Table A-2.

3.1.2. The Domestic Market and Foreign Trade.

It has been mentioned already in a previous part of this document that textile production for the domestic market has been decreasing since 1976 (see Table 7). Apparent consumption of all textile articles (yarns, fabrics, and garments) declined from 4.4 kg per capita in 1975 to 3.2 kg per capita in 1981 (see Table A-4). This decrease has to be mainly attributed to two factors: the decline in purchasing power of the working population and the surge of contraband textiles in the 1980's.

While the abolition of the "Registro Nacional de Manufacturas" in 1979 and the reduction of tariff rates in 1980 only led to a relatively small increase in imports of textile products, there is no doubt that the actual amount of foreign products entering the country is a multiple of legal imports. In 1982, the total volume of official textile imports was no more than 6% of the total volume produced by the Peruvian textile industry. At this level there would be no cause for alarm. It is rather that part of imports which comes into the country illegally that poses a threat to domestic producers. The World Bank (1982) estimated contraband to amount to US$ 30-60 million annually, and some producers suspect that it is even higher.

It is possible that part of the contraband consists of end-of-season dumping, since the end of the spring (fall) in the Northern Hemisphere meets with the beginning of spring (fall) in the Southern Hemisphere. Yet with the difference of prices in textile products in Peru and abroad (which will be discussed later on) dumping prices are not a necessary condition for contraband to be profitable. Dumping is not the problem to be attacked, but rather the inability to control contraband. In other words, the existence of contraband cannot be attributed to dumping, but rather to the lack of competitiveness of a large part of textile industry. (This does not contradict the fact that the textile industry is a large exporter, because the products exported are

not the ones which also enter as contraband.)[1] Exposing the industry to more competition from abroad in order to make it more competitive has to be done through a gradual reduction in tariff rates. In this process of liberalization it is vital though, that illegal imports are controlled, since they effectively carry no tariff charges at all.

The increasing competitive pressure that contraband and the informal sector (especially in the case of garments) have been exerting on domestic producers has had a definite dampening impact on the development of internal prices. With 1973 as a base year, the real price index of textiles [2] was 89.3 in 1980, 76.6 in 1982, and 60.3 in October 1983.

Tariffs for textile products have been reduced substantially between 1980 and 1982 (see Table 17). Tariffs on yarns, fabrics and garments are all equal to 69% now, while import duties on filament yarn are lower.

Comparing the protective structure for Peruvian textiles with that of 20 other developing countries (see Table A-5), the average tariff level is not too different from that of most of the other countries, though substantially higher than that of South Korea. With respect to non-tariff protective measures on the other hand (surcharges, licences, quotas, etc.), Peru figures prominently among the countries with the most unrestricted import structure (see Table A-6). In contrast to the majority of the developing countries, Peru has prohibitions only on cotton imports, which puts her in line with the successful East Asian textile exporters.

Textile exports grew rapidly between 1975 and 1980 (see Table 6),

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(1) In a visit to the informal market 'Polvos Azules', the main center for the sale of contraband in Lima, it was found that the principal competition from low-priced imported clothes came from China or Korea, and they were 55% rayon or 65% polyester. See Cerritelli (1984).

(2) The real price index of textiles is defined as the price index of textiles (ISIC 321 and 322) divided by the general price index.

TABLE 17

RECENT CHANGES IN IMPORT DUTIES FOR TEXTILE ITEMS

Item \ Effective Date	Jan. 1980	Mid 1980	Sept. 1980	Jan. 1982
Textile fibres	60 + 10*	55	40	46
Yarn	70 + 10*	70	60**	69
Filament Yarn	—	—	40	46
Fabrics	100 + 10*	90	60	69
Garments	120+10*+20[x] =150	100 + 20[x]	60	69

* Additional Tax

** Except Filament Yarn and Polyester

x Surcharge for Piece Goods

IMPORT DUTIES FOR TEXTILE MACHINERY

Item \ Effective Date	September 1980	January 1982
Spinning Frames	10	11.5
Looms	15	17.25
Warp Knitting - For Domestic Use	55	63.25
Warp Knitting - For Other Use	25	28.75
Circular Knitting for Domestic Use	25	28.75
Circular Knitting for Other Use	15	17.25
Auxiliary Equipment	15	17.25

Source: MITI

thus counteracting the decline in domestic demand. They stagnated in 1981, grew by 21.6% in 1982, but declined by 34% in 1983. Table 18 show a breakdown of textile exports by major categories. Although there exists some doubt about the accuracy of these figures, it is clear that the overwhelming part of textile exports (~80%) consists of cotton yarn and fabrics. More than 75% of cotton fabrics are exported to the USA and around 15% to the EEC. With respect to exports of cotton yarns the share of the EEC has declined in recent years, while that of the USA has increased (see Tables A-7 and A-8).

The relative decline of importance of the European market for Peruvian exports of cotton yarn has to be attributed primarily to the quantitative restrictions under the Multifibre Agreement, which has regulated Peruvian textile trade with the EEC since 1978. The decline in quota fulfillment in 1980 and 1981 (see Table 19) was mainly due to reduced exports to W. Germany and Italy which in turn resulted from the particular exchange rate developments in those years.(1) While these decreases in exports have to be regarded as temporary, the quotas themselves will present a barrier to more rapid growth, once the exchange rates are more in line again. Therefore, attention has to be paid to the conquering of new markets, like Sweden, Austria, Switzerland, and Canada - countries that do not apply quantitative restrictions to their textile imports. The fact that the quota for cotton fabrics has only been filled to maximally three quarters in recent years shows that there is still more room for exports, if the fabrics are competitive.

At the same time that exports of cotton products to Europe fell, they increased to the US market. Exports of cotton yarns to the USA increased by 411% in 1981 and by 67% in 1982, and the respective growth rates for cotton fabrics were 26.6% and 40%. While Peru's share in

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(1) While the sol depreciated against the US dollar by 46.5% in 1981 and 65% in 1982, it depreciated against the German mark by 17.8% and 53.6% in the respective years and against the Italian lira by 10.4% in 1981, but it appreciated against the lira by 42.7% in 1982.

TABLE 18

PERU - TEXTILE SECTOR

Breakdown of Exports by Major Categories (1980)

(Metric Tons)

Wool products[1]	8,731
Cotton yarn and fabrics	85,141
Synthetic yarn and fabrics	2,283
Synthetic Fibers	8,332
Jute	759
Carpets and rugs	780
Knitwear (cotton)	506
Knitwear (other)	1,771
Garments	663
Other textile articles (cotton)	1,056
Other textile articles (other)	493
TOTAL	108,921
of which cotton articles	86,703

1/ Including alpaca

Source: World Bank (1982: Table 18).

TABLE 19

PERUVIAN QUOTA FULFILLMENT WITH WESTERN EUROPE

	1978		1979		1980		1981		1982	
COUNTRY	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
				Cotton Yarns						
Germany	1723	100.2	1510	100.1	1672	100.0	1491	95.1	--	--
France	1515	97.3	263	99.8	264	100.0	267	95.5	--	--
Italy	200	98.5	1522	99.5	1878	86.7	1534	46.6	--	--
Benelux	400	106.0	302	99.9	305	100.0	307	99.5	--	--
U.K.	50	96.4	51	100.0	52	97.9	53	98.1	--	--
Ireland	95	70.1	195	86.9	197	0.0	197	31.2	--	--
Denmark	267	100.0	307	99.5	307	100.0	308	100.0	--	--
Greece	--	--	--	--	--	10	0.0	--	--	--
TOTAL	4250	98.9	4150	99.2	4675	90.4	4167	74.7	4855	91.8
				Cotton Fabrics						
Germany	751	99.5	738	100.0	592	62.8	595	46.9	--	--
France	228	100.0	229	100.0	230	80.1	231	89.4	--	--
Italy	1265	100.7	1220	99.5	1375	85.6	1079	54.6	--	--
Benelux	353	105.1	305	100.0	356	82.1	307	16.4	--	--
U.K.	74	98.2	75	98.8	76	67.1	78	100.0	--	--
Ireland	0	0.0	66	0.0	66	0.0	67	0.0	--	--
Denmark	112	0.0	133	89.4	114	39.7	114	3.3	--	--
Greece	--	--	--	--	--	11	0.0	--	--	--
TOTAL	2783	96.7	2746	96.9	2809	75.5	2482	48.6	2597	75.1

(1) allotted quota (in tons)

(2) % of quota filled

Source: Paus (1984).

total US textile imports is very small (1.5% in 1980), it is much larger for cotton fabrics and yarns, 6.4% and 4.7%, repectively, in 1980 (see Table A-9). Thus, after the rapid growth of Peruvian exports of those products in 1981 and 1982, the USA established counterveiling duties as of January 1st, 1983: 29% on cotton yarns and fabrics (cotton sheeting and satin) and 38% on clothing. Peruvian cotton exporters to the US renounced export subsidies (CERTEX and FENT) in September 1983, in the hope for a reduction in counterveiling duties. Their action met with success, since counterveiling duties were reduced to 3% for fabrics and 11% for yarns. Nevertheless, during the first half of 1984, other protectionist threats have arisen on the US horizon regarding the establishment of quotas for Peruvian exports of sailcloth (canvas) and cotton serge and of counterveiling duties for cotton floor maps.

Although it is true that Peruvian exports of cotton textiles were adversely affected by exchange rate developments with respect to European currencies in the early 80's and by protectionist actions in the US in 1983, it is also true that Peruvian cotton fabrics are not competitive internatonally - with the exception of cotton sheeting and drill (this will be discussed at length in the next section). Therefore, a revitalization of exports of cotton fabrics in the future has to be achieved not only through the exploration of new markets, through fighting protectionism in the importing countries by whatever diplomatic means possible, but also through increased competitiveness.

The drastic decline in textile exports in 1983 from US$ 281 million to US$ 186 million has in part been the result of the reduced internal cotton supply due to the weather conditions in the cotton growing areas. The textile industry was not allowed to make up for the shortfall of an estimated 20,000 tons of nationally produced cotton through imports with the reasoning that the import of cotton would or could have led to an infection of Peruvian cotton cultivations by the "Gusano Rosado" (Red Worm). However, cotton could have been fumigated prior to importation or

it could have been processed as far as carding and then imported.[1] The fact that it did not happen

allows natural disasters (droughts and flooding) in the cotton sector to spill over into man-made damage for the textile industry.

Exports of alpaca and wool (slivers, yarn, and fabric) have been declining from US$ 38.8 million in 1980 to US$ 12.9 million in 1982,[2] while exports of clothing have increased.[3]

For the last two years lack of liquidity has been an aggravating factor for texile producers selling on the internal or international market. The decline in production, tight monetary policy, and large investments (in some companies) have resulted in a shortage of working capital, financial losses, and foreign debt. According to a recent study of the balance sheets and profit and loss accounts of the industry in 1983, it was noted that the ten largest firms had been losing some S/ - 72,000 million, while the total losses of the industry were estimated at S/ - 150,000 million. The general debt of the textile industry in foreign currency is approximately US$ 150 million. A rescheduling of the debt or its conversion into soles, an extension of FENT loans and a simplication of the red tape necessary to obtain them would alleviate the financial situation of textile producers, and especially of exporters

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(1) It has to be noted that the zone of Puira is already infected with a plague of "Gusano Rosado" and that its arrival cannot be attributed to the importation of raw cotton. This pest can be carried on vegetable seeds and it is thought that the larvae have arrived in Peru in this way. Steps are now being taken to eradicate the plague in Peru.
There has also been a sharp increase in the contamination of Peruvian cotton attributable to farmers re-using their fertilizer bags when gathering the cotton and to the type of plastic material used for the baling of the cotton.

(2) The EEC and Japan are the main customers, but exports to the EEC fell by two thirds between 1980 and 1982.

(3) The figures for garment exports reported by FOPEX seem to be grossly exaggerated and probably include a large percentage of fictitious exports (e.g. 40 million of clothing exports to Panama in 1982.)

who were the main ones to undertake large investments after 1978.

The discontinuity and haphazardness in the policy package of export incentives sent rather conflicting signals to textile exporters. The provision of tariff exemptions on imported capital goods for producers who exported at least 40% of their output, which was introduced in 1978 proved to have a positive impact on exports. This was counteracted, though, by a reduction in CERTEX rates in 1981. The 'admisión temporal' which started in 1977 and allowed for duty-free temporary imports of raw materials and intermediate inputs to be used in the production of export. was not used very much, since entrepreneurs seemed to prefer paying tariffs on regular imports and thus collecting CERTEX on the value of the total output, rather than only on the value added part under the provisions of 'admisión temporal'.

3.1.3. Input Mix

The consumption of textile articles in Peru in 1982 has been estimated at 6,65 kg per person. Roughly half of that corresponded to products made of cotton, less than 10% to wool and alpaca, and the rest to synthetic and artificial fibers.

3.1.3.1. Cotton

Peruvian cotton is of the long (Tanguis) and extra long (Pima, Supima, Del Cerro) variety. Exports of raw cotton declined from 1970 to 1979 and then started increasing again (see Table A-10). The production of extra long staple which is mainly exported stagnated in the second half of the 70's, whereas the production of Tanguis increased during the same period, but with a rising share being sold to domestic textile entrepreneurs, who in turn increased their exports of cotton-based products.

The share of cotton in world fibre demand (based on weight) declined from 68% in 1960 to 49% in 1981.(1) Yet in absolute terms the use of cotton increased at 2% per year between 1971 and 1981.(2) Consumption of long staple cotton has been growing much faster, though, at 5% annually, whereas the use of extra long staple virtually stagnated. Within this scenario of a relative decline of cotton internationally with the exception of long staple cotton which is sold at a premium on the world market, Peruvian producers are clearly making use of the inherent comparative advantage by exporting Tanguis either in raw or processed form. Using the same cotton for the production of nationally consumed textiles, though, is not advantageous, since 80% of the internal requirements could be met by the cheaper short staple cotton.

3.1.3.2. Synthetic Fibers

While synthetic fibre production is basically classified under the chemical industry, it is such a large supplier of raw materials to the

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(1) GATT (1984: Appendix : 37).

(2) World Bank (1982).

textile industry that the two should really be grouped together. The synthetic fibres produced in Peru have accounted for about 80% of the needs of the industry. There are a few types of fibres with special tenacities or special profiles which are not produced in the country and therefore must be imported.(1) Synthetic fibres are protected by a 40% ad valorem import duty. Total apparent consumption of synthetic and artificial fibres has increased during the 70's. It was 19,700 MT in 1979 and with that 1.7 kg per capita (see Table A- 11).(2)

Figure 5 summarizes the key characteristics of synthetic fibre production in Peru. The production of nylon filament (by Manylsa and Mansur) and of acetate (by Rayon & Celanese) constitute the smallest share of synthetic fibres. Demand for them stagnated during the 70's and even declined in recent years, and the perspective for the future is further decreasing demand. The relative and absolute decline of the production of nylon filament and cellulosic fibers (acetate) in Peru is in line with the same trend on a world wide level, where they are increasingly losing out to polyester.

There are four producers of polyester filament in Peru, one of whom (FISA) accounts for 60% of installed capacity. While capacity is sufficient in view of present and future demand, steps have to be taken to rationalize the sector, since the remaining three companies cannot take advantage of economies of scale, resulting in unnecessarily high unit costs of production. In 1982, the price of polyester filament (per kg) in Peru was 128% higher than in the USA and 43% higher than in Western Europe (see Table 20).

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(1) In the case of polyester filament, these are yarns with special characteristics regarding X section tenacity, Denier, etc, which without a lot of costly changes on the machines and changes in the blends of chemicals cannot at present be produced in Peru.

(2) According to World Bank estimates (1982: Table 41) per capita consumption of synthetic fibres in 1979 was 1.8 kg in Colombia, 2.2 kg in Brazil, and 2.3 kg in Argentina.

FIGURE 5

SYNTHETIC FIBRE PRODUCTION IN PERU

PRODUCT	PRODUCERS	CAPACITY	DEMAND	FUTURE OUTLOOK
Filament Polyester	Filamentos Ind. S.A. Manufacturas Nylon Manufacturas del Sur Rayon & Celanese	7,200 1,800 1,200 1,800 12,000	7000 MT/1981, grown at 10% p.a. since 1972, imports of types not available domestically.	stable demand sufficient capacity
Nylon Filament	Manufacturas Nylon Manufacturas del Sur	1,800 1,200	2,456 MT/1980, stagnating since 1972.	declining demand
Polyester Staple	Rayon & Celanese	5,000	3,500 MT/1982, grown at 16% annually since 1972.	has good possibilities in the future, because of fibre characteristics and low price, demand will outgrow supply by 1984.
Acetate	Rayon & Celanese	N.A.	1,300 MT/1981, declining demand	declining demand
Acrylic	Bayer	36,000	10300 MT/1981, roughly one-third of production is expected.	stable

N.A.: Not available.

Source: CHEMTEX (1983), World Bank (1982), and field research.

The fact that productivity in FISA (measured as metric tons per man-year based on capacity) is four times greater than in Manylsa[1], has to be attributed to mainly three factors: a) the larger capacity allowing for higher economies of scale; b) the higher degree of specialization (FISA produces only two types of deniers in contrast to a larger variety by the others); and c) FISA started operations only in 1976 with a minimum number of operators, and thus has a lower relative labor share in costs given Peruvian labor legislation.

Rationalization of the polyester filament sector which has to aim at combining the capacities of the existing companies should also include a higher degree of specialization, and could maybe include the establishment of polymerization operations in Peru. Manylsa bought the necessary equipment in 1976, but it has been stored without being unpacked ever since, because of liquidity problems the company has been having.

The production of polyester staple is undertaken by one company only (Rayon & Celanese). According to projections by Chemtex (1983) demand will outgrow installed capacity by 1984. Given the relatively competitive prices (37% premium over the USA and 17% over Western Europe) an expansion of capacity should be considered.

Acrylic fibres are also produced by only one firm (Bayer) whose installed capacity is nearly twice as large as that of all the other synthetic fibre producers taken together. Bayer is a monopolist for acrylic fibres in the Andean market and exports roughly one-third of its production to the neighboring countries. It produces at comparative cost (see Table 20) without using the 40% tariff protection.

In summary, comparing the different components of the synthetic fibre sector in Peru, polyester filament is the one subsector that needs most attention with respect to restructuring.

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(1) See World Bank (1982: Table 42).

TABLE 20

COSTS OF SYNTHETIC FIBERS
(US $ per Kg)

Item	Denier	Price		% Premium	W. Europe
		Peru	USA		
Polyester Filament	150	4.67	2.05	128	3.26
Polyester Staple	2 a/	2.29	1.67	37	1.96
Nylon Filament	40	5.78	4.95	17	2.96
Acrylic Staple	3 b/	2.54	2.20	16	2.00

a/ 1.5 inches

b/ 2.0 inches

Source: World BAnk (1982).

3.1.3.3. Wool, Alpaca, and Vicuña

These two fibres are the main source of raw material for the worsted and woolen sectors of the textile industry. The wool produced is only of medium fineness of about $56^{s}/58^{s}$ quality with about 10% being slightly finer around 64^{s} quality. (The number indicates roughly the maximum spinability of the fibre). The count of yarn normally spun in Peru is around 40^{s} metric count with several spinners going up to about 52^{s} metric. This seems to be the finest spun by any worsted spinner. Unlike cotton the Peruvian wool is considered rather poor because of poor uniformity. Peruvian tops sell at a discount compared with tops made in other countries such as Uruguay which produces about the same average fineness. Converting local tops into yarn takes considerably more time than other tops on account of the above mentioned facts. This of course means higher costs.

Alpaca produced in Peru is said to account for about 80% of world production. This fibre is more difficult to process in 100% form than wool, and most Peruvian mills do not have the technology needed to produce 100% alpaca. Alpaca is special in that it has a very soft fine handle as compared to most other fibres. It is important to devote more time to improving technology in the production of this fibre in 100% form instead of exporting it to other countries where the transformation in 100% form is carried out very commercially. On top of this lots of young animals are slaughtered at only 2 to 3 weeks of age and their skins are used for making rugs, coats, bed spreads, etc.

Due to the fear that vicuña was becoming extinct the Peruvian government put a ban on the killing of the animal and the export of this fibre. The government is said to be cultivating a large herd of vicuña which is expected at the first skearing to provide 400 tons of fibre, eventually building up to 1,500 tons. Licences are not given to process this fibre, and some companies are said to have vicuña in refrigeration waiting for permission to process it. Some of the fibre is however exported as contraband and used in factories in the developed countries.

Vicuña is said to only grow in Peru and is considered to be the most luxurious fibre in the world.

3.2. Productivity, Technology, and Cost Structure

3.2.1. Competitiveness of the Peruvian Textile Industry

In 1981, Werner International made a comparative study of the textile industry in Peru with that of South Korea, Taiwan, Hong Kong, and Brazil. Although the analysis is based on a limited sample and all data refer only to one point in time (Nov.-Dec. 1980), it is worthwhile to summarize the main results here:

a) Production costs on Peru are on average higher than in the East Asian countries, but lower than in Brazil. (see Table 21).

b) The only items for which costs are similar are cotton sheeting and drill.

c) Productivity in East Asian countries is higher, and wages are lower than in Peru.

d) In contrast to the East Asian countries, Peru has tariffs on imported textile machinery and inputs not produced domestically.

f) In terms of comparative cost structure, Peru has

lower costs in :
- energy and water
- amortization

higher costs in:
- material inputs
- labor
- administrative costs
- financing

As discussed already before, Peru has a comparative advantage in long staple cotton. However, using the more expensive long staple in the production of fabrics for which the cheaper short-staple variety would do, turns the comparative advantage into a comparative disadvantage. Since the East Asian countries don't have any cotton cultivation of their own, they import all cotton and more specifically the cheaper kind. In addition, among the developing countries Taiwan and South Korea are the largest producers of synthetic fibres, and their prices are substantially lower than in Peru or even the industrialized countries.(1)

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(1) According to Werner International (1981: 17) the price of a kg. of polyester (1.5 d., 38 mm) in Dec 1980 was $2.84 in Peru, $2.76 in Brazil, $1.50 in Hong Kong, $1.47 in Taiwan, and $1.45 in South Korea.

TABLE 21

COST COMPARISON* OF TEXTILE PRODUCTS

Products, Material	Peru	Brazil	Hong Kong	Taiwan	South Korea
Print cloth, cotton	71.9	72.5	45.1	44.3	45.8
Sheeting, cotton	120.0	148.2	126.2	123.1	126.9
Sheeting, Poly-cotton	177.0	191.1	109.8	105.3	108.9
Poplin, Cotton	95.3	121.9	74.7	72.4	74.2
Poplin, Poly-cotton	109.1	117.4	57.0	54.6	55.7
Drill, cotton	155.4	293.3	157.8	153.1	156.8

* All costs are quoted in US cents per linear meter. The data refer to Nov./Dec. 1980. The particular specifications for each product are the same for all countries considered.

Source: Werner International (May 1981).

Peruvian productivity in spinning and weaving is the lowest when compared to the East Asian countries, the EEC, and the USA (see Table 22)[1], which when coupled with the higher wages (in comparison with the other developing countries cited) results in unit labor costs higher than in any of the other countries, except for the EEC.

When one looks at the nominal wage per man-year excluding fringe benefits (see Table 23)[2] labor cost in the Peruvian textile industry is higher than in Brazil and Korea, but lower than in Hong Kong and Taiwan. However, higher fringe benefits, relatively fewer work weeks per year and work hours per week mean that the labor cost including fringe benefits per work hour are higher than in any of the other four countries. In addition, none of the other countries have anything comparable to the Peruvian Labor Stability Law, which by making the wage bill basically a fixed rather than a variable cost - results in excessive labor costs in times of economic recession. Productivity (measured as real value added per worker) in the textile and clothing industries grew at an average annual rate of 1.9% between 1971-75, -7.7% between 1975-79, and -.6% between 1979-81 (see Table 8).

Evasion of the Labor Stability Law as well as the non-payment of fringe benefits are among the main factors that explain the growth of the informal sector. The costs of a clothing firm in the formal sector are 30% higher than for an identical firm in the informal sector.[3] And 30% of this difference is accounted for by fringe benefits (social security and related provisions such as the one for time of services).

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(1) It is important to note though, that there is a wide distribution in the productivity performance of Peruvian companies. Productivity in spinning in 1981 for example (measured as kg of yarn produced per operator/hour adjusted to 20 Ne yarn count) was 6.6 for FCA Textil El Amazonas, 10.5 for Textil Piura, 4.5 for La Union, 7.0 for Parcela, 4.5 for Nuevo Mundo, and 6.0 for the sample in the Werner International Study (see World Bank (1982: Table 40)).

(2) The data in Table 23 refer to Dec 1980 and are therefore strongly influenced by the exchange rate reigning at the time.

(3) For a detailed discussion, see the report on the informal sector in this document.

TABLE 22

TEXTILE PRODUCTIVITY IN SPINNING AND WEAVING

Country	Spinning[1] Kg/Op/Hr Ne 20	Weaving[2] Km of Weft/Op/Hr
Peru	6.0	35.8
Brazil	8.2	31.2
Hong Kong	10.4	68.5
Taiwan	9.4	61.8
South Korea	9.1	60.8
EEC	16.5	120.0
USA	23.6	183.0

Labor Cost

Country	Wages[3] U.S. Dollars	Per Kg of Yarn[4]	Per Km of Weft
Peru	2.18	0.36	0.061
Brazil	1.62	0.20	0.052
Hong Kong	1.64	0.16	0.024
Taiwan	1.34	0.14	0.022
South Korea	1.15	0.13	0.019
EEC	7.70	0.47	0.062
USA	6.37	0.27	0.035

1/ Kg. of yarn produced per man-hour adjusted to 20 Ne yarn count.
2/ Km of weft inserted per man-hour.
3/ 1980 in US dollars.
4/ In US dollars.

Source: Gherzi Textil and Werner International, Consultants.
Ne 20 = 20 Hanks of Skeins of a single yarn each 840 yds. long to weigh 1 lb.
Kg/OP/HR Ne 20 = Kilograms/Operator/Hour based on 20/1 Ne.
Km/WFT/OP/HR = Kilometres of yarn put into fabric (across the fabric) per Op/Hr.

TABLE 23

LABOR COST IN THE TEXTILE INDUSTRY

(in US Dollars)

	PERU	BRAZIL	HONG KONG	TAIWAN	SOUTH KOREA
Cost*/worker/year (w/o fr. benef.)	2425	1980	3596	2545	1827
Fringe Benefits (%)	84	81	8	22	50
Cost/worker/year (w. fr. benef.)	4462	3584	3884	3105	2740
Working days/year	280	277	296	289	297
Hours/week	44	48	46.5	48	48
Cost/worker/hour	2.18	1.62	1.64	1.34	1.15

* Cost = Salary

** Fringe benefits - direct costs

(+indirect costs = 130%)

Source: Werner International (1981).

Financial costs in the East Asian countries under consideration are lower than for the Peruvian textile sector due to lower real interest rates.(1)

(1) Werner International(1981) estimates that financial costs in the East Asian countries actually are one fourth of what they are in Peru.

3.2.2. Technological Developments in the Textile Industry - A Short Digression

Internationally, technological developments in the textile and clothing industries during the last 10-15 years have mainly taken two forms:

a) material innovations (advances in synthetic fibre technology)

b) process innovations (improvements in production technologies).

The decline in relative prices of synthetic fibers[1] has to be accounted for by declining unit costs in the production of synthetic fibres which in turn were due to economies of scale and productivity developments. During the 1970's, there were two additional factors with opposite effects on the price of synthetics: the increase in energy prices exerted upward pressure on the price of synthetic fibres, whereas the existence of large excess capacity on an international level had a dampening effect on prices.

Natural fibres (wool and cotton) have not completely given way to man-made fibres, though. While cotton has lost in relative importance in home furnishing and industrial uses, it has maintained its share in clothing (see Table A-12). Given the increased preference in the industrialized countries for 'nature-based' products in recent years, it is likely that cotton will remain an important input for clothing and therefore will remain an important export commodity for countries like Peru.

The technological change that the textile industry worldwide has witnessed during the last two decades has mainly been of an embodied nature. This is true for all elements of the production process from spinning to weaving to finishing. In spinning, the open-end rotors absorb in one process what conventional spinning accomplishes in three (roving, spinning, winding), and is 3-6 times faster than ring-spinning. In weaving, the replacement of the shuttle-loom by the shuttle-

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(1) The ratio of the price of a kg of cotton versus a kg of polyester has increased from 0.23 in 1960 to 1.07 in 1972 to 1.34 in 1978. Subsequently it declined again to 1.0 in 1981. See GATT (1984: Appendix: 37).

less loom and more recently a substitution of the latter by water- or airjet looms (where the weft yarn is transmitted across the weaving shed by air or water pulsed from a nozzle) have increased speeds of the machines by a multiple. Furthermore, since the new looms have a much larger width than the old ones, one can weave on them, what otherwise would be woven on two or three looms. And in the finishing process, a lot of tasks have become completely computerized.

Note that the changes in technology which are principally aimed at higher speeds and the integration of multiple process into single steps, go hand in hand with the advance of man-made fibres vis-à-vis natural fibres and the relative increase of knitted versus woven fabrics. On the one hand, the high speeds demand very specific characteristics of the fibers, so that those can resist the strains and stress of the machines. Natural fibers are ill-adopted to such requirements. On the other hand, productivity levels of knitting machines are still eight times higher than those of the fastest shuttleless loom.

Important technological developments have also taken place in the garment industry, but in contrast to the textile industry they have not yet found widespread introduction into the production process. These include numerically-controlled sewing machines, the mechanization of the picking up and positioning of fabrics, and the replacement of sewing by bonding.

One of the reasons for the massive introduction of new technology in the textile industry, especially in the industrialized countries, has been the increased competition among developed countries as well as from developing countries. An increasing number of the latter have tried to derive further growth and employment from export promotion, and the first manufactured commodities to be exported are textiles. It is doubtful, though, that productivity increases will ever be so large as to compensate for the lower wages in developing countries and so as to lead to a relocation of textile production to the industrialized countries.

On the one hand, textile machinery is freely traded internationally and thus accessible to companies in developing countries. And on the other hand, it is not only productivity increases in the textile industry but also in other industries that will determine the location of this industry, since it is comparative and not absolute advantage that determines trade and degrees of relative specialization. In an analysis of the textile and clothing industries in the world economy GATT (1984: 170/171) comes to the conclusion:

> "Given the international mobility of textile and clothing technology, and the expectation that natural barriers to trade, such as transport and communication costs, are likely to decline, the international competitiveness of textile and/or clothing production at any given location will, even more than in the past, depend on trends in relative costs of the various basic inputs. In other words, textile and clothing production is likely to become more footloose than in the past..... . The trend that low-skill labor intensive industries shift to developing countries may be partially offset by the increasing degree of automation, but it is not likely that differences in wage costs across the entire spectrum of the textile and clothing industries will be fully offset by this development."

3.2.3. Peruvian Productivity Performance Revisited

The reasons for the dismal productivity performance of the Peruvian textile industry (as discussed in 3.2.1. and allowing for all the differences in performance between different firms and different processes) are basically three-fold:

(a) insufficient incorporation of new technology

(b) the existence of X-inefficiencies

(c) the inflexibility in terms of employment due to the Labor Stability Law.

The implications of the Labor Stability Law for productivity and costs have been mentioned already before. Since they are not specific to the textile industry, though, the problem of insufficient labor flexibility has to be addressed on a national level and will be discussed in the last chapter of this document.

Table 24 shows the capacity installed in the textile industry as of 1982 as well as the age of the machinery park. Within the spinning sector open-end rotors account for 1.4% of all spindles, 95% of which are younger than 10 years. In constrast, 50% of traditional ring spindles are older than 20 years and nearly 30% of them are obsolete. The picture in the weaving sector is very similar. Shuttleless looms (the more modern technology) is still a small percentage of total weaving capacity (6.2 %), but 95 % are less than 10 years old. Seventy percent of traditional looms (shuttle looms), however, are older than 10 years, 55% are older than 20 years, and 30% are obsolete.

Thus, investments in machinery in recent years have mainly been directed at the incorporation of new technology (open end rotors and shuttleless looms)[1], whereas investments in previous years predominantly

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(1) In 1980 alone, 439 shuttleless looms were bought (no shuttle looms), and 1,672 rotors (as well as 11,755 wool/acrylic spinning spindles and 49,588 cotton spinning spindles).

TABLE 24

INSTALLED CAPACITY

(end 1982)

	Cotton Sector	Wool Sector	Synthetics Sector	Total
Spindles (short fibre)	645,000	---	---	645,000
Rotors (O-E)	9,840	---	---	9,840
Spindles (long fibre)	---	32,000	23,000	55,000
TOTAL SPINDLES	654,840	32,000	23,000	709,840
Shuttle looms	10,850	150	*	11,000
Shuttleless looms	650	78	*	728
TOTAL LOOMS	11,500	228	*	11,728

* included in cotton and wool sectors

Source: SOMEA (1984: 11).

MACHINERY PARK IN YEARS AS OF 1982

MACHINERY	Fibres	0-5	5-10	10-20	over 20	Obsolete	% Total
Cotton ring spinning	C-S	14%	20%	18%	20%	28%	100%
Open end spinning	C	65%	30%	5%	-	-	100%
Worsted/ woolen spinning	W-S	10%	18%	15%	25%	32%	100%
Shuttleless looms	WCS	70%	25%	5%	-	-	100%
Shuttle looms	WCS	5%	25%	15%	25%	30%	100%

Abbreviations C=Cotton, W=Wool, S=Synthetic

Sources: International Textile Association (Latin-American Textiles 1983) and SOMEA.

consisted of machinery with traditional technology. In addition, it is estimated that half of the machinery installed between 1974 and 1979 was second-hand.

While it is obvious that the modernization process still has ways to go, it must also be pointed out, though, that the goal should never be to have a machinery park consisting of 100 % open-end rotors and 100% shuttleless looms. This is not only a question of a cost-benefit analysis, but also an issue of appropriate technology. Open-end machines for example are most efficient for coarser yarn counts, and thus noils (combing waste) can be used as raw materials. Really fine yarn counts, though, cannot be spun on open-end, and thus to the extent that Peruvian long staple cotton is actually used for high quality products, it has to be spun on traditional ring spindles.(1) Furthermore, the alternatives are not necessarily between a shuttle and a shuttleless loom, because a still well-functioning shuttle loom can be improved substantially in terms of efficiency and productivity through the installation of automatic attachments.

To facilitate the technological up-dating of Peruvian textile machinery, a reduction and unification of import duties for textile equipment should be considered. Tariffs on textile machinery were increased between 1980 and 1982 (see Table 17), and the discrimination between producers for the domestic and for the international market in favor of the latter was maintained. Given the lack of competitiveness of parts of the Peruvian textile industry, the goal should be an improvement in productivity regardless of whether the entrepreneur is exporting or selling domestically. Therefore, producers for the internal market and exporters should have access to imported machinery and material inputs on equal terms.

A final way to increase productivity lies in the elimination of X-inefficiencies, which here is to mean an improvement in productivity through different kinds of measures that are independent of the type

(1) Although technological developments in open-end spinning have made it possible to make finer yarn counts than before, O-E rotors still cannot compete with ring spindles in the area of very fine yarns.

of technology or machinery used. While there is probably a whole variety of factors that could and should be considered in this context only a few will be mentioned here explicitly. One factor is related to the labor force and concerns the high degree of absenteeism and the inflexibility in assigning different tasks to the same workers at different points in time depending on the production requirements. Another factor is the availability of air-conditioning. During our study we found a number of companies who had no air-conditioning at all. Normally during days of high relative humidity in Lima these companies have to completely stop their spinning plants due to the bad conditions in spinning. Other plants have some type of air-conditioning, but have doors and windows open thus defeating the purpose of the exercise. (1) Finally, a very important issue is the lack of specialization, which constitutes a problem in the cotton as well as synthetic fibre sector. A large variety of fabrics and yarn counts results in short runs and therefore lower productivity and lower economies of scale than in the case of greater specialization.

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(1) Under ideal spinning conditions, higher spinning speeds can be obtained, the end-break rate is lower, the working area is much cleaner and healthier, the amount of spinning waste is reduced, and the yarn is better.

3.3. Problems and Policy Recommendations

The textile industry has been one of the most important industrial sectors of the Peruvian economy. It has a longstanding history with all the accumulated knowledge that comes along with it, some companies have started to gather export experience in recent years, and it has a comparative advantage on which to base further export growth. For all these reasons the textile industry has the potential of a promising growth sector in the future. Yet as this report has shown, this potential will not be realized unless the problems identified here are confronted and dealt with adequately and swiftly.

Restructuring of the textile industry means to align the industry more closely with its comparative advantage, thus increasing productivity and lowering unit costs which will lead to renewed growth and employment creation. Future growth of the textile industry cannot be based exclusively on exports on the one hand or increased internal demand on the other hand. Rather, it has to depend on both factors together, whereby the specific characteristics of demand and supply for the domestic market and the international market are different, though. These differences should be recognized and serve as a basis for policy and production decisions.

3.3.1. General Problems

There are a number of problems that do not only affect the textile industry in particular, but rather the industrial sector as a whole. Their solution constitutes part of the overall macro-economic framework necessary for lasting economic growth. Although a discussion of the respective policy options is delegated to the final section of this document, the main general problems should be listed here. They can be summarized in four parts:

(a) variations in the real exchange rate and export incentives creating uncertainties for producers.

(b) the Labor Stability Law which has made part of wage costs a fixed cost and increased training costs due to the high turnover of employees.

(c) the decline in purchasing power of the working population resulting in decreased demand.

(d) competition from the informal sector implying declining demand for the output of the formal textile sector.

3.3.2. Short Term Recommendations

Given the present state of the textile industry immediate measures have to be taken to ensure the survival of still existing companies. If nothing is done in the short run, there will be no need any more for medium-term restructuring policies. Thus, the policies discussed below serve a two-fold purpose: some of them will have an immediate impact to prevent further damage, and others will form part of the basis for successful medium-term restructuring.

Contraband and Imports

Illegal imports (contraband) and not legal imports pose a problem for Peruvian textile producers. Since the inability to control contraband lies at the heart of the matter, it is recommended to prohibit the imports of all textile products manufactured in Peru itself for a period of 3 - 6 months. While such a policy is clearly suboptimal from an efficiency point of view, it seems to be the only way in which contraband can be controlled in the short run. If such a measure is implemented, it must be made absolutely clear to all parties concerned that this is only a temporary measure which will be revoked subsequently.

Imports of textile machinery and inputs not produced domestically should not only be maintained, but they should be allowed free of duty to facilitate ongoing modernization and a reduction in the costs of production.

Exporters and producers for the internal market should be treated equally in their access to these duty-free materials.

Cotton supply

Should there be another shortfall in this year's cotton harvest, it is absolutely essential to allow imports of cotton to fill the gap between demand and supply. Sufficient availability of raw material is a necessary condition for continuing textile production, and it is well-known that potential problems of contamination can be controlled through fumigation or other measures. This is obviously not only a short term recommendation, since cotton imports should be allowed always and automatically, whenever there is a shortfall in domestic supply.

Cotton farmers should be forbidden to use bags made of polypropylene or polyethylene for the gathering of the fibre. That would reduce the risk of contamination and lower costs in spinning blow rooms, where automatic loading cannot be carried out without first checking the cotton for contamination.

Financial Situation

Given the precarious financial situation of many textile companies due to the lack of working capital and/or high foreign debt, additional credit lines should be made available and foreign debt should be rescheduled or converted into soles. Provision of credit at preferential interest rates could be coupled with certain stipulations depending on the type of enterprise (e.g. a certain quantity of exports for predominantly exporting companies, steps towards rationalization for the three companies producing polyester filament, etc.).

Provision of Information

Access to information about technological changes, marketing, foreign markets, change in fashions etc. is crucial for potential and actual exporters. The efforts that FOPEX has been starting to make in this respect should be greatly intensified. Participation in international fairs could initially be subsidized. Special attention should be paid to medium- and small-sized companies since their lack of information and fear to face the uncertainties of international trade are normally substantially larger. Peru should join international bodies like the International Cotton Institute [1] (organization of cotton growing countries), which is extremely helpful in the provision of technical advise as well as information on trends for cotton use according to different endproducts and markets.

Since it will take time to build up and institutionalize mechanisms for a speedy and continuous transmission of technical and marketing infor-

(1) So far Brazil is the only Latin American country who is a member of the International Cotton Institute.

mation, such an effort should be initiated as soon as possible.

Furthermore, feasibility studies should be initiated now concerning some of the policies suggested below for medium-term restructuring of the industry.

3.3.3. Medium Term Recommendations

There are three major issues that have to be addressed in the medium run: the alignment of inputs used with their comparative advantage, the improvement of productivity, and the control of contraband.

Inputs

a) Cotton

The comparative advantage that Peru possesses lies in long staple cotton. In contrast to short staple cotton, Tanguis and Pima can be spun to yarns of very high fineness which in turn are used for fabrics of high quality. For this reason long staple cotton is sold at a premium on the international market, and finer yarns and higher quality fabrics are sold at a comparatively higher price, too. On the other hand, average quality clothing and many industrial textile products can be produced with coarser yarns made from the cheaper short staple cotton. Using long staple cotton for these purposes is therefore a clear misallocation of resources.

It is strongly recommended to export (nearly) all long staple cotton in raw or processed form and satisfy a large percentage of internal requirements with short staple cotton. As a result export earnings would increase (even if all short staple cotton were imported, the result would still be a net gain of foreign exchange), and the price of domestic textile products would fall due to lower inputs costs. Before discussing the various aspects of this policy recommendation in greater detail, it has to be pointed out that such a strategy can be implemented successfully as has been shown by Egypt. Some years ago Egypt has started to reserve its long staple cotton for export and use imported short staple cotton for the production of most domestically consumed commodities.

There are at least three crucial questions to be answered in the context of this strategy:

(1) At which stage of processing should the long staple cotton be exported?

(2) Where should it be exported to?

(3) Where is the short staple cotton to come from?

Obviously all long staple cotton could be exported in raw form. This would be the least desirable option though, since domestic value added would be minimal. The higher the domestic value added content, the greater the benefits in terms of employment, income generation, etc. However, it is also true that the requirements in terms of quality, design etc. to meet international demand increase with the degree of processing.

The yarn has to be of a good quality to capture the premium on the world market. If the quality is poor, it will sell at a discount regardless of the fact that it is made of long fibres. Fabrics, too, have to be of a good quality, but in addition they have to meet the ever changing tastes and fashions, which means that producers have to have information regarding those developments and they have to be flexible and quick enough to react to them. Therefore, quality control and knowledge of market trends are necessary prerequisites to exporting cotton at a higher stage of processing. Furthermore, a flexible response will be facilitated if administrative procedures are reduced in time and volume.

Expanding exports of cotton-based products might run into potential and existing import restrictions by the industrialized countries in the form of quotas (MFA) and/or counterveiling duties. To circumvent these barriers as much as possible several parallel steps are necessary: a) fight protectionism by whichever diplomatic means in whichever international forum possible (this is obviously a long term

strategy which might or might not meet with success), b) use existing quotas to the very limit (it is very important that Peru fills the quotas with the EEC in order to prevent a possible invocation of the anti-surge procedure provided for under MFA III), c) constantly explore new markets (e.g. Canada, Sweden, Austria, Switzerland do not impose quantitative import restrictions and the incipient exports of textiles to the Soviet Union in repayment of part of the foreign debt might form a basis for a longer term trade relation), and d) try to upgrade textile products and consciously target high income consumers. To do so, is not only a question of quality and knowledge - as discussed above - but also of marketing, of access to these rather specialized markets. Contracts with international clothing companies or manufacturing on order (subcontracting) might not only be a desirable, but rather a necessary step to take.

There are two alternative ways to supply domestic textile producers with short staple cotton: either to import it or to cultivate it domestically. It is suggested here that imports are allowed (duty-free) barring the risk of infestation with available and appropriate measures. At the same time a feasibility study should determine where, how, and how much, short staple cotton can be grown in Peru itself. If it is possible to grow short staple cotton at world market prices, imports should be stopped once domestic supply is sufficient. Short staple cotton cultivation should not substitute for long staple, though, since the latter is more valuable. As long as international demand and adequate land for growing high quality cotton are available, it will be economically sound for Peru to export long staple cotton, while importing short staple cotton for part of the local market.

b) Synthetic Fibres

The production of synthetic filament should be rationalized. One possibility would be to merge the three smaller companies on one site thus enabling them to take advantage of economies of scale.

Serious considerations should be given to the establishment of polymerisation processing in Peru, especially since the equipment has already been bought by Manylsa. According to a study by Chemtex, if the plant were installed with an offshoot of it producing plastic bottles, it would be much more viable.

c) Wool

A detailed study should be done on the sheep farming methods used in Peru. It would obviously be better if Peruvian sheep farmers could raise animals that produced more uniform, finer types of wool than is currently being produced. This would eventually lead to Peruvian wools being sold at good market prices not discounted as at present, and it would permit the textile industry to produce finer cloths with a much higher value added. This is obviously a longterm strategy, since it would take many years of breeding and cross-breeding.

Improvement of Productivity

Various ways to improve productivity were discussed before under 3.2.3. They have to be carried out on a company basis, and there is very little the government can do except for the provision of technical assistance and information. Thought should be given to setting up an advanced technical college, which would fill the gap between SENATI and the universities. This would permit technical and some practical formation of technicians for the textile and other industries. The gap between SENATI and the universities is far two great, and the aim of a technical college would be to turn out individuals who are capable of doing machinery and production calculations, supervising a section or sections with the possibility of becoming junior line managers. The formula is well tried in the developed countries of the world and has enormous potential.

Contraband and Imports

In the medium term, import prohibitions have to be lifted and contraband should be effectively controlled by mechanisms devised in the meantime. These should include the setting up of a quality control section to check the imports of textile goods in the customs areas of Callao and Iquitos. This section should have the facilities of a fully equipped laboratory, where they could take a cut length from every bale of cloth in consignment and check for construction warp, weft, number of ends, counts of

yarn for type, fibre, count, resistance, regularity ensuring that this is according to specifications. In addition, they could be responsible for issuing export certificates which are needed in many importing countries. A logical follow-up to this would be to establish a laboratory testing service based on the lines of the Bradford conditioning house, Shirley Institute, etc., whose findings are accepted for judgement in most countries in the world.

TABLE A-4

Apparent Consumption of Textile Fibers
(Thousand Metric Tons) 1/

	1973	1974	1975	1976	1977	1978	1979	1981
Cotton								
Yarn Production	31.1	32.0	35.1	37.0	42.4	46.4	51.7	47.8
Export[2]	(1.3)	(3.2)	(0.9)	(2.4)	(10.0)	(15.5)	(18.1)	(33.0)
Import[2]	--	--	0.3	0.3	--	--	--	--
Apparent Consumption	29.8	28.8	34.5	34.8	32.4	30.1	33.6	24.6
Synthetic & Artificial Fibers								
Production	15.4	19.2	21.1	27.1	24.8	26.1	29.1	32.0
Export[3]	(2.3)	(2.3)	(1.2)	(5.2)	(8.4)	(10.7)	(10.4)	(10.3)
Import[3]	7.7	3.6	3.5	2.4	2.4	2.4	--	3.7
Apparent Mill Consumption	20.8	20.5	23.4	24.3	19.2	17.7	18.7	25
Wool & Alpaca								
Production	4.8	5.2	5.2	6.6	6.5	6.7	6.7	6.8
Export[4]	(2.6)	(1.6)	(1.5)	(2.1)	(2.3)	(2.4)	(2.5)	(2.6)
Import[4]	--	--	0.8	--	--	--	--	--
Apparent Consumption	2.2	3.6	4.5	4.5	4.2	4.3	4.2	4.2
Garments								
Export	--	--	--	--	--	(0.2)	(0.4)	(1.5)
Import	0.1	0.1	0.1	0.1	0.1	--	--	2.0
Other Exports	(2.0)	(2.5)	(1.6)	(2.0)	(2.2)	(2.4)	(2.6)	(3.1)
Other Imports	1.3	2.2	8.0	3.8	0.7	0.6	3.8	4.5
Total Apparent Consumption	51.2	52.7	68.9	64.5	54.4	50.3	57.5	57.
Population[5]	14.9	15.3	15.7	16.1	16.5	16.9	17.3	18.0
Apparent Consumption 6/7/	3.4	3.4	4.4	4.0	3.3	3.0	3.3	3.2

1/ Excluding jute and hard fibers
2/ Yarn and fabrics
3/ Staple and continuous filament
4/ Tops, yarn and fabrics
5/ Million
6/ Kg/capita
7/ 1977, 1978 and 1979 data for wool products and garments partially estimated

Source: World Bank (1982: Table 6B).

TABLE A-5

AVERAGE TARIFF LEVELS IN THE TEXTILE SECTOR: 21 DEVELOPING MARKETS IN THE EARLY 1980s[a]

(Percentages)

Markets (date of tariff)	TEXTILES AND CLOTHING	FIBRES					YARNS					FABRICS					MADE-UP ARTICLES			CLOTHING
		All	Wool	Cotton	Man-Made	Other	All	Wool	Cotton	Man-Made	Other	All	Wool	Cotton	Man-Made	Other	All	Industrial[b]	Other	
Argentina (1982)	37	27	25	30	37	24	37	38	38	33	36	39	37	39	38	38	35	35	37	38
Brazil (1981)	78	46	25	55	55	51	60	55	85	54	68	99	105	105	102	95	85	69	102	102
Colombia (1982)	64	32	27	19	37	32	50	66	66	43	60	83	90	76	62	92	77	60	97	98
Egypt (1982)	97[c]	15[c]	10	8	28	9[c]	56	60	63	64	47	111	125	125	102	110	96	83	120	145
India (1983)	86[c]	66[c]	60	60	140	55[d]	84[c]	60	60	160[d]	71[d]	97[c]	100	73	100	107[d]	91	93	100	100[d,e,f]
Israel (1982)	12[c]	2[c]	2[e]	0	3[d,f]	2	10[c]	9[f]	10[f]	12[d,e,f]	8	15[c]	16[c]	16[c]	15[d,e]	15[d,e,g]	12[c]	11[d,e,g]	10[d]	16[d,e,f]
Korea, Rep. of (1982)	36	15	27	12	30	24	30	30	30	30	30	49	50	50	46	50	47	45	50	50
Malaysia (1981)	22[c]	0	0	0	0	0	9[c]	6	15[f]	11[f]	4	30	28	33	32	28	29	23	32	27
Mexico (1983)	37[c]	14[c]	9	9	26	8[h]	22	10	10	28	14	39	43	32	35	43	42	35	62	84
Morocco (1982)	78[c]	23[c]	23	32	22	20[i]	64	41	41	51	46	109	107	100	113	112	95	67	150	94
Nigeria (1983)	54[c]	29[c]	10[f]	21	50[d,f]	34[c]	49[c]	42	52[c]	57[c]	60[c]	79[c]	100[c]	107[c,f]	53[c,f]	75[c,f]	49[c]	46[c,f]	48[c,f,h]	60[c]
Pakistan (1981)	128[c]	33[c]	31[f]	45	..[j]	32	65[c]	52[f]	85	70[f]	69[f]	130	102	91	157	127	110	92	131	102
Peru (1982)	54	34	37	31	38	38	56	60	60	51	59	59	60	60	58	59	55	53	58	60
Philippines (1982)	47	22	20	13	23	21	31	30	32	31	33	40	40	36	35	46	36	30	69	69
Singapore (1983)	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Spain (1983)	30[c]	10[c]	9	13	16	9[f]	20[c]	19	24	19	20[f]	30[c]	28	22	34	28[f]	29[c]	27[f]	30[f]	36
Sri Lanka (1983)	60[c]	25[c]	35	6	9	42[c]	27	35	17	22	48	41[c]	60	37	24	60[c]	64[c]	65[c]	103[c]	98[c]
Taiwan (1983)	60[c]	22	28	1[f]	34	21	39	50	23	34	47	64[c]	85	69[c]	61[c]	67[c]	72[c]	69[c]	79[c]	131
Thailand (1981)	53[c]	24[c]	30	..[f]	20[c]	23	24[c]	30	25[c]	20[c]	23	70[c]	80	80[c]	80[c]	65[c]	49[c]	40[c]	71[c]	90[c]
Tunisia (1981)	31	6	11	2	0	8	9	18	19	6	5	37	39	34	41	37	49	30	83	45
Yugoslavia (1980)	15	7	3	1	23	5	12	8	11	14	10	18	19	18	18	18	15	14	20	20

[a] Estimates.

[b] Unweighted averages of ad valorem duties, as per the latest available tariff schedule. A definition of the product classification used can be found in the Technical Notes.

[b] Mainly products for industrial use: BTN Nos. 58.05-07.09,10; 59.01-06,10,12,16-17.

[c] The tariff rate on old clothing (BTN No. 62.01), which is variable, has not been included in calculating this average.

[d] In addition to the ad valorem rates averaged, there are specific duties (not considered here): on 2/12 tariff lines for other fibres, 5/5 for man-made yarns, 5/17 for other yarns, and 2/18 for other fabrics, in India; and on 5/13 tariff lines for man-made fibres, 5/10 for wool yarn, 7/39 for man-made yarn, 2/10 for man-made fabrics, 7/53 for industrial made-up articles, 5/20 for other made-up articles, and 31/55 for clothing, in Israel.

[e] When the yield is higher, the ad valorem duties averaged here are replaced by specific duties (not considered): on 2/9 tariff lines for wool fibre, 11/39 for man-made yarn, 3/11 for other yarns, 2/3 for wool fabrics, 2/6 for cotton fabrics, 2/10 man-made fabrics, 18/34 for other fabrics, 14/53 for industrial made-up articles, and 3/55 for clothing, in Israel; on 1/5 tariff lines for man-made fibres, 2/12 for other fibres, 6/6 for cotton yarn, 10/11 for man-made yarns, 2/9 for other yarns, 2/2 for wool fabrics, 4/6 for cotton fabrics, 2/6 for man-made fabrics, 13/19 for other fabrics, 12/36 for industrial made-up articles, 3/17 for other made-up articles, and 17/32 for clothing, in Nigeria; on 1/16 for other fibres, 4/26 for other fabrics, 6/26 for industrial made-up articles, 26/32 for other made-up articles, and 91/95 for clothing, in Sri Lanka; on 6/16 tariff lines for cotton yarn, 3/11 for man-made yarn, 13/31 for other yarns, 3/91 for industrial made-up articles, and 2/49 other made-up articles, in Taiwan; and on 4/4 tariff lines for man-made fibres, 2/2 for cotton yarn, 2/5 for man-made yarns, 3/3 for cotton fabrics, 2/2 for man-made fabrics, 4/12 for other fabrics, 5/19 for industrial made-up articles, 4/8 for other made-up articles, and 11/25 for clothing, in Thailand.

[f] Only tariffs in those lines subject to ad valorem rates have been averaged here, without considering the lines subject to specific duties. Specific duties are applicable: to 3/13 tariff lines for man-made fibres, 1/3 for cotton yarn, 1/39 for man-made yarn, 1/10 for man-made fabrics, 4/34 for other fabrics, 2/55 for clothing, in Israel; to 18/24 tariff lines for cotton yarn, and 8/35 for man-made yarn, in Malaysia; to 3/5 tariff lines for wool fibres, 4/5 for man-made fibres, 1/6 for cotton fabrics, 2/6 for man-made fabrics, 1/19 for other fabrics, 2/34 for industrial made-up articles, and 3/17 for other made-up articles, in Nigeria; to 1/10 tariff lines for wool fibre, 4/16 for wool yarn, 60/61 for man-made fibres and 1/16 for other yarns, in Pakistan; and to 1/36 tariff lines for other fibres, 1/31 for other yarns, 4/59 for other fabrics, and 2/54 for industrial made-up articles, in Spain.

[g] Specific duties are levied on top of the ad valorem rates averaged, which are also replaced by other specific duties when the yield is higher: on 3/4 tariff lines for other fabrics, and 1/51 for industrial made-up articles, in Israel.

[h] Tariff rates have not been included, due to lack of consistent information, on the whole BTN chapter 63 for Morocco's other fibres, and on 2/17 tariff lines of Nigeria's other made-up articles.

[i] No ad valorem duty is applicable: to man-made fibres (17 tariff lines) in Pakistan, and to cotton fibre (4 tariff lines) in Thailand.

[j] Duties on sacks and bags (BTN No 62.03), which are either specific or variable, have not been included.

Source: GATT (1984: 126).

TABLE A-6

NON-TARIFF MEASURES ON IMPORTS OF TEXTILES AND CLOTHING REPORTED BY 22 DEVELOPING MARKETS (END-1983 OR NEAREST DATE)[a]

(Number of BTN 4-digit positions affected)

	Type of BTN[b]	FIBRES				YARNS				FABRICS				MADE-UPS		CLOTHING[c]
		Wool [5]	Cotton [4]	Man-made [4]	Other [11]	Wool [5]	Cotton [2]	Man-made [5]	Other [8]	Wool [2]	Cotton [3]	Man-made [2]	Other [12]	Industrial [17]	Other [8]	[15]
Argentina	L	.	.	.	.	1	1	2	.	2	3	1•(1)	5•(1)	8	8	15
Brazil	S	3•(1)	.	.	1•(4)	5	2	3	5•(1)	2	3	1•(1)	9•(1)	16•(1)	8	15
	LS	5	4	4	10	5	2	3•(2)	6•(2)	2	3	1•(1)	12	13•(3)	7•(1)	15
Colombia	L	5	4	4	11	5	2	5	8	2	3	2	12	17	8	15
Hong Kong		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
India	L	1	.	2•(2)	.	.	2	(5)	.	.	.	.	.	.	.	.
	ST	.	.	(2)	.	.	.	(5)	.	.	.	.	.	.	.	.
	P	2	.	(2)	.	3	.	(5)	.	1	3	2	5	5	8	15
Israel	L	.	.	(3)	.	(4)	1	(2)	.	1	1	2	1	1	.	.
Korea, Rep.	R	.	.	(3)	(2)	.	.	(2)	1•(1)	(2)	.	.	1•(3)	(1)	1•(2)	5•(2)
Macao		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Malaysia		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Mexico	L	1	.	1	1•(1)	3	2	2•(1)	.	1	3	1•(1)	1•(4)	1•(11)	5•(3)	8•(3)
Nigeria	L	.	.	.	4	.	2	5	.	.	.	.	.	(1)	1•(3)	2
	P	.	.	.	.	.	.	.	.	2	3	2	11•(1)	7•(3)	4•(1)	6•(1)
Pakistan	L	5	4	3	9•(2)	5	2	(5)	7•(1)	(1)	(1)	(2)	(5)	5•(7)	(2)	(2)
	P	.	.	1	(2)	.	.	(5)	(1)	1•(1)	2•(1)	(2)	7•(5)	5•(7)	6•(2)	13•(2)
Peru	P	.	4	.	.	.	.	.	.	.	.	.	.	.	.	.
Philippines	LS	.	.	.	.	.	.	.	.	2	2•(1)	2	7	.	.	.
	P	.	1	.	2	.	.	.	.	.	.	.	.	(1)	5•(1)	14
Portugal	L	1	1	1•(2)	2	5	1	3•(2)	3•(2)	2	3	2	12	16•(1)	7•(1)	14•(1)
Singapore		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Spain	L	.	.	.	(1)	.	.	.	.	.	.	.	.	.	.	.
	ST	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.
	Q	.	1	.	3•(1)	.	2	2	5	.	3	2	8•(2)	6•(7)	7•(1)	10•(3)
Sri Lanka	L	.	.	.	2	.	2	.	1	2	3	2	7	.	.	1
Thailand	L	.	.	.	1	.	.	.	1	.	.	.	1	.	(1)	.
Tunisia	L	2•(1)	2	2	9	.	.	1	5•(1)	.	.	.	2	4•(2)	.	.
	Q	.	.	.	1	.	.	.	.	1	2	2	5	.	1	12
	P	2•(1)	2	2	1	5	2	4	2•(1)	1	1	.	5	11•(2)	7	3
Turkey	L	1	.	.	.	.	.	2	.	.	1	(1)	.	3•(4)	.	.
	P	4	4	4	11	5	2	3	8	2	2	1•(1)	12	10•(4)	8	15
Yugoslavia	Q	.	.	(1)	.	1	.	1	.	1	3	1•(1)	(3)	(2)	4•(1)	(8)

[a] This table shows, for each heading (wool fibres, cotton fibres, and so on), the number of BTN 4-digit positions which are affected by one or another type of NTM (those only partly affected are shown between brackets). The total number of BTN 4-digit positions within each heading is indicated between [ ]; the exact content of the headings can be found in the Technical Notes.

[b] S = Surcharge; L = Licensing (any); ST = State trading; Q = Quota; LS = Licences/permits suspended; P = Prohibition; R = Restriction (type unknown).

[c] Including headgear and parts thereof (BTN Chapter 65).

Source: GATT (1984: 128).

TABLE A-7

EXPORTS OF COTTON YARNS BY DESTINATION; 1980-1982

(US $ FOB and %)

	1980	%	1981	%	1982	%
CEE	19,535,001	53%	14,170,608	68%	19,610,000	37%
Alemania	9,341,896	--	6,402,758	--	7,554,735	--
Italy	5,054,439	--	2,885,549	--	8,285,910	--
USA	1,054,439	4%	7,693,014	--	13,300,614	--
Canada	95,136	--	7,693,014	20%	13,300,614	25%
Sweden	3,493,733	10%	3,893,132	10%	4,150,206	8%
Austria	1,925,229	5%	1,922,685	5%	1,268,394	2%
Switzerland	3,888,417	11%	2,192,345	6%	1,223,547	2%
Others	6,231,821	17%	9,305,098	24%	10,600,000	20%
TOTAL	36,673,597	100%	37,539,354	100%	53,433,437	100%

Source: FOPEX

TABLE A-8

EXPORTS OF COTTON FABRICS BY DESTINATION, 1980-1982

(US $ FOB and %)

	1980	%	1981	%	1982	%
USA	32,528,096	77	41,166,024	79	57,988,000	76
CEE	7,075,547	17	4,672,067	91	11,763,764	16
GERMANY	1,114,324	3	907,684	2	3,245,200	4
ITALY	3,972,082	9	2,659,795	5	5,836,800	8
FRANCE	569,698	1	525,728	1	1,503,764	2
BENELUX	150,654	3	--	-	53,200	-
LOWER COUNTRIES	922,263	3	304,444	-	608,000	-
U.K.	264,254	-	262,291	-	516,800	-
IRELAND	--	-	--	-	--	-
DENMARK	82,272	-	12,125	-	--	-
OTHERS	2,474,839	6	6,346,880	12	6,049,600	8
TOTAL	42,078,482	100%	52,124,971	100%	75,801,364	100%

Source: FOPEX

TABLE A-9

SHARE OF WORLD TEXTILE MARKET

SELECTED LDC's IN TEXTILE IMPORTS

OF US; EEC, AND JAPAN

I. Total Textile Imports

	EEC		US		JAPAN	
LDC Exp.	1973	1980	1973	1980	1973	1980
India	4.0	4.8	4.3	5.3	2.2	0.9
Hong Kong	3.8	2.1	6.5	5.3	3.1	0.3
South Korea	1.2	2.1	1.5	5.1	14.6	22.7
Brazil	3.2	3.1	1.9	3.9	0.9	0.5
Colombia	0.7	0.6	0.8	1.0	0.3	--
P.R. China	2.3	3.9	0.7	6.0	7.8	15.9
PERU	0.04	0.5	0.08	1.54	0.05	0.013

II. Imports of Cotton Fabrics

	EEC		US		JAPAN	
LDC Exp.	1973	1980	1973	1980	1973	1980
India	10.9	7.0	10.7	7.6	6.4	2.9
Hong Kong	8.7	4.6	21.1	17.6	5.0	0.2
South Korea	1.2	2.4	1.6	6.2	11.6	8.6
Brazil	5.1	3.5	2.9	1.0	1.8	0.01
Colombia	0.9	1.1	2.3	2.8	0.8	---
P.R. China	5.8	7.1	2.3	10.3	17.6	39.9
PERU	0.07	0.4	0.26	6.4	0.08	0.009

III. Imports of Cotton Yarns

	EEC		US		JAPAN	
LDC Exp.	1973	1980	1973	1980	1973	1980
India	1.9	0.9	--	--	0.7	0.01
Hong Kong	1.9	0.2	0.01	0.01	1.1	0.01
South Korea	0.1	0.2	0.2	1.7	22.7	77.2
Brazil	13.2	10.5	25.0	0.4	0.4	1.9
Colombia	3.8	2.7	10.0	0.2	0.1	--
P.R. China	0.4	0.9	--	0.2	4.7	2.8
PERU	0.03	1.5	0.14	4.7	0.04	0.4

Source: Paus (1984).

TABLE A-10

PRODUCTION, DOMESTIC AND EXPORT SALES OF COTTON

YEAR	PRODUCTION	EXPORT	DOMESTIC SALES
1970	91.5 (32.2)	66.9 (25.1)[1]	22.3 (2.1)
1971	81.7 (26.0)	50.8 (28.1)	29.1 (2.3)
1972	75.7 (16.2)	49.9 (22.8)	32.5 (1.9)
1973	81.5 (29.7)	46.95 (30.1)	31.4 (2.1)
1974	90.0 (30.6)	47.6 (24.7)	40.3 (1.7)
1975	72.4 (23.4)	36.6 (20.3)	25.5
1976	56.8 (19.8)	35.7 (28.8)	39.6 (5.1)
1977	57.7 (15.9)	21.2 (15.5)	42.5 (3.8)
1978	76.2 (20.1)	18.1 (12.8)	56.3 (5.7)
1979	92.9 (23.6)	20.0 (15.2)	56.1 (4.0)
1980	97.9 (22.5)	32.2 (16.0)	52.9 (6.4)
1981	110.7 (18.5)	31.5 (9.8)	51.2 (3.5)

1/ Extra long staple, PIMA, SUPIMA and DEL CERRO, in parentheses.

Source: World Bank (1982).

TABLE A-11

APPARENT CONSUMPTION OF SYNTHETIC AND ARTIFICIAL FIBERS

	1979	1980	1981
		POLYESTER FILAMENT	
RayCel	1.3	0.7	0.4
FISA	2.0	3.4	4.1
Manylsa	1.1	1.0	0.8
ManSur	0.4	0.6	0.5
Imports	--	1.2	2.7
Apparent Consumption	4.9	7.0	8.6
		POLYESTER STAPLE	
RayCel	2.1	2.1	2.4
Imports	--	--	1.0
Apparent Consumption	2.1	2.1	3.4
		ACETATE	
RayCel	1.3	1.5	1.3
Export	0.3	0.3	--
Apparent Consumption	1.0	1.2	1.3
		ACRYLIC	
Bayer	19.8	18.7	20.5
Exports	10.4	7.4	10.3
Apparent Consumption	9.4	11.3	10.2
		NYLON FILAMENT	
Manylsa	1.2	1.1	1.0
ManSur	1.1	1.0	0.9
Apparent Consumption	2.3	2.1	1.9
TOTAL APPARENT CONSUMPTION	19.7	23.7	25.4

Source: World Bank (1982: Table 5).

TABLE A-12

FIBRE CONSUMPTION IN THE MAIN END-USES

(Based on weight - %)

A. EEC[a]

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

B. UNITED STATES

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

[a] Excluding Denmark, Ireland and Greece.

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

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

[d] Includes film and spunbonded polypropylene from 1978.

Source: GATT (1984: Appendix: 38)

4. Capital Goods for the Mining Sector

This chapter presents the results of an investigation of the industrial sector for the manufacturing of mining machinery and equipment. It is restricted to capital goods for the mining sector and covers all consecutive steps from exploration to mining to metallurgy (ore benefication to obtain ore concentrate). The study does not, however, consider capital goods for smelting and refining which are completely different items. For the sake of analytical transparency and to catch the obvious differences in type of capital goods and performance standards of firms operating on different scales of production, the following subgroups are considered,

- large scale mining
- medium scale mining
- small scale mining
- artisan mining (peasant mining on a very small scale).

In a first step some prominent features of the capital goods market are given. Since the demand for capital goods is a derivative of the developments in the mining sector, its present situation and future prospects have to be outlined briefly. Then the actual role and the future possibilities of Peruvian suppliers of capital goods are analyzed within this context.

4.1. Mining Production

The Peruvian mining sector contributed about S./ 29,982 million (in 1970 prices) to GDP in 1983, which implies a decline of about 8% from the 1982 level and even a decline, if the low basis of 1981 (30,616 Mill.) is taken as a reference (see Table 25). This result has to be attributed mostly to the decline in copper production of about 8% (see Table 26).(1) During the first half of 1984, the absence of labour disputes permitted a 15% increase of output at SPCC (Southern Peruvian Copper Corporation), and the producers are optimistic now that there will be a substancial production increase in 1984.(2) However, the prospects for the mining sector are gloomy in the short and medium run. This is especially true for lead, iron ore, and copper production. Mine output with recoverable copper content, for example, was 322,000 tons in 1983 but capacity is estimated at 422,000 tons, and the average production costs in 1983 were still US $0.10 / lb. above the world market price.(3) Iron ore production decreased by about 26% in 1983. This decline was also partly due to a major labor conflict (40 days of strike). But that lacking demand appears to be a more valid economic explanation becomes very clear, if the planned production increase of only 16% in 1984 is taken into account.

Despite the fact that there still exist worldwide excess capacities in the most important mining products, a considerable number of capacity expanding projects is under way. According to the Commodities Research Unit (CRU) almost 400 new mining projects or expansion plans might come on-stream world-wide in the next eight years for the production of copper, bauxite, lead, zinc, silver, nickel, molybdenium, iron ore, uranium, and gold. Out

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(1) Mining production in 1983 was heavily influenced by strikes. Nevertheless, world market demand possibly had a major impact, too, so that production losses cannot simply be attributed to the smaller number of work days caused by labour disputes.

(2) However, bad weather conditions caused production shortfalls at Mineroperu and Centromin in July, and the La Oroya lead mines were paralyzed by strikes.

(3) See: Peru, Lloyds Bank Group Economic Report 1984, pp. 11 and EIU, Quarterly Economic Review of Peru, Annual Supplement 1984, p.9.

TABLE 25

Gross Domestic Product by Sector: 1973-1983
(Million of 1970 Soles)

	1973	1974	1975*	1976*	1977**	1978**	1979**	1980**	1981**	1982**	1983**
Agriculture	38,536	39,422	39,816	41,130	41,130	39,896	41,125	38,918	43,900	45,525	41,454
Fishing	2,276	3,093	3,623	3,145	2,972	3,867	4,235	4,017	3,523	3,452	2,071
Mining	20,276	21,026	18,734	20,401	25,952	29,871	32,948	32,025	30,616	32,483	29,982
Manufacturing	71,595	76,965	80,582	83,966	78,508	75,682	78,634	82,802	82,719	80,486	66,642
Construction	13,055	15,927	18,603	18,082	16,690	14,003	14,521	17,257	19,156	19,597	15,423
Government	22,557	23,076	24,114	24,596	25,285	25,159	25,033	25,420	26,015	26,535	27,066
Others	116,089	124,370	129,557	132,239	129,192	125,505	129,342	135,174	140,041	140,317	124,235
Gross Domestic Product	284,384	303,879	314,029	323,559	319,729	313,983	325,838	335,613	345,970	348,395	306,873

* Preliminary: Instituto Nacional de Estadística.

** Preliminary: Banco Central de Reserva del Perú.

Source: Banco Central de Reserva del Perú, Memoria 1982.

of these, 125 projects are in the copper sector, and the majority of the new production units will have started before 1988. Given these prospects and the still existing capacities in Peru, it appears to be economically sound that a number of expansion plans were postponed or even stopped recently (see Figure 6). Among the most important ones are the Cerro Verde II project, Toromacho (copper), Madre de Dios (gold) and Jatumhuasi (coal). Other mines affected by the cutbacks are Cuajone and Toquepala.

With respect to the distribution of capacities between large, medium and small scale producers (see Table 27), 1983 data show that copper production is predominantly undertaken in large scale units (89.3%) while medium scale producers are important in the mining of lead (52.7%), zinc (54.4%) and silver (64.7%). Small scale and artesan activities together range from 4.2% in the copper sector to 9.7% in lead mining. Although they do no play an important role in terms of output, they are relatively stronger in generating employment, and - most importantly in this context - they are the principle users of low-technology capital goods.

Summary: The relatively gloomy prospects for mining products - especially for copper and lead - in the short and medium runs, have stopped expansion plans based on the very optimistic predictions of the late 70's. In view of worldwide overcapacities, the postponement of planned capacity expansions undertaken in Peru and other countries now, will have a significant influence on demand for capital goods in this sector. Thus, in 1984 the investment budget of SPCC was cut to US $4.9 million (compared to US $9.3 million in 1983)[1] and state-owned mining companies had to reduce investments by more than 30% to US $40.1 million.[2] Even if it is taken into account that both figures overstate the reductions to be expected in the medium run, there is a clear indication that the demand for mining equipment and capital goods will - if at all - grow only marginally during the next years.

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(1) See LAR Andean Report 22 June 1984.

(2) See LAR, Commodities Report CR 84-18, 14Sept. 1984.

Table 26

Mining Production - Principal Products

		1981					1982					1983				
			Trimesters					Trimesters					Trimesters			
		Annual	I	II	III	IV	Annual	I	II	III	IV	Annual	I	II	III	IV
Copper	TMF	342	93	90	63	96	369	91	86	96	96	336	69	91	95	81
Lead	TMF	193	46	48	52	47	212	52	52	55	53	213	48	53	57	55
Silver	Kg.F.	1,470	338	363	378	391	1,660	398	422	434	406	1,738	390	440	461	447
Zinc	TMF	499	113	119	134	133	556	134	139	142	141	576	131	142	151	152
Iron	TMF	4,008	1,003	1,124	1,044	836	3,767	934	942	983	908	2,848	571	844	472	961
Petroleum	Mio/Bar.	70.4	16.8	17.8	17.9	17.9	71.2	17.3	17.5	18.4	18.0	62.6	15.1	15.1	16.0	16.4

Source: Banco Central de Reserva del Perú, Reseña Economica, different volumes.

Figure 6

Main Mining Projects and Expansion Plans in Peru

COPPER

1) Southern Peru Copper Corportation's expansion programmes for Toquepala and Cuajone's open pit mines.
2) Centromin's Cabriza expansion programme.
3) Centromin's project for development of the Tambo Grande and La Granja deposits.
4) Centromin's projecto for development of the Atamina deposit.
5) Minero Peru's project for development of the second stage of the Cerro Verde deposit.
6) Empresa Minera Especial Tritaya S.A., 45% Centromin, 45% Minero Perú and 10% COFIDE, continued with the development of their project in Southern Peru.
7) Minera Los Montes' mine operation programme at Monterrosa mine.

Lead, zinc and silver

1) Centromin's project for development of the Andaychagua mine.
2) Centromin's expansion programme of the Casapalca mine.
3) Centromin's modernization and expansion programme for other mines. Some projects are completed and investments in new mining equipment has been made.
4) Cía. Minera Milpo's expansion programme.
5) Cía, Minera El Altiplano completed its expansion programme for Azulcocha mine.
6) Sociedad Minera Gran Bretana's expansion programme for Azulcocha mine.
7) Cía. Minera San Jynacio de MOrococha's modernization and expansion programme for its San Vicente mine.

Gold

1) Centromin's exploration programme for the development of its first alluvial gold mine, Madre de Dios.
2) Texas Gulf Exploaration has commenced exploration work upstream of Centromin's camp area.

Table 27

Mining Production in Peru in 1983
(Metal Production)

Type of operation	Copper tons	Copper %	Lead tons	Lead %	Zinc tons	Zinc %	Silver kg	Silver %
Large scale mining	288,783	88.3	70,982	37.6	190,012	38.9	383,309	26.3
Medium scale mining	24,679	7.5	99,493	52.7	264,992	54.4	943,970	64.7
Small scale mining	6,120	1.9	10,535	5.6	17,704	3.6	89,783	6.1
Artesan mining	7,463	2.3	7,690	4.1	15,292	3.1	42,938	2.9
TOTAL	327,000	100	188,700	100	488,000	100	1,460,000	100

Among other major mineral commodities produced, are the following:

Iron	2,850,175 tons
Molybdenum	2,632 tons
Tin	2,487 tons
Tungsten	430 tons
Cadmium	60 tons

Source: Producción Minera del Perú en 1983, Sociedad Nacional de Minería y Petroleo.

4.2. The Performance of the Capital Goods Industry for the Mining Sector

Unfortunately there are only few figures available on the sales of Peruvian capital goods. In 1981 and 1982, the national mining industry bought machinery and equipment on the national market for S./ 28.9 million and S./ 31.4 million, respectively. Imports are estimated to have been nearly three times as high (S./ 89.3 and S./ 92.0 million)[1] with the United States as the most important partner.

To get some more insights into the structure of the sector, some useful indicators of the relative position of Peruvian firms vis-à-vis foreign competitors are given in Tables 28-31. It is obvious that Peruvian producers are only supplying a limited range of capital goods. Out of 32 different goods analyzed in exploitation and exploration activities only 17 are offered by domestic producers, and in only six cases the number of domestic suppliers exceeded that of foreign competitors (see Table 28). In the ore concentration branch 36 different items were reviewed. Here only 6 items show a 100% import quota, and in 15 cases the number of domestic suppliers equalled or exceeded that of its foreign counterparts (see Table 29). Distinguishing domestic and foreign supplies not by the number of suppliers, but rather by the value of output, we find that in exploration and exploitation only 10-15% of capital goods are produced in Peru, in contrast to 80% of consumables (see Table 30). Peruvian firms are generally more competitive in those activities, where advanced technologies are not required. This is the case, for example, for small crushers (large ones are exclusively imported), air and water distribution, drainage, and most consumables. With respect to the production of equipment for ore concentration domestic suppliers appear to be relatively strong.

Some additional information can be gathered from Tables 30 and 31 with respect to the relative domestic participation for different products. In exploration and exploitation only small or low-technology items of the local production reach a relatively high degree of market penetration (small crushers, and water distribution, drainage). This is also true for ore concentration, although the market position of Peruvian

(1) Nachrichten für Außenhandel. "The Market for Mining Equipment in Peru", July 1984.

TABLE 28

Main Items of Mining Equipment for the Peruvian Mining Industry

Equipment	Number of Manufacturers	
	Domestic	Foreign with Repr. in Peru
Ore transport	3	9
Grinding equipement for drill steel and bits	-	7
Drill booms	-	7
Drill bits	4	21
Bucket wheel excavator	-	2
Cable bucket excavator	-	2
Mining trucks	-	10
Front-end loaders	-	10
Mine cars	6	3
Compressors	1	10
Compressor tanks	4	1
Dust collector	1	5
Drill core analyzing eqip.	-	1
Hoisting equipment	2	9
Exploration equipment	-	1
Drilling equipment		
- for exploration	1	6
- for exploitation	-	24
Mine safety equipment	9	4
Explosives	7	2
Blasting equipment	1	1
Charging equipment for explosives	-	4
Concreting equipm. for guniting	-	3
Steel structures	2	-
Spec. designed mine excavators (mainly for open pits)	-	8
Mine lamps	-	6
Locomotives	-	16
Air and water hoses	4	11
Mine doors	2	-
Mine rails and accessories	3	7
Roof bulting equipment	-	5
Ventilation fans	3	5
Winches	5	8
Number of Items	32	

Source: Anuario Minero-Comercial, La Minería en el Perú 82.

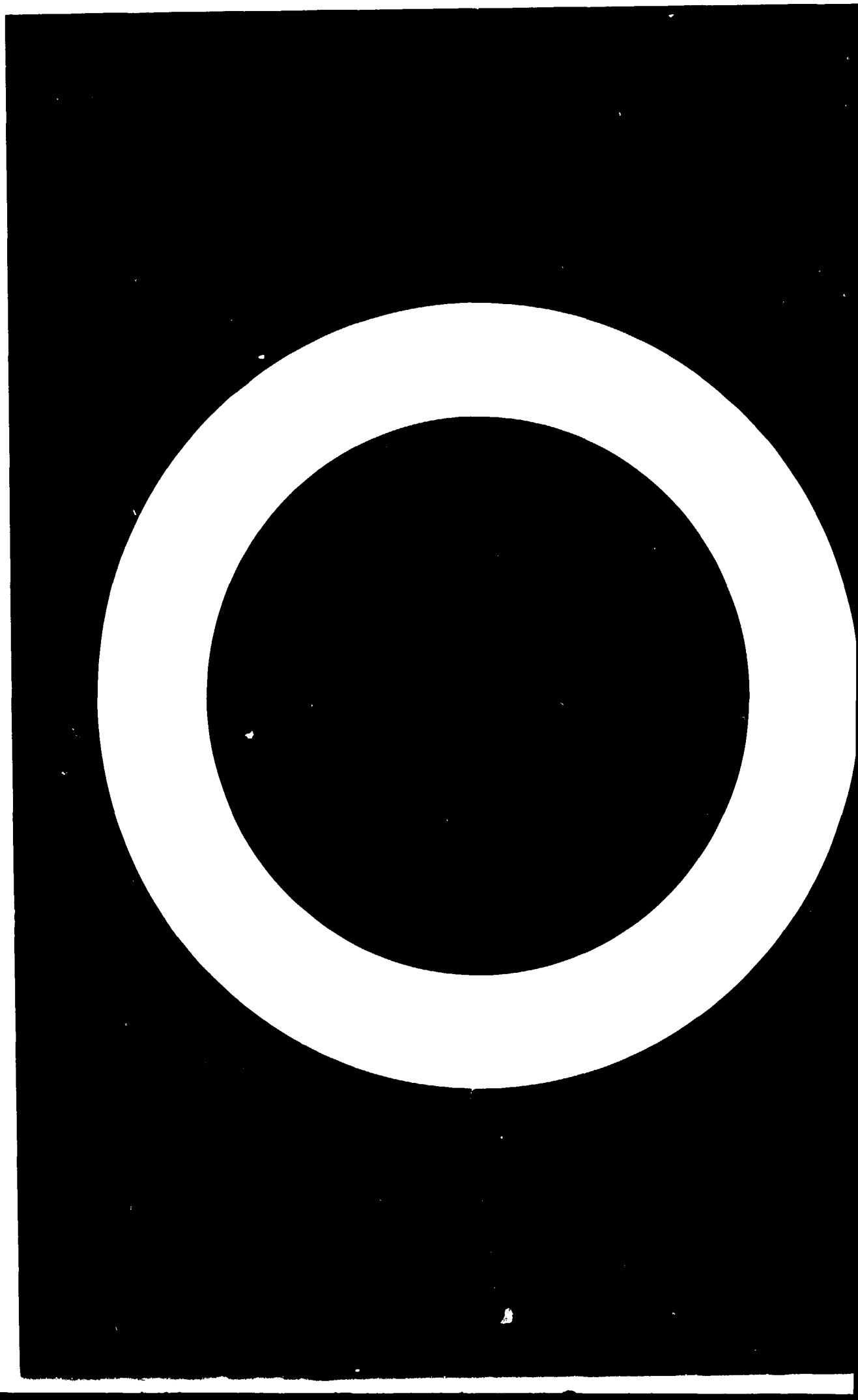

TABLE 30

Capital Goods and Consumables for Different Mining Activities

Branch of Mining: Exploration and Exploitation

MINING ACTIVITY	CAPITAL GOODS: ORIGIN		CONSUMABLES: ORIGIN	
	Domestic	Foreign	Domestic	Foreign
Exploration	10%	90%	25%	75%
Exploitation				
- Drilling		100%	90%	10%
- Blasting		100%	95%	5%
- Loading		100%	-	-
- Transport	10%	90%	80%	20%
- Crushing, small crushers	50%	50%	95%	5%
- Crushing, large crusher	-	100%	75%	25%
- Hoisting	20%	80%	-	-
- Rock reinforcement	-	100%	20%	80%
- Air compressors, small	20%	80%	-	-
- Air compressors, large	-	100%	-	-
- Air and water distribution	80%	20%	-	-
- Drainage	50%	50%	-	-
- Others	25%	75%	-	-
Total Expolration and Exploitation	10-15%	85-90%	80%	20%

Main consumables:

Drill bits for exploration (diamond bits)
Drill bits for exploitation drilling
Drill steel
Explosives
Detonators and cords
Wear parts for crushers
Reinforcement consumables
Rail and accessories

Source: Mission estimate.

TABLE 31

CAPITAL GOODS AND CONSUMABLES FOR DIFFERENT MINING ACTIVITIES

Branch of Mining: Ore Concentration

Mining Activity	Capital Goods: Origin		Consumables: Origin	
	Domestic	Foreign	Domestic	Foreign
Crushing, small equipment	90%	10%	90%	10%
Crushing, large equipment	-	100%	50%	50%
Grinding, small equipment	90%	10%	90%	10%
Grinding, large equipment	-	100%	50%	50%
Mechanical concentration, jigs, tables etc.	95%	5%	85%	15%
Flotation	80%	20%	85%	15%
Separation, cyclones, magnetic separators etc.	95%	5%		
Classification	80%	20%		
Dewatering filters	40%	60%		
Transport feeders, conveyors etc.	40%	60%		
TOTAL	70-80%	20-30%	85%1	15%

Main consumables: Balls for ball mills
Flotation reagents
Wall parts for crushers and mills

Source: Mission estimate.

Table 32

Capital Goods Produced By Peruvian Manufacturers Distributed On Type of Operation (Estimate)

Type of Operation	Exploration and Exploitation	Ore Concentration
Large scale mining	< 10%	30%
Medium scale mining	10-15%	60-80%
Small scale mining	15%	95%
TOTAL	10-15%	70-80%

Source: Mission estimate.

entrepreneurs is much stronger there. Consumables are generally produced in Peru to a very large degree (80% and 85%, respectively). As a result it can be stated that capital goods produced by Peruvian firms are sold only slightly less to larger than to medium and small scale miners in exploration and exploitation (< 10%-15%). But in ore concentration they are heavily concentrated on small (95%) or medium scale production (60%-80%) (see Table 32).

Summary

The capital goods production for the mining industry is more advanced in concentration processes than in exploration and exploitation and it is mainly concentrated on low-technology products such as mine cars, low capacity compressors, steelstructures, etc. These products are predominantly sold to small and medium scale mining firms, which do not produce according to latest technological developments. This result is not very surprising, if the actual technological standard of the local capital goods sector is taken into account. It even seems to indicate that there exists some scope for the development of "adapted technologies" which might be the most appropriate route for a lot of small producers in this sector at the moment.

It should be realized, however, that the concentration on small and medium-sized producers and their special desires cannot be a viable strategy in the long run, if this section of capital goods production is to grow considerably. This becomes clear in view of the relative importance of large scale mining. In 1983, 88.3% of copper - by far the most important mining product - was extracted by modern firms on a large scale. Even if there are some additional market segments for the installation of smaller capacity units in the future, it is hard to believe that the general picture of the copper sector will alter substantially. Even in those cases where technical progress in extraction and processing methods will establish a trend towards smaller units, these will probably be operating with more modern equipment.

In lead, zinc, and silver production, medium scale producers which are presently operating predominantly with low-technology equipment and machinery are much more common due to the different conditions for extraction and refinement (52.7% of lead, 54.5 % of zinc and 64.7% of silver is produced on this scale). While this provides an advantageous position for local producers in the near future, technical progress will affect those areas in the medium run, too. Thus, in order to meet the future investment demand of the large and of many medium-sized establishments at least partly, local producers of mining equipment have to keep in touch with technological progress on the international level and they will have to improve the quality of their products with far more intensity than today. Both lines of up-grading processes will be discussed in more detail later.

Keeping in mind the fact that 70-80% of total demand for capital goods concerning ore concentration equipment is met domestically, it seems to be clear, that this part of the mining equipment branch coincides most closely with actual production capabilities of Peruvian entrepreneurs, thus providing a relatively advanced stock of (traditional) knowledge to build on. Since the main type of capital goods manufactured for this sector in Peru is of the low-tech kind, arising problems are not primarily due to lacking technical content, but rather to low quality and poor design.(1)

4.3. Analysis of the Manufacturing Sector For Capital Goods to the Mining Industry

4.3.1. Number of Enterprises and Regional Distribution

The total number of enterprises working with deliveries to the mining

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(1) Low quality and poor design might be the result of insufficient technological standards in the firms or its suppliers (foundries etc.), so that this is (partly) a technological and know-how problem, too.

industry is approximately 50, of which around 25 are partly engaged in the manufacture of capital goods. Most of the enterprises are manufacturing consumables such as explosives, drill steel, wear and spare parts, but they also include smaller enterprises, so-called "work-shops". Of the 25 enterprises engaged in the manufacture of capital goods, only about 10 have substantial deliveries to the mining sector and to the metallurgical sector.

The manufacturing sector for capital goods is mainly located in the industrial areas of Lima-Callão. Of the above mentioned 25 enterprises all except 2 are producing in this area. This strong geographic concentration carries both advantages and disadvantages for the companies and for the country itself. The advantages are:

- Most mining enterprises have their head offices in the Lima area.
- Close contact with authorities, industrial organizations etc.
- Near to import/export harbor in Callão.
- Lack of good infrastructure in the provinces.
- Easier to employ qualified employees, especially technicians, engineers etc.

The disadvantages on the other hand are:

- Enterprises have in general limited space for expansion.
- Authorities can demand investment in environmental control to reduce the existing problems with smoke, dust, noise etc.
- Long distance from the production centres which might be a hindrance to training and service facilities and close personal contact.

Although the decentalization of economic activities is one of the important tasks of economic policy in Peru, it is not at all clear, if this is a valid strategy for the capital goods industry, too. Producers of capital goods normally have to plan, organize, and supervise relatively complex sets of different operations. Products are very often changing in design, quality of inputs and other properties according to individual desires of the customers. This means that the production runs

themselves are changing repeatedly, too, and very often only single products of one kind are required. Consequently, high technology standards are demanded from the engineering and technical staff. The same holds true for workers, who constantly have to adapt to changing working conditions.

It appears to be even more important though, that capital goods producers rely most heavily on related industries which have to supply special inputs
- in due time
- in exactly the way they are ordered
- in reliable quality.

It has been shown elsewhere, that the
- non-existence of adequate partners
- a lack of skilled sub-contractors and
- the impossibility to substitute imports for lacking domestic inputs

are among the most serious obstacles to capital goods production in LDC's. Therefore it appears to be essential for the capital goods sector to be able to rely on an agglomeration area which provides a satisfactory number of inter-linked and regionally concentrated industries and a close connection to the international market. These arguments as well as the relatively intensive use of skilled labour in design, organization and production indicate, that those kinds of industries are not open to regional diversification in a small country like Peru and at the present stage of economic development. In this special case, the use of stimuli to intensify regional concentration rather than deconcentration appears to be a precondition for the development of a viable industry.

4.3.2. Product Mix and Competition

The product mix does not vary significantly within the actual enterprises. Most of them are manufacturing all types of capital goods without having a well-founded technological background and knowledge in every product group. Although the firms are relatively small in size, they produce up to 60 different products, for which very different pro-

cesses have to be employed. But every enterprise producing the whole range of items demanded is exposed to severe problems of organizing the production process. The creation of idle capacity and X-inefficiency is the result. Most importantly, possible cost reductions due to static and dynamic economies of scale are not taken advantage of.

To stimulate specialization enterprises have to be provided with information regarding worldwide technological developments as well as market conditions in Peru and the Andean pact as the major areas of future sales. These two areas of information are needed to identify possible market "niches", on which firms can successfully concentrate. The small national market and the neighboring countries have to serve as an outlet for a relatively large number of independently operating firms. For example, 15 enterprizes produce mine cars and 12 manufacture flotation cells. This is obviously too big a number and where possible merging should be encouraged to form more viable production units.

4.3.3. Manufacturing Capacity

Exact figures on installed capacity are not available on a country-wide basis. Capacity utilization is generally low today. It is estimated to range from 60% to 80% of installed capacity, and - given the market conditions stressed at the beginning - entrepreneurs cannot be sure, that they will be able to use this idle capacity again during the lifecycle of the machinery. In that case, at least part of the existing capacity will have to be scrapped. It will be inevitable then to consolidate the firms and change the supply structure according to future market conditions.

There are a number of bottlenecks and constraints which are hindering producers even on the present low level of activities. Some of these are due to an insufficient infrastructure. Thus, the poor standard of information transmission (postal service, telephone, telex) is said to be a serious obstacle to the coordination of production and to exporting. Major problems are also reported with respect to the transportation facili-

ties and especially the harbor of Callao (delayed handling, excessive material losses etc.). Other constraints appear to stem from the effects of political measures aiming at distributional goals (such as the protection of labor rights manifested in the labor stability law) or at infant industry protection, lowering import competition and at the same time discriminating against local producers, who have to buy more expensive and low quality imports. For example, the price for nitroglycerine, used for the manufacturing of explosives is 6 times higher than internationally. As a result, protection is needed for explosives themselves, which are among those locally produced consumables used most intensively by the mining sector.

Apart from the side effects of adverse policy measures an often overlooked problem is the permanent change in data caused by the change in political priorities. Enterprises sometimes have difficulties in keeping abreast of all the changes regarding laws and regulations, especially those affecting their relative competitiveness on the international market. At the same time scarce resources in managerial talents are diverted from productive use.

4.4. Production Costs and Productivity

A superficial comparison of production costs might lead to the conclusion that capital goods manufactured in Peru are less costly than abroad. According to a questionaire answered by Peruvian firms capital goods produced in Peru are 5-15% cheaper than those of foreign competitors, based on prices 'ex-factory Peru' versus 'ex-factory abroad'. This differential basically holds for low-technology products, whereas high-technology items carry the same price whether produced domestically or imported. Taking into account freight costs and customs duties, the real price differences are considerably higher. Some enterprises, which are copying foreign products without licence, are sometimes selling their products at half the international price.(1)

There are some doubts regarding the validity of these figures, though. Why is it, that if these price differentials exist, Peruvian mining companies apparently prefer more expensive foreign products to local ones? A simple answer (though provoking a number of complex problems) to this puzzle could be given, if local and foreign products are not comparable qualitatively. The strong impact of quality differentials on the investment decision can be demonstrated for the case of a flotation cell. A poorly designed flotation cell yields a 1% lower recovery rate than standard equipment:

Normal recovery: 87% of a 25% copper concentrate
Ore to be treated: 2,000 tons/day with 1.5% copper

Copper loss per day due to lower quality equipment: 1% x 1.5% x 2000 = 300 kg

With the copper price at US $ 0.70 per pound the result is a daily loss of US $ 116 and a yearly loss of US $ 40,600.

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(1) So it was done with the leasing plants for small scale mining sold to Banco Minero.

This means that a poorly designed flotation cell which results in a 1% lower recovery will cause an annual loss exceeding its purchasing price more than twice. It is obvious that if there is such a difference in flotation cells produced at home and abroad, even a 50% lower price is not enough to make the foreign product less attractive.

It is obviously not valid to generalize on the basis of a single case. Instead, it would have to be shown convincingly, that there is a general inferiority in the quality of local capital goods. This is an extremely difficult task, if scientifically valid criteria are to be employed. The lack of such data justifies the presentation of expert opinions gathered during this study, to give a cautious evaluation of the possible outcome of a more comprehensive study of this subject. Enterprises have been divided into three groups according to the origin of the technology used:

1. Those working under licence from well-known international enterprises
2. Those working with self-developed products (in most cases copies)
3. Those working with a combination of licences and own developments.

Using this classification it was said that those firms working with foreign licences were - on the average - able to offer final products which are qualitatively superior. These enterprises also acquired more modern production methods and routines due to direct access to the technical know-how of the patent holder. At the same time the international firm is highly interested in defending the reputation of its own brands and presses the patent taker to meet certain quality standards. One of the control instruments are frequent follow-ups of production and quality control by representatives of the mother company.

There is another important aspect of this positive impact on the

patent takers if dynamic considerations are introduced. The interest of the supervising company in the qualitative performance of its partner is accompanied by the transmission of ongoing technical progress. In this way, the local company always stays in touch with new international developments. On the other hand it could be argued that companies relying exclusively on their own engineering talents are generally not able to keep up with international developments and therefore have a certain lag time in product development and organization of the production process.

These evaluations of the growth-stimulating role of foreign-owned technical know-how indicate that most probably there exists a systematic quality difference between foreign and local producers. On the average, this difference is non-existent in the case of well-established relations with foreign patent holders. But it becomes more significant with a declining degree of international backing.

4.5. The Andean Pact and its Impact on Peruvian Export of Capital Goods

Under the auspices of the industrial integration scheme of the Andean Pact, the Metalworking Sector Industrial Development Program has been put into operation. This program approved by the Andean Pact Decision No 146[1] in July 1979 allocates key industries to the different member countries and imposes restrictions on the operation of foreign enterprises. This is to say, that member countries cannot allow foreign direct investment within their territories, if this investment would be in an area assigned to a partner country. Peru has been granted exclusive manufacturing rights for the main types of mining machinery and equipment under this program, and consequently equipment manufactured in Peru is exempt from all import duties in the Pact countries.

Some discrepancies appear to exist, however, between the intentions of the participating countries and economic reality. Therefore it has to be analyzed in some more depth, how this decision has actually been implemented and what impact it has on Peruvian exports to the Andean countries. According to Peruvian manufacturers of capital goods, Decision No 146 has no significant importance for exports to the Andean countries. This is a unanimous answer from all manufacturers. They say that trade between Andean Pact members can hardly be seen as the result of this decision alone. Although exemption from all import duties has of course some importance for the export of capital goods and consumables, the possibility to offer atractive credit lines to buyers of Peruvian products, e.g. through FONEX, Fondo de Exportaciones, and Peru's Central Bank, has a much more important impact on Peruvian exports today, due to the difficult financial situation in many of the Andean countries. Nevertheless, trade liberalization between the partner countries surely had a positive impact, and opposition to Decision no 146 is not based on the liberalization of trade, but rather on other objections:

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(1) The Metalworking Industrial program was originally approved with Decision No. 57 in 1972 and then reformulated after the departure of Chile and the entry of Venezuela in Decision No. 146.

- Decisions concerning the implementation of a selective industrial policy are at the heart of the Andean Pact Treaty. From the point of view of market-oriented economic policy this is an especially controversial approach to economic development and growth, because in a dynimacally evolving world changes in consumption trends and virutally unforeseeable substitution processes caused by technical progress make it impossible to determine future growth potentials with any degree of reliability. Comparative advantage, if correctly identified today, may be a disadvantage tomorrow. It should be recognized, that no government can accept such a change in comparatively advantageous production lines which is against its own interests and those of the population. It is this political argument that poses deep doubts about the practicability and viability of any international allocation of industries fixed through detailed plans on future economic structures.

- Even the more simple tasks of assigning industries to different countries in a static framework seems to be beyond the planning capacity of the institutions involved. (1) Obviously in a number of cases products have been allocated to certain countries, which were lacking both resources and appropriate technology to manufacture them. Therefore the coordination in the development process between the participating countries could not succeed neither sectorally nor in accordance with the time schedules given.

- As already discussed before, the existence and the development of an economically viable agglomeration area is one of the most important tasks of economic policy, especially if a viable capital goods industry is to be created. The Andean Pact Decision, however, tends to create foreward and backward linkages between nations and over major geographical distances. This poses three main problems:

(1) Given the communication and transportation facilities within the region, the effective interplay of specialized firms producing inputs for relative complex end products is greatly hindered.

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(1) Even in industrialized countries this is seen as a very important argument against such activities, in spite of the fact that planning capacities and the technical prerequisites to implement such policies are more advanced there. See for example the case of EEC industrial policy.

(2) As long as definite rules and mechanisms for region-wide norms and production standards are not implemented, domestic firms very often cannot use foreign inputs. It is important that uniform standards and norms are introduced, but it has to be recognized that it is a rather time consuming endeavor.

(3) International liberalization treaties have a lower political priority than national policy goals. This causes the permanent threat that international treaties are renounced, when they conflict with the solution of national problems. In the case of internationally organized industrial specialization within relatively narrow industrial branches this frequently observable behaviour of national governments poses severe problems to industrial development and makes such a policy an extremely risky undertaking from the point of view of reliability of economic data.

- Last but not least, restrictions on foreign investments in Peruvian enterprises should be studied carefully to prevent the danger that urgently needed technical know-how is excluded and the options for an improvement of the manufacturing sector are further diminished.

4.6. Prospects of Medium and Small Scale Mining Operations

4.6.1. General Remarks

The general situation of the mining sector has been evaluated in the first part of this chapter. There is, however, a subgroup of mining enterprises, which deserves special attention here in spite of the fact that it is of minor quantitative importance for the economy as a whole. This is the medium and small scale mining industry which differs from the modern mining sectors [1] in some important respects. Firstly, small scale activities are considerably more labour intensive than large scale operations, so that a stimulation of this sector would have a relatively strong and immediate impact on employment creation. Secondly, capital goods used are predominantly low technology items, for which local supply is available on a competitive level. Thirdly, during the last decade there has been a growing interest in the development of small and medium sized establishments worldwide, so that within the relatively slowly growing demand for mining capital goods as a whole, this subsector appears to be the most dynamic one. Leaving aside the impact of recent cut-backs of public investments in Peru, the prospects for capital goods for medium- and small scale mining appear to be relatively good within the Andean market. These three arguments taken together justify some further study of this subsector.

4.6.2. Advantages and Disadvantages of Small-scale Mining

There are some advantages of small-scale mining operations, which are envisioned to prevail until the end of the century, so that this sector might increase in importance:

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(1) It should be emphasized that the distinction of large-scale mining on the one hand and medium- and small-scale mining on the other hand is not sufficient to separate the modern and the traditional sector unambiguously. Yet the use of modern technologies is decreasing significantly from large-scale to artisan mining.

(1) Units with smaller capacity can adapt more flexibly to changing market conditions, so that opportunities to increase sales at peak season can be used better.

(2) Small deposits are easier to find and in many cases are already well documented, so that additional exploration costs are minimized.

(3) Many small mineral deposits are high-grade multimineral deposits.

(4) The development of small mines is relatively less expensive, the construction time is short, and capital earns a relatively quick return. The limited risk for investors and the relatively small investment costs make those productions appropriate for local entrepreneurs.

(5) Small mines offer a widespread labour market over a vast geographical area.

It should be noted, however, that there are strong arguments in favour of modern (and mostly large scale) operations, too:

(1) Very often economies of scale arise in larger establishments, which pose a severe challenge to the competitiveness of smaller mines.

(2) Technical progress seems to favor integrated "extraction - concentration - refinement" processes which can only be undertaken on a very large scale today.

(3) The necessity to compete internationally has raised the demand for high-tech equipment in medium scale mining, too, so that it is not very clear today, if the potential for traditional capital goods will grow further in the medium run.

It appears to be relatively clear that in the short and medium run, the market potential for producers of low-tech mining equipment is

relatively good in Peru and within the Andean Pact countries. Peruvian entrepreneurs are capable of supplying this market immediately, if existing knowledge can be activated. In the long run, however, the traditional mining sector is challenged by two different but related developments. Firstly, technical progress in the modern sector is faster than in the traditional sector, so that ceteris paribus competitive pressure on traditional mining activities - caused by developments in the modern industry - will grow. Secondly, technical changes in large scale mining will trickle down to smaller firms progressively and stimulate the installment of modern equipment within this sector, too. To the extent that medium and small scale mining become open to modern equipment, the Peruvian capital goods industry will have to catch up with the technological development to defend its competitive position.

The present situation of the capital goods industry in Peru is relatively positive in comparative perspective. It must be emphasized, though, that the option to develop a strong capital goods industry on the existing basis has to be followed by strong efforts from private investors and the government to actually use the existing possibilities.

4.7. The Export Potential for Mining Machinery and Equipment

4.7.1. Recent Trade Performance

The stimulation of non-traditional exports from 1975 on has had a positive impact on the development of exports of mining equipment, too. Especially trade within Latin America and - even more - within the Andean Pact registered impressive growth rates. This can be taken as an indicator for the fact, that the long experience of Peruvian engineers in mineral production in mountainous areas constitutes a comparative advantage vis-à- vis foreign countries. The resulting scope for exports should be used without hesitation.

The fact that the production of mining equipment is one of the key industrial branches assigned to Peru under Decision No 146 of the Andean Pact seems to have had an especially positive impact on this sector in Peru. It should be pointed out, though, that Peru is likely to have a relative advantage in this sector anyway, so that the positive picture would not be altered very much if the Andean Pact guarantees would be eliminated. On the other hand there are obvious obstacles to the development of this industry, which arise exactly from the Pact membership. Firstly, the access to foreign technologies which is so eminently important for the long run future of this sector is hindered rather than stimulated by the restrictive Andean Pact decisions on technology transfers (transnationals, joint ventures etc.). Secondly, as discussed earlier, the problems which the international allocation of industries between member countries impose on national firms are large and not necessarily surmountable in the short run.

In the early 1980's trade in capital goods suffered very much from the decline of economic growth in the whole area and from the extraordinary sluggish demand for minerals in particular. The Peruvian mining industry was additionally affected by the abrupt changes in the

export promotion system and some new protectionist measures within the Andean Pact. Both developments had negative effects on the competitive position, which turned out to be especially harmful when combined with the gloomy national situation. In view of the importance of Latin American markets for Peru's mining capital goods, the impact of rapid changes of foreign trade regimes should be considered very carefully. On the other hand, the Quito Declaration from January 1984 seems to justify some hope at least, that recently introduced import restrictions within the Andean Pact (and Latin America) will be gradually taken back in the near future, so that the external prerequisites for a revitalisation of exports exist.

4.7.2. Review of Export Possibilities and Foreign Markets

4.7.2.1. General Evaluations

Bolivia

Peruvian industry has to develop a better market in Bolivia than exists at present. As the manufacturing industry of capital goods is considerably less developed than in Peru, the Bolivian mining industry should be a prime customer for Peruvian capital goods.

Ecuador and Colombia

Within the coming 10 years, the mining industry will be highly developed in these two countries. According to the new mining law, Ecuador for example will welcome foreign companies. This country has, on the whole, no existing industry for capital goods for the mining industry. Both hard and soft ware are needed and will have to be imported.

The same conditions are valid for Colombia, but this country has a well developed manufacturing industry, although it is not directed to the mining industry. Besides, it has to be pointed out, that the most dynamic development of the mining sector in Colombia is nearly exclusively on a large scale basis (the coal mining project of La Guajira


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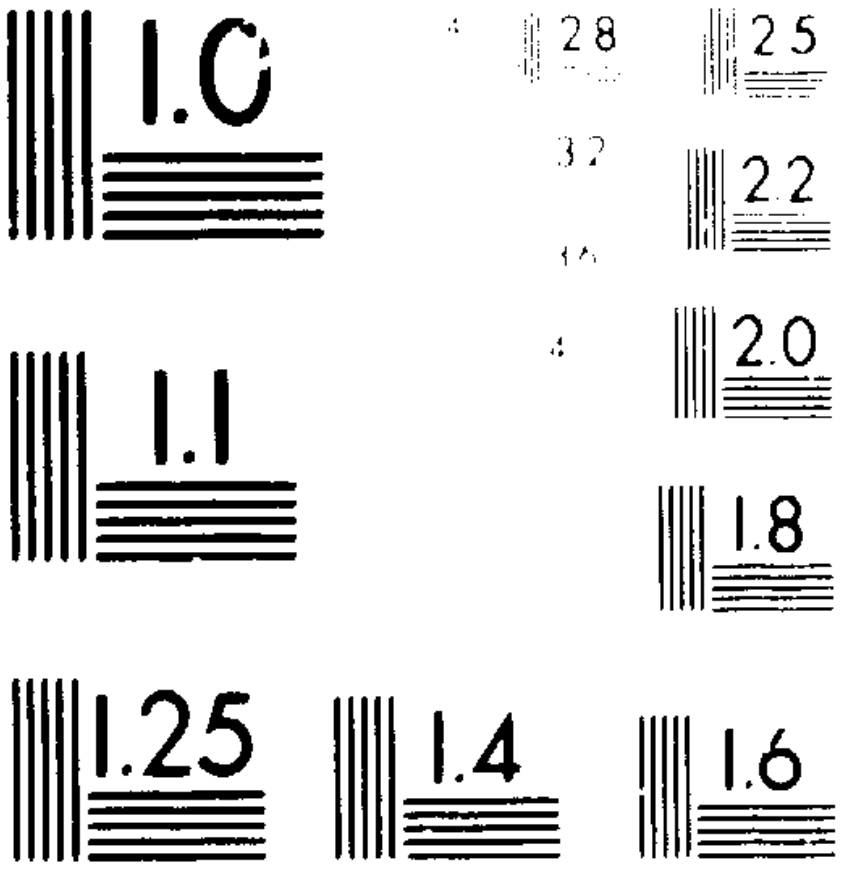

MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS
STANDARD REFERENCE MATERIAL
ANSI and ISO TEST CHART No. 2

for example is said to become the world's biggest mining project) so that the market for traditional mining equipment is fairly limited at the moment. This is documented by the fact, that the market for mining machinery is nearly completely covered by imports from industrialized countries. (1) Nevertheless, together with large scale mining there surely will emerge a medium and small scale sector.

If Peru wishes to enter these markets, it will have to launch a marketing drive now.

Venezuela

Venezuela is widely known as a difficult country to do business with, a view shared even by the Andean Pact countries. Delayed payments for goods and services and the country's efforts to expand its own capital goods industry have meant that many foreign enterprises have refrained from exporting to that country on a large scale.

Nevertheless, Venezuela is an interesting and important market in Latin America and should not be overlooked, especially since it is open to counter-trade business.

Chile

Chile, no longer a member of the Andean Pact, has a highly developed mining industry, but the capital goods industry for the mining sector has not been developed to the same extent. Peru has good possibilities for the export of capital goods, especially to the northern region of the country. Exports of certain consumables, e.g. sulphuric acid for copper leaching, are undertaken today. Collaboration in mining between Peru and Chile would be of great importance for the two countries.

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(1) See: DANE Anuario de Comercio Exterior 1982.

Argentina

Argentina is, compared with Peru, Chile and Bolivia, a young mining country. The country has many mining projects under evaluation, of which at least three projects can be implemented in the near future if financing can be settled. As the Argentine mining industry considers Peru a good mining country, Peruvian promotion of the sale of capital goods should be seriously studied. Counter trade might be interesting.

Brazil

Brazil will probably be of no interest for the Peruvian exporters within the nearest future.

Mexico

Mexico may be an interesting market for Peruvian exporters, as the mining industry is very much like the Peruvian industry. Proximity to the United States has naturally great importance for mining. However, it is important to bear in mind that Mexico is a Latin American country. It wishes to free itself from U.S. influence and to strengthen its collaboration with other Latin American countries.

Central American countries

These countries are now promoting their mining industries as for example Nicaragua (rehabilitation and expansion of the mining industry, specifically the gold mining sector) and Costa Rica and Honduras (general review of the mining industry). A general survey of the demand for capital goods in these countries is recommended. It should be mentioned that today Peru is making some deliveries of capital goods to the mining industry in Nicaragua under the financial aid program between Peru and Nicaragua.

Rest of the World

The launching of exports outside the above-mentioned countries can only be realized by highly specialized and modern Peruvian enterprises, e.g. the Peruvian explosives factories some of which have very high internally-developed technology. Most Peruvian producers of mining equipment, however, do need a longer period of development before their products can compete internationally with high-technology and high quality producers.

4.7.2.2. A Quantitative Assessment for Five Important Latin American Countries

In a joint project UNIDO and ECLA (1984) tried to estimate the demand for machinery and equipment for mining for Argentina, Brazil, Chile, Peru and Venezuela between 1983 and 1992. The results are shown in Table 33.

Although these data are highly tentative in view of long run changes in market conditions, the structure of investment demand might be seen as relatively reliable. Thus the major share of demand is for off-road trucks (34% in replacement and 10% in new projects). Other important machinery and equipment groups are excavating scrapers (22%) and mills (16%). Twenty-four percent of estimated new investment demand would be in Peru, 26% in Brazil and 41% in Chile.(1)

(1) See Unido (1984:69).

Table 33

Argentina, Brazil, Chile, Peru, Venezuela: Demand estimate of machinery and equipment for mining, 1983 - 1992

	Equipment	New projects		Replacements	
		Units	$US million	Units	$US million
1.	Rotative perforators (6"-12 1/4")	147	132	-	-
2.	Perforators-non tracked (3"-6")	59	4	89	6
3.	Raise borers	-	-	-	
4.	Jumbos	10	2	121	30
5.	Power shovels (3-10 sq yd)	93	130	-	-
6.	Power shovels (> 10 cu yd)	140	476	-	-
7.	Frontal loaders (without tires) (5- 7 cu yd)	62	16	98	25
8.	Frontal loaders (without tires) (> 7 cu yd)	96	38	73	29
9.	Scooptrams (2-13 cu yd)	16	4	214	47
10.	Heavy lorries (35-70 ton)	251	93	123	46
11.	Heavy lorries (70-170 ton)	655	459	214	150
12.	Lorries (10-35 ton)	5	1	46	9
13.	Tractors-non tracked (200-700 HP)	303	91	251	75
14.	Road building machinery	186	28	131	20
15.	Special purpose motor vehicles	-	21	-	-
16.	Mining machinery (non-heavy)	-	16	-	-
17.	Extraction machinery (drum and friction	-	2	-	-
18.	Grinding wheel machines (42 x 65" - 54 x 74")	8	7	-	-
19.	Grinding wheel machines (60 x 89" - 60 x 109")	22	48	-	-
20.	Grinding jaw machines (24 x 36" 48 x 60")	3	1	-	-
21.	Cone-shaped grinding machines (5 1/2" - 7")	193	48	-	-
22.	Mills, ball penetrators and bars (< 1000 HP)	112	78	-	-
23.	Mills, ball penetrators and bars (> 1000 HP)	203	365	-	-
24.	Supply apparatus, screen classifiers etc.	-	52	-	49
25.	Flotation equipment (cells, pumps, gutters)	-	81	-	26
26.	Thickeners, filters and dryers	-	81	-	-
27.	Locomotives and wagons	-	43	-	-
28.	Conveyor belts	-	48	-	-
29.	Compressors, water pumps and ventilators	-	72	-	-
30.	Machine tools		11		
31.	Electrical Installations		96		
32.	Metallic structures and boilers		197		
33.	Drill and boring machines		11		13
	Total		2,752		579

Source: UNIDO (1984:70)

4.8. Approaches to Foster the Production of Capital Goods for the Mining Sector

4.8.1. General Outline

Manufacturers of mining equipment in Peru concentrate on those products that are demanded by the medium and small scale mining industry. This supply structure coincides with the fact that these mining industri s rely heavily on low-technology capital goods, for whose production local firms have a relative advantage. On the other hand, large scale mining is of such an overwhelming importance quantitatively that the mining equipment industry, in limiting itself to "traditional" products, can only reach a fairly small market share in Peru and the neighbouring countries.

Given these facts, the following pre-conditions have to be considered, if a viable capital goods industry for the mining sector is to be developed:

1. There appears to be a sufficient amount of technical and engineering expertise which is especially familiar with mining problems in mountainous areas. This expertise is now predominantly used in the manufacturing sector to design, adapt and construct low-technology capital goods.

2. The market for low-technology capital goods in Peru is very small and cannot provide the demand necessary to establish such an industry at a satisfactory economic level.

3. Technical progress, though taking place at a higher rate in the modern sector, surely trickles down to those capital goods which presently are at the core of Peruvian production of mining equipment. It is therefore important to see, that Peru's mining industry has to be confronted with modern technology from abroad if it wants to become and remain an efficient competitor in Latin America.

4. Capital goods are typically developed on the national market and after a complex learning process may become exportables. This process, however, will only yield satisfactory results, if a big local market is at hand,[1] so that the minimum demand for final products and a relatively broad spectrum of suppliers, subcontractors etc. can evolve simultaneously. It is especially this precondition, which presents an obstacle to the development of such industries in small economies. Because of the market limitations Peruvian entrepreneurs have to reach out to foreign markets relatively early, so that the learning period on a purely national level cannot be extended until full international competitiveness is reached.

Thus, a successful promotional strategy has to pursue three major policy goals at the same time:

- the sector does need infant industry protection at least in the near future
- it does need, at the same time, a subsidization of exports, because it has to enter foreign markets at a relatively early stage of maturation, and
- it urgently needs access to foreign technology, if the actual scope of production is to be defended or even extended.

To fulfill all three tasks at the same time is not easy at all, because:

- The viability of a strategy which is aimed at the protection of national markets and at the same time promotes exports, depends

(1) For the case of Brazil see for example Teubal (1984).

in part on the acceptance by the trading partners. The Andean Pact regulations appear to be helpful in pursuit of such a strategy. But it should be realized, that in a world with wide spread growth problems the willingness not to implement counter-veiling duties has diminished.

- A lasting stimulation of exports and capital and technology inflows (e.g. one that stimulates investment to meet additional demand) will only be reached, if the economic concessions given to the industry are perceived as a reliable basis for medium term investment decisions. This means in particular that export incentives, import conditions, and the general direction of economic policy, have to be consistent and maintained over a period of time.

In view of these interrelated problems, which are discussed in more detail in Chapter 7, a general policy outline should concentrate on the following measures:

1. Protection of the local market for mining equipment, but with a specification of how and when the rate of protection will be decreased, so that local entrepreneurs realize that in a foreseeable future foreign competitors will face improved import conditions. This process should be working so slowly, that local producers can react to the change and increase productivity.

2. Increasing productivity of national production can be fostered, if

   - foreign technology is made available on the basis of the above mentioned criteria

   - inputs are available at competitive prices. This generally means a liberalization of inputs not available domestically (for locally produced inputs, point 1. applies respectively).

   - exports are subsidized. CERTEX and FOPEX appear to be suffisient instruments to reach adequate conditions (1) for trade within the region.

(1) This does not mean, however, that the present structure of CERTEX (i.e. subsidy on value of final output rather than on value added) does not need rethinking.

3. A generally improved macro-economic framework is necessary to meet the conditions of stability and consistency of economic data for local and international producers.

If the general idea of this policy package can be implemented, there appears to be a good chance, that the necessity for restructuring and up-grading can be linked with a consecutive penetration of international markets.

4.8.2. Specific Sectoral Policies

The overall task of sectoral policies should be the improvement of the conditions, under which producers have to compete nationally and internationally. There are different approaches to pursue this goal directly (raising productivity within the firm) and indirectly (stimulating the markets for capital goods, e.g. the mining sector). Direct productivity improvements may be undertaken by active entrepreneurs themselves:

Firstly, Peruvian partners should look for foreign partners more intensively to keep in touch with worldwide technical developments. Studies on successful developments indicate that this is a valid starting point on which special local know-how has to rely. The assimilation of foreign knowledge and its application to local circumstances can be seen as one of the promising lines of development for such a knowledge-intensive industry. Acquiring foreign know-how to increase the level of technology within the firm appears to be a necessary precondition for a lasting recovery. There is virtually no possibility for local manufacturers in Peru (and elsewhere in the world) to develop and manufacture mining equipment without a long-term commitment to the incorporation of technological progress elaborated in close connection with worldwide developments.

Secondly, all possibilities have to be evaluated to improve the production conditions themselves. This means:

- to diminish the range of products offered by any particular firm to allow for specialization gains, which are effectively used by all successful foreign competitors;

- to reorganize the production process starting from planning activities and going to the acquisition and timely provision of inputs;

- to fully realize the importance of reliable subcontractors and producers of spare parts and services. In the Peruvian case relations between the producers of final products and their subcontractors are especially complicated today because of the increasing role of informal producers. This phenomenon, which will be treated in a separate chapter, is clearly counterproductive in that quality control is effectively hindered;

- to gain flexibility to follow the changing conditions of the market. In this context it must be pointed out, that it is necessary for industries manufacturing products with different characteristics, to have a working staff willing to accept different kinds of employment within the firm;

- to build up an efficiently working service system. As a general rule of thumb - internationally - 50% of the sales price of mining equipment corresponds to services before and after the delivery of the product. The quality and kinds of services may be decisive for the mining company, when deciding from whom to buy the product. This is so, because a breakdown of capital goods in the production process might be extremely costly, if repairs are delayed unnecessarily long due to an inadequate service system. Foreign suppliers seem to be handling this problem better than local firms, as suggested by the number of service representatives in Lima and their speedy reactions to emergency calls from the mining companies;

- to establish training and education centres which improve the general quality of the workers and technicians. The foundation of the Instituto Tecnológico Superior (TECSUP) might be a hopeful step in this direction.

Indirect measures are to be used to improve the firms' knowledge of factor and product markets through publicly and privately financed research and training institutions. The activities of such institutes will be most efficiently used, if they are linked with international branch research centres which analyze production and demand developments world wide and which investigate future use of the products in question. (1) Thus, demand and supply factors are investigated sumultaneously, and new trends can be evaluated in close contact with public institutions and private enterprises.

Some efforts have been made in Peru to improve the transmission and diffusion of information regarding technology and marketing. In 1972, ITINTEC (Instituto de Investigación Científica y Tecnología de Normalización Técnica) was founded, and in 1974 an institute especially for the mining sector started operating, INCITEMI (Instituto Científico y Tecnológico Minero). The influence of these institutes has, however, been moderate up to date. Therefore utmost attention has to be paid to an extension of their services in the future. Again the necessity has to be emphasized that such measures must be part of an overall concept (see Chapter 7).

The use of minerals might be stimulated, too, if the fluctuation of mineral prices could be reduced.

A valuable effort to improve the national production conditions of the capital goods sector directly might be aimed at the stabilization of the demand for capital goods itself. Investment demand is particularly affected by cyclical fluctuations in all countries. This is especially the case in branches producing capital goods for mineral production, because the demand for raw materials is extremely vulnerable to supply and demand shocks. The fact that investment projects in these branches

(1) There is a lot of research, for example, to find more possibilities for the use of copper.

have a relatively long gestation period often accentuates the impact of cyclical fluctuations. Therefore policies should be considered that would help to introduce an anti-cyclical investment behavior of the mining companies. Although very complex planning problems have to be resolved before such a policy could be introduced, and a disciplined expenditure policy in expansionary times is a necessary precondition, there would be some scope for policy action due to the fact that the public sector itself has a great direct influence on such activities (Minero Peru, for example, provides about 30% of national copper production). Such a policy, carefully implemented at the beginning of a period of prosperity would avoid the pro-cyclical cut-back of investment plans during an already depressive situation.

Another promising instrument which can be employed for direct stimulation of the mining equipment sector would be the provision of improved access to the local capital market for small-scale miners. Interest rate subsidies, public guarantees, and other investment incentives like accelerated depreciation allowances might be considered to reach this goal.

In addition, any instrument appropriate to improve the efficiency of the production process in the widest sense has to be evaluated. One useful initiative is reported from Banco Minero, which leases ore concentration plants to a collective of different mines within narrowly defined geographical areas. Central ore concentration can thus serve 5-10 different mines with similar ore minerals. Due to the state of the infrastructure in the mining area, road conditions etc., the various mines can be situated up to 30 km from the central plant.

If the mines can fulfil the requirements of Banco Minero, such as ore resources, ore grades, number of mines, infrastructure, Banco Minero signs a leasing agreement with the mine owners to make an ore concentration plant available. If so required, Banco Minero can also assist in the training of responsible technicians for the plant and can also carry out tests for the ore concentration process and assist the mine owners in signing a sales contract for the ore concentrate.

The leasing agreement is usually contracted on a leasing-sale basis. The mine owners have the option to buy the plant after the leasing period (normally 18 months) is over. Payment is usually extended to a 10 year period and credits are given at reasonable conditions.

Twenty ore concentration plants with capacities from 30 to 200 tons per day have been delivered until now. From Table 34 it can be seen, that the unit cost of concentration decreases when bigger capacity units are employed. However, with larger concentration plants the transportation costs for all producers together increase. Only detailed cost studies could give an answer to the optimal size of such plants. According to Banco Minero, the result of these leasing agreements has been positive. Some collaboration problems between the mine owners do of course arise, but these have always been settled.

It is especially worth noting that under this project all deliveries of the complete plants have come from Peruvian manufacturers, though heavy foreign competition had to be met. This initiative from Banco Minero appears to be a promising example of a successful mining promotion with considerable benefits for the local capital goods industry. Similar actions are recommended for other types of equipment and also for technical services such as:

- leasing-purchase contract for compressors
- leasing-purchase for drilling and loading equipment
- technical services for geology, mine surveying, administration etc.

Government incentives could help to initiate such activities on an even larger scale.

Table 34

Estimated Investment Costs in US$ for Ore Concentration Plants

Costs, US$, per Leasing Plant

ACTIVITY	30 tons/day	50 tons/day	200 tons/day	Total Costs, 20 Plants
Complete plant	250,000	320,000	1,160,000	6,820,000
Electric supply	38,000	49,000	95,000	960,000
Civil work	100,000	128,000	450,000	2,714,000
Basic implementation	37,000	48,000	173,000	1,019,000
Transport	5,000	7,000	25,000	146,000
Taxes	20,000	26,000	92,000	550,000
TOTAL	450,000	578,000	1,995,000	12,209,000
Total Costs per Capacity unit (1 ton/day)	15,000	11,560	9,9975	
Number of Plants	6 units	13 units	1 unit	20 units

Source: Access to information from Banco Minero del Perú.

4.8.3. Identification of New Products

It is one of the most difficult tasks for every economist to identify future production possibilities with any degree of accuracy.

It is because of these problems that a set of possible new lines of production is suggested only hesitantly and should be taken as purely indicative and tentative. The data are based on interviews with national producers and reflect their individual evaluation of the respective markets. They are presented here despite these shortcomings, because they reflect the perception of the scope of future activities as seen by persons being especially familiar with local market conditions. These evaluations are based on the conditions that a) there is the possibility to use foreign technology through the acquisition of licences and patents, and b) imports of vital components and technical assistence from abroad are not discriminated against.

Short-range goals

PRODUCTS	COMMENTS
Screw compressors	One existing manufacturer of piston-type compressors is presently negotiating with international compressor manufacturers for the manufacture of screw-compressors under licence (import of vital components). It can be integrated into existing production lines.
-Locomotives, diesel and battery drive	Their production can be integrated into existing manufacturing lines. The existing Peruvian representative is supposed to continue the sale.
-Mine lamps, charging equipment and accessories	A new industry to be set up or to be integrated with the local manufacturing of safety equipment.

-Drilling equipment, hand-held rock drills, drill wagons	In spite of hard international competition it is recommended that manufacturers, existing representatives and the mining industry study conditions for the manufacture of drilling equipment. Exports to the Andean Pact countries should be considered. A study of the former factory established in Bolivia and the reasons for its failure should be carried out.
-Charging equipment for ANFO explosives	The increased use of ANFO explosives, which are locally manufactured, creates a good market for this equipment. It does not demand high-technological manufacturing but requires high quality control. It can be integrated with existing production lines.
-Reinforcement equipment such as accessories, reinforcement bolts, etc.	An increased demand from the mining enterprises and the mine workers to increase safety in the mines will also increase the demand for such equipment and consumables. They can be integrated with existing production lines.
-Metallurgical equipment and technology	New metallurgical technology such as gold cyanidation of placer deposits will call for a new type of metallurgical equipment. This requires foreign technology but does not demand high-technological manufacturing. It can be integrated in existing production plans.
-Rails and accessories	The existing import of this material ought to be completely substituted by local products. It can be easily integrated in existing production lines.

-Air and water pipes, ventilation tubes and accessories (valves, crane, couplings etc.)	Same comments as above. Manufacturing of ventilation tubes, plastic or woven material, may require new production lines.

Long-range goals

Regarding long-range goals (5-10 years) it is of the highest importance to maintain close collaboration between the manufacturers and the mining people. Additionally, all the policy options discussed above are applying. Examples of mining capital goods which might be produced in Peru are:

- Loading equipment with pneumatic, diesel or electric drive.
- Drill jumbos, pneumatic and all-hydraulic jumbos.
- Complete manufacturing of drill steel and bits.
- Manufacturing of a more complete range of metallurgical equipments.

5. PRODUCTION OF EQUIPMENT FOR POWER GENERATION AND DISTRIBUTION IN PERU

5.1. General Remarks

5.1.1. Scope and Classification of Products

Machines, equipment and products for the generation and distribution of electricity form part of the so-called engineering products or, excluding consumer durables from this group of products, of capital goods. The International Standard Industrial Classification (ISIC) contains the so-called engineering products in division 38, "Manufacture of Fabricated Metal Products, Machinery and Equipment." This division consists of the following major groups:

- ISIC No. 381: manufacture of fabricated metal products, handtools and general hardware
- ISIC No. 382: manufacture of machinery except electrical
- ISIC No. 383: manufacture of electrical machinery, apparatus, appliances and supplies
- ISIC No. 384: manufacture of professional and scientific, and measuring and controlling equipment not elsewhere classified, and of photographic and optical goods.

Equipment for the generation and distribution of electrical power is mainly included in subgroup 383, which is subdivided as follows:

- Group 3831: manufacture of electrical industrial machinery and apparatus
- Group 3832: manufacture of radio, television and communication equipment
- Group 3833: manufacture of electrical appliances and housewares
- Group 3839: manufacture of electrical apparatus and supplies not elsewhere classified.

The products of group 3833 are almost exclusively consumer durables

(except those cases, where occasionally products, e.g. vacuum cleaners or air heaters, are used as capital goods in industry or services), and those of group 3831 are exclusively capital goods. On the other hand, groups 3832 and 3839 consist of both, consumer durables and capital goods.

It is noteworthy that complete power generator sets, e.g. diesel generators or hydropower generators, are included in ISIC No. 3831 while the driving devices alone, diesel motors and hydraulic turbines, form part of ISIC Group No. 3821, manufacture of engines and turbines. The major portion of equipment for the generation and distribution of electricity is contained in ISIC Group No. 3831. A few products are included in ISIC Group No. 3839, such as manufacturing of insulated cable, insulated wire and electric insulators and insulating materials. Porcelain and glass insulators are included in ISIC Groups No. 3610 and 3611, respectively.

Thus, the electricity generation and distribution equipment is mainly classified in ISIC Group No. 3831 to which the few above-mentioned products of other groups have to be added, namely

- porcelain and glass insulators (3610 and 3611)
- insulated cables and wires (3839).

The statistical analysis in the following chapter will therefore concentrate on ISIC Group No. 3831, while the description of the results of the field work and other relevant factors will include the two product groups of the other ISIC groups.

5.1.2. Place of the Subsector in the Industrial Environment of Peru

The manufacturing industry contributed 25.4% of Peruvian GDP in 1981. In 1965, the share was at 23.7%; then it rose to a maximum of 26.6% in 1976, from which it fell constantly to the present value.

ISIC group 38 experienced a similar development. In 1971, its share in manufacturing value added (see Table 35) was 14.7%. It increased to 19.6% in 1976, and then it dropped to its lowest level in the past decade in 1979 (14.6%).

In 1979, MITI registered 9,631 enterprises with a workforce of more than 5 persons employing in total approximately 267,000 people (see Table 36). It can be seen that industrial division 38 has a similar share in the number of companies and in the workforce, which indicates that the average size of companies is in line with the average for the whole manufacturing sector.

The wood and furniture industries for example, hold a share in the number of enterprises almost twice as high as that in the workforce, which indicates that small enterprises are predominant in this industrial division. In contrast, basic metals account for an employment share almost 4 times as high as the share in the number of establishments indicating that the average size of this sector is far above the overall industrial average.

Table 37 gives an overview of the development of gross production value and value added in current prices for subgroups of ISIC 38 for selected years from 1976 to 1981. With respect to gross output of industrial division 38, ISIC group 384, manufacturing of transport equipment, is the most important one with a share of approximately 37% in 1976 and 34% in 1981. The second strongest group, ISIC 383, electrical machinery and equipment, accounted for 25% in 1976 and 24% in 1981 (1979: 27%). ISIC 381 registered an increase from 21% to 25% during the

Table 35

Percentage Distribution of Value Added
of the Peruvian Manufacturing Industries

ISIC Industrial Division	1971	1975	1976	1977	1978	1979
31. Food, beverages and tobacco	28.3	27.9	26.0	26.4	24.7	25.3
32. Textiles, garments and leather	16.9	14.7	16.1	13.7	13.0	15.5
33. Wood and furniture	2.6	2.5	2.1	2.2	1.4	2.0
34. Paper printing and editing	5.8	5.5	4.9	4.9	4.2	4.9
35. Chemicals and petroleum derivatives	20.7	18.0	20.8	21.4	28.6	20.1
36. Non-metallic minerals	5.1	4.2	4.3	4.4	4.4	4.3
37. Basic metal industries	4.5	5.1	4.9	6.8	7.4	12.5
38. Metal products, machinery and equipment	14.7	18.1	19.5	19.1	15.5	14.6
39. Other manufacturing industries	1.4	1.3	1.4	1.1	0.8	0.8
	100.0	100.0	100.0	100.0	100.0	100.0

Source: MITI, as quoted by ITINTEC.
"Evolución Económica y Social de la Industria Manufacturera en el Perú". Abril 1983.

Table 36

Number of Industrial Establishments and Workforce, 1979

ISIC Industrial Division	Number of enterprises	Percent	Number of employers	Percent
31. Food, beverages and Tobacco	2,141	22.2	51,656	19.4
32. Textiles, garments and leather	2,050	21.3	58,737	22.1
33. Wood and furniture	994	10.3	15,385	5.8
34. Paper printing and editing	622	6.5	17,554	6.6
35. Chemicals and petroleum derivatives	951	9.9	39,680	14.9
36. Non-metallic minerals	567	5.9	16,856	6.3
37. Basic metal industries	114	1.2	11,972	4.5
38. Metal products, machinery	1,849	19.2	50,794	19.1
39. Other manufacturing industries	343	3.5	4,248	1.6
TOTAL	9,631	100.0	266,882	100.0

Source: ITINTEC, op. cit.

Table 37

Gross Production Value and Value Added of Major ISIC Groups of Industrial Division 38 in Peru, 1976 - 1981 (Selected Years), (In Million Soles at Current Prices)

Major ISIC-Group	Gross Production 1976	1977	1979	1980	1981	Value added 1976	1977	1979	1980	1981
381	16,113	20,680	68,972	125,796	170,300	7,571	8,748	27,952	49,067	63,046
382	10,989	11,690	36,615	68,462	96,423	4,974	4,953	12,603	22,759	35,564
383	18,981	23,801	64,356	118,388	165,076	9,018	10,817	27,892	50,853	71,822
384	28,087	33,983	65,214	136,031	233,332	10,015	11,875	18,633	41,882	68,386
385	1,113	1,533	4,360	8,763	13,404	483	586	2,017	3,728	5,636
38	75,283	91,687	239,517	457,440	678,535	31,066	36,979	89,097	168,289	244,454

Source: MITI

same time-span.

Table 38 shows that the relative participation of the various subgroups in the value added of division 38 followed a similar development. It is noteworthy that ISIC 383 raised its position from second to first place between 1976 and 1981.

A look at Table 39 reveals an interesting fact: value added as a percentage of gross production decreased in all subgroups and over the whole period covered. There is no easy explanation of this behaviour, because there are different variables affecting the share of value added. Possible explanatory variables are only described here, but no evaluation of their relative importance during the period under consideration is attempted.

Firstly, the declining participation of value added could simply be the result of a more and more sophisticated distribution of the national production processes. In that case, this would be a necessary and almost desirable outcome of an ongoing development process. Looking at the output figures themselves, however, raises some doubts as to the validity of this explanation. In view of the continuously growing interrelations between the formal and the informal sector, it can be suggested that some of the decline may be due to the growth of the shadow economy, since it is especially attractive to relocate operations with a high value added content to that sector.

Secondly, there might have been a general loss of profitability as a result of rising costs relative to output prices. Again, different factors could cause such a development. One is a growing competition among producers. That would exert pressure on monopolistic profits and could even lead to changing actions, if some especially powerful competitors aggressively employ their market position to eliminate small firms. Another reason could be a cost increase which was not met by rising productivity and which could not be compensated through inflationary adjust-

Table 38

Percentage Distribution of Value Added Within ISIC 38

ISIC-Group	1976	1977	1979	1980	1981
381	23,6	23,7	31.4	29.2	25.7
382	15.5	13.4	14.1	13.5	14.6
383	28.2	29.2	31.3	30.2	29.4
384	31.2	32.1	20.9	24.9	28.0
385	1.5	1.6	2.3	2.2	2.3
38	100.0	100.0	100.0	100.0	100.0

Source: Calculations based on Table 37

Table 39

Share of Value Added in Gross Output
for Subgroups of ISIC 38

ISIC-Group	1976	1977	1979	1980	1981
381	47.0	42.3	40.5	39.0	37.0
382	45.3	42.4	34.4	33.2	36.9
383	47.5	45.4	43.3	43.0	43.5
384	35.7	34.9	28.6	30.8	29.3
385	43.4	38.2	46.3	42.5	42.0
38	42.6	40.3	37.2	36.8	36.0

Source: Calculations based on Table 37

ments. Such cost increases surely happened because of the price effects of imports. A rise in productivity which could compensate for this, however, was greatly hindered by the low degree of capacity utilization during most of the period. On the other hand, the inflationary process was so strong, that it is not clear at all, how much the competitive position has really weakened as a result of all these factors.

The relatively low value added content for group 384 seems to indicate that a larger proportion of its output is assembled instead of manufactured within the group (e.g. assembly of motor vehicles). The two groups least affected by a decline in the share of value added in gross output were group 383, the value added of which was approximately 9% lower in 1981 than in 1976, and group 385 which lost only 2% of its value added content between 1976 and 1981. During the same period, group 381 lost 21%, groups 382 and 384 lost 19% and 18%, respectively, and the whole of industrial division 38 lost 15% of its value added content.

The volume of production of industrial division 38 experienced an increase of almost 87% between 1971 and 1975, a decrease of nearly 29% from 1975 to 1979 and a renewed increase of almost 20% from 1979 to 1980 (see Table 40). Electrical machinery grew by 140% in the first half of the past decade to recover from 1979 to 1980 with a growth rate of 10 percent.

After 1981, production of ISIC group 38 declined drastically. Table 5 shows that output of electrical machinery decreased by 20.2% in 1982 and 40% in 1983.

Table 40

Index of the Physical Output of Industrial Division 38
(1973 = 100)

	1971	1972	1973	1974	1975	1976	1978	1979	1980	1981	1971-* 1975	1975-* 1979	1979-* 1980
38 Metal products	69.2	84.8	100.0	109.3	129.3	127.2	112.2	93.5	92.4	110.5	86.9	- 28.5	19.6
381 Metal products	90.6	92.7	100.0	108.0	115.3	109.1	103.6	97.0	92.0	99.4	27.3	- 20.2	8.0
382 Non-electrical machinery	65.1	92.4	100.0	118.9	150.6	151.7	142.1	122.3	134.6	160.8	131.3	- 10.6	19.5
383 Electrical machinery	62.7	80.8	100.0	123.9	149.7	145.7	140.9	125.7	115.1	126.8	138.8	- 23.1	10.2
384 Transport equipment	58.1	77.2	100.0	89.1	109.1	109.7	72.2	38.4	43.4	73.2	87.7	- 60.2	68.7
385 Scientific equipment	82.0	83.8	100.0	92.5	107.0	127.3	109.6	112.6	98.1	N.A.	30.5	- 8.3	N.A.

N.A.: not available

*: growth increase

Source: World Bank/UNIDO (1981)

5.1.3. Some Comparative Data on Capital Goods in Latin America

In Table 41 the products classified under ISIC division 3 are regrouped to roughly represent consumer durables (group A, covering ISIC 31, 33, 39), intermediate goods (group B, covering 34-37) and engineering products (group C, covering 38).

Even though the time series in Table 41 is too short for exact long-term determination, the following conclusions can be drawn:

- the share of consumer goods in manufacturing in Peru has dropped considerably in the past decade;
- the share of intermediate goods has increased;
- the share of the engineering industries (industrial division 38) has dropped to its original value at the end of the period after having passed through a peak from 1975 to 1977.

A comparison with the industrial development of the Andean Group countries (Table 42) shows the relatively large intermediate sector of Peru. Industrial division 38 has a higher share in Peru than in the total of the Andean Group, which is mainly due to the higher share of ISIC No. 383 and 384 in manufacturing value added.

Compared to Brazil (Table 43), however, one notes that the Brazilian production of transport equipment (ISIC 384) and of machinery except electrical (ISIC 382) account for a share in manufacturing, which is more than three times higher than in the Peruvian case. Fabricated metal products have approximately the same share in both countries. The relative position of Peruvian electrical machinery was comparable to the Brazilian one in the mid-seventies, but it then fell back again towards the end of the decade. The total share of industrial division 38, is approximately twice as high in Brazil as in Peru.

These data suggest, that the industrial sector in Peru is still of

Table 41

Percentage Distribution of Value Added
of Peruvian Manufacturing by Product Groups

	1971	1975	1976	1977	1978	1979
Grouping A	49.2	46.4	45.6	43.4	39.9	43.6
Grouping B	36.1	32.8	34.9	37.5	44.6	41.8
Grouping C	14.7	18.1	19.5	19.1	15.5	14.6
(381)	-	-	(4.6)	(4.5)	-	(4.6)
(382)	-	-	(3.0)	(2.6)	-	(2.1)
(383)	-	-	(5.5)	(5.6)	-	(4.6)
(384)	-	-	(6.1)	(6.1)	-	(3.1)
(385)	-	-	(0.3)	(0.3)	-	(0.3)

Source: Tables 35 and 38.

Table 42

Andean Group: Structure of the Manufacturing Industries, 1950 - 1977
(Percentages of the value added)

ISIC	Industry	1950a/	1955a/	1960	1965	1970	1971	1972	1973	1974	1975	1976a/	1977b/
311/312	Food	23.9	21.8	20.1	19.8	20.1	19.4	18.6	17.3	17.6	19.8	18.7	17.5
313	Beverages	12.9	11.3	10.6	9.2	9.0	8.8	8.9	8.6	7.9	9.4	9.8	10.8
314	Tobacco	5.5	4.2	3.5	3.0	2.8	2.8	2.9	2.7	2.6	2.6	2.8	2.7
321	Textiles	12.6	11.8	10.8	9.8	10.0	10.2	10.3	10.3	10.3	8.8	9.2	10.0
322	Wearing apparel	2.7	3.9	3.3	2.9	2.9	3.0	3.0	2.9	2.5	2.8	2.3	2.3
323	Leather	1.4	1.1	1.0	0.7	0.7	0.7	0.6	0.6	0.6	0.7	0.6	0.7
324	Footwear	1.3	1.2	1.7	1.3	1.2	1.3	1.3	1.3	1.1	1.2	0.9	0.7
332	Furniture	1.9	1.7	1.5	1.5	1.5	1.4	1.4	1.5	1.3	1.6	1.3	1.3
342	Printing and publishing	2.6	3.1	2.4	2.6	2.6	2.5	2.6	2.7	2.2	2.3	2.3	2.2
361	Pottery, china and earthenware	0.7	0.7	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5
390	Other manufactures	0.2	0.2	0.7	0.8	1.0	1.0	1.0	1.0	0.9	1.0	0.8	0.8
	Subtotal Group A	65.7	61.0	56.2	52.2	52.3	51.6	51.0	49.3	46.0	51.1	49.2	49.5
331	Wood and cork products	1.6	1.4	1.1	1.0	1.3	1.3	1.3	1.3	1.1	1.3	1.3	1.6
341	Paper and paper products	0.9	1.6	2.1	2.6	2.8	2.7	2.7	2.8	2.4	2.5	2.5	2.2
351	Industrial chemicals	1.5	1.6	1.8	2.0	2.2	2.2	2.5	2.6	2.5	2.7	2.7	3.3
352	Other chemical products	4.2	4.8	5.1	5.6	5.9	5.9	6.3	6.3	5.9	7.0	7.6	8.3
353	Petroleum refineries												
354	Miscellaneous products of petroleum and coal	12.0	12.9	14.9	13.1	11.5	12.1	10.7	12.0	16.4	7.1	8.5	3.8
355	Rubber products	1.4	1.9	1.9	1.9	2.1	2.1	2.1	2.0	2.5	2.0	2.6	2.8
356	Plastics	1.1	1.2	1.1	1.4	1.6	1.8	1.9	1.8	1.8	2.1	2.4	3.2
362	Glass and glass products	1.2	1.2	4.8	4.9	4.4	4.6	4.5	4.3	4.0	4.5	4.5	4.4
369	Other non-metallic mineral products	4.5	4.6										
371	Iron and steel	1.5	2.3	3.6	4.3	4.5	3.9	4.5	5.1	5.1	4.7	4.3	5.2
372	Non-ferrous metals												
	Subtotal Group B	29.9	33.4	36.4	36.8	36.4	36.7	36.6	38.1	41.8	33.9	36.5	34.8
381	Fabricated metal products	1.2	1.6	2.8	3.5	3.7	3.8	3.8	3.8	3.6	4.4	4.1	4.8
382	Machinery except electrical	0.8	0.9	1.3	1.9	1.8	1.9	2.2	2.2	2.1	2.6	2.7	3.6
383	Electrical machinery	1.0	1.0	1.3	2.1	2.6	2.7	2.9	2.9	3.0	3.7	3.7	4.1
384	Transport equipment	1.4	2.0	2.0	3.3	3.0	3.1	3.3	3.5	3.2	3.9	3.6	2.8
385	Professional equipment	-	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.4	0.2	0.3
	Subtotal Group C	4.4	5.6	7.5	10.9	11.3	11.7	12.4	12.6	12.2	15.0	14.3	15.7
	TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: JUNAC based on official statistics
a/ Excluding Bolivia.
b/ Excluding Bolivia and Venezuela

Table 43

Brazil: Structure of the manufacturing industries 1950 - 1978
(Percentage of the value added)

ISIC	Industry	1950	1955	1960	1965	1970	1971	1972	1973	1974	1975	1976	1977	1978
311/312	Food	18.7	16.9	15.7	14.2	13.5	12.4	12.5	11.6	11.5	11.4	11.2	11.7	11.3
313	Beverages	4.2	4.2	2.9	2.8	2.3	2.1	2.1	2.0	2.0	1.9	2.0	2.2	2.2
314	Tobacco	1.8	2.1	1.4	1.3	1.3	1.2	1.2	1.1	1.1	1.1	1.1	1.1	1.1
321	Textiles	22.2	20.3	16.5	13.2	9.6	9.7	8.8	8.0	7.5	7.6	7.1	7.0	6.7
322	Wearing apparel	10.1	9.2	6.2	5.3	3.2	3.8	3.5	3.1	3.0	3.0	2.9	2.7	2.7
323	Leather	-	-	-	-	.6	-	-	-	-	-	-	-	-
324	Footwear	-	-	-	-	-	-	-	-	-	-	-	-	-
332	Furniture	3.3	2.6	2.6	2.4	1.8	2.0	1.9	1.8	1.7	1.8	1.9	1.8	1.8
342	Printing and publishing	4.0	4.7	4.4	4.1	3.7	3.1	2.8	3.1	2.8	2.7	2.9	2.9	2.8
361	Pottery, china and earthenware	-	-	-	-	-	-	-	-	-	-	-	-	-
390	Other manufactures	1.3	1.3	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	Subtotal Group A	65.6	61.3	51.2	44.9	37.5	35.8	34.4	32.2	31.1	31.0	30.6	30.9	30.0
331	Wood and cork products	4.0	3.7	3.6	3.3	2.5	2.7	2.7	2.4	2.4	2.5	2.6	2.7	2.7
341	Paper and paper products	2.5	2.3	2.3	2.5	2.6	2.5	2.3	2.2	2.2	1.8	1.9	1.9	2.0
351	Industrial chemicals	2.8	5.4	7.2	9.9	3.2	10.9	11.1	11.5	11.9	11.9	12.8	12.8	13.0
353	Petroleum refineries	-	-	-	-	7.9	-	-	-	-	-	-	-	-
354	Miscellaneous products of petroleum and coal	1.0	2.0	2.5	3.6	3.2 .6	3.5	3.3	3.8	3.8	4.1	3.9	3.8	3.9
355	Rubber products	-	-	-	-	-	-	-	-	-	2.3	2.3	2.2	2.2
356	Plastics	2.6	2.6	3.0	3.1	2.0 1.9	3.9	3.9	4.0	4.5	2.2	2.3	2.3	2.7
362	Glass and glass products	5.2	6.5	5.8	5.2	5.9	5.5	5.5	5.4	5.9	6.3	6.2	6.6	6.6
369	Other non-metallic mineral products													
371	Iron and steel	5.2	5.1	5.9	6.8	7.5	7.5	7.4	6.8	6.9	7.3	7.2	7.8	7.8
372	Non-ferrous metals													
	Subtotal Group B	23.4	27.5	30.2	34.4	37.3	36.5	36.2	36.1	37.6	38.5	39.2	40.2	40.8
381	Fabricated metal products	-	2.9	3.4	3.9	4.3	4.7	5.0	5.4	5.2	5.2	5.2	5.0	4.8
382	Machinery except electrical		5.5	6.4	6.8	7.0	7.6	8.1	8.8	8.4	7.4	7.5	6.9	6.7
383	Electrical machinery	10.9	1.2	3.2	4.3	5.3	5.7	6.0	6.5	5.4	5.6	5.9	5.9	6.0
384	Transport equipment		1.2	5.2	5.1	8.0	8.9	9.6	10.3	11.7	11.5	10.9	10.4	11.0
385	Professional equipment		0.2	0.4	0.5	.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	Subtotal Group C	10.9	11.1	18.6	20.6	25.2	27.6	29.4	31.7	31.3	30.5	30.2	20.9	29.2
	TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

minor importance if compared to a country like Brazil. This is true for subdivision 38 as well. Thus, if an ongoing industrialization process can be implemented, there appears to be some room to raise the production of this sector progressively. The electrical machinery and equipment production would, under those conditions, face a good chance to regain its share of 1977 (5.7%) within a few years and to even go beyond that.

5.2. Analysis of the Present Industrial Stucture of the Subsector

5.2.1. Production of Electrical Machinery and Equipment (ISIC 383)

Gross output and value added of electrical machinery and equipment (ISIC 383) are shown in Table 44 in current prices and constant prices of 1973. Only one group, electrical apparatus n.e.s. (ISIC 3839), reached a higher production value and value added in 1981 than in 1976. After a growth period of different lengths (ISIC 3831: until 1979; ISIC 3839: until 1980; the two other groups show a varying performance) a steep decline occured between 1980 and 1981: 20% in production value and 18% in value added for ISIC 3831, and 12% and 2% respectively for the whole subsector, ISIC 383.

Comparing the share of value added in gross output (Table 45), one notes again a decrease for all subsectors over the years 1976 to 1981. It declined comparatively less for ISIC 3831 (7%), but for ISIC 3839 the decrease was considerable (17%).

During the period under consideration, the subsectors radio, TV and communication equipment (ISIC 3832) and general electrical apparatus (ISIC 3839) were the two most important subsectors representing jointly about 75% of the total value added in the production of electrical machi-

Table 44

Electrical Machinery - Gross Production Value and Value Added, 1976-1981,
(Million Soles at Current and Constant (1973) Prices)

	Gross Production Value					Value added				
ISIC Group	1976	1977	1979	1980	1981	1976	1977	1979	1980	1981
Current prices										
3831	3,021	4,503	13,298	20,455	26,017	1,448	2,242	6,614	8,958	11,586
3832	4.042	10,529	20,208	39,615	60,708	4,091	4,548	8,657	15,514	16,465
3833	2,020	2,390	4,803	11,843	13,382	1,063	1,273	2,185	4,587	6,799
3839	4,848	6,379	26,047	46,475	64,969	2,416	2,754	10,436	21,794	26,972
383	18,981	23,801	64,356	118,388	165,076	9,018	10,817	27,892	50,853	71,822
Constant prices*										
3831	1,705	1,967	2,067	1,986	1,595	817	979	1,028	870	710
3832	5,131	4,600	3,142	3,847	3,722	2,309	1,987	1,346	1,507	1,622
3833	1,140	1,044	747	1,150	820	600	556	340	446	417
3839	1,736	1,787	4,050	4,453	3,983	1,363	1,203	1,623	2,116	1,654
383	10,712	10,398	10,006	11,496	10,120	5,089	4,725	43,370	4,939	4,403
Price index	177.2	228.9	643.2	1029.8	1631.2	177.2	228.9	643.2	1029.8	1631.2

*: (rounded figures)

Source: Price index for major group 383 published by MITI. Indicadores del sector manufacturero 1981, December 1982.

Table 45

Value Added as a Share of Gross Output, ISIC-383

ISIC-Group	1976	1977	1979	1980	1981
3831	47.9	49.8	49.7	43.8	44.5
3832	45.0	43.2	42.8	39.2	43.6
3833	52.6	53.3	45.5	38.7	50.8
3839	49.8	43.2	40.1	46.9	41.5
383	47.5	45.4	43.3	43.0	43.5

Source: Calculations based on Table 43.

Table 46

Percentage Distribution of Value Added Within ISIC-383

ISIC-Group	1976	1977	1979	1980	1981
3831	16.1	20.7	23.7	17.6	16.1
3832	45.3	42.0	31.1	30.5	36.8
3833	11.8	11.8	7.8	9.0	9.5
3839	26.8	25.5	37.4	42.9	37.6
383	100.0	100.0	100.0	100.0	100.0

Source: Calculations based on Table 43.

nery, which includes equipment for the generation and distribution of electricity, oscillates between 16 and almost 24%. This maximum value was achieved in 1979, but it could not be sustained. In 1981, the share of ISIC 3831 dropped again to the level of 1976 (see Table 46).

The number of enterprises and the personnel employed in ISIC 383 are shown in Table 47. In 1981, there were 325 enterprises with a total workforce of 9,246 people. Employment per enterprise was 28.4 on the average, with the lowest value in ISIC 3831 (27 persons) and the highest value in ISIC 3832 (30.4 persons).

TABLE 47

Number of Enterprises, Personnel Employed and Value Added per Employee in the Production of Electrical Machinery, 1981

ISIC Group	Enterprises No.	%	Employment Number	%	Value Added per employee (mil. soles per person)
3831	81	24.9	2,183	23.6	5.31
3832	99	30.5	3,011	32.5	8.79
3833	36	11.5	875	9.5	7.77
3839	109	33.5	3,177	34.4	8.49
TOTAL 383	325	100.0	9,246	100.0	7.77

Source: MITI

While the figures of value added per employee are rather similar for three of the product groups (highest value: 8.79 million soles per employee in ISIC 3831; lowest and also overall average value: 7.77 million soles for ISIC 3933), the average value for ISIC 3831 is substantially lower (5.31). This difference will be treated in more detail in the following paragraph.

5.2.2. The Production of Industrial Electrical Machinery (ISIC 3831)

5.2.2.1. Enterprises and Employment

The number of enterprises registered under ISIC group 3831 has increased from 46 in 1976 to 81 in 1981, a surprising development in view of the reduction of output of industrial electrical machinery after 1979. Table 48 shows the development of the number of enterprises, employment and average size of company from 1976 to 1981. The decreasing number of persons employed per enterprise from 46.6 in 1976 to 27 in 1981 seems to indicate two different developments:

1. MITI has increased the coverage of the active industries by including a substantial number of small enterprises in MITI records. This is apparent for the period 1977 to 1979, when the number of companies increased by 54% and the work force by only 16%, which led to a drop in average employment per enterprise by 25%. This good performance in registration continued until 1981.

2. During the same period, the decrease in the volume of orders and sales caused by the economic recession, led to a reduction of the workforce by 15% between 1979 and 1981 bringing total employment in 1981 back to the magnitude of 1976. Preliminary estimates indicate that the workforce was further reduced by approximately 15% between 1981 and 1982, which would mean an employment figure of around 1900 for ISIC 3831 in 1983.

TABLE 48

Number of Enterprises,* Employment, and Average Size of Enterprises of ISIC 3831, 1976 - 1981

	1976	1977	1979	1980	1981
Number of enterprises	46	48	74	74	81
Total employment	2,141	2,227	2,578	2,387	2,183
(employees)	(813)	(821)	(1,089)	(961)	(914)
(worksmen)	(1,328)	(1,400)	(1,489)	(1,426)	(1,269)
Number of persons per enterprise	46.7	46.4	34.8	32.4	27

* The enterprises are concentrated in the metropolitan area of Lima, i.e. Lima and Callao.

Source: MITI

5.2.2.3. Scope of Production

The main products of the enterprises registered under ISIC - group 3831 are: power transformers up to 220KV and 50 MVA, distribution transformers, electric generators up to 500 KW, electric motors up to 300 KW, repair of electric motors, diesel generator sets, hydraulic generator sets (turbines up to 2MW), switchgears up to 24 KV and 630 A, current rectifiers and regulators, current transformers, power and distribution switchboards, relais, low voltage switchgears, and battery chargers.

5.2.2.5. Gross Production and Value Added

Gross production as well as value added per employee (Table 49) were the highest in 1977. Subsequently, they decreased until 1981 except for 1980, where gross output per worker rose slightly from the year before, yet value added continued decreasing. The production value per

employee expressed in US$ is in the order of US$ 19,000 to US$ 23,000, which compares favorably with figures from other developing countries.

According to preliminary estimates of early 1984 the production value remained more or less stable in 1982 compared to 1981, and decreased strongly again in 1983.

TABLE 49

ISIC 3831 - Production Value and Value Added per Employee at Constant 1973 prices (In Thousand of Soles)

	1976	1977	1979	1980	1981
Production value per employee	798	883	803	832	731
Value added per employee	382	440	399	364	325

Source: calculations based on Table 44 and 48.

5.2.2.4. Investment and Fixed Assets

Table 50 shows some information on the stock of fixed assets and on investment behaviour between 1976 - 1981. One of the most interesting developments is the rate of change in assets at constant prices of 1973. There was a tremendous drop in the stock of assets other than machinery and equipment between 1976 and 1977 (from S./446 million to S./213 million), whereas the value of assets in machinery and equipment itself rose considerably up to 1979. Between 1979 and 1980, however, the latter dropped from S./473 million to S./255 million, and it did not recover in 1981. Fixed assets other than machinery have demonstrated a weak positive trend since 1977.

Table 50

Fixed Assets at Current and Constant Prices and Investment Per Employee (In Million Soles)

	1976	1977	1979	1980	1981
Current prices					
Fixed assets	777	1,110	4,418	5,286	8,288
of which: machinery and equipment	448	622	2,655	2,624	3,950
Constant prices (1973)					
(1) Fixed assets	699	485	687	513	508
(2) of which: machinery and equipment	253	272	413	255	242
% (2) : (1)	36.2	56.1	60.1	49.7	47.6
Fixed assets per employee (thousand soles per person)	326	218	266	215	233
Machinery and equipment per employee (thousand soles per person)	118	122	160	107	110
Current prices					
Total annual investment	203	243	741	815	1,046
of which: machinery and equipment	148	138	442	501	476
Constant prices					
Total annual investment	115	106	115	79	64
of which: machinery and equipment	84	60	69	49	29

Source: MITI, own calculations.

There is a simple explanation for the extraordinary increase in the value of assets of machinery and equipment between 1977 - 1979. From the above investigation of the number and size of firms we know that during this period the number of companies increased by 54% due to the registration of a substantial number of small enterprises. At the same time, the relative increase of these small producers decreased the statistical average of the size of the firms as measured by the number of employees. This statistical effect, however, increased the total stock of assets registered. To test this hypothesis, a look at the other indicators shown in Table 50 is helpful. Machinery and equipment per employee rose from S./122,000 in 1977 to S./160,-000 in 1979. This is clearly less than the increase in assets and indicates that more small enterprises with a lower capital-labor ratio were incorporated. The behavior of total investment in machinery and equipment confirms this suggestion: the increase in total investment between 1977-1979 was less than 7.5% annually and cannot explain the tremendous increase in the capital stock.

It is especially worth mentioning that the positive trend initiated between 1977-1979 did not prove to be viable. Real investment dropped to S./49 million in 1980 and S./29 million in 1981 causing severe problems because of the age and size of the capital stock.

5.2.2.5. Production Inputs

The major part of inputs is of domestic origin (see Table 51), varying between a minimum of approximately 53% and a maximum of approximately 59%. Considering raw materials alone, however, foreign supplies dominate: local raw material inputs have a share of 36% (minimum, 1977) to 47% (maximum, 1976); in general it can be assumed that 40 % of the raw materials are of domestic origin. According to the results of preliminary estimates the share of domestic raw materials has increased strongly since 1981. The local content remained relatively stable during the time considered in Table 51, oscillating around two thirds of the value of production. This can be considered a positive achievement of the industry.

Table 51

ISIC 3831 - Production Inputs
at Current and Constant Prices (1973) (In Million Soles)

	1976	1977	1979	1980	1981
Total production inputs, current prices	1,573	2.261	6,684	11,497	14,431
Total production inputs, constant prices	888	988	1039	1116	885
Domestic inputs (%)	57.9	52.5	59.0	59.2	57.3
(Raw materials)	(36.8)	(27.2)	(27.9)	(32.2)	(26.2)
(Parts and accessories)	(0.2)	(0.3)	(0.6)	(0.1)	(1.3)
(Industrial services)	(12.1)	(16.0)	(19.8)	(15.2)	(17.8)
(Others)	(8.8)	(8.4)	(10.7)	(11.7)	(12.0)
Imported inputs (%)	42.1	47.5	41.0	40.8	42.7
(Raw materials)	(41.4)	(47.4)	(40.2)	(40.1)	(41.6)
(Parts and accessories)	(0.1)	(0.1)	(0.3)	(0.3)	(0.4)
(Others)	(0.6)	-	(0.5)	(0.4)	(0.7)
Share of domestic raw materials in total raw materials consumed (%)	47.0	36.4	41.0	44.3	38.6
Local content (1) (%)	68.1	63.4	67.1	66.4	67.2

(1) Calculation based on the formula applied by the Junta del Acuerdo de Cartagena: Apreciación global de la industria de bienes de capital del Perú, 1983.

Source: MITI.

5.2.2.6. Labor Costs

According to Table 52, total cost per employee at constant prices (1973) decreased between 1976-1981. This is in line with the decline in real wages, which the whole economy had to suffer after 1975. In Chapter 1, it was shown that the minor improvement in unit costs for the economy as a whole could be realized, because nominal wages decreased at a higher rate than productivity. It cannot be gathered from Table 52, however, if this was also true for the sector producing equipment for power generation and distribution. Again, a considerable part of the development of the trend between 1977-79 appears to be the result of the increase in registered firms during this period. Since the newcomers have been relatively small firms, paying lower hourly wages on average and employing less skilled labor, the effect on unit labor costs of all firms in this sector is ambiguous.

5.2.3. Enterprises Produc ing Equipment for the Generation and Distribution of Electricity

5.2.3.1. General Remarks

The manufacturers of equipment for the generation and distribution of electricity can be subdivided into the 5 following groups:

- producers of diesel and hydraulic generator sets, motors and alternators (part of ISIC group No. 3831);
- producers of power and distribution transformers (part of ISIC group 3831);
- producers of switchgears and switchboards (part of ISIC group 3831);
- producers of insulated wires and cables (part of ISIC No. 3839);
- producers of forged parts for high voltage transmission lines (part of ISIC group No. 3819).

Electric motors have been included in the first set of producers, even though they are consumers rather than producers of electricity. Yet the

TABLE 52

Salaries, Wages and Other Personnel Costs
(In Millions Soles)

	1976	1977	1979	1980	1981
Salaries and wages, fixed personnel	427	565	1,321	2,079	3,591
Salries and wages, non-fixed personnel	11	19	67	92	187
Other personnel costs	67	93	261	310	560
Total, current prices	505	677	1,649	2,481	4,338
Total, constant prices*	285	296	256	241	266
Total employment cost/ employee (constant prices,* '000 soles)	133	133	99	101	122

* 1973 prices

Source: MITI

technology for producing motors and alternators is very much the same, so that in many cases with minor technical changes an electrical motor can be used as an alternator.

5.2.3.2. Enterprises

During the field work the following number of companies were identified (some companies manufactured several of the products):

Production of:	
- electric motors	1 company
- electric generating sets (diesel and hydraulic incl. hydraulic turbines and alternators)	1 company
- transformers	5 companies
- switchgears	1 company
- low voltage switches	1 company
- switchboards and installation of switchboards	15 companies
- cables	5 companies
- forged parts	1 company

With respect to these products the production environment can be described as follows:

The electric motors are produced in a company which also manufactures other products like speed reducers, ventilators for industrial application, transformers and switchboards. There is one company specializing in the production of electricity generating sets up to the same power range (the diesel engines are mainly purchased from the Peruvian manufacturer), small hydropower stations up to 2 MW with turbines of the Pelton, Francis or Mitchell type.

Transformers are manufactured by 5 companies, of which 2 companies produce power transformers and distribution transformers and 3 smaller companies engage in transformer repairs and manufacturing of distribution

transformers. The power range of the transformers manufactured goes up to 50 MVA and 220 KV. One of the major producers of transformers also fabricates switchgears up to 630 A and 24 KV. Low voltage switches are produced by another company.

There are approximately 15 producers of switchboards. Among them are the companies manufacturing alternators (switchboards as required for the generator sets), two producers of transformers, and the manufacturer of low voltage switches. With respect to the production of switchboards one can distinguish between low voltage distribution of switchboards with relatively simple technology (approximately 15 producers), and switchboards for industrial uses, e.g. motor control centers (approximately 7 producers). The producers of medium voltage switchboards cover the whole product range.

Cables are manufactured by two relatively big, one medium-sized and three small companies. The copper used for the production of cable and wire is of domestic origin. It is relatively brittle because of its content of arsenic and silver impurities, which causes problems in the production process (occasional ruptures occur during manufacturing). It possesses, however, good characteristics for electric conductivity, even though the silver content is minimal. The cables produced cover the power range of up to 15 KV. The demand for cables for higher voltages is too limited to allow production on an efficient scale. Forged parts for uses in electric transmission lines, e.g. for fixing insulators or joining cables, are produced by the sole Peruvian company fabricating forged products.

In general, the existing Peruvian production of equipment for the generation and transmission of electricity covers a relatively wide range of products and can supply a good portion [1] of domestic con-

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(1) e.g. in cables approx. 95-97% of annual demand, in power and distribution transformers 100%; in the case of the other products market coverage depends on possible specific requests by the purchaser, in general terms, however, coverage can be above 80%.

sumption. Some products have been discontinued like aluminium transmission lines, as the drawing of aluminium using imported intermediate products proved to be uneconomic and not competitive with the imported finished product.

5.2.3.3. Sales Markets

The predominant part of production is normally sold to the state-owned electricity companies, Electrolima and Electroperu. Because of the reduction in public investment programs the sales to these clients were reduced considerably so that the manufacturers were forced to find additional markets. At present the average distribution of sales of the enterprises covered in the field work is:

- approximately 50% of sales goes to the public electricity companies,
- approximately 15% is sold to industrial clients, mainly mining industry,
- approximately 35% goes into export.

There are, however, companies with only very low export shares and others where exports are the predominant sales outlets. Products with a high export share are alternators, power and distribution transformers, switchgears and cables.

In the case of cable manufacturing, approximately 40% of the production is power cables, the remainder is telephone cables, cables for building installations and non-insulated cables and wires, e.g. for electric motors and alternators.

5.2.3.4. Capacity Utilisation

All companies complained about the low utilisation of their installed capacity due to reduced sales in the domestic market. While

in normal years the domestic demand for switchboards is in the order of US$ 20 million, it has only been around US$ 3 million since 1981. As a result the average utilisation of capacity is 15%, since export markets hardly exist for this type of product. In transformer production the capacity utilisation is 40%, in switchgear production (low and high voltage) around 20%, in electric motor and alternator production approximately 60%, and in cable manufacturing around 50%. Some companies have taken up subcontracting orders where technologically possible.

It was noticed during field work that many enterprises did not undertake measures to increase productivity in their manufacturing sections, as there was no possibility to sell additional output. At the same time, the industry is trying to keep the present work force, since - according to their statements - trained personnel is an important asset for future operations. The cost of training skilled labor, which can take up to 10 years depending on the specific job, is considered to be so high that the industry tries to avoid a further reduction of personnel.

5.2.3.5. Plant Layout and Operations

In most cases plant layouts were adequate for the production flows, and possible improvements would only marginally contribute to improved operations or cost savings.

Nevertheless, a few cases showed considerable defaults in the set-up of machinery, in warehousing and in the flow of semi-finished products between machining and/or assembling centres. At the same time, in these cases a relatively common phenomenon could be noticed: the uneven or sometimes disorderly production flow apparently influenced the quality of craftsmanship as shown by unproper welding gears, inaccurate machining or simply by the quality of painting of finished products. These examples showed again that the quality of products is

influenced by properly planned and executed flows of products during production.

The plant operation consists in general of metal-forming operations (e.g. bending) and in some cases of metal-cutting or removing operations (e.g. milling, drilling and lathe operating). Overall, the machines were of good quality and were kept in good conditions. The age of the machinery indicated, however, that hardly any investment had taken place in the recent past. Most companies had installed adequate product-testing facilities, yet in some cases these important units were improperly equipped or used.

5.2.3.6. Subcontracting

The enterprises visited all used subcontracting in their production operations, especially cast iron parts and components. In a few cases, the enterprises themselves had taken over orders to improve their capacity utilisation, e.g. for the production of pressed aluminium or machined products. Statistically, subcontracting is included under the item industrial services (see Table 51), which accounted for 12% of total production inputs in 1976, 20% in 1979, and 18% in 1981.

Thus, the general remarks about the significance of different kinds of forewardly and backwardly linked industries for capital goods production apply to this sector, too. Further specialization and quality improvement are among the important factors for improvements in capacity utilization and productivity.

5.2.3.7. Cost Efficiency in International Perspective

According to the enterprises, their products are competitive on export markets due to CERTEX and the other incentives. The main export markets are the Andean Pact countries, Central America and, especially for cables, also the USA.

On the domestic market there is competition from foreign suppliers in all internationally financed tenders. Because of the higher costs domestic products are normally not competitive with imports on a duty-free basis. The entrepreneurs point to import duties on imported raw materials and to the industrial community law as special cost factors. The latter payments increase the price of the final product by 8% according to the entrepreneurs, while an average share of imported raw materials of 20% of the production value (calculated for 1979) and an import duty of 60 plus 10% increases the product price by another 14%. In the case of cables, the relatively high price of domestic PVC material for insulation purposes has a strong negative effect on international competitiveness. Copper prices from the domestic suppliers, on the other hand, are no reason for concern.

5.2.3.8. General Aspects

The general impression obtained was that all enterprises tried to open up new markets to overcome the downward trend in their traditional domestic markets, and they also made efforts to include new product in their scope of production. But as industrial and public purchases were at an overall low, the market prospects for additional products were also so reduced that even minor investments to start new products lines were not undertaken.

An additional market outlet is seen by the entrepreneurs in the supply of equipment for major internationally-financed projects to generate electricity. Within the National Association of Industries domestic producers of equipment have formed a working commission on capital goods to promote a stronger domestic participation in the tenders for those projects. Apparently the public power sector welcomes those activities and has no objection against the local supplies, which is shown by the fact that 50% of the industry's sales goes to the power sector. The commission is also active in trying to open up bilateral financing agreements between Peru and possible supplier

countries for the inclusion of Peruvian supplies into the financing schemes. However, positive results might only be achieved on a case to case basis.

The industry is also partly engaged in own research and development activities. Some of the enterprises take advantage of the possibility offered by ITINTEC to use the 2 percent surcharge on all salaries and wages paid by the enterprise for own research and product development instead of paying the corresponding amount to ITINTEC. ITINTEC has to approve these activities and is ready to continue doing so, since several positive results have been obtained.

5.3. Demand for Equipment for the Generation and Transmission of Electricity

5.3.1. Past Trends and Present Situation

5.3.1.1. Apparent Consumption for Products of ISIC 3831

Due to the scarcety and unreliability of trade figures it is difficult to establish a statistical overview over production, trade and apparent consumption of the products considered in this study. The only available time series on exports is given by the World Bank for the ISIC group on a 3-digit level. According to that source exports of ISIC 383 developed as follows:

- 1976: US$ 1.9 million
- 1977: US$ 3.6 million
- 1979: US$ 13.4 million
- 1980: US$ 19.1 million
- 1981: US$ 13.7 million
- 1982: Jan. - June: US$ 4.2 million

For 1977 and 1979 data are available on trade, production and apparent consumption (see Table 53). Exports are relatively small in 1977, approximately 3% of production, and they grow to approximately 7% in 1979. Comparing these export figures for ISIC 3831 with those of the World Bank for exports of ISIC 383 shows that ISIC 3831 accounted for 44% of all exports of electrical machinery in 1977 and for 30% in 1979.

Table 53

Production, Imports, Exports and Apparent Consumption of Electrical Industrial Machinery (ISIC 3831) (in 1,000's of US$)

ISIC 3831	1977	1979
Production	50,827	53,410
Imports	23,060	29,560
Exports	1,609	3,951
Apparent consumption	72,278	79,019

Source: Apreciación global de la industria de bienes de capital del Perú, Junta del Acuerdo de Cartagena, 17.1.1983.

5.3.1.2. Investment Constraints of the Public Power Sector

The investment potential of Electroperu, holding company of all public power companies, is determined by its income through the sales of electricity and its access to external sources of financing. At present, both factors are at a critical stage: The income generated by the sale of electricity does not cover costs, as increases in the fees for electricity did not keep up with the rate of inflation during the last 10 years. In 1983, Peru had the lowest electricity prices in Latin America, and Electroperu had to use 65% of its income for debt service as a result of its externally financed investment

program. At present, the situation is gradually improving through periodical increases of the rates.

At the moment, the availability of external financing is not only affected by the weak income situation of Electroperu, but also by the external financial problems of Peru. It can be expected that, with respect to Electroperu, these negative influences can be overcome, once its income situation stabilizes. There are indications that international financing institutions are willing to finance specific projects, once Electroperu is able to raise its local contribution.

Nevertheless, due to the nature of power projects the investment decisions on new projects will only have a medium-term influence on the industry manufacturing power generation and transmission equipment, and they will therefore not contribute to improve the present low utilisation of capacity. These factors have also influenced the performance of ISIC 3831 in the past (see Table 44), in contrast to the development of ISIC 3833, which only subsumes consumer goods.

..3.2. Future Prospects

5.3.2.1. General System of Power Supply

In October 1983, Electroperu devised a Master Plan. (1) It is a revision of previous, more ambitious plans which were considered unrealistic because of the investment volume, for which financing could not be obtained. The projections of the Master Plan assume an annual growth rate of the demand for electricity of 6.1% and for power generation of 6%. This growth rate, however, appears to be still too high, if compared to international estimates. An UNDP/World Bank Study sees

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(1) Electroperu, Plan Maestro de Electricidad, Ministerio de Energía y Lunas, October 1983.

the growth potential of this sector as less promising, and projects an annual increase of 5% for power generations. (1) In the short term (i.e. until 1986) even this figure will not be reached, however, due to the reduced investment program of Electroperu.

This means that there will be delays in the tendering of new power plants in the middle of the present decade. Even if the present readjustment plan for electricity fees can be fully implemented, an increase in tendering of new power plants and transmission lines of the magnitude projected cannot be expected before the end of the decade. The projections can therefore only be taken as an indicator for the size of investment of the public power sector for the final part of this decade and beyond. The near future, however, must be seen even less optimistic. If the investments projected for the end of the decade are embarked upon, Electroperu will require an average annual investment of approximately US$ 450 million, of which the domestic counterpart contribution would have to be around 30%, i.e. US$ 150 million. The demand impact of these investments on specific products is shown in detail in a recent study prepared by the "Comisión de Integración Eléctrica Regional". The main sectoral statistics are shown in Appendix 1 at the end of this chapter.

5.3.2.2. Isolated Power Generation

Approximately one third of the electricity produced in Peru is generated in about 600 isolated systems. Many of them are operated by Electroperu, and they will be more and more integrated into the national grid system in the future. Important industrial power producers are:

- mining and oil: approximately 770 MW installed capacity
- sugar and fish industry: approximately 200 MW installed capacity
- other industry: approximately 170 MW installed capacity.

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(1) UNDP/World Bank Energy Assessment Program. Peru: Issues and Options in the Energy Sector, January 1984.

There are no indications that there will be an extension of autoproducing systems with the exception of a mining project discussed at present. Yet many of the autoproducers, especially in the sugar industry, have considerable replacement requirements, as there have been hardly any investments in the past.

5.3.2.3. Rural Electrification

At present, around 2,000 villages are without electricity supply, which affects 60% of the population. To improve this situation an electrification program has been established for a total of US$ 200 million, out of which US$ 25 million have been spent in 1982. This program receives support from several bilateral and multilateral aid institutions, e.g. the USA, the Federal Republic of Germany and IDB.

In total, 220 small systems for the generation, transmission and distribution of electricity have been identified. Fifty small scale hydropower projects have already been analyzed in more detail. Electroperu estimates that in the near future the following average number of hydropower plants will be installed:

- 50 - 500 KW plant capacity: 10 - 15 hydropower plants annually
- 500 - 5000 KW plant capacity: 3 hydropower plants annually
- more than 5000 KW plant capacity: less than 1 plant annually

In the past years, Electroperu has continuously increased its technical planning capacity to cope with the requirements of implementing such a program of small hydropower systems. As this program is not affected by adverse external financial problems and as its implementation is planned to proceed continuously, it represents a relatively stable demand for the domestic industry.

5.4. Recommendations

5.4.1. Institutional Framework for the Capital Goods Sector

The producers of equipment for the generation and transmission of electricity in Peru are members of the Committee of Capital Goods Producers of the Association of Industrialists ("Comité de Fabricantes de Bienes de Capital de la Sociedad de Industrias"), at present the only entity dealing specifically with the capital goods sector. It is a private industrial institution. The manifold problems and aspects of capital goods production and sales, however, require more complex institutional structures of support. In the industrialized countries there exists a complete network of private, public and mixed institutions many of which deal only with specific tasks, be it public relations of the industry, norms and control functions for equipment specifications, research institutions or training facilities, etc.

Three other member countries of the Andean Pact, namely Colombia, Ecuador, and Venezuela, have lately created public or mixed institutions to stimulate their capital goods industries. UNIDO has given support to these efforts through detailed planning and organisational assistance.

The Ecuatorian "Comisión de Bienes de Capital" pursues the objective to achieve the highest possible participation of domestic engineering and industrial enterprises in the execution of investment projects. Among the various programs executed by the institution are:

- permanent inventory of investment projects of the public sector
- domestic supply and demand comparisons of capital goods
- execution of technological disaggregation of investment projects to determine domestic supply potentials
- design of policy measures to promote the capital goods industry.

The institutions in Colombia and Venezuela have similar objectives. In addition, the enterprises are represented in their corresponding industrial associations.

It is recommended to analyze the possibilities of a similar approach to the capital goods sector in Peru. It is a measure which goes beyond the scope of the producers of electric equipment. Yet the creation of such an institution and its active support for the domestic capital goods industry would also be highly beneficial for the electrical equipment subsector.

5.4.2. Institutional Framework in Technological Matters

All of the Peruvian companies visited had testing laboratories, and most of them were at least adequately equipped for the current testing requirements of the industry. Nevertheless, in the production of electric equipment it is quite common to test equipment under extreme load conditions. These facilities are very costly and would, especially under the present difficult situation of the industry, hardly be justifiable for any of the enterprises. Furthermore, their capacity utilisation by anyone of the enterprises would be reduced.

In contrast, a common facility for educational purposes at the academic level for the power utility companies and for the producers of electric equipment might prove to be an adequate investment and a cost saving solution fo strengthen capacities according to requirements. It can also stimulate the industry to take up additional production of component and equipment, especially in the range of medium and high voltage.

The institution which appears most appropriate to further investigate this concept is ITINTEC. It has gathered experience in the execution of research in the area of electric power generation and distribution and testing laboratories. A study by ITINTEC should also indicate

the most appropriate way to organize the institution to be created and to attach it to the most adequate existing public establishment (e.g. university).

One of the most important areas to be covered by either the new or an existing institution is the design of norms and standards. These should be compulsory both for the power utility companies and the industry. The determination of standards should be combined with regional efforts by the Junta del Acuerdo de Cartagena, for which ITINTEC is responsible in Peru. It must also take into consideration already existing international treaties, if future access to the world market is not to be hindered. Company research, carried out by the enterprises themselves and in collaboration with personnel of the new institutions, should be an important issue during planning and operation. The important role of a thoughtfully planned research and advisory system for public development planning and private investment projects is discussed in more depth in Chapter 7.

5.4.3. Market Orientation

Peruvian producers of power generation and distribution equipment demonstrated a great deal of flexibility in the past, in that they quickly found sales outlets in new export markets, when domestic demand stagnated. Between 1976 and 1980 exports under ISIC subgroup 383 rose by 1000%. However, they dropped again by 28% from 1980 to 1981 due to the worldwide recession and adverse domestic conditions. Interviews with producers confirm that the local industry actively tries to escape the severe constraints on demand in Peru and the whole Andean Pact region. Promising new markets are believed to exist in Central America, if political turbulences can be settled. In terms of efficiency this industry is apparently close to the world market level for a number of different products. Thus, the existing CERTEX, conceding a gross subsidy of 22% to producers of electrical equipment, in combination with the export financing scheme appears to be sufficiently large export incentives.

Another possibility to overcome a stagnating market is to foster product diversification. Looking for new products of similar production technology for different domestic and foreign purchasers, has not been favored very much in the past by the Peruvian producers of electric equipment.

However, there are market "pockets" in the power sector which have not been covered by domestic producers. Namely the internationally-financed projects for power generation and distribution can be regarded as sources of additional demand, if the degree of tied aid can be reduced and if local supply can become competitive. Peruvian entrepreneurs claim that owing to their high production costs (low productivity, low production volume, high labor cost through the industrial community law) and owing to the reference price their offer is not competitive with foreign bidders. They claim that their cost advantage in bidding of 15% is insufficient to be able to win the bids. Their cost comparisons between domestic and foreign offers tend to criticize that foreign prices include all available export incentives of the foreign supply countries while the own check price does not include any incentive.

However, this argument is valid only, if there are no import tariffs on foreign products, or if the basis for the selection of suppliers is the world market price (excluding import tariffs). In reality, even after the implementation of the liberalization package announced in 1981, the average tariffs on metal and metal products (32.3%) and machinery (30.7%) [1] still formed an effective barrier to foreign competition. Thus, taking into account the 15% bidding advantage for local producers, foreign export subsidies must exceed 45% on average, if the claims of Peruvian producers were justified. It can be argued, however, that the given state of infant industry, which justifies export subsidies through CERTEX for Peruvian entrepreneurs,

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(1) See World Bank (1983: Table 3.4).

might equally substantiate a more preferential treatment in competition for internationally-financed projects.

5.4.4. Production Aspects

Once market prospects are more positive again, the Peruvian producers of power generation and transmission equipment will look more closely at additional production possibilities. These can arise in the area of intermediate products and components which at present are imported.

New products with an apparently high sales potential in the power sector are:

- high voltage insulators
- forged or cast steel parts for fixing cables and insulators
- transmission towers
- steel pressure tribes and
- floodgate and canal locks.

Projections for the size of future demand for these products are shown in the tables of the Appendix 1. All additional products with a high market potential and prima facie good prospects for local production by the power sector belong to ISIC groups other than 3831.

In all cases the production technology for the new products is relatively complex. A high quality of the raw material (e.g. steel, coaline) and precise manufacturing processes (e.g. rolling or forging of steel intermediates, casting) requires in some cases additional high precision machinery and equipment, and a highly trained workforce for finishing operations is needed, too. Furthermore, testing facilities and control standards will have to be created.

At present, there are some products of the iron and steel sector, on which domestic manufacturing of the above-mentioned products can be

built. Yet this will require substantial planning and control efforts, both organisational and technical control, for which an operational structure would have to be established. In this context reference is made to internal, operational and technical solutions within large enterprises and to external ways of cooperations, i.e. the establishment of specialized production units forming a subcontracting network.

Possible planning concepts for such an operational structure should be jointly discussed between public authorities, the power sector and the corresponding private and public industries. The results of the discussions should include the determination of the objectives of such a project and additional external inputs in manpower, technology transfer and financing required for its implementation.

APPENDIX 1

COMITE NACIONAL PERUANO

COMISION DE INTEGRACION ELECTRICA REGIONAL

SUBCOMITE INDUSTRIAL

INFORME DEL PERU

COORDINADOR TECNICO NACIONAL

ING. RICARDO CEBRECOS REVILLA

1983

LIMA - PERU

PRINCIPALES EQUIPOS PARA CENTRALES HIDROELECTRICAS

R E S U M E N
1982 - 1990
CANTIDAD

	1985	1986	1988	1989	TOTAL
TURBINAS	3	9	4	12	28
GENERADORES	3	9	4	12	28
COMPUERTAS DE SECTOR	3	6	8	8	25
COMPUERTAS DE TABLERO	6	3	2	6	11
CONDUCTOS FORZADOS	1	3	1	6	11

PRINCIPALES EQUIPOS PARA CENTRALES HIDROELECTRICAS

RESUMEN 1982 - 1990

P E S O EN TONELADAS

	1985	1986	1988	1989	TOTAL
TURBINAS	960	861	840	421	3,082
GENERADORES	384	735	320	276	1,715
COMPUERTAS DE SECTOR	105	280	165	355	905
COMPUERTAS DE TABLERO	120	52	100	197	469
CONDUCTOS FORZADOS	1,412	5,879	6,940	15,665	29,896

TURBINAS HIDRAULICAS

1982 - 1990

Año de entrada en servicio	Denominación	Potencia Unitaria MW	Tipo	Altura de caída Tn	Rotación RPM	Peso de Rotor Tn	Peso completo Tn	Cant.	Peso Total Tn
1985	Restitución	77.4	P(v)	255	200	36	320	3	960
1986	Carhuaquero	26.8	P(v)	500	514	9	38	3	114
1986	Charcani V	48.3	P(v)	690	600	12	107	3	321
1986	Ampliación Macchu-Picchu	25	P(v)	345	450	16	142	3	426
1988	Sheque *	162	P(v)	1,060	514	30	210	4	840
1989	Yuncán	45.4	P(v)	550	450	18	145	3	435
1989	El Chorro	64	P(v)	426	360	20	178	5	890
1989	Lluta	74.9	P(v)	750	600	11	98	4	392

P(v) : Pelton vertical

* En el último estudio ha sido transferido para próxima fecha de la década siguiente.

GENERADORES

1982 - 1990

Año de entrada en servicio	Denominación	Potencia Unitaria MW	Rotación RPM	Peso Rotor Tn	Peso Completo Tn	Cant.	Peso Total Tn.
1985	Restitución	72.3	200	84	128	3	384
1986	Carhuaquero	25	514	35	100	3	300
1986	Charcani V	45.6	600	28	48	3	144
1986	Ampliación Machu-Picchu	23.3	450	38	97	3	291
1988	Sheque *	160	514	33	80	4	320
1989	Yuncán	42.3	450	40	105	3	315
1989	El Chorro	60	360	47	91	5	455
1989	Lluta	70	600	40	80	4	320

* En el último estudio ha sido transferido para próxima fecha de la década siguiente.

COMPUERTAS

AÑO	COMPUERTAS DE SECTOR				COMPUERTAS DE TABLERO			
	Cant.	L x A	Peso unitario Tn	Peso total Tn	Cant.	L x A	Peso unitario Tn	Peso total Tn
1985	3	5 x8.2	35	105	6	4 x 3	20	120
1986	2	8 x 10	40	80	1	7x9.3	24	24
	2	15 x 18	60	120	1	3x4	6	6
	2	6 x 6.5	40	80	1	4x6	22	22
1988	4	10 x 10.2	55	165	2	7.9 x 9.4	40	100
1989	2	10 x 8.5	50	100	1	4.10x 5	17	17
	3	15 x 13	55	165	3	7 x 7	40	120
	3	6 x 9.5	30	90	2	5.9x6.2	30	60
1983-1990	21		[illegible]	905	17		[illegible]	469

CONDUCTOS FORZADOS

1982 - 1990

Año de entrada en servicio	Denominación	Altura de caida m	Diámetro m	Cantidad	Longitud Unitaria m	Longitud Total m	Peso Unitario Tn	Peso Total Tn
1985	Restitución	240	4.50	1	550	550	1,412	1,412
1986	Carhuaquero	263	2.50	1	1,350	1,350	2,694	2,694
1986	Charcani V	310	3.10	1	860	860	2,128	2,128
1986	Ampliación Macchu Picchu	255	2.16-2.90	1	523	523	1,057	1,057
1988	Sheque *	370	3.60-4.30	1	2,201	2,201	6,940	6,940
1989	Yuncán	292	2.50	2	400	800	1,292	2,584
1989	El Chorro	655	2.30	3	1,523	4,569	2,796	8,388
1989	Lluta	790	3.20	1	1,837	1,837	4,693	4,693

* En el último estudio ha sido transferido para próxima fecha de la década siguiente.

TRANSFORMADORES DE TENSION

CANTIDAD

TENSION EN kV

AÑO	60	66	138	220
1983	6	-	-	-
1984	-	-	-	-
1985	24	-	6	12
1983-1985	30	-	6	12
1986	28	4	9	13
1987	-	-	4	-
1988	4	-	7	-
1989	2	-	-	-
1990	-	-	4	6
1986 - 1990	34	4	24	19
1991	4	2	6	[illegible]
1992	-	-	-	11
1993	14	-	17	-
1991 - 1993	18	2	23	11
1983 - 1993	82	6	53	42

TRANSFORMADORES DE POTENCIA

TENSION EN KV

AÑO	60		66		138		220	
	Cant.	MVA	Cant.	MVA	Cant.	MVA	Cant.	MVA
1983	3	21	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-
1985	11	91	-	-	3	22	5	77
1983-1985	14	112	-	-	3	22	5	77
1986	5	138	2	13	3	45	4	160
1987	-	-	-	-	2	25	-	-
1988	2	10	-	-	4	77	-	-
1989	1	5	-	-	-	-	-	-
1990	-	-	-	-	2	28	2	95
1986 - 1990	8	153	2	13	11	175	6	255
1991	2	11	1	10	3	25	-	-
1992	-	-	-	-	-	-	4	75
1993	6	42	-	-	6	119	1	20
1991-1993	8	53	1	10	9	144	5	95
1983-1993	30	318	3	23	23	341	16	427

MATERIA PRIMA

RESUMEN
1982 - 1990
Peso en toneladas

AÑO	CABLES CONDUCTORES		CABLES PARARRAYOS	ESTRUCTURAS
	ACERO	ALUMINIO	ACERO	ACERO
1983	-	-	-	-
1984	-	863.40	-	1,913
1985	1,082.50	1,854.36	473.16	4,290
1983-1985	1,082.50	2,717.76	473.16	6,203
1986	-	3,974.90	395.43	12,687
1987	-	1,213.80	197.40	7,120
1988	1,102	1,302.18	914.96	11,988
1989	-	297.69	86.97	535
1990	1,155.29	2,443.12	393.12	4,488
1986-1990	2,257.29	9,231.69	1,987.88	36,818
1991	25.75	544.26	140.64	5,040
1992	-	398	136.18	3,226
1993	453.96	334.10	527.80	10,987
1991-1993	479.71	1,276.36	804.62	19,253
1983-1993	3,819.50	13,225.81	3,265.66	62,274

LINEAS DE TRANSMISION

TENSION EN kV
LONGITUD EN km

AÑO	60	66	138	220
1983	57	-	-	-
1984	-	-	-	217.5
1985	139.5	-	-	278.5
1983 - 1985	196.5	-	-	496
1986	7	75	343	287.8
1987	-	-	174	108
1988	65	10.8	319.7	326.4
1989	210	-	186	-
1990	-	-	534.4	255
1986 -1990	282	85.8	1,557.1	977.2
1991	89	-	134	-
1992	-	-	-	203.6
1993	365	-	705.3	182
1991 - 1993	454	-	839.3	385.6
1983 - 1993	932.5	85.8	2,396.4	1,858.8

CABLES CONDUCTORES

TENSION EN kV

LONGITUD EN km

AÑO	60	66	138	220
1983	188	-	-	-
1984	-	-	-	717.9
1985	459	-	-	1,794
1983 - 1985	647	-	-	2,511.9
1986	45	248	1,374	2,173
1987	-	-	574	720
1988	214	35	543	1,077
1989	784	-	-	-
1990	-	-	1,621	3,003
1986 - 1990	1,043	283	4,112	6,973
1991	294	-	1,029	-
1992	-	-	-	1,001
1993	1,117	-	2,818	-
1991 - 1993	1,411	-	3,847	1,001
1983 - 1993	3,101	283	7,959	10,485.9

ESTRUCTURAS DE ACERO

TENSION EN kV

AÑO	60		66		138		220	
	Cant.	Peso	Cant.	Peso	Cant.	Peso	Cant.	Peso
1983	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	4	29
1985	-	-	-	-	-	-	608	4290
1983 - 1985	-	-	-	-	-	-	612	4319
1986	-	-	-	-	839	4260	676	4680
1987	-	-	400	2400	400	2800	320	1920
1988	154	700	127	941	853	6447	650	3900
1989	107	535	-	-	-	-	-	-
1990	-	-	-	-	265	1388	608	3100
1986 - 1990	261	1235	527	3341	2537	14895	2254	13600
1991	212	1060	-	-	741	3980	-	-
1992	-	-	-	-	-	-	484	3226
1993	850	2550	-	-	1663	6947	423	2712
1983 - 1993	1323	4845	527	3341	4941	25822	3773	23,857

AISLADORES

CANTIDAD

TENSION EN kV

AÑO	60	66	138	220
1983	-	-	-	-
1984	-	-	-	27,324
1985	-	-	-	64,044
1983-1985	-	-	-	91,368
1986	-	18,630	59,832	82,404
1987	-	-	43,200	34,560
1988	8,316	6,858	44,382	70,200
1989	5,778	-	-	-
1990	-	-	14,310	65,664
1986 - 1990	14,094	25,488	161,724	252,828
1991	11,448	-	40,014	-
1992	-	-	-	26,136
1993	45,900	-	108,702	45,684
1991-1993	57,348	-	148,716	71,820
1983 - 1993	71,442	25,488	310,440	416,016

6. The Informal Sector in Peruvian Industry

6.1. Dimensions and Characteristics of the Phenomenon of Informality in Peru

6.1.1. What is Informality

It is not easy to give a distinct definition of what is an informal economic activity, as it is subject to different concepts. This difficulty can be illustrated, for example, by merely observing the diverse terms applied to this sector: "parallel economy", "clandestine economy", "unofficial economy", "underground economy", "unregistered economy", "black economy", "shadow economy", "illegal sector", "traditional sector", etc.

However, for a good analysis and measurement of the informal sector, it is necessary to have a clear idea of what this sector signifies. Based on the classification suggested by Kafka (1984), we consider the following to be informal activities:

a. Trade activities: they include ambulant sales of all types, whether seasonal or permanent, carried out full-time of part-time, established (with a fixed site in the street) or strictly ambulant.

b. Productive activities: they include unipersonal productive activities as well as those performed by a group or association of individuals, which in turn are or are not related by family ties. This category would include small unregistered clothing workshops, unlicensed mechanical workshops, small factories which may be registered but evade labour provisions, those self-employed, etc.

c. Tax evasion activities: they include entities which are duly registered and recognized, but which declare or invoice only part of their activities, the remaining activities thus being informal. Although tax evasion exists here, it also exists in the other cases, and thus it is necessary to distinguish between different degrees of informality.

d. Criminal activities: they include drug traffic, theft, prostitution, contraband, etc.

e. Other activities: they include family and domestic employees, mendicancy and others which reflect disguised unemployment, such as automobile-caretakers, practitioners, apprentices, etc.

6.1.2. The Size of the Informal Sector in Peru

At present no comprehensive study exists with precise data on the size of the informal sector in the Peruvian economy. However, some partial studies allow us to estimate the magnitude of the informal economy, although only in urban zones and usually with aggregate indicators.

Already in the past decade attempts were made to measure the informal urban sector. In 1975, it was estimated that 53% of employment in the urban areas, was generated by the informal sector.(1) In a recent study(2) it has been estimated that in 1981 the number of persons occupied in the informal urban sector in Peru amounted to 1,370,000 (42.6% of urban employment), while in 1983 this figure reached 1,723,000 (51.3% of urban employment). Both studies identify informality with unemployment. Another study (3) points out that the informal economy may account for over 60% of gross production in Lima-Callao and 70% of the urban labour force, that is, over 2.2 million people. With the total occupied population in Peru exceeding 5.5 million persons, it is evident that informality is a phenomenon of great social and economic importance in the country.

Complete information is also lacking with respect to the sectoral composition of the informal economy. The most important study in this respect is the one by the Ministry of Labor based on a poll of 720 establishments or informal productive units, which was carried out in 1982

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(1) Webb, R. (1975)

(2) F. Kafka (1984).

(3) Cited in Caretas (Oct. 1983). The article presents advances of an unpublished study undertaken by the "Instituto Libertad y Democracia", but fails to explain the methodology used for the estimate.

in Lima-Callao.[1]

Table 54 shows the structure of the productive units of the informal sector by branches of activity. It can be seen that trade (basically hawkers) is the most important informal activity (52%), followed in order of importance by industry (19%), with textiles, leather and footwear dominating with 8%, and then transport (12%), services (11%), and construction (6%).

As for employment, we can see from Table 55 that the Commercial Sector absorbs 47% of informal sector workers, while industry employs 27%.

6.1.3. Principal Characteristics of the Informal Sector

The same poll allows us to identify important aspects of the informal economy in Metropolitan Lima, such as the size of the informal firms, sources of financing, cost of credit, intensity of use of capital, income, occupational category, place of work, type of purveyors, etc.

a. Size of informal productive units:
   Informal firms are essentially small enterprises. In the transportation sector (mainly taxis or microbuses) 85% of the units are unipersonal enterprises. The commercial sector, basically composed of ambulant trade, also incorporates a high percentage of unipersonal businesses (71%). In the service and production sectors (which includes mainly industry) the productive units are relatively larger. (see Table 56).

b. Sources of financing of the informal sector:
   All informal activities are fundamentally financed with personal resources, which represent 70.5% of financial sources (see Table 57). It is important to note that the credit obtained from informal money lenders occupies a prominent place (16.4% of the total), while

(1) Chaves, E. and Renedo J. (1982).

TABLE 54

METROPOLITAN LIMA

THE STRUCTURE OF THE PRODUCTIVE UNITS IN THE INFORMAL SECTOR ACCORDING TO TYPES OF ACTIVITIES

TYPES OF ACTIVITIES	%
Food and beverages	1.0
Textiles*, leather and Footwear	8.0
Furniture	4.0
Printing and publishing	1.0
Other manufactures	
Total Manufacturing Industries	19.0
Construction	6.0
Trade	52.0
Transportation	12.0
Reparing service (footwear, jewels, machinery)	7.0
Personal service	4.0
Total Services	11.0
TOTAL	100.0

SOURCE: Ministerio de Trabajo y Promoción Social. Encuesta a Estratos no organizados en Lima Metropolitana 1982.

* Includes wearing apparel.

TABLE 55

METROPOLITAN LIMA

LABOR FORCE IN INFORMAL PRODUCTIVE UNITS
OF DIFFERENT TYPES OF ACTIVITIES

TYPES OF ACTIVITIES	%
Trade	47.0
Industry	27.0*
Services	13.0
Construction	8.0
Transportation	5.0
	100.0

SOURCE: Ministerio de Trabajo y Promoción Social. Encuesta de Estratos no Organizados. 1982.

* This number corresponds to our own adjustment in order to separate the construction sector from the industrial one, keeping the same proportion of the productive units in Table N° 1.

TABLE 56

METROPOLITAN LIMA

SIZE OF THE PRODUCTIVE UNITS IN THE
INFORMAL SECTOR BY TYPES OF ECONOMIC ACTIVITIES

Size	Total %	Type of Activities			
		Production	Trade	Transportation	Services
1 Person	71.0	65.0	71.0	85.0	64.0
2 - 3 Persons	25.0	26.0	26.0	14.0	33.0
4 - 5 Persons	3.0	6.0	3.0	1.0	3.0
6 Persons or more	1.0	3.0			
TOTAL	100.0	100.0	100.0	100.0	100.0

SOURCE: Ministerio de Trabajo y Promoción Social

TABLE 57

METROPOLITAN LIMA

DISTRIBUTION OF THE PRODUCTIVE UNITS IN THE INFORMAL SECTOR ACCORDING TO FINANCIAL SOURCES AND ECONOMIC ACTIVITIES

FINANCIAL SOURCE	ECONOMIC ACTIVITY				
	Total	Industry	Trade	Transportation	Services
Own capital	80.5	86.6	79.0	78.2	79.4
Banks and Investment Firms	1.8	1.0	1.6	3.2	2.4
Informal credit	16.4	11.2	18.3	15.4	18.2
No capital was required	1.3	1.2	1.1	3.2	0
TOTAL	100.0	100.0	100.0	100.0	100.0

SOURCE: Ministerio de Trabajo y Promoción Social. Encuesta de Estratos no organizados. Mayo 1982.

formal bank credit is almost nil (1.8%). Comparatively, industry uses more self-financing and less informal credit than the other sectors, while commerce is the sector which receives most informal credit.

c. Cost of Credit:

Credit in the informal capital market is notoriously more expensive than in the formal one. From Table 58 we can see that the annual nominal rate of interest reaches up to 500%, and that it is in no case under 125%. At the same date (August 1982), the rate of interest on the formal market was 80%. However, diverse institutional and legal barriers exist which prevent informal enterprises from having access to these credits.

d. Intensity of the use of capital:

An important characteristic of informal enterprises is its low capital-labor ratio. The weighted average of capital per worker is US $429, while in the formal sector it is approximately US $10,000. The low capital-labor ratio can be explained as much by the high cost of credit which leads to the choice of more labor-intensive processes, as by the features of and needs inherent in informal activities (i.e., working in the street and not in an adequate site or building).

e. Work premises:

The use of homes as work premises is quite generalized among informal activities, especially in the production and services sectors (40.0% and 28% repectively, see Table 59). Scarcity of capital prevents the financing of suitable work premises. Likewise, the use of productive processes with simple technologies and the employment of family workers, which lower the production costs, lead to the use of the home as work premises. On the other hand, use of the street, whether in a fixed or mobile site, is important in the commercial sector (51%).

f. Purveyors:

Another interesting indicator is the type of purveyors to informal enterprises. Here no differences are apparent between activities.

TABLE 58

THE STRUCTURE OF INTEREST RATES IN THE INFORMAL CAPITAL MARKET*

MARKET	LEVEL OF THE INTEREST RATES	
	Minimum	Maximum
URBAN		
Commercial credit	138 %	500 %
Suppliers credit	144 %	375%
Individual lenders	260 %	420 %
RURAL	125 %	230 %

*Information of samples of the most representative money lenders in each market. The rates are yearly and refer to August 1982.

SOURCE: Susano, R., "Flujo de Fondos del Mercado Informal de Capitales", en Diagnóstico y Debate N° 2. Fundación Friedrich Ebert.

TABLE 59

METROPOLITAN LIMA

DISTRIBUTION OF THE PRODUCTIVE UNITS IN THE INFORMAL SECTOR ACCORDING TO TYPES OF ACTIVITIES AND LOCATION

TYPES OF ACTIVITIES	LOCATION					
	Total	Factory	Home	Street		Door to Door Salesman
				Permanent Place	Mobile Place	
Production	100.0	25.0	40.0	0.0	6.0	29.0
Trade	100.0	30.0	19.0	28.0	23.0	0.0
Transportation	100.0	0.0	0.0	10.0	90.0	0.0
Services	100.0	36.0	28.0	3.0	14.0	19.0
TOTAL:	100.0	26.0	22.0	17.0	25.0	10.0

SOURCE: Ministerio de Trabajo y Promoción Social. Encuesta de Estratos no organizados. Mayo 1982.

TABLE 60

METROPOLITAN LIMA

DISTRIBUTION OF THE PRODUCTIVE UNITS
IN THE INFORMAL SECTOR ACCORDING TO
ECONOMIC ACTIVITIES AND TYPE OF SUPPLIERS

SUPPLIERS	ECONOMIC ACTIVITY				
	Total	Production	Trade	Transportation	Services
Big enterprises	57.7	55.0	59.2	57.8	52.9
Stores and little enterprises	21.6	32.7	13.7	20.0	38.3
Several persons	17.2	10.7	21.3	13.3	4.4
One person	3.5	1.6	3.8	8.9	4.4
TOTAL:	100.0	100.0	100.0	100.0	100.0

SOURCE: Ministerio de Trabajo y Promoción Social. Encuesta de estratos no organizados, mayo 1982.

TABLE 61

METROPOLITAN LIMA

THE OCCUPATIONAL CATEGORIES IN THE INFORMAL SECTOR

(1981)

OCCUPATIONAL CATEGORY	%
Employer	10.9
Private employee (white collar)	7.9
Private laborer (blue collar)	15.6
Self employed	57.9
Non-payed family worker	7.0
Apprentices	0.7
TOTAL:	100.0

SOURCE: Ministerio de Trabajo y Promoción Social. Encuesta de Niveles de empleo en Lima Metropolitana. 1981.

The fact that over 55% are supplied by the large enterprises (Table 60) indicates a high degree of interrelationship between formal and informal enterprises, which in turn increases the magnitude of the informal economy, as presumably sales by the former to the latter are not registered and therefore not taxed.

g. Occupational Category:

The presence of independent workers is quite significant in the informal sector amounting to 57.9% of the total. Laborers account for 15.6% and employers for 10-9% (see Table 61).

h. Earnings:

Salaries and wages in the informal sector are on the average lower than those of the formal sector. In Metropolitan Lima the average monthly earnings in the informal sector are equivalent to 55% of those in the formal sector (71 dollars versus 127 dollars). Nevertheless, 16.9% of informal workers receive average earnings higher than those of the formal sector.(1)

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(1) Carbonneto, D. (1984).

6.2. The Informal Industry

6.2.1. Magnitude and Structure

Based on the information presented so far, we have been able to establish the global magnitude of the informal sector within the Peruvian economy, as well as the relative importance of the informal industry, as opposed to other economic sectors of the country. In this section we will proceed to analyze the informal industry establishing its magnitude as well as its structure. In the first place we will discuss the quantitative results of existing studies, and subsequently we will present our own estimates in this respect.

According to a study by the World Bank and UNIDO (1981), the informal manufacturing sector represented 18.5% of the industrial value added of the country in 1978 (see Table 62). For this calculation the artisans and industrial firms employing less than 5 workers were defined as belonging to the informal sector, while the formal sector was composed of the enterprises registered in the Ministry of Industry, Tourism and Integration, that is, those employing 5 or more workers.

We can obtain another estimate of the magnitude of the informal industry from the poll carried out by the Ministry of Labour mentioned previously. Based on the sample chosen for said poll it is estimated that the universe of employed people in the informal sector in Metropolitan Lima in 1982 amounted to 440,295, 27.0% of which worked in industrial activities, that is 118,880 persons. Comparing this last figure with the industrial employment registered by the statistics of the Ministry of Industry, Tourism and Integration (169,706 persons), it is concluded that in Lima and Callao, the informal industrial employment represents 70% of formal industrial employment.

For the purpose of making an estimate of the informal sector as precise as possible we have undertaken our own estimates, which appear below.

TABLE 62

PERU: INFORMAL SECTOR MANUFACTURING

VALUE ADDED - S/. BILLION

	1971		1975		1978	
	Value	Share (%)	Value	Share (%)	Value	Share (%)
Total Manufacturing	73.7	100.0	156.5	100.0	504.7	100.0
Formal Sector 1/	60.5	82.1	138.8	88.7	411.4	81.5
Informal Sector						
Small Industry 2/	5.9	8.0	2.1	1.3	52.7	10.4
Artisans 3/	7.3	9.9	15.6	10.0	40.6	8.1

1/ Includes registered establishments with 5 and more employees.

2/ Includes non-registered establishments with 1 to 4 employees.

3/ Includes non-registered establishments without employment, independent workers, home workers, and artisans not includes in the Economic census or the Annual Statistical Survey.

Sources: Cuentas Nacionales, MICTI

The methodology for estimation consists of comparing the figures for manufacturing employment registered by the National Population Census with those of industrial statistics. According to the 1981 National Census 543,698 person are engaged in Peruvian Industry (see Table 63). Since the Census covers the whole number of homes in the country, we can learn of the economic activity of each individual, independent of whether it is formal or informal. On the other hand, the industrial statistics of the Ministry of Industry, Tourism and Integration register for the same year only 234,015 individuals employed in the industrial sector. Defining this latter figure as the formal industrial employment, we can consider the difference, that is to say 309,683 individuals, as the informal industrial employment. Thus, in relative terms, informal industrial employment in Peru represents 57% of total industrial employment.

The census information also allows us to make more disaggregated estimates, classifying industrial activities by use of economic destination. Following the same methodology, that is, considering as informal the difference between the census figure and the industrial statistics, we can observe that informal employment exists principally in the consumer good industry, while it is insignificant in the production of intermediate goods. The share of informal employment in the total of each activity, amounts to 72.8% in consumer goods, 21.5% in capital goods and 3.5% in intermediate goods.(1) If we presuppose that the value added per worker in the informal sector is similar to that of the small registered industries,(2) we can calculate the total value added of informal industrial

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(1) An explanation for the reduced presence of informal employment in intermediate goods industries is that they generally require large investments, especially in the paper industry, oil refineries, steel, etc. Usually, they are also state-owned firms.

(2) There are different arguments supporting or challenging the validity of this assumption. Informal firms generally are small firms and therefore show the same features. On the one hand, however, there are also medium-sized informal industrial firms whose production per worker is higher, which would raise the value added per capita in the informal industries. On the other hand, even small firms face much better financing conditions in the formal sector so that they might have equipment and higher productivity. Since it is not clear which effect is dominating the estimates might be biased in one direction or the other.

TABLE 63

INDUSTRIAL EMPLOYMENT BY ACTIVITY (CUODE)
(1981)

ACTIVITY	Total labor force in the Industry				Informal employment		Informal Employment / Total Employment
	Census (1)	%	Ministry of Industry (2)	%	(3)=(1)-(2)	%	% (4)=(3)÷(1)
Consumption goods	404,805	74.5	109,964	47.0	294,841	95.2	72.8
Intermedium goods	83,435	15.3	80,497	34.4	2,938	0.9	3.5
Capital goods	55,458	10.2	43,554	18.6	11,904	3.9	21.5
TOTAL:	543,698	100.0	234,015	100.0	309,683	100.0	57.0

Source: Censo Nacional (1981), MITI.

activities, multiplying that figure (value added per worker) by the number of workers employed in the informal sector.

Data on value added per worker in small industrial enterprises appear in Table 64 , classified according to consumer goods, intermediate and capital goods. Our estimates which are listed in Table 65 show that in 1981 the industrial value added of the informal sector was equivalent to 21.6% of total industrial value added.

This figure is higher than the 18.7% estimated by the World Bank/ UNIDO for 1978 which would indicate an increase in the informal activities. On a more disaggregated level we see that the degree of informality is highest in the production of consumer goods (37%) and lowest for intermediate goods (0.7%). With respect to the capital goods industries the informal sector accounts for 8% of value added.

TABLE 64

VALUE ADDED PER WORKER IN SMALL INDUSTRIAL ENTERPRISES

(1979)

ACTIVITY	Value Added by each worker (dollars)
Consumption goods	3,703
Intermedium good	3,895
Capital goods	4,378

SOURCE: Ministerio de Industria, Turismo e Integración

TABLE 65

FORMAL AND INFORMAL INDUSTRIAL VALUE ADDED BY ACTIVITIES

ACTIVITY	Formal Value Added 1/ (Millions of dollars) (1)	Informal Value Added 2/ (Millions of dollars) (2)	Total Value Added (Millions of dollars) (3)=(1)+(2)	Formal Value Added / Total Value Added % (4)=(1)÷(3)	Informal Value Added / Total Value Added % (5)=(2)÷(3)
Consumption goods	1,856	1,092	2,948	62.9	37.0
Intermedium goods	1,735	11	1,746	99.3	0.7
Capital goods	598	52	650	92.0	8.0
TOTAL	4,189	1,155	5,344	78.4	21.6

SOURCE: 1/ Ministerio de Industria, Turismo e Integración

2/ Own estimates, as a result of multiplying the numbers of the third column of Table N° 63 by the ones of Table N° 64.

pages 265 - 267 deleted

6.2.2 Determinants of Informality in Industry

We will now turn our attention to the economic aspects of the causes of informality, which are closely linked, however, with the political factors outlined above. The problem can be set out in terms of the costs and benefits of formality or legality as opposed to informality or illegality.

Following Kafka (1984), there are basically two types of costs and benefits. In the first place there is the cost of legality arising from the entry into the market or activity. This is the cost of registering and fulfilling pertinent requisites. The other type of cost is that of operating formally that is, a cost derived from the operation or function of the enterprise, more than its entry into activity. Both types of costs need not be the same. The cost of registering does not depend on the cost of operating.

A formal enterprise can face a strong registration cost, but a low operating cost. For instance, it can resort to promotional lines of credit granted by the government. But at the same time, it has to comply with labor regulations, social security charges, and the industrial community, which means higher operating costs and fewer profits. On the other hand, the informal enterprise does not pay the cost of registering, but is obliged to pay high rates of interest for informal credit, although this could be compensated by a lower cost of labor, or by unpaid income and sales taxes.

The abovementioned types of economic factors provide a strong explanation of the causes for informality in Peru. According to studies carried out and statements by the actual informal businessmen interviewed, the determining structural elements of informality are basically three: proceedings for constituting a formal business, the tax system, and labor legislation. In addition to these, there are factors derived from the economic crisis, which aggravate the phenomenon of informality in the country.

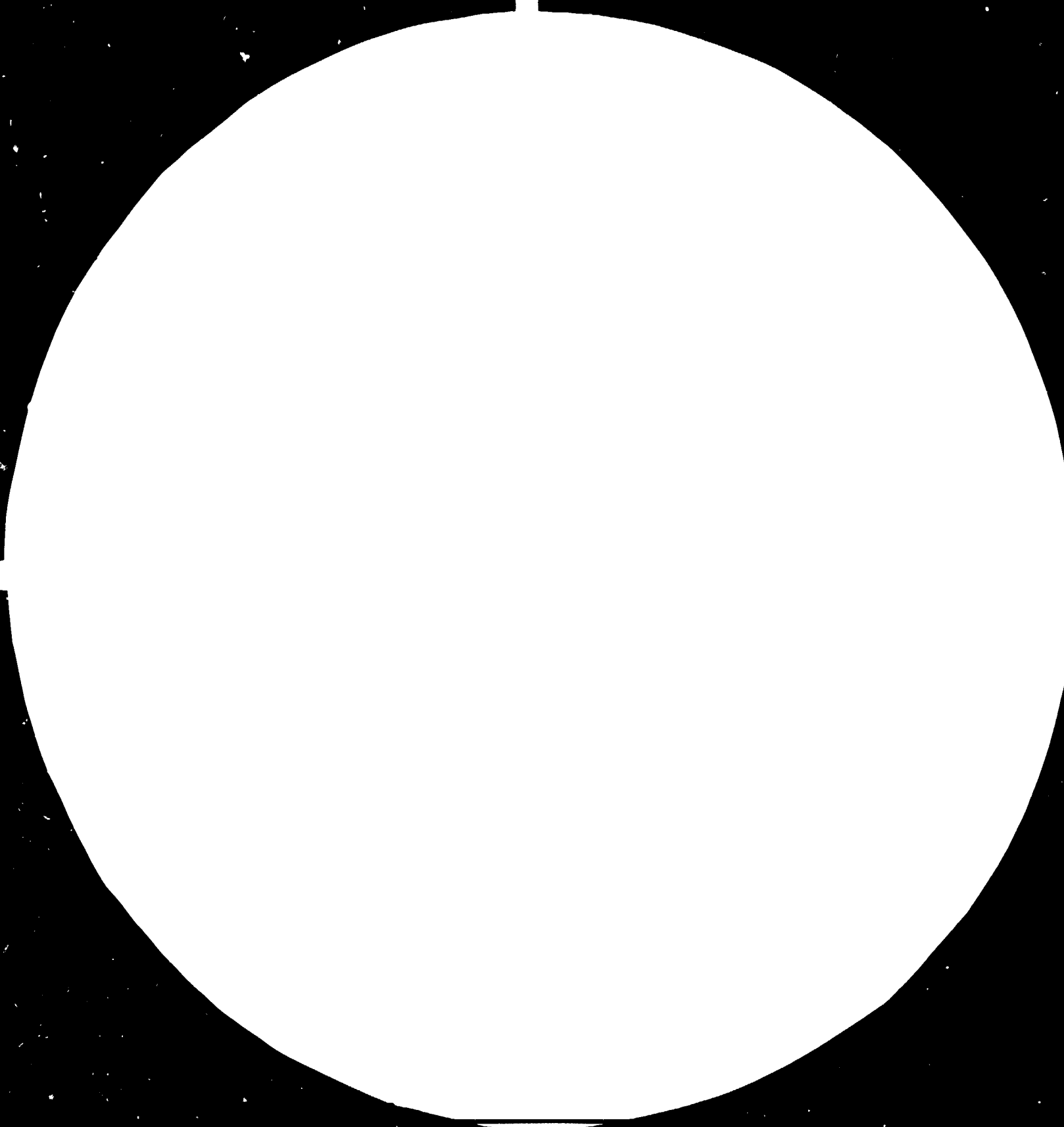
Proceedings for Constituting a Formal Industrial Firm

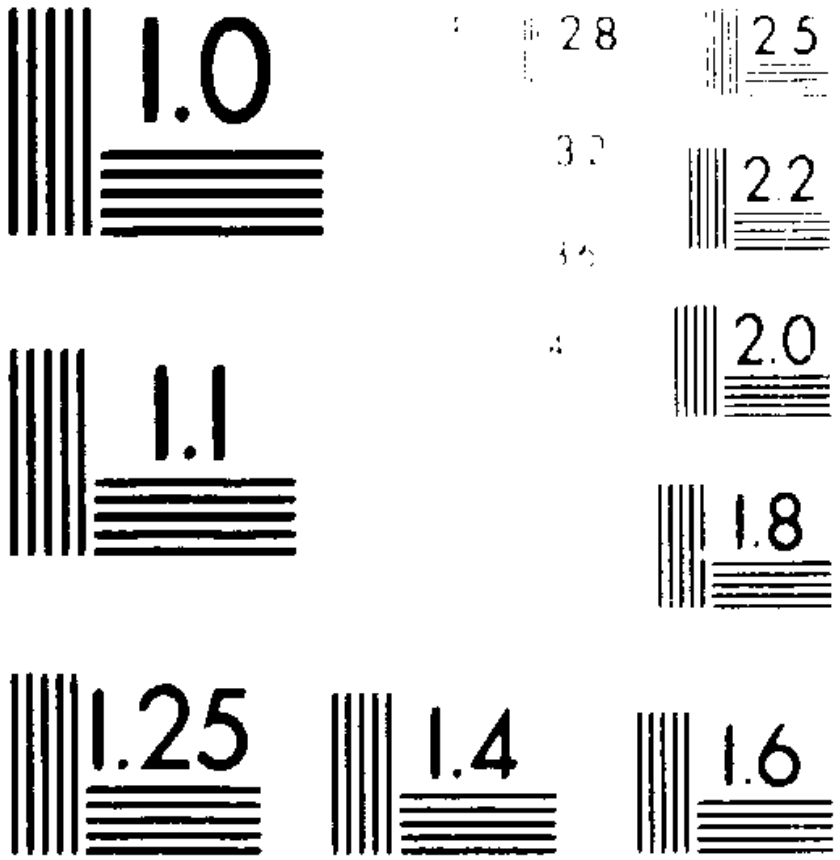
The diversity of proceedings which exist for constituting and registering a formal enterprise in Peru is truly asphyxiating, and constitutes an important cause for the existence of informal enterprises. An industrialist who wishes to initiate an enterprise has to deal with six public entities: the Municipality, the Public Registers, the Ministry of Industry, the Ministry of Labour, the Ministry of Economy and the Institute of Social Security. In each one of these institutions, he is forced to make several types of registrations, for which he must in turn fill out many forms and present accredited documents. In all, as shown in Figure 7 , he must inscribe himself in 10 different registers and obtain 18 permits, documents, certifications and legalizations, for all of which he must fill out 16 forms and applications and submit 37 documents.

Formally or legally, the proceedings in themselves are not costly, as public institutions charge very reduced fees or even none at all. In practive, however, there exists a cash cost consisting of "bribes", which must be paid to officials to get the papers into circulation, and a real cost represented by the time which must be spent to complete these proceedings. In an experiment simulating the constitution of a textile manufacturing company[1], it was shown that even working for over six months, at the rate of eight hours a day, it is almost impossible to actually constitute a company, without paying bribes or resorting to powerful relationships and important lawyers.

The Ministry of Industry initiated experimentally a new system of registration for small enterprises, which should contribute to reduce informality. Under this system, the businessman has to apply to only two public institutions, the Municipality and the Ministry of Industry, and the officials of this latter institution undertake to carry out the proceedings with the other public institutions, free of charge within 30 days. This can be considered as a "second best" solution,

(1) The experiment was carried out by the Instituto Libertad y Democracia in October 1983.





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS
STANDARD REFERENCE MATERIAL 1010a
ANSI/ASME PH2.1-1984

Figure 7

PROCEDURES TO INITIATE AN INDUSTRIAL FIRM

MINISTERIO DE INDUSTRIA TURISMO E INTEGRACION

A) Registro Industrial

REQUISITOS

1. Persona Jurídica
   - Certif. Zonificación
   - L.E./Tributaria
   - Solicitud
   - Copia simple de la Escritura de Constitución de S.A.

2. Persona Natural
   Cert. Zonificación
   L.E. y L.T.
   Solicitud

B) Inscripción en el Registro de Productos Industriales Nacionales.

REQUISITOS
- Copia R.I.
- Copia norma técnica

3. Contrato legalizado que acredite el derecho a la planta (alquiler).

CONCEJOS MUNICIPALES.-

A) Autorización-Apertura Cert. Zonificación

REQUISITOS
- Solicitud
- Croquis de ubicación
- Pago variable

B) Autorización Municipal

REQUISITOS
- Solicitud
- Escritura Constitución
- Contrato de locación y/o documento que acredite la propiedad.
- Recibo de luz
- Registro Comercial
- Alumbrado y Limpieza Pública.
- Registro Nacional del Centro de Trabajo
- Registro Industrial (MITI)
- Recibo de pago variable.

MINISTERIO DE TRABAJO Y PROMOCION SOCIAL

A) Inscripción

REQUISITOS
- Solicitud
- L.T.
- Escritura Constitución (P. Jurídica).

B) Autorización de funcionamiento del Centro de Trabajo.

REQUISITOS
- Solicitud

C) Registro Nacional de Centro de Trabajo.

REQUISITOS
- Solicitud

D) Registro de uso de Libros de Planillas.

REQUISITOS
- Solicitud
- Copia de Escritura de Constitución.

E) Libro de Pactos y Contratos.

REQUISITOS
- Solicitud

F) Solicitud de Inspección

I.P.S.S.

A) Inscripción

REQUISITOS
- Libro de Planillas, Sueldos y Salarios, autorizado por el Minist. de Trabajo y Promoción Social.
- L.T. del empleador (original y copia)
- Certif. domiciliaria
- Licencia Municipal
- R.I. (original y copia)
- Escritura Constitución
- Formulario D.J.
- L.E. ó Carnet

B) Chequera de Bonos
- Fonavi
- Imp. General Ventas
- Imp. Remuneraciones
- Imp. a la Renta

DIRECCION GENERAL DE CONTRIBUCIONES-MEFC

A) Inscripción

REQUISITOS
- Solicitud
- Copia L.T. (entidad)
- Copia Escritura y Estatutos

B) Libreto Tributario

REQUISITOS
- Llenar formulario (pers. jurídica o pers. natural)

C) Constancia Tributaria

REQUISITOS
- Llenar formulario

D) Registro Nacional

REQUISITOS
- Solicitud
- Formulario

E) Declaración Jurada de Asignaciones Cívicas ó Donaciones.

F) Registro Comercial

REQUISITOS
- Formulario Banco de la Nación.

REGISTROS PUBLICOS

A) Minuta

Cuadernillos de papel sello 6° (Notario)
- Escritura Constitución de la empresa
- Pago de derechos notariales.

B) Legalización de Libros
- Libro Diario
- Libro Mayor
- Libro Inventario y Balances.
- Libro Caja
- Libro de Registro y Transferencia de Acciones.
- Libro Reg. Ventas
- Libro Reg. Compras
- Libro de Juntas Generales.
- Libro de Acta de Directorio.

since the number of proceedings is not really reduced, but carried out by the bureaucrats themselves instead of the businessmen.

The Tax System

The Peruvian Tax System is particularly complex, and the tax pressure which falls upon the enterprises which apply it strictly, is substantial.

At present, an industrial enterprise in Peru has to pay 25 different taxes.(1) With a value added tax of 18%, a tax of 27% on net income (Industrial Community, Itintec, etc.) a profit tax of 40%, and a tax on dividends of 30%, it is clear that tax evasion is attractive. That it is also so widespread is a reflection of the absence of effective control mechanisms.

One faces a vicious circle where high tax rates make evasion attractive, where the lack of an efficient control system makes high evasion possible, which in turn leads to new hikes in tax rates or creation of new taxes. As of August 1st, 1984, the value added tax has been reduced to 8%, thus partly decreasing the profitability of evasion.

Not only is tax evasion very attractive for a firm when tax rates are high, it becomes a matter of survival in competitve markets, in which other firms are also evading taxes.

To illustrate the point, Table 66 shows a comparison between a (real) clothing textile manufacturing firm located in the formal sector and another imagined one with identical characteristics, in the informal sector. The formal enterprise would bear costs 30% higher than the informal one. Twenty points of the difference are explained by evasion of the sales tax, and the bulk of the remainder by non-payment of social charges (social security and related provisions such as the one for time of services). With the new taxes on sales, the excess cost descends from 30% to 19%.

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(1) A list of these taxes appears in Table A-13.

TABLE 66

THE COST OF BECOMING FORMAL IN THE WEARING APPAREL INDUSTRY (1982)

(U.S. DOLLARS)

		Formal Enterprise	Informal Enterprise
Operating expenses		148,963	148,963
Municipal Taxes		220	173
Internal Taxes		31,658	
-Assets Revaluation tax	117		
-Income tax	1,444		
-Net worth tax	271		
-Value added tax	29,826		
National Pensions System Tax		6,940	
Provision for retirement		6,071	
Others		494	310
TOTAL		194,346	149,446

SOURCE: Own elaboration based on a non-published study of the Instituto de Estudios Económicos y Sociales.

A similar situation exists in other industrial branches. Thus, for instance, in the footwear industry the production costs of a formal enterprise are 35% higher than for the informal, while in capital goods the difference is 64% (See Tables 67 and 68). With the new taxes, these figures decrease to 31% and 49% respectively.

Labor Aspects

One of the factors which greatly stimulates informality is related to the problems and legislation in labor matters. In this respect the rigidity of the labor relationship, the industrial community and social security are noteworthy.

According to current labor legislation it is very difficult to terminate the labor relationship of workers with more than three years in the enterprise, even in situations of indiscipline, excess personnel or economic difficulties for the firm. This rigidity has fostered low productivity, excessive bargaining power by unions in wage discussions, lack of discipline and in many cases the bankruptcy of firms.

Labor costs have become a fixed cost, which has deprived firms of the capacity to adapt to changing market conditions, particularly in a period of strong recession and rapid technological changes. The evasion of the labor legislation is a decisive stimulus to informality in its different forms. Businessmen in the formal sector have adopted several outlets:

- Purchase of a worker's resignation.
- Rapid personnel rotation (the worker is dismissed before three years have elapsed).
- Sub-contracting workers from other firms.
- Not placing workers on the firm's payroll, thus also avoiding Social Security payments, and therefore entering the area of informality.

TABLE 67

THE COST OF BECOMING FORMAL IN THE FOOTWEAR INDUSTRY 1982

(U.S. Dollars)

		Formal Enterprise	Informal Enterprise
Operating expenses		11,150	11,150
Municipal Taxes		26	19
Internal Taxes		752	-
Assets Revaluation tax	18		
Income tax	24		
Net worth tax	85		
Value added tax	625		
Social Security, etc		247	-
Provision for retirement		2,861	
Others		43	34
TOTAL:		15,079	11,203

SOURCE: Own elaboration based on a non-published study of the Instituto de Estudios Económicos y Sociales.

TABLE 68

THE COST OF BECOMING FORMAL IN THE CAPITAL GOODS INDUSTRY: 1982

(U.S. Dollars)

	Formal Enterprise	Informal Enterprise
Operating expenses	44,904	44,904
Municipal taxes	1,740	1,276
Internal revenue taxes	12,944	-
- Assets revaluation tax 443		
- Income tax -		
- Net worth tax 477		
- Value added tax 12,024		
Social Security, etc.	5,601	-
Provision for retirement	4,886	-
Others	8,991	2,129
TOTAL :	79,066	48,309

SOURCE : Own elaboration based on a non-published study of the Instituto de Estudios Económicos y Sociales.

The industrial community was created in 1971 by the Military Government for the declared purpose of fostering harmony between workers and employers within a system of co-management. Besides establishing the distribution of 10% of profits amongst the workers, an entity denominated Industrial Community was created in each industrial enterprise with over five employees. This entity would receive, in company shares, 15% of the years' profits until it held 50% of its social capital. At the beginning the Industrial Community was seen as a mechanism to progressively transform private enterprises into co-managed enterprises. It therefore led to increased labor conflicts. De facto, in many cases it became a second union within the firm. On the other hand, the workers showed little interest in participating in the direction of the firms, barring those aspects which suited them directly.

During the second phase of the Military Government, the size of small enterprise was redefined, thus increasing the number of enterprises exempted from the stipulations of the Industrial Community. The stock participation of the Industrial Community was limited to one third of the firm's social capital, and the labor shares were to be delivered directly to the workers to be sold freely by them. Under the Industrial Law workers have the option to receive 17% in cash as profit distribution, instead of receiving labor shares.

The Industrial Community and profit distribution by firms was in fact regressive, since the bulk of profits generated in industry comes from the larger firms which count with more capital and pay the highest wages. That is, they tend to increase differentials between earnings.

Payments to the Peruvian Institute of Social Security (Social Security and Retirement Pensions), and to the National Housing Fund, to the National Service of Industrial Apprenticeship, etc., represent an increase of the payroll by roughly more than 20%. Tax evasion is

particularly attractive to firms with labor-intensive production, but in fact the main reason for avoiding these taxes is to prevent the labor relationship from being legalized, thus avoiding the aforementioned rigidities in labor legislation. On the other hand, the poor operation of the Social Security in matters of health services together with the services lent by the hospitals lead many workers, particularly the younger ones, to prefer an additional cash payment to being inscribed in the Peruvian Institute of Social Security.

In summary, the differentials in labor costs between formal and informal businesses are considerable, Thus in the case of the aforementioned textile manufacturing firm, average nominal wages of the formal firm were 92.4% higher than in the informal one (including charges for social security and social benefits). In terms of unit costs of production, this represents a higher cost of 13.8%.

In the case of a firm of metal-mechanics manufactures, even more outstanding differentials are encountered. Labor costs per head would be 118.1% higher in the formal firm. In practice, much higher differentials can appear in labor costs per unit of output due t variations in productivity. Informal firms frequently pay totally or partly for piece work in some cases achieving double the yield per worker.

6.2.3. Analysis of Cases

Based on our estimates it has been established that informal industry exists mainly in the area of the production of consumer goods, and to a lesser extent in that of capital goods. It is necessary therefore, to analyze these two sectors in depth.

From the beforementioned poll by the Ministry of Labour, we can extract more detailed information concerning the structure of informal industry. Taking as a basis the information of Table 54, we have again calculated the relative participation of different informal industrial

activities within the industrial sector, which appears in Table 69. Textiles, leather and footwear, constitute the most important informal industrial branch with 42% of informal enterprises. There follow in order of importance the furniture industry (21%), food and beverages (5.3%), and printshops (5.2%), all of them producers of consumer goods.

The information available does not allow us to identify which branches belong to the heading "other industries", but eliminating consumer goods, which have already been taken into account, and intermediate goods, for which informal activities barely exist, these must correspond to capital goods.

We now present a more detailed analysis of the magnitude and effects of informality in two of the industries operating with a greater degree of informality, that is, textiles and garments, and capital goods.

6.2.3.1. Textile and Clothing Sector

The textile and clothing industries constitute an important sector of Peruvian industry. They represent 17.9% of industrial employment and 9.9% of industrial value added (see Table 70). Due to the labor-intensive nature of manufacturing as well as its easy commercialization, this activity shows a high and growing degree of informality. One study estimates that there are 8,000 enterprises producing garments in Lima, 90% of which, that is 7,200, are not registered.(1) Another study suggests that the personnel employed in unregistered clothing firms easily surpasses employment in the registered ones.(2)

We made our own estimate concerning informal employment in the

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(1) Caretas 1983. op.cit.

(2) Cerritelli, L. (1984) The work does not explain the method of estimation and basically seems to reflect the intuition and experience of the author in the textile area.

TABLE 69

STRUCTURE OF THE INDUSTRIAL INFORMAL ENTERPRISES ACCORDING TO TYPE OF ACTIVITY

TYPE OF ACTIVITY	%
Textile*, leather and footwear	42.0
Furniture	21.0
Food and beverages	5.3
Printing and publishing	5.3
Other industries	26.4

* Includes textile wearing apparel

SOURCE: Own elaboration based on Table N° 54

TABLE 70

TEXTILE SECTOR: EMPLOYMENT AND PRODUCTION (1981)

ISIC		Employment	%	Value Added (Millions of Dollars)	%
3211*	Cotton, woven and printed Fabrics	23,378	10.0	268.0	6.4
3212	Textiles except wearing apparel	1,452	0.6	12.5	0.3
3213	Knit wear	5,456	2.3	50.2	1.2
3214	Rugs and upholstery	315	0.1	4.1	0.1
3215	Ropes and cords	286	0.1	4.1	0.1
3219	Polyvinyl, artificial leather	237	0.1	4.1	0.1
3220	Wearing apparel	10,832	4.6	75.4	1.8
TOTAL TEXTILE		41,959	17.9	418.4	9.9
TOTAL INDUSTRY		234,015	100.0	4,189.0	100.0

* Includes ISIC 3216, 3217 and 3218

SOURCE: Ministerio de Industria, Turismo e Integración.

clothing industry. The method consisted of multiplying the number of informal enterprises (7,200 by the previous estimate) by the average number of workers in each informal enterprise, 1.75. Thus, our estimate results in 12,600 workers in the informal garment industry, a figure slightly higher than the one for registered workers, 10,832.

The existence of a large informal sector in this activity also becomes evident judging by other considerations, such as the structure and evolution of employment and production of formal activities. In effect, official figures (see Table 70) show that only a fourth of the individuals employed in the entire textile sector work in the garment industry. This is out of all proportion, since the structure of employment in the textile complex is normally such that garment manufacturing absorbs double the employment of that of the other industrial textile groups. On the other hand, the economic crisis seems to be leading to a greater degree of informality in the sector, thus distorting production statistics. In the past two years, clothing production and employment have been decreasing drastically. Although it is true that the country is undergoing a severe industrial contraction, in this case the figures would have to be accepted with a certain reservation, since in spite of such a reduction of official employment and production, imports of sewing machines have increased, from US $ 4.7 million in 1980 to US $9.3 million in 1982.

What seems to be ocurring is that the informal sector serves as an escape valve for many companies in view of the economic crisis. A formal enterprise has to compete with two types of informal activities: clandestine enterprises, which pay no taxes and therefore have the advantage of lower costs, and contraband. To remain on the market and face this competition, many formal enterprises are forced to operate informally, too.

6.2.3.2. The Capital Goods Industry

The industries producing capital goods provide employment to 18.6% of industrial workers, and represent 13.0% of industrial value added, (see Table 71). Likewise they constitute an important export sector, with 15.5% of non-traditional exports. The industries producing equipment for the generation of electricity and for the mining industry, grouped basically under ISIC 3821, 3824, 3829, 3831, and 3839 represent 5.2% and 8.4% of employment and industrial value added, and 28.1% and 29.5% of employment and value added of capital goods.

This type of industries shows quite particular traits of informal operations. The mechanism mainly used is that of sub-contracting. A formal enterprise, which takes over the final sale and the bulk of the transformation process subcontracts parts of the productive process to a series of workshops, which operate more of less informally. In this way, the costs of production are cheapened, yet since sales are carried out by formal producers, they are eligible for Certex in the case of exports. If the responsible firm is a civil construction firm, its labor system is that specified for construction workers and, moreover, it is not subject to the value added tax. This leads to such manufactures being undertaken directly by the construction firms, some of which possess large metal-mechanic workshops.

In one study it has been estimated that 85% of metal furniture proceeds from the informal industry, and it is sold to the public as well as clandestinely to recognized firms who put their brand name on these products. It is also known that in the outskirts of Lima there is an assembly plant for engines and auto parts, which works with stolen materials. Surprisingly, a metal-mechanics workshop has also been found which manufactures parts for the armed forces.(1)

With respect to the informal production of mining equipment, we

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(1) Caretas (1983). op.cit.

TABLE 71

CAPITAL GOODS : PRODUCTION AND EMPLOYMENT (1981)

ISIC		Employment (people)	%	Value Added (millions of dollars)	%
381	Fabricated metal products	14,490	6.2	148.7	3.5
3821	Engines, fuel filters	249	0.1	2.6	0.06
3822	Agricultural and daily equipment	1,003	0.4	14.9	0.4
3823	Wood working machinery	383	0.2	3.9	0.09
3824	Equipment and machinery for the industry	1,760	0.8	17.1	0.4
3825	Data processing and recording equipment	174		1.3	
3829	Other electronic machinery	4,859	2.1	65.5	1.6
3831	Electric industrial machinery and equipment	2,183	0.9	27.3	0.7
3832	Radio, Television and Telephone equipment	3,011	1.3	62.4	1.5
3833	Domestic electric equipment	875	0.3	16.0	0.4
3839	Electric equipment and Fittings	3,177	1.4	63.6	1.5
384	Transport equipment	10,160	4.3	161.3	3.9
385	Controlling and optical equipment	1,230	0.5	13.3	0.3
	TOTAL CAPITAL GOODS	43,554	18.6	597.9	13.0
	TOTAL INDUSTRY	234,015	100.0	4,189.0	100.0

SOURCE: Ministerio de Industria, Turismo e Integración.

have detected that besides the six largest firms registered at the Ministry of Industry, there is another semi-informal industrial firm registered in part as a commercial enterprise, which even sells to the foreign market. This company exports a value of US $2 million annually. If we presume - conservatively - that its sales on the local market are of an equal magnitude, then it would account for 17% of the production of the formal sector, since the sales of the six registered firms amount to US $12 million.

In the case of the industry for power generation, no significant informal production seems to exist (except for the possible existence of sub-contracting activities), since the government is basically the sole customer, and firms must usually be fully registered.

Table A - 13

TAXES APPLIED TO ENTERPRISES THAT ARE LEGALLY ESTABLISHED IN LIMA AND CALLAO

TAX	RATE	PERIOD
1. Income tax	Until 150 U.I.T.* 32% From 151 to 1500 U.I.T. 42% From 1501 to 3000 U.I.T. 52% 3001 or more U.I.T. 57%	Yearly
2. Value added tax	8% since August 1st. 1984	monthly
3. Selective consumption tax	Up to 123% depending on type of products.	monthly
4. FONAVI Contribution	This contribution is used to finance a housing program. A corporation must pay 4% of its monthly remuneration The contribution applies to remuneration up to a maximun of five minimum salaries.	monthly
5. SENATI Contribution	For corporations with more than 15 workers 1.5%	monthly
6. ITINTEC	2% of the income before taxes	yearly
7. Nutritional Compensation Fond	For corporations with income over 60 U.I.T.	yearly
8. Remuneration Tax	2.5%	monthly
9. Fixed Assets Revaluation surplus tax	3% on the revaluation surplus	yearly
10. Capitalization of the Fixed Assets Revaluation Surplus Tax	5%	
11. Tax on corporation Stockholders' Equity	Until 9 U.I.T. 1.5% From 10 to 29 U.I.T. 1.8% 30 U.I.T. or more 2.5%	yearly

* U.I.T.: Tributary Impositive Unit. For 1983 1 U.I.T. = $ 314.-

TAX	RATE	PERIOD
12. Tax on Non-Corporate Real Estate Property	The tax es applied on the total value of all real estate owned by a person within each province.	yearly
13. Municipal license for opening an enterprise	$ 0.40 for each square meter in 1984	yearly
14. National Health Assistance System	5% up to $ 155	monthly
15. National Pensions System	5% up to $ 155	monthly
16. Labor accidents and occupational disease	Regulated in accordance with the nature and frequency of risks. Goes from 1% up to 12.2%	monthly
17. Special tax to beverages	1%	monthly
18. Special tax to International Fares	US $ 1.00	
19. Special tax to money foreign exchange	1%	
20. Special tax to car owners	A_1 A_2 and A_3 1% C 2% A_4 3%	yearly
21. Municipal tax	Percentage of the electricity bills	monthly
22. Tax on vacant land	1 vacant urban land 0.5% 2 to 4 0.7% 5 or more 0.9%	yearly
23. Publication of balances	For the enterprises with income over 390 U.I.T.	yearly
24. Others	The enterprises with industrial community must separate 25% of their income before taxes, 10% to distribute between the workers, 13.5% to increase the labor patrimony and 1.5% for the patrimony of the industrial community.	

III. 7. Industrial Policies

7.1. The Case for a New Industrial Policy

7.1.1. The Goal of Industrial Policy and Macroeconomic Prerequisites

The task of industrial policy is to provide a consistent framework of rules and incentives that is conducive to a quick and lasting resumption of industrial growth. Such a general set of policies which is aimed at the establishment of favorable conditions for growth for the industrial sector as a whole has to be supplemented by sector-specific policies promoting growth and structural change in selected industrial branches. Within this two-pronged strategy the weights attached to the two parts are not equal, though. Supportive measures for particular industries can only be effective, once the general conditions conducive to growth are given. Consequently, the macroeconomic components of industrial policy have to be implemented prior to sector specific policies.

The conceptualization of such an industrial policy requires the identification of present barriers to industrial growth and proposals to overcome them on the one hand, and the identification of key industrial sectors providing especially good conditions for development on the other hand. Both tasks will be tackled in this chapter.

Industrial policy cannot be understood and designed, however, in isolation from other socio-economic elements characterizing Peruvian reality today. It cannot be the intention here to analyze industrial policy within a comprehensive development strategy that would incorporate all structural linkages between different economic sectors and the limitations imposed by these interrelations as well as by socio-political factors. Nevertheless, it is indispensable to begin a discussion of industrial policy with an identification of some key

structural linkages and limiting factors that have to be taken into account and addressed with appropriate policy measures. If these prerequisites are not met, the implementation of a well-conceived industrial policy will not yield the desired results.

1. The key structural link in any development process exists between agriculture and industry. Dynamic industrialization can never be maintained at the expense of the agricultural sector (except for very special cases, e.g. Singapore), because sooner or later insufficient agricultural growth will backfire and generate negative impacts on industrial growth. (1) There is no country in the world that developed successfully without providing an adequate role for agriculture in that process. (2) Kuzmin (1982) shows that those developing countries which reached above-average industrial growth rates also had satisfactory rates of agricultural growth. High rates of industrial growth are not only compatible with agricultural growth, but also and more importantly, they are closely linked to the development of the agricultural sector.
2. In a market-oriented economy private economic agents make decisions on the direction and quantity of investment and production based on available data about present relative prices, profitability and demand, and on the expected development of those factors in the future. Although future events by their very nature can never be known for certain, the government has to contribute its part to a reduction of that uncertainty by providing a consistent and lasting

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(1) There are two key aspects of the agrarian problem: a) a highly unequal distribution of land with the resulting distribution of income severely limits the demand of the rural population for the commodities produced in the industrial sector, and b) unfavorable terms of trade for agriculture - especially when coupled with the first factor - will eventually defeat their purpuse (extraction of surplus from the agricultural sector) and lead to an insufficient supply of foodstuff for the growing urban population.

(2) In Great Britain and the Low Countries an agricultural revolution preceded the industrial revolution. In the USA, the Civil War brought about a destruction of pre-industrial structures. And in the much-acclaimed examples of successful development, Japan, Taiwan, and South Korea, a restructuring of agriculture took place before dynamic industrialization got under way.

set of policies. Consistency and continuity of data is obviously not only vital for entrepreneurs in the industrial sector, but rather for economic agents in all sectors of the economy. If the government reacts to arising economic problems with ever new ad-hoc measures thus constantly changing the data set for industrialists, it is hardly surprising that the latter shy away from any investment projects with a long gestation period and prefer investments (in whatever economic sector) which render a quick rate of return. Consistency and continuity of data should not be confounded with fixed data, though. Changes in the national and international economic environment require a flexible response by the government. Such flexibility, however, can partly be incorporated a priori into the existing set of policies, (1) and it will never lead to a complete change in the data set, as long as the reformulation takes place within the general outline of the development strategy chosen.

3. Industrial policy as understood here is primarily supply-side policy in that policies are aimed at an improvement in the competitiveness of the industrial sector. The provision of general (and sector-specific) conditions conducive to a resumption of industrial growth will, however, not evoke the desired response by entrepreneurs, if demand remains at a low level. In the present situation of economic recession and large excess capacities a reactivation of demand is a necessary condition for further growth. In the absence of a rise in demand even the best industrial policies will not induce producers to increase investment and productivity.

4. The demand for investment goods is derived from the demand for consumer goods. Once consumer demand increases and investment

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(1) The functioning of the CERTEX system, for example, could be devised in such a way that rates are increased in the case of specific adverse conditions in the importing country. This idea was recently incorporated into the Peruvian export promotion scheme through the introduction of a 'CERTEX complementario'.

follows with a time lag government policies have to ensure that there is sufficient space then for rising investment. 'Sufficient space' means sufficient availability of financial and real resources on the one hand and of foreign exchange on the other hand.
With investment rising, it is possible that another component of aggregate demand will have to decline (or rise more slowly). A prime candidate in this respect is the government sector, whose spending behavior should be of a more anti-cyclical nature. In this context, a short comment on the present government deficit is in order. In view of the precarious situation of the government deficit and the external pressures for a drastic reduction of the deficit in a short period of time, the government has very little leeway to use expansionary government spending as a reactivating factor in the present recession. Yet the little space there is has to be used to a maximum. Furthermore, while it is very important to renegotiate a longer adjustment period for the government deficit with the IMF, additional breathing space will be useless economically, if it is not utilized sensibly for a reactivation of demand.

An increase in investment invariably means an increase in imports, for which additional foreign exchange is required. Presently, the lack of foreign exchange is probably the most limiting economic factor. In light of the improbability of large net capital inflows in the near future, it is vital that all imports not absolutely necessary for ongoing production are drastically reduced. These measures can be relaxed succesively, if net capital inflows increase in the medium and long run. (1)

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(1) When economic growth has picked up again, renewed net capital inflow is quite likely as present capital flight is reversed and direct foreign investment and/or foreign lending increase.

7.1.2. Different Alternatives for Industrial Policy

When evaluating different options for industrial policy for the specific case of Peru, key national and international characteristics and developments have to be kept in mind.

The main national feature of interest here is that Peru is a small country and therefore has a small internal market. (1) One of the well-known implications is that the production of many commodities cannot become sufficiently large to fully take advantage of economies of scale and to better utilize possibilities for specialization. As a result, the need to supplement internal demand with exports (external demand) arises much earlier for a relatively small country like Peru than for a larger one like Brazil. (2)

During the last 10-15 years the international environment has become increasingly characterized by a growing international economic interdependence and division of labor. Since the reasons for and implications of these developments will be discussed in more detail in section 7.3., they will not be presented here. Suffice it to say at this point that the importance of international trade in the process of development has increased, and that the importance of the technology factor in the determination of trade patterns and competitiveness has risen greatly. The former factor has been widely recognized by the

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(1) The only determinant of the actual size of the internal market is existing effective demand. Under appropriate conditions of economic growth and a redistribution of income and wealth, the size of the population is an important indicator of the potential size of the market. Thus, in the Peruvian case there is no doubt that the potential internal market is much larger than the actual one. Yet, one has to consider that even if that potential is realized, the internal market is still relatively small.

(2) There exists a possible vicious circle between the need to export to reach economies of scale and the disincentive to export precisely because of higher unit costs on the national market. As will be discussed in detail later on, it is one of the tasks of industrial policy to break such circles where they exist.

Peruvian and other Latin American governments as evidenced by the Quito Declaration of January 1984. (1)

The latter factor - the importance of technology - has probably not yet been fully realized, though. The example of the textile industry provides ample evidence that labor-intensity alone is no longer a guarantee for export success for a developing country - not even in 'traditional' commodities. Thus, the necessity arises to keep up with technological changes and incorporate them, wherever it is appropriate.

This point becomes even more important and obvious, when due note is taken of the fact that Peru is a latecomer in the industrialization process. In order to 'catch up' growth rates in the industrial sector have to be higher than in the developed countries. This intensifies the need to take advantage of already existing technologies, which will help to close the gap, since the assimilation of existing technologies is faster than the development of new ones in the industrialized countries.

In summary, as a result of the discussion above, effective industrial policy always has to be growth policy, allocational policy, and trade policy, whereby only technology-incorporating growth is viable in the long-run.

In light of the above comments three different industrial policies will be discussed briefly to put the views expressed in this report into perspective:

1. Continued primary emphasis on import-substituting industrialization (ISI)

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(1) "La expansión de las exportaciones de América Latina y el Caribe hacia los mercados de los países industrializados es un factor indispensable, no sólo para fortalecer la capacidad de pago de nuestros países, sino también para asegurar un desarrollo sostenido y estable de la región.' Declaración de Quito, Enero 12-13, 1984.

2. Indiscriminate opening to the international market

3. Export promotion and continued ISI with selective liberalization.

1. Continued Primary Emphasis on ISI

Historically industrialization in Peru (as in the other Latin American countries) had to take the form of import substitution. With the first 'easy' phase of ISI terminated though, three major problems arose:

a) the limitations imposed by the size of the internal market (a minimum scale for efficient production cannot be reached for many commodities - especially in the intermediate goods sector; furthermore there is little incentive for specialization.);

b) the inability of the traditional sector (agriculture, fishing, and mining) to generate sufficient foreign exchange to satisfy the growing import requirements of ongoing import substitution;

c) lack of competitiveness due to slow or insufficient absorption of technological change (which in turn can be explained by the reduced level of competitive pressures and the often insufficient scale that does not justify major investments).

These three problems cannot be solved satisfactorily within the logic of an ISI-model. Therefore, continued and exclusive emphasis on ISI without specifically addressing the problems outlined above is not viable. Since it would be a growth policy that neglects trade, the impact of foreign technology and the importance of an active national growth policy, the result has to be frustrated growth.

2. Indiscriminate Opening to the International Market

Economists and politicians who advocate this strategy propose it as a satisfactory solution to the problems arisen under ISI. The rationale is to force domestic producers to become more competitive

with increased competition from abroad, and to realign national relative prices with international ones so as to ensure specialization in the country's comparative advantages.

Such a strategy, however, puts exclusive emphasis on allocation policy and neglects completely the fact that shortrun allocational efficiency and long-run growth potential do not necessarily coincide. It therefore misses the importance of technological aspects and disregards well-founded arguments in favor of infant industry protection.

It is not surprising that in Chile, where this strategy has been followed most clearly, the radical opening on the import side has had a disastrous impact on industrial growth. After years (decades) of protection most industrialists were unable to swiftly react to the sudden increase in competition. The patient that was to be cured - industrial competitiveness - was killed in the process.

3. Export Promotion and Continued ISI with Selective Liberalization Based on Favorable Growth Conditions

The goal of this strategy is to take advantage of the international market (on the export as well as on the import side, especially as regards the import of technology) without opening up completely to international competition. Up to a certain extent it combines the positive aspects of the two strategies discussed above, the need for infant industry protection on the one hand and the need for competition on the other hand, but on a selective basis. It goes beyond those strategies, though, in that the importance of technology transfer and active national growth policy in light of international developments are considered explicitly. The emphasis in this strategy lies on growth through active participation in international trade, with a gradual improvement of allocative efficiency and an incorporation of technological changes in a broad front.

The apparent contradiction between continued infant industry protection and increased competition, applied simultaneously, is resolved by the fact that they are to be applied to different sectors (products). At this point in the process of industrial development there are some industries (products) in Peru that are (nearly) competitive already, that can enter the international market and need less protection, and there are other industries (products), which are still at the infant industry stage and need continued protection. Such protection should only be of limited duration, though, and the long-run goal of liberalization must not be lost sight of.

It is exactly the different degree of competitiveness that Peruvian industries have reached at this point of industrial development, which requires a selective approach. Because of the inherent difficulty and complexity involved in such selectivity it is certainly a difficult strategy to follow. But in our opinion it is the only viable one in the long-run. The provision of sector-specific policies has to take place, though, within a framework of generally conducive conditions for growth. The key elements of such a general framework will be discussed in the next section (7.2.), followed by an analysis of sector-specific policies in section 7.3.

Before, however, a short digression is in order on the difference between the industrial strategy proposed here and recent attempts in Peru and other Latin American countries to tackle the problems under ISI, which go in the same direction.

These attempts have basically consisted of a change in relative prices (between national and international prices) through a change in foreign trade policies: a more flexible exchange rate coupled with export incentives for industrial products and a reduction of import tariffs. Thus, the limitations of the internal market were to be circumvented, the industrial sector was to generate the foreign exchange needed for industrial imports, and dynamic industrialization would resume. While such a policy might be the way of least resistance in political terms, it will not fundamentally alter the picture.

The main argument in favor of infant industry protection is to give space and time to domestic producers to set up productive facilities so that through a learning-by-doing process they will eventually be able to compete with foreign producers. If producers, however, do not use this leeway, then once the economy is opened up to international competition, their relative competitive position will not have improved. It might even have deteriorated. The rationale for the extension of export subsidies is similar to that for infant industry protection: the provision of favourable conditions to support a learning process, but this time on the international market. It is clear from the Peruvian experience that some companies have used the exposure to international competition (on the export market) to increase investments and productivity and to become competitive. Yet in the face of present evidence, it is also clear that their experience and behavior cannot be generalized. In our opinion, this is due to mainly two factors, which have been discussed already before:

a) the absence of general provisions conducive to growth so that exports of many products contained a strong element of vent-for-surplus,

b) the insufficient attention being paid to ongoing incorporation of technology, with a negative impact on the competitive position of many Peruvian products.

In addition, the liberalization of imports - intended to exert greater competitive pressures on Peruvian producers - did not have the desired effect, as they were introduced too abruptly and the rapidly growing contraband could not be controlled.

In summary, the policies implemented were a step in the right direction, but by themselves insufficient to generate the desired impetus for industrial growth and restructuring.

7.2. Key Elements of the General Framework Industrial Policy has to Provide

In order to establish a consistent general framework for industrial policy it is necessary to identify the key present obstacles to a resumption of industrial growth and to an improvement in competitiveness. On that basis different policy measures are recommended to overcome these barriers.

7.2.1. Macroeconomic Elements - The Domain of the State

7.2.1.1. Provision of Infrastructure and a Communication Network

It is well-known that as industrialization progresses the degree and complexity of forward and backward linkages increases rapidly. This fact coupled with the desire to decentralize economic activities, which are still heavily concentrated in the Lima-Callão area, requires that infrastructural improvements are further intensified. Infrastructure is not only concerned with the physical outlay of connections (road, train and air services), but also with an improvement in the communication network (mail, telephone, and telegram services) and the provision of utilities (electricity, water).

Given the geographic characteristics of Peru, it is very difficult and above all costly to provide adequate infrastructure for every part of the country. Support for the creation of industrial (economic) subcenters rather than for unconditional decentralization would establish priority areas for improvements in infrastructure. The Peruvian policy of furthering the establishment of industrial parks through adequate provision of infrastructure should be pursued further, whereby the efforts should continue to be concentrated on a few selected areas. Based on interviews with producers in the industrial parks of Trujillo, Chiclayo, Tacna, and Areguipa, Mikus (1984) showed that the availability

of infrastructure was an important motive for these companies to set up production in these areas. Nevertheless, the relative importance of other reasons (tax subsidies, local supply of inputs, local market) indicates that the creation of industrial subcenters will only be effective, if they can be supported by local conditions.

In this context, a short comment on the virtues of export processing zones (EPZ's) might be in order. While EPZ's have the positive effects of generating foreign exchange and employment, they often create very few linkages with the rest of the economy, and the foreign companies producing in EPZ's are extremely footloose. (1) Thus, it would be advisable to make a more detailed cost-benefit analysis of EPZ's, before any such zones are established in Peru.

In face of the present difficult situation of the fiscal budget, government expenditures on infrastructure cannot have priority in the short-run. Within the generally gloomy prospects for Peru of securing new foreign credits from abroad, foreign financing for infrastructural projects can probably be obtained relatively more easily with the various international organizations. In that context, it might be important to grant more preferential treatment to domestic suppliers, as was discussed in chapter 5 for the case of producers of equipment for the generation and distribution of electricity.

7.2.1.2. De-Bureaucratization on a Broad Scale

An effective functioning of industrial (economic) activities does not only require the existence of appropriate infrastructure, but also a speedy handling of all those affairs where the government intervenes

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(1) For a discussion of the advantages and disadvantages of EPZ's see for example Warr (1984) and UNCTAD (1984).

with rules and regulations to impose order on economic activities. It is an absolute necessity that red tape which has invaded so many aspects of economic life in Peru be reduced substantially. Such a reduction could take two forms: administrative requirements should be rationalized and reduced in scope wherever possible (the registration requirements to establish a firm in the formal sector are a pertinent example), and the speed with which the fulfillment of such requirements is handled should be greatly enhanced (e.g. the handling of imports in the port of Callão).

Our argument is obviously not against administrative rules and regulations as such, but rather in favor of a rationalization of requirements and control. In effect, control has to be increased in some areas, e.g. with respect to tax evasion and contraband. In those cases, however, the issue is not one of establishing new requirements, but rather of effectively reinforcing existing ones. The goal should be to make rules simple and transparent and to introduce only those regulations, which can effectively be controlled.

7.2.1.3. Maintenance of an 'Equilibrium' Real Exchange Rate

It was argued before that a mere change in relative prices (between national and international prices) is not a sufficient condition for renewed dynamic industrialization. It is, however, a necessary condition, especially for the viability of the industrial strategy proposed here. Unless the exchange rate continuously compensates for the difference between the domestic and international price level, both, exporters and producers of import-competing commodities, will be discriminated against and their competitiveness will be decreased.

7.2.2. Improving Competitiveness

7.2.2.1. Attacking the Supply Side

One key issue can be identified on the supply side (production side) that has to be addressed in order to improve productivity growth and thus the competitiveness of Peruvian industry: the insufficient incorporation of technological changes.

The importance of the technology factor in dynamic industrialization has been relatively neglected for a long time in most Latin American countries. This did not happen out of ignorance, but it was rather a reflection of the national and international economic context at the time. The technological requirements for the production of most consumer goods were not as demanding as those for the manufacturing of intermediate and capital goods. And abundance of unskilled labor was (believed to be) a sufficient basis for export success of labor intensive manufactured commodities, as lower wages compensated for higher productivity in the industrialized countries. With a change in international and national developments, however, the need for technological knowledge and its incorporation into the production process has greatly increased for developing countries.

Nevertheless, one cannot argue for an indiscriminate incorporation of technological changes in all industrial sectors, nor for the acquisition of the latest technological developments in the industrialized countries. The argument rather is that the technology factor has become so important in the determination of international trade patterns and that the rate of technological change has been increasing so rapidly that no developing country that wants to participate in the international market of manufactured commodities can afford to ignore it.

The incorporation of technology has to be approached in four consecutive steps:

- availability of information on technological developments
- transfer of technology
- adaptation and diffusion of technology
- creation of own technology.

The first prerequisite for effective incorporation of technological changes is the knowledge about technological developments internationally on an industry-specific or even product-specific level. Within nearly every industrial branch there exist more and less capital-intensive production processes, more and less sophisticated technologies. Which technology should be used, can only be decided on a case-by-case basis because of the complexity and industry-specificity of a cost-benefit analysis. In order for an industrialist to decide which particular technology is appropriate for his purpose, he has to be able to rely on an informational basis about technological changes, an informational basis which has to be directed at the future.

The actual transfer of technology is no longer necessarily tied to direct foreign investment, but technology can also be acquired through licensing. Technology has increasingly become an internationally traded commodity, a fact developing countries should take advantage of. It has enhanced the bargaining power of a country like Peru, since she can play off different suppliers of technology against each other and thus increase the benefits accruing to Peru from such a deal.

The availability of pertinent information is again a prerequisite for effective utilization of the bargaining space, whereby the scope of that space will vary with the type of technology and the size of the project.

With respect to the importance of the way in which technology is transferred Amartya Sen (1980: 126) remarked: "In a good many cases, modern technology has sat on developing countries in much the same way

a drop of water sits on a lotus leaf: no mark anywhere and always ready to roll off."

It is therefore of utmost importance that technology once acquired is widely diffused. While diffusion of technology obviously is in part linked to the form in which new technology is acquired, the concept of diffusion and adaptation has to be understood as encompassing a much larger scope. Diffusion of particular technologies on an industry-level and their adaptation to local conditions - the top-down part - has to be complemented with a technological-educational offensive on a broad front - the bottom-up part. Such a general technological-educational improvement should start at the elementary school-level up to the high-school level to the broadening of technical schools and engineering departments at the university. It cannot be the intention here to devise curricula for the different types of schooling, but the point is that for longterm incorporation of technology to be viable and effective a general familiarity with technological concepts by a growing part of the population is as important as the creation of a large staff of well-trained engineers and technicians.

The last step in this whole process is the creation of own technology. While today this might appear to be a long way ahead in the future, the examples of other developing countries, e.g. Brazil and Korea, show that it can be done.

The implementation of the general ideas outlined above is obviously a longterm project, especially as regards the technological-educational offensive on a broad scale. Yet, the transfer, diffusion, and creation of technology require an institutional-organizational structure and network, the construction of which has to be started now and promoted rapidly. The already existing institutions in this area like ITINTEC, CECAPES, SENATI, are important elements in such a network. In addition,

the establishment of further elements definitely needs to be considered, though, whether they take the form of new institutions or new tasks being incorporated by already existing institutions.

The foundation of a data-information bank and accompanying advisory facilities would be one important factor. The functions of such an institution would be to:

a) collect information on the nature of technological developments, primarily in those industries already existing in Peru,

b) make that information available to all interested parties (e.g. upon request or regularly in the form of small bulletins),

c) conduct feasibility studies upon request as to their appropriateness for production processes in Peru,

d) enquire upon request as to which foreign companies provide a particular technology that a Peruvian producer is interested in, and on what terms.

It has to be analyzed in more detail, whether all these functions could be executed by ITINTEC. In any case it is important, though, that such an effort is undertaken in close coordination between public and private entities. Given also the complexity and the magnitude of the task, disaggregation on a sectoral level is crucial. Thus, the build-up of subdivisions in close connection with existing private associations, like the 'Comité Textil' or the 'Comité de Bienes de Capital' is vital.

To further the process of diffusion (and eventually creation) of technology a closer cooperation with the universities and their specific incorporation into this process has to be reached. While it has to be studied in more detail how and in which areas this can be done, it is clear that educating a larger number of engineers and technicians should be a major focus.

It is equally important that serious consideration is given to an improvement and expansion of training programs for workers. This issue is especially prone to close cooperation between the private and public sector with the provision of public training centers complementing on-the-job-training.

Furthermore, attention should also be paid to the expansion of programs of business administration, since improvements in the soundness of management and organizational structure would greatly contribute to a reduction of X-inefficiencies. Although an elimination (or less ambitiously: a reduction) of X-inefficiency cannot substitute for incorporation of technological change, it has to be seen as a complementary way to improve productivity. It is an especially important factor in the short-run in view of the present scarcity of foreign exchange.

The discussion so far has mainly focused on the acquisition of better manufacturing capabilities. Although design capabilities can only be fully developed once manufacturing capabilities are mastered, it is vital already now that more importance is attached to an improvement and standardization of quality. The analysis in chapter 5 of the sector producing mining equipment has shown very clearly that the economic loss resulting from equipment of poorer quality can quickly outweigh the gain obtained from a lower price. Although quality control is a task that in the end has to be carried out on a firm level, public entities like ITINTEC have to expand their efforts in devising standardization norms, advising companies as to their implementation, and eventually enforcing the observation of rules and requirements regarding quality control.[1] Production under foreign licensing can also play an important role in this respect, as was pointed out already in the sectoral studies.

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(1) The creation of a superior quality control system has been one of the important elements of the Japanese export offensive since the early 1960's.

7.2.2.2. Attacking the Demand Side

At the beginning of this chapter, the reactivation and expansion of internal demand was discussed as one of the macroeconomic prerequisites for renewed industrial growth. The problem addressed here is quite distinct, since it focuses on external demand.

Traditional trade theory normally operates with the simplifying assumption that the demand for a small country is infinitely elastic; i.e. such a country can sell any quantity at the reigning world market price. Reality is more complex, however, in that an exporter not only needs information on where he can place his product, but also needs to engage in marketing activities to ensure the viability of his trade contracts. Thus, the call for an attack on the demand side has to be translated into an effort to improve the transparency of the markets, into the need for constant market evaluations and marketing activities.

Such efforts to improve the transparency of international markets are needed for one more reason: if Peruvian industry is to develop by taking advantage of participation in international trade, then an informational basis is needed to detect dynamic comparative advantages, i.e. not only the export possibilities of today, but also the potential markets and export products of tomorrow.

Since the institutional-organizational infrastructure required in this context is similar to the one discussed before (only that here we are dealing with the gathering, evaluation and diffusion of information about product markets rather than about technological developments), some of the general recommendations are the same as before, namely:

a) the necessity for close cooperation between public entities and the private sector,

b) the need for the establishment of major subdivisions by product (and maybe by main export areas) under one organizational umbrella.

In view of the already existing institutions and associations in this area in Peru it is recommended that the task of constant market search and evaluation be carried out in close coordination between FOPEX and ADEX (whether under the direct auspices of one or the other remains to be studied). To facilitate the establishment of a data bank and on-going industry or product-specific market evaluations existing international bodies and institutes should be tapped for information, wherever possible. Furthermore, participation in important international trade fairs should be promoted effectively, not only for the purpose of gathering information, but also to enhance the visibility of Peruvian products abroad.

Since there will be some overlap in information and evaluation of technological developments on the one hand and trends in international product markets on the other hand, close communication and interchange of ideas has to exist between the two institutions responsible for the maintenance of the requisite data-information bank.

Part of the export success of some of the East Asian countries is possibly due to the fact that a large share of their foreign trade is carried out by a small number of big trading companies. The advantages of such trading companies become very obvious, when we consider the economies of scale to be derived from market search and penetration. Over time, a trading company accumulates information, experience, and inside knowledge of different product markets and export areas, which allow for the establishment of an international network and for increased flexibility in response to changing demand conditions in one or the other market. Having reached a certain size, such a company can more easily afford representatives abroad (with the ensueing benefits of closer contact with potential buyers), and it will also be in a better position to detect possibilites for barter and triangular trade.

There is no doubt that such trading companies have evolved historically in the East Asian context, and that the concept can there-

fore not simply be superimposed on the reality of a different country. In 1979, the Philippine government for example decided to promote trading companies by incentives in terms of favorable rediscounting privileges, liberal export payments terms, and access to other export incentives. So far, the initiative has not yet met with major success, mainly because the eligibility criteria were considered too restrictive. It is worthwhile though, to explore the idea of trading companies in more detail in the Peruvian context. FOPEX and ADEX together could possibly set up one trial trading company, which subsequently could evoke imitation by the private sector, if accompanied by appropriate incentives.

7.2.3. Correcting Imbalances in the Industrial Sector

Today, Peru's manufacturing sector is characterized by two major imbalances, which - although interrelated to a certain extent - are separated here for analytical purposes: the imbalance in the incentive structure which favors the employment of capital and discriminates against the employment of labor, and the imbalance between the formal and informal sector.

These imbalances have to be corrected, because they pose a problem for further dynamic growth. In view of the high rate of un- and under-employment in Peru an incentive structure in favor of capital leads to smaller creation of employment of labor than a more balanced incentive structure would do. The Labor Stability Law (LSL) in its present form reinforces this trend. The implications of the LSL can be analyzed under two aspects: the impact on entrepreneurs' behavior on the one hand, and the realization of job security for workers on the other hand. Since producers usually do not employ workers for more than three years any more, the result is not only a higher turn-over in employment, but also the absence of large investments in training programs. Furthermore, that part of the wage bill corresponding to 'tenured' workers becomes a

fixed cost, which is an aggravating factor in times of severe economic recession. From the workers' point of view, under present economic conditions the LSL defeats its original purpuse: job security for all employed. It has provided this security for a relatively small number of privileged workers, but at the expense of the majority of workers!

The discrimination against employing labor poses a strong incentive for small labor-intensive operations to be conducted in the informal sector. There, the distortion of relative factor prices is exactly the opposite from what it is in the formal sector: labor is relatively cheaper and capital is relatively more expensive. Also in contrast to the formal sector, protection of workers is non-existent (be it in the form of job security or minimum wages). Finally, the growth of the informal industrial sector not only implies loss of revenue for the government (in the form of unpaid taxes), and thus an increasing tax burden on those in the formal sector, but also an increasing lack of transparency in the economy, which makes it ever more difficult for private and public economic agents to predict and shape future economic developments.

Because of the factors discussed above one goal of general industrial policy has to be the correction of the imbalances in the factor market, and an integration of the informal industrial sector into the formal one. The existence and growth of the informal sector certainly is a complex phenomenon and problem. Here we are only referring to that part of the informal sector, which constitutes a part of manufacturing activities.

Since the present system of fiscal incentives and taxes was analyzed at length by the World Bank (1983: Part III), a detailed discussion will not be repeated here. The fiscal incentives which operate through a concession of tax credits against corporate income taxes coupled with the various taxes on capital and labor [1] benefit capital-intensive

(1) The taxes on capital are basically the taxes on patrimony and on revaluation of fixed assets, while the labor-related taxes consist of the payroll tax and contributions to social security, SENATI and FONAVI.

industries and discriminate against labor-intensive industries. Therefore, it is absolutely vital that the reinvestment incentives are redesigned in such a way as to neutralize the negative impact of labor charges.

A reformulation of the LSL has to be considered, too. While its termination might be desirable, it is probably not feasible because of its sensitive political nature. Since the desirable state of affairs cannot be the one presently reigning in the informal sector either, because it would imply no rights for workers at all, the difficult task arises of finding a middle way. One possible strategy would be to maintain the LSL in its present form, but to complement it at the same time with an attractive alternative, so that the number of 'tenured' workers will become increasingly smaller over time.

Such an alternative could take different forms, two of which are discussed below:

(1) One possibility would be to allow for time contracts exceeding three years. Since the present LSL de facto works in such a way, that few entrepreneurs will extend employment after three years, the option of time contracts for more than three years will offer more stability and security to employees (yet no 'tenure' for life) and might induce entrepreneurs to expand their training facilities. For time contracts to be attractive for presently "tenured" workers too, they would have to be coupled with a higher wage.

(2) Another alternative might be to allow for time contracts at a higher wage than under the LSL option coupled with the provision of some unemployment compensation upon termination and non-renewal of the contract. The creation of an unemployment compensation scheme encompassing all workers obviously has to be a long-term project for Peru in face of limited financial resources and the frequent occurrence of unemployment. Yet it is worthwhile studying in more depth, whether it would be feasible financially to start on a small-scale as envisioned here, where unemployment compensation is only

available to those workers choosing this employment alternative. If the problem of financing such an unemployment fund can be resolved satisfactorily, this alternative seems to be very promising and might find a positive response by workers, since it promises a minimum amount of security during a limited time of unemployment.

A correction of the distortions in the incentive-tax structure for the employment of capital and labor and a reformulation of present labor legislation along the lines indicated above will certainly contribute to reducing the imbalance between the formal and informal sector, as it lowers the incentive to operate in the informal sector. Since these measures by themselves, however, are probably insufficient to lead to a significant decrease of the informal sector, they have to be complemented by additional policies.

The entry costs into the formal sector, i.e. the costs of registering a new firm, have to be drastically reduced in terms of time and money. It should be considered to extend the experimental new system of registration for small enterprises currently conducted by the Ministry of Industry to comprise all new firms.

Furthermore, to entice firms to leave the informal sector, small-scale industry in the formal sector should be given special attention, which could take the form of small subsidized loans, temporary profit tax exemption, provision of specific services, etc.

The provision of specific incentives on the one hand has to be complemented though, with an improvement in the control mechanisms on the other hand. Control then has to be exercised after a grace period of a few years (e.g. 2-3 years) over those firms remaining in the informal sector, at least over those of a certain size (e.g. with more than 3 or 5 workers).

7.3. Sector-Specific Policies

Sector-specific policies have to be devised with due respect to the global economic policy framework, which was discussed in the previous section. With respect to the sectoral industrial policy itself there are a number of important questions that have to be answered. It is only after the discussion of these questions, that some cautious recommendations for Peruvian sectoral policies can be advanced.

In the following, we will first discuss some common implications of sectoral policy. Secondly, some criteria for the determination of potential growth sectors will be analyzed. These criteria represent the analytical tool for the evaluation of some general trends for sectoral policies in LDCs. They have to be interpreted in terms of the actual and the future situation of Peru. In a final step, industrial sectors will be subdivided into three different categories, a differentiation which should be used as a preliminary guide to industrial policy in Peru.

7.3.1. Implications of Sectoral Policies

The general idea underlying all sector-specific policies is the suggestion, that global growth policy is insufficient to stimulate the dynamic forces of an economy optimally. Growth can best be achieved, if there is a continuous and rapid movement of factors of production to those sectors, which have a growth potential and away from those, which are shrinking (relatively!) in the course of development. Postponing the discussion of what constitutes a 'growth potential' for later, it can be concluded, that such mobility helps to concentrate the productive factors in those activities, where demand and/or productivity are highest, so that the average productivity of the economy increases. This movement of factors in the direction of higher output per man or per capital unit is not limited to sectoral changes, and it is not just a one-time movement, which leads to a new static equilibrium. Rather, it must be emphasized that growth-stimulating shifts in

productive activities are taking place continuously, within and between firms. This becomes especially clear, when the ongoing process of innovation with the resulting changes of products and production processes and the permanent changes in the level and the structure of final demand are taken into consideration.

In an economic system based on the principle of consumer sovereignty the owners of the means of production have to adjust the production structure to the expected demand structure without delay and in a way that employs the scarce productive factors most efficiently. This task can only be realized incompletely in reality, which is always characterized by a relatively high degree of uncertainty. Two aspects of this problem have to be emphasized. Firstly, decisions on future production normally bind the capital involved for a considerable number of periods, because fixed assets are not indefinitely separable. Secondly and closely linked to the first argument, the above-mentioned changes in consumption patterns and available technologies pose a threat to the economic life of assets. As a consequence, there is neither a clear-cut answer to what is the right decision about future capacities nor is there more than a probability that the investment decisions undertaken now will prove to have been the right ones in the future. Looking at the growth process in this way reveals that the transmission mechanism leading to growth might be hindered, if reliable data on future developments are scarce. This has provoked a number of development theorists (e.g. Lewis, Hirschman) to emphasize the bottlenecks in development planning caused by insufficient knowledge of future economic conditions.

Sector-specific industrial policy is only another one of the possible means to pave the way for correct investment decisions in view of optimal growth performance. It differs, however, from other models in that supply side factors tend to be the main policy targets. Thus, positive sectoral policy - if implemented correctly - should make the inherent growth potential of different sectors more visible and calculable, so that the profitability of activities in the favoured sectors is increased at the expense of sectors of lower priority.

It might even increase profitability to an artificially high level for some time, if this is necessary to overcome entry barriers (e.g. in the presence of increasing returns to scale).

It is intuitively clear, that such a stimulation of selected sectors has to utilize essentially the same instruments as those available for growth policies:

- subsidization of factors of production,
- subsidization of inputs,
- provision of information,
- foreign trade regulations.

The fact, however, that they are aimed at only some sectors within the whole economy, might cause quite different effects on the whole economic system. (1) It is this fact (i.e. the selection of specific sectors rather than the instruments used), which poses the most difficult problem for sectoral industrial policy. (2) Given the framework for growth (= given the conditions offered to all producers alike), the provision of even better conditions to some can only be reached at the expense of the rest. Reformulating this statement in terms of a growing economy two very important conclusions are reached:

1. With a given rate of growth for the whole economy the discrimination of some industrial branches does not necessarily lead to their absolute decline. Rather, the discrimination can be reflected in a

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(1) This is not to say that different global measures do not have different impacts on the structure of the economy. Under global policies such effects are, however, unintended, while under sector-specific policies they are fully intended.

(2) An institute founded to improve the transmission of new knowledge to firms might serve the whole economy. Such an institute working exclusively for the chemical sector might improve growth in this and some related branches, but reduce the competitiveness of substitutes.

differentiation of sectoral growth rates. Should shrinking sectors not be squeezed in a way that calls for an absolute decline, then the favorization of growth sectors (and so the degree of sectoral policy) can be the more pronounced, the higher the average growth rate for the whole economy.

2. The more pronounced the differences are between favored and discriminated sectors, the more intensive will be the drive to growing sectors. This process will only succeed without major tensions on factor and goods markets, if the transfer of factors from one sector to another is not hindered. Skill limitations, fragmented markets, and economic policy itself might be obstacles to flexible adjustment. The adjustment problem, which is one of the most striking growth obstacles in developed countries as well, has to be attacked on both fronts: fostering growth in the selected sectors and easing the process of restructuring in the shrinking branches. The problem is of only minor importance, if the growth rate is high enough to allow the relatively shrinking sectors to still grow in absolute terms. In this case and leaving aside skill limitations new (previously unemployed) workers can be integrated into the production process. Much of the adjustment, however, will take place within and between individual firms, so that the rearrangement of factors of production is not a mere sectoral problem.

Based on these considerations, three main problem areas are to be expected when sectoral policies are implemented. Each of them is providing its special policy problems.

1. A higher rate of growth of income will be achieved after all adjustments have taken place, if and only if the sectors selected as a target for industrial policy can grow over a longer planning period. As a general rule, this will only be possible, if they are not favored in spite of adverse national and international

developments in the respective markets. (1) Exactly because of this problem, in Japan for example, sectors which are to be selected for promotion are very carefully studied in view of their national and international prospects. Once selected as a priority branch in industrial development, however, sectoral subsidization will not be changed over a period of 10-15 years (this does not preclude a change in absolute protection rates or the mix of instruments used), so that stable data guarantee a relatively safe calculation of long-term investment projects.

2. The acceleration of growth initiated through information on future growth industries forces factors of production to move more rapidly from one use to the next. Therefore a prerequisite for effective sectoral policy is a sufficient degree of flexibility of these factors.

3. Given the growth-promoting effect of a correctly implemented sectoral policy, an increased complexity of the industrial structures has to be expected. The process of capital widening and capital deepening leads to an ever growing complexity of production processes and interrelated industrial activities. Thus, if sectoral policy has a very strong impact on the determination of sectoral discrimination, it might effectively hinder the implementation of new complementary industries which are not covered by the initial subsidization scheme.

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(1) This is not to deny, that there exists some scope for political decisions on what should be a growing sector in Peru. But there are obvious limitations to a government acting as a promoter of specific branches - especially if they are to enter the world market within some time. Obviously sectoral policy will be the more successful, the more it is based on the correct evaluation of market trends. If this condition is not met adequately, then economic agents at home and abroad will realize very quickly, that this kind of policy has no chance to survive for the minimum number of periods necessary for success. In that case, they will not react to the incentives provided!

Furthermore, the emergence of new growth sectors might be hindered by the existing subsidization schemes.

Given these three major implications of sectoral policy, its potential dangers become obvious:

1. Sectoral policy must rely on long-term projections, but it must at the same time be open to flexible adjustment to new economic conditions. To meet both (potentially conflicting) goals, a thorough evaluation of market prospects is inevitable.

2. The capacity to adjust smoothly to changing economic conditions must be stimulated, if the scope for growth provided by specific policies is to be exploited sufficiently.

3. The supposition underlying the suggestion that sectoral policy is advantageous is that the 'right sectors' can be identified. The determination of future growth sectors, therefore, becomes an essential prerequisite for sectoral industrial policy.

It is this last point, which will be at the center of the following analysis.

7.3.2. Guidelines for Identification of Growth Sectors

The problem of determining potential growth sectors may be approached from the demand as well as from the supply side. Since there are strong interdependencies between the two sides, the limitations to growth found in either one are limiting the whole growth process. Demand and supply conditions must be addressed simultaneously, therefore, if a complete sectoral evaluation is aimed at.

Some simple criteria for the determination of such sectors can be derived as follows:

(1) Sectors with a higher elasticity of income do have a better chance to sell additional output with rising income, even if its competitive position is not strengthened.

(2) With a given elasticity of income the sectoral growth rate can be stimulated, if new markets can be gained. This goal can be reached, if the relative efficiency of the firms or the terms of trade can be improved, so that their competitiveness grows more rapidly than that of their rivals.

(3) The quicker the process of maturation of an infant industry, the earlier the advantages of world wide specialization can be exploited, which in turn stimulates new gains in productivity.

(4) The better the relative position of an industry or a firm on the world market, the better are its chances to realize rates of growth of production that exceed those obtainable on the national market.

While the significance of elasticities of income as a leading demand factor is not seriously questioned and forms part of the development plans of theorists as well as practitioners (e.g. Japan, Korea), the criteria given under points (2) - (4) give rise to a number

of heterogeneous problems which are not easily evaluated. These problems include

- the complex new economic and political developments in world-wide perspective and
- the highly arbitrary developments which can be attributed to the unforeseeable changes which technical progress and the international market evoke.

While in highly developed countries which are operating at the frontier of the development of new and sophisticated technology, the latter has to be seen as one of the single most challenging phenomena for economic policy, the technology factor has a quite different meaning for less developed countries. The fact that existing technology depreciates relatively rapidly at the beginning of the product (and process) cycle but can be used extensively and over a larger time period, if incorporated in production processes depending predominantly on factor cost differentials, opens up a good chance for latecomers in economic development to adapt and use existing technology relatively easily. In fact, all major successful developing countries of the last two decades relied heavily on licenses, imitations, adaptations, and joint ventures to exploit existing technology to their advantage. Thus, from the point of view of Peru as a small country in terms of economic indicators, the possibility to efficiently exploit existing knowledge in advanced countries and to raise national output (and efficiency) by penetration of existing international markets (once efficiency has been increased to a minimum level in terms of international standards), forms a two-fold argument in favor of a careful evaluation of new developments of the world market before deciding on sectoral strategies.

7.3.3. The Significance of International Economic Developments for the Selection of Key Industrial Sectors in Peru

7.3.3.1. Specialization Schemes to be Fostered on the Basis of Traditional Trade Theory

The main emphasis of traditional trade theory has been on the identification of scarce (abundant) factors of production. The fact that relatively scarce factors have higher prices than those relatively abundant leads to the almost universal conclusion that a country should specialize in the production of those goods which use the abundant factors more intensively.

In its classical variation traditional trade theory concluded that developing countries should specialize in the production of primary products and trade them against industrial commodities. The obvious long-run limitations of such a strategy, discussed at length in the literature, led to its rejection, however, and increasing attention was paid to the differences in capital and labor as the factors determining efficient specialization within the modern industrial sector.

It is argued that specialization in labor-intensive production processes is advantageous for developing countries, even if the elasticities of income do not indicate favorable prospects on the demand side, if and as long as:

(1) the competitive advantage due to especially favorable factor endowments permits ongoing penetration of new markets in foreign countries. In this case the growth rate of exports (and, as a consequence, that of national production) will exceed the growth rate indicated by the elasticity of income alone.

(2) alternative specialization in other branches, which *a priori* appear to be more promising, is not possible under given circumstances,

but the participation in international trade with existing exportables is judged to be better than no trade.

It is a widely-held view today, that the second condition holds for the majority of developing countries and it goes without saying that it holds for Peru, too. It is not so clear, however, if a successful penetration of foreign markets with a sufficient growth rate can be initiated by Peru through a mere change in relative prices and subsidization of non-traditional exports. The necessity to implement an effective growth strategy to attain this goal has already been emphasized before (see point 7.1.).

7.3.3.2. New Developments in the World Economy and Their Impact on Industrial Policy in Peru

During the time of growing international trade after WW II a number of important developments in the international division of labor have taken place. They have not only led to a mere intensification of trade relations between individual countries, but they rather changed the structure and the factors determinating trade flows drastically. Many politicians seem to realize only hesitantly the significance of these changes for the design of (foreign) economic policy, though it is already obvious, that the general validity of specialization patterns derived from traditional wisdom about international trade becomes more and more questionable. Full advantage of the new developments in the division of labor can, however, only be taken by those countries, which manage to quickly translate the new insights derived from these dynamic processes into economic policy.

Thus, a rough presentation of the major new trends in the international division of labor appears to be very helpful for the identification of some incidents of dynamic comparative advantage for Peru. Five major areas of change are to be considered here. Although they are closely interrelated, they are presented separately for analytical purposes.

(1) The Phenomenon of Intra-Industry Trade

Since WW II (and especially pronounced in recent years) trade flows between countries with almost identical factor endowments (e.g. the industrialized countries) and of quite similar products have grown considerably more than trade flows between developed and less developed countries. (1) In the recent past, intra-industry trade has also gained in importance between developed countries and some advanced developing countries. It can be concluded, therefore, that intra-industry trade is an unlimited source for new profitable trade from today's point of view, and it becomes the more important the more a country's industry develops. Present trade relations cannot be explained by traditional trade theories alone any more. Obviously cheap labor is only one factor, which is giving rise to trade and it is of diminishing importance. Other explanations for the exchange of goods between countries have to be found.

(2) The Increasing Participation of LDCs in International Trade

During the last two decades some developing countries successfully managed to place non-traditional exports on the markets of advanced industrialized nations and those of neighboring countries. As a result the developed countries witnessed increasing market penetration by Third World countries in a number of important industries, namely in textiles, apparel, leather goods, toys and some consumer durables. The pressure put on these industries led to a variety of efforts within the developed countries to regain competitive strength. There are three different kinds of reactions which in turn altered the relative position of the producers in developing countries again:

(a) In so far as resources moved out of the affected industries in developed countries, additional room was created for LDC exports.

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(1) South-South trade, on the other hand, could not gain much importance until recently.

The fact, that even today export growth rates for most of the successful newly exporting nations are above the growth rate of national demand in the importing countries indicates, that the restructuring process in the affected industries still continues.

(b) Developed countries undertook considerable efforts to fend off import competition in the respective industries by up-grading their products and increasing capital intensity. It is especially the latter development, which forces developing countries, too, to partly follow a pace of up-grading which is not in line with their national employment objectives.

(c) Those industries in the developed countries challenged by severe foreign competition successfully bargained for protection, which was originally envisioned as temporary assistance to adjustment, but most often degenerated into long-term subsidization of inefficient industries at the expense of national consumers and foreign suppliers (especially those from LDC's).

(3) The Increasing Importance of Technological Know-How

It has been estimated that the overwhelming part of scientific knowledge available at present has been accumulated during the last 30 years. New knowledge has continuously been translated into new product designs and the re-organization of production processes. As a result, sophisticated management methods and technical know-how play an increasing role in economic development, and they become a growing integral part of sophisticated products manufactured on a world-wide scale. Thus, the creation of new knowledge and its implementation have become key elements in this process of growth. It is an important characteristic of the inventional process that no exact forecasts are possible about its concrete direction. Scientific progress and entrepreneural inventions are more or less randomly distributed between equal competitors, instead; leads

in design and production are temporary, as competition forces the other producers to incorporate further inventions.

(4) The Continued Process of Internationalization

The evaluation of international trade has been accompanied by a rapid diversification of production processes, which fundamentally changed the nature of international economic relations. Stimulated by growing national markets, easier access to foreign demand and a relative decline in the cost of information and transportation, and inspired by new technical and organizational talents, a further division of increasingly complex production processes was progressively pursued under the goal of international profit maximization. (1) This process was favored by a number of complementary developments such as a world wide increase in the mobility of capital, management and technical abilities. As a consequence, the set of preconditions for the establishment of efficient production units became increasingly mobile internationally, and traditional comparative advantages disappeared (problem of 'footloose' industries). Transnational enterprises (TNE's) play a dominant role in this process of internationalization of production. At present, many of them are so diversified internationally, that the parent companies only contribute a minor part to total economic activity. Taken as a single category, these firms are responsible for a considerable part of world trade today, (2) and this share is still rising. It has been concluded therefore, that TNE's "because of their dynamic nature... have become (and still are) the primary agents in the emergence of a new world economy". (3)

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(1) Katrak (1983).

(2) For example, 20-40% of foreign trade of the USA, Great Britain and Sweden are estimated to be intra-firm trade. See Helleiner, Gerald (1979: 162).

(3) Michalet (1982: 44).

With the growing importance of TNE's the element of economic power in oligopolistic markets has surely increased. However, what has been felt as a severe threat to small developing countries for a number of years has turned out to become a growing (potential) chance for LDCs to develop more rapidly in co-operation with these enterprises. This argument, which might seem weak at first sight, rapidly gains importance in the emerging process of internationalization because of the growing competition among equally potent TNE's. An increasing number of developing countries has managed to successfully exploit this constellation to their own advantage.

(5) New Protectionism and the Threat to Developing Countries' Exports

The changes in the structure of trade and production inherent in the process of increased internationalization have been resisted by a number of well-established manufacturing branches in the developed countries. While trade liberalization based on the principles of GATT has been pushed foreward continuously, a highly obscure system of non-tariff barriers (such as countervailing duties, escape clauses and administrative procedures discriminating againgst foreign suppliers) has emerged in recent years. The textile producers, for example, which are among the most important and successful exporters of manufactures in most newly industrializing countries including Peru, are among the industries most severely hit by the new protectionism. The Multi Fibre Arrangement can be seen as a clear example of a misconceived adjustment policy, which led to an ever growing degree of protection and to an ever growing number of products covered. But even in those branches where developing countries are expressedly said to be favored, a sophisticated net of quantitative restrictions has been constructed to avoid 'unfair' competition. In the EEC, for example, a three-fold system of protectionist barriers has evolved, which affectively hinders developing countries' exports as well as the welfare of national consumers. Other protectionist procedures have been reported from the USA. The latter were especially harmful to Peruvian textile exports in recent years.

Despite the growing concern about protectionism it has to be emphasized, however, that the export offensive from the LDCs as a whole could not be stopped in this way until today. There appear to be some indications that the dangers of world-wide protectionism are realized by a growing number of politicians today. An increasing understanding of the already realized degree of world-wide interdependences might contribute to this development in that it sheds more light on the fact, that a return to isolation would be desastrous for all countries. At this point in time, it is impossible to foresee whether protectionism - especially in the form of non-tariff barriers - will continue to increase or not. Since a large part of the discussion around this issue focuses on the bleak perspectives for a reduction in protectionism, it might be worthwhile to briefly indicate that powerful factors and forces do exist, which are aimed at a continuous integration of the world economy:

(a) The disappearance of clear-cut differentiations between the relative sectoral advantages of different countries makes it increasingly difficult to distinguish between products to be protected and those to be liberalized (from the point of view of nationalist economic policy).

(b) Because of the emergence of a sophisticated net of internationally-organized production and capital flows, it is in the interest of the powerful TNE's to gain success to all markets on a reliable basis. Therefore, they will be an effective lobby against the particular interests of national industrialists seeking protection.

(c) Competition among producers in DC's has become harder. One outcome of this development is that technical progress is diffused more rapidly and that product-cycles are becoming shorter. Thus, the identification of possible new targets for protection becomes much more ambigous.

(d) Some newly-industrializing countries are just starting a new phase in the catching-up process in that they try to adjust their production structure to their rising labor costs and advanced technical capability. During this process of up-grading new export fields for the late-comers will arise.

7.3.4. Consequences for Sectoral Industrial Policy

7.3.4.1. Lessons from Worldwide Economic Developments for Peru

The discussion in the previous section leads to two major consequences for Peru:

(1) Specialization in industrial branches using labor-intensive production processes is increasingly challenged by new developments in so far as capital intensification and the extensive use of new technology (micro-electronics, computers, numerically-controlled machinery etc.) tend to counteract the advantages of cheap and unskilled labor.

This is not to say, however, that comparative advantages are lost immediately and for the whole sector. The development of capital-intensive and high technology substitutes, though of growing importance during the development process, can outweigh the comparative advantage of traditional LDC exports only within a longer time period. The velocity of this process is highly dependent on the capacity of the individual enterprises to introduce the new technologies, i.e. it is the rate of technical progress that limits the velocity of substitution of new for old technology. And this rate has proved to be relatively constant over time. Furthermore, technical progress is not applicable to all production processes alike, so that in many cases labor-intensive production remains the most efficient solution in economic terms.

Consequently competitive strength, as measured on the basis of a whole industry might weaken, but this process takes time and it usually does not affect the different subsectors equally. Therefore, specialization in labor-intensive industries remains a promising strategy for a (reduced) number of sub-sectors within what has traditionally been called a 'labor-intensive industry'.

(2) The dynamic interplay of the imbalances of constantly changing supply and demand structures, fed by ever new production and consumption possibilities, generates an evolutionary system of new and complex specialization schemes. Two major implications for Peru's future specialization structure may be derived:

(a) According to Vernon's product cycle, new products undergo different stages of production. They usually start to be produced on a small scale and with very technology-intensive production. This constitutes a comparative advantage for producers in developed countries. During the course of maturation, the products and the production processes become more and more standardized, and products find a larger market, so that countries endowed with lower-level technology and mainly unskilled labor become increasingly capable of producing these standardized commodities.

(b) Industrial manufacturing becomes more and more complex within the advanced countries, and the production process itself is increasingly open to separation into single operations in nearly all relevant branches.

Both developments together contribute to the creation of new sets of production activities with fairly different technological properties. The individual sub-processes can usually be carried out independently and without being constrained by local factors. In this way, a completely new hierarchy evolves, which is based on factor rather than branch-specific criteria. The new capital, technology and labor-intensive operations can be spread over different nations according

to the familiar efficiency criteria, but without special reference to certain branches.

One important aspect of this development is the fact that labor-intensive productions are now increasingly found within the smallest sub-sectors and down to the firm level. Consequently, new export chances for Peru arise within a fairly wide range of manufacturing sectors, which have been exclusively reserved to producers in advanced countries until recently.

A second important aspect is the fact that the advantages to be derived from trade at different stages of development require different policies, so that they are exploited optimally.

7.3.4.2. A Dynamic Outlet of Sectoral Industrial Policy

Following the above analysis it can be concluded, that there are different stages of development. Applied to Peru, this signifies that a new sectoral policy has to be specified in accordance with the actual stage of economic development. At the same time, possible future trends have to be incorporated as indicated by the development of the Peruvian economic position vis-à-vis the world market and the regional markets (Andean Pact). Available statistical information shows, that Peru had developed the principal prerequisites for further development in the 1960's already. Peru then was in a position not very different from countries like Brazil (although there is an obvious difference in size), Korea (although the latter could count on considerable U.S. foreign aid), Malaysia or Colombia, which doubled national income during the following 10-15 years. The growth process in Peru nearly stagnated during this period, so that GDP per capita today is not very different from what it was in 1965-70.

In other words, a gap has arisen between Peru and those countries, which are now commonly called NIC's (Newly Industrializing Countries). This puts Peru in line with a number of countries, which seem to become

the successful developing countries of the second generation, and again national economic policy will be one important factor to stimulate this process effectively.

Starting the growth process within such a group of countries calls for a sequence of policy advices which have to aim, firstly, at the implementation of measures strengthening that production structure which appears to be the most convenient under present circumstances. Subsequently, and once growth is under way, the direction of the future production structure has to be evaluated. Economic policy then should try to pave the way for the resources used in the emerging new industries. The two approaches do not exclude one another. Rather, they complement each other in a time sequence.

Sectoral Policy during the First Stage

Given human ability and technical capacity the kind of sectors which can increase efficiency most quickly to meet the international standard are those using predominantly low-skilled labor and well-known technology. In this respect, sectoral policy as recommended here does not differ from traditional propositions. But the question arises which one of the set of labor-intensive industries will be worth stimulation in Peru? Two different sources will be used to attempt an answer to this question:

- the constant market share (CMS) analysis presented in chapter 2 of this document and
- an index of products which have proven especially successful (non-successful) performance in LDC's, as developed by Michaely. (1)

(1) The Michaely-Index is an indicator correlating production structures with the relative income position of a country. It probably is one of the most sophisticated and convincing approaches to explain the dynamic behavior of different branches in international trade. See Michaely (1981).

If there exists a product category which is supposed to be a successful policy target in Peru (as shown in the CMS analysis) and if this product group does belong to the preferential category in Michaely's worldwide classification, too, then the corresponding production sector will be called a potential growth sector in Peru. If there are product groups in the Michaely classification which are not among the successful export items according to the CMS analysis but which do not meet especially adverse conditions of production in Peru, these will be called potentially new growth sectors.

However, both analyses are based on historical data, and therefore they do not necessarily reflect the scope for future growth adequately. This problem surely cannot be solved completely, (1) but some further insight may be gained from the previous discussion about new trends in the world economy. All three elements will be combined to analyze the future prospects of specific industries in Peru.

The ranking of industries used by Michaely is presented in Table A-14. We also make use of a paper by Tuong/Yeats (2) applying this ranking to identify future growth sectors for all LDC's. According to this ranking, (3) which is shown in Table 72, eleven product groups have shown especially dynamic growth for Third World countries during the first stages of industrial development.

Comparing those products with the findings of the CMS-analysis for Peru reveals that a number of them have been especially successful in Peru, too:

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(1) The fact that uncertainty about future events can never be completely eliminated, calls for a cautious application of any advice on future production structures.

(2) See Tuong/Yeats (1980).

(3) The calculations are based on a sample of 108 countries and SITC-3-digit industrial sub-groups.

(1) Textile and related products, woven cotton, clothing

This set of products is of utmost importance in Peru today, because it has especially good chances to become efficient on the world market within a short time period. Also due to their quantitative importance, these products present an exceptionally promising target for sectoral policy. Policy recommendations to overcome present problems and stimulate long run growth in this sector are presented in chapter 3 of this document.

(2) Copper products

The size of this sectors and the present situation on the copper market make any economic policy package for this branch a highly sensitive task. There surely is some scope for the expansion of copper production in the medium and long run. Yet the dramatic development on the world copper market (and its possible substitutes) since 1979 warn against putting too much emphasis on a resource-based industrialization scheme of this kind (see chapters 2 and 4).

(3) Footwear

This is one of the classical labor-intensive sectors. Today the production of footwear still contains a relatively high share of labor even in DC's. Therefore, the prospects to successfully promote this industry are relatively promising even today. The success of Peruvian exporters between 1975-80 was not so much due to sales on the markets of high-wage countries, but rather to exports to other Latin American countries (especially Argentina). This seems to indicate that there are still a number of improvements to be made before local producers will be able to face world market competition without government assistance.

Table 72

Sectoral Policy Targets

SITC 3-Digit Michaely	Peru CMS-Analysis (1) Actual exports	Peru Possible New Export Products (2)	
1. Stage Industries	(Peru's 1. Stage)	2. Stage	3. Stage
611 Leather			
631 Plywood and veneers			631
633 Cork manufactures			633
651 Yarn and threat production	651		
652 Woven cotton fabrics	652		
656 Textile products, nes	656		
661 Cement building products			
682 Copper products	682		
687 Tin products		687	
831 Travel goods and handbags		831	
841 Clothing, except fur	841		
851 Footwear	851		
2. Stage Industries			
612 Leather manufactures		612	
613 Dressed furskins			613
629 Rubber articles, nes			629
632 Wood manufactures, nes			
642 Paper articles			642
653 Woven non-cotton fabrics		653	
654 Lace and ribbons			654
655 Special textile products			655
657 Floor coverings	657		
662 Clay building products			662
665 Glassware	665		
666 Pottery	666		
671 Pig iron			
672 Iron and steel ingots			
676 Steel rails			
681 Silver and platinum products	681		
685 Lead products	(685)		
686 Zinc products			686
689 Non-ferrous metal products			689

Table 72 (continued)

692 Metal containers			692
693 Non-electic wire products			693
694 Nails and screws			694
696 Cutlery			696
697 Base metal household equipment		697	
698 Metal manufactures, nes			698
723 Electric distribution machinery			723
724 Telecommunications equipments			724
733 Road non-motor vehicles			
735 Ships and boats			735
842 Fur clothing			842
863 Developed cinema film			
864 Watches and clocks			864
891 Musical instruments		891	
892 Printed matter	892		
894 Sporting goods		894	
897 Gold and silver jewelry	897		
899 Other manufactures			899

(1) Products with successful export performance between 1975 and 1980.

(2) Possible growth sectors are those whose production possibilities are not questioned by present indications to the contrary.

Source: Michaely (1981: 123-127), Tuong/Yeats (1980: 538), CMS-analysis (chapter 2 of this report).

Sectoral Policy during the Second Stage

The second generation of export sectors will have to be spread over an increasingly wide range of manufacturing branches, whereby the labor-intensive products are not any more identical with whole sectors, but rather with subsectors or even subprocesses. Again we can draw on the Michaely classification to support this fact and to get a first idea of the probable direction, which the ongoing development process will take. The second-stage industries as classified by Tuong/Yeats (1980) are shown in Table 72. Their number exceeds that of the first-stage industries by more than three times.

There is another interesting piece of information to be obtained from this table. Although Peru has started industrial production for the international market only recently, she has already successfully exported a number of products belonging to the second generation: 657 (floor coverings), 665 (glassware), 666 (pottery), 681 (silver and platinum products), 892 (printed matter) and 897 (gold and silver jewellery). (1) Each of these products has been discussed in more detail in chapter 2, so that we can proceed immediately to the main conclusions to be drawn from this observation.

The Peruvian experience indicates that entrepreneural talent and skilled labor do exist in Peru, which allow entry into the international market with already more sophisticated products, when accompanied by export support policies. The special circumstances surrounding the Peruvian social and economic development during the last two decades are lending support to this hypothesis, too.

Combining both arguments, the cautious statement may be advanced, that the learning period necessarily to switch successfully from the

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(1) SITC group 685 (lead products) is not included here because of poor growth chances (see CMS-analysis in chapter 2).

first to the second stage of sectoral policy can be kept relatively short in Peru, once the growth process is under way. Actual policy planning could indeed be conceptualized in such a way that the problems involved in both strategies are attacked at a time (though due attention has to be paid to the sequential character of both). The support of traditionally favorable branches (such as textile and footwear) must be accompanied by a simultaneous reformulation of the policies regarding foreign direct investment and other possibilities to transfer technology on a general basis. This policy, which can be interpreted as a first step towards a growth anticipating policy, has to be combined with a foreign trade policy and a national sectoral policy both directed at the same goal. All together this bundle of policies should form a consistent framework open to different possible paths, which development in Peru could take.

The fact that the second-industries already show a tremendous increase in the degree of diversification may be helpful to specify the problem more clearly and give some additional information on possible future sectoral growth in Peru. From the 38 second-stage products identified in Table 72, six have gathered export experiences during the 70's. Another group of 8 branches did not produce for the international market until now, but they do have an export potential in the future: leather manufactures (612), wood manufactures (632), woven non-cotton fabrics (653), tin products (687), base metal household equipment (697), travel goods and handbags (831), musical instruments (891) and sporting goods (894). They are listed under "new export branches" of the second stage. Going even one step further, nearly all of the second-stage industries (according to Tuong/Yeats) will become feasible for Peruvian firms. A closer look at these branches reveals, that their production processes are already relatively heterogeneous and that they do not rely any more on cheap and unskilled labor exclusively.

Industrial Policy and the Role of National Markets and the Andean Market Integration

It has been emphasized repeatedly, that a viable modern industry crucially depends on large markets. This is not only so because of the achievements of economies of scale, but also because a complex net of complementary industries is necessary to provide inputs and specialized services for each other. Not only the market for end products has to have a minimum size, but the far more specialized markets for diverse inputs as well. This undeniable prerequisite for industrial growth would be met immediately, if Peru could open up to the world market without problems. Since this would not be a meaningful strategy in the short and medium run for obvious reasons, but big markets are urgently needed today, the integration of Andean markets might be an important approach to resolve this dilemma.

It was demonstrated in chapter 2, that the provision of improved access to these markets indeed had a strong impact on export growth between 1975-80, and that it went hand in hand with the development of a relatively diversified set of industries. Exports to the other Latin American countries show quite similar tendencies (especially in the case of Chile, but not so for Brazil!).

There appears to be little doubt therefore, that the regionalization of markets has a positive impact on exports and the national scale of production. Thus, liberalization efforts within the region should be continued to further stimulate the integration process.

However, it has to be pointed out that even a wholly-integrated Andean Market cannot substitute for the world market, nor will it be a sufficiently large and economically potent region to reach sustained growth in isolation. Rather, it will be a very helpful element on the way to economic maturation, which cannot be obtained without due observation and exploitation of what the world market offers for developing countries.

In practice, this means that there is some scope for local industries to find additional markets within the Andean countries. It must be avoided though that integration policy is deprived of its advantages and degenerates into a policy sustaining import substitution on a larger scale. Policies aimed at the Andean market should strive for a common system of trade barriers and export incentives vis-à-vis the outside countries on the one hand (which could be oriented along the lines of national policies suggested here), and for a relaxation of the rigid interregional industrial planning schemes combined with a more open policy towards foreign technology.

Even if such a policy can be correctly implemented against opposing interests, there remain a number of industries which do not encounter favorable conditions in a country like Peru. This is the case for example for the automobile industry, which today operates with a minimum plant size far beyond the size of the markets which Peru could potentially serve. (1) It also seems to hold for the iron and steel complex, which appears to be favored by some LDC's today more because of its historical merits rather than because of its actual economic value in a world with large excess capacities and cheap imports (it is even doubtful, whether hyper-modern and large scale iron and steel complex like the one developed in Venezuela will ever have the chance to operate at full capacity).

In this context, an evaluation of the prospects of the national capital goods industry is more complex. As a general rule, these industries need a relatively complex and heterogeneous productive environment and advanced human skills to be able to produce efficiently. Most LDC's are only poorly prepared to meet these tasks, so that the development of less demanding productions has to be considered first. Although this problem applies to Peru, too, there might be some exceptions as in the case of the capital goods sector for the mining industry analyzed

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(1) This problem has been discussed at length by the World Bank (1981).

in chapter 5 of this report. This branch faces relatively good prospects in Peru and the Andean market, because of practical experience gathered over a longer period of time by Peruvian entrepreneurs and technicians, and due to the fact that the structure of the mining industries in the member countries of the Andean Pact does not vary too much so that these markets will easily be penetrated. Therefore, this sector could be a future growth option for Peru, and existing capabilities should be fostered today.

7.3.5. A Policy Framework for Sectoral Policy

In the following some corner-stones of sectoral policy are discussed briefly (some have been part of the sectoral studies or were discussed under point 7.2. and will only be referred to here).

In this report the importance of international markets for the development of a viable domestic manufacturing industry has been stressed. The discussion focused on the necessity to raise the productivity of local industries as quickly as possible to gain access to the world market. It is at the core of Peru's development problem, that she has to rely on the world market (imports, technology) now to stimulate national growth,while competitiveness will only be gained in later periods. This 'lag' problem has to be reflected by an optimal set of policies to be implemented.

Exports

The main Peruvian instrument in export policy so far has been the so-called CERTEX system, which is a tax refund system based on the price of the endproduct. CERTEX rates had been reduced considerably after 1980 but rose again this year to a maximum of 35% of F.O.B. value (Decreto 291). The following considerations take the latter data as a given base, which should not be changed again in the short run. This export promotion scheme has been successful in stimulating non-traditional exports during the 1975-80 period. Its principle weakness (as discussed in chapter 2 of this report) lies in its application to the product price rather than net value added. This has the effect, that those products are subsidized mostly, which have a minimum national value added content. As a consequence, further processing (i.e. adding to national value added) is relatively discriminated against. Another problem might be seen in the unconditional provision of decentralization CERTEX, which is partly subsidizing those productions which have to be located outside the Metropolitan area anyway.

However, the restructuring of the whole system may not be advisable now, because a scheme based on value added data is more complicated, and because of the adverse effects on those industries which built upon the present scheme during the last decade. To avoid further turbulences in the given incentive scheme CERTEX should not be changed within the next years except for a conditioning of decentralization CERTEX and the introduction of a minimum value added content (e.g. 20%). These measures would not have any negative side-effects, but they would effectively hinder the exploitation of subsidies by a number of industries and diminish the bias against further processing implicit in the system.

Imports

Restructuring imports to provide the scope for national industrial growth without doing harm to exactly this growth process is a far more complicated task than subsidizing exports. It has been discussed at length during the debate about import-substitution policy, that it is one of the main contradictions of this approach, that the protection of national markets effectively discriminates against those producers, who use protected inputs in export production. This problem has been attempted to be resolved by the implementation of sophisticated draw-back schemes. There are, however, some shortcomings in draw-back schemes, too. Firstly, when imports to be used in the production of exportables are exempted from tariffs, national producers of the respective or substitute inputs are discriminated against. Secondly, during a dynamic growth process new local producers enter the market. They might need inputs not being covered by the draw-back scheme or produce inputs which can substitute for foreign inputs. Both lines of development are hindered, if the selective tariff policies cannot be changed anticipatorily and continuously - a requirement which has only been met by policy-makers in very few cases. For the sake of simplicity and openness to structural change, the rigidity of draw-back schemes and its implicit discriminating against present and future producers of inputs should be avoided

as far as possible. Rather than providing a sophisticated and bureaucratic system of incentives and compensations, sectoral policy should aim at transparency and continuity. This can be reached with more success, if exports are subsidized directly (and addtionally to existing CERTEX) in so far as inputs originating from foreign or national markets exceed the world market price.

Technology Transfer

The main goal of technology policy (as discussed in detail above) has to be seen in exploiting superior foreign technology to Peru's own advantage. This task cannot be mastered without intensive contacts and co-operations with TNE's and industrialized and newly industrializing countries, which will try to bargain for a maximum share of incremental income for themselves. It is, however, exactly the intensified link of foreign technology and favorable local conditions for production, which will create additional sources of income in almost any case, so that each party should end up in a better position than before. Once a set of rules is established that allows a minimum participation in the growth process for all parties involved, the most serious obstacle to further co-operation is eliminated. A careful implementation of policies aimed at the regulation of reliable and co-operative conditions for foreign enterprises, licence holders and governments are considered to be of utmost importance and should be among the first steps of sectoral (and general) economic policy. As a general rule it may be suggested, that obligations imposed on foreign economic agents can be the more in favor of Peru, the more reliable they are. Implicit in this statement is the fact, that the rules for foreign enterprises can be hardened, once a sustained growth path is obtained and the local market gains importance for foreigners, as for example in the case of Brazil.

Table A-14

Indexes of Income Levels of Expor

SITC Code	Commodity	Income level of exports (y)
0	*Food and live animals*	
001	Live animals	60.85
011	Meat fresh, chilled, frozen	58.56
012	Meat dried, salted, smoked	74.86
013	Meat canned or prepared	58.29
022	Milk and cream	70.05
023	Butter	69.11
024	Cheese and curd	71.69
025	Eggs	69.43
031	Fresh fish	46.80
032	Canned or prepared fish	52.04
041	Unmilled wheat	88.30
042	Rice	53.20
043	Unmilled barley	78.37
044	Unmilled maize	81.70
045	Unmilled cereals, n.e.s.	76.04
046	Wheatmeal or flour	72.24
047	Non-wheatmeal or flour	70.50
048	Cereal preparations	71.08
051	Fresh fruit and nuts	30.79
052	Dried fruit	40.13
053	Preserved or prepared fruit	43.92
054	Fresh vegetables	47.50
055	Preserved or prepared vegetables	44.52
061	Sugar and honey	24.74
062	Sugar preparations	61.23
071	Coffee	11.39
072	Cocoa	16.80
073	Chocolate	66.69
074	Tea	10.12
075	Spices	13.45
081	Animal feeding stuff	58.51
091	Margarine, shortening	68.14
099	Food preparations, n.e.s.	67.28
1	*Beverages and tobacco*	
111	Non-alcoholic beverages, n.e.s.	65.98
112	Alcoholic beverages	54.30
121	Tobacco, unmanufactured	54.85
122	Tobacco manufactures	71.69
2	*Crude materials, inedible, except fuel*	
211	Hides and skins	
212	Fur skins	
221	Oil seeds, nuts, kernels	
231	Crude synthetic rubber	
241	Fuel wood and charcoal	
242	Rough wood	
243	Shaped wood	
244	Raw cork and waste	
251	Pulp and waste paper	
261	Silk	
262	Wool and animal hair	
263	Cotton	
264	Jute	
265	Vegetable fibres, excluding cotton and jute	
266	Synthetic, regenerated fibre	
267	Waste of textile fabrics	
271	Crude fertilisers	
273	Stone, sand and gravel	
274	Sulphur	
275	Natural abrasives	
276	Other crude minerals	
281	Iron ore, concentrates	
282	Iron and steel scrap	
283	Non-ferrous base metal ore, concentrates	
284	Non-ferrous metal scrap	
285	Silver and platinum ores	
291	Crude animal materials, n.e.s.	
292	Crude vegetable materials, n.e.s.	
3	*Mineral fuels, lubricants, related materials*	
321	Coal, coke, briquettes	
331	Crude petroleum	
332	Petroleum products	
341	Natural gas and manufactures	
4	*Animal and vegetable oils and fats*	
411	Animal oil and fats	
421	Fixed vegetable oils, soft	
422	Fixed vegetable oils, non-soft	
431	Processed animal and vegetable oils	

ts by Commodity

Income level of exports (%)	*SITC Code*	*Commodity*	*Income level of exports* (%)
	5	*Chemicals*	
60.74			
69.28	512	Organic chemicals	75.00
73.92	513	Inorganic elements, oxides, etc.	69.20
29.89	514	Other inorganic elements	71.81
55.73	515	Radioactive and associated elements	86.44
37.43	521	Coal, petroleum etc. chemicals	56.24
69.56	531	Synthetic organic dyestuffs, etc.	81.06
22.14	532	Dyes n.e.s., tanning products	49.51
80.83	533	Pigments, prints, etc.	71.04
19.10	541	Medical and pharmaceutical products	71.34
58.31			
33.64	551	Essential oil, perfumes, etc.	61.97
9.67	553	Cosmetics etc.	66.36
	554	Soaps and cleaning preparations	70.94
31.83	561	Manufactured fertilisers	68.26
68.02	571	Explosive and pyrotechnic products	63.86
79.70	581	Plastic materials, etc.	73.50
32.08	599	Chemicals n.e.s.	72.78
63.63			
64.36	6	*Manufactured goods classified by material*	
56.60			
60.18	611	Leather	44.72
51.46	612	Leather manufactures	55.53
84.14	613	Fur skins, tanned or dressed	64.30
	621	Rubber materials	71.81
39.55	629	Rubber articles, n.e.s.	65.61
75.33	631	Veneers, plywood, etc.	50.91
59.46	632	Wood manufactures, n.e.s.	64.23
50.57	633	Cork manufactures	30.70
53.42	641	Paper and paperboard	76.57
	642	Paper articles	68.92
	651	Textile yarn and thread	56.54
	652	Woven cotton fabrics	47.08
83.12	653	Woven non-cotton fabrics	56.91
23.45	654	Lace, ribbons, tulle, etc.	65.33
38.49	655	Special textile products	68.49
65.66	656	Textile products n.e.s.	40.45
	657	Floor coverings, tapestry, etc.	56.16
	661	Cement building products	46.50
80.46	662	Clay building products	62.20
50.53	663	Other non-metal mineral manufactures	71.41
24.91			
69.41	664	Glass	70.74

Table A-14 (continued)

SITC Code	Commodity	Income level of exports (y_i^x)
	Manufactured goods classified by material (contd.)	
665	Glassware	66.12
666	Pottery	61.51
667	Pearls, precious and semi-precious stones	50.52
671	Pig iron	56.53
672	Ingots of iron and steel	66.74
673	Iron and steel shapes	71.23
674	Universals, plates and sheets of iron and steel	68.05
675	Hoop and strip of iorn and steel	75.18
676	Rails and other track materials of steel	65.12
677	Iron and steel wire, excluding rod	71.80
678	Iron and steel tubes, pipes, etc.	70.18
679	Iron and steel castings, unworked	75.24
681	Silver, platinum etc	62.29
682	Copper	42.96
683	Nickel	74.22
684	Aluminium	69.93
685	Lead	57.62
686	Zinc	64.47
687	Tin	19.07
689	Non-ferrous base metals, n.e.s.	62.79
691	Structures and parts n.e.s.	68.79
692	Metal containers	64.40
693	Non-electric wire products	65.49
694	Nails, screws, etc., of iron, steel or copper	71.06
695	Tools	74.81
696	Cutlery	61.71
697	Base-metal household equipment	58.27
698	Metal manufactures, n.e.s.	69.82
7	*Machinery and transport equipment*	
711	Non-electric power machinery	76.86
712	Agricultural machinery	75.94
714	Office machines	75.53
715	Metal-working machinery	77.35
717	Textile and leather machinery	74.53
718	Machines for special industries	77.71
719	Non-electric machines, n.e.s.	75.99
	Machinery and transport equipment (Contd.)	
722	Electric-power machinery, switches	74.64
723	Equipment for distributing electricity	66.38
724	Telecommunications equipment	67.54
725	Domestic electric equipment	67.26
726	Electromedical, X-ray equipment	80.13
729	Electric machinery, n.e.s	72.54
731	Railway vehicles	69.76
732	Road motor vehicles	76.21
733	Road non-motor vehicles	66.81
734	Aircraft	87.17
735	Ships and boats	66.84
8	*Miscellaneous manufactured articles*	
812	Plumbing, heating and lighting fixtures	67.83
821	Furniture	67.94
831	Travel goods, handbags	46.24
841	Clothing, except fur	45.33
842	Fur clothing	57.41
851	Footwear	41.12
861	Scientific instruments and apparatus	75.12
862	Photographic and cinematographic supplies	76.79
863	Developed cinema film	55.67
864	Watches and clocks	79.68
891	Musical instruments, recorders, etc.	66.76
892	Printed matter	67.62
893	Plastic articles, n.e.s.	68.72
894	Toys, sporting goods, etc.	58.40
895	Office supplies, n.e.s	72.63
896	Works of art, etc.	73.21
897	Gold and silver ware, jewellery	60.71
899	Other manufactured goods	56.46

Source:

Michaely, Michael, Income Levels and the Structure of Trade, in: Grassman, S. and Lindberg, E. (eds.), The World Economic Order: Past & Prospects, The MacMillan Press LTD., London and Basingstoke, 1981, pp. 121-161.

Explanation:

Income Level of exports

$$y_i^x = \sum_j y_j \frac{X_{ij}}{X_i}$$, where:

X_{ij} = exports of good i by country j

X_i = world exports of good i

y_j = index of income of country j

$$= 100 \cdot \frac{Y_j}{Y_u}$$

Y_j = GNP per capita of country j

Y_u = GNP per capita in the USA both in 1973 US$

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