



IDRC-TS19e

# **Science and Technology for Development**

**The Evolution of Industry  
in STPI Countries**

**STPI Module 2**

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Postal Address: Box 8500, Ottawa, Canada K1G 3H9  
Head Office: 60 Queen Street, Ottawa, Canada

Cardettini, O.  
Sagasti, F.  
Carrido Lecca, G.  
Gonzalez Vigil, F.

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STPI MODULE 2: THE EVOLUTION OF INDUSTRY  
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O. Cardettini  
F. Sagasti  
G. Carrido Lecca  
F. Gonzalez Vigil



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## FOREWORD

This module constitutes an integral part of the Main Comparative Report of the Science and Technology Policy Instruments (STPI) project, a large research effort that examines the design and implementation of science and technology policies in 10 developing countries (Appendixes 2 and 3).

The STPI project generated a large number of reports, essays, and monographs covering a great variety of themes in science and technology for development. More than 250 documents were produced by the country teams and the Field Coordinator's Office, and this proliferation posed rather difficult problems during the comparative phase of the project. It was decided that a Main Comparative Report, covering the substantive aspects of the research work of the country teams would be published, and that several monographs treating specific subjects would complement it.

The Main Comparative Report is organized in three parts. The first consists of a short essay covering the main policy and research issues identified through the research, and the second contains the most relevant results of a comparative nature that were obtained in the project. These first two parts have been published by the International Development Research Centre in a single volume in English, Spanish, and French (109e, 109s, and 109f).

The third part of the Main Comparative Report consists of 12 modules containing material selected from the many reports produced during the STPI project. They provide the supporting material for the findings described and the assertions made in the first two parts of the Main Comparative Report.

The modules were prepared by several consultants, and given the diversity of topics covered, the IDRC staff did not consider it desirable nor possible to impose a single format or structure for their preparation. The reader will find a diversity of styles and structures in the modules and will find that the selection of texts reflects the views of the consultant who compiled the module. However, the modules were prepared in close collaboration with the Field Coordinator and were also submitted to a STPI editorial committee who ensured that they provided a representative sample of STPI material. They should be read in conjunction with the first two parts of the Main Comparative Report.

Francisco R. Sagasti\*  
Field Coordinator  
Science and Technology Policy  
Instruments (STPI) Project

\*Present address: Grupo Analisis para el Desarrollo (GRADE), Apartado L. 18-5008, Miraflores, Lima 18, Peru.

## INDUSTRIAL DEVELOPMENT IN ARGENTINA<sup>(1)</sup>

### Historical Background up to the 1930s

The birth of industry in Argentina is basically linked to the development of agricultural exports, which shaped Argentina's economic growth from the mid-19th century to the first half of the 20th century. Industrial activity centred around the repair and manufacture of components for railroads, ports, silos, agricultural machinery, and meat-packing houses. A consumer goods industry was established to serve the needs of the population engaged in production for exports and in ancillary activities. During the first years of the 20th century workshops and factories producing some specialized capital goods could be found, and there were also foundries using local scrap, which later became the basis of the steel industry. These early attempts at industrialization were the result both of the demand created by the export-oriented sector and of the scarcity created by the 1890 depression and the protectionist policies that followed it.

During the early 1920s industrial growth was taking place in a protected environment. The first wave of direct foreign investments appeared at this time, mainly in durable consumer goods and some light metalworking industries. By creating a virgin and protected market for manufactured products and consumer goods in particular, tariff barriers would become the main instrument of industrial promotion throughout the development of Argentinian industry. These barriers induced a reorientation from consumption to investment of part of the surplus generated by the primary sector and stimulated the inflow of foreign capital for the local production of previously imported goods. In this way the manufacturing sector gradually increased its participation in the gross domestic product, based on a tariff structure that allowed high internal prices.

Prior to 1930 industry passively followed the expansion of exports, although this changed after the Great Depression when economic growth began to depend critically on the capacity of import substitution industry to generate employment and internal demand. It has been shown that the more than proportional growth of the manufacturing industry during 1925-1929 is closely linked to a reduction in the ratio of imports to products manufactured in Argentina, that is, to the process of import substitution.

### Economic Evolution since World War II

From 1946 to 1955 and under the continued push of import substitution, industrial expansion centred around the sectors of durable and nondurable consumer goods, light machinery, and some intermediate goods, with considerable participation of the state as producer or administrator. This was accompanied by a sustained redistribution of income, which, together with the stimulus given to industries with high labour absorption potential, broadened considerably the market for mass consumer goods.

Until 1950 capital goods industries were almost nonexistent, and, as a result of their late development, a crisis would ensue in the 1960s, primarily because the industrialization process based on import substitution was - paradoxically - incapable of lessening the dependence on imports. On the contrary, it worsened the external position of the country as it limited the possibilities of reducing imports. The reason is that to the extent that this process started to involve products of greater technical complexity, the requirements of machinery and equipment and of intermediate inputs necessitated a growing share of imports. To the same effect, the high tariff barriers hindered the international competitiveness of industry and created an inefficient industrial structure. In consequence, the primary sector had to continue to be the supplier of foreign currency to the economy, a role it did not perform well because of the decreasing productivity recorded throughout the period, which was due to the lack of investment in the expansion of the agricultural frontier or in a more intensive exploitation of the existing resources.

The economy lost dynamism with the exhaustion of the import substitution



possibilities of the industries that were promoted initially. Alternative paths involving more progressive income redistribution, which might have given a new impulse to the production of mass consumer goods; greater specialization, which might have allowed access to external markets; or more extensive vertical integration of industry were not followed. For this reason the ratio of imports to local production remained stable (or grew) from 1953 to 1960. Furthermore, the process of import substitution was based exclusively on foreign technology.

The isolation from external competition brought about by tariff barriers, the ease with which benefits could be obtained, and the dominant role of foreign capital gave rise to a class of national entrepreneurs with little predisposition to change, without the strength to struggle for their own interests, and incapable of improving their position to the national and international markets in relation to foreign firms.

From 1958 onward an attempt was made to increase investment through measures such as regressive income distribution policies. Through the manipulation of relative prices, taxation, commercial credit, and salaries, income policies favoured the sectors that supposedly have a greater potential for savings and accumulation (e.g., landlords, large entrepreneurs). At the same time the government sought to provide attractive conditions for foreign investment, thus integrating Argentina in the process of massive flows of surplus resources from central capitalist countries to dependent ones.

The results of this policy were felt almost immediately: from 1959 to 1960 gross investment in durable and capital goods increased by 83%. A further growth of 27% was achieved in 1961. Direct foreign investment represented 20% of the total investment in 1960, the highest figure recorded in the country's history.

The industrial structure that emerged as a result of the measures taken between 1950 and 1962, which were consolidated during later years when the level of accumulation in the hands of large enterprises increased, reinforced the tendency toward satisfying the consumer demand of the higher-income strata. Discretionary handling of industrial and consumer credit to the top income group also contributed in this direction. This process evolved in an unfavourable direction for the industries producing mass consumer goods, which employed a substantial proportion of the labour force, and it favoured primarily the industries producing intermediate goods, which had a relatively low labour absorption capacity despite their high rates of growth. As a result the pronounced inequalities in income distribution were accentuated, while the manufacturing sector became incapable of absorbing more labour.

The process of concentration and denationalization of Argentinian industry deepened when the military took power in 1966. The main economic goal was to stop inflation, which had exceeded an annual average of 60% during the previous 6 years. To this end, the currency was devalued, salaries were frozen, and price controls were enforced. As a result of such measures the percentage of total income corresponding to wage earners decreased from 50% in 1955 to 37% in 1973.

The dynamic branches of industry, which employ modern technology and have a continuously expanding demand, are capable of paying higher salaries, which are for the most part compensated for by productivity increases. The depressed branches, which confront a depressed demand and must rely upon less efficient technology because of their limited capitalization possibilities, have historically kept their salaries depressed, as the only possible (and officially accepted) means of generating surplus. On the whole the greater weight of the depressed industries has largely exceeded the improvements obtained by the dynamic ones, thus bringing about a deterioration in the overall condition of industrial workers.

With respect to foreign capital an extremely liberal attitude was adopted, favouring in particular the inflow of financial capital. Hence, the consolidation of foreign capital that took place during the 1960s was due not only to the investment wave recorded between 1958 and 1962, but also to the subsequent inflow of financial capital, which absorbed important local enterprises in several sectors of industrial activity. The results were the disappearance of small and medium firms or their absorption by larger ones, and the purchase of a large number of local enterprises by foreign capital. The position of foreign investors was greatly favoured by devaluations, which made local enterprises rather cheap to buy and created a difficult situation for those that had debts in dollars. The purchase of technology from foreign countries increased noticeably, following the innovation patterns of the large multinational firms that became the leaders in their respective branches of industry.

## Main Characteristics of the Present Industrial Structure

The Argentinian economy has been characterized during the last few years by a relatively low growth rate, although industrial production has continued to grow at higher rates than the total product. Industrial branches displaying a clearly depressed behaviour operate in markets showing a small degree of concentration and mostly produce mass consumer goods (textiles, clothing, footwear, lumber and cork, furniture and accessories, etc.). Industries producing durable consumer goods and the intermediate products needed for the production of durables operate in highly concentrated markets (rubber, chemical products, oil derivatives, metals, transport machinery and equipment, electrical machinery and devices, paper, and cardboard). Furthermore, foreign capital holds a dominant position in the dynamic sectors, which have the greatest capacity for the absorption of surplus and occupy key positions in the web of intersectoral relationships.

The inability of industry to compete in international markets, the relatively little interest shown by industrialists in exporting, and the constraints imposed by the dependence on foreign capital and technology have kept Argentinian industry incapable of generating the foreign currency indispensable for its development and expansion. This role has been taken by the primary sector - as was the case before import substitution was initiated. This had led to a situation where industrial activity, employment, etc., became dependent on the performance of the primary sector.

This dual system, where one sector generates the currency necessary for the functioning of the rest of the economy, is worsened by the low level of productivity of agricultural and livestock activities. As a result the primary sector has been incapable of satisfying simultaneously the needs of the internal market and of exports, even after domestic demand was drastically reduced. The lack of foreign currency has also reduced the possibilities for expansion, despite the importance of internal savings (22% of the gross domestic product). Domestic savings are not sufficient to import the capital and intermediate goods needed by industry. To a large extent this has been because of the relatively high level of prices of investment goods compared with consumption goods in Argentina (1). As a result the country depends on external financing, which is usually restricted and imposes technological constraints.

Industrial policies enforced since the mid-1950s have neglected the branches that employ a larger number of workers, whereas they have stimulated activities that are capital intensive and technologically more sophisticated. In spite of their greater dynamism, these industries have a limited capacity for labour absorption, more so when substantial productivity increases are sought.

In virtually all spheres of production of goods and services the state plays a most important role, which can take a variety of forms: producer, regulator, buyer, financier, and so on. Its participation in production can be through wholly owned state enterprises (nine of the 20 largest enterprises are state owned) or through firms in which it has substantial equity holdings. Federal and provincial banks receive 66.3% of total deposits, whereas many private firms, such as suppliers of state enterprises and firms contracting infrastructure works, depend almost exclusively on public expenditure for their survival.

Large enterprises, particularly foreign ones, enjoy easy access to internal credit, which, together with the advantages of a highly inflationary economy and with the possibility of getting financing from their parent firms, place them in a privileged situation. This gives foreign enterprises better capacity to face demand fluctuations and also a remarkable capacity for capitalization. In the technological field the advantages enjoyed by these firms that operate in oligopolistic markets are reflected in their higher productivity and in product differentiation. Both elements are mixed in the dynamics of imperfect markets, thus allowing the leading firms to obtain monopolistic profits that feed into their capitalization process.

A survey of 123 firms (3) that represent 22% of the total production of the markets in which they operate shows the relative importance attributed by entrepreneurs to certain technical elements that they consider as instruments of competition and that are derived from access to foreign licences. The basic reason why the entrepreneurs seek foreign technology is the possibility of differentiating their product from that of established competitors, using quality, trademarks, designs, and novelty for this purpose. On the other hand, entrepreneurs grant only marginal importance to those

technological elements that give rise to absolute cost advantages.

## INDUSTRIAL DEVELOPMENT IN BRAZIL<sup>(4)</sup>

### Historical Background

Up to the beginning of the 20th century the Brazilian economy was based mainly on export agriculture. During the 19th century the economy's behaviour could be broken down into a period of export stagnation and a period of development of coffee cultivation.

For various reasons, during the first period the major Brazilian products were not able to prevail over competition in the international market, which brought about a phase of relative economic stagnation. Sugarcane had to face both the competition from sugar beet and Cuba's appearance as the main supplier of the U.S. market; cotton dropped its share of foreign trade while other agricultural commodities did not offer any possibilities for expansion.

The rise in coffee prices starting in the 18th century became an incentive for the expansion of coffee cultivation during the second period. Brazil had adequate physical as well as socioeconomic conditions for coffee cultivation, and after less than a century, coffee ranked third in Brazilian exports, preceded only by sugar and cotton.

The industrialization process began under the impact of the coffee economy, which, since the end of the 19th century, accounted for 70% of all exports. Agricultural accumulation created the necessary conditions for the establishment of industry by providing resources. At the same time it gave rise to needs that had to be served by an industrial sector through a distribution of income among the workers directly linked to production or, basically, among the population linked to the urban infrastructure necessary for circulating the product, e.g., banking, commercial, and related institutions.

Coffee led to an expansion of the monetary economy and laid the foundations for a financial system, both of which are basic conditions for capitalist expansion. The curtailment of the flow of African slaves and the profitability of coffee cultivation led to an expansion of paid labour in agriculture and in the economy as a whole. Concurrently, the basic infrastructure expanded as a result of the development of railroads, ports, and public utilities. This sector, which was foreign owned and used foreign technology, acted as a proper European economic frontier, within the scope of primary export production, and provided the conditions for the start of Brazilian industrialization in the first 2 decades of this century.

### Decade of the 1920s

By the end of the decade Brazil was producing nondurable consumer goods in sufficient amounts to satisfy domestic demand for textiles, shoes, construction materials, etc. Production was concentrated on the cheaper items for purposes of satisfying the needs of low-income groups, while high-income groups continued buying their consumer goods abroad. Such incipient industrialization, which developed in a low-income and narrow market, took place while coffee prices and production were booming and could find a sufficient basis to expand. At a later stage it would act as a true national base for the subsequent process of industrialization.

Development of the consumer goods industry was encouraged by several major factors. First, the limited technological requirements of traditional industry made possible its expansion in an economy with a low level of capital accumulation. Concurrently, it allowed an optimal use of the infrastructure setup as a function of coffee production. Second, for these industrial products the ratio of unit price to transportation cost was so high that even when using the most rudimentary techniques it was economical to produce them domestically.

Third, the periodic instability of the balance of payments and the deficit of the foreign sector favoured industrialization by reducing the availability of foreign exchange, thus limiting imports and encouraging domestic production. The exchange rate was kept stable until August 1914, contributing to protecting the income and the wealth of the coffee sector, which was in accord with the objectives of this overvaluation. This represented a trend to institutionalize a mechanism that would dominate Brazilian economic policy for many years, that is, the defence of coffee. The distortions it

brought about became evident through the disorganization of the market as a guide for investments, the increase in coffee production beyond the marketable levels, and the restrictions it imposed on the development of other sectors and agricultural diversification.

From the end of the Empire (1889) until the 1920s the policy of the Brazilian economy could be defined as seeking monetary balance and exchange stability. This corresponded to alternating inflationary and deflationary periods as well as to serious exchange problems.

#### Decades of the 1930s and 1940s

In 1930 the world economic depression deeply affected the Brazilian economy. The drop in coffee prices reduced foreign exchange earnings through exports. With capital inflows being stopped, the availability of foreign exchange became dependent on the results of the commercial balance, and this availability was further reduced by the need to pay back foreign debts and by other remittances, which brought about a crisis in the exchange market. The foreign trade crisis also disrupted public finances.

The crisis deepened in 1931, when coffee prices were half the levels attained in 1925-29. The exchange rate dropped substantially, and the government deferred part of its payments and introduced foreign exchange controls through the Bank of Brazil (Banco do Brasil). By the end of the year, imports had been reduced to less than half the 1928-29 levels.

As of 1933, economic policy again emphasized financial balance and monetary and exchange stability. In 1937 a large increase in imports (resulting from a gradual trade liberalization until 1936, especially of industrial imports) exhausted whatever was left of the trade balance. This forced the return of the exchange monopoly to the Bank of Brazil and - for the first time in Brazilian history - all foreign debt payments were suspended for 2 years.

The 1930s, with the coffee crisis and industrial growth, seem to be the period in which industrialization began to be considered as an alternative to economic development. The first public agencies directed at promoting and financing industrial growth were created in that period. The Federal Foreign Trade Council (Consejo Federal del Comercio Exterior), created in 1934, was the first agency entrusted with industrial policy.

During this decade there was a displacement of traditional industries, related to the agricultural sector, toward modern "competitive" industries designed for export substitution. This took place at a time when the situation of various traditional industries, such as textiles, was becoming increasingly difficult. The industrial base that developed gradually got further away from agriculture, and its production, consisting basically of consumer goods, did not depend on agriculture for its inputs or for the end use of its products. The final destination for these products was the Rio-Sao Paulo area, which sheltered large strata of middle- and higher-income groups, formed by industrialization itself as well as by urban land development. Their consumption patterns were the base for a new generation of industries directed at the production of more sophisticated goods. Concurrently, coffee prices led to the recession of the mass market coffee had developed, thus harming traditional industries. Therefore, what would become a main feature of the Brazilian industrialization process started to unfold: industries producing relatively sophisticated goods directed at a narrow population group with high purchasing power.

The impact of World War II was felt through a high inflow of foreign exchange, which was a result of the rise in prices for raw materials and of the difficulties hindering imports. International reserves increased from \$67 million in 1939 to \$760 million in 1946. This situation encouraged industrial growth, the use of installed capacity, and industrial diversification. Industrial production increased by close to 60% between 1939 and 1946, and the growth of industry was reflected in its increased share of the domestic product: from 17.4% in 1939 to 21.7% in 1947. During the war, state intervention in the economy became evident, especially with regard to price regulation and the production and distribution of some goods.

In 1946, with a large foreign exchange reserve and a continued demand for consumer goods and capital, the new government of President Dutra liberalized imports, tried to attract foreign capital, and encouraged private enterprise. This led to a

depletion of foreign exchange reserves. In 1947 an attempt was made to restrict imports through licences to be granted for each imported product. Capital goods became a major part of imports and, despite the scarcity of foreign exchange, industry recorded an expansion that was characterized by a relatively slender and disjointed industrial base, both regionally and in the different sectors, which hindered economies of scale and complementarity among the industries. Furthermore, the existing infrastructure, except for some slight improvements, was the same one that served the primary export model, and therefore bottlenecks arose in power and transportation.

#### The 1950-1961 Period

The initial years of the 1950s were characterized, at the international level, by the expansion of capitalism. The boom in international trade had a direct effect on commodity prices and this was reflected in the rise in coffee prices, which in 1954 were 11 times higher than the 1939 price level.

The durable consumer goods industry became the new dynamic sector in Brazilian economic growth. The 1920s and 1930s had provided the foundations for the establishment of import substitution industries. State intervention, industrialization, and developments in housing and construction had changed Brazil's economic, social, and political outlook, replacing the primary export phase. Built upon this base, the durable consumer goods industry was the expression of the level attained by the industrialization policy of import substitution. It is important to recall the impact of the tariff system on industrial expansion through the barriers it created for the importation of nonessential goods. This industrial expansion was reflected by the sector's increasing participation in the gross domestic product, which by 1961 was practically 30%.

During the early 1950s very important decisions that reflected the new status of industry were made: Instruction 70 from SUMOC (Currency and Credit Superintendency) was promulgated, and the National Bank for Economic Development (Banco Nacional de Desenvolvimento Econômico - BNDE) was created. SUMOC's Instruction 70 of 1953 divided imports into five categories with differential tariff levels in accordance with their importance and nature: nonessential goods had a higher surcharge than those that were classified as essential. With this, the government received higher revenues and also attempted to counteract a phenomenon that characterizes Brazilian industry even today, namely the concentration of production on superfluous or nonessential products directed at high-income groups. Instruction 70 served as a much better control mechanism over imports than the deficient instruments used from 1947 to 1953. The new system of differential tariffs penalized superfluous goods and encouraged the importation of intermediate and capital goods.

The National Bank for Economic Development was created in 1952 with the specific objective to support industrial diversification, despite the fact that for some time it was directly concerned with the installation of a basic infrastructure to support industrialization.

During this period a major struggle developed for the state oil monopoly, which led to the creation of Petrobras. This struggle showed that conflicts between domestic and foreign capital existed although the underlying theme for the period was harmony. The entrance of foreign capital was encouraged both by investment needs and by the need to import technology, and as a result foreign capital acquired control of the more capitalized and technologically complex sectors, based on the advantages obtained through the importation of equipment, technological knowledge, and foreign and domestic financing, whereas domestic capital continued to predominate in the traditional sectors. With the creation of Petrobras the state started participating directly in the economy as an entrepreneur.

The year 1954 was marked by a serious political crisis in Brazil: the polarization that developed between the Vargas government's nationalistic policy and the U.S. government's policy, which emphasized the creation of an "appropriate environment" for private investment, led to tensions between Brazil and the United States. At Vargas's death, a transition period was started in economic policy that found its expression in SUMOC's 1955 Instruction 113, which is a very important legal document favouring the inflow of foreign private capital.

The focus of economic policy for 1954-1955 was directed at monetary stability and credit restrictions to face the reactivation of the inflationary pressures of the preceding years. The result was a decrease in the rate of growth, which was felt more

heavily by industry because of its extreme financial vulnerability. The coming to power of the Juscelino Rubitschek government was an expression of the need for a redefinition of objectives. These were redefined in the Development Aims (Plano de Metas) of the new government, which would be implemented in the 1956-1960 period. This plan assigned priority to the construction of the upper stages of a vertically integrated industrial pyramid as well as to the development of the basic infrastructure that would support this industry. It would continue to broaden the import substitution process implemented in the preceding decades, having the increase of production and employment as general objectives. It was based on a financial and inflationary scheme, on the support for industrial capital, and on the division of labour between private capital and public funds. State capital would be entrusted with the tasks that the private sector was not prepared to undertake, such as implementation of the power and transportation networks.

Economic policy during this period was based on the following premises: giving favourable treatment to the inflow of foreign capital so as to obtain, especially through loans, the necessary resources for financing the plan; increasing the participation of the public sector in the domestic development of capital, based mainly on inflationary financing; subsidizing priority investments; and using the inflation process itself, which became the main instrument of economic policy. The plan subordinated the correction of monetary imbalances to the interests of industrialization.

The policy framework of the plan aimed at reaching a stage of the import substitution process that would consolidate the branches producing durable and non-durable consumer goods, particularly those that did not have very complex production and technological requirements. The scheme included the establishment of some enterprises for the intermediate and capital goods branches. It gave absolute priority to complementing the industrial structure through the creation of industries producing basic input and capital goods. As regards intermediate industries the emphasis was put on iron and steel processing, cement, and nonferrous metals. In the field of capital goods the main aim was to develop the automobile industry, naval construction, heavy electrical equipment, and machinery. As a result of the plan's implementation, the production of machinery and equipment increased by more than 100% with respect to the 1955 level, electrical equipment increased by over 200%, and foreign participation in the overall supply of capital goods at the end of the decade decreased by one-third.

However, inflation was so high at the start of the 1960s that it forced entrepreneurs to accumulate stocks. Workers were involved in frequent strikes. The inflation rate, which was 10% in 1948-1952, doubled in 1953-1960, and then increased to 50% in 1962, 70% in 1963, and 90% in 1964. On the other hand, the intensive nature of industrialization led to a marked increase in income concentration and the relative concentration of the number of participants in the market.

The average growth rate of investment was 14.5% per annum between 1957 and 1960; the public sector's participation in investment increased to 27.5% between 1950 and 1960, and 37.1% was recorded between 1957 and 1960. Moreover, the increasing inequality between industry and agriculture became evident; in 1950 average agricultural productivity was one-fifth of industrial productivity and in 1960 it dropped to one-seventh. From the point of view of employment, industry occupied only 9.8% of the economically active population in 1950, and this dropped to 9.1% in 1960. Agriculture, on the other hand, employed 62.4% in 1950 and 55.1% in 1960. Activities that showed an increase in their participation in employment were government administration, trade, and most services.

With regard to income concentration and market size in Brazil, it is necessary to point out that despite the fact that Brazil had 70 million people in 1960, the number of people who had real access to the nondurable and durable consumer goods markets was rather small. In 1960, 10% of the population had an average monthly income of 23.3 cruzeiros (1 cruzeiro = 5.27 dollars), while 20% had an average income of 16 cruzeiros. The weakness of the market reduced the possibilities for firms to increase their production and to achieve economies of scale. It also limited the number of enterprises that could be competitive in the same market. In any case, competition in the Brazilian market was not sufficiently high to affect the costs and stimulate the enterprises to improve their competitiveness.

#### The 1961-1973 Period

The 1961-1964 period was characterized by a loss of dynamism in the industrial

sector and by higher inflation. After having recorded an average 8% rate of growth between 1953 and 1957 and 13% between 1957 and 1961, industry grew only 4.4% between 1961 and 1964. On the other hand, price increases amounted to 31% in 1961, 51% in 1962, 73% in 1963, and 84% in 1964. As a consequence the purchasing power of wage earners suffered a drastic reduction in real terms, despite nominal wage increases. For instance, purchasing power went from an index of 146 in 1956 to 128 in 1960 and 112 in 1964, that is, a relative decrease of 23% over the course of the period. Apparently this phenomenon was a reflection of the exhaustion of expansion possibilities through import substitution industrialization, and economic policy was searching for objectives that, in a certain sense, were irreconcilable: financial stability and economic expansion, limitation of the inflationary process, and maintaining the support of the masses. The government identified the poor distribution of income and the consequent reduction of the domestic market as the cause for the decrease in the rate of growth. A set of "basic reforms" were proposed as a long-term way out of the problem (administrative reform of the public sector, agrarian reform, etc.). However, the government was not able to reduce the rate of inflation or to expand substantially the domestic market because it could not carry out a redistribution of income. As a consequence the rate of growth of the economy could not be maintained either.

With the change of government in 1964 development priorities were changed, as well as the scheme of political alliances and the economic policy. The cause for the economic crisis was attributed to the very high public deficits, to the expansion of credits to the private sector, and to wage raises in excess of productivity.

The basic strategy of the economic policy adopted consisted of a reduction in the overall demand for goods and services, and there was a deliberate accentuation of the depression, thus putting a brake on financial mechanisms. An attempt was also made at reducing the deficit of state finances, not only through a reduction in expenditures, but also by raising the tax load. To accelerate capital accumulation and to concentrate income, the mass of wages and salaries was reduced. The consequence, which was not opposed to the general objectives of the policy adopted, was the disappearance of marginal enterprises that were quite vulnerable to the problem of short-term capital. Because of the limitation on credits, successive bankruptcies occurred, and this measure was called a "sanitation mechanism." Weaker enterprises disappeared, thus increasing the scope of action of stronger enterprises and raising the concentration of production.

During 1964-1966, and despite increases in the cost of living, no salary raises were granted, the right to strike was suspended, and union freedoms were curtailed. Although a wage readjustment policy was adopted starting in 1966, these readjustments were made at such levels that the workers' real income decreased. Thus, in the State of Guanabara the index for the real minimum wage went from 108 in 1964 to 88 in 1972; in the State of Sao Paulo the index was 105 in 1964 and 85 in 1972, which led to a reduction in the inflation rate from 25.5% in 1968 to 15.7% in 1972.

Price controls for industrial goods were established by the government in 1964. Previously, only state enterprises - the iron and steel industry, for example - had their price levels fixed by government authorities. During the period of high inflation rates, enterprises could raise prices as they wished, and this was one of the reasons for their loss of interest in improving productivity. This, together with sustained rates of investment in fixed assets, led to high levels of unused capacity in industry, which averaged around 30% to 40% of installed capacity. For the purpose of limiting price increases, the government resorted to a variety of complementary control mechanisms: salary increases were regulated by the Ministry of Labour and Social Protection; energy prices by the Ministry of Energy and Mines; the price of transport services by the Ministry of Transport; the depreciation of assets by the Ministry of Planning and General Coordination; and the exchange rate by the National Monetary Council. Initially price controls were voluntary on the part of the enterprises, which were offered a series of benefits in exchange. The present mechanism is based on the principle that price readjustments are linked to proportional cost increases.

By 1968 all the conditions for economic expansion had been met: the state administration had been restructured, the system of financial intermediaries had been practically eliminated, salaries had dropped to very low levels, the confidence of foreign capital had been regained, and the international situation was favourable. With the full development of credit facilities that year, an overall expansion took place. The annual growth rate of the gross domestic product went from 1.9% in 1964 to 4.8% in

1967, and then from 9.3% in 1968 to 10.4% in 1972. Industry led the way, and the industrial growth rate rose from 3.0% in 1964 to 13.8% in 1972, whereas agriculture showed a very irregular development, far below that of industry. In 1964 agriculture grew at 5.7%, and in 1968, at 1.5%. In 1971 it grew at 11.4% but dropped the following year to 4.1%.

After revealing a negative rate of growth of -12.8% in 1965, the investment rate of growth reached 13.3% in 1971. The ratio of investment to gross domestic product was 18.4% in 1971, the highest of the period.

The following figures can be given for 1973 for the growth rates for specific industrial branches: steel, 9.1%; vehicles, 16.9%; tractors, 21.2%; cement, 19%; machinery and equipment, 13.1%; tires, 21.8%; textiles, 10%; paper and cellulose, 15.5%; fertilizers, 35.5%; and industrial consumption and electric power, 14.5%.

In 1973 the gap between the traditional sectors and the recently developed sectors of Brazilian industry broadened even more. With certain exceptions the traditional sector was characterized by a high degree of fragmentation and low productivity, leading to high production costs. The newer and more dynamic sectors of the Brazilian industry (petrochemicals, steel plants, and vehicles, in particular) reveal the opposite situation, with an increasing concentration of production and the emergence of oligopolistic structures.

## INDUSTRIAL DEVELOPMENT IN COLOMBIA<sup>(5)</sup>

### Industrial Development before World War II

In Colombia the share of industry in the gross domestic product before the 1930s never exceeded 10%. Industry at that time was related to agricultural activities, particularly coffee and sugarcane processing, the grinding of grains, beverages, textiles, cigarettes, shoes, and similar activities.

During the five-year period from 1925 to 1930 a number of changes occurred that made it possible to develop favourable conditions for industry, especially for consumer goods. Export revenues increased considerably, the bank of the Republic was established, and the existing highway system was expanded. The foreign exchange received for exports also made it possible to promote the import of capital goods. The 1925-1929 period was one of accelerated growth, reflected in the form of radical changes in the composition of the economically active population and in the production and distribution of capital by sectors of economic activity. During this period the annual growth of the gross domestic product was 5.2%. The volume of exports expanded more rapidly than imports and the availability of goods and services increased at 4.6% a year. Consumption increased at a more modest rate of 2.1%, whereas per capita investments doubled. Fundamental changes took place in the investment coefficient in transportation, industrial activities, and services.

The emerging industries in the large cities began to attract new population groups, inducing a pronounced development in construction activities. The economically active population engaged in industry went from 86,000 in 1925 to 107,000 in 1929, and during the same period gross investments in machinery and equipment for industry were 71.4 million pesos and 116.1 million pesos respectively. Gross fixed investment in the construction of facilities for industry increased from 8.4 million pesos in 1925 to 18.9 million pesos in 1929.

The world crisis for capitalism that ended the 1920s had immediate repercussions on the Colombian economy, whose industry depended on foreign sources for the supply of about 60% of its inputs. Investments in the construction of factories and shops during 1931, 1932, and 1933, as well as investments in capital goods, were less than half of what they had been before the crisis. The physical volume of industrial production in 1932 was only 38% of the 1929 level.

In 1931 the Customs Law was passed with the immediate objective of solving balance of payments problems. In practice, this law represented the beginning of the import substitution process, creating incentives for the domestic production of the manufactured goods whose importation was subject to duties.

As a consequence of this process of industrialization and urban development,



the industrial bourgeoisie was given strong support by Alfonso López Pumarejo's government, starting in 1936. This change at the political level was reflected in important changes in the general economic environment, and particularly in the renewed effort to promote industrial development. In 1937 a noticeable growth of food processing industries took place, together with the beginning of a new boom for the textile industry. The accelerated pace of industrialization and the levels it achieved were based on the utilization of domestic raw materials such as farm products and minerals.

### Repercussions of World War II

World War II made import operations in Colombia very difficult, thereby stimulating import substitution industrialization. The government helped by establishing the Institute for Industrial Promotion to support industrial development, and the cement, chemicals, paper, and rubber products branches became the most dynamic. Industrial growth took place within the framework of protective tariffs established in 1931 and strengthened during the war.

By 1945, when foreign trade was stabilized, the country had accumulated sizable international reserves and the domestic market had been enlarged as a result of a substantial increase in purchasing power. The 1945-1950 period was one of sustained industrialization, averaging a yearly growth rate of 11.5%, far above the figures previously achieved, and contrasting, in particular, with the 3% rate obtained from 1939 to 1945. However, postwar industrial growth strengthened primarily the established production lines without developing new ones.

### The 1950-1970 Period

Because of the exceptionally high prices for coffee during 1954, Colombian industry acquired the means to import the capital goods and inputs required for the transition from the phase of substituting imports of consumer goods to the substitution of imports of intermediate products. However, beginning in 1957 the drop in coffee prices in the world market brought the consequent scarcity of foreign exchange and the appearance of sizable foreign investments in industry. The chemical and metalworking industries were established during this decade. The first attempts at establishing automobile plants were made in 1955, together with the production of medium-sized mechanical units such as metallic structures, containers, etc.

However, in spite of industrial growth, Colombia continues to be a predominantly agrarian country. Although slowly decreasing, the participation of the agrarian sector in the gross domestic product is the largest of all. In 1965 it was 31% and in 1973, 27%. Manufacturing industry ran second with a tendency to increase its participation in the gross domestic product: in 1965, industry represented 18% and in 1973, 20.2%. The other sectors were as follows: commerce and finance, 17%; mining, 2.6%; construction, 4.5%; transportation and communications, 7.5%.

Agricultural and livestock activities are also the most important sectors from the point of view of employment. At the end of the last decade they absorbed 42.3% of the economically active population; industry absorbed 12.8%, and commerce, 17.6%. However, as far as productivity was concerned, agricultural and livestock activities revealed the lowest figures of all the economic sectors. According to the relation between the value of sectoral production (at 1958 prices) and the number of persons employed, the figure for agriculture was only one-fourth of that for industry. Furthermore, the reduction that developed in the agricultural and livestock sector as to the share of the gross domestic product was due more to the relative stagnation of that sector than to the growth of others. From 1960 to 1973 the growth rate of agriculture and livestock production was 6.1%, far below the growth rate of the gross domestic product for the same period, which reached 7.2%.

Among the causes for this relative stagnation it is possible to identify the small size of the farm units for traditional crops geared toward domestic consumption, as well as the increase in costs of certain inputs such as fertilizers and spare parts for farm machinery. The low yields of the sector may be readily seen by considering that at the end of the 1960s only 3.6% of farm production was mechanized, the introduction of improved seeds was limited to a few crops, herbicides and pesticides were lacking, and few crops were raised on land treated with fertilizers.

The agricultural sector has also been very important in the Colombian economy

from the point of view of exports and, as a consequence, for the foreign exchange needs of the country. Coffee was traditionally the most important item in the structure of both primary and total national exports. Although the proportion has tended to diminish and the export structure reveals a process of diversification, coffee continues to be the most important product. In 1960 coffee represented 93% of farm exports and 71% of total exports, whereas in 1973 its share dropped to 73% of agricultural products and 49% of total exports.

Industrial development in Colombia has taken place as a consequence of the surplus extraction from the agricultural sector, particularly from coffee producers. For that reason the development of industry has followed closely the coffee cycles in the international market. One of the most important effects of this has been the irregular pattern of fixed capital formation in the industrial sector: idle installed capacity has reached 50% when there have been problems with the balance of payments, although some shortages in industrial capacity have occurred when no problems have been experienced.

The industrial sector has developed at a faster rate than other sectors. The average annual growth rate during the 1960-1973 period was 9.5%. From 1955 to 1967, due in part to the fall in world coffee prices, the growth rate of the industrial sector revealed pronounced cycles, and stability was achieved only after 1968.

Industry grew through the support of protective tariffs and, more recently, through the assistance resulting from import restrictions. Many lines of industrial production were developed under monopolistic conditions, with supply being restricted by the limited demand. To a large extent this has indirectly influenced market prices and production costs. Since 1960, the elimination of duties on raw materials, the incentives provided for exports through the Tax Credit Certificates (CAT), and possibly the changes in labour policies, have fostered the modernization of equipment in the manufacturing sector, a reduction of costs, and the greater utilization of productive capacity in certain industries, leading also to an increase in the export of final and intermediate goods.

As a result of import substitution policies, the consumer goods branches have acquired the largest share of industrial production, although the limit for the "easy" stage was reached when local production met domestic demand for these products. At the same time there was moderate progress in the substitution of chemicals and basic metals. In 1968, for example, food industries were the most important from the point of view of their share in the value of gross industrial production, which reached 27%. From the point of view of their share in employment, the largest industries were: textiles, 16.1%; tobacco, 16.1%; foodstuffs, 14.7%; and clothing 10.2%; whereas the machinery and electric appliance industries represented 3%; transportation equipment, 4.52%, and nonelectric equipment, 1.96%.

Also in 1968, the investment-employment ratio was higher in the chemical sector (54,300 Colombian pesos per worker), transportation materials (53,000), and paper and by-products (51,000), whereas the lowest ratios were for wooden furniture (25,700), clothing (26,900), and textiles (33,600). Furthermore, as a result of the import substitution policies oriented toward consumer goods, these represented only 15% of imports, whereas raw materials and intermediate products represented 50% of imports, and capital goods the remaining 35%. Throughout this period the textile industry was the most dynamic, achieving a productivity level equal to the world average for cotton textiles, with internationally competitive prices.

It is important that from the beginning of the industrialization process to the late 1950s industry was mainly in national hands. It was only in the 1960s and 1970s that a progressive denationalization of industry took place. However, even in 1976, foreign control of the Colombian economy was relatively limited compared with other developing countries of similar economic size.

Import substitution and the weight of nondurable consumer goods, as well as the limitations on the growth of other fields of industry, are directly linked to income distribution in Colombia. Toward the end of the 1960s the average per capita income was \$367; but 20% of the population had a per capita income of \$108; 30%, \$175; another 30%, \$283; 15%, \$643; and the remaining 5%, \$2,231. In other words, more than 80% of the total population had income levels between \$108 and \$283, whereas at the other extreme only 5% of the population received more than \$2,000. Expressed in percentages, the income distribution was as follows:

<u>% of Population</u>	<u>% of Total Income</u>
0-20	5.9
20-50	14.3
50-80	23.1
80-95	26.3
95-100	30.4

### Recent Developments in Economic Policy

During recent years, 1972-1974, Colombia adopted the so-called Four Strategies Development Plan, which emphasized government programs as follows: financial aid for urban construction projects; the promotion of exports, particularly industrial products; an increase in agricultural productivity through an agrarian reform; and a simultaneous and continuous process of redistributing income to impoverished groups.

However, the high degree of protection and the monopolistic market structures generated a situation where government incentives concentrated on the construction industry and on production for export, without increasing agricultural productivity, having unfavourable results with respect to the agrarian reform, and with a marked trend toward the concentration of income.

The import substitution model has contributed to the establishment of an industrial base in which luxury items receive high protection, thereby stimulating domestic production. As is still the case, this meant meeting the needs of the groups with the highest incomes. To the extent that the dynamic nature of industry is based on the demand of such groups, there is an accentuation of the phenomenon of poor utilization of the productive capacity of enterprises. Such idle capacity, which begins to appear in all sectors because the income tends to become more concentrated rather than more distributed, has led industrial groups and the government to seek a solution through incentives for exports.

The rapid growth of exports during recent years has been the result of the withdrawal of the more developed countries from the export of light manufactured goods (textiles, footwear, etc.) and of the need for growth in view of the limitations of domestic demand. However, even if exports are regarded as one of the key components of a development strategy to solve the main problem of expansion of the domestic market, their impact on the redistribution of income will probably be minimal.

Summarizing the most important factors that have influenced Colombian industrialization in the last 30 years are the following: customs tax policies and qualitative controls on imports; the size of the Colombian market and the domestic purchasing power; the promotional action of the state through the Institute of Industrial Development (IFI); income tax policies that have influenced the creation of new industries and the capacity for repair and maintenance of machines; labour policies that have exerted pressure on the choice of techniques (toward greater capital intensiveness); the indigenous capacity of assimilation and adaptation of foreign technologies; the monopolistic or oligopolistic structure of most industrial branches; and the technocultural dependence suffered by politicians and technicians as a consequence of the insertion of the Colombian economy in the periphery of advanced capitalist countries, mainly the United States.

Finally, although the Colombian economy has experienced periodic contractions that have affected the rate of growth, the level and quantity of human resources have improved steadily in the last 20 or 30 years. Given the low wages that are prevalent in the Colombian economy and the permanent high rates of unemployment, this leads to a contradictory situation: on the one hand, Colombian exports are promoted because of low salaries and a relatively good labour force compared with other Latin American countries; and on the other hand, Colombia faces the continuous emigration of professionals, technicians, and skilled labour in general.

### Some Special Features of Colombian Industrialization

Foreign Trade: The Colombian economy is still characterized by the considerable influence that coffee has on the structure of exports and on the generation of foreign exchange. However, the volume of exports for this product has remained relatively stable, whereas other raw materials (bananas, cotton, sugar, and tobacco) have shown a

considerable increase. The share of manufactured products in exports is relatively small, reflecting the weaknesses of the Colombian industrial structure. Furthermore, the most dynamic export-oriented sectors are textiles, glass, and cement, all of which have been supported through fiscal incentives, export credits, and other export promotion mechanisms.

On the import side, there has been a significant increase in machinery and industrial equipment, reflecting the requirements of a process of industrial growth that is completely dependent on foreign sources of capital goods. The present situation of imports reveals that Colombia has practically exhausted the stage of easy substitution and must now face the more difficult stage of producing at least some of its own capital goods. For this reason the development of these technological capabilities will be of the utmost importance.

The import substitution process has been supported by customs policies, advance payments and quotas. All the protective measures have influenced primarily imports of durable consumer goods, whereas imports of capital goods have been subject to fewer restrictions and domestic production has not been given equal support because of technological and financial requirements. This has given rise to a situation of technological dependence on foreign sources for the supply of capital goods.

The establishment of the Royalties Committee in 1968 was the first step toward a greater control of technology imports to reduce some of the negative consequences. The Committee approves or rejects contracts for imports of technology regarding the use of patents, trademarks, industrial processes, commissions, and other elements of industrial property. Initially, the activities of the Committee were oriented toward reducing balance of payments problems and saving foreign exchange, without considering explicitly the development of a national technology policy. It was only at a later stage that the Committee made an effort to incorporate a technological development approach in its responsibilities. In general, the Committee had achieved the following objectives by 1971:

- A 90% reduction in the "tie-in" clauses for the purchase of international goods.
- The total elimination of restrictive export clauses.
- An 80% reduction in the minimum royalty payment clauses.
- The prohibition of payment of taxes by the licensee for royalties remitted to the licensor.
- The establishment of a maximum percentage of royalties by sector.

Tariff Policies: The Colombian government has resorted to tariff policies as one of the main instruments for industrial development. For example, the textile industry goes back to the last century, but it was only during the 1920s that it began to emerge as a significant branch of the economy. During the 1930s and 1940s, when the mechanical loom was gradually replaced by automatic machines, it showed a significant growth rate. At that time tariffs on machinery were very low, and before 1951 there were no qualitative controls and imports were unrestricted. Similar considerations apply to spinning equipment.

Although an adequate technical level has apparently been achieved in certain branches of industry, production has not been encouraged and developed to the degree that is possible by virtue of very little protection. These branches include the printing industry, mining equipment, and textile equipment. As regards publishing firms and the printing industry, custom tariffs on the importation of books and magazines have always been very low or nonexistent because of agreements with other countries, such as Spain, Mexico, Argentina and Chile, where publishing companies are highly developed. On the other hand, printing paper for publishing firms has been highly protected.

With regard to mining equipment, which enters duty-free in a great majority of cases, Colombia has for the past 10 or 15 years been in a position, technically, to build many types of equipment and spare parts. However, their manufacture never developed because of the negative effects of the exemption of customs duties. Generally, such equipment consists of units such as crushers, screens, and hammer and ball mills. However, under this system of exemptions the oil and mining companies, as well as cement manufacturers, have managed to import much duty-free equipment that is not used exclusively for mining (tanks, pumps, wheelbarrows, etc.).

A similar situation occurred with textile equipment. Within the concept of promoting the textile industry, the equipment was traditionally subject to very low tariffs. This was, and continues to be, a restraint on Colombian production of textile equipment. However, another economic factor, of a fiscal nature, forced the textile companies to develop their own technological capabilities in equipment and machinery. This was due to the tax legislation that did not permit depreciation of the equipment in less than 10 years, whereas it accepted as deductions all expenses for equipment repair and reconstruction. Thus, the large plants gradually trained highly skilled mechanics in the textile industry, and repair shops were established where spare parts were produced, machines were adapted, and even complete units, such as looms and spinning machines, were built. Law 81 of 1960 provided tax exemptions to enterprises engaged exclusively in the metalworking industry, and consequently some textile plants converted their shops into metalworking plants.

**Industrial Productivity:** A negative feature of the industrialization process in Colombia has been that technical change was, and still is, introduced into the country mainly through the creation of new enterprises or the expansion of others already established, whereas increases in plant efficiency and productivity, as well as continuous improvements and adaptations, are small and infrequent. The only exception to this rule is the textile industry, in which Colombia has higher rates of productivity than those of many developed countries and all of the Latin American countries.

Different theories have tried to explain this isolated behaviour. The textile industry has developed as a result of an uninterrupted effort by entrepreneurs from Medellin (where 60% of the industry is located) during the last 60 years. It is said that these entrepreneurs have a certain Calvinist ethic, that their life-style is centered around work, and so on. But perhaps a deeper explanation would be that these entrepreneurs have had the opportunity to extract a substantial surplus from a very badly organized labour force, in a very conservative and religious environment where the Catholic church is the first ally of the industrial bourgeoisie. The scarcity of natural resources and the hard topography (high and steep mountains with very poor soil) have forced people of the region to work harder than others for survival. The abilities generated in this struggle have been exploited by entrepreneurs from Medellin.

**Industrial Dispersion:** The dispersion of industry and the high degree of regional industrial development is one of the main features of Colombian industrialization. Not only Medellin, but also Cali, Barranquilla, and other cities, constitute important industrial centres. Until 1954, when Bogota took the first place, Medellin had the largest percentage of the gross industrial product. Even with the continuous process of industrial concentration around the capital city in the last 25 years, it could be said that Colombia has the most regionally dispersed pattern of industrial development in Latin America.

**Lack of Coherent Industrial Policy:** Another important feature of Colombian industrialization is that, although industry has been developing during the last 50 years, there never was a coherent industrial policy. As with most Latin American countries, the process has been one of "involuntary industrialization," forced by the Great Depression and World War II, and the government has been using implicit industrial policies more than explicit ones. The main explicit industrial policy has been the creation of the Institute of Industrial Promotion (IFI) in 1940. It has created or invested in high-risk enterprises, selling them to the private sector when they were working steadily, and it has bought bankrupt enterprises from the private sector. It has also participated in ventures with private capital - local, foreign, or both - as a common instrument for industrial promotion.

**Concentration of Demand:** Perhaps the most important feature of Colombian industrialization has been the concentration of demand for industrial goods. It is hardly risky to say that 60% of the population does not get more than 10% of the industrial production in Colombia. As a result the actual size of the market shrinks and becomes approximately one-third of the total potential market. The consequences for industry of such small but relatively rich markets are well known: growth takes place by diversification more than by increasing industrial production; there are high rates of obsolescence and replacement of consumer goods; and finally, markets are too small to promote the development of basic and capital goods industries.

## NOTES ON EGYPTIAN INDUSTRIALIZATION<sup>(6)</sup>

### Historical Background

The economic growth of Egypt has depended on cotton exports ever since this commercial crop was introduced into the country for the benefit of the British and later the world textile industry. Even by the mid-1970s Egyptian economic growth remained basically tied to the capacity to export raw materials.

Between the two World Wars some light industries (textiles, food processing) were established, but they functioned very inefficiently and little attention was paid to economic and technical criteria. For example, Egyptian cotton was used by the local textile mills to produce thick instead of thin fabrics, as was appropriate for the local high-quality fibre. The existing industrial plants functioned at high costs. Incentives were granted to foreign investors and many foreign-owned industries produced goods that were of little use to the majority of the population. By 1952 the contribution of the industrial sector to the national income was only about 10%.

The great majority of the population, being engaged in agriculture and living at very low standards, had little possibility of contributing to domestic savings. Accumulated capital was either hoarded or invested in low-cost and quick-yielding commercial or industrial ventures. In 1952, for instance, industrial investment represented only about 12% of total investment.

### Evolution of Industrial Policies since 1952

With the coming to power of Nasser in 1952, an impulse was given to the creation of new industries based on the local supply of manpower, raw materials, fuel, and electric power. The state-planning apparatus began to take shape, the National Production Council was established to deal with economic development, and a series of legislative measures was issued to promote industrial development.

The public and private sectors have coexisted in Egypt since 1952. The public sector was first established with the nationalization of a few foreign firms. The growth of the state firms was financed later by domestic savings and, above all, by foreign funds that were channeled through state institutions. In particular, since 1958 the government has been borrowing funds on a bilateral basis and it has also been using export credits from foreign banks.

In 1958 the government enforced a system of previous licencing that allows private and state enterprises to obtain fiscal and other benefits to expand industrial facilities and to establish new industries. Import controls and high tariff barriers have been maintained to protect local industry, but their effects have been distorted by the licencing system. The private firms benefited from a number of fiscal and import privileges once the licence was granted, and they also obtained technical and economic assistance from government bodies. On the other hand, the beneficiaries were expected to comply with given product and material specifications and standardized product norms.

In 1959-1960 industry accounted for 42% of the gross domestic product. During the next 5 years, between 1960 and 1965, almost 2 million new workers found employment, about two-thirds of them in industry, where 600,000 workers were absorbed in 1959-1960. During the same period the average wages of workers in industry also increased by 42.2%, whereas productivity gains were estimated to grow by only 18.3%. However, in the next 5 years, from 1965 to 1970, wages increased by only 5.6%, whereas productivity went up by 16.9%. These changes took place while the amount of investment in industry during the two periods, 1960 to 1965 and 1965 to 1970, remained approximately the same. The contribution of industrial production to the gross domestic product dropped slightly to 40% in 1964-1965 and 39.6% in 1969-1970.

These changes in the industrial structure of Egypt in the 1960s are further highlighted by the fact that in 1968 the private sector was granted new benefits for the purpose of increasing its role in economic and industrial growth. The state attempted to establish procedures that allowed easy renewal of equipment, provided training and industrial services, and facilitated exports. As a result the private sector increased its exports by almost 42% between 1966-1967 and 1969-1970. In response to the state incentives the private sector increased the value of investments by 342% between 1967-1968 and 1969-1970 and, after a decrease during the next 2 years, private investment

grew once more at a high rate in 1972-1973, showing an increase of 456% compared with investments in 1967-1968. Capital invested in the private sector still accounts for only 16% of the total capital invested in industry, although it employs 49% of the total industrial labour force. The sectors that benefited most from this wave of private investment were cotton spinning and weaving, engineering industries, metallurgical products, and chemicals. However, in spite of these increases in investment, the private sector has been growing at a slower rate than the public sector, and in 1967-1968 its contribution to the total value of industrial production was roughly one-fourth.

During the early 1970s industrial investments in public ventures made by the Ministry of Industry were largely concentrated on oil and petrochemicals, and on iron and steel, which absorbed about 60% of the ministry's investment funds. In 1971-1972 foreign financing provided 28.8% of investment funds in oil and petrochemicals and 34.6% in iron and steel. During the same years the average share of foreign funds in total industrial investment was 33.8%, reaching 61.3% in spinning and weaving and 51.4% in engineering and electronics. This shows that the growth of Egyptian industry has depended heavily on the availability of foreign finance and has led to an acute foreign indebtedness.

In 1974 the government established new regulations giving generous incentives and guarantees to Arab and foreign investors. The creation of free zones where production will be solely for exports is also envisaged. The new regulations exempt investors from taxes, permit the repatriation of profits and capital, and insure the foreign investors against nationalization and expropriation.

An array of procedures to reduce the risks of commercial banks in lending to industry have also been devised: the government guarantees against default on loans, refinances loans, applies preferential discount rates on bills related to purchases of equipment and raw materials, and allows the banks to maintain low levels of reserves. Arab and foreign capital is not only welcomed for industrial ventures but also for the development of housing and tourism.

In an attempt to increase income from exports, the government has been encouraging exports of manufactured goods. To this end, facilities have been granted to firms to import technology that will improve the quality of manufactured goods up to world levels. Furthermore, it was considered necessary to improve the packaging, which would make Egyptian products similar to products from the developed world. Productive units are thus encouraged to purchase licences and trademarks. Exporters are also granted a tax drawback system whereby they are refunded all customs, excise, and other duties paid on imported raw materials that are incorporated in the goods sold abroad. Total exemption from import duties is granted to goods that are reexported after processing. The enterprises may also be refunded any loss incurred from exports.

However, in spite of these measures aimed at promoting industrialization, there remains a major problem of unemployment in Egypt. Modern industry has generally had a low absorptive capacity for labour in relation to the amount of capital invested, whereas the labour force continues to grow at a fast pace.

## INDUSTRIAL DEVELOPMENT AND POLICIES IN KOREA<sup>(7)</sup>

### Historical Background

It is said that Buddhism and Confucianism were the sources of the profound social conservatism and the "closed door" policy with respect to the Western world that prevailed in Korea until 1867, when, under Japanese pressure, a degree of access to foreign trade and technology was permitted. From 1910 to 1945 Korea was subject to economic and cultural colonialism resulting from Japanese occupation.

Korea achieved political independence at the end of World War II but was divided along Parallel 38, with the consequent loss to South Korea of the manufacturing industries, mines, and electric power generation located in the North.

The war of 1950-1953 brought economic and social chaos. The reconstruction period, which took place primarily on the basis of foreign-aid programs, lasted from 1954 to 1958 and was followed by 2 years of political instability and economic stagnation. Over the whole postwar period from 1954 to 1961, the average annual growth rate of per capita income was only 2.6%, reaching \$95 in 1961. However, the educational

system was developed and expanded, permitting the establishment of a highly literate labour force.

The 1960s signaled a radical shift in the economy. After the Korean War, priority was given to the attainment of political stability, whereas after the revolution of May 1961, priority was given to the rapid growth of the economy and its modernization. During this decade the annual growth rate was 8.7%, reaching 17% in 1973. An open economy, based on export promotion, was implemented through modifications in exchange and interest rates, as well as through changes in customs duties. Thus, exports went from \$123 million in 1962 to \$3 billion in 1973.

During this period the industrial structure changed its orientation from consumer goods to intermediate and capital goods, thus expanding and deepening import substitution industrialization. Traditionally imported goods, such as cement, fertilizers, oil, electric wires, and cables, began to be produced locally, and certain raw materials of industrial origin, such as nylon fibers, viscose nylon fibers, polyacrylic fibers, and PVC, began to be produced locally for the manufacture of consumer goods. Other durable consumer goods industries developed (automobiles, household appliances, electrical devices, and accessories), although on the basis of imported components and know-how.

During the implementation of the Second Development Plan (1967-1971) the synthetic fiber and electronics industries expanded to the point that a sizable proportion of their output was exported; the government also placed emphasis on the machinery, petrochemical, and iron and steel industries as the basis for the future development of the heavy and chemical industries in the 1970s.

As a result of this industrialization effort, the participation of agriculture and fishing in the gross national product dropped from 37% to 29% during the decade, and mining and manufacturing grew from 17% to 23%. Changes also took place in the structure of the manufacturing industry, with a shift from the predominance of foodstuffs and textiles to a greater predominance of metals and machinery. The share of heavy industry in the value added to the sector rose from 12% to 29%.

Commodity exports rose from \$55 million to \$1 billion, and the share of manufactured goods in exports increased during the decade from 27% to 86%, with textiles, plywood, wigs, fishing products, electronic devices, cement, and iron and steel products becoming the main export items. The average value added to exports was about 40%. However, because of the increase in imports of raw materials and intermediate goods, the commercial deficit grew from \$367 million to \$1,326 million.

The economically active population rose from 7.9 million to 9.7 million, with unemployment dropping officially from 8.4% to 4.5%. The percentage of labour engaged in agricultural activities, forestry, and fishing declined from 65% to 49%. On the other hand, the employment share of mining and manufacturing increased from 11% to 14% and that of the service sector grew from 24% to 37%.

#### The General Development Pattern

At the beginning of the 1960s Korea had an essentially agrarian economy, with very limited availability of natural resources and arable land (23% of the total area). The labour force was basically engaged in agricultural, fishing, and forestry activities. In mining the only exports were tungsten and ores of less importance. Eighty percent of the manufactured commodities were consumer goods (foodstuffs and textiles). Transportation and electric power services were lacking. The population growth rate was 2.8%, with increasing unemployment and subemployment.

In view of this situation the development strategy for the 1960s set its goal at breaking the "vicious circle" of low savings, low investments, and slow growth. This required an increase in public savings, an increase in the inflow of foreign capital, and the awarding of priority to export-oriented industries.

In general, economic policies had the following objectives:

- Price stability through monetary and fiscal mechanisms as a condition for increasing domestic savings;
- The use of market mechanisms for the determination of prices to achieve the desired allocation of investable resources;
- The modification of interest and exchange rates, as well as wages, to



reflect the opportunity costs of resources and to provide an alternative to the control of production, prices, salaries, exports, and imports;

-Public investments centred in key sectors, with simultaneous support for the formation of an infrastructure.

Among the policy decisions and actions that were taken to reach such objectives and goals it is possible to highlight the following:

-Priority was given to the promotion of exports to counterbalance the previous strongly protectionist policy centered around import substitution, which resulted in the low reinvestment of accumulated funds and the removal of incentives for the development of new technologies and entrepreneurial capabilities;

-The development of light industry was promoted in view of the low capital requirements of these branches.

-Although the export of labour-intensive products became competitive, the government decided to grant entrepreneurs a number of subsidies in the form of tax and duty exemptions, together with loan facilities, to compensate for what was considered the small profit margin of the exporters.

-Import restrictions were reduced to provide the "profit motivation," which would develop entrepreneurial capacity.

-Education was oriented toward productive activities with emphasis on vocational training.

-Improvement in the terms of trade between agriculture and industry was sought so as to favour the former.

Summarizing: the development strategy in the early 1960s was based on the use of market mechanisms, operating in harmony with the policy of export promotion and of import substitution of light, labour-intensive manufactured goods that processed imported raw materials and intermediate goods. The development of agriculture and the promotion of the chemical and heavy industries was left for the 1970s.

At the beginning of the 1970s the outlook for a substantial expansion of light industry exports showed its limitations. The heavy and chemical industries began to be regarded as the new basis for growth: their share in industrial output is planned to increase from 32% in 1972 to 51% in 1981.

The general strategy for the 1970s sought to accelerate exports to improve the balance of payments, increasing them from \$1.6 billion in 1972 to \$5.3 billion in 1976. In spite of the world economic recession, the actual performance exceeded these estimations. Consideration was also given in the plan to achieve self-sufficiency in cereals (grains) and to consolidate industries whose development had already been initiated: iron and steel, automobiles, electronics, petrochemicals, shipbuilding and medium-machinery building.

The new general guidelines were oriented toward achieving harmonious growth with stability and a balanced economy, especially at the regional level, as well as to achieve a self-sustaining economic structure. The growth rate of the gross national product from 1972 to 1976 was 10.9% a year, and an attempt was made to reduce the share of the basic industries in the total value of production, increasing the participation of the secondary industries and leaving the tertiary activities practically constant. The participation of labour in the secondary and tertiary industries was expected to increase, whereas it would decline in primary industries.

Beginning with the 1974 energy crisis the economy suffered a brief decline in new investments and exports. However, the Korean economy recovered remarkably in 1976 to achieve the original goals, and although the high priority granted to the heavy and chemical industries was somewhat modified, the original strategy for industrialization is still intact.

#### Some Specific Features of Korean Industrialization

The economic expansion during the 1960s was accompanied by the implementation of a growth policy that emphasized manufacturing and the development of the infrastructure (electric power, transportation, and communications). Thus, mining and manufacturing

activities increased by 14.2% during the First Plan (1962-1966) and by 20.4% during the Second Plan (1967-1971), whereas the infrastructure and services increased by 8.4% and 11.3% respectively. During this decade exports of commodities increased about 20 times.

Within the manufacturing sector light industries continued to represent two-thirds of the value added, but their share tended to decline. The heavy and chemical industries increased their share of value added from 13% in 1960 to 36.3% in 1973, due particularly to the expansion of the chemical, electrical equipment, and transportation industries.

The main instruments of industrial development policy were centered around the following: incentives and special assistance to facilitate investments and productive activities, particularly industrial exports; financial assistance through the banking system, special funds, and agreements with the government; and the development of research and development capabilities and assistance in solving technical problems (product design, productive practices, etc.).

The background and reasoning behind this policy emerged out of reflections on the limitations of the Korean pattern of industrialization. Around 1960 Korea had completed an import substitution phase for durable consumer goods through high customs duties and import quotas. However, the limitations arising out of the size of the domestic market and of capital availability made it infeasible to continue with the process of import substitution as a way of meeting requirements for nondurable consumer goods, raw materials, and machinery.

A decision was made to develop an export-oriented economy and to take advantage of international market opportunities that were expected to increase the growth rate and employment. To implement this policy, the currency (Won) had to be devalued by 100% in May 1964. In September 1965 bank interest rates on loans were doubled. To control inflation and increase the tax burden, the government implemented a price stabilization policy and a tax reform, notwithstanding that the currency was kept at a free exchange rate through successive devaluations. In 1967 a more liberal import system was established. Up to that time, only those items appearing in the trade list could be imported. Thereafter, any product could be imported provided proper reasons were given. In 1973 import duties were lowered.

A large number of incentives for exports have been put into effect to establish Korea's comparative advantage in foreign markets. Among the main instruments of export promotion it is possible to identify the following:

- The exemption of customs duties and commodity taxes for imported raw materials used for the manufacture of exported goods.
- A 50% reduction in the income tax on export earnings and a 100% reduction in the business tax. This exemption may provide from 14% to 25% of the firms' net earnings.
- The establishment of preferential interest rates on loans. Exporters were permitted to borrow 90% of their financial requirements at 6% interest, whereas the commercial rate was 25%. The same terms were applied to commodity credits for the importation of raw materials used in the manufacture of export goods.
- Upon taxing the partially duty-free imported material, consideration was given to the waste of scrap resulting from the conversion of the material into the final product. The materials not used for exports may be sold or used in the domestic market at a considerable profit.

The motives behind the incentives included the following: the tax exemptions were granted so that exporters would have raw materials at international prices; the margin or allowance for scrap was intended to help the entrepreneurs during the initial stages of their learning process; and the establishment of preferential interest rates was designed to permit exporters to compete in the world market in credit and payment facilities.

The entire system of incentives could be enforced in Korea because of the very close interests and coincidences between the government and private enterprise. It is asserted that policy instruments stimulated exports without giving rise to a poor allocation of resources (the 25% average protection rate and the 7% to 9% subsidy are not regarded as high protection compared with international standards) and without

restraining industrialization.

It is nevertheless admitted that the system has certain weaknesses. The search for international market opportunities has resulted in specializing in labour-intensive industries as well as in certain phases of the productive process. For example, this is clear in the lumber and plywood industry, which is associated with the U.S. building industry, and in the subcontracting agreements for assembly operations (electronics, household appliances, and automobiles). All goes well during periods of expansion, but Korean industry is very dependent upon the critical cycles of the developed nations and also excessively dependent on contractors who control markets and technologies. On the other hand, the incentive system has involved a costly and complex administrative setup. Finally, there has been insufficient development of capabilities for product design and adaptation to market needs.

To overcome these problems it has been suggested that the industrial system should be integrated and diversified (particularly the heavy and chemical industries), export markets diversified, capital markets as well as research and development institutions developed, and industry decentralized.

The government maintains that there are special reasons for developing the heavy and chemical industries. It believes that Korea should take advantage of the fact that, due to factors related to environmental pollution and the scarcity of labour, the developed nations have begun to displace to the developing nations certain activities in the fields of machine construction, shipbuilding, electronics, and iron and steel. An attempt should be made to have such industries established in Korea, which has the advantage of a highly literate labour force. These activities and the chemical industry might be used to establish a complex network of "brain-using industries" that would help to replace the "low-wage-level industries" through technology increasing the efficiency of existing plants and creating new products and processes. Therefore, it is necessary to promote technological development, design, and research and development activities, as well as innovation. Medium and small industries might develop extensively as "ancillaries" of the large plants.

The energy crisis has until now had the effect of focusing attention on the need to promote industries that save energy and raw materials, as well as to limit the promotion of energy-consuming industries. This implies that there should not be complete dependence upon the export sector.

## INDUSTRIALIZATION IN MEXICO<sup>(8)</sup>

### Historical Background

Throughout the colonial period and up to the 19th century Spain sought by every possible means to preserve its American colonies, and it tried to prevent them from developing their own industrial activities because it needed a captive market for Spanish industry. At the same time Spain needed the raw materials produced in the colonies, in particular minerals, for which they paid a low price. As a result some primary economic activities were developed, although the productive techniques provided by Spain were generally backward, because Spain had been isolated from the main currents of scientific and technological developments that were taking place in the rest of Europe.

The incorporation of Mexico into the world economy was accelerated during the 19th century, when two factions of the local bourgeoisie - the liberals and the conservatives - fought to take over the government and led the way in severing ties with the colonial power. In economic policies, the liberals favoured protectionism for taxation purposes; however, the idea of the "Banco de Avio," an institution dedicated to the promotion of industrial development, was put forward by the conservatives.

Discussions between both currents revealed a fairly clear awareness of the relative scientific backwardness of Mexico. When formal independence was obtained, economic growth was stimulated, research and education were actively promoted, and production, trade, and ties with international finance were significantly expanded. New industries were established (textiles, paper, and mining), the production of agricultural exports was modernized, and communications, transportation, and power generation were enlarged. The market was expanded by eliminating internal duties and taxes, and the main investment effort was provided by foreign capital. However, the incipient industrial

potential was partly destroyed during the Mexican-American war in the 1870s, at the end of which Mexico lost half of its territory to the United States.

By the first decade of the 20th century Mexico was closely linked to the international economic system and moved with its erratic changes. The economy was strongly hit by the 1907-1908 economic crisis: exports found no outlet, their price fell in the international market, and a critical situation developed in the balance of payments. Wages had been cut down in the previous decade (average salaries fell from 0.92 to 0.36 pesos per day from 1897 to 1910) so that at the onset of the economic crisis the per capita demand for essential goods such as corn, beans, sugar, tobacco, and cotton was drastically reduced.

The economic crisis met with an excessively low internal demand that could not be reduced further, except by provoking violent social upheavals. The Mexican revolution burst out in 1910. The civil war lasted until 1921, followed by a period of instability that lasted until approximately 1935. During the years following the Mexican revolution, social reforms - including land redistribution - dampened the impulse toward change and contributed to strengthening the state and its institutions, a process that was further consolidated after the 1929 economic crisis.

The immediate effects of the civil war were a fall in production (except in mining and oil) and the destruction of the physical infrastructure: industrial production went down by 75% and corn production was reduced by 40%. Nevertheless, toward 1921 the first signs of recovery began to show when mineral exports were resumed. Then, between 1925 and 1929, the country enjoyed the most favourable terms of trade in its history. During the 1920s a boom in construction works, irrigation systems, road building, and so on, took place. Public investments in these fields doubled compared with the pre-civil-war levels, but deficit financing was high, with the subsequent negative effects on real income. Land redistribution also continued and played an essential role in capital accumulation and in the development of industry. While industry was recovering, the rural sector was able to increase agricultural production and at the same time to supply more labour to industry, where low salaries could be maintained. It was also during this period that the state monetary and financial institutions were created. The Bank of Mexico, which was responsible for the emission of paper money and later for the control of the monetary supply, was founded in 1925. The Agricultural Credit Bank was founded 1 year later. Primary and technical education were further expanded and science-based universities were started.

The 1910 social uprising was a landmark in the reassignment of responsibilities between private enterprise and the public sector in the process of economic development. The public sector progressively assumed the role of spearheading economic activities in fields of little interest to the private sector, either because of high risk or because of low profitability. During the 1920s and early 1930s private investment (especially foreign) remained dormant, while social reforms, such as land redistribution, were carried out.

The 1929 crisis was a great blow to the Mexican economy. It held back the process of economic growth and also aggravated the situation of the workers whose income was drastically reduced. The land reform had been kept within limits, and labour laws had been reformed only to the extent that they would not become a threat to private enterprise and the profit motive. Strong pressures from workers and peasants led to new social reforms. The redistribution of land was resumed on a larger scale: the proportion of small holdings to total cultivated land went up from 15% in 1930 to 49% in 1940. However, agricultural production increased very slowly at the modest rate of 1.9% a year between 1925 and 1940.

The thorough redistribution of land brought about a number of changes in the structure of the economically active population, in the distribution of income, and, consequently, in the scale of the domestic market, as well as in the structure of both agricultural and industrial production. The land reform eliminated the obstacles that hindered the mobility of labour toward industry, and the latifundia ceased its hold on the peasant who was normally underemployed and indebted. As a result a large number of peasants joined the urban labour force, which led to a decrease in wages and an increase in profit rates. Moreover, the displacement of large amounts of rural labour to other sectors, together with investments in infrastructure works, made possible the modernization of commercial agriculture, which, in turn, made this sector highly sensitive to variations in demand in the internal and foreign markets. Up to 1940 industrial

expansion was mostly directed toward consolidating the small or handicraft plants that produced almost exclusively nondurable consumer goods, while the existing basic industries, such as steelworks, were modernized.

The impulse to industrialize came not only from the availability of cheap labour, but also from the institutionalization of industrial credits. The "Nacional Financiera," the future national development bank, was founded in 1934, and it took over all the functions for which it would be responsible in the future, such as granting industrial credits and financing public services, and it was also instrumental in providing long-term investment funds, which would yield results in the following decades.

Foreign investment has been welcomed since around 1875 and has become predominant in all the dynamic sectors of the economy. Foreign capital obtained concessionary rights over large tracts of land, and it played an essential role in the construction of railways and electricity generation, as well as in the development of mining, oil, and manufactured goods.

Social unrest developed in the 1930s, culminating in strikes that led to the nationalization of the oil industry and railways. Although Mexican oil production had progressively lost its share of world oil production (which was more than 25% in 1921), the expropriation of the oil industry greatly strengthened the power of the state and signaled the beginning of its direct intervention in production. The takeover of the oil industry presented serious problems because of the lack of technical cadres, but many workers managed to fill the posts vacated by foreign technicians. It has been suggested that the successful takeover was made possible because the oil companies had used relatively obsolete equipment.

#### Recent Economic Evolution

Mexico's economic growth during the past 3 decades can be characterized in terms of the following facts:

- The rate of growth has been relatively high and stable: an average rate of increase of 6.2% occurred each year from 1940 to 1974, and the gross domestic product multiplied 10 times, at constant value, in the 3 decades after 1940.
- The most dynamic decade was that of 1960-1970, during which the gross domestic product grew at a yearly average of 7.1%, compared with 6.0% in the 1940s and 5.6% in the 1950s.
- The share of the gross domestic product devoted to investment also grew from 11.1% in 1940 to 19.8% in 1970.
- Per capita income increased, but the distribution of income has remained highly skewed.
- The participation of each sector in production and employment changed in favour of industry, the share of agriculture declined in both respects, and the share of the service sector increased only in employment.

Within each sector substantial changes have taken place. In industry, the production of intermediary and capital goods grew faster than the sector as a whole. In agriculture, changes in land tenure (characterized by greater concentration of capital and production) brought a larger output to the market and consequently reduced the share available for subsistence consumption. In services, the expansion of employment was the result of the growth of a very diversified pattern of demand, an evolution that is closely related to income distribution.

The capital-output ratio showed a stable decline from 1950 to 1967, falling from 2.67 to 2.38. From a sectoral perspective the decline in agriculture was linked to the concentration of holdings that took place in the rural areas. The ratios in industry remained relatively stable, which can be understood as evidence of a balancing process whereby consumer industries retained a large idle capacity while capital and intermediary goods industries expanded production.

Two phases of the same general strategy of import substitution industrialization can be identified in the economic evolution of Mexico since World War II. The first runs to 1956, and the second from 1956 to the early 1970s.

During the first phase the Mexican pattern of industrialization began to change. A devaluation had taken place in 1938, and during the war it was difficult to obtain supplies from abroad. The expansion of manufacturing was linked to the domestic market, and also to exports on the basis of using idle installed capacity. Nevertheless, economic growth still relied on exports of agricultural commodities, and even in 1965 agriculture's contribution to the total value of exports was 55%.

From 1940 to 1956 industrial investment centred around the production of manufactured goods that required relatively simple technologies. Industrial protection generated a diversification of production because the entrepreneurs, freed from foreign competition, found it profitable to enter into many fields of activity without having to maintain high levels of efficiency and use obsolete techniques. Since access to external funds was restricted, this policy was carried out on the basis of deficit financing.

At the end of World War II there was a remarkable increase in industrial investment, but the negative effect it had on the balance of payments, as well as the relaxation of the limits put on external competition, led to another devaluation in 1948. Thereafter, tariff levels for imports were increased and a system of import permits was enforced. New opportunities for highly profitable investments were opened up behind the strengthened protective barriers. Between 1948 and 1955 industrial output grew by 7.6% annually.

As a result of more strict controls on imports between 1950 and 1965, the share of consumer goods in total manufacturing output went down from 72.2% to 54.7%. Production goods, on the other hand, almost doubled. The change in the composition of industrial output did not entail a net fall in imports. The proportion of consumer goods in the total value of imports fell steadily from 1940 to 1955. At the same time imports of capital goods and raw materials increased to reach a maximum level in 1960, when they represented 81.3% of the total value of imports.

One of the aims of protectionist policies linked to import substitution industrialization was to increase government revenues and to correct the negative effect of the deficit in the balance of payments. For instance, in 1930 tariffs represented 34% of total state revenue. In 1940 foreign-trade taxation accounted for 27% of total federal tax income, two-thirds of which came from imports. From 1945 to 1955 new protective measures were adopted to curtail rapid inflation and the deficit in the balance of payments. During this period ad valorem tariffs were established and a system of licences was adopted. During the first half of the 1950s there was a marked effort to maintain development through price and exchange-rate stability. In 1954 the Mexican peso was devalued in an attempt to make exports more competitive and to reduce imports, and import tariffs were raised by 25%, although capital goods and other industrial inputs indispensable to expansion were excluded. Two sets of criteria were thus applied: low tariff rates for raw materials, machinery, and equipment, and high tariffs for luxury consumer goods.

During the second phase, starting in 1956, the government implemented a full-fledged import substitution industrialization policy. Beginning with consumer goods this policy was extended later in the mid-1960s to nonconsumer goods. The idea was to base economic growth primarily on the domestic market and its expansion.

One result of the import substitution policies implemented during the past 3 decades was that imports could not be reduced further, which, together with the fact that sources of foreign exchange exports and tourism declined, has created increasingly serious problems in the balance of payments. Furthermore, in the early years of import substitution it was thought that public funds would be obtained through deficit financing and foreign loans. Domestic savings were encouraged but did not materialize as expected, and eventually the country has come to rely more and more on foreign financing, with the resulting growth of the external debt.

As a result of the growing indebtedness, an increasingly greater proportion of total foreign exchange earnings has been devoted to amortizing the debt, reducing the amount available for the purchase of raw materials, intermediate products, and capital goods required by the economy. In 1960 the government debt service amounted to \$167.1 million, representing 8.6% of total foreign exchange expenditures. In 1970 it rose to \$791 million, i.e., 17.2% of total expenditures in foreign currencies.

Although figures show a substantial increase in gross fixed investment

(representing 7.1% of the gross domestic product in 1940 and 18.6% in 1971), the increment in the capital-output ratio over this period was low. Among the factors that promoted the increase in gross fixed investment, it is possible to identify the relatively high inflation rates that prevailed from the 1930s to 1966, the decreasing share of salaries in the structure of costs up to 1966 when the share of salaries reached the same level as in the 1930s, the high industrial protection levels, the role played by banking institutions in increasing the availability of credit, and the availability of foreign capital and increases in direct foreign investment.

Protectionist policies have not changed substantially, although some sectoral variations have taken place in both nominal and effective protection rates. Industries competing with imports are granted a high level of effective protection, whereas the level for industries that do not compete with imports is much lower. Exports are even less protected, although they benefit from substantial incentives. Such strong protection has encouraged the growth of consumer industries using capital-intensive technology, with the paradoxical result that the most modern and capital-intensive industries are also the most protected, at the same time that they are less competitive. The highest effective protection rates are to be found in industries that produce consumer goods: wool, textiles, paper products, durables, man-made fiber textiles, and automobiles.

### Some Key Features of Mexican Industry

**Foreign Trade:** The strategy of import substitution adopted since the mid-1950s radically changed the structure of foreign trade, while it lost importance in comparison with domestic production: in 1950 the total value of imports and exports represented 45.8% of the gross domestic product whereas in 1970 it went down to 21.5%. Exports dropped considerably, from 21.4% of the gross domestic product in 1940 to 4.1% in 1970, and imports diminished from 19.2% of gross domestic product in 1940 to 7.3% in 1970. In spite of this loss of importance, which was the result of the import substitution policy and the increasing importance of the domestic market, the operation and development of the economy are still closely linked to the capacity to import. As an illustration, after 1955 imports of consumer goods increased with respect to the levels attained in the preceding decade, and imports of capital goods and raw materials represented 76.1% of total imports in 1972 compared with 29% in 1950-1952.

By focusing import substitution primarily on consumer goods, the process of industrialization altered the role of imports, turning them from a supplementary element of consumption to a key factor in the operation and expansion of the country's industry. However, although the process of import substitution industrialization reduced the relative importance of foreign trade in economic growth, it closely linked the capacity for economic growth to the capacity to import. For the economy to continue developing as it has in the last 3 decades, and given the key role of imports in capital formation, an increasing volume of imports will be required. At present, raw materials and intermediary and capital goods that are essential for the operation and expansion of the economy constitute a rigid 45.9% of imports.

In the late 1960s and early 1970s attempts were made, particularly through incentives established by the government, to increase the access of Mexican manufactured goods to foreign markets, although this search for new markets is not conceived as a substitute for the domestic market. The impact of government policies on increasing the exports of manufactured goods is illustrated by the changes in trade figures. In 1940 consumer goods represented 15.8% of the value of exports; in 1970, 54%. Manufactured goods in general generated almost 40% of the income derived from exports in 1970. However, because of the relative decline of foreign trade, the ratio of exports of manufactured goods to gross domestic product actually fell over the past 3 decades: in 1950 they represented 3.3% of the gross domestic product and 17.7% of the total output in manufacturing, whereas in 1969 the percentages were 2.1% and 9.5% respectively.

**Public Financing:** The direct participation of the state in productive and service activities has traditionally taken place whenever industry was in need of a drastic change, either to improve its profitability or to supplement in general the shortcomings of private enterprise. State-owned enterprises are oriented toward basic industrial activities (steel, oil, petrochemicals, mechanical products, metallurgy, fertilizers, cement, sugar, etc.), which require relatively large investments. Among

the 500 most important firms in Mexico, 81 were established with government funds. The predominance of state intervention is even more marked among the top 10 firms, eight of which belong to the state. However, the government does not wish to compete with private capital; rather it has tried to meet the needs of industrialization that the local entrepreneurs were not able to meet or not interested in meeting, either because of the large investments required or because of the risks involved. Furthermore, in global terms, the share of public investment has declined over time: in 1942 public investment represented 52.3% of total investment; by 1960 this percentage was 34.4% and in 1970 it reached 38.1%.

Up to 1960 more than half of the public funds were invested in infrastructure works for agriculture, transportation, and communications. Since 1940 approximately 30% of total public investment has been channeled to the industrial sector, mainly through the "Nacional Financiera," which provides long-term credit to industries engaged in import substitution, as well as to the crucial capital goods sectors such as iron, steel, and oil.

**Foreign Finance:** During the 1960s direct foreign investment increased its participation in gross fixed investment, whereas it began to decrease in the 1970s, representing only approximately 5% of gross fixed investment in 1970. However, public investment, and the current and capital accounts of the balance of payments, reveal a significant dependence on external financing, which exerts an increasing pressure on the capacity of the Mexican economy to meet its international payments.

Foreign investors have moved from one field of investment to another as a result of the profitability guaranteed by the government in selected sectors. At the beginning of the century direct foreign investment was concentrated in mining, public services, communications, and transportation. The same situation prevailed in 1940, although investment in mining had declined. In 1970 manufacturing absorbed almost three-quarters of total direct foreign investment, whereas in 1940 it absorbed only 7%. Foreign capital is predominant in all the branches where complex technology is required.

The United States accounted for 80% of the value of foreign investment in 1970, and 73 of the 100 most important American firms classified by "Fortune" are represented in Mexico. The remaining 27 companies are legally excluded from acting in Mexico by the 1938 Petroleum Expropriation Act, or they are aircraft construction firms, which are clearly limited by the size of Mexico's domestic market. Of the 20 largest firms operating in Mexico, about one-half are foreign owned. In 1970, of the 1883 firms that are registered as foreign, 54% were totally foreign owned. The absolute value of direct foreign investment in Mexico and its relative participation in the accumulation of capital since 1940 have tended to increase. Between 1965 and 1970 the total assets of foreign firms grew in line with domestic resources, but their share of external financing decreased. Thus it is likely that foreign firms in Mexico have grown with the help of domestic savings.

Furthermore, foreign investors are increasingly buying industries that are already established. This process, which began in the 1960s, affects the manufacturing industry in particular (food products, chemicals, electricity, machine tools). Foreign investment becomes predominantly financial and thus tends more and more to call on Mexican funds (these represent about 80% of total liabilities), even for reinvestment and acquisition of existing firms. This means that domestic resources contribute toward strengthening the position of foreign capital.

The "open door" policy of the Mexican government toward foreign capital was intended to eliminate the bottlenecks in obtaining the scientific and technological requirements for industrial growth. A law was enacted early in 1973 to promote national investment and to regulate the flow of foreign investment. The law was mainly designed to negotiate the participation of foreign capital in the economy rather than to eliminate it as a competitor. A maximum participation of 40% is allowed to foreign investors in all the branches that the legislation does not specifically reserve for national firms. Foreign investors must seek authorization before purchasing more than 25% of the capital of a private Mexican firm or more than 49% of its fixed assets.

**Industrial Concentration:** Industrial concentration is a characteristic of the branches where foreign capital predominates. A census taken in 1965 showed that 938 firms, owning only 0.8% of the total industrial establishments, accounted for 64.2%



of the total industrial production and 66.3% of the total capital invested in industry. Of these 938 firms, 68% belonged to local private capital, 26.7% were owned by foreign capital, and 5.3% were public. As a result foreign investment has acquired a predominant place in the production of basic industrial products and in the most dynamic branches of industries. Furthermore, many enterprises are directly or indirectly controlled by large groups. In 1962 five of these large groups were managing approximately three-quarters of the joint assets of the commercial banks, financial firms, savings and loans banks, and mortgage banks, as well as 60% of the assets of insurance companies and capitalization banks.

**Linkage of Industrialization with Agriculture:** Agriculture has contributed toward the development of the economy basically through an increased supply of food and raw materials, displaced labour, foreign exchange, and the net transfer of capital. On this last point, an analysis of the intersectoral transfer of capital - through fiscal policy, the ratio of agricultural prices to general price levels, and the private-banking system - reveals a net balance in favour of the nonagricultural sectors of the economy.

Until roughly 1961 the agricultural sector was able to take advantage of foreign market opportunities, such as the postwar condition, the Korean War, and even the cancellation of the sugar quota formerly assigned to Cuba by the United States. After that, the composition of farm output changed, and consumer goods began to lose importance, while industrial agricultural products gradually increased their share of total output. Agricultural production has now come to serve mostly the internal market.

The average annual growth rate of both the cultivated areas and yields has remained unchanged since about 1956. The growth of output was basically due to increases in cultivated land, to investments in irrigation works, to the introduction of improved seeds for the main crops, to a more intensive use of fertilizers, and, in general, to the introduction of more advanced farming methods. Further expansion now depends upon increasing yields because the possibilities of extending the cultivated lands are few and very costly. As agriculture depends increasingly on the domestic market, its growth is conditioned by increases in national income and improvements in the distribution of income.

**The Market Problem:** Ever since import substitution began, the necessary conditions were created to satisfy the needs of an ample internal market. However, the peculiar features of the Mexican economy did not allow the effective linkage of market potentialities with the newly established industrial capacity. With a population of about 50 million in 1970, Mexico possessed a sizable potential domestic market that favourably compared with any of the European industrialized countries. However, the low purchasing power of the majority of the Mexican population, even though it has been raised in recent years, is still a limiting factor in the expansion of the domestic market.

Unbalanced regional development has been another limiting factor in the expansion of the domestic market, and from the beginning of the present century to 1960 regional economic disparities increased cumulatively. The geographical concentration of income has prevented a real incorporation of the inhabitants of marginal areas into the domestic market. Regional development projects not only have been unable to overcome this trend, but in some cases have even contributed toward accentuating it. In addition, domestic demand is severely restricted by the fact that 40% of the population supports itself from low-productive farming activities.

The unequal distribution of personal income has also seriously limited the expansion of domestic demand and has generated a structure of production focused on consumer goods for the high-income strata. In addition, it has led to a stratified and diversified domestic market that prevents the efficient utilization of imported technology, which has been designed for a relative factor endowment and market scale different from those existing in Mexico. Protective measures, which have practically reserved the domestic market for local entrepreneurs and eliminated foreign competition, have allowed Mexican industry to operate at high costs. This situation, together with the oligopolistic structure of most industries, is another factor that has adversely affected the expansion of internal demand.

**Income Distribution:** The Mexican economy has shown a marked trend toward an increasing concentration of income due - among other things - to a regressive tax

structure, to a high concentration of the ownership of the means of production, and to the fact that the labour force, as an organized power group, has had little influence upon determining the behaviour of the distribution process. The situation in income distribution deteriorated steadily from 1950 to 1965, to the disadvantage of the lowest 50% of the income scale. Families with the lowest incomes (50% of the population) earned 19% of the national income in 1950 but only 15.4% in 1963-1964, whereas the top 20% of the income scale enjoyed a stable share of the national income - 59.9% in 1950 and 58.5% in 1963-1964.

The concentration of the means of production is undoubtedly the main factor in the uneven distribution of income. For instance, in 1960 the owners of 2.8% of the land possessed 31.5% of the value of machinery and 31.5% of all irrigated lands. In the same year 1.5% of industrial concerns possessed 77.2% of the capital invested in industry.

The economically active Mexican population is seriously affected by unemployment and underemployment. An estimate was made of the level of "equivalent unemployment," defined as the number of persons who would be unemployed if the total employment of the underemployed were distributed in such a manner that only the fully employed were integrated into the productive system. The equivalent unemployment thus obtained was 3 million people, i.e., 23% of the economically active population.

More than half of the underemployed live from agriculture, where productivity has persistently deteriorated. Industry has been unable to absorb the increasing migration of rural labour toward the cities. It has been asserted that demographic growth, rural migration, and the type of technical changes in industry all aggravate the employment situation.

## INDUSTRIALIZATION IN PERU<sup>(9)</sup>

### Historical Background

Historically, Peru has been and is an economy established on the basis of dependence upon the international capitalist system. Until very recently the Peruvian economy was geared almost exclusively toward exports, based on the extraction and production of raw materials (agriculture and mining). The initial and disconnected attempts at industrialization were primarily due to problems of supply and "blockades" of the foreign sector and, incidentally, to the income effect resulting from urban development. The local power groups, closely linked to foreign capital, controlled the subsidiary activities related to exports and finance and lacked the stimulus and motivation to undertake industrial activities.

During the 19th century and until approximately 1890 local accumulation took place mainly through foreign loans and the exploitation of guano, saltpeter, sugar, and silver. Between 1890 and 1900 agricultural activities in the great landed estates and exports permitted a certain growth of the manufacturing and financial sectors. Domestic demand increased and earnings from import duties allowed fiscal revenues to increase. This situation permitted an expansion of certain light industries and consumer goods, such as cotton and wool textiles, flour, beer, ice cream, chocolates, furniture, and leather.

Toward 1910 between 50% and 60% of the value of exports was accounted for by sugar, rubber, cotton, and wool products, which at that time were enjoying a boom in the international market. The flow of foreign capital was centered almost exclusively in the field of profitable exports. United States investments began to concentrate in the field of mining, primarily copper and oil. As these new investments developed, there was a decline in the growth of cigarette manufacture, matches (they became a Swedish monopoly), and candles (when electric power appeared as a substitute).

From 1920 to 1930 the country received a considerable influx of foreign investment because of the facilities provided to remit funds abroad. Government policy concentrated on promoting and financing urban development and modernization of Lima and, although it provoked a construction boom, it also generated budgetary problems. The volume of public expenditures was negatively affected and the weight of the public debt increased. The period thus ended with a pronounced deficit in the balance of payments. Exports lost part of their dynamism and manufacturing declined, with import substitution occurring only for fuels.

From 1930 to 1940 imports of other consumer and intermediate goods were substituted (for example, some chemical and pharmaceutical products), with signs of a weak and short recovery of manufacturing activities from 1932 to 1934.

It is interesting to highlight the growth of foreign investment during this period. At the end of the 19th and at the beginning of the 20th century there were substantial direct foreign investments in the sectors producing for exports and in the manufacturing of goods, particularly textiles. British capital was invested preferably in services, railroads, commerce, and manufacturing activities. United States capital, which occupied a leading position after World War I, was invested mainly in export activities, particularly mining. At the beginning of the 20th century 5% of exports was controlled by foreign firms, by 1920 the figure was 17%, and in 1930 it went up to 50%. Furthermore, toward the end of the 19th century the export of finance capital generated in the country was high.

#### The 1940-1968 Period

From 1940 to 1948 there was a policy of intervention in industrial development conditioned by World War II. In 1940 the first Industrial Promotion Law was passed, providing tax exemptions for companies entering into agreements with the state. Certain consumer goods were subsidized, and rather rigid controls were applied to trade and foreign exchange transactions. To expand the influence of the state on the economy, a number of laws establishing state-owned enterprises were passed: the Corporation of the River Santa Valley (CORSAN), the Civil Aviation and Airports Corporation (CORPAC), the Peruvian Amazon Company, and the State Oil Enterprise (EPF).

In 1948 the export sector was given renewed support and economic policy was once again established on a traditional and liberal basis. The external tariff structure was modified (combining it with ad valorem duties) and rates were increased to protect fiscal revenues during periods of rising costs. Duties on the import of consumer commodities were slightly increased, with heavy increases in the duties on inputs or commodities of difficult substitution, motivating a distorted domestic demand. Lastly, foreign investment in the mining sector was stimulated through the 1950 Mining Code.

During the late 1950s and the 1960s industrial growth was accelerated with the emergence of a vague and confused industrialization policy, which ended up by encouraging all kinds of industries. In 1959 a new industrial promotion law was passed, providing the framework for the "easy stage" of import substitution. Above all, it fostered industrialization at the level of consumer goods. During this period the industrialization process was geared toward a highly concentrated market structure linked to the unequal distribution of income, and was fostered by the balance of payments crisis and the devaluations that took place in 1953 and 1958. Foreign investment increased and received special treatment in the mining field, the oil industry, and the electric power sector.

A new import tariff structure was established in 1964, and updated in 1967, placing low duties on imports of capital goods and heavily taxing foreign consumer goods. Nominal protection was less than that provided by other Latin American countries, but effective protection was greater for traditional consumer products.

Public investments, which concentrated in the construction industry, were financed to a large extent by foreign loans. Fishing and electric power activities were also promoted, but the most favourable treatment was accorded to mining and oil industries. The agricultural and livestock sectors were practically neglected and the agrarian reform virtually remained on paper. Generally, the state intervened through the state-owned companies and the development banks, but the state's entrepreneurial sector grew rather slowly.

As part of the modernization of the state apparatus demanded by the International Monetary Fund and the World Bank, the Central Office for Studies and Programs (Ministry of Finance) was established in 1961. The National Planning System was created in 1963 under the stimulus of the Alliance for Progress, and the Central Reserve Bank was entrusted with the preparation of the National Plan for Economic and Social Development, 1962-1971.

As to monetary and financial policies, the state sought monetary stability and free convertibility of currency, which in practice became the basis for the import substitution industrialization efforts.

By the mid-1960s it was obvious that Peru was, as a result of its incorporation in the international capitalist system and the survival of precapitalist forms of production, a country where the oligarchy and foreign enterprises played an essential part in its economic and political life, having as their main economic support base the export, commercial, and financial activities. These activities appeared as enclaves, because they arose from the accumulation needs of foreign capital and their countries of origin. But within the country these activities have an economic and social weight far greater than their name as enclaves implies. The domestic market did not provide the initial demand for industrialization but merely expanded as a result of it. Industry developed slowly, conditioned by the lows and highs of export activities, on the basis of light industries and consumer commodities and under the control of a weak bourgeoisie lacking effective independence with respect to the local oligarchy and foreign centres of power.

For these reasons industry showed the following main features at the beginning of the 1960s: a dualistic structure existed where the traditional sector generated about two-thirds of industrial employment and only 1.8% of industrial production, and where the modern sector comprised 6% of the enterprises but contributed 92% of industrial production; industry absorbed only 9.5% of the approximately 86,000 workers annually seeking employment, and 92% of the firms employed less than five people; manufacturing industries were concentrated in the capital region of Lima and Callao; about two-thirds of the companies produced consumer goods for final consumption; industry was strongly controlled by foreign interests with respect to both ownership and technological, financial, and commercial decisions, and it depended on foreign sources for inputs and essential capital goods; lastly, the multiplying effect of the foreign sector was minimal, because only 2.5% of its inputs were of industrial origin. This situation was aggravated by an industrial policy emphasizing free enterprise and a free exchange rate and characterized by the enforcement of monetary stability and anti-inflationary policies.

#### The 1968-1975 Period

During 1968-1973 industrial production for export continued to play the main role in economic growth, setting the pace for the import substitution process. With the exception of 1971 the balance of payments was positive, due to the favourable development of export prices, the influx of foreign capital, and foreign exchange control. Direct foreign investments receded temporarily in 1968-1969, but once the treatment of foreign capital was made clear, foreign investors returned, particularly in the extractive industries (mining and oil). Starting in 1971-1972 increases in the long-term capital accounts permitted compensation of the deficit in the trade balance but caused a rapid growth of foreign debt.

The expansion of the productive structure was based on the secondary sectors (manufacturing, construction, energy). Mining activities grew slowly and the agricultural and livestock sectors have witnessed a decline in output since 1971. The situation in the agricultural sector illustrates in many ways the achievements of this period and the constraints that the economy faces at present.

The agricultural sector has been characterized by an acute concentration of landholdings: 1% of all landholdings comprise 14 million hectares, whereas 85% of small landholders own a total of only 2 million hectares. Confronted with this fact, the state remained voluntarily passive. The 1969 agrarian reform redistributed land among peasants and represented a transformation of the form of land tenure, and the agro-industrial complexes, which remained as large landholdings, were nationalized and transformed into cooperatives. Although cooperative and collective production have developed for a substantial segment of agricultural activities and workers, income inequalities among the rural population have not yet been reduced significantly.

With regard to financing support for agriculture, there has been a predominance of short-term credit, while loans to promote export products represented 38% of the total loans, and public investment has been channeled basically to irrigation developments. Furthermore, the lack of technical assistance and the low prices for agricultural products have not helped the expansion of agricultural production. The farm-to-city trade has been unequal, to the advantage of urban traders, industrialists, and exporters. As a result agriculture has endured a marked process of decapitalization in favour of the commercial, service, and industrial sector, and the agricultural sector has grown at a very low rate (around 1% net average per year) or has stagnated in

comparison with population growth.

In the industrial sector the state assumed the majority of the costs of supporting the inherited import substitution industrial structure and of the efforts required for industrial modernization, increasing its investments in the basic productive sectors and going beyond the usual investments in infrastructure. Private investments, which had declined appreciably since 1965, showed a short-lived recovery in 1971 due to reinvestments consolidating the traditional productive structure (mainly in facilities).

However, the activities of public enterprises were adversely affected by the rapid development of the international crisis and by the inexorable growth of the foreign debt, particularly when international financing bodies adopted a stiffer attitude, creating serious financing problems.

During 1973 there was a crisis in the fishing industry caused by the overcatch of anchovy, with the consequent reductions in export earnings and in agricultural production (a 3.6% decrease between 1970 and 1973). Additionally, a pronounced increase in inflation took place and prices increased by 15.1% compared with the 6.7% average from 1969 to 1972.

Revenues from exports were undermined because of the substantial increase in the foreign public debt, which went up by 93.2% between 1972 and 1974. But this foreign support, together with a slight recovery of the fishing industry and the growth of industry and construction activities, permitted a growth rate of 6.6% in the gross domestic product by the beginning of 1974.

However, in that year the effects of the international crisis began to be overwhelming: export prices dropped, import prices rose, and the current accounts balance showed a deficit of \$809 million, which was covered through still more massive foreign financing.

In 1975 the different elements of the internal economic crisis developed and converged: the gross domestic product grew by only 2.5% during the first 6 months, with a reduction of 5% in the agriculture and livestock sector and of 6% in mining (due to the negative effects of high internal prices and slack international demand). Similarly, the construction industry grew at a rate of only 4.5% (compared with 19.5% in 1974) due to lack of investments in that sector. Industrial production also dropped its rate of growth (from 8% in 1974 to 5% in 1975) due to the higher cost of imported inputs and capital goods, as well as to the constraints imposed on imports.

In this way the negative trade balance at the end of the first 6 months of 1975 was 30% greater than for the same period in 1974, with the consequent reduction of international reserves and the lack of liquidity of the domestic financial system. The state attempted to control inflation by freezing wages, controlling expenditures abroad, reducing subsidies, and increasing taxes.

### Key Features of the Peruvian Economy

**Capital Formation and its Financing:** Although by 1973 the state already played an important role in the allocation of resources, local financing of expenditures was rather limited because of the economic crisis and the distrust for the new regime shown by the private financial sector. Furthermore, tax revenues were handled prudently at the beginning, it being feared that any increase in the tax burden might undermine the support of the government among the urban middle class. There was extensive use of foreign indebtedness, thus increasing financial dependence.

Foreign investments, which have been present in Peru since the end of the 19th century, have been predominant because of the advantages that international corporations have over national firms with respect to financial and technological resources, as well as capacity and efficiency in marketing and management.

Peruvian capitalists, in spite of their participation in earnings from foreign trade, were never in a position to take the lead in industry. Foreign investments that poured into the country were at all times more powerful and kept the economy in a near-bankrupt situation. When local entrepreneurs were displaced from export activities, they found it most difficult to reinvest in industry and showed little interest in doing so. They remitted their profits abroad and engaged in the consumption of luxury items, thus reducing savings. Thus, in 1969, 67% of medium-sized firms were subsidiaries of

American firms, primarily engaged in producing intermediate goods. Whatever the way of looking at proportions between foreign and local capital in the control of the productive structure, the important thing is that the common interests and linkages between foreign and national investors have always been very solid.

A 1969 survey revealed that, in general, local entrepreneurs invested preferably in activities geared toward local consumption. The main obstacle for them was the narrowness of the local market, kept captive by foreign enterprises. For many of them, the lack of capital and technology was a serious disadvantage. The majority of local enterprises interviewed had begun with less than 20 workers.

The largest industrialists, who looked toward the possibility of introducing new production lines and increasing production, believed that the state should develop strategic industries and that it should promote the substitution of intermediate and capital goods. The small industrialists were far more conservative and were very concerned with mechanizing their activities and introducing technical improvements.

Beginning in 1968 new forms of treatment of foreign capital were introduced through decrees, with the intention of establishing some national control over natural resources, of controlling basic industries, of participating directly in the international market for Peruvian primary exports, of restraining foreign penetration in certain areas, of improving the national bargaining position in other fields, and of reducing the transfers of surplus abroad. The state assumed control of the oil industry, communications, railways, part of the financial sector, the fish-meal industry, electric power generation, part of the mining industry, and some intermediate goods industries (cement and fertilizers). Foreign firms in the agricultural field were also expropriated. However, international capital continued to be important in large-scale mining activities and in supplying technology, finance, and market outlets, thereby ensuring its dominance over industries that had Peruvian majority stockholders or that were state controlled.

Thanks mainly to the influx of foreign capital (direct investment and loans) the investment rate has been high in relation to the gross domestic product, and since 1965 a trend has developed toward greater participation of the public sector in investment, with local capitalists remaining basically as financiers and rentiers.

Income Distribution: Income distribution in Peru has traditionally been highly skewed and has steadily deteriorated in a regressive pattern, which, together with the oligopolistic structure of the productive system, explains the narrowness of the domestic market.

In 1969 the highest average salaries were paid by banks and insurance companies, followed by the mining industry and electric power generation. The lowest were found in agriculture and in services, although these activities employed the majority of the economically active population. An intermediate position was occupied by industry, construction, defence, and public administration. Regional disparities were substantial, the highest salaries being paid in Lima and the lowest in certain jungle areas.

Factors of Production and their Use: During the past 2 decades the investment coefficient has represented about 20% of the gross domestic product, and the productive capacity, particularly with respect to capital resources, has increased. However, the productive system shows a distorted structure, oriented toward a diversified urban market, and its various sectoral components are disproportionate, thus generating an idle capacity of about 45% on the average. This helps in understanding why production has increased during recent years to a larger degree than new investments. There is no data regarding the degree of efficiency and obsolescence of capital stock.

The potentiality of the labour force is still much underused. Not only are the traditional unemployment and underemployment rates very high - a combined total in excess of 40% - but there is also a lack of correspondence between the level of training of the labour force and the requirements of modern industrial production.

Foreign Trade: During the 1950s and 1960s exports increased and became more diversified but did not change their basic primary nature, showing high sensitivity to short-term fluctuations in international markets. Export prices declined in the 1950s but rose in the 1960s, resulting in a 41% improvement in the terms of trade.

Around 1950 Peru was basically an exporter of agricultural and livestock products such as cotton, sugar, and wool, but toward the end of the 1960s the most important

exports were fish meal and mining products such as copper, iron ore, lead, zinc, and silver. The reduction in agricultural and livestock exports was due to the combined effect of policies that were detrimental to farming activities, of the slow expansion of international demand together with the low income elasticity of such products, of the protective policy of certain industrialized countries, and of the increasing competition from substitute products. As to the fishing industry, the introduction of nylon nets in 1956 helped enormously in "anchoveta" catches, and changes in processing technology increased the production and exports of fish oil.

Beginning in 1968, with the overt intention of depending less on the foreign sector, the state increased its participation in, and its control over, domestic marketing activities and attempted to orient resources to domestic needs, at the same time that it diversified foreign markets. However, the main export products have continued to be the same, it has been difficult to sever old and forge new links in the international markets, and exports have continued to be dependent on the demand for raw materials and inputs. During 1968-1973 the volume of exports remained static, but the rises in prices permitted an almost 30% increase in the total value of exports. Mining products increased their share of the total, although limitations arose with production capacity and with the upsurge of severe labour problems. Fishing products reduced their share because of the overcatch of "anchoveta" and the depletion of this resource.

Imports have increased very rapidly, 7% annually, during the last 2 decades because of the peculiarities of the import substitution industrialization process, the stagnation of agriculture, and the unfavourable gap between local and foreign prices. During the 1950s imports of consumer goods increased above all others. During the 1960s the greatest increase was in imports of raw materials, responding to an import substitution policy for nondurable consumer goods.

From 1963 to 1968 was the first peak period of import substitution for the production of goods employing simple technologies, which increased the dependence on imported inputs. Foreign indebtedness was resorted to and in 1967 it became necessary to devalue the currency. After 1968 the rate of growth of imports dropped somewhat (to 5.7%), whereas imports of industrial inputs and capital goods grew at a somewhat faster rate than consumer goods. The limitations imposed on imports of luxury items had palliative effects, although their application left much to be desired.

State Intervention in the Economy since 1968: Once the state began in 1968 to assert its role as entrepreneur and extended the process of import substitution, industry expanded to cover certain difficult types of production (basic industries for intermediate goods and the metalworking industry). A new economic policy appeared in the early 1970s and an ambivalent industrial strategy was implemented with priority given to the development of heavy and strategic industries, although incentives were also given for the growth of light, labour-intensive industries.

Other policy measures aimed at converting the export-oriented sector into the driving force for industrialization and at expanding the domestic market and making it more uniform. Measures were also taken to orient foreign investments toward oil, mining, and nonbasic industries, and regulations were established for profit remittances as well as for the approval of technology contracts. A system of progressive conversion of foreign into mixed enterprises with the participation of local capital was put into effect, and workers' participation in the ownership and management of industrial enterprises was established through the "industrial community," which bought shares of the enterprises using a percentage of the enterprises' net income before taxes. Industry acquired an effective priority with respect to agriculture, although the latter was said to set the basis for industrialization. Public investments declined in agriculture and increased in industry. Agrarian Reform Bonds payments to former landowners were channeled mainly to industry, although the funds to redeem these bonds and invest them in industry were soon exhausted. The replacement of unsophisticated technologies was promoted, stimulating the local production of inputs, the training of the labour force, and the development of certain local technologies, above all, agricultural, livestock, and craft activities. Finally, a network of research institutes and funds was established by setting aside a small percentage (between 1% and 2%) of the enterprises' net income before taxes for technological research.

However, this change did not succeed in altering substantially the pattern of industrial growth. Dependence on intermediate and capital goods has increased along with efforts to substitute imports, and a large part of the consumer goods produced

locally are nondurable. Furthermore, industrial expansion has taken place through greater use of previous installed capacity and reinvestments, with little new investment taking place.

Foreign capital continues to control the largest enterprises and the most profitable activities: rubber, mining, oil, chemicals, automobiles, electronics, and pharmaceuticals. Foreign exchange policy has favoured the trend to use capital-intensive technology, a trend that has strengthened during recent years.

The industrial structure is still extremely concentrated: on the average a few (no more than four or five) large firms in most industrial branches control from 50% to 80% of production, and in some specific lines of production they control 90%. The geographic concentration in the Lima-Callao area continues.

The development-banking system established by the state has supported small and medium-sized mining operations and industries, but loan allocation criteria (interests, repayment conditions, etc.) have not varied substantially. The commercial-banking system has increased appreciably its share of loans to industry.

## THE INDUSTRIALIZATION PROCESS IN VENEZUELA<sup>(10)</sup>

### Historical Background

Venezuela began to form part of the international division of labour as a raw-material exporter and an importer of manufactured commodities, and this situation still persists despite changes that have taken place in the economy. Throughout the development of the Venezuelan economy the productive structure has been directed toward the production of primary export commodities. The situation appeared successively in the form of the predominant production of indigo, tobacco, coffee, cacao, and, since the 1930s, oil. The coffee cycle emerged at a time when indigo and tobacco, then the traditional export products, were in the midst of a serious crisis, because indigo was replaced in the international market by artificial dyes, and Venezuelan tobacco had to compete with other regions where more advanced production methods were employed.

The international market thus played a major role in the development of the Venezuelan economy and, above all, in conditioning the structure of the key branches of industry. The domestic market played a very small role in comparison with the demands of the central countries within the framework of the international capitalist division of labour, even though manufacturing production was oriented toward the internal market. At the same time foreign capital acquired considerable importance, particularly when oil resources began to be exploited. Both factors, the world market and foreign capital, complemented each other and to a large degree defined the specific nature of Venezuelan economic development.

The productive structure shows marked imbalances among the different branches of industry, and these imbalances also stand out regionally. Moreover, although these internal differences existed for a long time, they were aggravated even more when oil exploitation started. One of the most outstanding consequences of the coffee cycle was the emergence of an increasing imbalance among regions that, in one way or another, benefited from coffee production and trade, and others that were completely deprived of such benefits and endured an economic regression. The oil boom accentuated these differences and also had a negative effect on the development of scientific and technical capabilities.

The operational capabilities required for the establishment of the oil industry required technologies that the productive structure, and the level of scientific and technological development in Venezuela, were not in a position to provide. The oil industry developed on the basis of foreign demand and was sustained by the technological advances taking place in the United States and Europe. This process of mimetic technology transfer helped to thwart the organic development of indigenous technological capabilities. The phenomenon of technological dualism is largely a consequence of this form of technological implantation: at one extreme are a few enterprises making intensive use of modern technology, and at the other are firms using traditional technologies that date from Venezuela's economic past.

The process of industrialization in Venezuela was, although to a lesser extent than in other Latin American countries, related to World War II, which closed foreign



supplies and forced the creation of some industries, particularly in the food branch. These were later favoured by the accumulation of foreign exchange, the expansion of public expenditures, and a relative increase in domestic demand, which resulted from oil revenues (although most of these were squandered on luxury imports). Venezuela did not start a drive toward industrialization to the same degree that other Latin American countries did during the war, primarily because oil revenues continued to flow during the conflict, because of the privileged character of oil as a strategic resource, which ensured a preferential treatment to Venezuelan imports, and because the lack of a technoeconomic infrastructure, of coherent policies, and of human resources prevented Venezuelan industry from taking advantage of the import restrictions to stimulate local production.

The industrial structure, which developed under the support of import substitution policies, was biased toward high capital intensity. Therefore, it had a low labour absorption capacity and operated within a system where consumer goods industries prevailed over intermediate and capital goods industries. This led to greater dependence of the national productive system on the central economies exporting capital goods.

#### The 1940-1959 Period

In 1936 industry was characterized by the predominance of artisan activities, progressing slowly toward small and medium-sized industrial units. In that year more than 50% of the enterprises were related to food processing, thus reflecting the dependence of industry on agricultural activities. The technology employed had a low capital-labour ratio.

Beginning in 1940, as a result of World War II, the economy endured the impact of a partial shutoff of foreign supplies for the sector that served the domestic demand, resulting in an incipient industrial boom. The net formation of fixed capital in the private sector of the economy rose from 52.8 million bolívares in 1940 to 406 million bolívares in 1948. Imports also diminished, but after 1944 a process of recovery began. The oil industry began to have a positive impact on the domestic demand as of 1945. A higher level of purchasing power diffused throughout the rest of the economy through public expenditures, but it was mostly channeled toward imports. Thus began a process of industrial growth that was based primarily on foreign technology, as was reflected in the reduction in the number of Venezuelan patents as compared with patents from the United States and Europe: from a 20% share of domestic patents registered between 1901 and 1927, the share dropped to 12% in 1940 and to nearly 10% in 1950.

Beginning in 1950 the oil industry was characterized by an extraordinary boom resulting in a high monetary flow into the economy. Total government revenues tripled in a decade, going from about \$2 billion in 1950 to nearly \$6 billion in 1959. Gross fixed investments showed a relatively high growth: between 1950 and 1957 average investments represented 27% of the gross domestic product, whose growth rate was 8.4% for that period.

The manufacturing sector expanded considerably. In 1959 it occupied second place in the distribution of investments, with oil leading with a share of 14% (in 1950 oil represented 7%). Overall, there was a noticeable change: the secondary sector's participation in the economy rose to 19% in 1959, after having stood at 10% in 1950. Within the industrial sector the machinery and equipment industry accounted for 30% of investments, whereas the construction and improvements branches reached 57%.

During this period industrial growth took place within the framework of two contradictory forces: on the one hand, it was stimulated by the growth of demand arising from the increase in public expenditures; on the other, it was hindered by the application of the Treaty of Reciprocity with the United States, which kept the domestic market open with very low customs duties for products from that country. This resulted in industrial growth stimulated by the increased revenues but limited by foreign competition. The tariff policy, aimed at protecting industry, did so only for foodstuffs, beverages, and textiles, with the effectiveness of protection being limited by the Treaty, which was revised only in 1959. Therefore, industrial growth took place in those branches that were of no interest to importers.

Industrial growth was sustained by a large foreign exchange reserve and by unrestricted foreign exchange policies, which meant a high import capacity. As a result industry developed on the basis of modern equipment imported from the United States and Europe. Credit, fiscal, and tariff policies, with no selective criteria,

contributed to the development of a technological situation heavily dependent on foreign sources. During this period there was low absorption of labour, and between 1950 and 1959 only 54,000 new industrial jobs were created. This was the result of using capital-intensive techniques and modern labour-saving equipment and machinery, which was not compensated for by an adequate rate of expansion of industry. This low absorption of labour took place not only in industries with advanced technology, such as the chemical and metalworking industries, but also in traditional industries, such as the apparel, footwear, and textile industries, probably because of the modernization of the old plants.

Toward the end of the 1950s the Office of Coordination and Planning (CORDIPLAN) was established, with responsibilities for planning economic and social development. In 1959 the Ministry of Education established the General Education Planning Office (EDUPLAN). Furthermore, the Central University of Venezuela established the Scientific and Humanistic Development Council. Attempts at technological research were made through the establishment in 1958 of the Venezuelan Institute for Technological and Industrial Research (INVESTI), sponsored by entrepreneurs and foreigners residing in the country.

In the field of patents a new law was passed in 1955, which stimulated and consolidated the participation of the foreign capital in the economy because the national private sector received no preferential treatment; the law thus failed to provide incentives for local inventiveness.

### The 1960-1973 Period

After confronting a recession during the early 1960s, the Venezuelan economy returned to a favourable balance of payments position, which led to an increase in international reserves from \$580 million in 1962 to more than \$1 billion in April 1971. The economy had an average annual growth rate of 5.5%, and investments represented an average of 16.7% of the gross domestic product. As to the gross fixed investments, there was a relative reduction in the participation of the machinery and equipment sector (dropping from 19.7% in 1960 to 16.3% in 1969). Imports rose from 3,273 million bolívares in 1960 to 7,382 million bolívares in 1970, with primary products, machinery, and equipment showing a marked increase during the decade. These figures are the result of the continuance of the import substitution policy instituted during the previous decade, which included the development of the petrochemical and metallurgical industries and the application of industrial complementation criteria with other Latin American countries.

An important result arising from the industrial growth pattern of Venezuela was the effects produced by conflicts between the productive capacity of manufacturing units, conceived for large-scale markets, and the effective limitations imposed by the demand characterizing the Venezuelan market. This difference, carried over from the previous period, reveals itself in the large idle capacity of plants, which in 1975 was about 40%.

The fiscal policy established during this period tended to favour the importation of foreign technology through fiscal exemptions that facilitated the purchase of machinery and equipment abroad. Furthermore, the accelerated depreciation rates for equipment and machinery that firms were allowed to use stimulated the early replacement of such units, thus favouring their purchase abroad. At the same time fiscal policy failed to stimulate the development of local technology.

From the credit policy point of view, technological considerations were not introduced as part of the requirements for the approval of loans, thus preventing the determination of the most suitable technology for each case. Profitability was the prevailing criterion, and it was relatively easier to obtain loans for investment in fixed assets than for working capital.

There is no foreign exchange control in Venezuela, which makes impossible any kind of effective control of foreign investment, thus favouring unrestricted technology imports.

Industrial promotion instruments were established on the basis of a protectionist import substitution policy, which, although permitting a certain growth of the sector, was turned into a mechanism whereby foreign interests dominated Venezuelan industry. Foreign capital, primarily from multinational corporations, penetrated the economy by two routes: investments in key sectors of industry, and the acquisition of

existing local firms.

The process of import substitution industrialization, which transfers to the country the production mainly of consumer goods on the basis of imported technology, has come to represent a new form of dependence for the Venezuelan economy, limiting the development of local scientific and technological capabilities. For example, in 1970 there were only 306 researchers in the manufacturing field, representing 12% of the total and absorbing financial resources representing nearly 11% of the total expenditures for research and development.

The rise in oil prices decreed in September 1973 changed the world situation, putting vast amounts of foreign reserves in the hands of oil-producing countries like Venezuela. However, the possibilities opened were not used to the benefit of the country as was thought possible. The surplus oil revenues did not find an easy road to productive investment and were mostly kept in the international market on a short-term basis. Large industrialization projects, such as petrochemicals, had to resort to international financing. The most visible effect of surplus oil revenues was inflation.

In recent years large investment projects that have started have had difficulties with completion and have faced a shrinking world market. Furthermore, as a result of the world recession, which has brought down the demand for Venezuelan oil by nearly 40% since 1973, the first quarter of 1976 brought a balance of payments deficit, forcing the government to revise its investment, subsidy, and budgetary plans.

#### Remarks on the Recent Evolution of Venezuela's Industrialization Strategy

The changing world economic situation, particularly after the rise in oil prices in 1973, has forced a reappraisal of the industrialization strategy followed by Venezuela. This is reflected in the new development strategy outlined in the fifth National Development Plan (1976-1980), which seeks to accommodate the development of Venezuela to the new situation arising out of the rise in oil prices, with the consequent increase in the national revenues, and out of the relative failure - within the import substitution model - of the initial solutions posed to counteract the exhaustion of import substitution industrialization, and the subregional integration schemes (the Andean Common Market) in particular.

The response of the government to this new situation has an important feature that is worth highlighting: the new role to be played by the state in the Venezuelan economy. Up to 1973 public expenditures were directed mainly toward infrastructure works that supported private investment. For the 1969-1973 period 27% of public expenditures were directed toward state economic activities, whereas manufacturing and extractive industries accounted only for 4% of total public expenditures. However, the exhaustion of the import substitution process and the progressive deterioration of integration schemes have forced a shift toward the world market as a way of making industrial expansion possible. It was obvious that the vices and shortcomings of the existing industrial sector did not allow Venezuela to pursue an export-oriented industrialization strategy based on private industry, which operates with high costs and inefficiently.

The way out appears in the design of a new model of development, which would be adequate for the new conditions found in the international markets, and which would allow Venezuela to compete on the basis of its productive conditions, energy resources, raw materials for basic industries, extensive infrastructure of services, high financial capabilities, and relatively stable social situation. The fifth National Development Plan is an expression of this new model, which seeks to redefine and extend the role of the state as a producer of goods and services and to concentrate public investment in the basic industries.

With regard to the first feature, it is interesting that in 1974 the state's participation in gross fixed investment was 32%, whereas the fifth National Development Plan expects it to rise to 53% in the 1976-1980 period. If sectoral provisions are examined in detail, the state's participation in production becomes more clear: its share of manufacturing investment is planned to rise from 33% for the 1970-1974 period to 50% for 1976-1980. If manufacturing, oil, and mining are considered together, the figure of 26.6% for the state's participation in investment becomes 66.1% according to the Plan's provisions for 1976-1980.

What are the technological consequences of this increased participation of the state in the economy? The fifth Plan does not contain any answers to this question, but only formal and isolated declarations that reflect that science and technology are relegated to a subsidiary position with regard to other government policies. However, if the technological implications of the Plan are examined with some attention, it is possible to find a different model of development, which, rather than leading to greater autonomy, will steer the Venezuelan economy toward increasingly complex forms of association with, and dependence on, foreign suppliers of technology and foreign capital.

## THE INDUSTRIALIZATION PROCESS IN THE REPUBLIC OF MACEDONIA, YUGOSLAVIA<sup>(11)</sup>

### Historical Background

Before World War II Macedonia was a predominantly agricultural and handicraft nation. Three-quarters of the population were engaged in agricultural production, using backward techniques. Only 14,000 workers were employed in industries of some sort: tobacco, food processing, and mining. For many decades Macedonia has been an economically stagnating nation with economic growth rates that scarcely matched the rate of population increase. By the end of World War II Macedonia, as well as the rest of Yugoslavia, had to start reconstructing the economy with fewer people and a seriously disabled industrial structure: 11% of the Yugoslavian population died in the war and most industries were totally destroyed.

### The Reconstruction Phase and the First Five-Year Plan

With the liberation of the country in 1945, the economy of Yugoslavia, and therefore of Macedonia, was established on the basis of the nationalization and state ownership of industries and services, the state monopoly of foreign trade, and the collectivization of land, which followed an earlier land reform.

During the first few years, industrial activities were directed toward reconstructing the physical infrastructure and consumer goods industries that were destroyed during the war. The first 5-year plan that was started in 1947 was meant to accelerate the reconstruction phase and to establish the foundations of the country's industrialization through state ownership and central planning. The plan gave priority to heavy industry. Basic industry was to provide capital and intermediate goods to further its own growth as well as to equip the consumer goods sector. The enlargement of the consumer goods sector (industrial consumer goods and food products) was to be limited to the amount of wages disbursed in the country. Large-scale plants were established so that Yugoslavia would become inserted in the division of labour among the socialist European countries.

### Toward Self-Sufficiency in Basic Industry (1951-1965)

The 1950s workers' self-management of state-owned enterprises was established and central planning was considerably weakened (12). State enterprises began to be administered by the workers, who controlled and participated in decision-making at the enterprise level, while the central federal authorities kept overall decision powers over the economy and its general orientation (relative weight of economic sectors, trade policy, investment rates, employment targets, etc.). In the 1-year plans up to 1957 and the second and third 5-year plans (i.e., 1957-1961 and 1961-1965), investment policy gave priority to basic industry (power generation, ferrous and nonferrous metallurgy, organic chemical industry, etc.), while it oriented consumer goods industries toward using local raw materials. To implement the industrialization policy, a system of accumulation rates was set up and bank loans were kept regulated rather tightly through the investment funds. Investment funds were established at the local and federation levels for the financing of industry.

Each of these funds had its own purpose. For example, the local investment funds served to finance mainly local, small-scale projects or their reconstruction and extension; the republican funds were used for financing new projects, primarily in the consumer goods sector, and for participation in the construction of larger industrial projects financed by the federation or foreign sources; and the federation fund was

employed for financing basic industry projects (in Macedonia, for instance, the iron and steel plant "Skopje" and some power generation plants).

To carry out successfully the planned policy of industrialization, committees were set up within the planning departments of each commune, province, republic, and the federation itself, with the task of evaluating the socioeconomic justification of each investment project.

During this period industrial financing also used foreign loans as supplementary sources of accumulation. The development of industry was inevitably based on the transfer of foreign technology. About 60%-70% of the equipment and installations, as well as industrial property rights (licences, patents, know-how, etc.), were acquired abroad, mostly from the Western developed countries and a smaller part from the Eastern European socialist countries. As for small-scale industries, some of the equipment was provided from domestic organizations.

This setup allowed the reconstruction, construction, and expansion of the large-scale industrial plants in branches such as nonferrous metals, nonmetallic industries, cement, ceramics, building materials, welded steel pipes, textiles, and organic chemicals.

However, the industrialization policy had a negative influence on the primary sector (agriculture, mining, etc.). Federal authorities enforced a price system that fixed a maximum price for raw materials, intermediate goods, and agricultural products, and also for some manufactured goods. The pricing system, which actually undervalued primary materials, benefited the manufacturing sector. In this way a large part of the surplus generated in the primary sector flowed into the manufacturing sector. This was one of the means used for obtaining the funds needed for industrialization.

By 1956 Macedonia's contribution to the Yugoslavian gross domestic product was still less than 5%. The economy in Macedonia had been growing at an average annual rate of 5% since the end of the war, with industry (including mines and construction) taking an increasing share of the regional product (24% in 1947 and 30% in 1956). Total employment as well as industrial employment grew significantly during this period.

In addition to large-scale capital-intensive investment projects, high-employment projects in the consumer goods sector (textiles, food processing, tobacco), which used relatively more labour-intensive techniques, were also implemented. For example, the textile and tobacco industries absorbed more than 40% of total industrial employment in Macedonia at that time.

The second and third 5-year plans (1957-1961 and 1961-1965) aimed at reducing the increasing deficit in the balance of trade through a greater integration of the existing industrial sectors. Industry was directed to serve the domestic market. To this end the central and state authorities promoted a greater domestic supply of raw materials, intermediate goods, energy, and manpower. This policy of import substitution of capital and intermediate goods is generally referred to as "extensive" development as opposed to the post-1965 policies of "intensive" development. Investment during this period was carried out as before, through deficit financing and borrowing foreign funds. Considering the pricing system that was applied up to 1965, it is not surprising that agriculture in Yugoslavia grew at the low rate of 2.2% per year while industry expanded at an annual rate of 6.4%.

### The 1965 Economic Reforms

New policy directives began to emerge toward the end of the third 5-year plan. Until 1965 Yugoslavian industry was mainly geared to the domestic market, and from then on it was directed to confront competition in the international markets, as a way of removing its limitations. Government policies expressed this turn as a move from extensive back to intensive development and justified it by the need to increase labour productivity to participate in the international division of labour.

To achieve the aim of fully inserting Yugoslavian industry in the international division of labour, a new radical departure from previous socioeconomic policies took place. To increase productivity, the use of capital-intensive technology was accelerated, facilitating its importation. This entailed a greater opening to foreign finance and direct foreign investment through joint ventures. The search for higher productivity also encouraged the full use of installed capacity, and workers were allowed to demand individual incentives for this purpose.

As a direct result of the 1965 reforms, labour productivity increased between 1966 and 1970 at an average annual rate of 6.6%, although this was accompanied by a yearly decline in employment of 1.5% (unemployment rates today are around 10%-12% for the overall economy, and around 20%-24% for the Macedonian economy).

In 1968 more than 58% of the economically active population was engaged in low-productivity primary activities (agriculture, forestry, hunting, and fishing). Furthermore, the labour situation may be judged by the fact that from 1966 to 1970 about 57% of all investments were directed to industry. Industrial investments benefited the expansion and modernization of existing plants rather than the creation of new factories. The dynamic industrial branches in Macedonia during the second part of the 1960s were mostly capital intensive, including ferrous metallurgy, chemicals, metalworking, and electrical products, whereas the production of raw materials and consumer goods, including food products, lagged behind.

In the early 1970s a greater emphasis began to be placed on the production of consumer goods, in line with requirements that had been identified some 10 years earlier, in the third 5-year plan of 1961-1965, concerning health protection, housing, education, and scientific and technological research. By 1972 industry, including mining and construction, contributed with over 45% to the Macedonian gross domestic product, whereas the share of agriculture had fallen to 25%.

With regard to the problem of migration, according to the population census of 1971 there were about 54,000 persons from Macedonia temporarily employed abroad as compared with 672,000 from Yugoslavia as a whole, although these figures do not include those who migrated permanently to some overseas countries (e.g., Australia, Canada, United States, New Zealand). Employment opportunity is the primary motive, resulting from the disparity between the needs and real possibilities for the productive employment of all persons who want to work. Although a basic reason, this is not the only reason for seeking jobs abroad; there are also other reasons, such as finding a solution to the housing problem, ensuring additional conditions for private work at home (purchase of land, transport, performance in trade, etc.), personal assertion (further education and training, personal car, etc.), and tradition.

In foreign trade, Yugoslavia diversified its exports during the past decade and manufactured products were added to the traditional exports of tobacco, food, and wood products. At present Yugoslavia also exports textiles, leather goods, chemicals, and ferrous and nonferrous products. However, imports are still much higher than exports by a 62% margin.

The 1965 Economic Reform had three main declared intentions: to increase the use of the price mechanism for resource allocation; to support the further development of workers' self-management; and to reduce the role of the central government. Closely linked to these aims was the introduction of a series of stabilization measures such as trade regulation, selective credit policy, limitations to personal income, and reform of tax and price systems.

Greater reliance on the price mechanism has increased the mobility of resources and reduced the earlier overemphasis on heavy industry, but it has also led to a considerable increase in unemployment. By 1969 more than half of industrial production and almost three-quarters of retail sales had been freed from price controls. Greater reliance on the price mechanism also accompanied import liberalization, increasing competitive pressures for a number of industries. Subsequently, the federal government found it necessary to impose price controls from time to time to stabilize the economy as the market system introduced an unstable market situation.

Workers' self-management has evolved steadily since the system was established in 1950 and broadened under the 1965 Economic Reform. All employees of an enterprise or an institution can participate in decision-making in their respective economic organizations.

A development parallel to this increase in localized decision-making and increased reliance on market forces has been the sharp reduction of state control within the economy since 1965. The 1971 Constitution accelerated even more the process of reducing official intervention. By turning the responsibility for investment decisions over to individual enterprises and business banks, the 1965 Economic Reform introduced the concept of an organization's economic viability as a basic criterion for the allocation of capital resources within the economy.

In the 1966-1970 and 1971-1975 plans the role of the central government became mainly indicative. The major characteristic of this form of planning is that it provides guidelines for economic development that identify high-priority sectors, but it does not control the market through the mandatory allocation of resources. The plan is updated annually to reflect current performance in particular sectors.

Yugoslavia's overall development strategy is managed by the federation, although the republican influence on national planning is considerable. The individual planning efforts of the republics and autonomous provinces are synthesized into the National Plan. The federation continues, although to a lesser degree than previously, to finance the development of the economically less-developed republics. The role of the republics in development financing is increasing, but the overall availability of resources for the relatively backward republics was decreased, as the developed republics cut down proportionally the resources they transferred to the less-developed ones. During the 1971-1975 plan only 1.94% of the social products of each republic was devoted to the centrally administered regional development fund.

The socialist republic of Macedonia, together with the republics of Bosnia, Herzegovina, and Montenegro, and the autonomous province of Kosovo, is classified as one of the less-developed regions of Yugoslavia. Per capita income amounted to \$620 in 1973 compared with the national average of \$880. The decline of the regional development funds is likely to hinder the efforts oriented to the suppression of regional inequalities. Macedonia has received financial aid from the fund for the less-developed regions since 1966, and the bulk of this aid has been invested in industry (mainly basic industry), whose production is oriented in part to the rest of the federation.

At present manufacturing and mining have become the most important sectors of the Macedonian economy, overtaking the agricultural sector. Industry's contribution to the republic's social product has risen from less than 30% in the mid-1960s to almost 40% in 1973, whereas agriculture's share has dropped from over 30% to under 25%.

Industrial growth in Macedonia has been higher than that in the rest of Yugoslavia: from 1960 to 1973 Macedonian industry expanded at an average yearly rate of 12.6% compared with 8.2% for Yugoslavian industry as a whole, and its share of Yugoslavia's total industrial output grew from 3.1% in 1957 to 6.1% in 1973. Industry's share of the total output of the Macedonian economy expanded from 12.5% in 1953 to 39.2% in 1973.

The gap in development levels between Macedonia and the overall economy seems to be narrowing according to these statistics. Yet, further detailed examination shows that the pace at which the gap is narrowing is extremely slow. During the postwar period the economy of Macedonia showed a 7.5% average rate of growth, which is only 0.3% higher than the average rate for Yugoslavia. The situation has been similar with regard to rates of growth for industry, where only statistically insignificant differences in favour of Macedonia are recorded. This implies that if things remain as they are, it will take several decades before Macedonia can catch up with the rest of Yugoslavia.

A new Constitution was passed in 1976, and in the "postconstitutional" period, efforts are being made to remove the shortcomings experienced previously in the economy. Domestic shortages of energy, as well as shortages of some basic raw materials and certain agricultural commodities, have continuously hindered progress, and to correct this, official policies now emphasize investment in raw materials and energy production. For example, two energy generation plants are being constructed in Macedonia using foreign capital and technology. Large investments are also being made in agriculture and food-processing industries, using World Bank loans.

The success of these plans, however, will depend to a large extent on the developments in the present international crisis of capitalism, which is hindering the overall development of the Yugoslavian economy.

Table 1: Basic Data for the STPI Countries.

Countries	Population							Gross Domestic Product (GDP)		
	Year	Total (In thousands)	Economically Active Population (EAP)		Year	Employment in Manufacturing (1)		Year	Value (In millions US \$)	Per Capita (In US \$)
			Number (in thousands)	% of Total Population		Number (in thousands)	% of EAP			
Argentina	1970	23390	9011	38.5	1970	1771	19.7	1971	29706	1260
Brazil	1973	97926	37750	38.5	1970	3241	11.0	1972	50717	513
Colombia	1970	21117	6226	29.5	1970	348	15.4	1972	10651	474
Egypt	1973	35092	9267	26.4	1966	1071	12.9	1971	7671	225
India	1971	547950	180373	32.9	1971	17068	9.5	1970	53117	99
Korea	1974	33459	12080	36.1	1974	2012	16.7	1973	12445	378
Mexico	1974	58118	15946	27.4	1975	2961	17.8	1973	49656	914
Peru	1972	13538	3872	28.6	1972	481	12.7	1972	5474	379
Venezuela	1971	10722	3015	28.1	1971	403	13.4	1973	17822	1579
Yugoslavia	1971	20523	8890	43.3	1971	1574(2)	17.7	n.a.	n.a.	n.a.
-Total LDC's	1973	3110000						1971	425500	230
-Capitalist World (10)	1973	750000						1971	2331900	3280
-World	1973	3860000						n.a.	n.a.	n.a.



Countries	GDP By Kind of Economic Activity (3)						National Income At Market Prices		Foreign Trade		
	Year	Agri- culture (4) (%)	Industry		Con- struction (7) (%)	Other (8) (%)	Year	Value (In millions US \$)	Year	Imports (In millions US \$)	Exports (In millions US \$)
			Total (5) (%)	Manufactures (6) (%)							
Argentina	1969	11	31	28	4	42	1971	28079	1973	2235	3266
Brazil	1969	13	22	20	1	41	1971	40856	1974	14063	7405
Colombia	1972	27	23	20	5	46	1972	9590	1974	1337	1352
Egypt	1971	26	21	18	4	36	1971	7151	1974	2348	1516
India	1970	44	14	12	5	28	1970	49956	1974	4971	3906
Korea	1973	26	29	26	5	39	1973	11327	1974	6844	4460
Mexico	1970	11	29	23	5	56	1971	34632	1974	6519	3420
Peru	1972	16	30	21	7	47	1972	4850	1974	1531	1514
Venezuela	1972	7	38	18	5	49	1973	14758	1973	2524	5571
Yugoslavia	1973	19	39	n.a.	11	31	n.a.	n.a.	1974	8047	4071
-Total LDC's									1973	96500	111600
-Capitalist World (10)									1973	429800	407900
-World									1973 (9)	588400	577300

(1) Manufacturing covers ISIC division 3. (2) Yugoslavia's figures for employment in manufacturing include mining and quarrying. (3) Percentages may not add up to 100% because import duties are not included in the reported industrial groups. (4) Agriculture, hunting, forestry, and fishing; ISIC division 1. (5) Mining and quarrying, manufacturing, electricity, gas, and water; ISIC divisions 2 to 4. (6) ISIC division 3. (7) ISIC division 5. (8) Other includes financing, insurance, real estate and business services, community, social, and personal services, public administration, and defence; ISIC divisions 6 to 9. (9) Totals of world trade do not include trade among China, Mongolia, North Korea, and Vietnam. (10) United States, Canada, Austria, Belgium, Denmark, Finland, France, Federal Republic of Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, Australia, New Zealand, Israel, Japan, South Africa.

Sources: International Labour Office, Yearbook of labour statistics 1975, Geneva, 1975, pp. 9-148. United Nations, Statistical yearbook 1974, New York, 1975, p. 8, 622-632, 644-647, 650-652. United Nations, Yearbook of international trade statistics, New York, 1974, pp. 16 and following.

Table 2: Growth of Gross Domestic Product in the STPI Countries.

Countries	Annual Average Growth Rate (at factor cost)	
	1970-1970	1970-1974
Argentina	4.3	4.5
Brazil	6.0	10.4
Colombia	5.2	6.6
Egypt	3.4(1)	3.9 2)
India	3.4(3)	n.a.
Korea	8.9	10.9(4)
Mexico	7.0	6.2
Peru	5.4	6.8
Venezuela	5.9	5.0
Yugoslavia(5)	6.6	6.0(4)

(1) Covers 1964-1970.

(2) Covers 1970-1971.

(3) Covers 1960-1968.

(4) Covers 1970-1973.

(5) For Yugoslavia, figures refer to gross material product.

Sources: For Latin American countries: CEPAL, Indicadores del desarrollo económico y social en América Latina, Cuadernos Estadísticos de la CEPAL, Naciones Unidas, 1976, pp. 11-12. For other countries: United Nations, Statistical yearbook 1974, New York, pp. 634-637. For India: Indicative figures obtained from data provided by Central Statistical Organization, Eastern Economist Annual Number 1970, p. 1332.

Table 3: Share of Manufacturing Output in GDP in Selected STPI Countries.

Countries	Share of Manufacturing Output in GDP (in percentages)			
	1960	1965	1970	1974
Argentina	25.9	28.6	29.9	32.2
Brazil	22.3	21.9	24.8	25.6
Colombia	16.3	17.0	17.5	18.9
Egypt	n.a.	n.a.	18.0(1)	16.0(2)
India	13.0	n.a.	13.0(3)	14.0(4)
Korea	14.0	n.a.	22.0	28.0
Mexico	19.2	21.3	23.4	23.8
Peru	13.3	15.2	16.8	18.2
Venezuela	9.4	11.2	11.5	13.2

(1) Covers 1971.

(2) Covers 1973.

(3) Covers 1969.

(4) Covers 1972.

Sources: For Latin American countries, GDP is at constant prices. See CEPAL, *Indicadores del desarrollo económico y social en América Latina, Cuadernos Estadísticos de la CEPAL, Naciones Unidas*, 1976, pp. 58 and 71. For other countries, GDP is at current prices. See UNIDO, *Industrial development survey*, New York, United Nations, 1974, p. 13; United Nations, *Statistical yearbook 1974*, New York, 1975; and UNCTAD, *Handbook of international trade and development statistics 1976*, New York, United Nations, 1976, p. 360.

Table 4: Index Numbers of Industrial Production in the STPI Countries.

Countries	Total Manufacturing (Index numbers)				% Annual Rate of Growth 1960-1970
	1960	1965	1970	1972	
Argentina	77	100	128	147	5.7
Brazil	84	100	164	n.a.	6.4
Colombia	74	100	137	162	5.7
Egypt	42	100	116	129	10.3(1)
India	64	100	116	124	4.9
Korea	57	100	294	400	17.2
Mexico	68	100	149	167	9.5
Peru	65	100	143	170	7.2(1)
Venezuela	64	100	123	138	6.7
Yugoslavia	59	100	133	158	8.5(1)

(1) Covers 1960-1969.

Sources: United Nations, The growth of world industry, 1958-1967, Vol. 1, General Industrial Statistics, 1968 edition, New York, 1970. United Nations, The growth of world industry, 1960-1969, Vol. 1, General Industrial Statistics, 1970 edition, New York, 1972. United Nations, The growth of world industry, Vol. 1, General Industrial Statistics, 1973 edition, New York, 1975. UNIDO, Industrial development survey, Special issue for the Second General Conference of UNIDO, New York, United Nations, 1974, p. 13.

Table 5: Structure of Manufacturing Output by Sector in the STPI Countries in the Early 1970s.

Countries	Year	Production of Mainly Non-durable Consumer Goods (1)		Production of Mainly Intermediate Goods (2)		Production of Mainly Durable Consumer Goods and Capital Goods (3)		Total Manufacturing Output (in millions US \$)
		Gross Output (in millions US \$)	% Share of Total Output	Gross Output (in millions US \$)	% Share of Total Output	Gross Output (in millions US \$)	% Share of Total Output	
Argentina	1968	n.a.	40.0	n. a.	29.0	n.a.	31.0	n.a.
Brazil	1969	7686	45.9	5521	33.0	3526	21.1	16732
Colombia	1972	2507	65.8	829	21.8	475	12.4	3812
Egypt	1970	1846	71.8	478	18.6	246	9.6	2570
India	1969	7510	49.6	4644	30.7	2974	19.7	15128
Korea	1972	3210	57.2	1687	30.0	722	12.8	5618
Mexico	1968	n.a.	44.0	n.a.	33.0	n.a.	23.0	n.a.
Peru	1971	2323	66.0	626	17.8	574	16.2	3522
Venezuela	1972	2669	43.3	2729	44.2	769	12.5	6167
Yugoslavia	1972	5506	44.5	3432	27.8	3421	27.7	12359

(1) Covers ISIC categories 311, 312, 313, 314, 321, 322, 323, 324, 331, 332, 342, 361, and 390.

(2) Covers ISIC categories 341, 351, 353, 354, 355, 356, 362, 369, 371, and 372.

(3) Covers ISIC categories 381, 382, 383, 384, and 385.

Sources: United Nations, The growth of world industry, Vol. 1, General Industrial Statistics, 1973 edition, New York, 1975 (exchange rates taken from UN Statistical Yearbook 1974, New York, 1975). For Argentina and Mexico only, Hector Soza Valderrama, Principales problemas de la industrialización latinoamericana, in Desarrollo industrial latinoamericano, ed. Max Nolff, Mexico, Fondo de Cultura Económica, 1974, p. 224.

Table 6: Growth of Manufacturing Output by Sector in Selected STPI Countries  
From 1960-1971.

Countries	Average Annual Growth Rate (in percentages)		
	Nondurable Consumer goods (1)	Intermediate Goods (2)	Capital goods (3)
Argentina	4.8	8.0	7.0
Brazil	4.5	9.2	9.4
Colombia	7.3	7.7	7.7
Egypt	7.4	11.5	16.3
India	5.6	8.6	8.7
Korea	16.8	20.4	17.0
Mexico	7.9	10.7	9.9
Peru	6.8	10.4	9.0
Venezuela	6.4	9.3	12.8

(1) Covers ISIC 31, 32, 33, 342, 385, and 390.

(2) Covers ISIC 35, 36, and 341.

(3) Covers ISIC 37, and 381-384.

Source: UNIDO, Industrial development survey, Special issue for the Second General Conference of UNIDO, New York, United Nations, 1974, p. 17.

Table 7: Growth of Employment in Manufacturing Industries in Selected STPI Countries in the 1960s.

Countries	Period	Average Annual Growth Rate (in percentages)		
		Total Manufacturing	Light Manufacturing (1)	Heavy Manufacturing (2)
Brazil	1963-1968	1.6	0.7	2.7
Colombia	1963-1969	2.6	1.6	3.9
India	1963-1967	2.3	-0.1	5.3
Korea	1963-1970	11.4	10.8	12.1
Peru	1963-1967	3.1	1.4	6.0
-Average for develop- ing countries	1960-1972	3.4	2.8	4.8
-Average for advanced capitalist countries	1960-1972	1.5	1.1	1.9

Data refer to the number of persons engaged in the organized manufacturing sector. This concept covers working proprietors, active business partners, and unpaid family workers, as well as regular employees; homeworkers are excluded.

(1) Covers ISIC 31, 32, 33, and 34.

(2) Covers ISIC 35, 36, 37, and 38.

Sources: United Nations, Industrialization and development progress and problems in developing countries, E/AC.54/L.61, quoted in UNIDO, Industrial development survey, Special issue for the Second General Conference of UNIDO, New York, United Nations, 1974, p. 91.

Table 8: Structure of Industrial Imports in the STPI Countries (at current prices).

Countries	1960			1965		
	Total Value of Imports (2) (in millions US \$)	Value of Machinery Imports (1) (in millions US \$)	Percentage of Machinery Imports in Total Imports	Total Value of Imports (2) (in millions US \$)	Value of Machinery Imports (1) (in millions US \$)	Percentage of Machinery Imports in Total Imports
Argentina	1249.3	548.4	43.9	1198.6	301.3	25.1
Brazil	1460.1(4)	523.1(4)	35.8	1096.4	244.3	22.2
Colombia	518.6	222.2	42.8	453.5	205.9	45.4
Egypt	615.7(5)	155.1(5)	25.1	933.3	217.9	23.3
India	2355.4	699.3	29.6	2957.9	1033.5	34.9
Korea	343.5	40.1	11.6	463.4	73.1	15.8
Mexico	1186.5	555.4	46.8	1559.6	774.0	49.6
Peru	372.9	138.3	37.1	719.0	n.a.	n.a.
Venezuela	1060.3	382.0	36.0	1297.5	553.0	42.6
Yugoslavia	910.0(4)	328.2(4)	36.0	1288.0	356.6	27.7
-Total LDC's	30200.0	8030.0	26.6	37900.0	11460.0	30.2
-Capitalist World(6)	89200.0	14680.0	16.5	136900.0	27740.0	20.3
-Total World	135500.0	27770.0	20.4	197500.0	45690.0	23.1



Countries	1970			1973		
	Total Value of Imports (2) (in millions US \$)	Value of Machinery Imports (1) (in millions US \$)	Percentage of Machinery Imports in Total Imports	Total Value of Imports (2) (in millions US \$)	Value of Machinery Imports (1) (in millions US \$)	Percentage of Machinery Imports in Total Imports
Argentina	1688.6	519.4	30.7	2235.3	601.3	26.9
Brazil	2844.6	1002.1	35.2	6992.1	2345.6	33.5
Colombia	843.0	391.8	46.5	859.0(3)	386.2(3)	45.0
Egypt	786.6	209.0	26.6	914.0	226.5	24.8
India	2093.7	490.3	23.4	2230.4(3)	604.2(3)	27.1
Korea	1983.3	589.5	29.7	4240.3	1156.8	27.3
Mexico	2460.7	1235.1	50.2	4145.6	1839.9	44.4
Peru	621.7	214.8	34.5	n.a.	n.a.	n.a.
Venezuela	1640.1	737.8	45.0	2139.3(3)	1054.6(3)	49.3
Yugoslavia	2874.0	955.5	33.2	4782.7	1500.5	31.4
-Total LDC's	57900.0	19450.0	33.6	103950.0	35060.0	33.7
-Capitalist World(6)	220760.0	59450.0	26.9	408560.0	108850.0	26.6
-Total World	311990.0	89720.0	28.7	572650.0	164270.0	28.7

(1) Covers division 7 of SITC code.

(2) C.i.f. value.

(3) The figures refer to 1972.

(4) The figures refer to 1961.

(5) The figures refer to 1959.

(6) United States, Canada, Austria, Belgium, Denmark, Finland, France, Federal Republic of Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, Australia, New Zealand, Israel, Japan, South Africa.

Sources: United Nations, Yearbook of international trade statistics 1974, Vol. 1, New York, 1975, for years 1970 and 1973 (except Korea, for which Yearbook of international trade statistics 1972-1973 was used). United Nations, Handbook of international trade and development statistics, 1966, New York, 1964, for years 1960 and 1965.

Table 9: Structure of Manufactured Exports from Selected STPI Countries to 11 Capitalist Countries (1) 1965 and 1971

Countries	Chemicals (SITC 5)			Manufactured Goods Classified by Materials (SITC 6)			Machinery and Transport (SITC 7)			Miscellaneous Manufactured (SITC 8)			All Manufactured Goods (SITC 5-8)		
	Exports (\$ million)		Annual Growth Rate	Exports (\$ million)		Annual Growth Rate	Exports (\$ million)		Annual Growth Rate	Exports (\$ million)		Annual Growth Rate	Exports (\$ million)		Annual Growth Rate
	1965	1971	1965-1971 (%)	1965	1971	1965-1971 (%)	1965	1971	1965-1971 (%)	1965	1971	1965-1971 (%)	1965	1971	1965-1971 (%)
Argentina	23.3	22.0	-1.0	7.3	46.8	36.3	4.0	16.3	26.4	0.5	7.6	57.4	35.1	92.7	17.6
Brazil	11.8	26.9	14.7	35.2	108.0	20.5	1.6	35.7	67.8	1.1	36.3	79.1	49.7	206.9	26.8
Egypt	2.4	2.0	-3.0	13.0	17.6	5.2	1.2	2.1	9.8	1.5	1.1	-5.0	18.1	22.8	3.9
India	10.0	11.3	2.1	433.7	468.1	1.3	4.1	12.9	21.1	10.3	33.8	21.9	458.1	526.1	2.3
Korea	0.7	5.6	41.4	32.2	231.2	38.9	0.9	57.7	100.1	24.4	348.2	55.7	58.2	642.7	49.2
Mexico	41.7	61.8	6.8	127.5	199.3	7.7	3.3	210.9	99.9	11.2	118.5	48.2	183.7	590.5	21.5

(1) Includes Australia, Belgium, Luxembourg, Canada, Federal Republic of Germany, France, Italy, Japan, Netherlands, Sweden, United Kingdom, and United States.

Source: Commodity trade statistics, 1965 and 1971 (ST/STAT/SER.D), quoted in UNIDO, Industrial development survey, special issue for the Second General Conference of UNIDO, New York, United Nations, 1974, pp. 44-45.

Table 10: Growth of Value Added in Manufacturing, Gross Fixed Investment, and Imports of Capital Goods in Selected STPI Countries, Early 1960s to Early 1970s (At Constant Prices).

Countries	Years	Average Annual Growth Rate (in percentages)			% Share of Imports of Capital Goods in Gross Fixed Investment	
		Value Added in Manufacturing	Gross Fixed Investment	Imports of Capital Goods(1)	Early 1960s	Early 1970s
Argentina	1960-1961/1969-1970	5.4	3.8	-1.4	32	20
Brazil	1960-1961/1970-1971	8.3	7.5	5.2	20	17
Colombia	1960-1961/1970-1971	6.1	4.8	3.3	37	33
India	1960/1961-1961/1962 1969/1970-1970/1971	5.2	5.2	-7.2	22	7
Korea	1960-1961/1970-1971	17.3	23.0	31.0	19	33
Mexico	1960-1961/1969-1970	9.5	8.6	7.1	27	24
Peru	1960-1961/1969-1970	6.7	3.5	n.a.	n.a.	n.a.
Venezuela	1960-1961/1970-1971	6.5	5.7	5.4	34	33

(1) Capital goods refers to SITC 7 (except 732.1); SITC 661; SITC 67, SITC 68, and SITC 69.

Source: United Nations, Industrialization and development: progress and problems in developing countries, E/AC.54/L.61, quoted in UNIDO, Industrial development survey, Special issue for the Second General Conference of UNIDO, New York, United Nations, 1974, pp. 167-168.



## NOTES

- (1) The section on "Industrial Development in Argentina" is based on the reports by E. Amadeo, Analysis of the Argentinian industrial structure, Buenos Aires, STPI team, 1974, and Synthesis of the Argentinian STPI project, Buenos Aires, STPI team, 1976.
- (2) See A measure of price level and the purchasing power of currencies in Latin America 1960-1962, Economic Bulletin for Latin America, Vol. VIII, No. 2, October 1963.
- (3) Francisco Sercovich, Dependencia tecnológica en la industria Argentina, Desarrollo Económico, No. 53, 1974.
- (4) The section on "Industrial Development in Brazil" is based on the reports by R. Bonelli and R. Tolipan, Industrial policies in Brazil: a summary of two decades, Rio de Janeiro, FINEP, STPI team, 1975, and Relatorio preliminar para as fases I e II, Doc. No. 1, FINEP, STPI team, 1974.
- (5) The section on "Industrial Development in Colombia" is based on the following reports: Factores contextuales que inciden sobre el desarrollo científico-tecnológico de Colombia, Bogotá, COLCIENCIAS, STPI team, 1974; S. Araoz, Políticas implícitas de desarrollo tecnológico, Bogotá, COLCIENCIAS, STPI team, 1975; F. Moreno, Estilos de desarrollo y política de industrialización, Bogotá, COLCIENCIAS, STPI team, 1975; and G. Poveda, Estudio sobre políticas económicas y modalidades tecnológicas del desarrollo industrial de Colombia, 1925-1975, Bogotá, COLCIENCIAS, STPI team, 1976.
- (6) The section on "Notes on Egyptian Industrialization" is based on the report, Structural features of the Egyptian industry, Cairo, STPI project, 1975.
- (7) The section on "Industrial Development and Policies in Korea" is based on the report, Science and technology and the development of Korea, Phase I, Seoul, KAIS; STPI team, 1973.
- (8) The section on "Industrialization in Mexico" is based on the reports by A. Nadal, Historical background of Mexico's scientific and technological system, El Colegio de Mexico, STPI team, 1974, and Agricultural development and the process of industrialization within the framework of economic growth in Mexico, El Colegio de Mexico, STPI team, 1974.
- (9) The section on "Industrialization in Peru" is based on the report by F. González Vigil, Análisis histórico del desarrollo del sistema científico y tecnológico en el Perú, Lima, Oficina de Investigaciones en Planificación, INP, STPI team, 1976, and on work carried out at the Field Coordinator's Office in Lima.
- (10) The section on "The Industrialization Process in Venezuela" is based on the reports, Informe sobre el subsistema económico, Volume V of the report for Phase I, Caracas, CONICIT, STPI team, 1974, and I. Avalos y R. Rengifo, El desarrollo industrial y su impacto sobre el sistema científico y tecnológico, Caracas, CONICIT, STPI team, 1976.
- (11) The section on "The Industrialization Process in the Republic of Macedonia, Yugoslavia" is based on the report, Macedonian science technology policy instruments project, Phase I, University of Skopje, Faculty of Economics, 1974, and Nikola Kljusev, Model of economic development of social republic Macedonia with analysis of investment and employment structure, University of Skopje, Faculty of Economics, STPI team, May 1976.
- (12) Soon afterward Yugoslavia was cut off from Eastern European trade, which until then had been the main source of capital goods for the incipient Yugoslavian industry. Thus, planned production was disrupted and foreign trade was drastically reoriented to Western Europe.

## Appendix 1 STATISTICS

This appendix provides a general quantitative background on the evolution of industry in the STPI countries. Issues such as the growth and structure of industrial production, the employment effects of industry, and the relation between foreign trade and industrialization will be covered briefly.

### Industrial Growth and Employment

Table 1 contains basic data for the STPI countries; it covers population, gross domestic product, structure of the economy, national income, and foreign trade. The rate of growth of the gross domestic product is indicated in Table 2, while Table 3 gives the share of manufacturing output in the gross domestic product in selected STPI countries. Tables 4 to 7 give further statistics on industrial production, manufacturing output, and the growth of employment in the STPI countries.

### Foreign Trade and Industrialization

In examining the relations between foreign trade and industrialization, two aspects merit particular attention because of their relation to technological issues: the imports of capital goods embodying technological progress and the exports of manufactured goods.

In all the STPI countries (Tables 8, 9, and 10) the imports of capital goods represent a high proportion of both total imports and gross fixed investment. In countries where the process of import substitution has gone further, the proportion of machinery imports in total imports and in gross fixed capital formation decreased from the early 1960s to the early 1970s. Argentina is a clear example of this process, and a similar trend can be noted for Brazil, India, Mexico, Peru, and Yugoslavia, although in the latter the reason should be found less in import substitution policies than in the priority given to the establishment of a capital goods industry. On the contrary, Korea - and to a lesser extent Venezuela - have been importing greater quantities of capital goods as a percentage of total imports and of gross fixed investment. Nevertheless, even where a percentage decrease in machinery imports has taken place between 1960 and 1973, the ratio of machinery imports to total imports has remained very high in this last year, ranging between 25% for Colombia and 50% for Venezuela.

The share of imported capital goods in gross fixed investment decreased in most STPI countries from the early 1960s to the early 1970s. The exception is Korea, which underwent a massive industrialization process in the 1960s, and which was expanded further in the early 1970s. In Colombia, Korea, and Venezuela imported capital goods accounted for 33% of their gross fixed investments; in Argentina, Brazil, and Mexico the figure was around 20%, whereas in India it was only 7%, which could be accounted for to a large extent by foreign exchange shortages.

With regard to the value of imported capital goods, figures in current prices for the STPI countries show increases in absolute terms between 1960 and 1973 (except for India again), with the highest percentage increases shown by Korea (2,785%), Brazil (349%), Mexico (231%), and Venezuela (176%).

Table 9 illustrates the structure and growth of manufactured exports from 6 STPI countries to 11 capitalist countries between 1965 and 1971. Over this period the annual growth rate of all manufactures ranged from a high of 49.2% for Korea and a low of 2.3% for India. Among the STPI countries considered, only Egypt and India did not manage to increase significantly their manufactured exports, despite policies to this effect. If the export figures are examined by category, it is seen that in all the 6 STPI countries the exports of machinery and transport equipment grew at a faster pace than the exports of all manufactures, with this figure ranging from a remarkable 100.1% annual growth rate for Korea to an as yet high rate of 9.8% for Egypt, although these high growth rates can be explained primarily by the low initial volume of exports in 1965. The relative weight of machinery and transport equipment in total manufactured

exports can be appreciated in Table 9.

In 1965 Argentina was far ahead of the other STPI countries in the export of technology-intensive machinery and transport equipment, but it was caught up by Brazil and overtaken by Mexico, which developed their exports of machinery and equipment at an annual rate of 67.8% and 99.9% respectively. Korea, which increased machinery exports at the annual rate of 100%, was in 1971 still exporting mainly light manufactured goods, which made up almost 90% of its total exports.

Appendix 2  
INSTITUTES AND COUNTRIES PARTICIPATING  
IN THE STPI PROJECT

Argentina	Secretaria Ejecutiva del Consejo Latinoamericano de Ciencias Sociales (CLACSO) Country Coordinator: Eduardo Amadeo
Brazil	Financiadora de Estudos e Projetos (FINEP) Country Coordinator: Fabio Erber (until September 1974) and José Tavares
Colombia	Fondo Colombiano de Investigaciones Cientificas y Proyectos Especiales "Francisco José de Caldas" (COLCIENCIAS) Country Coordinator: Fernando Chaparro
Egypt	Academy of Scientific Research and Technology Country Coordinator: Adel Sabet (until July 1975) and Ahmed Gamal Abdel Samie
India	National Committee on Science and Technology Country Coordinator: Anil Malhotra (until June 1975) and S.K. Subramanian (until March 1976)
South Korea	The Korea Advanced Institute of Science (KAIS) Country Coordinator: KunMo Chung
Mexico	El Colegio de Mexico Country Coordinator: Alejandro Nadal
Peru	Instituto Nacional de Planificacion (INP) Country Coordinator: Enrique Estremadoyro (until February 1975) and Fernando Otero Technical Directors: Fernando Gonzales Vigil (until February 1975) and Roberto Wangeman
Venezuela	Consejo Nacional de Investigaciones Cientificas y Tecnologicas (CONICIT) Country Coordinator: Dulce de Uzcategui (until July 1974) and Ignacio Avalos
Yugoslavia (Macedonia)	Faculty of Economics, University of Skopje Country Coordinator: Nikola Kljusev



### Appendix 3 SURVEY OF THE COUNTRY TEAM'S WORK

The organization, composition, and orientation of each of the country teams reflected the own interests and those of the institutions that hosted them, always within the framework of the STPI project concerns. A brief review of the approach and the work of each team may help to place the STPI project and the comparative reports in perspective. To complete the survey, a description of the field coordinator's office work is given.

**ARGENTINA:** The initial location for the Argentine team was the Department of Economics of the Catholic University. However, after some months, the university decided to withdraw its application and the country coordinator moved to the Argentine branch of the executive secretariat of the Latin American Social Science Council (CLACSO). The team was headed by Eduardo Amadeo, an economist, and two other members were appointed to work full time on the project. An advisory committee of several researchers and policymakers active in science and technology policy was formed. To carry out the research, the team relied on consultants who wrote reports on specific subjects that were integrated into a final report.

A significant change took place when the country coordinator was named president of the Instituto Nacional de Tecnologia Industrial (INTI), the national industrial technology institute, which is the largest and most important industrial research organization in Argentina. Mr Amadeo never relinquished his formal role as coordinator; after 6 months, he left his new post and resumed his position as country coordinator. Because most of the work was well under way, his absence did not substantially alter the team's pace, although the preparation of the Argentine synthesis report was postponed. Part of the team's work was reoriented to be most useful to the coordinator in his new position.

The Argentines focused on two branches of industry - machine tools and petrochemicals - but studied many broader issues. For instance, the reports include a document on the technological content of the 3-year development plan (1974-77), a study of the Argentine industrial structure, a description and brief analysis of technology policy instruments in Argentina, a study of the system for regulating technology imports, and several short reports on international technical assistance as an instrument of technology policy.

The structure of the Argentine scientific and technological system was studied in detail, as were the conditions under which it could be made more responsive to industry's needs. The Argentines covered the public sector, examining the possible role of the public sector as promoter of scientific and technological development. Detailed studies were carried out at two enterprises: one in charge of generating electricity in Buenos Aires (SEGBA) and the other in charge of generating and distributing gas for household and industrial consumption. Other contributions of the Argentine team were a study of the emergence and development of engineering and consulting firms in the chemical process industries, a detailed analysis of two research centres within the national industrial technology institute (INTI), and two short papers on capital accumulation and on the crisis of capitalism.

The Argentine team followed the methods guidelines; however, they produced a series of thematic reports on issues of actual and potential interest to policymakers in the country, coinciding with the themes selected for study in STPI.

**BRAZIL:** The Brazilian team was hosted at the research group of the Financiadora de Estudos e Projetos (FINEP), the state agency in charge of financing studies for investment projects and also the executive arm of the national fund for scientific and technological development. The first coordinator was the director of the research group,

Fabio Erber. When he took a leave of absence from FINEP in September 1974, he was replaced by José Tavares, the new head of the research group. The group at FINEP had been carrying out research on science and technology policy for some time, and the STPI assignment was one of its tasks for 1973-76. Practically all of the work was done by members of the FINEP research group, although two or three reports were contracted to professionals outside FINEP.

From the beginning, the Brazilians decided to concentrate on the role of state enterprises in technology policy. They chose branches of industry that were dominated by state enterprises (oil and petrochemicals, steel, and electricity), conducting detailed interviews, analyzing existing data, and testing hypotheses systematically to cover issues such as the selection of equipment and processes, the purchase of engineering services, the performance of research and development, and the planning activities at these state enterprises.

In addition to the new material generated by the Brazilian team during STPI, several reports based on past research carried out by FINEP were made available to the STPI network. These included background reports on the organization and structure of the Brazilian science and technology system, a study on the machine tool industry, a report on the demand for services of 12 research institutes, and a background report on industrial policies in Brazil during the last 2 decades.

In parallel with the work for STPI, the FINEP team was also engaged in a research project on the diffusion of technical innovations in three industrial branches (pulp and paper, cement, and textiles) and they agreed to put their results at the disposal of the STPI network as an additional contribution.

The Brazilian team used the guidelines only as a general reference, given that most of their work went along different lines from those originally envisaged for the project. Nevertheless, the richness and variety of their material effectively upgraded the comparative reports.

COLOMBIA: No Colombian participant was present at the initial organizing meeting, and the Colombian application to join the STPI network was received later and formally accepted at the Rio meeting of the coordinating committee. The team was hosted by the Colombian Council for Science and Technology, COLCIENCIAS, and was headed by a sociologist, Fernando Chaparro. In spite of joining the STPI network late, the Colombian team caught up with the pace of work and finished all its work by the deadline.

COLCIENCIAS organized a special team with five members who devoted practically all their time to research in STPI. Several other consultants were also asked to prepare reports on issues of specific interest such as selected policy instruments. For example, a study was commissioned on the impact of tariff mechanisms; a report was prepared on the influence of price controls; and a preliminary analysis of the possible use of the state's purchasing power as an instrument of technology policy was also prepared. The branches chosen for study were all linked to agriculture: fertilizers and pesticides, agricultural machinery, and food processing, taking into consideration the interests of Colombian policymakers as perceived by the team. In these branch studies, the methods guidelines were closely followed.

Other reports prepared by the Colombian team include a study of science and technology planning, an analysis of implicit industrial technology policies, a conceptual framework for the study of consulting and engineering organizations, a series of reports on industrial branches based on discussions with panels of experts, a study of science and technology policies in the agricultural sector (to complement the analysis done for industry), and two essays on the process of industrialization in Colombia and its technological implications.

Five groups of policy instruments were studied in detail, and their impact on each branch was examined through interviews at various enterprises. All of the findings were integrated into the final report of the Colombian team.

EGYPT: Although an Egyptian representative participated in the initial deliberations leading to the STPI project, it was not possible to organize the team to carry out

research and prepare inputs for the international comparison. There were several administrative difficulties and staffing problems that prevented the organization of a working team. The host institution was the Academy of Scientific Research and Technology and the first coordinator was Adel Sabet, who was replaced by Gamal A. Samie in July 1975. The Egyptian team presented papers that were personal contributions based on past experience rather than the result of research carried out by a team; and research was not begun at the academy until the second half of 1976.

**INDIA:** The host organization in India was the National Committee on Science and Technology, and the first coordinator was Anil Malhotra, who was replaced in June 1975 by S.K. Subramanian. Mr Subramanian resigned in March 1976, and no one replaced him. No funds were requested to set up a country team in India, and the Indians provided background material that had already been collected as background for a new science and technology plan.

Three background documents were distributed along with the final S & T plan to all the teams in STPI. In addition, a report on foreign collaboration, a note on science and technology planning in India, a survey of engineering consultancy services, a report on the development of the electronics industry, and two papers on small-scale industries and technology transfer were distributed by the Indian coordinator. No empirical research was done following the methods guidelines, and the Indian contribution to the comparative reports reflects this.

**SOUTH KOREA:** The South Korean team was one of the first to be organized and was established at the Korean Advanced Institute of Science, KAIS, as part of the activities of its science, technology, and society program. KunMo Chung was named country coordinator and the team consisted of five other members. All but one of them had other academic duties and could allocate only a portion of their time to STPI research. Then, Graham Jones was hired to advise in the preparation of the report for phase 1.

The South Korean team advanced rapidly and completed its work in time for the Sussex workshop, following the methods guidelines and introducing modifications only where necessary. Two reports were produced corresponding to the requirements for phases 1 and 2 of the project.

The branches chosen for study were electronics, petrochemicals, and powder metallurgy, and a report was prepared for each one. In addition, the team prepared documents on engineering services and industrialization in South Korea, on the Korean Institute of Science and Technology, on transfer of technology in the electronics industry, on the interface between the science and technology plan and the economic development plan, and on state enterprises in technical development.

Although most of the work was done by the team located at KAIS, consultants were asked to deal with specifics. The team predominantly represented engineering and physical sciences, but an economist who was a senior government official, helped to relate the results to South Korean policymakers and to balance the other team members' biases.

**MEXICO:** The Mexican team was among the first to start working in STPI and was located at El Colegio de Mexico, an academic and social research and graduate training organization. Alejandro Nadal was country coordinator and there were four other members of the team who worked full time on STPI. The Mexican team initially followed the guidelines rather closely and was one of the first in suggesting modifications and changes as a result of contrasting concepts with preliminary research findings. In particular, the team found it difficult to interpret the results of interviews in enterprises using the schema proposed to study technological behaviour. The branches chosen for detailed study were capital goods, food processing, and petrochemicals.

A background report on the structure and evolution of the Mexican scientific and technological system was prepared, together with a description of the industrialization process and of agricultural development. Documents on particular subjects included a report on engineering firms, a study of the technology policy of PEMEX (the state oil monopoly), and progress reports dealing with hypotheses on the impact of policy instruments on technical behaviour at the enterprise level, a description of policy instruments in Mexico, etc.

Most of the findings of the Mexican team were integrated into the main final report, part of which was delivered at the coordinating committee in New Delhi (January 1976) and the rest at the Sussex workshop (June 1976). The work of the Mexican team covered practically all the research topics considered in STPI, and its contribution to the comparative report reflects this. The Mexican report was published in Spanish in 1977 and was awarded second prize in a contest for the best works in economics.

For various reasons, the Mexican team chose to limit its direct interaction with policymakers and followed its own research program. Results were made available to policymakers in the form of draft reports, and through the participation of the coordinator in one of the committees established to prepare the Mexican plan for science and technology.

PERU: The Peruvian team was established within the research group of the National Planning Institute. A series of administrative difficulties affected the progress of the team, including a change of technical director, when Fernando Gonzales Vigil was replaced by Roberto Wangeman in February 1975. Approximately two-thirds of the research was completed in time for the Sussex workshop.

From the beginning, the team decided to adopt a sectorial approach to the research. Efforts were focused on the study of industrial branches connected with the extraction and processing of minerals and with the provision of machinery for the mining industry. The steel industry was also studied, with emphasis on the state enterprise in charge of the largest steelworks. This meant that the guidelines were used primarily in sectorial studies and in the analysis of policy instruments.

Background reports on the situation of the scientific and technological system and on the evolution of Peruvian industry were prepared following the general framework put forward in the guidelines. In addition to these and the sectorial reports, the team prepared other documents, dealing with issues such as explicit and implicit science and technology policies, consulting and engineering capabilities, the possible use of state enterprises as instruments of technology policy, and the government administrative machinery for science and technology policy.

The Peruvian team was located within an official government organization, but its direct impact on policymaking is difficult to assess because it took the form of daily contact with government officials. On the basis of the sectorial reports on mining, a committee has been set up to review the findings of the STPI team.

VENEZUELA: The Venezuelan team was hosted by the national council of science and technology (CONICIT) and was among the first to start working. The team was initially dominated by sociologists, although economists increased their participation at later stages. The first coordinator, Dulce de Uzategui, was replaced by Luis Matos, who was soon followed by Ignacio Avalos. Three other members worked full time, and the team was biased toward sociology and economics.

They progressed through two stages punctuated by a change in government. In the first stage, most of the background reports corresponding to phases 1 and 2 of the STPI methods were prepared, covering the science and technology, the political, the educational, and the economic systems. These reports were made obsolete by the change in government. In the second stage, the team tried to adjust to the new situation, repeating some of the earlier studies and continuing the research. However, the organization of a national congress on science and technology, which mobilized all the staff working at CONICIT, affected the team's progress.

The branches chosen for study were capital goods, electronics, and petrochemicals. In addition, reports were written on specific issues such as the government organizational structure for science and technology policy, instruments for industrial science and technology policy, economic and financial policy instruments and their impact on technology, the purchase of capital goods in two industrial branches, and the relations between the financial system and technology policy. The Venezuelan team concluded its research shortly after the Sussex workshop.

The fact that the Venezuelan team was located in a government agency that took

a very active role in science and technology policy after the change in government created both opportunities and problems. As a result of the new tasks undertaken by CONICIT, the pace and continuity of the STPI work was frequently altered. On the other hand, there was more possibility for actively contributing to policymaking. The Venezuelan contribution to the comparative reports reflects this situation.

YUGOSLAVIA (MACEDONIA): The Macedonian team was organized at the faculty of economics of the University of Skopje. A senior faculty member, Nikola Kljusev, was appointed coordinator. The team was composed of a very large number of faculty members and researchers who devoted part of their time to STPI. The tasks were subdivided and individual reports requested from various members of the team, although at a later stage two team members were asked to work full time on STPI.

The Macedonian team did not follow the guidelines, except in the preparation of a background report for phase 1. Individual reports were submitted on issues of interest to the STPI network, covering topics such as the problems of research and development in industrial enterprises, aspects of science and technology policy in Yugoslavia, the metallurgical industry in Macedonia, and the growth of engineering firms in Yugoslavia.

The Macedonian team's specificity is reflected in their relatively limited contribution to the comparative reports. At any rate, given the high degree of participation of professionals at all levels in policymaking in the Yugoslav self-managed economy, it is rather difficult to assess their contribution toward policymaking in conventional terms.

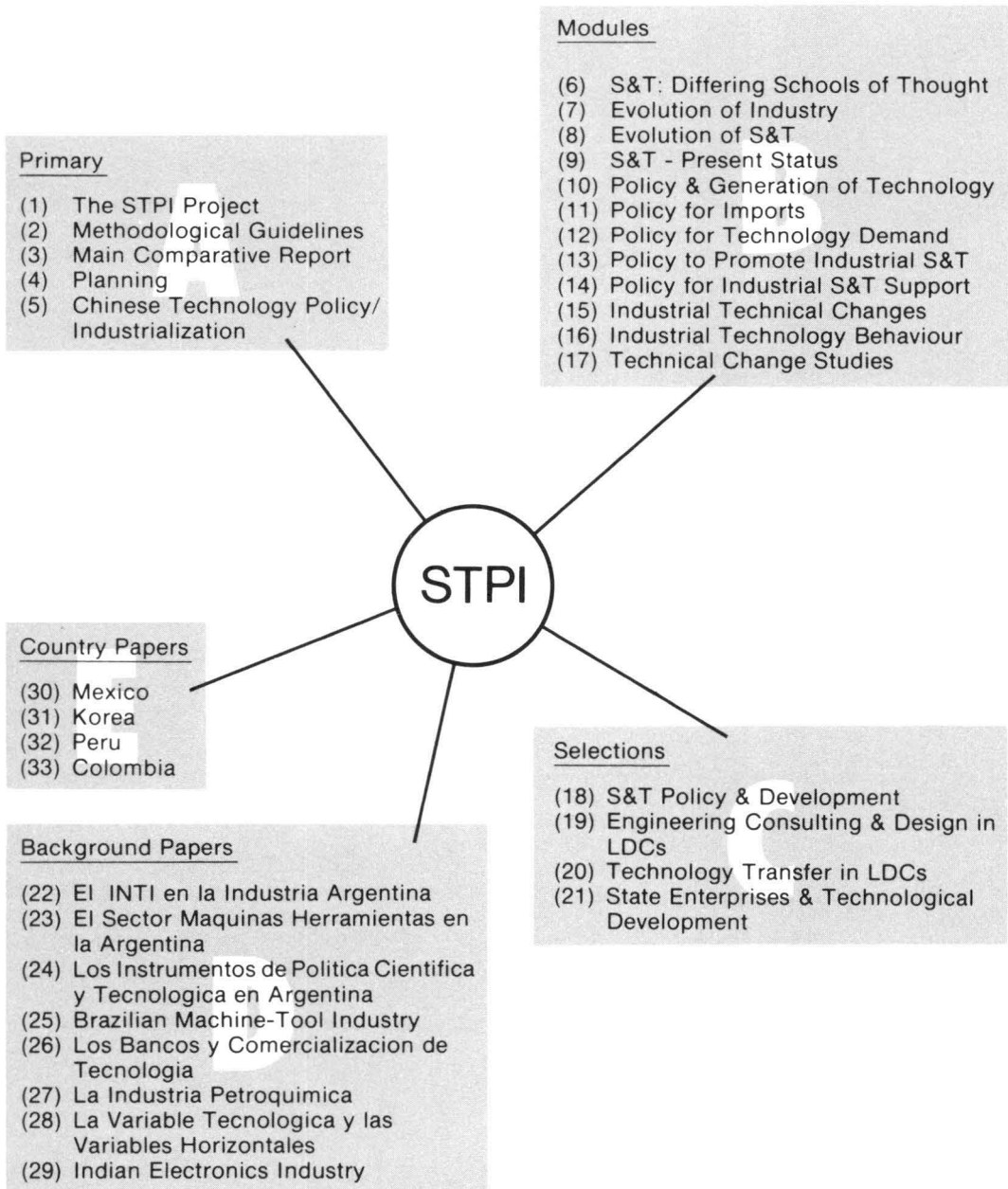
THE FIELD COORDINATOR'S OFFICE: In August 1973, at the first meeting of the coordinating committee, Francisco Sagasti was appointed field coordinator of the project and his office was established shortly thereafter and began operating in a limited way. Staffing was completed in April 1974 with the addition of two members.

The field coordinator's office was independent from the teams and was not engaged directly in empirical research. It offered organizational and technical support and contracted consultants to prepare reports on topics defined by the coordinating committee.

The field coordinator, first, drew up methods guidelines for phases 1 and 2 of the project. Background reports on technology policy in China, on technological dependence/self-reliance, on science and technology planning, on technology policies in Japan, and on technology transfer were also prepared, either by staff members of the field coordinator's office or by consultants. The guidelines for phases 3 and 4 of the project were prepared jointly by the field coordinator and a consultant. The office also organized the Sussex workshop and drafted the comparative reports. The field coordinator was also active in the board of the Peruvian Industrial Technology Institute (ITINTEC).

With the exception of the teams that were engaged in science and technology policy research as part of the activities of their institutions (the Brazilian and South Korean teams, for example), the teams were dismantled after the STPI project was completed. The field coordinator's office was closed in December 1976, and the comparative reports were prepared during 1977-1978, although some teams had not finished their work by April 1978. Even though most teams had concluded their STPI activities by the end of 1977, this does not mean that the team members left the field of S & T policy research and that their effort in STPI was not followed up. What was dismantled, as planned from the beginning, was the formal structure of the STPI project. The network of personal contacts remains in operation and most of the former team members are active in the field of science and technology policy, carrying the experience accumulated in STPI to their new positions.

## Key to STPI Publications



# **A GUIDE TO THE SCIENCE AND TECHNOLOGY POLICY INSTRUMENTS (STPI) PUBLICATIONS**

## **A. Primary Publications**

- (1) The Science and Technology Policy Instruments (STPI) Project (IDRC-050e) (out of print)
- (2) Science and Technology Policy Implementation in Less-Developed Countries: Methodological Guidelines for the STPI Project (IDRC-067e) (out of print)
- (3) Science and Technology for Development: Main Comparative Report of the STPI Project (IDRC-109e). (Also available in French (IDRC-109f) and Spanish (IDRC-109s).)
- (4) Science and Technology for Development: Planning in STPI Countries (IDRC-133e)
- (5) Science and Technology for Development: Technology Policy and Industrialization in the People's Republic of China (IDRC-130e)

## **B. Modules**

These constitute the third part of (3) above and provide supporting material for the findings described and the assertions made in (3).

- (6) STPI Module 1: A Review of Schools of Thought on Science, Technology, Development, and Technical Change (IDRC-TS18e)
- (7) STPI Module 2: The Evolution of Industry in STPI Countries (IDRC-TS19e)
- (8) STPI Module 3: The Evolution of Science and Technology in STPI Countries (IDRC-TS20e)
- (9) STPI Module 4: The Present Situation of Science and Technology in the STPI Countries (IDRC-TS22e)
- (10) STPI Module 5: Policy Instruments to Build up an Infrastructure for the Generation of Technology (IDRC-TS26e)
- (11) STPI Module 6: Policy Instruments for the Regulation of Technology Imports (IDRC-TS33e)
- (12) STPI Module 7: Policy Instruments to Define the Pattern of Demand for Technology (IDRC-TS27e)
- (13) STPI Module 8: Policy Instruments to Promote the Performance of S and T Activities in Industrial Enterprises (IDRC-TS28e)
- (14) STPI Module 9: Policy Instruments for the Support of Industrial Science and Technology Activities (IDRC-TS29e)
- (15) STPI Module 10: Technical Changes in Industrial Branches (IDRC-TS31e)
- (16) STPI Module 11: Technology Behaviour of Industrial Enterprises (IDRC-TS32e)
- (17) STPI Module 12: Case Studies on Technical Change (IDRC-TS34e)

## **C. Selections**

These are a selection of the numerous reports prepared for the STPI Project chosen as a representative sample of the various topics covered by the STPI Project in the course of the main research effort on policy design and implementation.

Science and Technology for Development: A Selection of Background Papers for the Main Comparative Report.

- (18) Part A: Science and Technology Policy and Development (IDRC-MR21)
- (19) Part B: Consulting and Design Engineering Capabilities in Developing Countries (IDRC-MR22)
- (20) Part C: Technology Transfer in Developing Countries (IDRC-MR23)
- (21) Part D: State Enterprises and Technological Development (IDRC-MR24)

## **D. Background Papers**

- (22) El INTI y el Desarrollo Tecnológico en la Industria Argentina (In press)
- (23) El Sector Maquinas Herramientas en la Argentina (In press)
- (24) Los Instrumentos de Política Científica y Tecnológica en Argentina (In press)
- (25) The Brazilian Machine-Tool Industry: Patterns of Technological Transfer and the Role of the Government (In press)
- (26) Rol de los Bancos en la Comercialización de Tecnología (In press)
- (27) Comportamiento Tecnológico de las Empresas Mixtas en la Industria Petroquímica (In press)
- (28) Interrelación Entre la Variable Tecnológica y las Variables Horizontales: Comercio Exterior, Financiamiento e Inversión (In press)
- (29) A Planned Approach for the Growth of the Electronics Industry — A Case Study for India (In press)

## **E. Country Reports**

- (30) Instruments of Science and Technology Policy in Mexico (In press)
- (31) Technology and Industrial Development in Korea (In press)
- (32) Los Instrumentos de Política Científica y Tecnológica en el Perú: Síntesis Final (In press)
- (33) STPI Country Report for Colombia (In press)





