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EXTERNAL DISEQUILIBRIUM IN THE ECONOMIC DEVELOPMENT OF LATIN AMERICA: THE CASE OF MEXICO

(Volume I)

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Chapter II

GENERAL PROJECTIONS OF DEVELOPMENT TRENDS

/PRELIMINARY NOTE

PRELIMINARY NOTE

In view of the interest displayed by the Governments members of the Commission, the secretariat has for some years past been enquiring into the problems of external disequilibrium in the development of the Latin American countries. Particular attention has been devoted to this question in the studies previously carried out on Brazil, Chile and Colombia, as well as in those on Argentina and Bolivia now in course of preparation. 1/ All these studies, however, deal with countries that have applied exchange controls as a means of combating external disequilibria.

The case examined here is of a different nature. A characteristic of Mexico is its free exchange régime. While in some respects the problem of external disequilibrium is similar in Mexico to that in the countries mentioned above, Mexico's experience is marked by special features of its own, in view of the solutions adopted through devaluation of the currency. This and other aspects of the case of Mexico account for its selection as the subject of the present report.

The procedure followed in this study for projecting Mexico's economic development trends over the next decade includes certain new features in the application of the technique of analysis and projections on which the secretariat has been working during the last few years. 2/ Instead of adopting a given rate of growth as a target in order to derive from it the necessary sectorial changes and projections, the structural relationships observed in the recent past have been taken as the basis of the analysis, together with a specific study of foreign market prospects such as is carried out in every instance. Apart from the interest this study may arouse as a contribution to a better understanding of significant aspects of Mexico's economic development, this first attempt to apply the procedure itself provides an opportunity for a

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1/ See The economic development of Brazil (E/CN.12/364), The economic development of Colombia (E/CN.12/365), Preliminary study on the technique of programming of economic development (Part Two) (E/CN.12/292), The economic development of Argentina (Conference Room Paper) and The economic development of Bolivia (E/CN.12/430).

2/ See Introduction to the technique of programming (E/CN.12/363), United Nations Publication, Sales No.: 1955. II G.2.

/more general

more general consideration of its scope and value as an instrument of analysis and projection in comparison with the methods used in other studies.

The main purpose of this report is to indicate the sort of structural modifications that would enable the Mexican economy to maintain an intensive rate of development under conditions of relative internal stability and external equilibrium. How great the changes required would be would depend on the rate of growth aimed at. The rate estimated on the basis of the assumptions and method adopted in this study is to be regarded as a reasonably-founded hypothesis, from which specific calculations of the sectorial adjustments required by development are derived. Other hypotheses as to a future rate of growth could be formulated, either by virtue of different analytical procedures or through prior adoption of a target envisaged within an integrated development programme; but whatever reasonable postulate is established, the nature of the changes referred to will not be affected. It is worth mentioning that a rate similar to the one assumed in the present analysis might also be reached by other means; indeed, the rate in question approximates to that which would result from combining the expected increase in the capacity to import over the next few years with a degree of import substitution similar to that of the past decade. On the basis of the substantial body of data contained in this document, as well as of the findings of the analysis, other rates could also be estimated and the conditions for their attainment clearly established.

The present study forms part of a broader enquiry into the problem of the trend towards external disequilibrium in Latin America's economic development. In view of the experience acquired, it seems possible to draw some general conclusions regarding the interpretation of the facts and the kind of action that may be called for. The secretariat has under consideration a study dealing with these preliminary conclusions, to serve as the general introduction to which reference is made in the body of this report.

/Introduction

Introduction

The general introduction to the present study dealt with the problems linked to external disequilibrium which have to be tackled by an underdeveloped economy in process of rapid growth. The chapters that follow here contain an analysis of the specific way in which these problems affected the Mexican economy during the decade which has elapsed since the Second World War.

Before this analysis can be established on a proper basis, some significant statistics on Mexico's economic development during the period under review must be presented.

The population of Mexico rose from 22.7 to 29.6 million, that is, it increased by 30 per cent. Although no data on employment structure are available for the intervals between censuses, it is very likely that the downward trend in the size of the agricultural population continued in the five-year period 1951-55 with much the same intensity as between the 1940 and 1950 censuses. Should this prove to be the case, the share of agriculture in total employment, which stood at 65 per cent in 1940 and 57 per cent in 1950, would have been only 53 or 54 per cent in 1955.

Compared with the growth of the population, the gross product expanded by 80 per cent. Consequently, a 38 per cent increment was registered in the per capita product, which rose by 1955 to 1,948 pesos (225 dollars) at 1950 prices.

This development raised a series of questions, on which the first chapter of the present study attemps to shed some light. An endeavour is made to identify the dynamic factors which gave an impetus to development; the main structural modifications introduced into the system are described; and, on these bases, the causes of the trend towards external disequilibrium are examined. By way of conclusion, the consequences of the reforms designed to remedy such disequilibria are discussed. The most important data and the principal findings of the study are summed up below.

With reference to the factors that stimulated development, an analysis of the components of global demand reveals a series of

/inter-relationships

inter-relationships between them. Particularly noteworthy is the effect of the variations in the terms of trade on the amount and direction of private investment, the fluctuations in which were largely offset by the behaviour of public investment. Stress is also laid on the decisive impetus given by the latter to development in the first half of the decade. In contrast, attention is drawn to the rather passive role played by the Government's current expenditure. Lastly, some indication is given of how far private consumption contributed to the stimulus provided by the other elements of demand, although its behaviour represented the combination of two dissimilar trends: that recorded in the lower income groups, where consumption grew barely as fast as the population, and that registered in the higher income brackets where it more than doubled.

Next, as a logical counterpart to the analysis of demand, comes an examination of the structural changes in supply and production, followed by a brief review of the salient features of these variations.

The expansion of agricultural production exceeded that of industry in the decade under consideration, the former increasing by 100 and the latter by 80 per cent. Agricultural production for export more than trebled, while that for the domestic market showed an increment of only 69 per cent. The country reached a more advanced stage of self-sufficiency as regards foodstuffs, since the proportion of supplies covered by domestic production rose between 1945 and 1955 from 92.5 to 97.9 per cent.

The share in industrial activities corresponding to the production of capital goods was enlarged from 16.7 to 23.8 per cent during the decade. This was the result of a 156-per-cent expansion in the output of capital goods as against an increase of only 57 per cent in that of consumer goods. Consequently, the proportion of the supply of capital goods represented by domestic production rose from 48 per cent in 1945, and about 40 per cent in 1946 and 1947, to 59 per cent in 1955.

The percentage share of imports in the supply of consumer goods, including raw materials and fuels, varied very slightly, from a minimum of 5.5 per cent of consumption in 1945 and 1949 to a maximum of 7.7 per cent, recorded in 1947. On the other hand definitely divergent trends were

/observed in

observed in the participation of final goods and raw materials. The proportion for which the former accounted - 2.8 per cent in 1945 and over 4.0 per cent in 1946 and 1947 - fell to 1.8 per cent in 1955. Raw materials, on the other hand, which represented only 2.7 per cent in 1945 and by 1947 had barely attained 3.3 per cent, reached their peak figure of 4.1 per cent in 1955.

A necessary corollary of the analysis of the factors of development and of structural modifications is the study of trends towards external disequilibrium. Thus the behaviour of the capacity to import and the demand for imports are examined, as well as the tendency towards disequilibrium deriving from the discrepancy between supply and demand entailed by development. Consideration is given to the experience acquired through the use of devaluation as a corrective policy, and its positive and negative aspects are indicated. This leads to discussion of the probable consequences of such disequilibria as may arise in the future and of methods that can be contemplated as alternatives to devaluation.

Chapter II lays the foundations for a projection of future development trends. For this purpose the causal relationships merely glanced at in the description given in chapter I are subjected to a strict process of quantitative appraisal. An attempt is made to identify the factors conditioning the savings effort and those mainly responsible for the level of private investment. It is thus determined how far development has depended upon the action of factors of external origin, such as the real income of the export sector, and on the causal relationships between these and other elements. The imports function is analysed, and attention is called to the variations in its degree of elasticity at different rates of growth. By means of the scheme of inter-relationships drawn up in chapter II, the most probable rate of

/growth of

growth of the product can be computed, once the behaviour of real income in the export sector and of public expenditure has been ascertained, and an idea can be formed of the maximum rate compatible with the specific increment in the real income of the export sector. For purposes of the projection undertaken in the present study, it is not essential to formulate a definite hypothesis of the evolution of public expenditure.

On the basis of certain assumptions as to the evolution of real income in the export sector, the most likely rate of growth of the product was estimated to be 5.4 per cent, that is, not much lower than the average annual rate of growth of 6 per cent recorded over the last decade. The implicit rate of growth of consumption will presumably be 5 per cent, representing an annual increase of 1.94 per cent in per capita consumption. This latter rate falls considerably below the average of 2.7 per cent noted in the period 1946-55, not only on account of the less intensive rate of growth of the product, but also because development in the next few years is likely to call for a relatively higher rate of investment.[1/]

In chapter III the most important of the factors of external origin - the capacity to import - is examined. The principal elements of Mexico's exports and the tourist industry are separately analysed; each of the most important commodities or groups of commodities is also discussed individually. The essential points may be summed up as follows.

1/ Owing to the rise in the product-capital ratio during the last decade, the product (and consumption) increased more intensively than productive capacity (and investment). In the future this phenomenon could recur only on a very limited scale (see below, chapter I, section II).

/With respect

With respect to cotton, the rapid growth of Mexico's exports in the recent period is analysed with reference to the world market and changes in the competitive position of the large exporters, as well as the United States surplus disposal policy, are discussed. All these elements are utilized as a basis for projecting the volume and prices of Mexico's exports in 1965. In this way three hypotheses were obtained The first assumes the maintenance of the real value registered for exports in 1955 (minimum hypothesis); the second, an increase of 39 per cent in relation to this base figure (maximum hypothesis); and the third, an average between the foregoing assumptions (intermediate hypothesis).

Coffee market prospects are next considered, on the basis of an examination of recent and predictable trends in world demand as regards both volume and prices. Three hypotheses for exports in 1965 are thus reached, corresponding to increments of 18 per cent in the real value of exports on the least favourable, 40 per cent on the intermediate and 95 per cent on the most optimistic assumption.

A similar method is followed in the analysis of exports of other farm produce, mining products and manufacturers. In the case of the second of these groups a detailed study is made of current and predictable applications of each of the most important types of ore, namely, copper, lead, zinc and sulphur, due regard being paid both to the techniques at present in use and to their possible development in the near future. The competitive position of other world market suppliers - especially the United States - is also examined and alternative growth hypotheses are formulated for each group.

The combination of all the individual projections gives the following hypotheses for the growth of exports in relation to their 1955 level:

(a) Minimum hypothesis: agricultural and livestock production - including cotton and coffee - 1 per cent; mining products, 7 per cent; manufactures, 71 per cent.

(b) Maximum hypothesis: agricultural and livestock production, 60 per cent; mining products, 75 per cent; manufactures, 120 per cent.

/c) Intermediate

(c) Intermediate hypothesis: agricultural and livestock production, 26 per cent; mining products, 52 per cent; manufactures, 95 per cent.

The capacity to import deriving from the tourist industry is next considered. An investigation of its possible determinants reveals a close functional relationship with disposable personal income in the United States. It can also be seen that variations in relative prices as between the latter country and Mexico exert practically no influence on tourist expenditure, the amount of which is consequently by devaluations. Here, too, alternative assumptions of possible expansion up to 1965 are formulated. The minimum and maximum hypotheses envisage increments of 74 per cent and 134 per cent respectively. It should be noted that fluctuations in the growth of income in the United States have fewer repercussions on holidays abroad than on imports, which is one reason why the increasing significance of Mexico's income from the tourist industry represents a stabilizing element in its economy.

Projections of the capacity to import are based on the combination of the hypothesis as to commodity exports and as to the tourist industry. In this way the maximum growth rate forecast for the next ten years is 85 per cent, the minimum 27 per cent and the intermediate rate 58 per cent. This last hypothesis implies an annual rate of 4.7 per cent, and this is the figure most frequently utilized in the present study as a basis for the projection of development trends.

The aim of chapter IV is to assess the structural modifications in domestic production and imports whereby domestic supplies can be adapted to a demand which varies in terms of the intensity of economic growth. Once the relevant growth hypothesis has been formulated, an endeavour is made to define the general lines along which the main branches of production should develop so that the necessary compromise between the demand for imports and the capacity to import can be reached with the least possible pressure on the balance of payments. From another angle, this part of the study seeks to ascertain what changes will have to take place in the composition of imports if sharp external disequilibria of a structural nature are to be avoided. By such means the rate of growth assumed to be most probable could be achieved with less strain on resources and lower

/social costs;

social costs; or, alternatively, consideration might be given to the possibility of intensifying growth without any increased pressure on resources. The need for projections by sectors of production having thus arisen, they were prepared in the following way. In the first place, the structure of consumption was projected on the basis of the increment forecast in income available for per capita consumption and in the income-elasticity coefficients of demand by types of goods. These coefficients were corrected so as to include the changes that have taken place to date in the distribution of income and in relative prices. Import substitution hypothesis were then formulated on the basis of the substitution trends recorded and the possibilities of accelerating such substitution, in terms both of prospective resources, techniques, etc., and of projects in the course of execution or under study. It was thus possible to forecast the production of final consumer goods. The following are among the most significant data in this projection, on the basis of the intermediate growth hypothesis.

Agricultural and livestock production should be 55 per cent higher in 1965 than in 1955, if coffee and cotton are taken into account. If these two commodities are excluded, the corresponding figure will rise to 62 per cent. Production of wheat should increase by 62 per cent, that of maize by 57 per cent and that of other commodities for domestic consumption by 73 per cent. The expansion target will be 39 per cent for cotton, 50 per cent for coffee and 24 per cent for other export commodities.

Production of manufactured consumer goods should expand by 76 per cent, as the joint outcome of increases of 72 per cent in the non-durable and 273 per cent in the durable goods industries.

Demand, imports and production of consumer goods having been projected, derived demand was forecast, that is, the raw material and equipment requirements which would result from the former projections. Strictly speaking such derived demand should be considered in conjunction with the adaptation of the capacity to import to structural changes in demand and domestic production. In the combination of projections of

/derived demand

derived demand and utilization of the capacity to import, different treatment was accorded to intermediate and capital goods. As regards the former, substitution trends and possibilities were projected by the same method used for the projection of consumer goods. With respect to capital goods, a projection was made of the margin of the capacity to import left over after satisfaction of that part of demand for consumer and intermediate goods which would not be covered by domestic production.

A brief indication must be given of a series of difficulties which were encountered in projecting the production of intermediate goods. In the first place, the variety of uses to which many of these goods are put made it difficult to link demand for them to demand for any specific final commodity. Secondly, the possibilities of applying the input-output method, which is the device habitually used for the calculation of derived demand, proved to be limited in a number of ways. These limitations related especially to the treatment of imports, the calculation of capital goods requirements, the excess of sectorial data in the matrix and the speed with which economic development alters the technical coefficients. Another obstacle was the want of detailed statistics on the production and markets of destination of intermediate goods.

To overcome these difficulties, the projection was simplified in a number of different ways. Agricultural and livestock production was taken as consisting only of final goods, as the commodities involved are either foodstuffs requiring little or no processing, or else export commodities. The same treatment was accorded to mining products intended for foreign markets, but figures for iron ore and mineral coal were projected in terms of the growth forecast for the iron and steel industry. Projections for electric energy and petroleum were worked out indepently. Consequently, the intermediate goods projections took into account only chemical products, building materials and iron and steel rolled products. In every case the classification adopted was detailed enough for each homogenous commodity to be related to the corresponding demand and for this ratio to be expressed in terms of technical coefficients measured in physical units. The findings of the most important projections are

/given below

given below.

As regards chemical products, complete import substitution was forecast for sulphuric acid, ammonium sulphate and superphosphate, although these last will have to continue to depend on imports of phosphoric rock; in the case of alkalis, on the other hand, the substitution predictable for the decade 1956-65 will only allow the share of imports to be reduced from 67 to 47 per cent of demand. On the basis of these forecasts and of the projection of demand, production increases were estimated at 138 per cent for sulphuric acid, 195 per cent for ammonium sulphate, 87 per cent for superphosphate and 294 per cent for alkalis.

It is forecast that consumption of cement, which stood at 2 million tons in 1955, should reach 4.2 million by 1965; this would entail raising production capacity to 5 million tons, a level 89 per cent above that of the first year cited.

A 177 per cent increase in the output of iron and steel rolled products was forecast as the result of an expansion of 135 per cent in demand and a decline (from 27.3 to 14.5 per cent between 1955 and 1965) in the part of this latter satisfied by imports. Total production of rolled products should thus attain 1.6 million tons. If the increases projected for the various intermediate goods are combined, an increment of 16 per cent in the production of the whole sector is obtained.

When the future output of consumer and intermediate goods had been estimated and it had been determined what margin of the capacity to import would be available for the purchase of final capital goods, domestic production of these latter was forecast. It was estimated that the output would rise 111 per cent above the 1955 level.

The total increase in manufacturing output resulting from the sectorial projections would be 93 per cent, or the equivalent of an annual rate of 6.8 per cent, which is higher than that registered in the past decade.

These forecasts are compatible with projects currently under study or in process of execution in important sectors of economic activity. In this connexion it can safely be asserted that, far from representing a mere

/statistical exercise,

statistical exercise, the projections provide a valuable indication of real trends in Mexico's economic development and a means of testing the compatibility of the various programmes that are being carried out by public and private investors.

/Chapter I

Chapter I

THE DEVELOPMENT OF THE MEXICAN ECONOMY DURING 1945-55

I. AGGREGATE DEMAND

Between 1945 and 1955 aggregate demand[1/] expanded by 73 per cent, which is equivalent to an annual rate of 5.7 per cent (see table I-1). There were in fact three phases of expansion: 1946, 1950-51 and 1954-55, and two intermediate stages of relative stagnation: 1947-49 and 1952-53, the years 1950 and 1951 being characterized by a marked acceleration in the rate of growth. The two phases of stagnation differed from each other in that the first and longer phase was the result of a gradual decline in the development rate, whereas the second showed an initial drop which was followed by a very slow recovery (see figure I-I).

The foregoing remarks raise a number of questions. First of all, it should be asked which factors determined growth throughout the period and how they behaved in each phase; secondly what caused the stagnation and decline and, finally, what motivated the accelerated growth in 1950 and 1951.

The answers to these questions call for a general explanation of the operation of the Mexican economy during the period under review. This explanation in turn necessitates an analysis of the various components of aggregate demand and an examination of their behaviour at each phase and of the way in which they conditioned the acceleration or reduction of the rate of development.

This analysis may usefully begin with a study of external demand. Its contribution to aggregate demand is measured in terms of income from exports, and income from the tourist industry and border trade, which together determine the capacity to import. The following analysis deals with the behaviour of the two factors separately, since as will be seen later, each has its own dynamics.

1/ Aggregate demand comprises the sum of the capacity to import, gross investment, current Government expenditure and private consumption. A definition of each of these concepts is given in appendix A at the end of the chapter.

/Table I-1

Table I-1

MEXICO: AGGREGATE DEMAND, 1945-55

Year	External income a/ (including tourist industry)	Gross investment (public and private)	Current Government expenditure	Private consumption (excluding tourist industry)	Total
		(Millions of 1950 pesos)			
1945	4,485	4,643	1,580	26,647	37,355
1946	4,908	5,848	1,393	29,086	41,235
1947	5,056	5,872	1,600	29,830	42,358
1948	5,719	5,361	1,779	30,581	43,440
1949	5,588	5,165	1,882	30,718	43,353
1950	6,602	5,937	2,115	34,114	48,768
1951	6,930	7,498	2,040	39,263	55,731
1952	7,238	7,754	2,164	38,079	55,235
1953	7,289	7,053	2,125	40,453	56,920
1954	7,981	7,237	2,450	43,173	60,841
1955	8,619	8,068	2,467	45,365	64,789
		(Percentage)			
Increase 1945-55	92.2	73.8	56.1	70.2	73.4
Annual rate	6.8	5.7	4.6	5.5	5.7

Source: Chapter I, appendix B.

a/ According to the definition in appendix B, it is equal to the capacity to import.

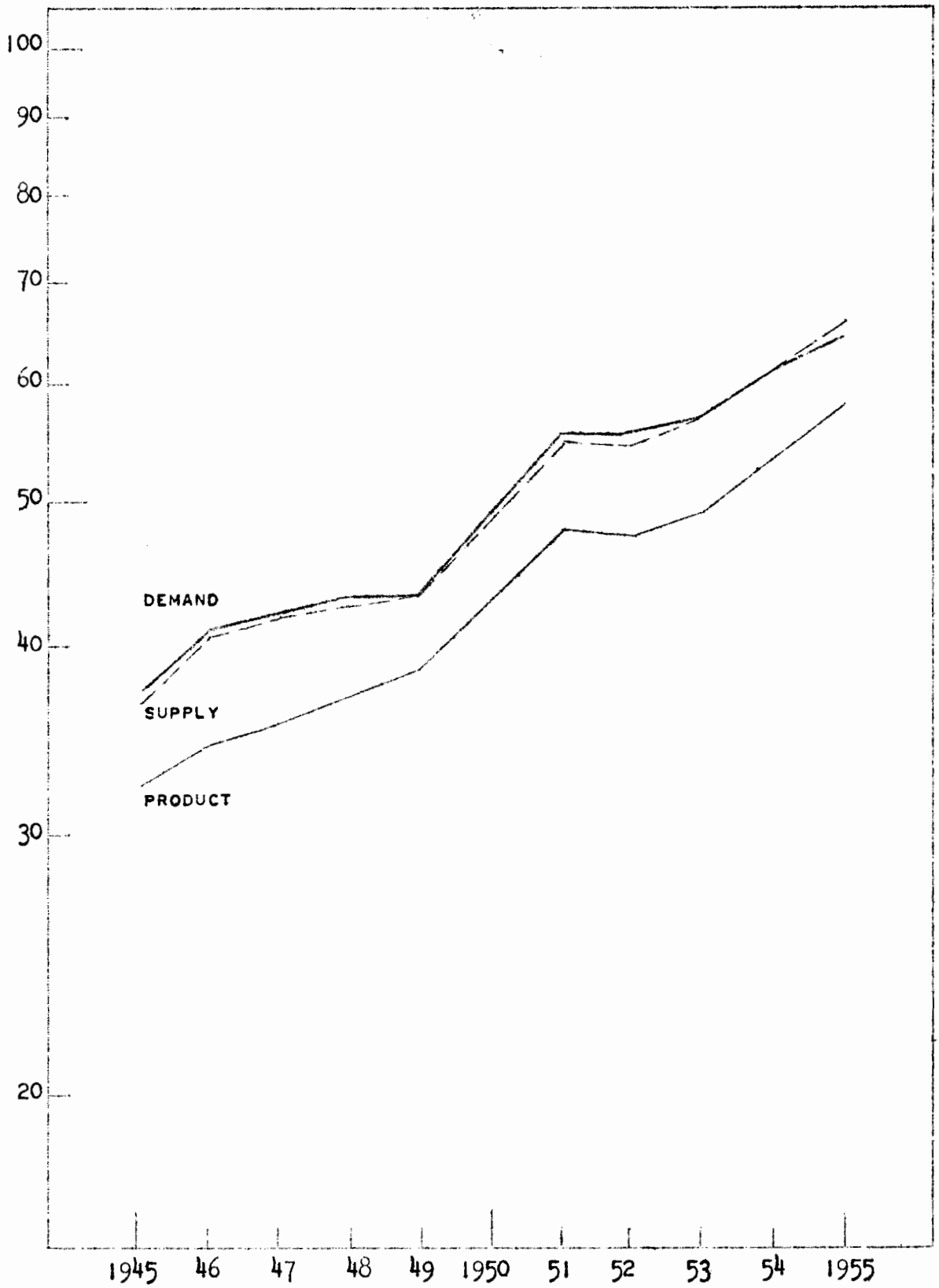
/Figure I-I

FIGURE I - I

MEXICO : AGGREGATE SUPPLY AND DEMAND AND THE NATIONAL PRODUCT

(THOUSANDS OF MILLIONS OF 1950 PESOS)

SEMI-LOGARITHMIC SCALE



1. Total external income [2]

External income increased 92 per cent (see table I-1), thus becoming the component of aggregate demand with the most rapid increment. Its growth was also fairly regular (see figure I-III), a falling-off being observed in only one year (1949) and virtual stagnation in another (1953), both coinciding with declining intensity in aggregate demand. The period of particularly rapid growth was confined to 1950.

(a) Commodity exports

Income from commodity exports increased 87 per cent during the period under review (see table I-2 and figure I-II). This rise was interrupted twice only - in 1949 and 1953. A close study of the growth curve will show two cycles, reaching their respective peaks in 1948 and 1952 and their lowest points in 1949 and 1953. After 1953, a new phase of very rapid and steady growth began.

A comparison of the growth of the capacity to import with that of the quantum and of the terms of trade brings out a number of interesting facts which help to explain the functioning of the Mexican economy. Among these, the following are of particular importance.

In the first place, the greater capacity to import resulted from an increase in the export quantum, which amounted to 111.7 per cent during the period under study, i.e. at an annual rate of 7.8 per cent. In addition, the expansion of the capacity to import showed no sudden variations and was almost uninterrupted, its only decline taking place in 1948. In contrast, the terms of trade showed a very marked downward trend. Figure I-II indicates that each of the peak and minimum levels was lower than the preceding one.

In the second place, although the quantum conditioned the over-all growth of the capacity to import, fluctuations in the latter were governed by the terms of trade. Figure I-II clearly reveals that the minimum levels of the capacity to import, were not offset by any deterioration in the quantum; on the contrary, the only year in which the latter declined (1948) corresponded to the first peak level attained by

2/ This study uses the terms "external income" and "capacity to import" indiscriminately since, although they embody different concepts, they are the same for purposes of calculation.

/Table I-2

Table I-2

MEXICO: CAPACITY TO IMPORT AND TERMS OF TRADE, 1945-55

Year	Capacity to import generated by exports	Capacity to import generated by the tourist industry	Aggregate capacity to import	Terms of commodity trade	Terms of tourist trade	Aggregate terms of trade
	(Millions of 1950 pesos)			(1950 = 100)		
1945	3,187.1	1,298.1	4,485.2	103.9	154.1	114.8
1946	3,371.5	1,536.5	4,908.0	103.5	153.4	115.2
1947	3,785.1	1,271.2	5,056.3	101.1	138.4	108.4
1948	4,025.0	1,694.0	5,719.0	112.3	126.9	116.3
1949	3,915.9	1,672.2	5,588.1	96.3	102.5	98.1
1950	4,537.3	2,064.8	6.602.1	100.0	100.0	100.0
1951	4,838.6	2,091.3	6,929.9	105.9	110.4	107.5
1952	5,066.4	2,171.8	7,238.2	107.4	117.5	110.3
1953	4,754.0	2,535.1	7,289.1	93.2	118.4	100.7
1954	5,280.8	2,699.7	7.980.5	98.6	96.0	97.7
1955	5,971.6	2,637.5	8,619.1	91.1	94.6	92.3
			(Percentages)			
Increase 1945-55	87.3	103.1	92.1	-12.3	-38.6	-19.6
Annual rate	6.5	7.3	6.7	-1.3	-4.8	-2.2

Source: Chapter I, appendix B.

/Figure I-II

FIGURE I - 11

MEXICO : VOLUME OF EXPORTS AND TOURIST INDUSTRY, CAPACITY TO IMPORT AND TERMS OF TRADE

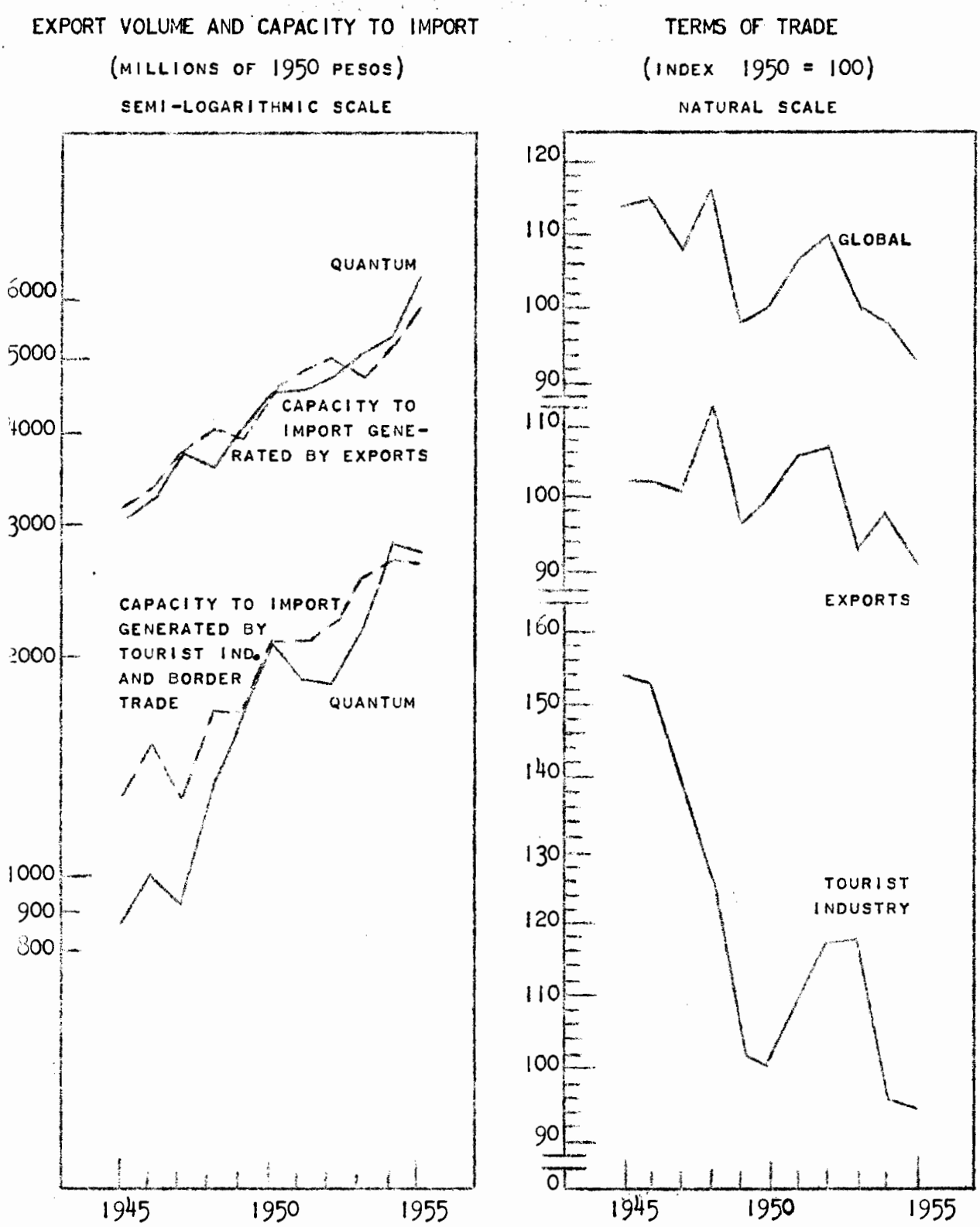
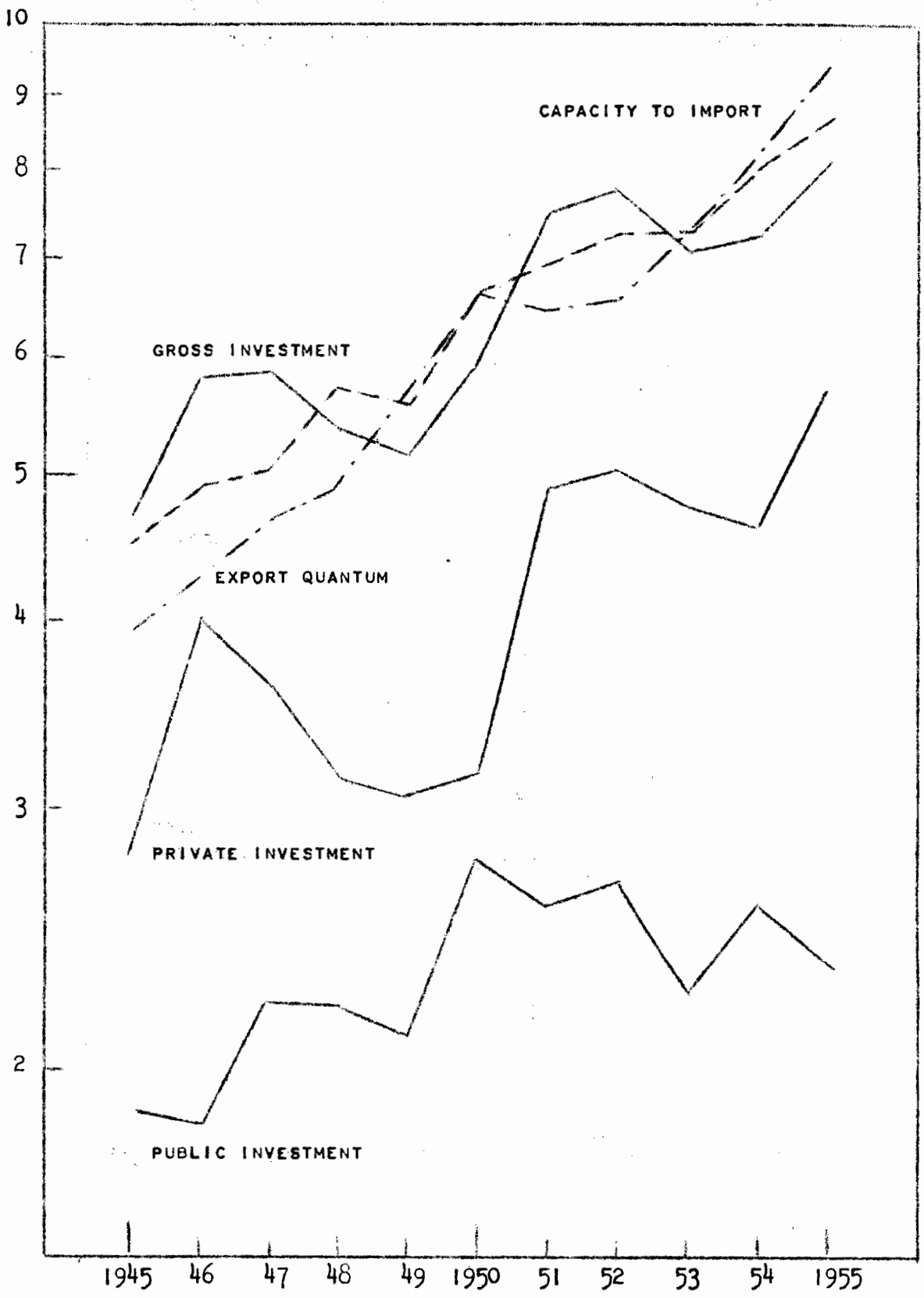


FIGURE 1 - III

MEXICO : GROSS INVESTMENT, CAPACITY TO IMPORT AND EXPORT QUANTUM
(INCLUDING TOURIST INDUSTRY)

(THOUSANDS OF MILLIONS OF 1950 PESOS)

SEMI-LOGARITHMIC SCALE



the former. The slight variations that can be perceived in the capacity to import were much more clearly defined as regards the terms of trade and contained cycles of distinctly different magnitude and duration with very marked peaks in 1948 and 1952 and clearly defined minimum points in 1949 and 1953, as in the case of the capacity to import.

Thirdly, although the absolute maximum for terms of trade was reached in 1948, a more sustained increase occurred in 1950, 1951 and 1952. This was a result of the Korean war and provides the first clue to an understanding of the accelerated development that followed.

The facts mentioned call for a detailed study of the behaviour of different export items, since the rapid and steady increase of the quantum overshadowed highly important changes in the export structure (see table I-3). These structural changes were also connected with the downward trend in the terms of trade.

The quantum which showed the highest increase - with the most sustained and steady development - was that of agricultural commodities which rose more than fivefold. 3/ If coffee and cotton are omitted from this group, the quantum of the remaining agricultural exports shows no increment, since, after rising until 1950, it dropped again to its initial level. In contrast to the rapid increase of the quantum, the terms of trade for this commodity group fell 45 per cent, with the notable exception of coffee, the relative price of which improved considerably.

In comparison with the rapid growth of agricultural exports, the minerals quantum rose less than 50 per cent and, in fact, from 1948 onwards, merely fluctuated around the figure for that year which was slightly lower than the peak level in 1950 and the 1954 and 1955 figures, but higher than the other years. Its particular terms of trade, although variable, tended to improve and, by the end of the period, had exceeded the initial level by almost 70 per cent.

The quantum of the remaining commodities hardly rose during this period. The fishing industry showed an increment, but forest products

3/ The details relating to the behaviour of the different export items appear in the annex to chapter III.

/Table I-3

Table I-3

MEXICO: INDICES OF THE EXPORT QUANTUM, 1945-55

(1950 = 100)

Year	Crops and livestock, fishing and forestry	Minerals	Manufactures	Total
1945	40	67	146	68
1946	53	54	154	72
1947	69	78	124	83
1948	55	96	126	79
1949	85	85	116	90
1950	100	100	100	100
1951	105	84	124	101
1952	116	84	94	104
1953	124	93	94	112
1954	129	99	109	118
1955	163	98	131	144
		(Percentage)		
Increase 1945-55	307.5	46.3	-10.3	111.7
Annual rate	15.1	3.9	-1.1	7.8

Source: ECLA, based on official statistics.

/and, to

and, to a lesser degree, manufactures, declined. Their terms of trade definitely deteriorated, falling more than 50 per cent in the case of manufactures.

Four very distinct tendencies may therefore be said to exist: rising quantum and declining terms of trade (cotton); both rising (coffee); stationary quantum and rising terms of trade (minerals); and stationary or declining quantum with declining terms of trade (other exports).

It may be adduced from the above comparison that the quantum of certain commodities rose substantially in spite of the drop in their relative prices, whereas others, again in spite of a large-scale decline in relative prices, continued to be exported in almost the same amounts. The joint effect of the trends for these two categories stimulated exports as a whole. This is important as it apparently indicates that there were dynamic elements in the system which stimulated the growth of the export quantum or at least prevented its decline, despite a deterioration in relative prices. Finally, it should be noted that the quantum of some commodities tended to stagnate although their relative prices substantially improved.

An explanation of these facts should not overlook the ratio between export prices and the over-all level of prices within the country, as well as the export - import price ratio. The former ratio reflects the effect of changes in commodity prices - in local currency - on real export earnings.

Table I-4 compares the indices for the two price ratios and clearly shows that the two devaluations of the last decade virtually offset the effect of falling export prices in practically every case. In relation to total export volume, the deterioration in the external terms of trade amounted to 12.5 per cent between 1945-55, but the internal terms of trade for the export sector nevertheless improved 40.6 per cent during the same period.

On the basis of these data, an attempt may be made to explain the development of the export sector of the Mexican economy during the last decade. The upward movements in external demand, which were reflected in

/ Table I-4

Table I-4

MEXICO: TERMS OF TRADE INDICES, 1945-55

(1950 = 100)

Years	Crops, livestock, fisheries and forestry products		Minerals		Manufactures		Total	
	(A)	(B)	(A)	(B)	(A)	(B)	(A)	(B)
1945	114	70	68	42	167	103	104	64
1946	98	59	71	43	169	103	104	63
1947	96	67	96	67	139	96	101	70
1948	103	80	109	85	149	115	112	87
1949	82	81	112	111	123	122	96	96
1950	100	100	100	100	100	100	100	100
1951	97	90	124	115	98	91	106	98
1952	98	80	130	107	98	80	107	88
1953	87	68	103	81	109	85	93	73
1954	90	88	116	113	93	91	99	96
1955	83	82	115	113	88	86	91	90
			(Percentages)					
Increase 1945-55	-27.2	17.1	69.1	169.0	-47.7	-16.5	-12.3	40.6

Source: ECLA, based on official statistics.

(A) = External ratio (ratio between the index of export prices and the general index of import prices).

(B) = Internal ratio (ratio between the index of export prices and the index of wholesale prices).

/improvements in

improvements in the terms of trade, promoted expansion in the export quantum, thereby modifying the volume and direction of investments,[4] and facilitating an expansion in the output capacity of the export industries.

The process described did not operate in the opposite direction, that is to say, the upward trend of the quantum was not checked by the decline in the terms of trade, owing to the compensatory action of the exchange devaluation, which diverted the effect of the deteriorating terms of trade away from the export sector to the remainder of the economy. This led to an internal redistribution of income which more than offset the drop in relative external prices. The compensatory role played by the devaluations enabled the quantum of cotton export to expand and those of other agricultural commodities and manufactures to maintain their current level. In other words, the devaluations made it possible for the total export quantum to continue rising despite a deterioration in the terms of trade and incidentally eliminated the sharp fluctuations of real income in the export sector.[5]

The devaluations do not appear to have had any direct or immediate effect upon the decline in the terms of trade for an obvious reason. Nearly all Mexico's mayor export items are subject to the price quoted on the international market, where Mexico's position as a supplier was not strong enough to modify these quotations. It may therefore be inferred that exchange policy had no short-term influence on variations in the terms of trade, but, over the long-term, the latter's downward trend can only be attributed to changes in the export structure arising from the re-direction of productive resources as a result, at least in part, of the devaluations. Consequently, the short-term variations in the terms of trade were governed by the movements of

4/ See paragraph 4 of this section.

5/ The devaluation proved less of a stimulus to the export sectors dependent upon foreign capital, since in these sectors real dollar income expanded less than real peso income. Even so, in the case of metals, the export prices rose sufficiently to increase the real dollar income of the mining sector. The reason why the export quantum for this sector did not increase lay in difficulties of supply or stronger competition from other producer regions.

/external demand,

external demand, although their downward trend appeared to derive from changes in the structure of exports.

The hypotheses formulated explain the steady upward trend of the quantum and the variable downward trend of the terms of trade, as well as the relationship of both to the devaluations, and show that the expansion of the capacity to import was achieved at the cost of a more than proportional allocation of resources to the export sector, or, in other words, that the units added to the capacity to import constituted an increasing drain on resources. As the capacity to import was the most dynamic factor of demand, however, it may be asked whether the rapidity of development was not connected with the devaluations themselves.[6]

(b) Tourist industry and border trade

Income from the tourist industry and border trade [7] increased 103 per cent during the period reviewed. Except for a marked decline in 1947, it showed a very vigorous upward trend free from cyclical fluctuations and the changes occasioned by the exchange devaluations (see table I-2 and figure I-II). Its behaviour was consequently very different to that of the capacity to import deriving from commodity exports and, in order to interpret it properly, the movements of both components should be observed, i. e., of the quantum and the terms of trade.

The quantum of the tourist industry - services to tourists, and goods purchased by them - more than tripled between 1945-55, the increment being much greater during the first half of the decade (150 per cent as against 35 per cent only in the second half). The years of rapid growth coincided in both phases with the devaluations.

In comparison with the rapid growth of the quantum of the tourist industry, the terms of trade deteriorated considerably and by the end of the decade were almost 40 per cent below their initial level (see again table I-2 and figure I-II). This decline took place almost entirely in 1950, and from 1950 to 1953 a notable recovery was registered. This recovery was finally halted by the 1954 devaluation which reduced the terms of trade to the lowest level recorded for the eleven years under review.

6/ See section III of this chapter in regard to this problem.

7/ Definitions of the quantum, terms of trade and the capacity to import of the tourist industry and border trade may be found in appendix A of this chapter.

/Hence it

Hence it may be assumed that the exchange policy had no particular influence on the capacity to import but affected both the quantum and the terms of trade of the tourist industry to a striking degree. In other words, the variations in the two latter subsequent to the devaluations apparently neutralized each other, as will be explained below.

The actual state of affairs - as will be seen in chapter III - was that dollar expenditure by tourist and Mexico's resultant dollar purchasing power abroad were conditioned by external factors, the most important being the level of available personal income in the United States which determined tourist expenditure, and the price level of Mexico's imports, which determined the purchasing power of foreign exchange obtained from tourist expenditure. In addition, the quantum of goods and services acquired in Mexico was governed fundamentally by exchange policy. This was natural, since the prices of hotels, restaurants, petrol and handicraft articles were fixed internally, and each of these items had a high component of wages and domestic raw materials. Again, the rates for hotels, restaurants, public services and petrol were controlled, which retarded the effect of the devaluations upon these sectors.[8/]

In the previous paragraph, reference was made to the fact that the devaluations, although contributing to a reduction in the terms of trade, had stimulated the export quantum and, consequently, the capacity to import derived from exports. The situation as regards the tourist industry was different. In this case, the devaluations contributed to a rise in the quantum

---

8/ Mexico has no index to measure the fluctuations in the prices paid by tourists. The wholesale price index was employed for this purpose as it is probably the best indicator of the over-all price level. It is not possible to state whether its use as a deflationary factor over - or under-estimated tourist expenditure, since, although this expenditure included a high proportion of petrol, the prices of which were not affected directly or immediately by the devaluations, it also included beverages and some imported foodstuffs. This point could only be elucidated by means of a special study.

/without appreciably

without appreciably influencing the capacity to import.[9] Although this problem will be dealt with more extensively in section III of this chapter, it may be pointed out at this juncture that the social cost of the expansion in the capacity to import following the devaluations rose proportionately to the increasing relative importance of the tourist industry.

2. Gross investment

As a starting point in the analysis of gross investment certain facts should be emphasized that will be brought out when gross investment trends are studied.

In the first place, the rise in gross investment between 1945 and 1955 was 74 per cent (see table I-1), and thus had the same intensity as that of aggregate demand. Its trends were obviously much more cyclical in nature than those of the series observed previously (see figures I-III and I-IV), being divided into two well-defined cycles, one from 1945 to 1949 and the other from 1949 to 1953. In 1953 a new cycle appears to have begun.

If the regularity of the cycle described by absolute investment values is surprising, that of the respective rates of growth, calculated as percentages of the gross product, is even more so (see figures I-IV and I-V)

The fact that should be emphasized is that the gross investment cycle apparently intensified that of the capacity to import. The minimum values in both were particularly well defined and coincided in 1949 and 1953, but the investment curve oscillated more freely (see figure I-III). An even closer resemblance can be traced between the movements of the gross investment rate and the terms of trade (see figure I-V). This was equally applicable to the terms of trade for commodity exports and to aggregate terms of trade (including the tourist industry).

A more detailed study will show that the unusually regular movements of gross investment were the result of the trends followed by its components -- public and private investment. In figures I-III and I-IV it can be clearly seen that private investment fluctuated very widely and rather unevenly.

9/ See chapter III, annex, section IV.

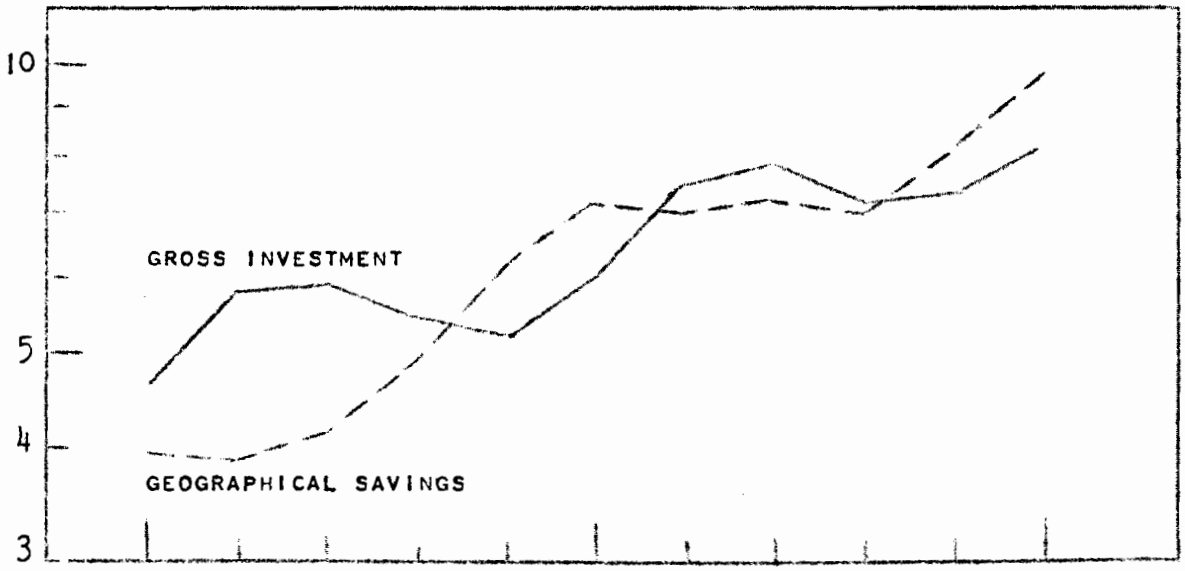
/Figure I-IV

FIGURE I - IV

MEXICO : GROSS INVESTMENT AND GROSS SAVINGS

(THOUSANDS OF MILLIONS OF 1950 PESOS)

SEMI-LOGARITHMIC SCALE



MEXICO : GROSS INVESTMENT AND GROSS SAVINGS AS PERCENTAGES OF GROSS PRODUCT

NATURAL SCALE

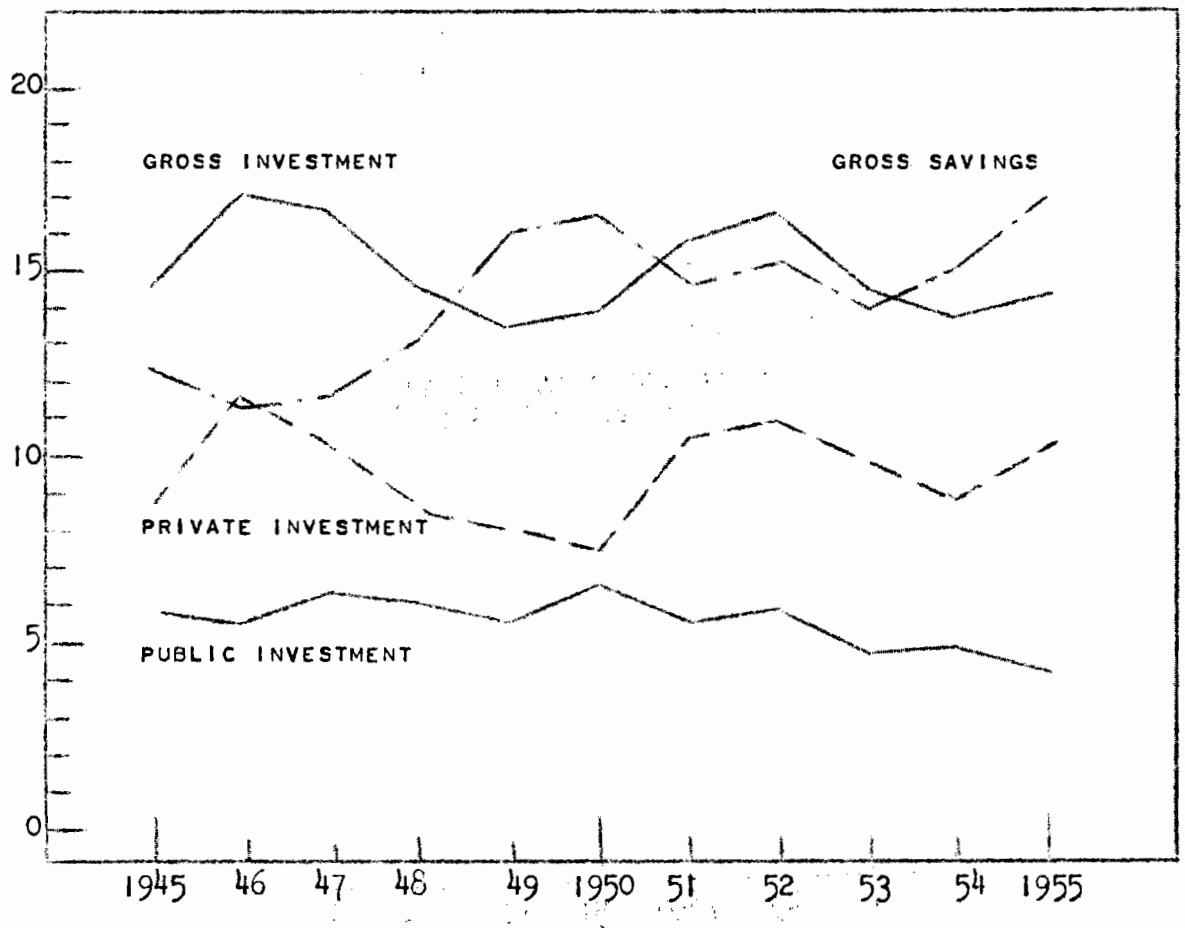
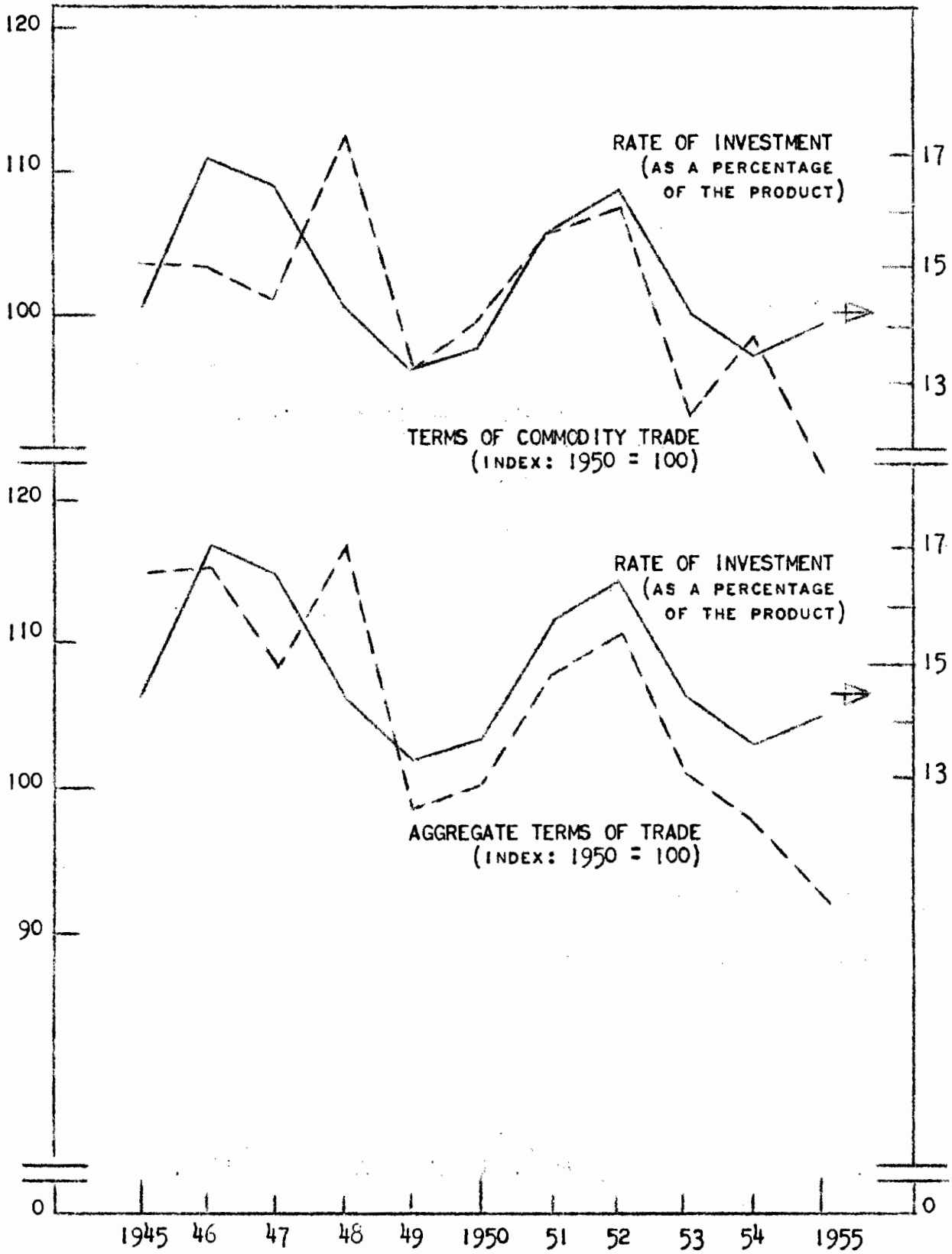


FIGURE I - V

MEXICO : TERMS OF TRADE AND RATE OF GROSS INVESTMENT

NATURAL SCALE



The compensatory factor appears to have been public investment, the divergencies of which were less sharply-defined and tended, in general, to correct the variations of private investment. This accounted for the regular fluctuations of total investment.

A final comparison of trends will lead to important conclusions concerning the ratio of the changes in investment and savings. If their respective curves - in absolute values as well as relative rates - are superimposed, an inverse curve is observed for savings, although it is highly irregular and displays a definite upward trend (see figure I-IV).

An attempt will now be made to interpret the foregoing remarks and to explain how the system operated.

In view of the sharp fluctuations in private investment, the role of public investment appears to have been that of a counterweight. This was even more evident when it was a question of stimulating and not restricting investment, and, above all, when it was combined with an improvement in the terms of trade. The most notable case of this combined action was the year 1950 which seems to have determined the steep rise of private investment in 1951. The combination of these three dynamic forces produced the tremendous acceleration in the development mentioned at the beginning of this chapter. But the effect of public investment on this acceleration actually came from further back and was more far-reaching.

Apart from its compensatory function, public investment between 1945 and 1950 was one of the most dynamic factors in demand. During this five-year period it increased 48 per cent as against an increase of only 31 per cent in aggregate demand, 15 per cent in private investment and 47 per cent in the capacity to import. In subsequent years, especially from 1953 onwards, its rate of growth was less rapid and declined not only in relation to total investment but also in absolute volume (see tables I-5 and I-6 and figures I-III and I-IV).

The decisive role of public investment was, however, not so much in its operation as a component of demand as in the expansion of productive capacity, and, from this standpoint, it achieved two fundamental results. In the first place, it created the infrastructure for private investment, through the construction of roads, irrigation projects, hydro-electric power stations, oil refineries, pipelines, etc., and, in the second place,

/Table I-5

Table I-5

MEXICO: PUBLIC AND PRIVATE INVESTMENT, 1945-55

(Millions of 1950 pesos)

Year	Public investment	Private investment	Total investment
1945	1,879	2,764	4,643
1946	1,841	4,007	5,848
1947	2,229	3,643	5,872
1948	2,219	3,142	5,361
1949	2,115	3,050	5,165
1950	2,771	3,166	5,937
1951	2,590	4,908	7,498
1952	2,689	5,065	7,754
1953	2,265	4,788	7,053
1954	2,592	4,645	7,237
1955	2,357	5,711	8,068

Source: Chapter I, appendix B.

/Table I-6

Table I-6

MEXICO: PUBLIC AND PRIVATE INVESTMENT, 1945-55

Year	Public investment	Private investment
	(Percentage of total investment)	
1945	40.5	59.5
1946	31.5	68.5
1947	38.0	62.0
1948	41.4	58.6
1949	40.9	59.1
1950	46.7	53.3
1951	34.5	65.5
1952	34.7	65.3
1953	32.1	67.9
1954	35.8	64.2
1955	29.2	70.8
	(Annual average)	
1945-50	39.8	60.2
1951-55	33.3	66.7
1947-52	39.4	60.6
1953-55	32.4	67.6

Source: Chapter I, appendix B.

The growth of private consumption, excluding tourist expenditure, amounted to 70 per cent during the decade, and was thus very slightly less than that of aggregate demand and gross investment (see table I-1).

/Figure I-VI.

the channelling of resources to the agricultural sector led to a simultaneous increase in the export quantum and the supply of foodstuffs, thereby neutralizing to some extent the inflationary pressure exerted by the expanded capacity to import and private investment. Its influence on supply was particularly marked during the phase of accelerated growth that coincided with the Korean war.

3. Current public expenditure

Current public expenditure had the slowest rate of growth of any factor of aggregate demand (see table I-1). As in the case of public investment, its expansion of only 56 per cent during the decade was the result of distinctly different trends during the two five-year periods. During the first five years, current expenditure dropped in 1946 but thereafter showed a rapid and steady upward movement (see figure I-VI). In the second period, it tended to stabilize itself between 1950-53, rose in 1954 and then re-established itself in 1955. Current public expenditure increased more intensively than private consumption up to 1950, but during the next five years it declined relatively more than the latter, and increased more slowly over the decade as a whole.

The slow rate of growth of current Government expenditure was largely a reflection of the relative decline in wages and salaries paid in the public sector. The real services provided by the Government possibly rose more rapidly than would appear from the series under study, since, in an economy undergoing rapid development and urbanization, the real requirements of public services tend to grow with equal or even greater intensity than the product.

A lag in current Government expenditure can have adverse effects on an under-developed economy, since public services may serve as a means of checking any inclination towards a regressive redistribution of income. Moreover, public expenditure is the channel for investment designed to improve the labour force, such investment being especially necessary during a period of large-scale rural migration of manpower to the towns. The corrective action of fiscal policy was limited in this way, not only from the point of view of taxation, but also from that of expenditure. Yet it should be emphasized that current public expenditure, unlike public investment, showed no tendency to decline after 1950.

4. Private consumption

FIGURE I - VI

MEXICO : CURRENT EXPENDITURE OF THE FEDERAL GOVERNMENT

(MILLIONS OF 1950 PESOS)

SEMI-LOGARITHMIC SCALE

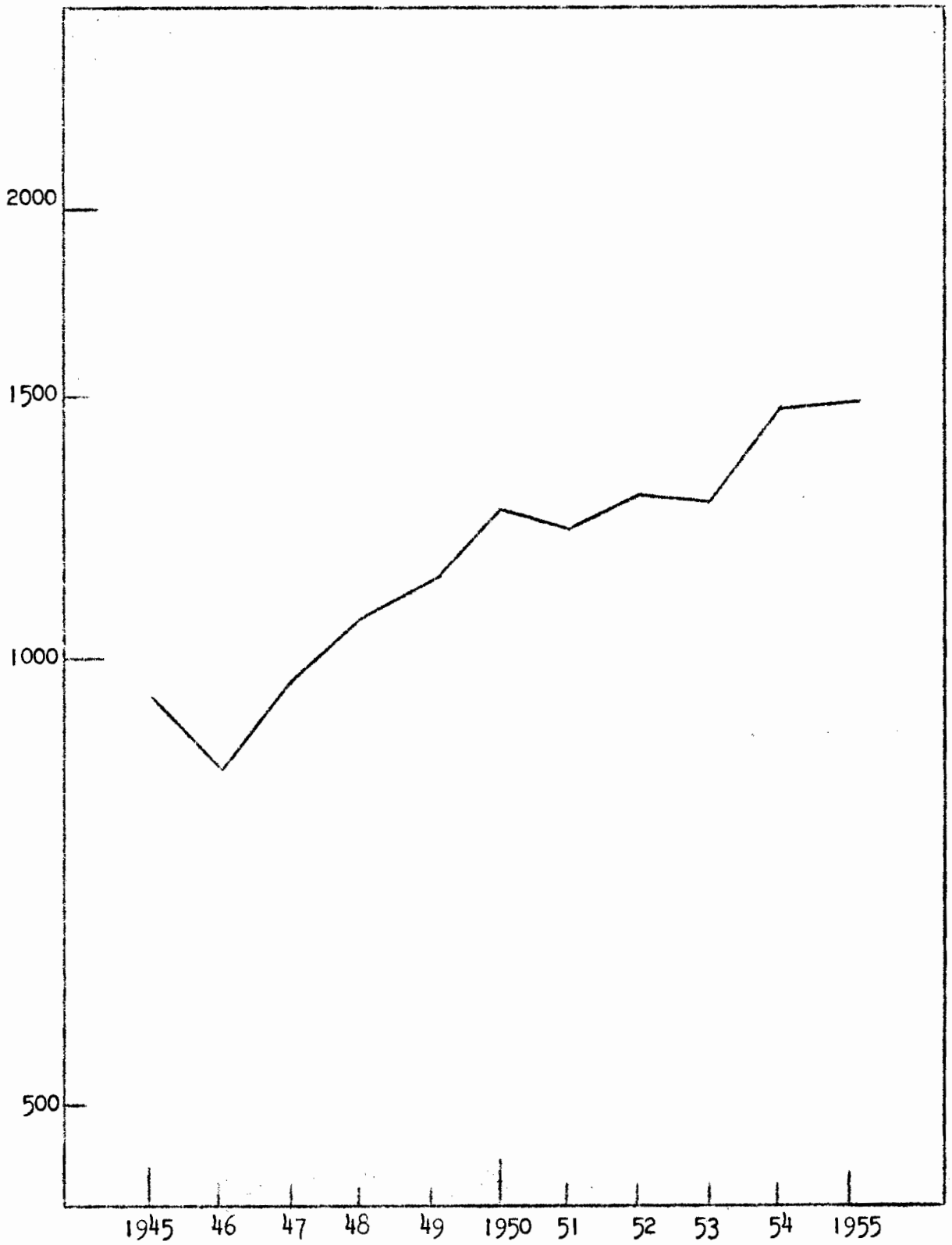
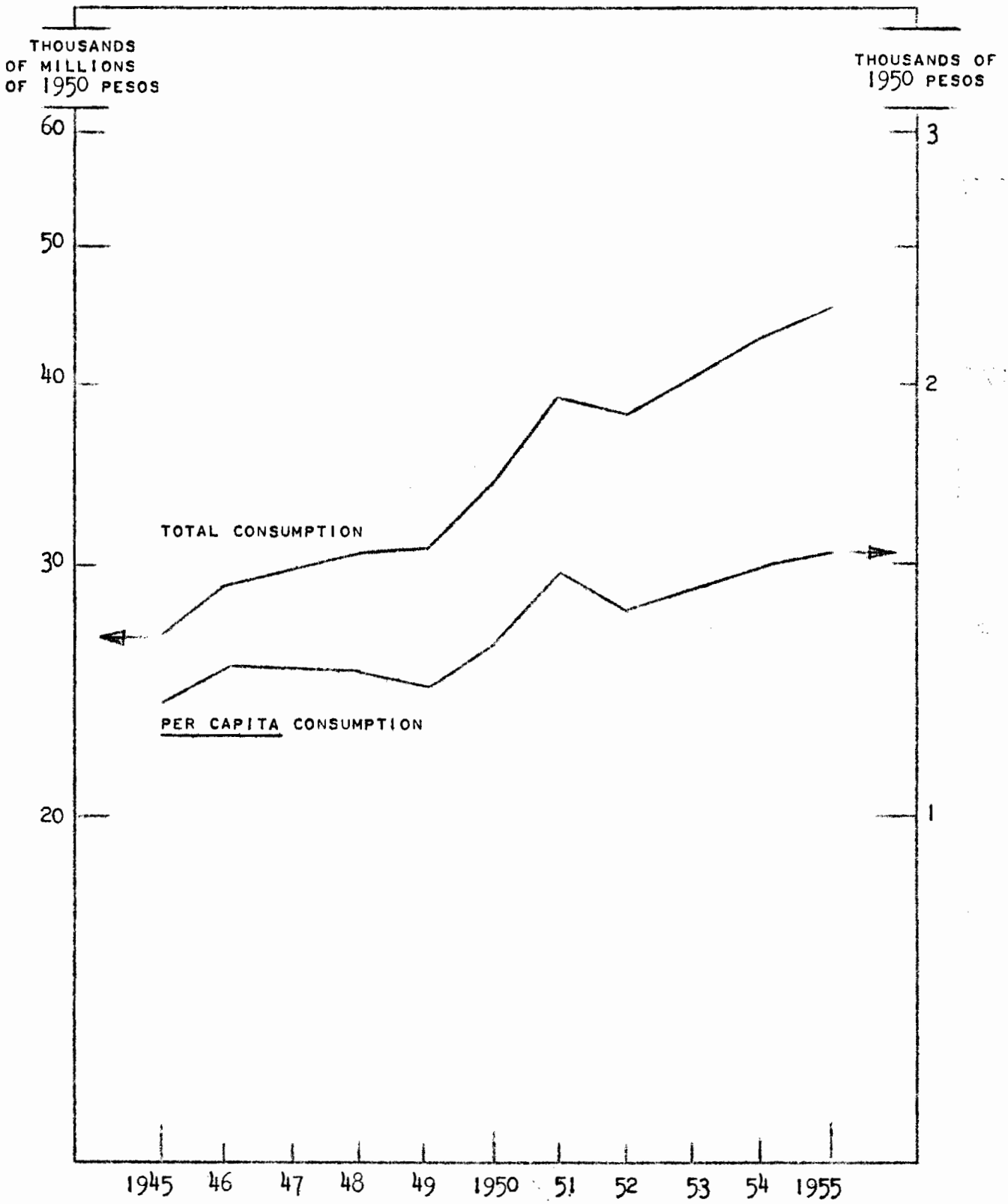


FIGURE I - VII

MEXICO : TOTAL AND PER CAPITA PRIVATE CONSUMPTION

(EXCLUDING TOURISTS)

SEMI-LOGARITHMIC SCALE



The two phases of slow growth with the intervening period of acceleration, which distinguished aggregate demand also appeared, and more markedly so, in the consumption trend (see figure I-VII), and, in terms of per capita consumption, were even more sharply defined. The initial stage from 1946 to 1949 was, in fact, one of decline rather than stagnation. Similarly, consumption fell so markedly in 1952 that, by 1954, it had barely recovered its 1951 level and, in 1955, exceeded it by a very slight margin only. The data referring to the yearly movements should not be considered as wholly valid however. Owing to the lack of adequate information on changes in inventories - the investment estimate having been confined to fixed assets - 10/, year to year changes in consumption partly reflected fluctuations in the most sensitive sector of investment. Thus, the strong upward trend of consumption in 1951 was perhaps partly attributable to the large-scale speculative imports effected during the Korean war boom. On the other hand, 1952, which was a very poor crop year, was probably most noteworthy for the liquidation of agricultural stocks. The conjunction of these two factors, together with changes in inventories, was probably responsible for the steep decline in consumption during 1952. Mention should be made of the large volume of imports in 1946 intended partly to reconstitute inventories, and of the very inferior cereal crop in 1949, which presumably resulted in depleted food reserves.

The phases of decline and slow recovery in per capita consumption were apparently due to the redistribution of income under the pressure of inflationary forces, since the minimum level of 1949 corresponded to the first devaluation and a decline in production of foodstuffs, and the minimum level of 1952 to greatly increased inflationary pressures. The latter, although caused by a contraction in agricultural production due to bad weather, was aggravated by the increase in the remaining components of aggregate demand.

10/ Appendix B, at the end of this chapter, explains how the yearly investment changes were calculated.

/Table I-7

Table I-7

MEXICO: PUBLIC AND PRIVATE INVESTMENT, 1945-55

(Percentage of gross product)

Year	Public investment	Private investment
1945	5.8	8.6
1946	5.4	11.6
1947	6.3	10.2
1948	6.0	8.4
1949	5.4	7.9
1950	6.4	7.3
1951	5.4	10.3
1952	5.7	10.7
1953	4.6	9.7
1954	4.8	8.7
1955	4.1	9.9

Source: Chapter I, appendix B.

/Although the

Although the validity of the yearly changes in the private consumption series may leave some room for doubt, there is no doubt at all that, over the whole period, private consumption tended to rise and that its cumulative growth was almost identical to that of investment, although the data on aggregate consumption covered a number of heterogeneous factors.

In figure I-VIII, private consumption is divided into its two main items - expenditure on foodstuffs and other expenditure. As foodstuffs represent a high proportion of expenditure by a large number of people and this ratio does not decline until a real income level is reached which is higher than that enjoyed by the majority of the Mexican population, the lower line plotted on the graph is a preliminary approximation of the evolution of real income for the majority. The increment may be estimated at 47 per cent, or about 13 per cent per capita for the whole period, if the ratio between the medium- and high-income groups is assumed to have been stable.

The upper line in figure I-VIII represents a first approximation of the rise in consumption for the medium- and high-income brackets. In this case, growth was more even and showed a distinct tendency to accelerate. The increment for the whole decade was 102 per cent, corresponding to a rise of approximately 55 per cent per capita.

As the data for 1946 and 1951, in the upper series, are inflated by the large-scale imports to reconstitute and build up stocks, it is clear that the discrepancy between the two series was concentrated in 1949 and 1954-55. In spite of their limited validity, these data indicate that there were two phases when income redistribution was intensified, both coinciding with the devaluations.[11]

The rate of growth of domestic consumption in the medium- and high-income brackets is proof of the forceful role of this sector of demand in industrial development. Its increase was in point of fact, greater than that of the capacity to import, which was believed to be the aggregate demand component with the most rapid growth. Although its influence was felt by important manufacturing sectors, it should be remembered that it played a major part in forcing up the import coefficient.

[11] In section III of this chapter, an attempt is made to measure with greater accuracy the effect of the devaluations on consumption.

II. AGGREGATE SUPPLY

1. Introduction

Aggregate supply comprises the sum of production and imports and differs from aggregate demand only in the positive or negative effect of the external terms of trade.[12]

From this definition it may be inferred that the movement of aggregate supply throughout the period under review differed relatively little from that of aggregate demand, since the terms-of-trade effect was a very small fraction of the latter. This was actually the case, the increment in aggregate supply being slightly higher than that of aggregate demand (see figure I-I). An analysis of aggregate supply trends would therefore be repetitive; the main interest lies in a study of the movements of its two components - the gross product and the import quantum. The present section will study the evolution of the first component, particularly its more important or more dynamic items such as crop and livestock production, manufacturing, mining, petroleum and electric energy. Imports will be dealt with in the final section of the chapter, which consists of an analysis of the various aspects of the trend towards external disequilibrium.

2. The gross product

(a) General trends

The gross product rose 79.6 per cent during 1945-55. Except in 1952, it showed no decline, and during the other years exceeded population growth. Two phases of moderate growth may be distinguished, together with an acceleration in 1950 and 1951, as in the series examined in the preceding section (see table I-8 and figure I-I).

In order to give a correct interpretation of the product's movements, two types of analysis will be undertaken. Firstly, the movements will be considered in relation to the movements of productive capacity and the intensity of the latter's utilization, and secondly, the behaviour of the different national production sectors will be studied to see how they contributed to over-all trends.

In the first analysis, national wealth or capital will be used to measure productive capacity, the output-capital ratio being employed in its turn to measure the intensity of capital use. The national capital

12/ See Appendix A at the end of this chapter.

FIGURE I - VIII

MEXICO : COMPONENTS OF PRIVATE CONSUMPTION

(THOUSANDS OF MILLIONS OF 1950 PESOS)

SEMI-LOGARITHMIC SCALE

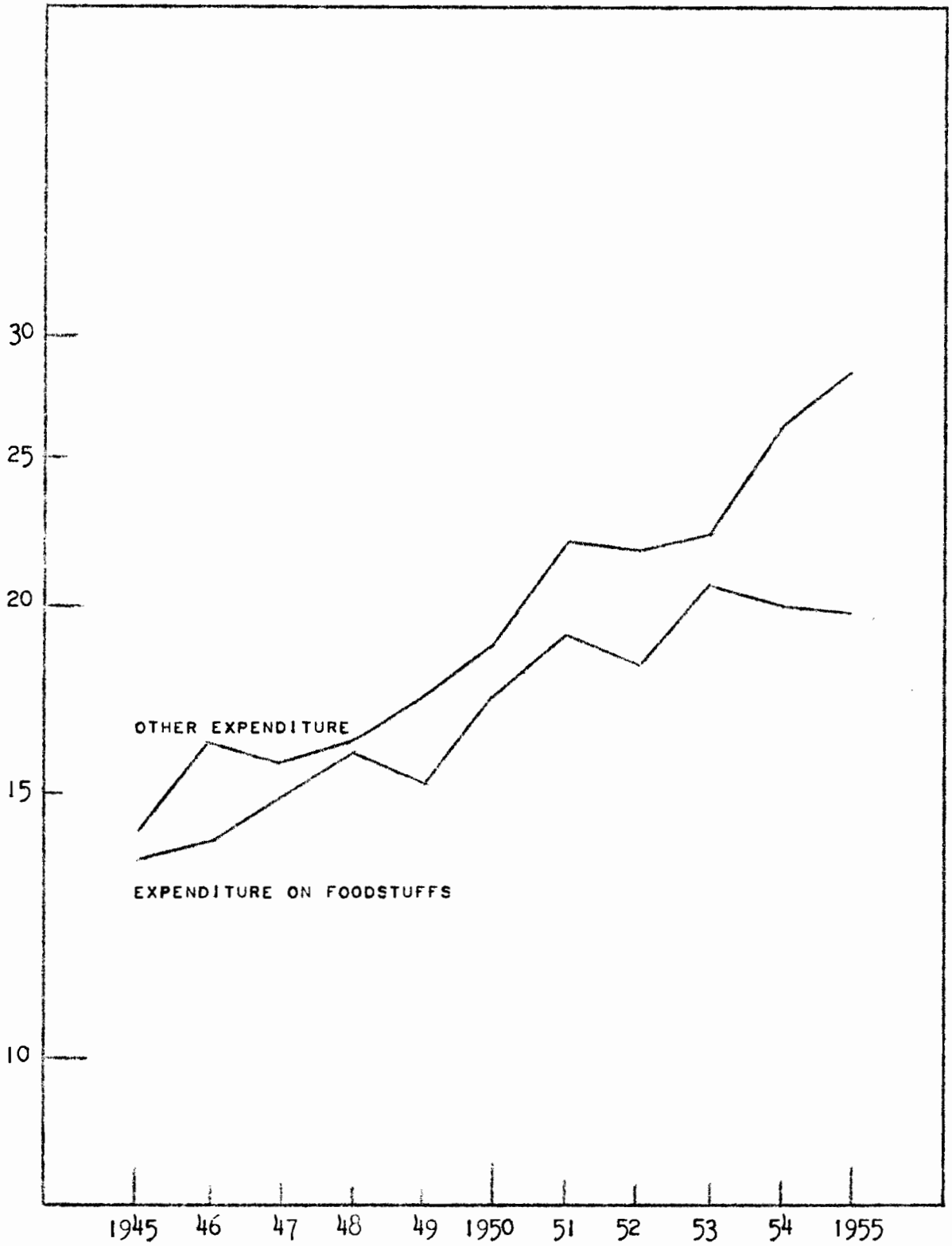


Table I-8

MEXICO: AGGREGATE SUPPLY, 1945-55

(Millions of 1950 pesos)

Year	Gross product	Import quantum a/	Aggregate supply
1945	32,132	4,646	36,778
1946	34,326	6,260	40,586
1947	35,521	6,445	41,966
1948	37,213	5,426	42,639
1949	38,777	4,686	43,463
1950	43,299	5,469	48,768
1951	47,801	7,047	54,848
1952	47,369	7,191	54,560
1953	49,337	7,536	56,873
1954	53,554	7,474	61,028
1955	57,658	7,852	65,510

Source: Chapter I, appendix B.

a/ Including imports in border trade, but excluding other Mexican tourist expenditure abroad.

/series was

series was constructed on the basis of the estimated value of fixed assets and inventories for all production sectors in 1950. The estimate was extended to the preceding and subsequent years on the basis of the series for gross investment and of an annual depreciation rate.[13/] The product-capital ratio was obtained by dividing the yearly data for the gross product among the above values.

Allowances have been made for the limitations of the material on which the analysis was based, but it is believed that the results obtained by this method might be used as a starting point for other more detailed studies.

(b) Productive capacity

Reproducible capital rose 40.3 per cent between 1945-55 (see table I-9). Its increment was slower than that of nearly all the series that have been studied, but it was uninterrupted and more rapid than population growth during the decade, except in 1945, 1948 and 1949.

The growth rates of national capital followed the same cyclical pattern as those of investment (see figure I-IX). It is nonetheless important to note that, although the investment rate cycle had no particular trend, the capital increment cycle showed a very definite though oscillating upward movement. This factor was of great importance in determining the rapid development of the last decade, as it indicates that, by investing a constant proportion of the product, it was possible to accelerate the growth of productive capacity. This was due to the continuous improvement in the utilization of productive capacity, i.e. in the product-capital ratio, during the decade.

(c) The product-capital ratio

The movements of the product-capital ratio are the key to an understanding of several important facts referred to previously. Two distinct levels can be observed in figure I-X; in the first, relating to 1945-49, the product-capital ratio was maintained at approximately 0.41, while, in the second, which continued until 1951, the ratio fluctuated around 0.49. The jump from one level to the other took place in 1950-51 and corresponded to an increase of about 20 per cent in the intensity and efficiency with which productive

13/ See appendix C at the end of this chapter for the estimate of national wealth.

/FIGURE I - IX

FIGURE I - IX

MEXICO : GROWTH RATES OF REPRODUCIBLE CAPITAL AND GROSS INVESTMENT

(PERCENTAGE)

NATURAL SCALE

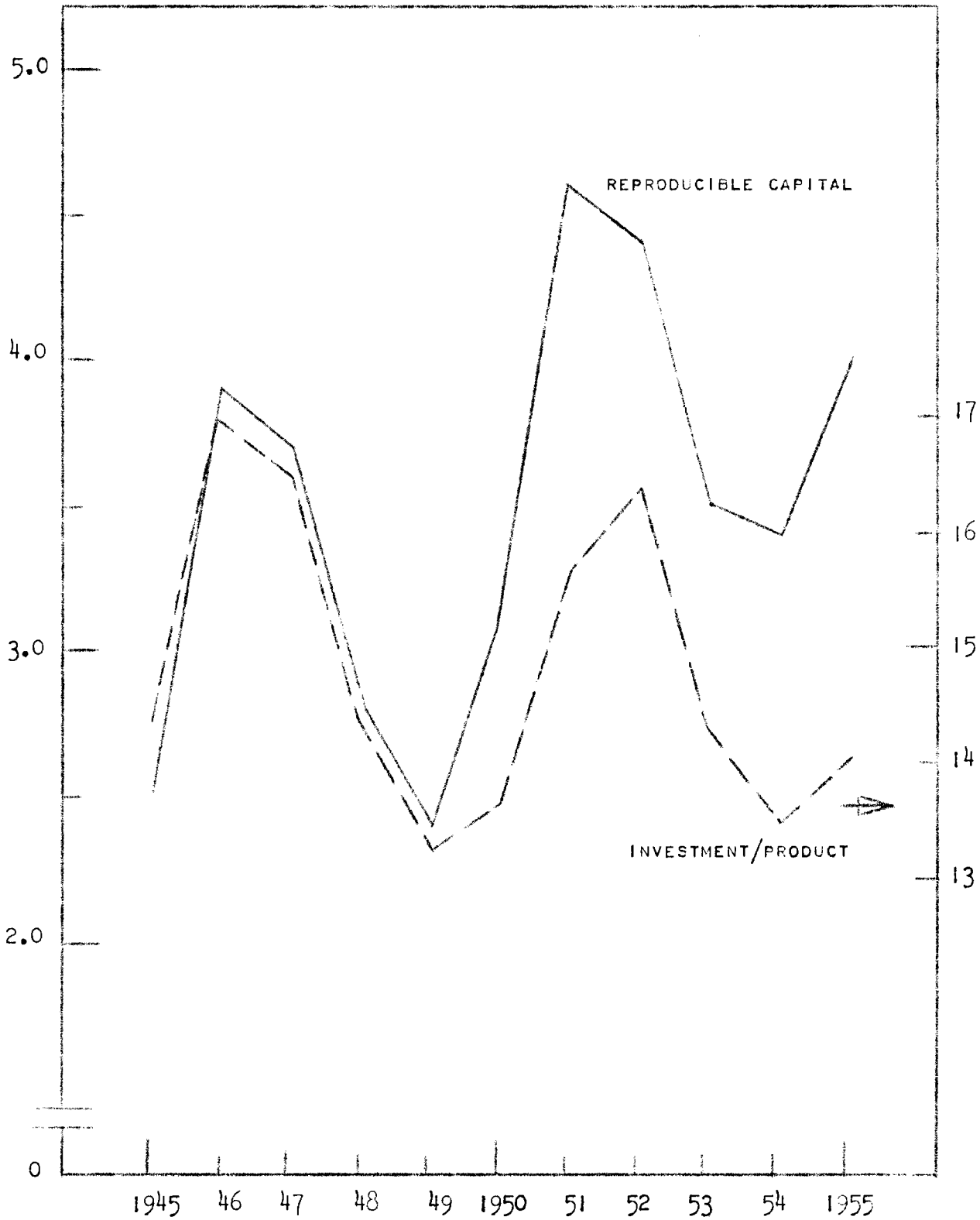


Table I-9

MEXICO: REPRODUCIBLE CAPITAL AND THE PRODUCT-CAPITAL RATIO, 1945-55

Year	Reproducible capital	Gross product	Product-capital ratio
	(Millions of 1950 pesos)		
1945	80,434	32,132	0.40
1946	82,467	34,326	0.42
1947	85,687	35,521	0.41
1948	88,820	37,213	0.42
1949	91,310	38,777	0.42
1950	93,508	43,299	0.46
1951	96,436	47,801	0.50
1952	100,891	47,369	0.47
1953	105,457	49,337	0.47
1954	109,132	53,428	0.49
1955	112,871	57,723	0.51
	(Percentage increment increase)		
1945-55	40.3	79.6	
1945-50	16.3	34.7	
1950-55	20.7	33.3	
	(Annual rate)		
1945-55	3.4	6.0	
1945-50	3.1	6.1	
1950-55	3.8	5.9	

Source: Chapter I, appendix B and C.

/capacity was

capacity was utilized. Another interesting feature revealed by figure I-X is the contrast between the trends of the product-capital ratio during the two periods; in the first it was much more stable than in the second when it dropped sharply in 1952 and 1953 to recover subsequently.

Some hypotheses can be formulated on the basis of these facts with a view to interpreting them and linking them to the phenomena analysed earlier. The low level of the product-capital ratio in the first few years appears to have been primarily due to the type of investments made. They were infrastructural investments (public investment was predominant at that time). These investments had low direct productivity and took a long time to mature. Moreover, as a result of the tendency of consumption to stagnate in that period, installed capacity was not adequately utilized in major branches of the industrial sector, such as the textile industry.

The change that took place in 1950 and 1951 was apparently due to a favourable combination of factors, of which one of the most important was the incentive to export provided by the higher prices paid to exporters. The 1948 and 1949 devaluations were followed by the boom created by the Korean war. In this connexion, it is useful to remember that in the majority of cases production for export employs natural resources that cannot be used otherwise, and that one feature of activities connected with the external market - particularly mining - is that they provide a fairly elastic supply over the short-term.

In the second place, many of the public investments made during the previous five years began to mature in 1950, thus preparing the ground for investments with higher productivity per unit of capital and earlier maturity.

Finally, the sharp increase of 20.5 per cent in agricultural production during 1950 and 1951 was reflected directly in the agricultural sector's product-capital ratio, and indirectly in that of the industrial sector through increased expenditure by the low-income consumer brackets.

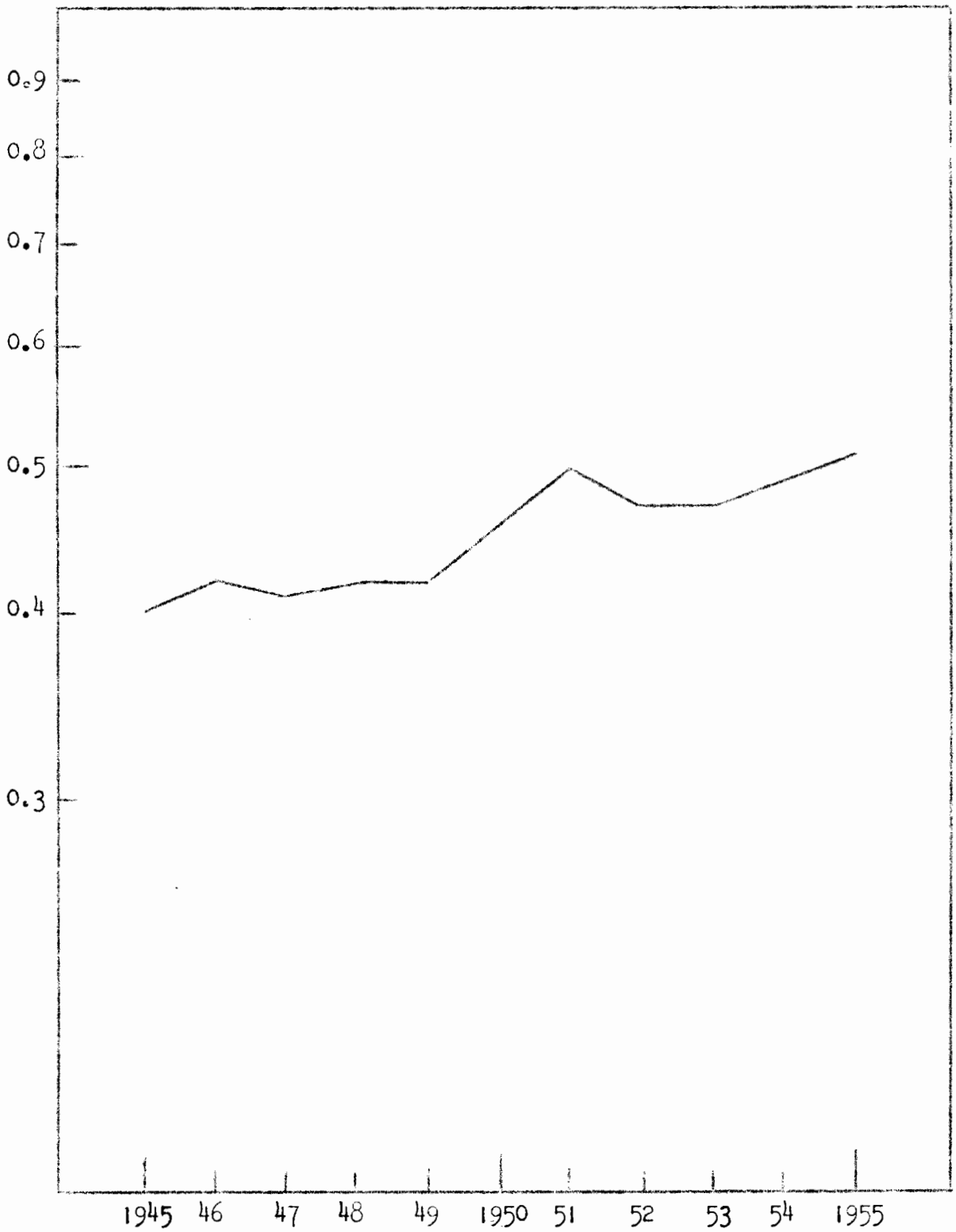
After the qualitative change in 1950-51, the contraction in the two following years was very slight. Neither the lowered agricultural production of 1952, with its negative effects on the over-all efficiency of the economy, nor the decline in investment and the capacity to import in 1953, with its

/Figure I-X

FIGURE I - X

MEXICO : PRODUCT-CAPITAL RATIO

SEMI-LOGARITHMIC SCALE



consequent repercussions on the utilization of equipment, succeeded in reducing the product-capital ratio to the low levels of the 1945-49 period. It would seem that the Mexican economy was enjoying a new combination of productive factors more conducive to capital savings.

The fact that the product-capital ratio attained such a high level indicates that an exceptional effort will be needed to maintain the rate of growth of the last decade. A product-capital ratio of 0.50 is, in fact, so high that it is most unlikely that it can be exceeded. Assuming that it remained constant, however, the net rate of capital accumulation would have to be 12 per cent in order to obtain an annual growth rate of 6 per cent for the gross product. The former would in turn - assuming a 3-per-cent annual depreciation of national capital - require a gross investment equivalent to 18 per cent of the gross product. The magnitude of the problem of how to maintain this rate of development may be realized if it is remembered that the gross investment rate exceeded 16 per cent in no more than three out of the ten years (1945-55) and rose to 17 per cent in only one of those years.

(d) Production trends by sector

(i) Agriculture. Crop and livestock production was doubled between 1945 and 1955 (see table I-10), purely agricultural production showing an even higher rate of growth (118 per cent) than that of livestock, which was less than 60 per cent. As there are no complete data on livestock production, and as animal husbandry is often considered to be a sideline to agriculture, the following remarks refer only to the latter.

The trend of agricultural production during 1945-55 was free from the cyclical movements and changes in level observed in the other series, but showed two clearly-defined phases of rapid growth: from 1947 to 1950 and from 1953 to 1955. The rate of growth was very slow up to 1947; from 1950 to 1953 it lagged behind population growth, and dropped sharply in 1952 owing to the bad weather conditions prevailing that year (see figure I-XI).

Table I-10

MEXICO: INDEX OF CROP AND LIVESTOCK PRODUCTION, 1945-55

(1950 = 100)

Year	Crop production	Livestock production	Crop and livestock production
1945	63.5	80.3	67.7
1946	65.4	88.6	71.2
1947	67.8	90.3	73.4
1945-47	65.6	86.4	70.8
1948	79.8	90.2	82.4
1949	86.8	89.7	87.5
1950	100.0	100.0	100.0
1951	104.6	94.3	102.0
1952	98.5	96.6	98.0
1953	105.3	114.0	107.5
1954	126.3	123.9	125.7
1955	138.2	127.4	135.5
1953-55	123.3	121.8	122.9
	(Percentage increase)		
1945-55	117.6	58.7	100.1
1945-50	57.5	24.5	47.7
1950-55	38.2	27.4	35.5
1945-47 to 1953-55	88.0	41.0	73.6

Source: Chapter I, appendix B.

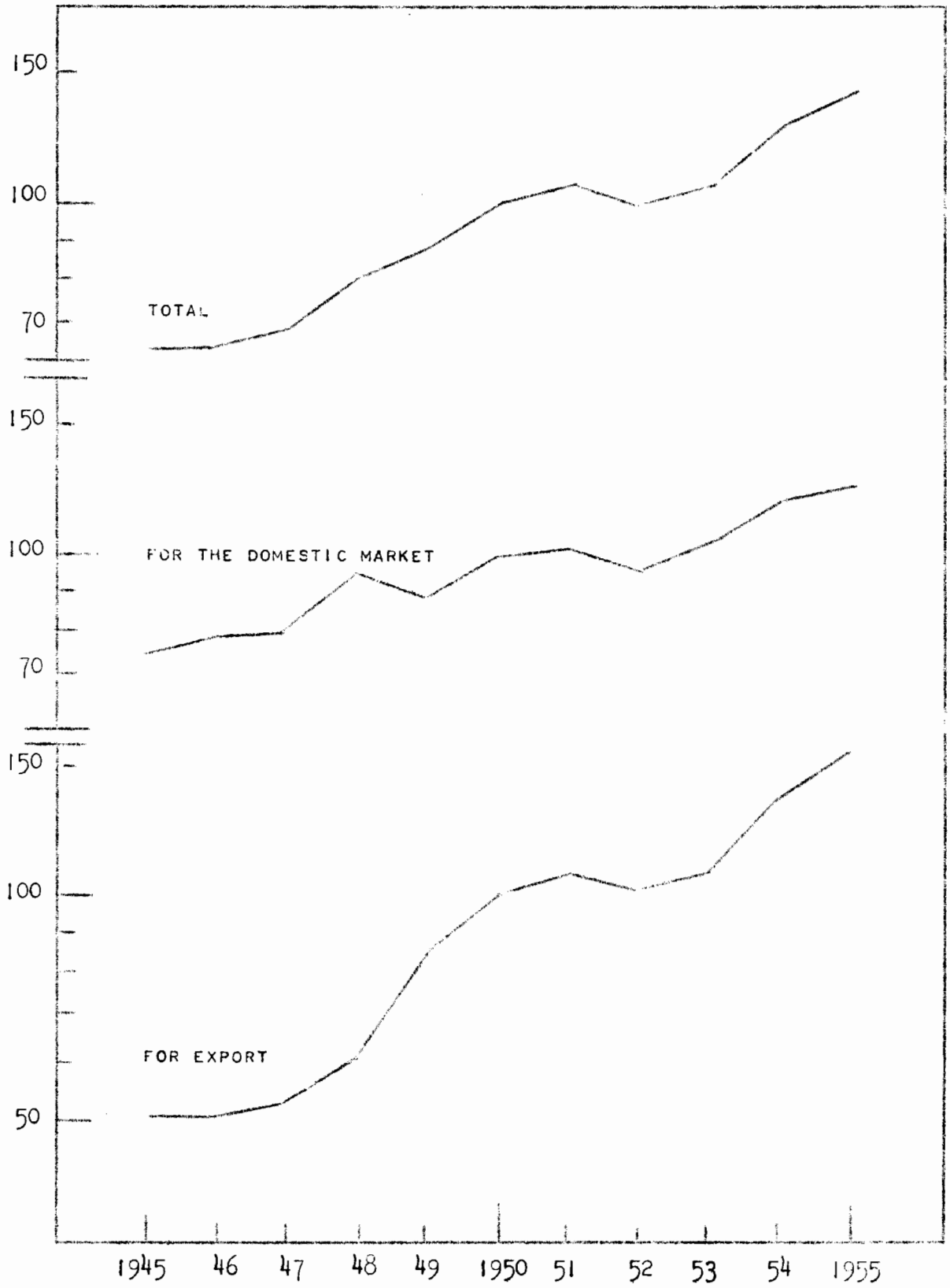
/Figure I-XI

FIGURE I - XI

MEXICO : INDICES OF AGRICULTURAL PRODUCTION

(INDEX : 1950 = 100)

SEMI-LOGARITHMIC SCALE



In order to explain the unusual increment in agricultural production and the alternation of slow and accelerated periods of growth, some mention should be made of the part played by the enlargement of the crop area, improvements in yield and changes in production structure, i.e. the replacement of subsistence crops giving low returns by more profitable crops. The area harvested increased by a mere 30 per cent between 1945-55, thus proving to have been only a subsidiary, if by no means negligible, factor in production growth (see table I-11). Average yields rose 37.5 per cent, although they were larger for some crops; for instance maize and cotton increased 38 and 73 per cent respectively (see table I-12). Although these factors are indicative of the large-scale technical transformation of Mexican agriculture, they do not entirely explain the exceptional development of this sector.

Another decisive factor in the striking production increase was the structural change in land use, which alone accounted for 22 per cent of the total production figure and was important enough to warrant a detailed examination of its more outstanding traits, such as the evolution of production for the domestic market (see table I-13 and figure I-XI). Its increment of 68 per cent was lower than that of total production during the decade and was more intensive during the first five years. Moreover, the declines were more accentuated than those of over-all production, owing to a greater dependence on rainfall. It might be more useful to study the tendencies of the group's major commodities rather than its movement as a whole.

Maize and wheat are not only the most important commodities within the group but are also representative, the first of traditional subsistence agriculture and the second of modern commercial agriculture. Wheat is also of special interest for the analysis because of its role in import substitution. Maize production rose 56 per cent during the decade in question, its rate of increase showing fluctuations and dropping to two clearly defined minimum levels in 1949 and 1952 (see figure I-XII). Conversely, wheat production increased more than two and a half times, with an important setback in 1952 only. From 1948 to 1950, it went through a phase of rapid growth and during 1953-54 increased even more

Table I-11

MEXICO: INDICES OF PRODUCTION AND PRODUCTIVITY IN AGRICULTURE, 1945-55

(1950 = 100)

Year	Index of area harvested	Index of unit yield	Index of changes in production structure $\frac{(D)}{(A) \times (B)}$	Index of production volume
	(A)	(B)	(C)	(D)
1945	80.9	88.2	89.0	63.5
1946	78.0	92.9	90.2	65.4
1947	83.1	96.1	84.8	67.8
1948	89.2	98.4	90.9	79.8
1949	93.5	104.9	88.4	86.8
1950	100.0	100.0	100.0	100.0
1951	101.0	99.6	103.9	104.6
1952	93.0	100.3	105.5	98.5
1953	97.3	105.5	102.5	105.3
1954	101.9	116.6	106.2	126.3
1955	104.9	121.3	108.6	138.2
		(Percentage increase)		
1945-55	29.6	37.5	22.0	118.1
1945-50	23.6	13.3	12.3	57.4
1950-55	4.9	21.3	8.6	38.2

Source: Chapter I, appendix B.

/Table I-12

Table I-12

MEXICO: INDICES OF AGRICULTURAL YIELD, 1945-55

(1950 = 100)

	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955
Rice	115.8	124.7	108.5	113.4	97.2	100.0	98.2	104.1	91.9	107.3	107.3
Maize	87.9	99.7	99.4	105.5	105.0	100.0	107.2	104.9	106.2	118.4	121.1
Wheat	81.2	89.9	92.9	90.8	103.3	100.0	96.3	94.7	112.0	120.5	120.2
Beans	86.0	73.2	103.9	103.1	101.2	100.0	96.1	98.1	118.6	139.9	139.9
Chick peas	104.0	107.1	111.1	109.7	103.6	100.0	102.1	107.3	109.4	113.7	122.7
Coffee	102.0	105.8	103.0	98.7	102.7	100.0	103.3	102.0	107.8	107.3	105.8
Cacao	78.4	85.0	82.9	83.6	85.7	100.0	100.3	105.6	103.1	125.1	135.5
Tomatoes	90.0	89.1	92.3	91.6	93.0	100.0	99.0	93.4	95.5	95.4	95.8
Potatoes	102.6	100.5	102.7	101.1	101.4	100.0	99.6	99.2	107.5	104.1	112.7
Alfalfa	100.9	101.2	100.5	98.6	99.7	100.0	103.7	104.1	105.3	100.4	110.3
Henequen	103.3	106.9	115.4	122.2	102.8	100.0	93.2	91.0	85.5	96.8	100.3
Cotton	78.1	81.3	84.2	86.6	110.5	100.0	95.3	98.5	106.1	124.0	135.1
Cotton seed	75.5	78.2	80.3	84.4	108.1	100.0	94.2	99.1	106.9	124.7	135.7
Sesame	104.1	115.2	130.6	111.5	101.9	100.0	108.8	114.3	107.9	109.2	120.7
Copra	92.1	97.5	86.7	98.3	96.4	100.0	106.8	97.9	110.7	114.5	121.9
Coquito	96.8	105.3	103.2	98.4	98.4	100.0	103.4	104.5	172.6	180.1	170.7
Peanuts	87.3	94.4	84.0	95.4	89.4	100.0	105.4	107.1	110.1	117.6	112.7
Linseed	65.3	70.2	76.5	79.5	89.6	100.0	95.7	100.8	94.1	75.9	91.5
Sugar cane	93.2	94.9	104.1	107.4	101.0	100.0	96.6	99.5	102.3	102.5	102.5
Tobacco	102.1	98.1	99.4	99.4	97.1	100.0	100.6	101.6	102.0	101.2	101.5
Oranges	133.4	136.0	136.1	135.8	123.6	100.0	85.0	92.2	93.4	99.2	95.4
Lemons	112.4	91.9	91.3	94.7	95.3	100.0	102.1	104.0	100.7	103.8	100.3
Bananas	108.3	108.7	108.2	108.8	108.2	100.0	78.3	89.0	88.4	89.5	92.4
Pineapples	86.3	91.6	90.9	91.3	92.8	100.0	102.1	98.3	92.4	89.8	93.1
General index	88.2	92.9	96.1	98.4	104.9	100.0	99.6	100.3	105.5	116.6	121.3

Source: Chapter I, appendix B.

/Table I-13

Table I-13

MEXICO: INDICES OF AGRICULTURAL PRODUCTION, 1945-55

(1950 = 100)

Year	Production for the domestic market	Production for export		Total production
		Including cotton	Excluding cotton	
1945	73.6	51.3	78.2	63.5
1946	77.8	50.5	81.0	65.4
1947	80.0	53.2	85.3	67.8
1948	95.2	61.3	91.1	79.8
1949	88.4	84.8	94.7	86.8
1950	100.0	100.0	100.0	100.0
1951	102.8	106.8	99.6	104.6
1952	95.9	101.6	101.1	98.5
1953	104.7	105.9	107.1	105.3
1954	119.1	135.0	105.9	126.3
1955	123.5	155.7	113.3	138.2
		(Percentage increase)		
1945-55	67.8	203.5	44.9	117.6
1945-50	35.9	94.9	27.9	57.5
1950-55	23.5	55.7	13.3	38.2

Source: ECLA, on the basis of official statistics.

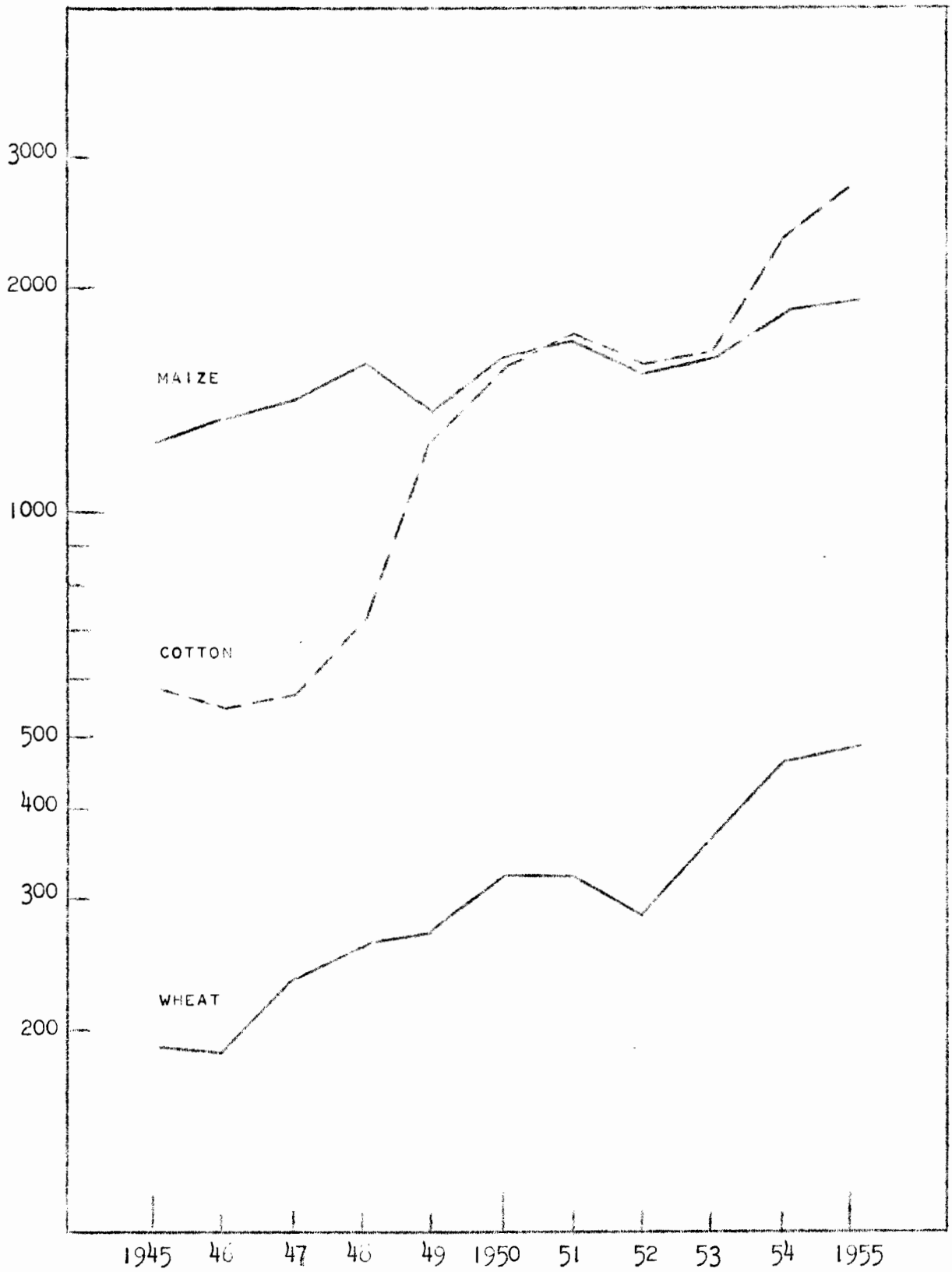
/Figure I-XII

FIGURE I - XII

MEXICO : MAIZE, WHEAT AND COTTON PRODUCTION

(MILLIONS OF 1950 PESOS)

SEMI-LOGARITHMIC SCALE



intensively by 60 per cent or more than the maize increment for the whole decade. The disparity between the two growth trends described indicates the increasing importance of the modern commercial sector in agricultural production. The influence of the devaluation as a stimulus to import substitution was also unmistakably demonstrated by their accelaration of wheat production during a period of pressure upon the balance of payments.

This leads to a study first, of the behaviour of aggregate agricultural production for export and, secondly, of cotton as a separate item because of its special characteristics.

Agricultural exports more than trebled during the decade, though, if cotton is excluded, the index shows an increment of only 45 per cent, which was lower than that of production for the home market. If coffee is also excluded, the production of which rose more than 70 per cent, the increment for the remaining commodities grown chiefly for export amounted to no more than 34 per cent.

During 1945-47, cotton production was at a standstill. In the three following years it rose 2.5 times, but stagnated again during the following three years finally making a strong comeback in 1954 and 1955, when it increased 69 per cent. These movements offset the phenomenon analysed during the discussion of demand, i.e., the response of a production sector with high supply-elasticity to the stimulus of a substantial improvement in relative prices arising from the devaluations and the boom created by the Korean war. In the case of coffee, the improvement of relative prices was even greater, but the very nature of the crop prevented any large-scale expansion of supply which nevertheless, amounted to more than 70 per cent.

It remains to be asked what factors were responsible for the high supply-elasticity of agriculture. In other words, references to the structural changes in land use, improved yields and expansion of the crop area are not sufficient without some specific indication of the factors implicit in these changes.

/A factor

A factor of primary importance in agricultural progress was the official development policy which covered a number of aspects that will be described later. On the one hand, there was a decided flow of public investment to agriculture, mainly for irrigation projects and flood control. This item should also include investment in road construction which was more intensive than usual during the last decade and opened up to the national market zones that had hitherto been completely cut off. Another aspect of this policy was the activities of the two specialized Government banks, which transferred an increasing amount of resources to the agricultural sector, thereby facilitating normal crop financing and imports of agricultural machinery, higher grade livestock, etc. The third factor was that of agricultural development work, including not only purely educational aspects such as instruction on the use of machinery, fertilizers, pesticides and fungicides,etc., but also the direct distribution of improved seeds. This work was backed by public investment in technical organizations for agricultural research. Finally, industries promoted and financed by Government resources were partly intended to encourage agriculture, as in the case of some enterprises manufacturing synthetic fertilizers and agricultural machinery.

One particular important aspect of over-all economic policy with far-reaching repercussions on the agricultural sector was that of the price policy - especially for agricultural commodities - implicit in the devaluations. Action concerning agricultural prices may take two forms. One form is what is commonly understood as the fixing of guarantee prices for producers, its main objective being to protect the farmers' real income against the middle men and the more integrated sectors producing goods and services. The other form does not involve any special line of action, but is a result of exchange policy; its effect is less obvious but has nearly always been more far reaching.

The devaluations had a notable effect on agricultural development and policy during the past decade. On the one hand, they provided a strong incentive to cotton and coffee production, and kept the output

/of the other

of the other export crops at a fairly high level in spite of the extemely unfavourable conditions of external demand. On the other, they encouraged import substitution, both directly, as in the case of wheat, and indirectly, as in the case of processed foodstuffs.

Government development policy and external demand, in their turn, spurred on the farmers to further efforts, which were a key factor in the technical transformation and growing commercialization of Mexican agriculture.

But the very direction taken by agricultural development during the last ten years was apparently an obstacle to the solution of certain basic problems, among which the most urgent was that of over-population in the poorer regions of the country,[14] (see table I-14). The largest per capita increases of agricultural land were recorded in the north and north-west (Pacífico Norte), where, for obvious climatic reasons, efforts to extend the irrigated area were concentrated. Agriculture in these zones was already more technical and more commercialized, and the per capita availability of cultivated land was higher than elsewhere, whereas in those States where agriculture was more backward and on a smaller scale, it appeared to be disminishing.

The "technical revolution" in agriculture did not reach the great majority of rural workers, a fact which is closely connected with the over-crowding of the poorer regions. The effects of this population pressure were so far reaching that they went beyond the purely agricultural sector and may be said to be at the root of Mexico's economic problems. Agricultural growth should preferably be concentrated in those areas where there is less pressure on resources, since the introduction of improved techniques in densely populated areas is far more difficult, because intensive cultivation methods require training and other forms of investment in the working population that are by no means easy to carry out and take time to mature. In such circumstances

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14/ Table I-14 only compares the census data for 1940 and 1950, as the figures for 1945 and 1955 are unavailable. It seems unlikely, however, that the five-year lag will have appreciably altered the actual picture.

/Table I-14

Table I-14

MEXICO: EXPANSION OF THE CROP AREA, 1940-50

Zone	Crop area				Land per capita a/ (Hectares)		Crop area as a percentage of the total	
	1940	1950	Increase	Percentage increase	1940	1950	1940	1950
	(Thousands of hectares)							
Pacifico Norte b/	1,147.2	1,546.9	399.7	34.8	1.34	1.49	2.78	3.75
Norte c/	3,559.7	4,899.3	1,339.6	37.6	1.41	1.64	4.44	6.12
Centro d/	5,427.0	5,917.2	490.2	9.0	0.99	0.95	19.70	21.48
Golfo e/	2,564.7	2,688.4	123.7	4.8	1.54	1.39	10.82	11.34
Pacifico Sur f/	2,172.5	3,175.7	1,003.2	46.1	0.97	1.23	9.12	13.33
Total	14,871.1	18,227.4	3,356.3	22.5	1.17	1.23	7.57	9.28

Source: L.M. Echeverría, "Progresos recientes de la agricultura mexicana", Problemas Agrícolas e Industriales de México, Vol. VI, N° 4, October-December 1954.

a/ Rural population only.

b/ Including Baja California Norte, Baja California Sur, Nayarit, Sinaloa and Sonora.

c/ Including Coahuila, Chihuahua, Durango, Nuevo Leon, San Luis Potosi, Tamaulipas and Zacatecas.

d/ Including Aguas calientes, Distrito Federal, Guanajuato, Hidalgo, Jalisco, Mexico, Michoacan, Morelos, Puebla, Queretaro and Tlaxcala.

e/ Including Campeche, Quintana Roo, Tabasco, Veracruz and Yucatan.

f/ Including Colima, Chiapas, Guerrero and Oaxaca.

/it was

it was only to be expected that the development of the Mexican economy should consist mainly of a combination of agricultural expansion in the regions possessing relatively greater natural resources, intensified cultivation in the more densely-populated rural areas and the transfer of the surplus population from the latter to activities elsewhere. Some of the people may migrate - as they have done up to the present - to the rapidly developing agricultrual regions, but the main burden of absorbing the surplus manpower must be borne by industry and related activities. Rural population growth in the densely populated regions during 1940-50 indicates that efforts to transfer even the increment in population were unsuccessful. In spite of the Mexican economy's intensive development during the last decade,its fundamental problem may still be expressed in traditional terms: how to reduce the surplus population living in areas, and engaged in activities of extremely low productivity.

Finally, it may be asked whether it is possible for the rapid growth of agricultural production in the last decade to continue. This problem has two aspects: the physical and technical feasibility of continuing to enlarge the area cultivated and improve yields, and the maintenance of development incentives.

So far as the first aspect is concerned, there is every indication that, on the national scale there are no physical obstacles as regards the supply of land. although there is a local insufficiency especially in the central plateau. Population growth, erosion and soil exhaustion may make the situation even worse in the next decade. It is also likely, in view of the current low yields, that the production of some staple crops, such as maize, beans and even wheat, will improve in future although that would call for increasingly large investments.

With regard to development incentives, it is very probable that, even in the absence of a specific economic development programme, some measures of development policy may be retained such as investment in irrigation and road building, Government agricultural credits and agricultural development work. But the incentives provided by improved relative prices are of a very different nature, and are worthwhile commenting on in some detail.

/In relation

In relation to production for the domestic market, it should be pointed out that the stimulus offered by higher relative prices led to import substitution rather than to a real increment in supply. This was most evident in the case of wheat where doubled output did not result in an increase of per capita consumption but practically eliminated imports. If wheat is not imported in future, the possibility of substitution will disappear, thus eliminating one of the essential forces in agricultural development.

In the case of production for export, it has already been shown that the incentive was provided by improved internal relative prices, since the external terms of trade tended to decline. This caused a widespread redistribution of income which will probably not be able to continue. These questions have been dealt with more extensively in other parts of the study, but ought to be mentioned at this juncture.

Although prospects are encouraging in some cases, agricultural development for export purposes will find it difficult to maintain throughout the next decade the rapid rate of growth it achieved during the last ten years. In view of this and of the fact that the easiest stage of import substitution has already passed, it is evident that future agriculture development will depend much more directly on an expansion of the domestic market. In contrast to the last decade, when income redistribution arising from the devaluations had a favourable effect on a major agricultural sector, that of exports and import substitution, it is more than likely that agriculture will be unable to continue developing during the next few years without a steady expansion in domestic demand. Such an expansion will take place only if consumer demand in the low-income brackets increases more intensively than during the last decade.

(ii) Manufacturing industry. Manufacturing output rose 79 per cent, at approximately the same rate as aggregate supply (see table I-15 and figure I-XIII). The rate was slower during the first years of the decade, but accelerated from 1948 onwards, and reached its peak in 1950 and 1951. In 1952 a sharp falling-off took place and the 1951 level was not recovered until 1954. A new phase of acceleration appeared to begin in 1955.

/ FIGURE I - XIII

FIGURE I - XIII

MEXICO : INDICES OF MANUFACTURING OUTPUT

(INDEX : 1950 = 100)

SEMI-LOGARITHMIC SCALE

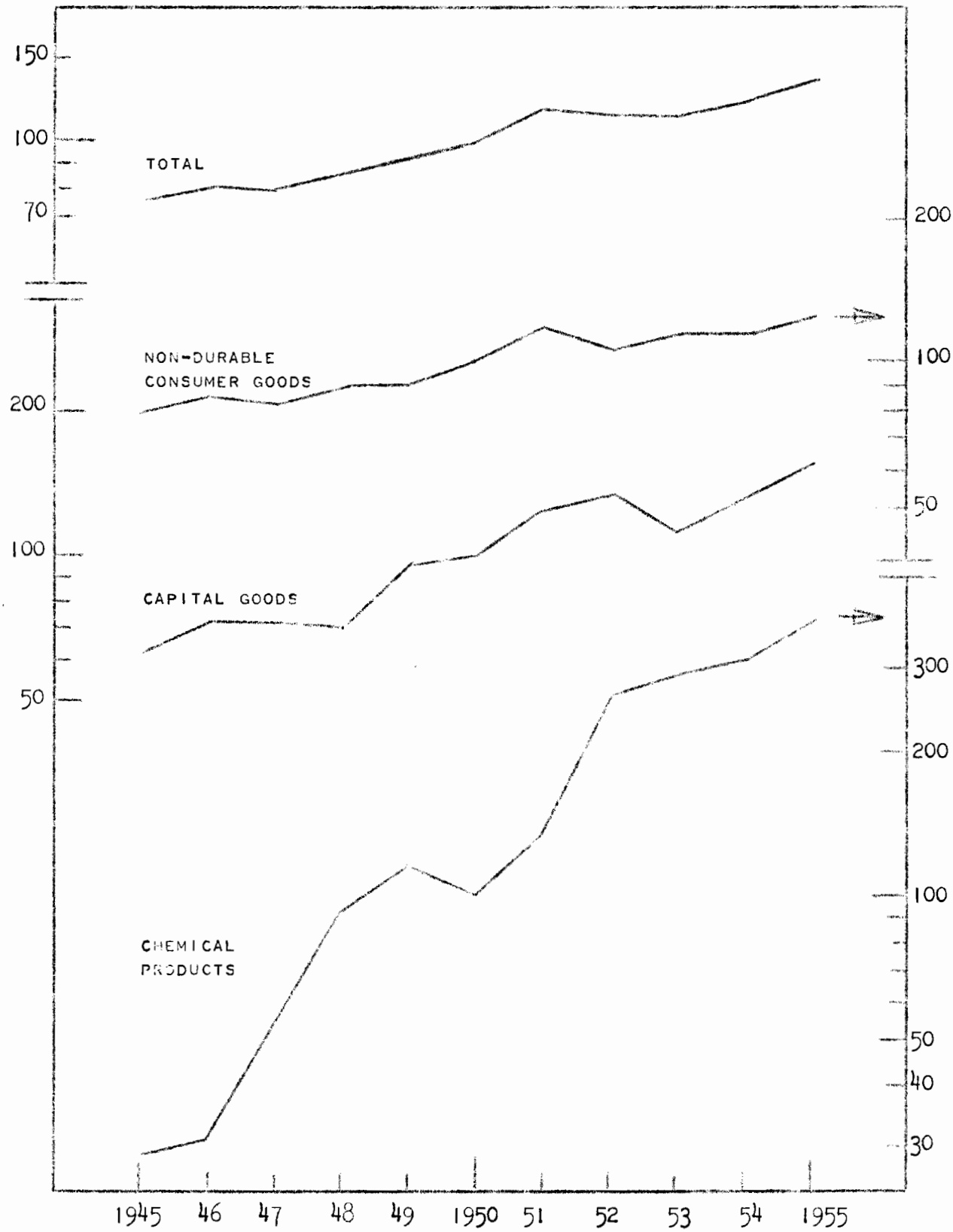


Table I-15

MEXICO: INDEX OF MANUFACTURING OUTPUT, 1945-55

(1950 = 100)

Year	Chemical products	Non-durable consumer goods	Capital goods a/	General index
1945	27.6	79.0	61.8	74.9
1946	30.8	82.5	71.2	79.6
1947	53.7	81.3	72.4	79.2
1948	92.6	88.4	71.2	85.0
1949	117.3	88.8	95.3	90.5
1950	100.0	100.0	100.0	100.0
1951	138.2	117.2	122.7	118.6
1952	264.7	106.6	133.7	114.0
1953	296.7	113.1	110.5	114.8
1954	318.0	115.3	131.0	120.9
1955	382.7	123.9	158.0	133.9
		(Percentage increase)		
1954-55	1,286.6	56.8	155.7	78.8
1945-50	262.3	26.6	61.8	33.5
1950-55	282.7	23.9	58.0	33.9

Source: Chapter I, appendix B.

a/ Including durable consumer goods produced by the mechanical industry.

/The manufacturing

The manufacturing trend was clearly connected with that of other productive sectors and of aggregate demand. For instance, the deterioration in 1952 was, to a large extent, associated with the decline in agricultural production, so much so that the stagnation of 1953 was apparently due to the contraction of investment in that year. A separate examination of the production trends of non-durable consumer goods and capital goods will reveal the associations more clearly. At the same time, other facts will emerge which will go far to explain the structural changes in industrial production, and the import substitution process, in particular the role played by the devaluations in that process and the effects of income redistribution.

Taking the production of non-durable consumer goods first, the outstanding feature was the comparatively slow rate of growth which was only 57 per cent for the whole decade. Moreover, the acceleration during 1950 and 1951 was relatively greater than that of manufacturing as a whole. Similarly, the falling-off in 1952 was sharper and the subsequent recovery so slow that by 1955 the level attained in 1951 had only been passed by a slight margin.

From the rate of population growth in conjunction with the trend described above, it may be concluded that per capita production of non-durable consumer goods remained at a standstill up to 1949, that it declined after 1951 and that it was subsequently not even capable of recovering the level attained in that year. The total per capita production increment of 21 per cent for the decade was thus presumably concentrated in the two year period from 1950 to 1951, which accords with the facts revealed by the analysis of demand. The phenomenon was, however, more accentuated in the present case, total growth being less, and the phases of stagnation and recession more pronounced. This confirms the observations made at the end of the preceding section on the behaviour of demand for general consumer goods.

The trend of capital goods production was very different. In the first place, its rate of growth was far more intense, increasing 2.6 times between 1945 and 1955. In the second place, the annual fluctuations were dissimilar in behaviour being marked by an initial strong upward

/trend in

trend in 1946 and stabilization at the latter level until 1948. During the next four years, the rate of growth gathered momentum, the 1952 level being 88 per cent higher than that of 1948. In 1953 a notable decline took place and the level had not been completely restored even in 1954. 1955 saw the start of a new acceleration.

The trend indicated above draws attention to some important points, such as the effect on investment expenditure, both during the years of accelerated growth and the 1953 contraction, the import substitution of capital goods and the considerable impetus given to import substitution by the devaluations. In order to give some idea of the force of this impetus and the degree of substitution, a calculation was made of the ratio between the indices of capital goods production and equipment imports. This ratio showed an increment of 0.81 to 1.07 for the whole decade, but its changes as a result of the devaluations were even more significant, as in 1947-49 it rose from 0.59 to 1.09, and from 0.84 to 1.07 in 1953-55.

It is important to note that the three components forming the index of capital goods production - cement, rolled steel products and the mechanical industry - had an almost identical rate of growth (see table I-16), though this homogeneity is not so obvious if the first and second five-year periods are studied separately. The production of rolled steel products and of cement would thus be seen to have risen more intensively during the first five years, the reason for this being - in the case of cement at least - the declining rate of growth of public investment referred to previously.

During the second five years, the rolling mills had greater difficulty in obtaining supplies of ingots, although this problem was soon solved by the installation of electric furnaces, the capacity of which increased more than five times during 1950-55, thus rising from 15 to 45 per cent of the country's steel potential.

/Table I-16

Table I-16

MEXICO: INDEX OF CAPITAL GOODS PRODUCTION, 1945-55

(1950 = 100)

Year	Rolled steel products	Cement	Engineering equipment	General index
1945	56.8	58.3	65.0	61.8
1946	67.0	63.3	75.0	71.2
1947	73.0	72.0	72.3	72.4
1948	73.0	77.8	68.8	71.2
1949	96.3	84.9	97.2	95.3
1950	100.0	100.0	100.0	100.0
1951	121.3	110.7	126.1	122.7
1952	137.4	118.2	135.5	133.7
1953	112.5	120.5	107.3	110.5
1954	131.3	127.3	131.8	131.0
1955	153.1	150.3	162.1	158.0
		(Percentage increase)		
1945-55	169.5	157.8	149.4	155.7
1945-50	76.1	71.5	53.8	61.8
1950-55	53.1	50.3	62.1	58.0

Source: Chapter I, appendix B.

/The rapid

The rapid growth of the mechanical industry and especially its intensification during the second half of the decade, was partly due to import substitution of equipment and durable consumer goods. This fairly new industry was stimulated by the devaluations and developed very rapidly, although incomplete statistics make it impossible to measure its growth directly. Nevertheless, as will be confirmed in chapter IV where the problem of import substitution is treated at greater length, the rapid increase in the production of certain items such as refrigerators, washing machines and television sets contrasts with the slow increment in the production of non-durable consumer goods. This was partly attributable to the disparity between the growth rates of consumption in the medium- and high-income brackets, on the one hand, and in the lower-income brackets, on the other, although it should not be forgotten that the process of import substitution in this sector was only incipient whereas substitution in respect of non-durable consumer manufactures had already reached a very advanced stage.

Another extremely interesting aspect of industrial development in this period was the unusual development of the chemical industry, the production of which increased almost 14 times. This increment was partly due to basic structural changes, closely linked to import substitution and the vigorous expansion of agriculture. It may be said that the decade in question saw the birth of the alkali, ammonium sulphate and superphosphates industries, the production of which was negligible up to 1945. Even the production of sulphuric acid, which was already a well-established industry, increased almost 6 times, thus reflecting, to a great extent, the expansion in fertilizer production.[15/]

The relative development of the heavy - metallurgical, mechanical and chemical - industries helped to diversify the industrial sector and to make the Mexican economy as a whole more self-sufficient. A relative increase in the production of capital goods, such as that which occurred during the last decade, implied greater flexibility for the over-all productive system. As will be seen from the following section, the capital formation process became less dependent upon external trade.

15/ See chapter IV, section VI, paragraph 2, for production in the major branches of the chemical industry.

/(iii) Mining

(iii) Mining, petroleum and electric energy. In contrast to the striking expansion of manufacturing, mining remained practically stationary during the decade. This was even more surprising in view of the substantial improvement in relative prices resulting from the combination of high international prices and the exchange devaluations, which benefited the large mining export sector. Mining production showed scarcely no increase during 1945-55 and dropped 12 per cent per capita. Annual fluctuations were extremely irregular and on a small scale, except for a decline of 25 per cent in 1946 (see table I-17 and figure I-XIV).

The outstanding event in the mining sector was the expansion of sulphur production at the end of the decade. In 1945, barely 8,500 tons of sulphur were produced. The first impetus was provided by the establishment of a subsidiary plant near the oil wells of Poza Rica, in order to extract sulphur from the gases obtained as by-products. By this means production reached 41,000 tons in 1953. The radical change occurred, however, when the salt domes on the Isthmus of Tehuantepec began to be exploited; this raised Mexican output to 521,000 tons in 1955 and made Mexico the second largest producer in the world.

In contrast to the traditional mining of non-ferrous metals for export, the production of coal and iron - both connected with the home market - showed a relatively intensive rate of growth. Iron ore production benefited from the expansion of the iron and steel industry and rose 136 per cent during 1945-55. Coal production was stationary during the first five years, but rose 47 per cent from 1950 to 1955. Its production is increasingly dependent on the demand for more coking coal for the iron and steel industry, since low petroleum prices have made it uneconomic to use solid fuel as a source of energy.

Petroleum production doubled during the decade, its growth being practically continuous, with only two years of stagnation (1948 and 1949). It experienced periods of accelerated growth in 1945-47, 1950-51 and 1954-55 (see table I-18 and figure I-XIV).

In addition, the petroleum industry underwent a series of very important changes. Refining capacity rose from 138,000 to 266,000 barrels daily and there was considerable improvement in the installations and techniques employed, which enabled the range of products to be extended.

/Table I-17

Table I-17

MEXICO: INDICES OF MINING OUTPUT, 1945-55

(1950 = 100)

	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955
Precious metals	123.7	92.3	118.1	109.4	100.2	100.0	91.2	105.2	103.4	85.0	96.7
Gold	122.3	103.0	113.9	90.1	99.4	100.0	96.5	112.5	118.5	94.8	94.5
Silver	124.3	88.6	119.7	117.0	100.6	100.0	89.1	102.5	97.4	81.2	97.5
Non-ferrous industrial metals	95.1	69.2	93.5	85.4	88.6	100.0	94.2	103.1	100.6	97.6	105.5
Copper	100.0	98.9	101.3	95.7	92.8	100.0	109.2	94.7	97.5	88.8	88.6
Lead	86.2	58,9	93.7	81.2	92.7	100.0	94.7	103.3	93.0	91.0	88.5
Zinc	93.9	62.4	87.6	80.1	79.8	100.0	80.5	101.7	101.3	100.1	120.5
Antimony	149.2	112.0	84.7	125.8	98.0	100.0	116.3	94.3	62.8	70.8	65.0
Bismuth	61.3	28.9	96.9	61.0	117.5	100.0	128.5	154.3	127.4	136.8	133.3
Cadmium	152.9	104.1	113.1	131.5	119.1	100.0	129.8	106.6	115.4	74.4	289.7
Manganese	128.2	78.4	98.1	166.1	164.4	100.0	197.2	311.5	523.8	576.4	247.6
Mercury	437.7	310.4	257.8	127.2	139.9	100.0	215.0	232.4	310.0	392.7	795.4
Arsenic	174.8	107.4	107.8	84.2	39.8	100.0	142.0	31.9	22.2	27.0	32.9
Tin	39.6	59.8	38.9	41.3	81.4	100.0	83.5	93.9	108.3	79.4	137.7
Molybdenum tungsten	157.5	111.8	113.8	198.0	97.0	100.0	482.5	659.5	1,009.2	807.9	842.0
Iron	61.2	59.8	79.0	79.4	86.4	100.0	109.4	118.9	115.7	109.8	144.4
Total: metals	100.7	74.1	98.6	90.5	91.1	100.0	92.9	103.9	101.5	95.1	104.4
Coal	100.3	107.2	114.1	115.9	117.9	100.0	122.7	144.4	157.1	144.1	147.2
Sulphur	76.2	45.1	49.7	46.0	45.6	100.0	259.2	456.0	359.5	1,009.6	4,265.2
Graphite	96.0	89.1	113.6	143.2	96.7	100.0	135.2	98.1	123.2	88.4	119.1
Total: minerals	100.6	74.7	98.9	91.2	91.5	100.0	94.1	105.3	103.2	97.8	113.9

Source: ECLA on the basis of official statistics.

/Table I-18

Table I-18

MEXICO: PRODUCTION OF CRUDE PETROLEUM AND DERIVATIVES, 1945-55

Year	Crude petroleum	Derivatives	Crude petroleum	Derivatives	Total a/
	(Millions of barrels)		(Indices: 1950 = 100)		
1945	43.5	41.7	58.9	74.6	67.6
1946	49.2	44.0	66.6	78.7	73.3
1947	56.3	51.3	76.2	91.8	84.8
1948	58.5	49.8	79.2	89.1	84.7
1949	62.1	54.7	84.0	87.9	86.1
1950	73.9	55.9	100.0	100.0	100.0
1951	78.8	61.3	106.6	109.7	108.3
1952	78.9	65.0	106.8	116.3	112.0
1953	74.1	71.5	100.3	127.9	115.5
1954	85.0	77.1	115.0	137.9	127.6
1955	91.4	80.5	123.7	144.0	134.9
		(Percentage increase)			
1945-55			110.0	93.0	99.5
1945-50			69.7	34.0	47.9
1950-55			23.7	44.0	34.9

Source: Basic data from Petróleos Mexicanos, S.A.

a/ Index weighted with prices and volume of production of crude petroleum and derivatives in 1950.

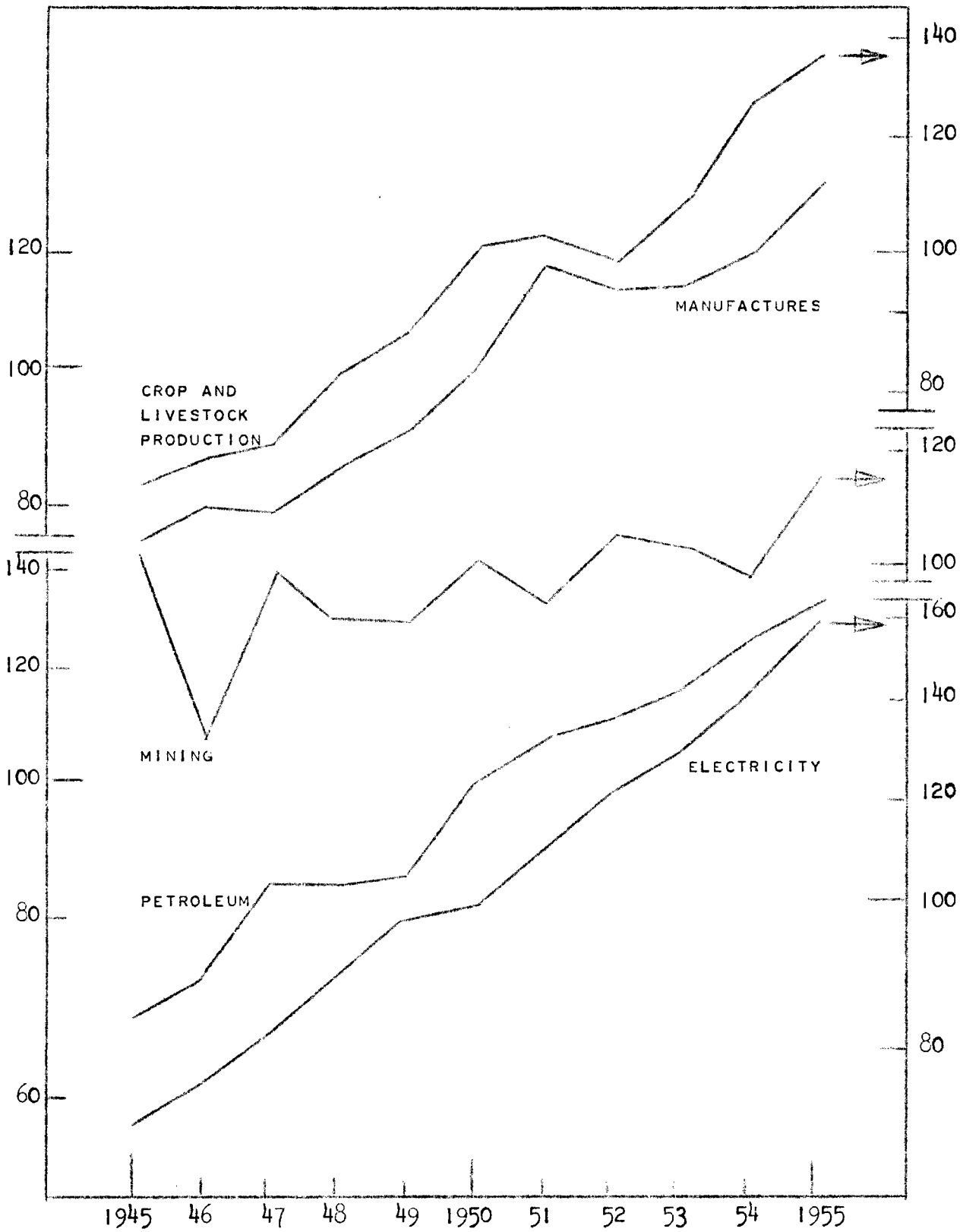
/Figure I-XIV

FIGURE I - XIV

MEXICO : PRODUCTION INDICES

(INDEX : 1950 = 100)

SEMI-LOGARITHMIC SCALE



During this period, the production of lubricants and high-octane petrol began, while the network of pipelines and transport equipment were developed sufficiently to provide large areas of the country with a continuous and ample supply.

The increment in petroleum production, the low-price policy and all the other changes indicated have played a decicive part in expanding the infrastructure of the Mexican economy. They have enabled the greatest possible benefit to be derived from the expansion of the highway system, and have laid the foundations for the development of fertilizer production, which is one of the most dynamic branches of the chemical industry. The expansion of this industry and the completely elastic supply of fuel for tractors and other agricultural machinery have played a major role in the technical transformation of agriculture.

From the foregoing remarks it may be concluded that the quantitative and qualitative development of the petroleum industry also contributed to the increment in the output-capital ratio during the decade under review.

The case of electric energy was fairly similar. Electric power generated increased from 3,069 million to 7,049 million kWh, i.e. by 129.6 per cent (see table I-19 and figure I-XIV). Installed capacity during the same period increased from 720,000 to 1,93),000 kW. The unusually regular growth of electric power was a striking feature. Neither the cyclical movements of the capacity to import and of investment, nor unfavourable weather conditions appear to have seriously impaired the rapid and steady growth of this essential sector of economic development. The problem of expanding commercial sources of energy is considered at greater length in chapter IV and its annex.

/Table I-19

Table I-19

MEXICO: ELECTRIC ENERGY PRODUCTION, 1945-55

Year	Total generated (Millions of kWh)	Total generated Index (1950=100)	Installed capacity (Thousands of kWh)	Installed capacity Index (1950=100)
1945	3,069	69.4	720	58.3
1946	3,317	75.0	894	72.4
1947	3,598	81.3	957	77.5
1948	3,969	89.7	1,040	84.2
1949	4,328	97.9	1,097	88.8
1950	4,423	100.0	1,235	100.0
1951	4,908	111.0	1,400	113.4
1952	5,337	120.0	1,572	127.3
1953	5,703	128.9	1,701	137.7
1954	6,282	142.0	1,850	149.8
1955	7,049	159.4	1,930	156.3
		(Percentage increase)		
1945-55		129.6		168.0
1945-50		44.0		71.5
1950-55		59.4		56.3

Source: Federal Electricity Board.

/III. THE TENDENCY

III. THE TENDENCY TOWARDS DISEQUILIBRIUM IN THE BALANCE OF PAYMENTS AND THE PROBLEM OF DEVALUATION

1. The overvaluation hypothesis

The general introduction to this study deals with several hypotheses designed to explain the tendency towards disequilibrium which is displayed by the balance of payments in an under-developed economy with a high rate of growth. It was concluded that neither the overvaluation hypothesis nor that relating to the surplus of investment over savings was adequate to explain this phenomenon, and that its origin should be looked for in the actual structural changes that constituted economic development. Taking Mexico as a case in point, an attempt will be made in this section to show how such disequilibrium is produced.

Before analysing the structural changes underlying this disequilibrium, it may be useful to dwell on a series of facts which clearly indicate that its reappearance during the last decade was not due to an overvaluation of the exchange rate which increased imports and prevented exports. The nature of the problem varies, of course, according to the export item in question.

During the period prior to each devaluation there was apparently no exchange rate impediment in the case of cotton, since its export volume showed no decline. As a result of the devaluations, Mexican cotton was sold under highly profitable conditions at lower prices than United States cotton of similar quality, the adjusted exchange rate being a means of strengthening the competitive advantage enjoyed by Mexico.

The downward trend of the other agricultural exports was presumably due to an overvaluation of the exchange rate, but the very fact that the devaluations did not succeed in checking that trend indicated that its origin was not to be found in exchange rate policy. In fact, a careful study of this phenomenon will lead to the conclusion that the decline was mainly due to the critical situation of the United

/States agricultural

States agricultural market where certain Mexican exports competed with commodities produced domestically and were consequently replaced by them. In the case of henequen, the decline was due to technical changes and the competition of other fibres.

Mineral exports do not appear to have been adversely affected by overvaluation or stimulated by the devaluations. As already pointed out, their export quantum remained stationary while the price level was exceptionally favourable.

Although exports were apparently unharmed by overvaluation of the exchange rate, the rapid growth of import demand should not be attributed to this either, since it was largely a problem of tariff protection. In any event, the behaviour of imports was a much more complex question which will be thoroughly analysed in subsequent pages.

For all these reasons, the hypothesis of price-cost disparities appears, at first sight, to be incompatible with the conditions prevailing in Mexico during the last ten years. This question can best be judged, however, by resorting to the direct approach, i.e. by observing the price trends in Mexico and the United States over a longer period and by comparing them with the changes in the peso/dollar exchange rate. This will show whether the exchange rate really tended to be overvalued ant to bring about recurrent disequilibria in the balance of payments. The results of these comparisons are presented in table I-20 and figure I-XV; in order to facilitate their interpretation, a brief explanation will be given concerning how the data were prepared. In the first place, the ratio between the wholesale price indices for Mexico and the United States was established, and then multiplied by the exchange rate in force in 1937 to obtain purchasing power parity. Finally, the latter was compared with the exchange rate prevailing each year, and an index of over and undervaluation was constructed which is represented in figure I-XV.

/FIGURE I - XV

FIGURE I - XV

MEXICO: INDEX OF OVERVALUATION OR UNDERVALUATION OF THE EXCHANGE RATE

(INDEX : 1937 = 100)

SEMI-LOGARITHMIC SCALE

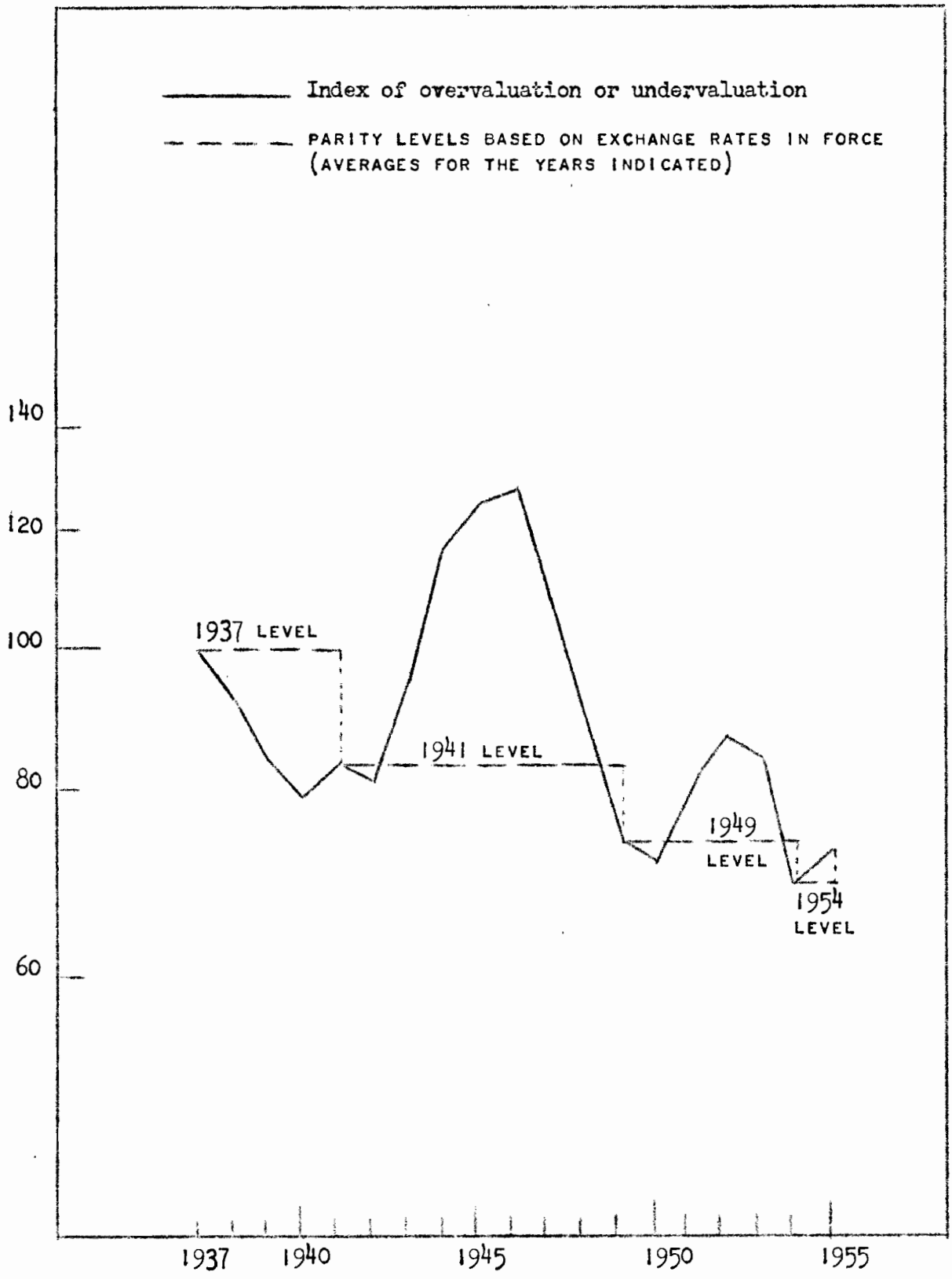


Table I-20

MEXICO AND THE UNITED STATES: RATIO OF PRICES AND EXCHANGE RATES, 1937-55

(Base: 1937)

Year	Price indices			Exchange rates		Index of over or under valuation of the exchange rate
	México	United States	Ratio (A)/(B)	In force	Parity (D)x(A)/(B)	(E)/(F)
	(A)	(B)	(C)	(D)	(E)	(F)
1937	100	100	100.0	3.60	3.60	100.0
1938	106	91	116.5	4.52	4.19	92.7
1939	107	89	120.2	5.18	4.33	83.6
1940	108	91	118.7	5.40	4.27	79.1
1941	114	101	112.9	4.86	4.06	83.5
1942	125	114	109.6	4.85	3.95	81.4
1943	153	119	128.6	4.85	4.63	95.5
1944	191	121	157.9	4.85	5.68	117.1
1945	208	123	169.1	4.86	6.09	125.3
1946	240	140	171.4	4.86	6.17	127.0
1947	254	176	144.3	4.86	5.19	116.8
1948	272	191	142.4	5.73	5.13	89.5
1949	298	180	165.6	8.01	5.96	74.4
1950	326	189	172.5	8.64	6.21	71.9
1951	404	209	193.3	8.65	6.96	80.5
1952	419	203	206.4	8.63	7.43	86.1
1953	411	201	204.4	8.62	7.35	85.3
1954	450	201	223.9	11.53	8.06	69.9
1955	511	201	254.2	12.49	9.15	73.3

Source: IMF, International Financial Statistics, and Banco de México, S.A.

/1937 was

1937 was selected as the base year as it was the most "normal" of the prewar period, although it was possibly undervalued in relation to the twenties. In the final analysis, however, the base year selected did not affect the trend of the curve in figure I-XV, since it was plotted on a semi-logarithmic scale which made the yearly valuations equal whatever their starting-point. In order to show this clearly and to facilitate a comparison with other levels than that of 1937, parities for 1941, 1949 and 1954 - when the exchange rate was successively stabilized - were also indicated on the graph.

Following this clarification, figure I-XV should be studied carefully. Its outstanding feature is the very marked tendency to undervalue the exchange rate. In other words, there was a disparity between internal and external prices and costs which was precisely the opposite of what would occur if this were at the root of the external disequilibria. The exchange rate was far from being a hindrance to exports; on the contrary it tended to strengthen their competitive position, which confirms the hypotheses formulated in the previous sections on the declining terms of trade for both commodities and for the tourist industries.

The undervaluation trend was so intense and sustained that, during the nineteen years, only one short period of overvaluation occurred in relation to the 1937 parity rate. This was at the end of the war and during the two first post-war years, i.e. the period of acute inflation within the country and exceptional import difficulties.

But the clearest indication of the index's decidedly downward trend was the fixing of official parity at increasingly lower levels (see the

/lines for

lines for 1941, 1949 and 1954 in figure I-XV). This suggests a causal relation between the increasing undervaluation and the devaluations which is difficult to detect at first glance, but may be clarified by an analysis of the index fluctuations and their comparison with the successive devaluations.

Although the ups and downs of the curve are its most striking feature, the fact that its fluctuations, as well as occurring more frequently, became less marked as they dropped to successively lower levels, is of far greater importance. The 1941 parity - obviously fixed at a very low level as a result of the economic and political difficulties in 1938-40 - was retained for seven years. As mentioned previously, the only period of genuine overvaluation was during that time. This overvaluation reached its peak in 1946 but was almost completely corrected during the following year, owing to the acute inflation in the United States following the abolition of price controls, which coincided with the stability achieved by Mexico. The 1948 and 1949 devaluations thus did little to correct a state of overvaluations, which had in any case almost entirely disappeared, but merely aggravated the downward trend, reducing parity 25.6 per cent below the 1937 level and even 10.9 below that of 1941.

The parity rate fixed in 1949 lasted for five years and the tendency to undervalue continued, in a moderate form, up to 1950. After the Korean war this trend was reversed, although it cannot be said that overvaluation actually took place but rather that parity tended to re-establish itself at the 1941 level, exceeding it by a slight margin in 1952. In 1953 the curve had already begun to drop again, the decline being sharply accentuated by the 1954 devaluation which reduced the purchasing power of the exchange rate to the lowest level recorded during the nineteen years under review (30.1, 16.3 and 6 per cent lower than in 1937, 1941 and 1949 respectively).

It is clear from the above figures that the devaluations did not take place during periods of overvaluation, but merely prolonged trends that were

/already in

already in existence. The origin of the constant tendency towards external disequilibrium should therefore be looked for elsewhere. At this juncture it would perhaps be relevant to recall the observations made in the general introduction to this study on structural disequilibria resulting from the economic development process and their influence on the balance of payments. In order to explain them more thoroughly, it is advisable to begin with an analysis of the import function.

2. The import function

(a) Analysis

In order to determine the ratio between economic development and import trends, the latter's annual rates of growth were compared with those of the gross product, the devaluation years (1948, 1949 and 1954) being excluded, as well as 1946 which was obviously unrepresentative in that the import requirements accumulated during the war were finally satisfied during that year. A correlation was made on the basis of the remaining data, and appears in table I-21.[16/] In spite of the limits of the data employed, this estimate of the import function goes a long way towards explaining the instability of Mexico's economic development. For instance, the factor that, for lack of a more accurate term, may be loosely called "income-elasticity of import demand", was not constant but fluctuated according to the growth of the product. In other words, elasticity was not a parameter of the import function but a variable depending upon the internal growth of the economy. The second observation that can be made is that elasticity was not below unity except at very low rates of growth and tended to reach 1.79 when the annual rate of product growth increased. It is important to note that elasticity varied considerably when the product recorded increments of between 1 and 4 per cent, almost doubling between these two extremes. When the rate of growth was more intensive, elasticity showed almost no change.

It may be inferred from this that the import function was more conducive to instability when rates of growth were fairly low, or, rather, when an attempt was made to accelerate development from virtual stagnation point. If this can be proved, it will help to explain some reactions characteristic of the Mexican economy that were connected with the devaluations.

16/ The correlation coefficient is 0.73. This will rise to 0.95, if the year 1951 is omitted which was strongly influenced by speculative importing.

/Table I-21

Table I-21

MEXICO: CORRELATION OF RATES OF INCREASE OF THE PRODUCT AND OF IMPORTS[a]

(Import function)

Rate of increase of the product	Rate of increase of imports	Income-elasticity of import demand
(Percentage)		
1	0.79	0.79
2	2.58	1.29
3	4.37	1.46
4	6.16	1.54
5	7.95	1.59
6	9.74	1.62
7	11.53	1.65
8	13.32	1.67
9	15.11	1.68
10	16.90	1.69

a/ Correlation based on the rates of increase of the product and of imports during 1945-55, excluding 1946, 1948, 1949 and 1954.

/Assuming that

Assuming that an improvement in the terms of trade initiated a phase of growth for the product, the consequent increment in imports would be supported by the greater capacity to import. Again, assuming that the trend of the external sector moved in the opposite direction, a deterioration in this sector would be reflected, although belatedly, in private investment and, eventually, in the income level. But as imports can continue to increase in spite of a decline in the capacity to import, the fiscal authorities, when faced by lowered foreign exchange reserves, would reduce the volume of public expenditure and introduce credit restrictions. The general contraction of all the dynamic elements in the economy would lead to a lower rate of growth and inadequate demand, which would again be counteracted by the fiscal authorities' raising the level of public expenditure and extending credit facilities to the private sector. The stimulus provided by the recovery of the external sector and by the fiscal and credit policy would also result in a re-establishment of private investment.

Even when development is accelerated as a result of the revived capacity to import, the latter may lag behind import expansion owing to the sudden change in import-elasticity following upon an intensification of development. This finally produces disequilibrium in the balance of payments, which rapidly increases to such a degree that normal methods of control are unavailing and foreign exchange reserves are soon exhausted, which may eventually lead to devaluation.

Since the way in which devaluation restored equilibrium is dealt with extensively in subsequent pages, it will be sufficient to point out here that the changes in the exchange rate led to readjustments in the import structure rather than a reduction in total imports. These changes will enable a more penetrating analysis to be made of the way in which the trends towards external disequilibrium operate and they should therefore be studied in some detail.

(b) Import trends and their contribution to aggregate supply

The movement of the import quantum and its contributions to aggregate supply should first be observed. The quantum increased 69 per cent during the decade, if purchases by Mexican residents in United States communities along the border are included, and 64 per cent if border traffic is excluded (see table I-22).

/Table I-22

Table I-22

MEXICO: QUANTUM AND STRUCTURE OF IMPORTS, 1945-55

(Millions of 1950 pesos)

Year	Total imports		Imports for consumption (direct or indirect)					Imports for investment		
	Including border traffic	Excluding border traffic	Total	Non-durable consumer goods	Durable consumer goods	Raw materials for consumer goods	Fuels and lubricants	Total	Raw materials and other materials for building	Equipment and machinery
1945	4,646	4,064	1,596	672	150	679	95	1,606	631	975
1946	6,260	5,725	2,187	812	446	801	128	2,335	848	1,487
1947	6,445	4,975	2,497	806	629	907	155	2,610	1,044	1,566
1948	5,426	4,747	1,989	642	340	842	165	2,099	766	1,333
1949	4,686	4,259	1,872	504	298	872	198	1,852	737	1,115
1950	5,469	4,807	2,232	638	351	1,033	210	2,059	787	1,272
1951	7,047	6,335	2,804	875	485	1,243	201	2,831	1,069	1,762
1952	7,191	6,392	2,893	975	424	1,225	269	2,704	996	1,708
1953	7,536	6,529	3,335	1,311	456	1,238	330	2,459	785	1,674
1954	7,474	6,209	2,993	749	400	1,377	467	2,350	658	1,692
1955	7,852	6,664	2,963	392	485	1,544	543	2,641	770	1,871
			(Percentage increase)							
1945-55	69.0	64.0	85.6	-41.7	223.3	127.4	471.6	64.4	22.0	91.9
1945-50	17.7	18.3	39.8	-5.1	134.0	52.1	121.0	28.2	24.7	30.5
1950-55	43.6	38.6	13.3	-38.6	38.2	49.5	158.6	28.3	-2.2	47.1

Source: Chapter I, appendix B.

Note: The sum of the components is not equal to the total, because the former are only samples.

/There is

There is a marked discrepancy in import trends between the two periods: 1945-51 and 1951-55 (see figure I-XVI). During the first period, they fluctuated very noticeably, while, during the second, they were very steady. During the first period, there was an initial upward phase reaching its peak in 1947. This upward movement was connected with the accumulation of import requirements in the early post-war years. The second phase, in 1948 and 1949, was characterized by a heavy drop in the import quantum, caused, to a great extent, by the devaluations in those same years. During the third phase, in 1950 and 1951, there was a further upward movement, which coincided with increases in aggregate demand, the gross product and the product-capital ratio, and which was connected with the Korean war boom and its effect on external demand. Imports nevertheless increased more intensively than the other factors, expanding more than 50 per cent during 1949-51, whereas the gross product and capacity to import increased 22 and 25 per cent respectively.

From 1951 to 1955, the expansion of imports was very steady and the interruption caused by the 1954 devaluation had no appreciable effect upon it. It should be noted that the rate of growth for the import quantum was less than that of the population during the second period, and that, as a result the greatest volume for per capita imports up to the present was attained in 1951.

The factors determining import trends may be perceived more clearly if the behaviour of their different components is examined. They were divided into two groups for this purpose, the first consisting of imports destined directly or indirectly for consumption, and the second of imports for investment.

In the first group, the wide fluctuations of end consumer goods, both durable and non-durable were very noticeable. The latter had two clearly defined cycles, one from 1945 to 1949 and the other from 1949 to 1955 (see figure I-XVII), both showing an initial rising phase followed by a decline. This decline was especially marked in the second cycle, when in 1955, imports fell 70 per cent below the 1953 level. This had an unfavourable effect on the over-all trend for the decade, resulting in a deterioration of 42 per cent between the first and last years (see table I-22).

/Figure I-XVI

FIGURE I - XVI

MEXICO : IMPORTS

(MILLIONS OF 1950 PESOS)

SEMI-LOGARITHMIC SCALE

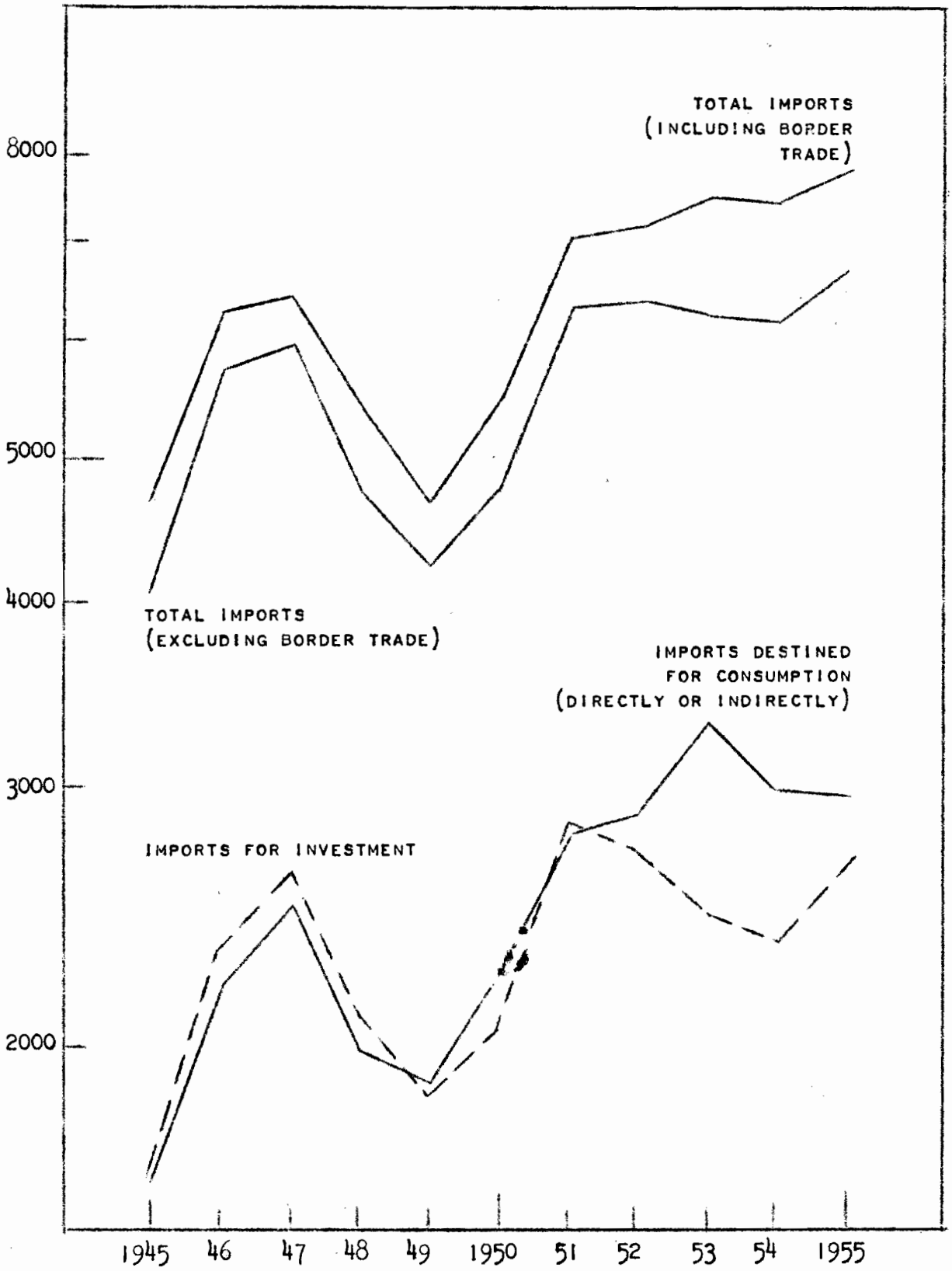
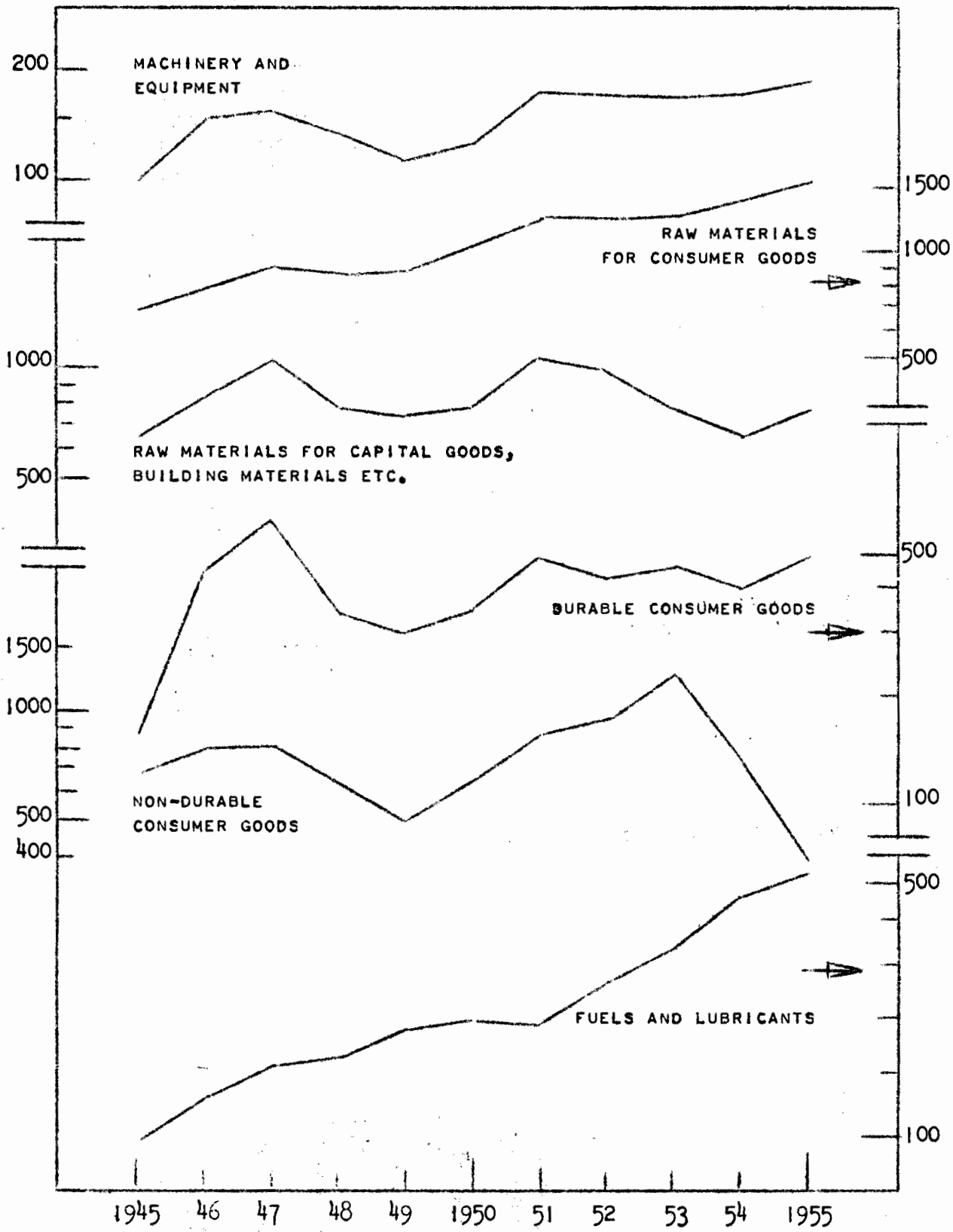


FIGURE I - XVII

MEXICO : IMPORTS BY GROUPS

(MILLIONS OF 1950 PESOS)

SEMI-LOGARITHMIC SCALE



Durable consumer goods, on the other hand, showed more extreme fluctuations at the beginning of the decade (see figure I-XVII), which reached their peak levels in 1946 and 1947, since during those years, as has so often been pointed out, demand accumulated during the war was finally satisfied. This was followed by a decline, reaching its nadir in 1949, and by a subsequent recovery until 1951. From that year onwards, the fluctuations were less marked, and the general trend of the last five years was toward stagnation. Over the whole decade, the quantum of durable consumer goods increased 3.2 times, evidently because of the abnormally low level in 1945 - the base-year chosen. If the average for 1945-46 is taken instead, the increment during the decade would amount to no more than 60 per cent.

In contrast to the two preceding groups, imports of raw materials for consumer goods showed no special fluctations, but a steady upward trend (increasing 2.3 times during the decade). Imports of fuels and lubricants were characterized by an analogous, though lower rate of growth, since they increased 5.7 times in the ten years under review.

Imports destined for investment are of two kinds: machinery and equipment, and raw materials for capital goods, building materials, improved livestock, etc. The trends of both groups were unusually parallel between 1945 and 1951, their fluctuations being very similar, rising rapidly until 1947, dropping to their lowest points in 1949 and recovering during the two following years (see figure I-XVII). The rate of growth was fairly rapid for both groups during those six years, amounting to 81 per cent for machinery and equipment, and 70 per cent for other capital goods. From 1951 onwards, however, both groups showed increasingly dissimilar trends, equipment imports remaining almost stationary until 1955, whereas those of the other capital goods fell sharply. In 1954, they had almost dropped to their level at the beginning of the decade, and their recovery in 1955 amounted to scarcely 70 per cent of the volume attained in 1951. Owing to these divergent trends in the last four years, the data for the rate of growth during the decade differ considerably from one group to the other, imports of machinery and equipment having increased 92 per cent and those of the other capital goods only 22 per cent (see table I-22).

/A much

A much more logical explanation of these tendencies emerges if the various import groups are compared with aggregate supply and its components. In the first place, the contribution of imports to aggregate supply should be studied. In table I-23, this contribution shows a slight downward trend, which is scarcely visible if 1955 is compared with 1945, but becomes clearer if the averages for the two five-year periods are compared with each other.

This slight downward trend also had cyclical movements which were particularly noticeable during the first five-year period, when the lowest and highest points for the whole decade were registered. The maximum figure of 15.4 per cent was reached in 1946 and 1947, and the minimum of 10.8 per cent in 1949 (see figure I-XVIII).

A more detailed examination can be made by analysing the share of imports in consumption (see table I-24 and figure I-XIX). The contribution made by total imports for consumption, including raw materials and fuels, revealed no clear upward or downward movements but well-defined cyclical fluctuations which reached their peaks in 1947 and 1953, and their lowest levels in 1945, 1949 and 1955.

The absence of any definite trend was due to the combination of divergent movements in consumer goods imports, in the strict sense, and raw materials. Within the group of consumer goods, those of a non-durable nature showed a marked downward trend, fluctuating in accordance with the cycle indicated in preceding paragraphs. Durable consumer goods, however, remained fairly stable after the three first years which were admittedly abnormal. Nevertheless, table I-25 shows that the share of imports in the supply of durable consumer goods very clearly deteriorated, this apparent disparity arising from the fact that consumption of the latter increased much more than aggregate consumption.

The share of raw materials and fuels in aggregate consumption showed a clear upward trend, apparently unaffected by the 1948 and 1949 devaluations, although that of 1954, paradoxically enough, appeared to accentuate it. The import trend of raw materials is sufficiently interesting to warrant more prolonged study and a comparison with manufacturing trends.

/Table I-23

Table I-23

MEXICO: SHARE OF IMPORTS IN AGGREGATE SUPPLY, 1945-55

Year	Percentage
1945	12.6
1946	15.4
1947	15.4
1948	12.7
1949	10.8
1950	11.2
1951	14.7
1952	13.2
1953	13.3
1954	12.2
1955	12.0

Source: Chapter I, appendix B.

/Table I-24

Table I-24

MEXICO: SHARE OF IMPORTS IN GEOGRAPHICAL CONSUMPTION, 1945-55

(Percentage)

Year	Imports of non-durable consumer goods	Imports of durable consumer goods	Total (A) + (B)	Imports of raw materials and fuels	Grand total (C) + (D)
	(A)	(B)	(C)	(D)	(E)
1945	2.3	0.5	2.8	2.7	5.5
1946	2.6	1.4	4.0	3.0	7.0
1947	2.5	1.9	4.4	3.3	7.7
1948	1.9	1.0	2.9	3.0	5.9
1949	1.5	0.9	2.4	3.1	5.5
1950	1.7	0.9	2.6	3.2	5.8
1951	2.0	1.1	3.1	3.4	6.5
1952	2.3	1.0	3.3	3.5	6.8
1953	2.9	1.0	3.9	3.5	7.4
1954	1.5	0.8	2.3	3.8	6.1
1955	0.8	1.0	1.8	4.1	5.9

Source: Chapter I, appendix B.

/FIGURE I - XVIII

FIGURE I - XVIII

MEXICO : SHARE OF IMPORTS IN AGGREGATE SUPPLY

(PERCENTAGE)

NATURAL SCALE

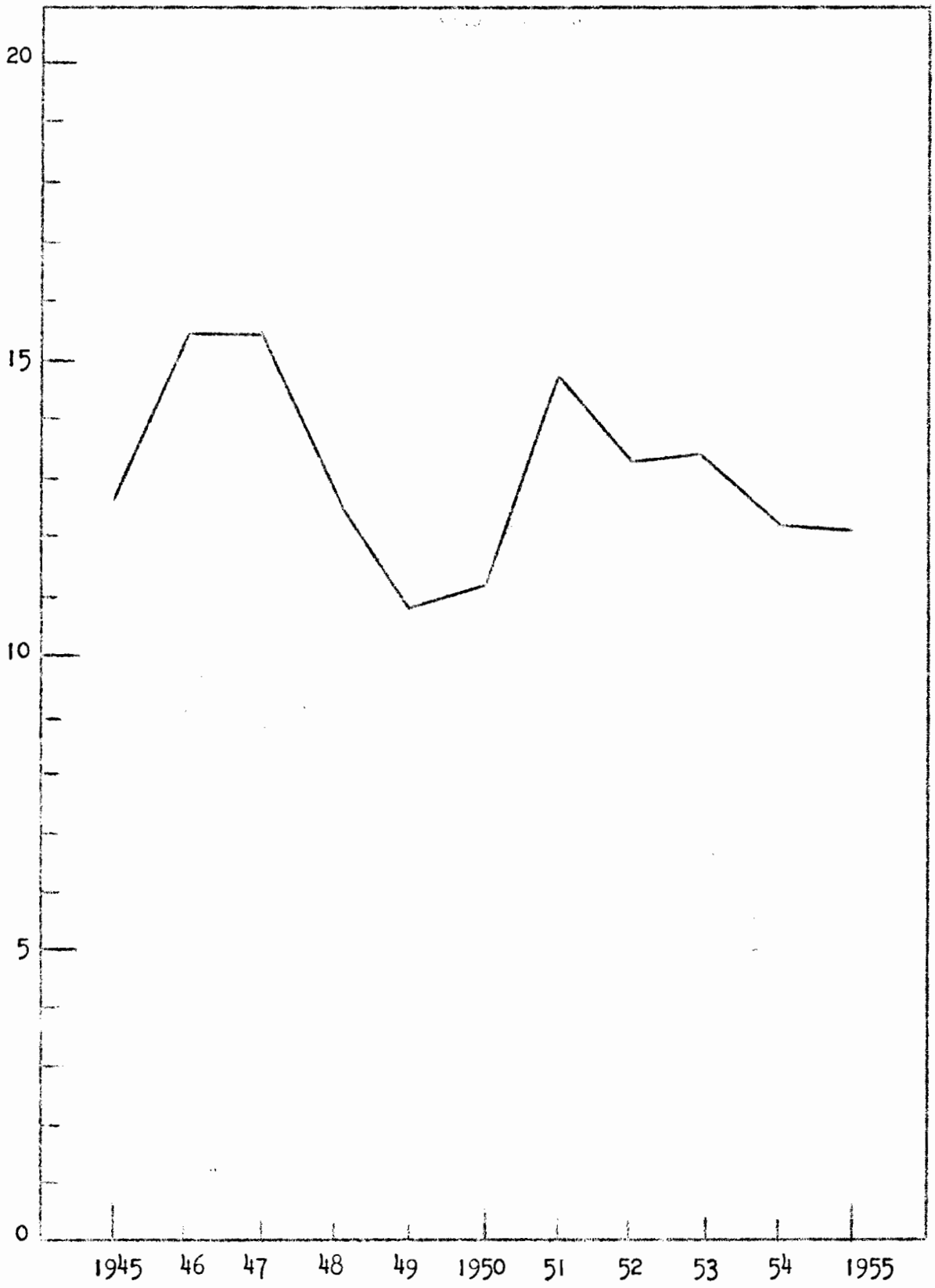


FIGURE I - XIX

MEXICO : SHARE OF IMPORTS IN CONSUMPTION

(PERCENTAGE)

NATURAL SCALE

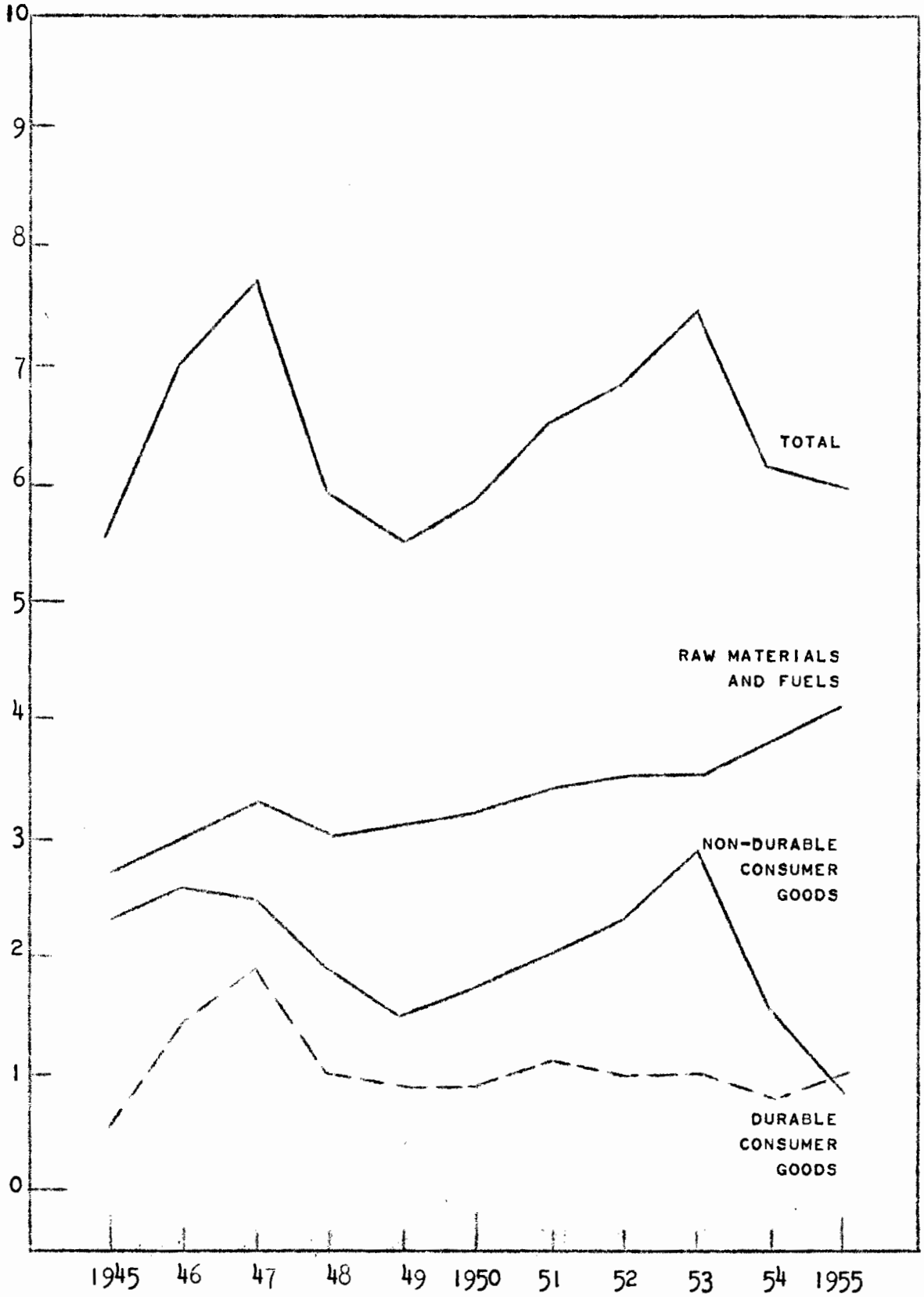


Table I-25

MEXICO: SHARE OF IMPORTS IN THE SUPPLY OF DURABLE METAL CONSUMER GOODS, 1945-55

(Percentage)

Year	Ratio of imports/ supply
1945	94.4
1946	92.9
1947	90.3
1948	82.8
1949	77.9
1950	80.6
1951	74.0
1952	70.4
1953	76.6
1954	72.8
1955	76.0

Source: Chapter I, appendix B.

/A comparison

A comparison of total imports of raw materials, excluding fuels and building materials, for producing both consumer and capital goods with total manufactures shows that neither side had any special tendency (see table I-26). Even the effect of the devaluations was barely perceptible. If, however, raw materials for consumer goods and capital goods are considered separately and then compared with respective domestic production, some very interesting facts would emerge.

Imports of raw materials revealed a marked tendency to increase their contribution to consumer goods industries, apparently interrupted by the 1948 devaluation, although, strictly speaking, the 1947 figure was abnormally high owing to the need to regain the customary level of reserves after the wartime shortages. The capital goods industries, on the contrary, revealed a tendency towards the import substitution of raw materials, which seems to have been accentuated by the devaluations.

The latter comparison leads to an examination of the behaviour of capital goods imports in relation to the aggregate supply of these goods and to gross investment. In table I-27 it may be seen that the share of capital goods imports in aggregate supply showed a persistent deterioration, whereas the ratio between production value in the mechanical industry and imports of equipment rose steadily.

On the other hand, table I-28 shows that the contribution of capital goods imports to gross investment declined very little, as in the case of equipment imports. It may be asked whether these facts are consistent with those which have just been studied. The discrepancy between them was actually due to the fact that construction showed the lowest increment of any gross investment component and, thus, although national production of equipment and other capital goods increased more than their imported counterparts, the latter continued to expand proportionately to total investment.

The phenomena examined up to now lead to a number of conclusions. On the one hand, the share of certain import items in internal supply tended to increase, raw materials being typical of this group. Another group consisted of durable consumer goods, in which domestic demand in terms of income had such high elasticity that, notwithstanding the

/Table I-26

Table I-26

MEXICO: RATIO BETWEEN IMPORTS OF RAW MATERIALS AND THE GROSS VALUE OF MANUFACTURES, 1945-55

(Percentage)

Year	Total industry	Consumer goods industries	Capital goods industries
1945	6.3	5.6	12.2
1946	7.3	6.3	15.0
1947	8.2	7.1	15.5
1948	6.8	6.1	12.3
1949	6.7	6.1	9.8
1950	6.9	6.5	9.4
1951	7.2	6.6	10.6
1952	7.3	7.0	9.2
1953	6.9	6.8	7.6
1954	7.2	7.3	6.5
1955	7.3	7.5	6.2

Source: Chapter I, appendix B.

/Table I-27

Table I-27

MEXICO: SHARE OF IMPORTS IN THE SUPPLY OF CAPITAL GOODS, 1945-55

(Percentage)

Year	Ratio of capital goods imports to their supply	Ratio of gross value of production in the engineering industry to equipment imports
1945	52.0	44.3
1946	57.8	33.5
1947	60.1	30.7
1948	44.9	34.3
1949	44.7	57.9
1950	46.2	52.2
1951	49.0	47.5
1952	45.7	52.7
1953	48.1	42.6
1954	42.8	51.7
1955	41.1	57.5

Source: Chapter I, appendix B.

/Table I-28

Table I-28

MEXICO: SHARE OF IMPORTS IN GROSS INVESTMENT, 1945-55

(Percentage)

Year	Imports of capital goods	Imports of equipment
1945	34.6	21.0
1946	39.9	25.4
1947	44.4	26.7
1948	39.2	24.9
1949	35.9	22.3
1950	34.7	21.4
1951	37.8	23.5
1952	34.9	22.0
1953	34.9	23.7
1954	32.5	23.4
1955	32.7	23.2

Source: Chapter I, appendix B.

/increased proportion

increased proportion of national production in their supply, imports tended to increase more intensively than the gross product and capacity to import. In yet another group, that of capital goods the share of domestic production tended to increase, but imports fluctuated widely according to the level of activity in the country. Finally, imports of non-durable consumer goods displayed a clear downward trend, not only in relation to domestic supply but in absolute terms as well.

3. The structural origin of disequilibrium and the devaluations as a corrective measure

The import function showed that Mexico's tendency towards external disequilibrium arose from structural causes. In the general introduction to this study it was stated that disequilibrium was a common phenomenon in under-developed countries passing through a period of rapid growth, and resulted from an imbalance between the forces of supply and demand that originated in the development process itself. At the same time, some characteristics of such imbalances were described, which appeared unmistakably in the successive balance-of-payments crises undergone by the Mexican economy.

First of all, it should be pointed out that external disequilibria were aggravated when development was accompanied by a concentration of income, owing to the fact that import demand for consumer goods originated primarily in the medium- and high-income brackets. This was associated with the high income-elasticity of demand for durable consumer goods.

In the second place, the increasing dependency on imports of intermediate goods which is typical of the initial phases of industrialization also characterized the case of Mexico, or so it may be inferred from the disproportionate expansion of imports of raw materials and semi-processed imports in relation to aggregate consumption.[17]

17/ An analysis of the import function in Mexico emphasizes the fact that the trend referred to did not appear in the case of raw materials for capital goods. This was partly due to the comparative homogeneity of this group and the absence of highly-complicated manufacturing procedures, and partly to the establishment of the iron and steel and cement industries at a very early date with a sufficiently large national market to make it worthwhile for them to expand. This is perhaps the main explanation of the phenomenon.

/Finally, demand

Finally, demand for capital goods also grew disproportionately once the periods of contraction or stagnation were superseded by moderate development. This characteristic feature of the economic development process is also illustrated by the change in import-elasticity.

As the external disequilibria confronting the Mexican economy were produced by structural causes, some further attempt should be made to find a more effective solution to them. The general introduction has already indicated the limitations to the devaluations, so that only their main drawback need be recalled here. This was their failure to have any far-reaching effect on the tendency of imports to increase more rapidly than income. It must be admitted, though, that in specific cases, the devaluations of the last decade did play an efficacious part in adjusting the balance between supply and demand.

On the one hand, they stimulated certain export items, such as cotton, which had very great opportunities to expand its production, and, on the other, they fostered the import substitution of goods that were fairly easy to produce domestically and offered an ample margin for substitution. On the whole, however, export prospects were very restricted, and it is problematical whether even commodities whose export trends show a sharp upward trend will be able to imitate the exceptionally rapid development of cotton which finally reached an inflexion point when the foreign cotton policy of the United States underwent a change in 1956.

For these reasons, there appears to be little likelihood that future devaluations will serve to attenuate the disequilibria produced by a contraction of demand and intensified income concentration. In contrast to the effect of adjusting the exchange rate, a re-direction of productive resources according to the development trends in demand and capacity to import would enable structural changes in supply to take place more gradually, and thus reduce the possibility of a disequilibrium in the balance of payments. In other words, if investment were so planned that the requisite rate of import substitution was obtained, this would largely help to eliminate or reduce the trend towards external disequilibrium, without imperilling the free exchange regime prevailing in Mexico.

/Appendix A

Appendix A

DEFINITION OF THE CONCEPTS USED

The purpose of this appendix is to define the concepts used in the preceding chapter. All magnitudes are expressed in monetary units of constant purchasing power (pesos at 1950 prices), as required by the method of analysis adopted, which is designed to determine the changes that have taken place in the real availability of goods and services (aggregate supply) and in the various sectors competing for their use (aggregate demand).

I. AGGREGATE DEMAND

Aggregate demand is considered here to be the sum of the following income from external sources (equivalent to the capacity to import), gross investment, current Government expenditure and private consumption.

1. Income from external sources

Income from external sources is constituted by the total aggregate resources, accruing from sales of goods and services abroad, that can be utilized for imports. In view of the use to which they are to be put, such resources must be expressed in terms of their purchasing power, which is the relationship between the prices of exports of goods and services and the prices of imports, or, in other words, the terms of trade. Consequently, income from external sources is equivalent to the capacity to import and represents the product of the quantum of exports of goods and services and the terms of trade.

In the special case of Mexico it was deemed necessary to make separate estimates of the capacity to import generated by commodity exports and that deriving from foreign tourist expenditure within the country. Consequently, the sum of these two elements gives the total capacity to import.

As the definitions of "quantum" and the "terms of trade" are well-known, all that is indicated here is the way in which they have been extended to the tourist industry.

/The capacity

The capacity to import generated by the tourist industry consists of total foreign exchange income under this head, expressed in terms of purchasing power. It can therefore be defined as total income in dollars, deflated by import prices, also in dollars. The following formula will give a clearer idea of this concept:

$$(1) \quad \text{Capacity to import} = \frac{\text{Total income (in dollars)}}{\text{Index of import prices (in dollars)}}$$

The quantum of the tourist industry is constituted by the amount of goods and services, in real terms, purchased within the national territory by persons domiciled abroad. It can be calculated by converting dollar income into local currency at each year's exchange rate and deflating the amounts thus obtained by the index of wholesale prices. The appropriate formula is as follows:

$$(2) \quad \text{Quantum} = \frac{\text{Total income (in dollars) x exchange rate}}{\text{Index of wholesale prices}}$$

From the usual definition of the terms of trade, it can be deduced that, so far as the tourist industry is concerned, the terms of trade are represented by the quotient of the index of wholesale prices in Mexico and the index of import prices in pesos, viz:

$$(3) \quad \text{Terms of trade} = \frac{\text{Capacity to import}}{\text{Quantum}} =$$

$$\frac{\text{Total income (in dollars)}}{\text{Index of import prices (in dollars)}} \div \frac{\text{Total income (in dollars) x exchange rate}}{\text{Index of wholesale prices (in pesos)}}$$

$$= \frac{\text{Index of wholesale prices (in pesos)}}{\text{Index of import prices (in dollars) x exchange rate}} = \frac{\text{Index of wholesale prices (in pesos)}}{\text{Index of import prices (in pesos)}}$$

2. Gross investment

The term "investment" in its broadest sense includes all expenditure effected by the community with a view to accumulating additional wealth and replacing that proportion of the capital previously accumulated which has been consumed in the process of production. Consequently, this definition embraces all types of construction, the purchase and installation of machinery and equipment and the accumulation of inventories of consumer and intermediate goods. However, owing to the lack of data on this last

/last item,

last item, the concept of gross investment adopted here relates only to fixed capital, that is, to expenditure on construction, machinery and equipment.

3. Public investment

The concept of public investment is taken to include investment outlays by the Federal Government; the State, territorial, Federal District and municipal authorities; the decentralized or autonomous organizations; and the publicly-owned enterprises. Many of the sources utilized very probably included maintenance costs in investment statistics.

4. Private investment

This is simply the difference between gross investment and public investment.

5. Current public expenditure

This item comprises all expenditure, with the exception of investment and transfers, by the Federal Government; the State, territorial, Federal District and municipal authorities; the Mexican Social Security Institute (Instituto Mexicano de Seguro Social); and the Pensions Department (Dirección General de Pensiones Civiles y de Retiro).

6. Private consumer expenditure

Under this heading all personal expenditure on goods and services is considered in the aggregate. As, however, this item is obtained residually, it really comprises all errors and omissions in the other components of demand. Among these constituents may be mentioned inventory accumulation, which could not be included under gross investment.

II. AGGREGATE SUPPLY

Aggregate supply is understood here to represent the sum of production and imports. More exactly, it is the sum of the gross product and the quantum of imports. It differs from aggregate demand only to the extent of the positive or negative terms-of-trade effect. Thus it can be deduced from the definition of aggregate demand already given, i.e., the

/sum of

sum of internal demand (consumption and investment by the public and private sectors) and external demand (measured by the capacity to import deriving from exports of goods and services).

1. Internal supply

A concept frequently used in ECLA's and other studies is that of available goods and services, or internal supply. Although it has not been used in the present analysis, an indication of its relationship to aggregate supply may be useful.

Internal supply may be interpreted in three ways, namely: (a) as aggregate supply minus the quantum of exports; (b) as the sum of the gross product and the excess of imports over exports, which, in turn, is equivalent to the amount whereby investment exceeds geographical saving; and (c) as the counterpart, in terms of supply, of the sum of the internal components of aggregate demand - namely, investment and consumption - both in the public and in the private sector.

2. Gross product

The definition of the gross product used here is that adopted in previous ECLA studies, i.e. the value at market prices of all goods and services produced within the national territory in the course of one year.

3. Imports

For the analysis of imports it was considered appropriate to use two concepts of the quantum. The narrower - whereby the term is understood to mean the real amount of commodities imported into the national territory - is also the more commonly used. When the quantum is calculated in this way, imports into the free-trade zones are included.[18/]

The broader concept of the quantum of imports includes expenditure by Mexicans in United States border towns. This item, considered as a rule as part of the outlay of Mexican tourists abroad, was added to the

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18/ In Mexico the term "perímetros libres" (free-trade zones) is applied to certain border areas where imports are exempt from customs duties. The most important of these areas is the State of Baja California Norte.

/concept of

concept of quantum in the stricter sense, because it was felt that the greater part of such expenditure consists in purchases of goods for consumption within the national territory, which are comparable to commodity imports and can be included in the estimate of aggregate supply. Other Mexican tourist expenditure abroad, however, was excluded from the calculation of the quantum in this wider sense, since such outlays cannot be regarded as part of the supply of goods and services within the country. To express data on border trade in terms of constant purchasing power, they were deflated by the index of import prices.

/Appendix B

Appendix B

SOURCES AND METHODS FOR STATISTICAL SERIES

Before a detailed description is embarked upon of the method by which each series was prepared a general observation should be made. In each series reference is made to the corresponding table in the text and to the supplementary tables included in the present appendix, into which they were incorporated because of the useful light they shed on the main text.

I. AGGREGATE DEMAND

1. Capacity to import (table I-2)

(a) Exports (tables I-3 and I-4)

To construct the export quantum and terms of trade series estimated by ECLA on the basis of the Anuarios estadísticos del Comercio Exterior (Yearbooks of Foreign Trade statistics) were multiplied together.

(b) Tourist industry (table I-2)

Appendix A included a description of the method followed for estimating the quantum and terms of trade in the case of the tourist industry, as well as the capacity to import generated by this activity. It only remains to indicate here the sources of the basic series used for this computation. These were as follows:

Foreign exchange income from tourist industry and border trade: Banco de México, Department of Economic Studies (Departamento de Estudios Económicos).
Index of import prices: ECLA.
Rate of exchange: Banco de México, Department of Economic Studies.
Index of wholesale prices: Banco de México, Department of Economic Studies.

2. Total investment in fixed capital (tables I-5 and I-29)

This series was prepared on the basis of the gross investment figure calculated by the Combined Mexican Working Party [1] corresponding to 1950, extended forwards and backwards by means of a special index, consisting in turn of three sub-indices, namely, those of construction, the mechanical

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1/ The economic development of Mexico (Baltimore, John Hopkins University, 1953).

/industry and

industry and imports of equipment.

(a) Weighting of sub-indices

(i) Construction. The value of private construction was added to 50 per cent of private investment in electric energy, plus the public sector's investments in public works and construction. To obtain this last item, the following were deducted from total public investment: the investments effected by Petróleos Mexicanos and by Guanos y Fertilizantes, S.A., investment in rolling stock, 50 per cent of the National Railways' investment in tracks and maintenance of equipment, and 50 per cent of the investments of the Comisión Federal de Electricidad and of the Compañía Eléctrica de Chapala.

(ii) Mechanical industry. To the gross value of the production of the mechanical industry, as given in the 1950 industrial census, 40 per cent was added for costs of installation, freight, etc., of domestically produced equipment.

(iii) Imports of equipment. The c.i.f. value of imports of equipment and machinery was used. For this purpose, groups 21 to 24 in the ECLA import classification were added together, with the exception of some items for railways included under imports of rolled products for the mechanical industry. The c.i.f. value of imports was raised by 50 per cent to allow for customs duties, freight, insurance, installation costs, etc.

(b) Preparation of the sub-indices

(i) Construction. The sub-index for construction was prepared on the basis of apparent consumption of cement, plate glass, structural shapes and rod. These commodities were weighted by their gross values, to obtain which wholesale prices in 1950 were multiplied by annual apparent consumption in tons (or in square metres, in the case of plate glass). The following were the sources used:

Cement: Cámara Nacional del Cemento, and yearbooks of foreign trade statistics.
Plate Glass: Banco de México, S.A., (Department of Economic Studies.)
Rod and shapes: Compañía Fundidora de Hierro y Acero de Monterrey, S.A.; Altos Hornos de México, S.A., and yearbooks of foreign trade statistics. It should be noted that the imports of bars appearing in the yearbooks were included under imports of rod. In addition, for imports both of rods and of shapes, three-year moving averages were calculated for

/purposes of

purposes of estimating apparent consumption, as its year-by-year fluctuations were so wide.

(ii) Mechanical industry. The method of building up this sub-index will be explained later, in the section dealing with the construction of the index for the manufacturing industry.[2/]

(iii) Imports of equipment. This sub-index was obtained by adding together the values (at constant 1950 prices) of groups 21 to 24 in the ECLA import classification, with the exclusion of the items mentioned in the discussion of weighting.

3. Public investment (tables I-5, I-6, I-7, I-30 and I-31)

To obtain this series, a special price index was used to deflate the data on the total investment expenditure of the public sector supplied by the Investments Commission (Comisión de Inversiones). This price index was computed from the sub-indices for building materials and metals in the wholesale price index (comprising 210 articles) of the Banco de México, and from the index of import prices for equipment and machinery (ECLA groups 21 to 24). The weighting of each sub-index is the result of an approximate estimate of the structure of public investment, and differs from the weighting of the quantum index for total investment in that greater importance is given to construction, as can be seen from the following table.

WEIGHTING OF SUB-INDICES

(Percentages)

	Quantum index for total investment	Price index for public investment
Construction	48.2	60.0
Mechanical industry	17.0	10.0
Imports of equipment	34.8	30.0
	100.0	100.0

2/ See section II, point 2, of this appendix.

/4. Private

4. Private investment (tables I-5, I-6 and I-7)

This series is the difference between total and public investment.

5. Current public expenditure (table I-1)

The series under this head was prepared on the basis of the total expenditure of the public sector 3/ in 1950. To extend the data to the whole of the decade 1945-55 the following procedure was adopted.

In the first place, the Federal Government's current expenditure was deflated and expressed in terms of 1950 prices. In the process of deflation, payments to personnel were treated differently from other expenditures. The former were deflated by means of the index of salaries and wages (remunerations) used for estimating the product generated by the Government;4/ the latter, by the wholesale price index of the Banco de México.

The second step consisted in extending the federal expenditure series to the whole of the public sector, for which purpose a constant relationship of 60 per cent between federal and total expenditure was assumed, since this corresponded approximately to that recorded over the period 1945-51, for which data are available.

The following were the sources used for the total expenditure of the public sector:

Federal Government: from 1945 to 1949, Ramón Beteta, Tres años de política hacendaria, México, 1951; from 1950 to 1955, Department of Financial Studies (Dirección de Estudios Hacendarios). (The figure for 1955 is tentative.)
States, Territories, Federal District and Municipalities: Combined Mexican Working Party, table 113.
Mexican Social Security Institute (Instituto Mexicano del Seguro Social) and Pensions Department (Dirección General de Pensiones): Combined Mexican Working Party, table 113.

6. Private consumption (table I-1)

This series was obtained by eliminating the other components of aggregate demand.

3/ See the definition of this concept in appendix A.

4/ See below, section II, point 9, of this appendix.

Table I-29 a/

MEXICO: INDEX OF FIXED INVESTMENT

(1950 = 100)

Year	Construction	Mechanical industry	Imports of equipment	Over-all index
1945	84.1	65.0	76.6	78.2
1946	93.5	75.0	117.0	98.5
1947	90.8	72.3	123.2	98.9
1948	87.5	68.8	104.8	90.3
1949	82.8	97.2	87.7	87.7
1950	100.0	100.0	100.0	100.0
1951	117.5	126.1	138.5	126.3
1952	126.2	135.5	134.3	130.6
1953	113.7	107.3	131.6	118.8
1954	110.3	131.8	133.1	121.9
1955	118.6	162.1	147.1	135.9

Weighting of sub-indices by 1950 prices

(Percentages)

Construction	48.2
Mechanical industry	17.0
Imports of equipment	34.8
	100.0

Source: See accompanying text.

a/ Supplementary to table I-5.

/Table I-30

Table I-30 a/

MEXICO: DEFLATOR OF PUBLIC INVESTMENT

(1950 = 100)

Year	Sub-indices			Over-all index
	Construction	Mechanical industry	Imports of equipment	
1945	56.2	46.9	36.5	49.4
1946	65.2	53.0	45.3	58.0
1947	66.4	64.0	53.6	62.3
1948	75.6	75.6	66.8	73.0
1949	101.0	93.6	89.7	96.9
1950	100.0	100.0	100.0	100.0
1951	117.5	109.9	111.9	115.1
1952	138.3	117.5	108.0	127.1
1953	149.8	118.0	116.6	136.7
1954	163.9	127.2	150.6	156.2
1955	176.7	136.5	168.3	170.2

Weighting of sub-indices

(Percentages)

Construction	60.0
Mechanical industry	10.0
Imports of equipment	30.0
	100.0

Source: See accompanying text.

a/ Supplementary to table I-5.

/Table I-31

Table I-31 a/

MEXICO: INDEX OF CONSTRUCTION

(1950 = 100)

Year	Cement	Shapes	Rod	Plate glass	Over-all index
1945	66.9	81.1	100.8	132.4	84.1
1946	75.5	129.5	107.9	69.4	93.5
1947	78.2	118.7	100.2	71.3	90.8
1948	76.6	109.8	90.3	97.2	87.5
1949	85.6	70.6	87.6	69.7	82.8
1950	100.0	100.0	100.0	100.0	100.0
1951	112.2	122.4	122.8	119.0	117.5
1952	119.9	160.3	119.8	120.1	126.3
1953	122.2	112.2	101.1	117.1	113.8
1954	129.0	115.5	71.0	146.9	110.3
1955	148.7	113.0	68.4	151.5	118.6

	Weighting (Percentages)	Unit prices in 1950 (Pesos per ton)
Cement	46.7	120.00
Shapes	15.7	1,070.00
Rod	30.7	1,150.00
Plate glass	6.9	8.41 (por m2)
Sum total	100.0	

Source: See accompanying text.

a/ Supplementary to table I-5.

/II. AGGREGATE

II. AGGREGATE SUPPLY

Gross product (tables I-8, I-32 and I-33)

The gross geographical product at market prices was estimated on the basis of the 1950 figure in table 1 of the Combined Mexican Working Party. A special index was used to obtain the product generated by each activity in other years. The combination of the various indices in a single over-all index was based, in principle, on the weightings used in table 2 of the Combined Mexican Working Party; these, however, required two types of adjustment. The first was necessary because, in this latter table, product data were expressed in terms of factor cost and not of market prices. A second adjustment had to be made because it proved impossible to construct separate indices for certain services which accounted for 11.4 per cent of the gross product at factor cost in 1950. Instead, an index of "Other services" was prepared,[5/] the weighting of which, in terms of gross income of the services included, represented 3.2 per cent of the gross product at market prices in 1950. The difference between these two percentages stood for the services not directly estimated in this study, and was apportioned among the other activities.

1. Over-all index of agricultural and livestock production (table I-10)

This index comprises two sub-indices, for agricultural and for livestock production respectively. These were weighted in accordance with the figures for the gross product generated by both activities as worked out by the Combined Mexican Working Party (table 2), and their construction is described below.

(a) Index of agricultural production (tables I-10, I-11, I-12 and I-13)

Data supplied by the Department of Rural Economy of the Ministry of Agriculture (Dirección de Economía Rural, Secretaría de Agricultura y Ganadería) and by the Banco de México were used for the preparation of the index of agricultural production. Twenty-four products - to be indicated below - were taken into account, weighted by their gross values in 1950. To obtain these values, physical production was multiplied by rural prices. For purposes of the analysis contained in section II of the present chapter, the index was divided into two sub-indices, one of production for the domestic market and the other of production for export. The following are the items included in each:

5/ See section 11 of this appendix.

/Table I-32

Table I-32 a/

MEXICO: REAL GROSS PRODUCT BY ACTIVITIES, 1945-55

(Millions of pesos at 1950 prices)

Activities	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955
Real gross product b/	32,132	34,326	35,521	37,213	38,777	43,299	47,801	47,369	49,337	53,428	57,726
Agricultural and livestock production	6,038.6	6,350.8	6,547.0	7,349.8	7,804.7	8,919.6	9,098.0	8,741.2	9,588.6	11,211.9	12,086.1
Manufacturing production	6,486.2	6,893.2	6,858.6	7,360.8	7,837.1	8,659.8	10,270.5	9,872.2	9,941.5	10,469.7	11,595.5
Mining production	1,393.9	1,035.0	1,370.4	1,263.7	1,267.8	1,385.6	1,303.8	1,459.0	1,429.9	1,355.1	1,578.2
Production of electric energy	150.3	162.4	176.0	194.2	212.0	216.5	240.3	261.3	279.1	307.4	345.1
Production of crude petroleum and derivatives	497.6	539.6	624.2	623.5	633.8	736.1	797.2	824.4	850.2	939.3	993.0
Building and construction	764.7	850.2	825.6	795.6	752.9	909.3	1,068.4	1,147.5	1,033.9	1,003.0	1,078.4
Transport	1,479.4	1,550.7	1,674.8	1,813.2	1,872.2	2,035.0	2,061.5	2,409.4	2,492.9	2,523.4	2,808.3
Trade	10,885.5	12,607.3	12,913.7	12,767.8	12,972.1	14,591.8	16,882.7	16,459.6	17,130.8	18,210.6	19,786.5
Public Sector	1,964.7	1,728.9	1,907.5	2,107.5	2,259.9	2,381.4	2,614.8	2,643.4	2,807.7	3,174.4	3,060.1
Rents	1,806.1	1,853.9	1,918.4	1,989.0	2,034.8	2,078.4	2,157.4	2,244.7	2,317.4	2,390.2	2,467.1
Other services	665.0	753.7	705.2	947.7	1,129.2	1,385.5	1,306.5	1,306.5	1,464.5	1,842.7	1,927.2

Source: See accompanying text.

a/ Supplementary to table I-8.
b/ Rounded figures.

Table I-33 a/

MEXICO: REAL GROSS PRODUCT, 1945-55

(Index: 1950 = 100)

Year	Agricultural and livestock production	Manufacturing production	Mining production	Production of electric energy	Production of crude petroleum and derivatives	Building and construction	Transport	Trade	Public sector	Rents	Other services	Overall index	Real gross product at market prices (Millions of pesos at 1950 prices)
1945	67.7	74.9	100.6	69.4	67.6	84.1	72.7	74.6	82.5	86.9	48.0	74.2	32,132.0
1946	71.2	79.6	74.7	75.0	73.3	93.5	76.2	86.4	72.6	89.2	54.4	79.3	34,326.0
1947	73.4	79.2	98.9	81.3	84.8	90.8	82.3	88.5	80.1	92.3	50.9	82.0	35,521.0
1948	82.4	85.0	91.2	89.7	84.7	87.5	89.1	87.5	88.5	95.7	68.4	85.9	37,213.0
1949	87.5	90.5	91.5	97.9	86.1	82.8	92.0	88.9	94.9	97.9	81.5	89.6	38,777.0
1950	110.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	43,299.0
1951	102.0	118.6	94.1	111.0	108.3	117.5	101.3	115.7	109.8	103.8	94.3	110.4	47,801.0
1952	98.0	114.0	105.3	120.7	112.0	126.2	118.4	112.8	111.0	108.0	94.3	109.4	47.369.0
1953	107.5	114.8	103.2	128.9	115.5	113.7	122.5	117.4	117.9	111.5	105.7	113.9	49,337.0
1954	125.7	120.9	97.8	142.0	127.6	110.3	124.0	124.8	133.3	115.0	133.0	123.4	53,428.0
1955	135.5	133.9	113.9	159.4	134.9	118.6	138.0	135.6	128.5	118.7	139.1	133.3	57,723.0

Source: See accompanying text.

Note: The production weighting percentages are as follows: agriculture and livestock, 20.6; manufacturing, 20; mining, 3.2; electric energy, 0.5; petroleum and derivatives, 1.7; building and construction, 2.1; transport, 4.7; trade, 33.7; public sector, 5.5; rents, 4.8; other services, 3.2.

a/ Supplementary to table I-8.

/Production for

Production for the domestic market	Production for export
Rice	Chick-peas
Maize	Coffee
Wheat	Cacao
Beans	Tomatoes
Potatoes	Henequen
Alfalfa	Cotton
Sesame	Cottonseed
Copra	Linseed
Coquito (for oil)	Peanuts
Sugar-cane	Bananas
Tobacco	Pineapples
Lemons	
Oranges	

The index of the area harvested (table I-11) was based on data for the crops included in the production index. It is not a weighted index, but measures the variations in the total number of hectares harvested. Again the basic data were supplied by the Department of Rural Economy.

The index of yields (tables I-11 and I-12) was prepared by weighting unit yields for every crop (production in kilogrammes over area in hectares) by the corresponding production values in 1950.

The object of the index of changes in the structure of production (table I-11) was to assess the effects of the replacement of certain crops by others of a more remunerative nature. It was obtained by means of the following formula:

$$\text{Index of changes in structure} = \frac{\text{Index of production}}{\text{Index of area} \times \text{Index of yields}}$$

(b) Index of livestock production (tables I-10 and I-44)

This index was built up on the data for cattle, pigs and sheep slaughtered for consumption within the country, according to the Department of Statistics (Dirección General de Estadística). The physical data were weighted by 1950 prices. As from 1953, a wider range of sources was utilized by the Department of Statistics. To preserve the homogeneity of the series, the index for the years before that date was linked with another relating only to the Federal District, where no additional sources were used.

/2. Over-all

2. Over-all index of manufacturing production (table I-15)

This index was prepared by combining three sub-indices of production, namely those of non-durable consumer goods, capital goods - including durable consumer goods produced by the mechanical industry - and chemical manufacturers. These were weighted by the value added in the industry concerned, in accordance with the 1950 industrial census.

(a) Index of production of non-durable consumer goods (table I-45)

The following groups of industries are covered by this index: textiles (cotton, woollen and synthetic fibres), rubber goods, foodstuffs and beverages (beer, vegetable oils, tinned foodstuffs, milled wheat products and sugar), tobacco and matches, pulp and paper, soap and pharmaceutical manufactures.

The sources and methods used were as follows:

Textiles: For cotton and woollen yarns and textiles, Banco de Mexico (index with 1945 as base year). For synthetic fibres an index of apparent consumption was constructed by adding domestic production to imports.
Rubber goods: Banco de México.
Foodstuffs and beverages: The indices for beer, vegetable oils, tinned foodstuffs and milled wheat products were combined with one for sugar production based on data supplied by the Unión Nacional de Productores de Azúcar, S.A. All these indices were weighted by the corresponding 1950 production values.
Tobacco and matches: Banco de México (the weighting was adjusted, that of the value added in 1950, according to the census, being utilized, as in all other cases).
Pulp and paper: For paper, Banco de México. For pulp, ECLA (data obtained by direct inquiry).
Soap: Banco de México.
Pharmaceutical manufactures: The production of the pharmaceutical industry was estimated indirectly, on the basis of imports and of exports of its manufactures. This procedure was adopted because the Mexican laboratories producing for the domestic market consume almost exclusively imported raw materials, and because at the same time Mexico is the principal exporter of synthetic hormones and cortisone. As the unit prices of hormones dropped in consequence of radical technical developments, the usual method of deflation by base-year prices would not show the trend of income really generated by the industry. To overcome this difficulty, the value of exports was converted into dollars, and was then turned back into pesos at the 1950 exchange rate, which was taken as constant prices.

/(b) Index

(b) Index of production of capital goods (tables I-16 and I-46)

This is made up of three sub-indices: for rolled products, cement and goods manufactured by the mechanical industries. The first covers the total output of steel rolled products. The sources utilized were the Annual Reports of the Compañía Fundidora de Hierro y Acero de Monterrey, S.A., and an unpublished survey carried out by Altos Hornos de Mexico, S.A.

As regards cement, production data were supplied by the Cámara Nacional de la Industria del Cemento.

The production of the mechanical industry was estimated indirectly on the basis of apparent consumption of flat steel products (excluding tinplate). The figures for galvanized sheet, which ought strictly to have been excluded as well, could not be isolated. To obtain consumption of flat products the following items were excluded from production and imports of rolled products: structural steel, rod, tinplate, rails sleepers, wire and cable, tubing and containers. For these deductions to be made, it was essential to determine apparent consumption of each of the items excluded. With this end in view were added to the relevant import statistics production data obtained as indicated below.

Rails and structural steel: Compañía Fundidora de Hierro y Acero de Monterrey, S.A.
Rod: From 1946 to 1950, Banco de México, Departamento de Investigaciones Industriales (figures raised by 10 per cent to allow for enterprises not included in the sample). From 1951 to 1955, Department of Statistics. The two series were linked in accordance with the construction index prepared by the Banco de México.
Tinplate: Altos Hornos de México, S.A.
Wire and cable: La Consolidada, S.A., and Compañía Fundidora de Hierro y Acero de Monterrey, S.A.

/(c) Chemicals

(c) Chemicals industry (table I-47)

This index was prepared on the basis of data for production of sulphuric acid, alkalis (expressed in terms of soda ash), ammonium sulphate and superphosphates.

The sources utilized in estimating production were the following:

Ammonium sulphate and superphosphates: Guanos y Fertilizantes de México, S.A.
Sulphuric acid and alkalis: Banco de México, Departamento de Investigaciones Industriales.

Figures for the value added in the production of the components of the index could not be ascertained. They were therefore weighted by the gross values. To compute these, the volumes of each article produced were multiplied by the corresponding prices. For this purpose, wholesale prices were used, obtained from the following sources: sulphuric acid, United Nations, Monthly Bulletin of Statistics; ammonium sulphate and soda ash, Anuario Estadístico del Comercio Exterior de los Estados Unidos Mexicanos; superphosphates, information supplied directly by Guanos y Fertilizantes, S.A.

3. Index of mining production (table I-17)

This index was based on data for the production of metals and other minerals, including sulphur, but excluding petroleum and natural gas. These data were obtained from the Boletín de Minas y Petróleo issued by the Ministry of Economy, except for those on sulphur, which were ascertained by ECLA in the course of first-hand inquiry. For weightings the gross production values at 1950 prices were utilized.

4. Index of production of crude petroleum and derivatives (table I-18)

In the preparation of this index, production figures for crude petroleum and derivatives were weighted by the relevant 1950 values, to obtain which the volume produced was multiplied by the corresponding prices. The source for the basic data was Petróleos Mexicanos, S.A.

/5. Index

5. Index of the production of electric energy (table I-19)

The amount of energy generated in terms of kilowatt-hours is measured in this index. The data were supplied by the Comisión Federal de Electricidad.

6. Index of construction (tables I-29, I-32 and I-33)

The same index was used here as for estimating gross investment.[6/]

7. Over-all transport index (table I-34)

The four sub-indices comprised in this index are those for freight traffic, passenger traffic, urban transport and telecommunications.

To obtain the weighting of the sub-indices for freight and passengers, average prices per ton/kilometre and per passenger/kilometre in the base year (1950) were multiplied by the corresponding volume of transport in the year in question. In the case of urban transport an average bus (first and second class) and tram fare for 1950 was estimated and was multiplied by the total number of passengers. For telephones, the weighting corresponds to gross income, estimated in terms of the average rate and the number of installations.

(a) Freight transport (table I-34)

This index measures the volume of rail, road and air traffic in terms of tons/kilometre.

(i) Railway traffic. Data supplied by the Department of Statistics.

(ii) Road traffic. An indirect procedure was followed in estimating the volume of road traffic. In the first place, the number of lorries in service was determined from the statistics prepared by the Federal Traffic Department of the Ministry of Communications and Public Works (Departamento de Tránsito Federal de la Secretaría de Comunicaciones y Obras Públicas). From the resulting figure 25 per cent was deducted, as this was considered representative of the proportion of vehicles normally undergoing repairs.

The next step was to estimate the average distance per working-day and to multiply this by the average number of actual working-days in

6/ See above, section I, point 2, of this appendix.

/the year,

the year, so as to obtain the average distance covered by each lorry in a year. Average capacity per lorry was then calculated, together with the degree of utilization of such capacity on outward and return trips. The average freight transported per lorry per year was thus computed, and multiplication of this by the average distance run gave the volume of traffic (in ton/kilometres) per vehicle/year. Finally, this last figure was multiplied by the number of vehicles in service in order to obtain the total volume of traffic.

The whole of this process, as well as the data used for the calculation and the sources from which they were obtained, is shown in table I-35.

On the basis of the volume of traffic in the base year (1952) and the total number of lorries in circulation, an index was constructed for other years, as annual data on lorries actually in service were not available.

(iii) Civil aviation. The series for ton/kilometres of air freight was obtained by using 1951 as a base year and linking the series estimated by the International Civil Aviation Organization with an earlier series in tons prepared by the Department of Statistics. It was therefore assumed that the average distance covered in 1945-50 was the same as in the year linking the two series.

(b) Passenger transport (table I-34)

This index measures the volume of rail, road and air traffic in terms of passenger/kilometres.

(i) Railway traffic. Data supplied by the Department of statistics.

(ii) Road traffic. The same procedure was used as for estimating freight traffic. The basic data utilized and the sources drawn upon are given in table I-36.

The volume of traffic in the base year (1953) and the total number of buses in circulation were used to construct an index for other years, since annual data on buses actually in service were not available.

(iii) Civil aviation, (table I-34). Data supplied by the Department of Statistics and the Internation Civil Aviation Organization.

/(c) Urban

(c) Urban transport (table I-37)

This index measures the number of passengers carried by trams, trolley-buses and omnibuses in the Federal District. Data for trams and trolley-buses were obtained directly from the Department of Statistics. Those for omnibuses came from the Alianza de Camioneros de México, which supplied only the figure for the number of passengers transported in 1953. An estimate for the remaining years was prepared by multiplying the number of buses in service by the average number of passengers per bus in the year cited.

(d) Telecommunications (table I-34)

Telephones are only referred to here, as the telegraph and postal services are covered by the public sector index. The telecommunications index was calculated on the basis of the number of telephones installed in the country, as given by the Department of Statistics and Teléfonos de México S.A.

8. Index of trade (table I-40)

To measure the trend of commercial activity an index of commodity movements was constructed. For this purpose the indices of agricultural and livestock production, manufacturing output and imports were combined. The first two were weighted by means of the data for the product generated in 1950 by the activities concerned, as given in table II of the Joint Mexican Working Party; for the weighting of imports the figure in the Foreign Trade Yearbook for 1950 (Anuario de Comercio Exterior de 1950) was used.

Table I-34 a/

MEXICO: OVER-ALL TRANSPORT INDEX

(1950 = 100)

Year	Freight traffic	Passenger traffic	Urban transport	Telecommunications b/	Over-all index
1945	70.8	79.6	68.2	75.9	72.7
1946	75.5	78.7	73.5	78.8	76.2
1947	81.7	84.6	80.0	84.2	82.3
1948	87.3	90.2	99.5	89.2	89.1
1949	91.7	89.2	98.2	95.7	92.0
1950	100.0	100.0	100.0	100.0	100.0
1951	106.8	108.7	116.9	107.2	101.3
1952	119.4	110.4	134.4	111.2	118.4
1953	124.6	111.9	135.1	117.8	122.5
1954	135.7	115.3	148.9	123.8	124.0
1955	140.3	128.5	151.0	126.9	138.0

Weighting of sub-indices (revenues)

Freight	= 64.2 per cent	1,244.2	million
Passenger	= 20.5 " "	397.7	"
Urban	= 8.9 " "	172.4	"
Telephones	= 6.4 " "	124.3	"
	100.0	1,938.6	"

Source: See accompanying text.

a/ Supplementary to table I-8.

b/ Telephones only (telegraph and postal services are included in the index for the public sector). The index is calculated on the basis of the number of telephones in existence.

/Table I-35

Table I-35 a/

MEXICO: ESTIMATE OF VOLUME OF ROAD FREIGHT TRAFFIC, 1952

1. Number of lorries in service:	
On the road b/	30,800
Less 25 per cent undergoing repairs	7,700
Number actually in service	23,100
2. Average distance covered per lorry	
Per working day c/	300 km
Working days in the year c/	300
Annual average distance per lorry (300 days x 300 kilometres)	90,000 km
3. Average capacity per lorry c/	
Average utilization of capacity: on outward trips (50 per cent of the time) 110 per cent, i.e.	3.58 tons
on return trips (50 per cent of the time) 50 per cent, i.e.	1.62 tons
Average load per lorry	5.20 tons
4. Average annual volume of traffic per lorry	
5.2 tons x 90,000 kilometres = 468,000 tons/km	
Total volume of traffic 23,100 x 468,000 =	10,810.8 millions of tons/kilometres

Source: See accompanying text.

a/ Supplementary to table I-8.

b/ According to the Federal Traffic Department of the Ministry of Communications and Public Works.

c/ Estimate prepared by ECLA on the basis of direct information supplied by road transport enterprises.

/Table I-36

Table I-36 a/

MEXICO: ESTIMATE OF VOLUME OF ROAD PASSENGER TRAFFIC, 1953

1. Number of buses in service:		
On the road b/		5,680
Less 33.3 per cent undergoing repairs		1,893
Number actually in service		3,787
2. Average distance covered:		
Per working day c/		300
Working days in the year c/		300
Annual average distance per bus	300 x 300 =	90.000 kilometres
3. Average capacity per bus c/		30 passengers
Average utilization of capacity (70 per cent)		21 "
4. Average annual volume of traffic per bus:		
90,000 kilometres x 21 passengers = 1.89 millions of passenger/kilometres		
Total volume of traffic 3,787 x 1.89 million = 7,057.4 million passenger/kilometres		

Source: See accompanying text.

a/ Supplementary to table 1-8.

b/ Federal Traffic Department of the Ministry of Communications and Public Works.

c/ Estimate prepared by ECLA on the basis of direct information supplied by road transport enterprises.

/Table I-37

Table I-37a/

MEXICO: URBAN TRANSPORT, 1945-55

(Millions of passengers, and indices; 1950 = 100)

Year	Passengers carried by rail, tram and trolley-bus	Index (1950=100)	Passengers carried by bus in the Federal District	Index (1950=100)	Index of urban transport a/
1945	304.0	114.6	521	60.4	68.2
1946	291.4	109.8	581	67.4	73.5
1947	300.4	113.2	642	74.5	80.0
1948	292.6	110.3	842	97.7	99.5
1949	268.9	101.4	842	97.7	98.2
1950	265.3	100.0	862	100.0	100.0
1951	283.0	106.7	1,022	118.6	116.9
1952	283.0	89.8	1,223	141.9	134.4
1953	208.3	78.5	1,246	144.5	135.1
1954	211.8	79.8	1,383	160.4	148.9
1955	213.4	80.4	1,403	162.8	151.0

Source: See accompanying text.

a/ Supplementary to table I-8.

b/ Weighted by the number of passengers carried by tram and bus in 1953.

/Table I-38

Table I-38 a/

MEXICO: INDEX OF PAYMENTS TO PERSONNEL (FEDERAL GOVERNMENT), 1945-55

Year	Payments to personnel (millions of pesos)	Total number of posts	Average remuneration (pesos)	Index of the level of remuneration (1950=100)	Average payments to personnel at 1950 prices (Pesos)	Payments to personnel (absolute numbers at 1950 prices) (Millions of pesos)	Index of payments personnel (1950=100)
1945	473.2	100,333	4,716.3	68.4	6,895.7	692.3	82.5
1946	539.4	116,097	4,646.1	88.5	5,248.6	609.2	72.6
1947	595.3	119,517	4,980.9	88.5	5,626.8	672.1	80.1
1948	659.1	126,294	5,218.8	88.7	5,883.1	742.6	88.5
1949	796.3	128,295	6,206.8	100.0	6,209.9	796.3	94.9
1950	839.1	130,934	6,408.6	100.0	6,408.6	839.1	100.0
1951	920.9	132,351	6,958.0	100.0	6,959.7	921.3	109.8
1952	1,055.7	138.113	7,643.7	113.4	6,741.8	931.4	111.0
1953	1,232.1	139,531	8,830.3	124.6	7,087.9	939.3	117.9
1954	1,541.4	146,653	10,510.5	137.8	7,626.2	1,118.5	133.3
1955	1,617.2	148,758	10,871.3	150.0	7,248.1	1,078.2	128.5

Source: See accompanying text.

a/ Supplementary to table I-8.

/Table I-39

Table I-39 a/

MEXICO: INDEX OF STOCK OF HOUSING AND RENTS, 1945-55

Year	Gross investment in housing	Depreciation of housing	Net investment	Stock and rents	Index of stock and rents (1950 = 100)
	(Millions of pesos at 1950 prices)				
1945	894	241	653	24,568	86.9
1946	1,109	248	861	25,221	89.2
1947	1,218	257	961	26,082	92.3
1948	899	267	632	27,043	95.7
1949	860	273	587	27,675	97.9
1950	862b/	279	583	28,262c/	100.0
1951	1,363	283	1,080	29,342	103.8
1952	1,464	293	1,171	30,513	108.0
1953	1,319	305	1,014	31,527	111.5
1954	1,279	315	964	32,491	115.0
1955	1,376	325	1,051	33,542	118.7

Source: See accompanying text.

a/ Supplementary to table I-8.

b/ From 1950 onwards, the index for construction was applied to the gross investment statistics.

c/ Stock of residential buildings, as estimated for 1950.

/Table I-40

Table I-40 a/

MEXICO: INDEX OF MOVEMENTS OF COMMODITIES, 1945-55

(1950 = 100)

Year	Agricultural and livestock production	Manufacturing output	Imports	Commodity trade
1945	67.7	74.9	84.5	74.6
1946	71.2	79.6	119.1	86.4
1947	73.4	79.2	124.3	88.5
1948	82.4	85.0	98.7	87.5
1949	87.5	90.5	88.6	88.9
1950	100.0	100.0	100.0	100.0
1951	102.0	118.6	131.8	115.7
1952	98.0	114.0	133.0	112.8
1953	107.5	114.8	135.8	117.4
1954	125.7	120.9	129.2	124.8
1955	135.5	133.9	138.6	135.6

Weighting: b/

Agricultural and livestock production	$ 7,184.8	millions	37.9 %
Industrial production	6,964.9	"	36.7 %
Imports	4,807.1	"	25.4 %
	18,956.8		100.0

Source: See accompanying text.

a/ Supplementary to table I-8.

b/ Combined Commission of the Government of Mexico and the International Bank for Reconstruction and Development, The economic development of Mexico (Baltimore, Johns Hopkins University - 1953), table 2.

/9. Index of

9. Index of the product generated by the public sector (table I-38)

The purpose of this index is to measure annual changes in the real volume of services provided by the public administration. It was prepared on the basis of the following assumptions as to the productivity of labour, adopted for the sake of simplicity: (a) this productivity does not vary within a given category of activities; (b) it is proportionate to the remuneration received in each category, and (c) consequently, it is a function of the number of employees and of their distribution by categories.

As it was impossible to obtain a break-down by categories of the personnel employed in public administration, an indirect procedure was followed in preparing the index in order to determine the variations concerned. The first step consisted in working out an index of average per capita payments at each year's prices (total salary payments being divided by the number of posts for personnel in the employ of the Federal Government).

As the increase in average per capita payments is a function of increments in cash salaries and of changes in structure, and as it is these latter that need to be ascertained, the former must be eliminated by the use of an appropriate deflator. For this purpose an index of monthly salaries by categories was constructed. The weighting assigned to each category was based on a break-down of the personnel of the Ministry of Agriculture in 1950, as data for all the personnel employed by the Federal Government were not available.

After the index of average per capita payments had been deflated, it was multiplied by the average base-year payment, so that a series for average per capita payments at 1950 prices was obtained. This series was multiplied by the total number of posts in order to determine total payments to personnel. In accordance with the assumptions postulated, these payments are equivalent to the product generated by the public sector.

/The following

The following were the sources used:

Payments to personnel: Department of Financial Studies of the Ministry of Finance.

Number of posts for personnel employed by the Federal Government: Federal expenditure budgets, 1945 to 1955.

Break-down of the personnel of the Ministry of Agriculture: Federal expenditure budget, 1950.

10. Index of rents (table I-39)

To measure the trend of paid and implicit building rents it was assumed that they would vary in proportion to the country's stock of buildings. As is shown in appendix C, to estimate the 1950 figure for this stock, the corresponding figure for 1945-50 had also to be determined. Data for 1951-55 were estimated by applying the index of construction to the value of gross investment in construction in 1950.[7] The annual depreciation of stocks was calculated as explained in appendix C and was deducted from gross investment year by year to obtain net investment. The successive figures for net investment were added to each year's stock in order to estimate that of the following year.

11. Index of other services (tables I-41, I-42 and I-43)

This index comprises two sub-indices, one for public entertainments and the other for income from foreign tourist expenditure. To combine these, they were weighted by the corresponding gross values in millions of pesos at 1950 prices.

The index of public entertainments was calculated from the series for tickets sold for cinemas, theatres, sports and bullfights, expressed in terms of 1950 prices. These series were prepared by the Department of Statistics. The data for 1955 are provisional.

The index for income from foreign tourist expenditure corresponds to the tourist industry quantum index.[8] However, only 50 per cent of this quantum was taken into account, as it was considered that the other half of tourist expenditure was represented by payments for transport and purchases of goods, and had already been allowed for in the indices concerned.

7/ See above, section II, point 6, of this appendix.
8/ See above, section I, point 1 (b), of this appendix.

/Table I-41

Table I-41 a/

MEXICO: INDEX OF OTHER SERVICES, 1945-55

Year	Public entertainments (receipts from number of tickets sold)	Income from foreign tourist expenditure b/	(A) + (B)	Index (1950 = 100)
	(Millions of pesos at 1950 prices)			
	(A)	(B)	(C)	(D)
1945	199.9	421.2	621.1	48.0
1946	203.2	499.7	702.9	54.4
1947	199.0	459.4	658.4	50.9
1948	216.3	668.0	884.3	68.4
1949	238.0	815.6	1,053.6	81.5
1950	260.3	1,032.4	1,292.7	100.0
1951	280.0	938.5	1,218.5	94.3
1952	295.6	924.0	1,219.6	94.3
1953	295.7	1,070.6	1,366.3	105.7
1954	313.1	1,406.5	1,719.6	133.0
1955	344.1	1,453.6	1,797.7	139.1

Source: See accompanying text.

a/ Supplementary to table I-8.

b/ On the assumption that an equal proportion is used to cover transport and purchases of goods.

/Table I-42

Table I-42 a/

MEXICO: PUBLIC ENTERTAINMENTS, 1945-55

(Millions of tickets, and millions of pesos at 1950 prices)

Year	Cinemas		Theatres		Sports		Bullfights		Total receipts per ticket	Over-all index
	Tickets sold	Pesos	Tickets sold	Pesos	Tickets sold	Pesos	Tickets sold	Pesos		
1945	108.9	165.5	2.5	9.2	4.2	13.3	1.6	11.9	199.9	76.8
1946	108.1	164.3	2.4	8.8	4.1	13.0	2.3	17.1	203.2	78.1
1947	106.5	161.9	1.9	7.0	4.8	15.2	2.0	14.9	199.0	76.5
1948	116.5	177.0	2.5	9.2	4.8	15.2	2.0	14.9	216.3	83.1
1949	127.6	194.0	2.6	9.6	5.2	16.5	2.4	17.9	238.0	91.4
1950	142.3	215.7	4.4	16.2	5.2	16.5	1.6	11.9	260.3	100.0
1951	153.3	233.0	4.2	15.5	5.5	17.4	1.9	14.1	280.0	107.6
1952	163.3	248.2	4.2	15.5	6.1	19.3	1.7	12.6	295.6	113.6
1953	164.5	250.0	3.7	13.6	6.6	20.9	1.5	11.2	295.7	113.7
1954	173.9	264.3	4.0	14.7	7.0	22.2	1.6	11.9	313.1	120.3
1955	190.3	289.3	5.1	18.8	7.6	24.1	1.6	11.9	344.1	132.2

Source: See accompanying text.

a/ Supplementary to table I-8.

/Table I-43

Table I-43 a/

MEXICO: INCOME FROM FOREIGN TOURIST EXPENDITURE AND BORDER TRADE, 1945-55

Year	Income (Millions of dollars)	Rate of exchange (Pesos per dollar)	Income (Millions of pesos)	Index (1950 =100)	Index of wholesale prices according to Banco de Mexico (210 articles) (1939 = 100)	(1950 = 100)	Income b/ (Millions of pesos at 1950 prices)	Index (1950= 100)
1945	110.7	4,855	537.4	26.0	198.7	63.8	421.2	40.8
1946	151.6	4,855	736.0	35.6	228.7	73.5	499.7	48.4
1947	147.3	4,859	715.7	34.7	242.3	77.9	459.4	44.5
1948	194.7	5,725	1,114.7	54.0	260.0	83.5	668.0	64.7
1949	186.4	8,011	1,493.3	72.3	284.8	91.5	815.6	79.0
1950	238.9	8,643	2,064.8	100.0	311.2	100.0	1,032.4	100.0
1951	271.6	8,647	2,348.5	113.7	386.0	124.0	938.5	90.9
1952	275.1	8,629	2,373.8	115.0	400.0	128.5	924.0	89.5
1953	313.4	8,615	2,699.9	130.8	392.5	126.1	1,070.6	103.7
1954	336.8	11,527	3,882.2	188.0	429.4	138.0	1,406.5	136.2
1955	364.8	12,490	4,556.4	220.7	487.9	156.8	1,453.6	140.8

Source: See accompanying text.

a/ Supplementary to table I-8.

b/ Fifty per cent of expenditure, in accordance with the calculation in table I-41.

/Table I-44

Table I-44 a/

MEXICO: CATTLE SLAUGHTERED FOR CONSUMPTION WITHIN THE COUNTRY, 1945-55

Year	Cattle		Pigs		Sheep		Total value c/	Index (1950=100)
	Volume b/	Value c/	Volume b/	Value c/	Volume b/	Value c/		
1945	120.9	274.9	51.2	185.3	4.1	12.8	473.0	80.3
1946	134.8	306.5	56.2	203.4	4.0	12.4	522.3	88.6
1947	133.7	304.0	59.6	215.8	4.0	12.4	532.2	90.3
1948	137.0	311.5	56.3	203.8	5.3	16.5	531.8	90.2
1949	130.6	296.9	57.5	208.2	7.5	23.3	528.4	89.7
1950	143.7	326.7	67.2	243.0	6.3	19.6	589.3	100.0
1951	147.6	335.6	55.6	201.3	6.0	18.7	555.6	94.3
1952	154.0	350.1	55.0	199.1	6.5	20.2	569.4	96.6
1953	162.4	368.6	77.3	279.8	7.6	23.6	672.0	114.0
1954	176.0	399.5	84.2	304.8	8.3	25.8	730.1	123.9
1955	168.8	383.2	94.5	342.1	8.1	25.2	750.5	127.4

Source: See accompanying text.

a/ Supplementary to table I-10.

b/ Thousands of tons.

c/ Millions of pesos at 1950 prices.

/Table I-45

Table I-45 a/

MEXICO: INDEX OF MANUFACTURES OF NON-DURABLE CONSUMER GOODS, 1945-55

(1950 = 100)

	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955
I. Non durable consumer goods	79.0	82.5	81.3	88.4	88.8	100.0	117.2	106.6	113.1	115.3	123.9
1. Textiles	102.6	102.8	93.5	100.0	90.4	100.0	97.7	96.0	89.6	102.4	114.0
Cotton yarns and textiles	111.0	109.6	100.0	105.0	94.4	100.0	94.3	91.8	89.2	104.4	115.1
Woollen yarns and textiles	115.9	110.7	96.7	89.0	95.6	100.0	115.5	100.3	84.7	80.6	71.4
Synthetic fibres	43.1	57.0	53.6	82.6	63.1	100.0	100.0	115.4	96.2	111.6	147.7
2. Rubber goods	48.7	74.8	89.3	104.4	90.6	100.0	125.0	122.9	115.5	130.9	150.8
3. Foodstuffs and beverages	70.0	72.7	73.3	81.4	85.9	100.0	119.5	109.7	113.5	120.6	127.6
Beer	68.5	79.2	60.2	62.4	74.7	100.0	127.0	117.2	115.7	135.0	134.7
Vegetable oil	60.2	50.8	72.1	69.7	82.0	100.0	103.7	87.0	98.6	89.9	135.3
Tinned foodstuffs	63.2	74.2	71.1	78.0	61.9	100.0	137.4	96.9	78.8	76.0	72.8
Milled wheat products	114.2	92.2	86.0	86.4	87.9	100.0	101.4	96.4	121.3	115.9	112.8
Sugar	63.1	64.9	84.6	105.4	111.4	100.0	112.7	117.1	132.0	140.5	152.9
4. Tobacco and matches	87.5	95.4	88.9	92.1	97.8	100.0	110.4	113.4	103.9	110.1	101.0
cigarrettes and cigars	86.2	97.9	88.6	91.0	98.5	100.0	111.8	116.9	107.2	113.0	103.6
Wax and wooden matches	94.5	81.8	90.5	98.5	94.0	100.0	102.9	94.4	86.0	94.4	86.6
5. Pulp and paper	82.8	79.3	83.7	87.1	89.9	100.0	109.9	107.8	120.4	117.8	147.9
Paper	87.9	84.1	85.4	88.0	90.4	100.0	110.5	107.5	122.4	118.1	149.5
Pulp	22.7	22.7	63.6	76.2	84.8	100.0	102.5	111.3	96.4	114.0	129.3
6. Soap	68.9	69.6	66.4	75.3	84.5	100.0	85.6	77.2	83.4	91.2	98.5
7. Pharmaceutical manufactures	67.2	81.0	92.5	96.2	97.0	100.0	110.8	118.2	124.3	128.7	127.4

Source: See accompanying text.

a/ Supplementary to table I-15.

/Table I-46

Table I-46 a/

MEXICO: INDEX OF DOMESTIC PRODUCTION OF CAPITAL GOODS
(1950 = 100)

Year	Iron and steel rolled products	Cement	Mechanical industry b/	Over-all index
1945	56.8	58.3	65.0	61.8
1946	67.0	63.3	75.0	71.2
1947	73.0	72.0	72.3	72.4
1948	73.0	77.8	68.8	71.2
1949	96.3	84.9	97.2	95.3
1950	100.0	100.0	100.0	100.0
1951	121.3	110.7	126.1	122.7
1952	137.4	118.2	135.5	133.7
1953	112.5	120.5	107.3	110.5
1954	131.3	127.3	131.8	131.0
1955	153.1	150.3	162.1	158.0

Weighting of sub-indices c/

Rolled products	28.43
Cement	13.14
Mechanical industry	58.41

Source: See accompanying test.

a/ Supplementary to table I-15.

b/ Including durable consumer goods.

c/ Weighting is based on the value added in the corresponding industries, according to the 1950 industrial census.

/Table I-47

Table I-47 a/

MEXICO: INDEX OF PRODUCTION OF THE CHEMICALS INDUSTRY, 1945-55

(1950 = 100)

Year	Sulphuric acid		Alkalis in terms of soda ash b/		Ammonium sulphate		Superphosphates		Over-all index c/
	Production (Tons)	Index	Production (Tons)	Index	Production (Tons)	Index	Production (Tons)	Index	
1945	21,991	50.7	1,908	8.3	3,000	100.0	4,500	29.1	27.6
1946	21,991	50.7	3,548	15.5	3,000	100.0	4,100	26.5	30.8
1947	33,365	76.0	5,521	24.1	3,000	100.0	13,690	88.5	53.7
1948	36,167	83.4	24,178	105.6	3,000	100.0	11,415	73.8	92.6
1949	38,011	87.6	32,166	104.4	2,800	93.3	16,429	106.3	117.3
1950	43,374	100.0	22,903	100.0	3,000	100.0	15,462	100.0	100.0
1951	56,667	130.6	13,641	59.6	33,813	1,127.0	19,154	123.9	138.2
1952	92,208	212.6	22,636	98.8	60,000	1,999.9	56,000	362.2	264.7
1953	102,503	236.3	27,591	120.5	64,223	2,140.7	62,977	407.3	296.7
1954	109,962	253.5	39,452	172.3	59,687	1,989.5	61,132	395.4	318.0
1955	124,887	287.9	53,704	234.5	64,903	2,163.4	74,919	484.5	382.7

Source: See accompanying text.

a/ Supplementary to table I-15.

b/ Including caustic soda, sodium bicarbonate and soda ash.

c/ Weighted by the following prices, in terms of pesos (at 1950 prices) per ton: sulphuric acid, 170 pesos; alkalis, 580 pesos; ammonium sulphate, 380 pesos; and superphosphates, 340 pesos per ton.

/Appendix C

Appendix C

ESTIMATE OF REPRODUCIBLE CAPITAL

I. Definition

This appendix presents a preliminary estimate of Mexico's geographical assets [1] in 1950, in the restricted sense of "tangible reproducible wealth".[2] This means that, for practical and theoretical purposes, the concept of geographical assets is limited to assets of an economic nature which are produced or constructed by man.

The above definition thus excludes assets of the soil and sub-soil; natural resources, such as forest wealth in its unprocessed state as well as mineral and other deposits; durable consumer goods, such as private cars, refrigerators, radio and television sets, etc.; non-durable consumer goods and tangible assets of a military nature, except for constructions.

On the other hand, it includes the following fixed assets: equipment, machinery, buildings and work tools,[3] as well as land improvements, permanent crops and large- and small-scale irrigation projects; buildings, vehicles and transport equipment; roads and telecommunications; public and residential buildings; buildings, installations and equipment for trade and services; producers' and middlemen's inventories; and, finally, gold reserves.

1/ No distinction is made between the nationality of the various assets within the country, and Mexican assets abroad are not considered.

2/ See Raymond W. Goldsmith, "The Growth of Reproducible Wealth of the United States of America from 1805 to 1950", Income and Wealth, Series II, Bowes & Bowes, Cambridge, 1952, pp. 249 and 250, and "A perpetual inventory of national wealth", Studies in Income and Wealth, Vol. XIV, National Bureau of Economic Research, New York, 1951, pp.10-61, also Simon Kuznets, "The Measurement of National Wealth", Studies in Income and Wealth, Vol. II, National Bureau of Economic Research, New York, 1938.

3/ The value of the fixed assets as given in the Industrial Census forms the basis of the estimate and is equivalent to their estimated cost of replacement at the 1950 level.

/Table I-48

Table I-48

MEXICO: ESTIMATE OF TANGIBLE REPRODUCIBLE CAPITAL IN 1950

(Millions of pesos)

	Fixed assets	Inventories	Total
Tangible reproducible capital			93,508.38
I. Agriculture	6,020.65	6,065.09	12,085.74
1. Livestock, poultry and beehives		4,326.14	
2. Permanent crops		969.02	
3. Inventories		769.93	
II. Forestry	104.11	18.32	122.43
III. Fishing industry	23.88	1.84	25.72
IV. Mining	761.91	507.91	1,269.82
V. Manufacturing industries	5,326.99	3,107.06	8,434.05
1. Non-durable consumer goods	3,216.77	2,088.45	5,305.22
(a) Textiles	780.37	727.17	1,507.54
(b) Foodstuffs	1,766.63	691.23	2,457.86
(c) Paper and pulp	200.20	70.19	270.39
(d) Rubber goods	67.58	49.88	117.46
(e) Pharmaceutical products	59.30	108.40	167.70
(f) Clothing and toilet articles	93.11	144.96	238.07
(g) Footwear and leather goods	50.33	74.43	124.76
(h) Tobacco and matches	101.95	178.22	280.17
(i) Printing and lithography	97.30	43.97	141.27
2. Durable consumer goods	342.22	256.92	599.14
(a) Cars	121.65	64.03	185.68
(b) Furniture and similar articles	84.51	72.58	157.09
(c) Ceramics and glasswear	31.82	21.37	53.19
(d) Household articles	97.38	92.03	189.41
(e) Jewellery and ornaments	6.86	6.91	13.77
3. Capital goods	1,768.00	761.69	2,529.69
(a) Metallurgical	391.04	146.94	537.98
(b) Building materials	565.84	151.83	717.67
(c) Mechanical	238.31	219.80	458.11
(d) Chemical	572.81	243.12	815.93
VI. Petroleum	2,309.57	391.95	2,701.52
VII. Electricity	2,278.81	111.99	2,390.80
VIII. Building industry	291.22	119.05	410.27
IX. Transport	6,450.13	19.70	6,469.83
X. Communications	-	-	9,955.98
1. Roads	-	-	8,977.70
2. Public telephones	-	-	978.28
XI. Trade and services	3,370.27	2,988.73	6,359.00
XII. Private credit agencies	-	-	147.35
XIII. Public entertainments	656.76	27.18	683.94
XIV. Residential buildings	-	-	28,261.50
XV. Public property	-	-	11,988.30
XVI. National credit agencies	-	-	115.21
XVII. Gold reserves	-	1,788.50	1,788.50
XVIII. Unclassified	134.55	163.87	298.42

/II. METHODOLOGY

II. METHODOLOGY AND SOURCES

The estimate of reproducible capital was based on data supplied by the different censuses for 1950. Indirect estimates were only prepared in some isolated cases when census data were unavailable.

1. Estimate of agricultural capital

This was based on the 1950 agricultural and livestock census (holdings of more than and less than 5 hectares) and the 1950 land census (censo ejidal). It includes the value of constructions, roads and railways, machinery, tools and vehicles, private hydraulic projects, utensils, goods and chattels, livestock, poultry and beehives, considered as a separate group, and the value of inventories, obtained from the difference between total production value and sales as of 31 December 1950.

2. Permanent crops

This was estimated on the basis of the 1950 agricultural and livestock census (holdings of more than and less than 5 hectares) and 1950 land census (censo ejidal). It comprises the value of plantations of coffee, coconut palm, cacao, vanilla, henequen, and agaves producing "pulque", "tequila" and "mezcal", as well as that of perennial fruit-trees, but excludes land value. For practical purposes, it was assumed that the value of plants in current production was the same as current production from them in 1950.

3. Large- and small-scale irrigation projects

The estimate was based on the reports and yearbooks of the Ministry of Water Resources (Secretaría de Recursos Hidráulicos), which supplied the figures for annual investment from 1926 to 1950. It included investment in the large- and small-scale irrigation projects under construction by the Ministry, and in the Valle de México, Papaloapán and Tepalcatepec projects, as well as in sanitary engineering works. For lack of a more adequate index, the annual investment series was adjusted to 1950 prices according to the wholesale price index of the Banco de México for 1926 to 1938, and its index of building prices for 1939 to 1950. The sum of this series, at 1950 prices, was taken as representing total capital investment in irrigation works. As the average life-span of these projects is at least 40 years, no adjustment was made for depreciation.

/4. Forestry

4. Forestry

This group comprises investments (including inventories) in the extraction and preparation of raw chicle, charcoal, gums, resins and candelilla wax, for which the data were obtained from the 1950 industrial census. The figures were adjusted by subtracting investment in land, cash assets, bank assets, receivables, debts, etc.[4/] from the total.

5. Fishing industry

The estimate of tangible capital in the fishing industry was also derived from the 1950 industrial census, and includes investments by co-operatives and license-holders. The total figure was adjusted by deductions similar to those in the preceding paragraph.

6. Mining

The summary of the 1950 industrial census was used as the source for investment, adjusted as before, in the exploitation of quarries and building clays (tepetates), as well as in the extraction of stone of all types for building purposes, sand, gravel, clay and salt, the mining of limestone, kaolin, fluorspar and silicas and other non-metallic minerals, and in smelting plants.

7. Manufacturing industries

The estimate of this category was based on the industrial census for 1950. As in the preceding case, the investment total was adjusted by means of the corresponding deductions for land, cash, bank deposits, receivables, etc., with figures taken from the census returns for each industrial class provided by the Statistics Department. The classification into non-durable and durable consumer goods and capital goods appears in the general table of estimates of tangible reproducible wealth (see table I-48).

8. Petroleum

This was estimated on the basis of investment in oil refineries, pipelines, gas pipelines, oil fields, oil wells, floating equipment, rolling stock, urban construction, the "Department of Domestic Sales" (Departamento de Ventas Interiores), "Navy Department" (Departamento de Marina)

4/ The relevant figures were obtained directly from the returns for each industrial category kept by the Statistics Department (Dirección General de Estadística).

/and "Miscellaneous"

and "Miscellaneous" (1938-50) as given by the Combined Mexican Working Party of the Mexican Government and the International Bank for Reconstruction and Development in The economic development of Mexico (table 64). The figures for investment in the above items up to and inclusive of rolling stock were adjusted to 1950 prices by means of the United States wholesale price index for "minerals and mining products".[5] Investments in urban construction, the "Department of Domestic Sales", "Navy Department" and "Miscellaneous", were estimated at 1950 prices, employing the index of building prices prepared by the Banco de México. The figures thus obtained were added to the "inventories" included in the 1950 industrial census under the heading: "Extraction of petroleum and natural gas, refining of crude oil and extraction of their by-products".

9. Electricity

The capital estimate for this group was based on the 1950 industrial census. Investment in "electric generating plants for public service" and private generating plants" was adjusted by making the usual deductions (land, cash, etc.) from the total.

10. Building industry

The estimate was derived from the 1950 industrial census, and the necessary adjustments were made to the total figure by subtracting investments in land, cash assets, bank assets, etc.

11. Roads

Capital investment in the highway system was estimated on the basis of information obtained from the National Roads Department, (Direccción Nacional de Caminos) of the Ministry of Communications and Public Works. The figures refer to the highway network for which the National Road Department is responsible, and the farm-to-market roads, at an average cost of 400,000 pesos per kilometre, and 6,000 pesos per metre for bridges and road embellishment, according to the Ministry of Communications.

5/ See Statistical Abstract 1950-51.

/12. Transport

12. Transport

The estimate was based on the 1950 transport census and includes the value, at 1950 prices, of land (the estimate was later adjusted by excluding this item), fixed installations, vehicles and equipment, and other fixed assets, as well as the book value of tools and the following inventory items: buses, lorries, air transport, maritime and coastal traffic, river and lake traffic, railways, tramways and trolley-buses, taxi-ranks and inter-urban passenger car services (regular or chartered).

13. Public telephones

The estimate of capital in the public telephone system was based on the Combined Mexican Working Party's figures for investment in installations, lines, land, buildings and various types of equipment from 1939 to 1950 (table III), as well as the number of telephones and exchanges, and the distance covered. Investment in "installations" and "miscellaneous equipment" was adjusted to 1950 prices by means of the United States price index for metals and metal products, whereas investment in lines, land and buildings was adjusted to the index of building prices (Banco de México). The series for land and buildings was also modified to exclude investment in the former on the assumption that it absorbed 10 per cent of annual investment in both. The unit cost per kilometre of line per telephone and per exchange was obtained by calculating the increase in each of the above items. The unit costs were then multiplied by the number of telephones and exchanges in 1950, and by the length of line laid in the same year, which gave the figure for tangible reproducible wealth invested in this category.

14. Trade and services

The trade census of 1945 provided the data for this estimate, since more up-to-date figures are not available. A calculation was made of investment in buildings, fixed installations, machinery, repairs and tools, motor vehicles, animal-drawn vehicles and animals, furniture, utensils and stocks of merchandise. The trade census comprised establishments with annual sales of more than 10,000 pesos, as well as public baths,

/bowling-alleys

bowling-alleys, billiard-rooms, nightclubs, hotels, private clinics and hospitals, international cable offices, hairdressers, garages and petrol-stations, restaurants, private schools, broadcasting, undertaker firms, and miscellaneous services. As 95 per cent of these items were included in the census, the total figure was adjusted to cover all of them and modified to conform with 1950 prices by means of the wholesale price index for Mexico City. The estimated growth of trade and services after 1950 was obtained by adjusting the total in accordance with the index for the geographical real product (trade) drawn up by the Combined Mexican Working Party.

15. Private credit agencies

The fixed assets belonging to private credit agencies were calculated from the figures supplied by the National Banking Commission (Comisión Nacional Bancaria).

16. Public entertainments

This item was estimated from the data provided by the Film Department (Dirección General de Cinematografía) and the 1950 industrial census on film production. It includes investment in exhibition, production and distribution, the figure being adjusted by deducting land investment on the assumption that this represented 10 per cent. In order to obtain the total figure for tangible reproducible wealth invested, it was assumed that cinemas absorbed 85 per cent.

17. Residential buildings

This was estimated by the following method:

(a) Investment in residential buildings from 1939 to 1950, as estimated by the Combined Mexican Working Party, was expressed in 1950 prices, with the use of the index of building prices prepared by the Banco de México.

(b) Total gross investment in building thus obtained was divided by population growth between 1938-50 to give gross per capita investment for that period.

(c) It was assumed that gross per capita investment during 1939-50, multiplied by the 1939 population figure, would equal the maximum value of the stock of buildings for 1939.

/(d) On

(d) On the basis of this stock, and assuming an annual depreciation of 1 per cent, a calculation was made of the net investment corresponding to the gross investment series in point (a).

(e) Net investment was divided by population growth and the figure thus obtained for per capita investment was assumed to be equal to the minimum value of the per capita stock in 1939.

(f) The average for the maximum and minimum stock levels was calculated and assumed to equal that of 1939.

(g) Net investment during 1939-50 was re-estimated on the basis of the new stocks thus obtaining the figure for 1950.

18. Public property

Public property was calculated on the basis of the 1939-50 gross investment figures, for each Government department, as drawn up by the Combined Mexican Working Party (table 18). Only investments by the Federal Government, autonomous and State enterprises, other institutions, States and territories, the Federal District Department (Departamento del Distrito Federal) and municipalities, were taken into account, always provided that they had not been estimated separately under other items. The present group comprised investment by the Ministry of Agriculture - buildings, conservation of resources and agricultural development; the Ministry of Communications - telecommunications, airports and buildings; Ministry of Marine (Secretaría de Marina) - port facilities, dredgers and dredging; the Ministry of Public Health and Welfare (Secretaría de Salubridad y Asistencia) - hospitals and sanitary engineering; the Ministry of Defence (Secretaría de la Defensa) and Department of Defence Industries (Departamento de Industria Militar) - constructions only; free ports - port facilities, dredgers, dredging, water and drainage, schools, paving, electric energy, municipal buildings and private roads; the Pensions Department - buildings, hotels, housing and holiday camps; the Mexican Social Security Institute - hospitals, clinics, buildings, housing, furniture and equipment; the Administrative Committee for the Federal School Building Programme (Comité Administrador del Programa Federal de Construcción de Escuelas) - schools and institutes; the Ciudad Universitaria

/ - the university

- the university buildings, playing fields, roads, bridges, water and drainage, urbanization, nurseries and reforestation; National Maize Commission (Comisión Nacional del Maíz), National Olive Commission (Comisión Nacional del Olivo), National Coffee Commission (Comisión Nacional del Café), National Storage Warehouses (Almacenes Nacionales de Depósito), Federal Materials Improvement Boards (Juntas Federales de Mejoras Materiales), other organizations, States and territories, the Federal District Department and the municipalities. Investment from 1939 to 1950 was estimated at 1950 prices according to the building index of the Banco de México, on the assumption that the inventory of public property increased proportionately to that of residential buildings.

19. National credit institutions

The data supplied by the National Banking Commission were used as a basis.

20. Gold reserves

The 1950 figures for the gold reserves as given in International Financial Statistics were used as a source.

21. Unclassified

This includes the unclassified groups in the manufacturing industries, and was based on the summary of the 1950 industrial census. It comprises coquito de coyol, the processing of vanilla, the ginning and packing of cotton, copra, unbleached cotton sacks, plugs and other articles of cork, musical instruments, the processing of cattle-intestines for castings and cords, doll and toy repairs, fountain pens and pen-stands, writing articles of all kinds, sports goods, articles of tortoise-shell and mother-of-pearl, toys of all kinds, paintbrushes, brushes and brooms, all types of labels and posters, coffins, drinking water, heating and steam power.

Chapter II

GENERAL PROJECTIONS OF DEVELOPMENT TRENDS

I. INTRODUCTION

The purpose of this chapter is twofold: firstly to identify as precisely as possible, within the main variables discussed in the previous chapter, functional and basic causal relations; secondly, once hypotheses have been formulated regarding the probable behaviour of the principal exogenous factors, to project the general growth trends of the system consistent with such relations.

The technique of projections is being applied more and more extensively in economic analysis. Given the basic structural relations and certain hypotheses on the behaviour of specific strategical variables, the required conditions for successful development and reduction of instability can be clearly established, and even quantified. These hypotheses may derive from the desired development policy, or may simply be based on a study of growth trends of the economy. In the latter case, projections give advance warning of possible trends towards external disequilibrium, of the formation of bottlenecks, or of other maladjustment which may obstruct development in coming years. Through prior identification of obstructing and disequilibrating factors, the technique of projections supplies elements for the formulation of both development and stabilization policies.

The present study does not claim to make more than a tentative projection of trends; however, it would be as well to define the limits implied by this statement. To project trends, it is necessary to identify from the outset those elements that play a dynamic role in development. Once these are known, they must be studied from two aspects: that of the factors which govern them, and that of their effect on the remaining elements of the economic system.

Without attempting a complete explanation of the dynamics of Mexico's economy and its development process, since this is only a tentative projection of the growth trends, a model of the structural

/relations between

relations between the principal elements of the Mexican economic system was prepared, starting from an observation of its behaviour during the past ten years. This model has only limited usefulness, since development, by modifying the structure of the economy, itself necessitates changes in the relations between these elements. It is nevertheless a useful instrument for the projection of trends.

An analysis of the behaviour of the principal elements of Mexico's economy emphasizes the basic importance of the growth of the real income of the export sector during the past decade.[1/] On the other hand it was found that the level of public spending had an undoubted influence, directly or indirectly, on the rate of economic activity. Although from some points of view it may seem to be an oversimplification, the next step was to attempt a model of inter-relations within the economy in which these two elements constitute the only exogenous variables.

The preparation of a model of this nature involves certain simplifications which must be explained in detail. The most important of them derives from the fact that the plan is based on the observation of variables for a period which cannot be considered to be typical from all points of view. It was seen, for instance, that the shape of the consumption function was greatly affected by devaluations, or by the phenomena which they produced. In fact, in the years of readjustment of the exchange rate, consumption showed much less elasticity to the dynamic elements of demand. The apparent hypothesis is that the devaluations caused a greater concentration of income, which in turn affected the consumption function. Although for the limited purposes of the analysis carried out in this chapter, that hypothesis does not need to be proved, its formulation alone is sufficient to raise the question of the possible future shape of the consumption function. While admitting that phenomena arising from the devaluations probably affected this function, any

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1/ The real income of the export sector (Y_e) is defined as the domestic purchasing power of income derived from exports, which is given by the value of exports in domestic currency and the domestic price level. Y_e is affected by the quantum of exports and their price level in domestic currency, and the domestic price level.

/hypothesis as

hypothesis as to its future shape must be based on other hypotheses, for example, in regard to the following: (a) the possibility of further devaluations, and (b), should devaluations occur, possible changes in the distribution of income.[2/]

The model used in these pages is based on certain facts suggested by observation, and proved statistically. It is a fact that the behaviour of private saving has been basically determined by the course of the real income of the export sector. It is also a fact that private investment has been basically induced, and its behaviour may be forecast, to a certain extent, once there is a hypothesis for forecasting specific components of aggregate demand. A further fact is that the behaviour of private consumption can be predicted, provided that there is a hypothesis for the probable course of certain dynamic elements of demand, such as real income of the export sector, public expenditure and private investment. Finally, it was seen that the degree of utilization of productive capacity has been governed by the level of aggregate demand, and by the extent to which this capacity was used in previous periods. If it is accepted that the basic structural relations of the Mexican economy will be maintained without appreciable change over the coming years, the causal and functional relations given in the preceding paragraph could be used to project the development trends of that economy. That projection is made here, starting from soundly-based hypotheses regarding the probable behaviour of the real income of the export sector.

Having defined a hypothesis for the rate of annual growth of Y_e, the most probable rate of growth of private saving is estimated (S_p). This is a most important datum in an under-developed economy. Starting from the principle that in Mexico public investment is financed with fiscal revenues and that private saving is the source of capital for private investors, it may be assumed that the action of these investors is limited by the availability of savings.

2/ It could be argued that devaluation, followed by adequate fiscal policy measures, may have very limited effects on the distribution of income.

/If a working

If a working hypothesis is accepted that private saving (S_p) is totally absorbed by private investors (that is, $I_p = S_p$), it is possible to estimate the rate of growth of aggregate demand less gross investment $\left(\frac{\Delta (D-I)}{D - I}\right)$ 3/ compatible with that increment of private investment, since it is already known that the latter is induced by D - I.

If the rate of increase of D - I is known, the rate of increase of consumption may be estimated, since $\Delta (D - I) - \Delta Y_e = \Delta C$.

The share of public consumption (C_g) in total consumption (C) is very small, and it may therefore be assumed that - for the limited purposes of the projection - the rate of increase of private consumption is equal to the rate of increase of total consumption $\left(\frac{\Delta C_p}{C_p} = \frac{\Delta C}{C}\right)$.

Since the rate of growth of private consumption is a function of the rate of increase of the three dynamic elements of the economy - real income of the export sector (Y_e), public expenditure (G) and private investment (Y_p) - if this is known, it is possible to find the composite rate for these three dynamic elements. Thus, since $\frac{\Delta C_p}{C_p} = \varphi\left(\frac{\Delta Y_e + \Delta G + \Delta I_p}{Y_e + G + I_p}\right)$ the implicit value of $\frac{\Delta G}{G}$ can also be obtained, since the values of $\frac{\Delta C}{C}$, $\frac{\Delta Y_e}{Y_e}$ and $\frac{\Delta I_p}{I_p}$ are already known.

The increase of aggregate demand (D) is given by the sum of Y_e, C_p, I_p and G, and the increase of the product by the difference between ΔD and ΔY_e. 4/

3/ See below, footnote 16.

4/ The increase of the product (ΔP) is not strictly equal to $\Delta D - \Delta Y_e$, since it is possible that ΔY_e may be affected by a monetary devaluation, without any change in ΔD and ΔP. Nevertheless, this difficulty will not arise in the projection, since the assumption is made that no exchange rate adjustments will occur with effects on the distribution of income.

/A projection

A projection made in this way may be used to define the maximum rate of increase compatible with the structural relations of the economy, given a certain rate of increase of real income in the export sector. To define this maximum rate, it was assumed that the variable $\frac{\Delta G}{G}$ may be of any value. This assumption has a very special signification, and it is advisable to examine it more closely.

The assumption that $\frac{\Delta G}{G}$ may be of any value implies an admission that the joint effect of the dynamic factors $\frac{\Delta Y_e + \Delta G + \Delta I_p}{Y_e + G + I_p}$ which determine private consumption would always be strong enough to maintain this latter at the maximum level permitted by structural relations. This level is necessary in order that consumption,[5] together with the income of the export sector, may induce private investment to rise to the potential level of private savings. Now the effectiveness of raising the rate of growth of G, as explained in this chapter, is dependent upon the form of financing of the increased public expenditure. On the other hand, without predetermining a policy - thereby abandoning the intention to project trends - it would be impossible to accept the hypothesis that public expenditure could increase at a higher rate than the remaining elements of the demand together.

Nevertheless, for projection purposes, there is considerable practical interest in following the indicated form, for in this way - given an assumption on the rate of increase of a variable which may be studied sufficiently, Y_e - the limit towards which the development rate tends may be determined.

Assume a rate of increase of 4 per cent for Y_e. In this method of projecting, it is simple to show that the maximum value which the rate of growth of the product may attain, given the observed structural

5/ As will be explained later, the increases of private consumption in a given year, and in the previous year, are those which - together with the growth of income of the export sector - induce private investment. But the increase of private investment in the given year also affects - together with the increase of income of the export sector and public expenditure - the level of private consumption in the same year.

/relations, would

relations, would be 8.4 per cent. Nevertheless, the same structural relations show that in practice it would be difficult to achieve this rate, since it presupposes a rate of increase of consumption of 7.4 per cent, which is greater than that of two of the dynamic elements which govern consumption: the income of the export sector (4 per cent) and private investment (6.9 per cent).[6] The required value of $\frac{\Delta G}{G}$ would be approximately 20 per cent, which would be difficult to achieve without lowering the levels of consumption and of private investment. The 8.4 per cent rate of growth of the product could nevertheless be achieved without a disproportionate increase of public expenditure if, under the influence of other factors, the shape of the consumption function were modified.[7] A relative decline in the prices of imported consumer goods, as a result of an improvement in the terms of trade and an abundant supply of domestically-produced food, caused in turn by excellent harvests, are two factors among many which could modify the shape of the consumption function, although only temporarily, in a given year.

The problem has a further and more important aspect. It has been previously stated that the shape of the consumption function was determined on the basis of the experience of the past ten years. There are some indications that the devaluations, possibly through their effects on the distribution of income, changed the consumption function, making it less

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6/ Assuming the total absorption of private saving by private investors. A rate of increase of 4 per cent in Y_e implies an increase of 6.9 per cent in savings. The data referring to this example may be found in the appendix to this chapter.

7/ The experience of the past ten years shows that ocassionally very high rates have been achieved, possibly close to total absorption of potential saving - and even an excess of investment over planned saving when there is inflationary pressure - without increasing the share of public expenditure in aggregate expenditure. These rates have coincided with strong increases of demand, arising from intense import substitution and very good harvests. A broad import substitution, such as that which took place immediately after devaluation, implies a more intense utilization of productive capacity, and leads to an increase in total wage payments. The combined effect of these two factors, and of a very favourable external demand, appear to be the reasons for a rate of increase higher than 8 per cent in 1955.

/elastic to

elastic to the stimulus of the dynamic elements of demand (see below, figure II-V). If the effect of this factor is eliminated, that is to say, if the hypothesis that external disequilibrium may be corrected without affecting the distribution of income is accepted, a greater elasticity of the consumption function may be admitted. The extent to which this function is changed, on the one hand, and the extent to which, at a given moment, favourable conditions may exist on the supply side of consumer goods, will determine the degree of approximation of the rate of growth of the product to the theoretical limit mentioned above.

The determination of the maximum rate of growth to which the economy tends - given certain assumptions on the behaviour of exogenous variables - constitutes only one stage in the projection of trends. Elements of internal and external instability continuously affect an economy such as that of Mexico. If the product rises at a very high rate, imports will tend to reach exceptionally high levels, as shown in this chapter. Excess of outward demand means, on the one hand, insufficient internal demand - always assuming that there is no monetary expansion - and, on the other, the drawing down of reserves. A broad and effective import substitution may largely reduce external instability. But, in a country with free exchange, a substitution policy is not sufficient to avoid the short-term changes in outward demand initiating strong forces tending to cause internal instability. It will always be necessary, in addition to this policy, to take short-term measures in good time, tending to compensate for sudden changes in the level of outward demand.

Some hypotheses are formulated in the following pages on the possible variation of the rate of growth of Mexico's economy. That is to say, certain minimum limits of that rate are assumed in different hypotheses of the effectiveness of internal compensatory action. On the basis of these minimum limits, and of the maximum, a rate is determined which may be considered as the representative average development rate for the next ten years.

It is important to remember that this is not a forecast of development in the coming years, but rather a representative rate of growth in the light of certain well-based assumptions regarding the behaviour of the

/most dynamic

most dynamic element of demand. Nor may it be said that this rate will actually occur in one or more future years, since it is an average of a group of values which are not known individually.

The rate of growth of the product referred to in the preceding paragraph would be 5.4 per cent, that is, not much lower than the average for the last ten years (6 per cent). It must not be forgotten, however, that the increase in external demand in the last decade was much greater than the assumption for the coming years. On the other hand, it was implicitly accepted that the consumption function would be more elastic in the future than in the recent past. Admitting this second assumption implies starting from the principle that the compensatory policy for external disequilibrium would not have the same effects on the consumption function which it had during the past decade. In other words, this rate of growth of product (5.4 per cent) - given a rate of 4 per cent growth in the export sector - presupposes an active import substitution policy. Without such a policy, the changes in the consumption function caused by exchange rate modifications would tend to reduce the maximum rates of growth, and finally, adversely affect the representative rate.

The rate of 5.4 per cent constitutes a simple average of the projected maximum and minimum values. Starting again from the same structural relations model, it is possible to determine also the probable values of the remaining variables, compatible with that rate. Given the same value of $\triangle Y_e$ as in the previous case (4 per cent), the increase in public expenditure would have to be something over 6 per cent - very little less than private investment (6.9 per cent) - and therefore greater than the product. Nevertheless, since it is assumed that the consumption function will be more elastic in the future, the probability of reaching an average rate of 5.4 per cent may be admitted without a necessary increase in the public expenditure share in the product.

The following sections contain an explanation of the details of the construction of the model of inter-relationships, and of the calculation procedure used in the projections.

/II. UTILIZATION

II. UTILIZATION OF PRODUCTIVE CAPACITY

Economic development, since its final expression is an increase in per capita product, basically reflects the expansion of productive capacity under conditions of equal or improved efficiency in its use. The increase of productive capacity is in turn a problem of capital accumulation.[8] Consequently, the question to be examined has three aspects: first, efficiency in the use of productive capacity; second, the ability of the system to generate savings; and third, its ability to transform this saving into productive capacity.

Nevertheless, to increase productive capacity is not all. In addition, it is necessary that the growth of supply should allow the system to satisfy the new needs of consumers and entrepreneurs. The capacity to import plays a basic role in this process of continuous adjustment of supply and demand. The more rapid the growth of an underdeveloped economy, other things being equal, the more difficult is the adjustment, and the greater is the potential pressure on the external sector. In cases such as Mexico's economy, when the attempt is made to absorb total savings without a sufficiently adequate channelling of investments, a strong pressure on the balance of payments may often arise. On the other hand, to subordinate the volume of investment to balance-of-payments equilibrium involves the risk of a persistent reduction in the rate of growth. Both in the former case, external disequilibrium, and in the latter, internal disequilibrium, the basic problem is the same; inability of supply to increase spontaneously in accordance with the requirements of a rapidly changing demand.

The problem of the degree of utilization of productive capacity has already been discussed in chapter I, when the behaviour of the product-capital ratio was examined: the higher this ratio, the more complete will be the utilization of productive capacity as a whole. It was seen that the increase of this coefficient during the past decade is

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8/ The expression "capital accumulation" is used in its widest sense, including both real capital investment and that intended to increase the worker's capacity to use his equipment, organize production, introduce new techniques, etc.

/related to

related to general changes in the investment structure. Nevertheless, apart from this trend, which characterizes the period as a whole, there are short-term changes both in the absolute level of the coefficient and in its rate of annual increase. If these short-term variations of the product-capital ratio are examined, it is easy to see that they are accompanied by changes in the rate of increase of aggregate demand. It appears that each time the expansion of aggregate demand accelerates, that is, each time there is a short-term increase of pressure on resources, the degree of utilization of productive capacity by the system was intensified. As demand eased, the pressure on productive capacity also eased. This obviously is not a simple proportional variation, since, as the level of efficiency in utilization of equipment becomes higher, it becomes more and more difficult to increase it further. The experience of the past ten years in Mexico shows that the product-capital ratio is basically determined by changes in the level of aggregate demand and the level of the ratio itself during the preceding year (see figure II-I).[9/] Thus, given an annual rate of increase of demand of 5.5 per cent, if the product-capital ratio for the previous year was 0.49, that of the current year would also be 0.49; if, however, it was 0.51 in the previous year,

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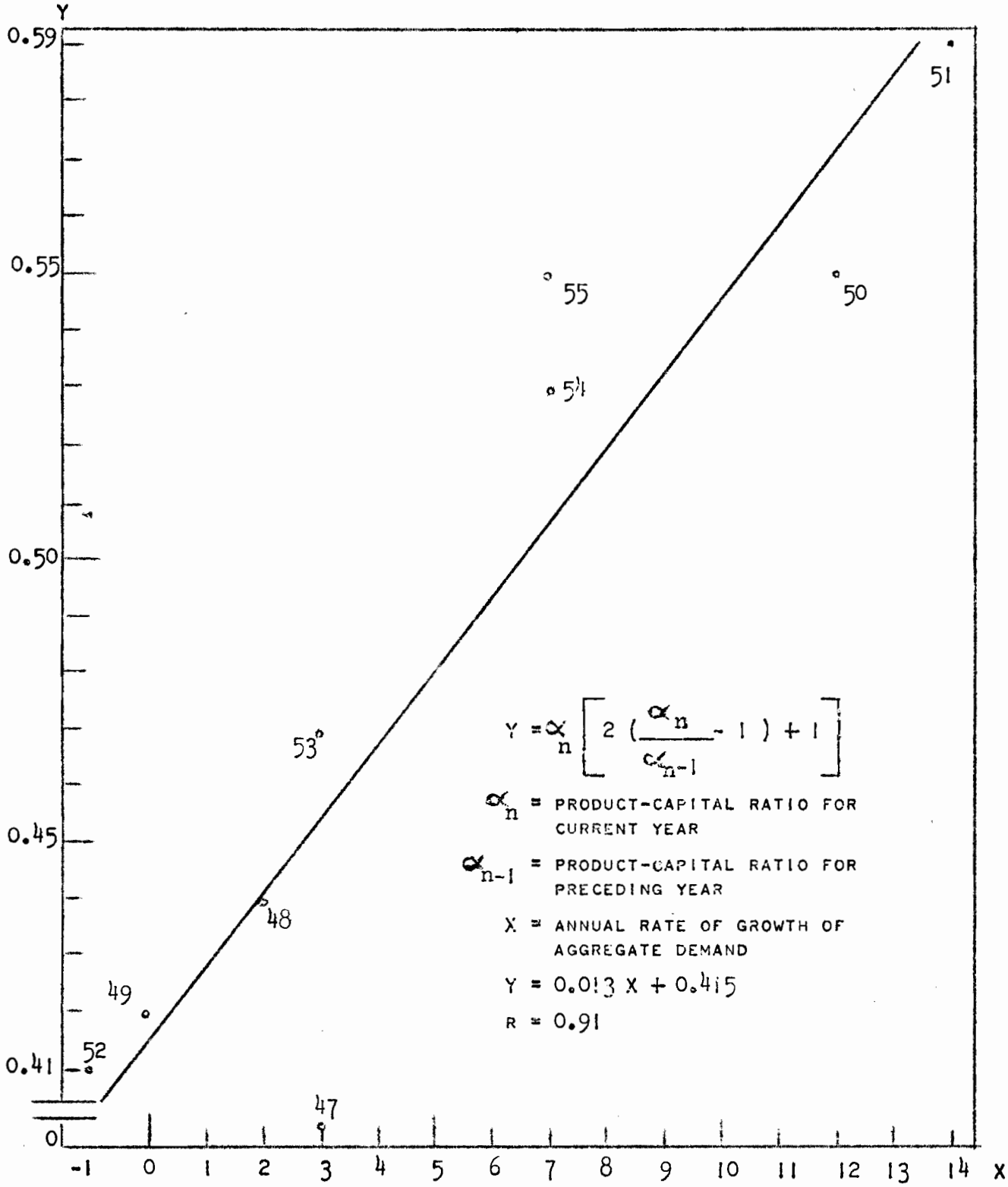
9/ It may be demonstrated empyrically that the value of y defined by $\alpha n \left[2\left(\frac{\alpha n}{\alpha n-1} - 1\right) + 1\right]$ in which αn is the product-capital ratio for a given year, and $\alpha n-1$, the ratio for the preceding year is that which has a greater correlation with the annual rate of increase of aggregate demand. For this reason it has been used in figure II-I, where $y = 0.013x + 0.415$, where x is the annual rate of increase of aggregate demand. The coefficient of correlation (r) is 0.91.

/the present

FIGURE II - 1

MEXICO : REGRESSION OF THE PRODUCT-CAPITAL RATIO ON THE RATE OF GROWTH OF AGGREGATE DEMAND

NATURAL SCALE



the present year would tend to be 0.50.[10/]

III. CAPITAL ACCUMULATION

Capital accumulation is the outcome of the combined effect of the ability of the system to save and of its ability to transform savings into productive capacity. These two aspects of capital accumulation will be discussed separately.

It is known that the rate of saving is a relatively stable element in any economic system. Its range of variation only alters when there are changes which substantially affect the form of income distribution, the structure of tax burden, or the general level of development. Even then, the short-term variations within this limited range are usually of significance.

Variations observed within the past decade in the rate of saving appear to have been induced basically by changes in the profitability of the export sector. This fact can be seen from figure II-II, where the movement of the rate of saving is compared with the internal terms of trade of the export sector.[11/] The correlation between the two variables is very high (0.93), and the only notable discrepancy is in 1951, when

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10/ If $x = 5.5$, the value of y in the two cases will be: $0.013\ (5.5) + 0.415 = 0.49$. Substituting the values of α_{n-1} and y in the equation $y = \alpha_n \left[2\left(\frac{\alpha_n}{\alpha_{n-1}} - 1\right) + 1 \right]$, the value of α_n may be calculated. In the first case: $0.49 = \alpha_n \left[2\left(\frac{\alpha_n}{0.49} - 1\right) + 1 \right]$, from which it may be deduced that $2\alpha_n^2 - 0.49\,\alpha_n - 0.25 = 0$ and therefore $\alpha_n = 0.49$ for the positive value of the root. In the second case: $0.49 = \alpha_n \left[2\left(\frac{\alpha_n}{0.51} - 1\right) + 1 \right]$, where $2\alpha_n^2\ 0.51\,\alpha_n - 0.25 = 0$; and therefore $\alpha_n = 0.50$ for the positive value of the root.

11/ The internal terms of trade of the export sector are expressed by the ratio between the export price index in domestic currency and the domestic price index.

/the rate

the rate of saving was probably underestimated.[12] The highest correlation was obtained between the rate of saving and the average of the terms of trade in a given year and the preceding one, which is quite explicable, since the repetition of periods of high profits favours an increase in the rate of saving.

It was seen in chapter I that there was a persistent downward trend during the last decade in the external terms of trade. The internal ratio of the export sector, however, developed differently: it rose strongly in the first five years, and maintained a relatively high level during the second (see table I-I). An improvement in the internal terms of trade of the export sector, unaccompanied by a similar improvement in the external ratio, shows that there was a redistribution of income in favour of that sector.

This redistribution appears to be that which, when profits increased in certain large productive sectors, produced the trend towards the increased rate of saving seen in figure II-II.

If it is a fact that variations in the rate of saving have been caused basically by changes in the profitability of the export sector, a working hypothesis could be accepted that the changes in total savings accompanied the changes in the income, measured in internal purchasing power, of the export sector. If the yearly rates of growth of saving are compared with those of income of the export sector, a fairly high correlation is obtained.[13]

In graph II-III, line A represents the functional relation between

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12/ In the calculation of investments, which formed the basis for the estimate of consumption (and saving), inventory changes were not included. Since there were heavy speculative imports in 1951, the ratio of inventories to investment probably increased, which would mean an overestimation of consumption and an underestimation of saving.

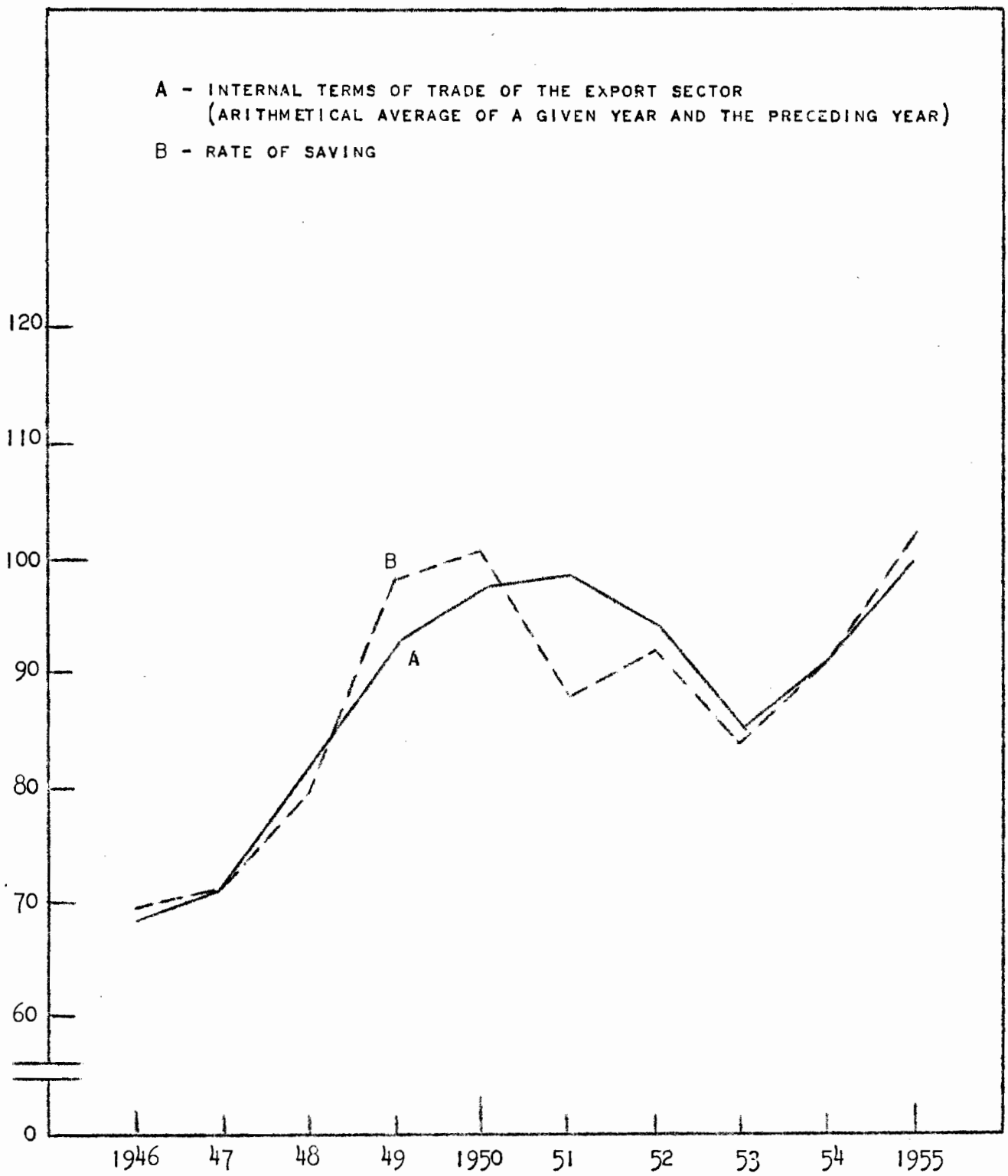
13/ The coefficient of correlation is 0.77 if the years 1945 and 1946 are omitted, since these two were greatly influenced by excess liquidity in the enterprises, due to import difficulties during the war. The correlation would probably be higher if public savings were omitted.

/the annual

FIGURE II - II

MEXICO : COMPARISON BETWEEN THE BEHAVIOUR OF THE RATE OF SAVING AND THE INTERNAL TERMS OF TRADE OF THE EXPORT SECTOR

NATURAL SCALE



the annual growth of savings (S) [14/] and that of real income of the export sector (Y_e). The function is very elastic, especially for the lower values of Y_e. The rate of growth of S is more than double the rate for Y_e for values of the latter less than 3.5 per cent, and more than 50 per cent greater for values up to 5 per cent. In other words, the rate of growth of S changes much less than that of Y_e, and is much greater within the range of more probable values. This latter is easily explicable when it is remembered that the increases in Y_e have been caused not only by increases in the true volume of trade, but also by internal transfers of income arising from the devaluations.

Proceeding to the problem of investment,[14a/] careful observation of private investments seems to show that their behaviour has been induced by other factors, that is, that they have not constituted an autonomous factor during the period under review.[15/] If gross investment (I) is subtracted from aggregate demand (D), the balance is made up of consumption (C) and external demand (De). Changes in the level of private investment (I_p)

14/ The analysis was based on data for aggregate saving, since it was statistically impossible to exclude public saving. Nevertheless, variations in exporters' income would affect the latter much more indirectly. The inferences are therefore all the more valid for private saving, which is discussed directly in the succeeding paragraphs.

14a/ The investment concept used in making the model of inter-relations only refers to the accumulation of fixed assets, that is, to investments which have an immediate effect on productive capacity. Investments abroad and those used for inventory accumulation are excluded, even though they form part of saving.

15/ It is not believed that the behaviour of private investments is always passive. Obviously, part of them have been "autonomous". On the other hand, as will be seen later, private investments affect the level of aggregate demand, and thus amplify the stimulus. The statement in the text refers to the principal characteristics of private investments.

/Table II-1

Table II-1

MEXICO: TERMS OF TRADE OF THE EXPORT SECTOR

Year	Export price index	Wholesale price index	Internal terms of trade	External terms of trade
1945	43.0	63.8	67	104
1946	49.6	73.5	68	104
1947	56.9	77.9	73	101
1948	73.9	83.5	89	112
1949	86.0	91.5	94	96
1950	100.0	100.0	100	100
1951	118.9	124.0	96	106
1952	117.4	128.5	91	107
1953	99.2	126.1	79	110
1954	141.8	138.0	103	99
1955	151.0	156.8	96	91

Source: ECLA, on the basis of official statistics.

/therefore appear

therefore appear to have been caused by variations in the level of C and De.[16]

The correlation obtained by yearly comparison of the two variables is sufficiently high,[17] and emphasizes the great importance within private investment as a whole of that part caused by increased consumer and external demand. Figure II-IV compares the behaviour of the two variables. The highest correlation is that between the rate of increase of private investment and the average of the rates of increase of $C + Y_e$ in a given year and the preceding one. This is reasonable, since the expansion of productive capacity reflects to a great extent the level of activity during the preceding period.

Line B of figure II-III shows the shape of the functional relation observed between the rates of increase of I_p and $C + Y_e$. When the rate of increase of $C + Y_e$ is low, investments tend to decrease. A stable rate of investment is achieved with a rate of increase of $C + Y_e$ between 4 and 4.5 per cent. About 7 per cent, both rates are equal, and from this point I_p increases more than proportionally.

By superimposing the two functions, as in figure II-III, it is clearly seen that a rate of increase of Y_e of about 4.2 per cent corresponds to an increase of 7 per cent in private saving.[18] If private investment is to increase by 7 per cent, the factors causing this must also increase jointly by 7 per cent. Since one of these factors (Y_e) would be increasing

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16/ The difference between external demand (De) and exporters' real income (Y_e) comes from the transfers arising from foreign exchange adjustments. If the effects of these adjustments are omitted, aggregate demand less gross investment (D - I) will be equal to consumption plus exporters' income ($C + Y_e$). The highest correlation observed in the past was between the rate of increase of private investment (I_p) and those of ($C + Y_e$) (average of current and preceding years). But since it is assumed that in future De is approximately equal to Y_e, ($C + Y_e$) may be substituted by (D - I) for projection purposes.

17/ The coefficient of correlation is 0.85, and the regression equation is $y = 2.92x - 13.45$.

18/ See note 14.

/by 4.2

by 4.2 per cent, the other (consumption) would have to increase by more than 7 per cent. It is therefore important to establish which are the main factors conditioning its behaviour.

The analysis of the consumption functions involves more difficulties than the other variables mentioned. The reason for this, already mentioned in chapter I, is that the consumption datum is residual, and involves a high margin of error. This margin will obviously be greater if the observation refers to the annual changes in the level of consumption. Further, since Mexican statistics do not permit an adequate estimate of public consumption, which is an autonomous element, variations in the level of private consumption can only be observed through their effects on the level of aggregate consumption.

If annual variations of consumption are compared with the dynamic demand factors (Y_e, G and I_p), it is seen that they tend to follow the movements of the latter, considered jointly.[19]

Figure II-V gives two consumption functions. Curve A was calculated on the basis of values for the whole period 1945-1955, while for curve B the years most affected by devaluations were omitted (1948, 1949, 1954). It is clearly seen that these reduced the elasticity of the consumption function throughout the whole range of most probable true values.[20]

19/ The greatest difficulty lies in the fact that the consumption series include inventory variations. In 1953, for example, when there were apparently heavy replacements of agricultural stocks, the series behaves in a completely abnormal manner. Eliminating this year, the correlation between the rate of increase of the two variables is 0.71

20/ It may be wondered why consumption and savings are treated as independent factors, when from the accounting point of view they are complementary. The reason is that saving was only considered from the point of view of the strong influence exercised on its movements by variations in the real income of the export sector. The level of saving depends more on the yield of that sector than on the general level of activity. On the other hand, the income of the great majority of the population, whose saving capacity is almost non-existent, largely affects private consumption. Since the factors determining the level of this income are not exactly the same as those which decide the level of income of the small saving minority, it is essential to analyse the two factors independently.

FIGURE II - III

MEXICO : SAVING AND PRIVATE INVESTMENT

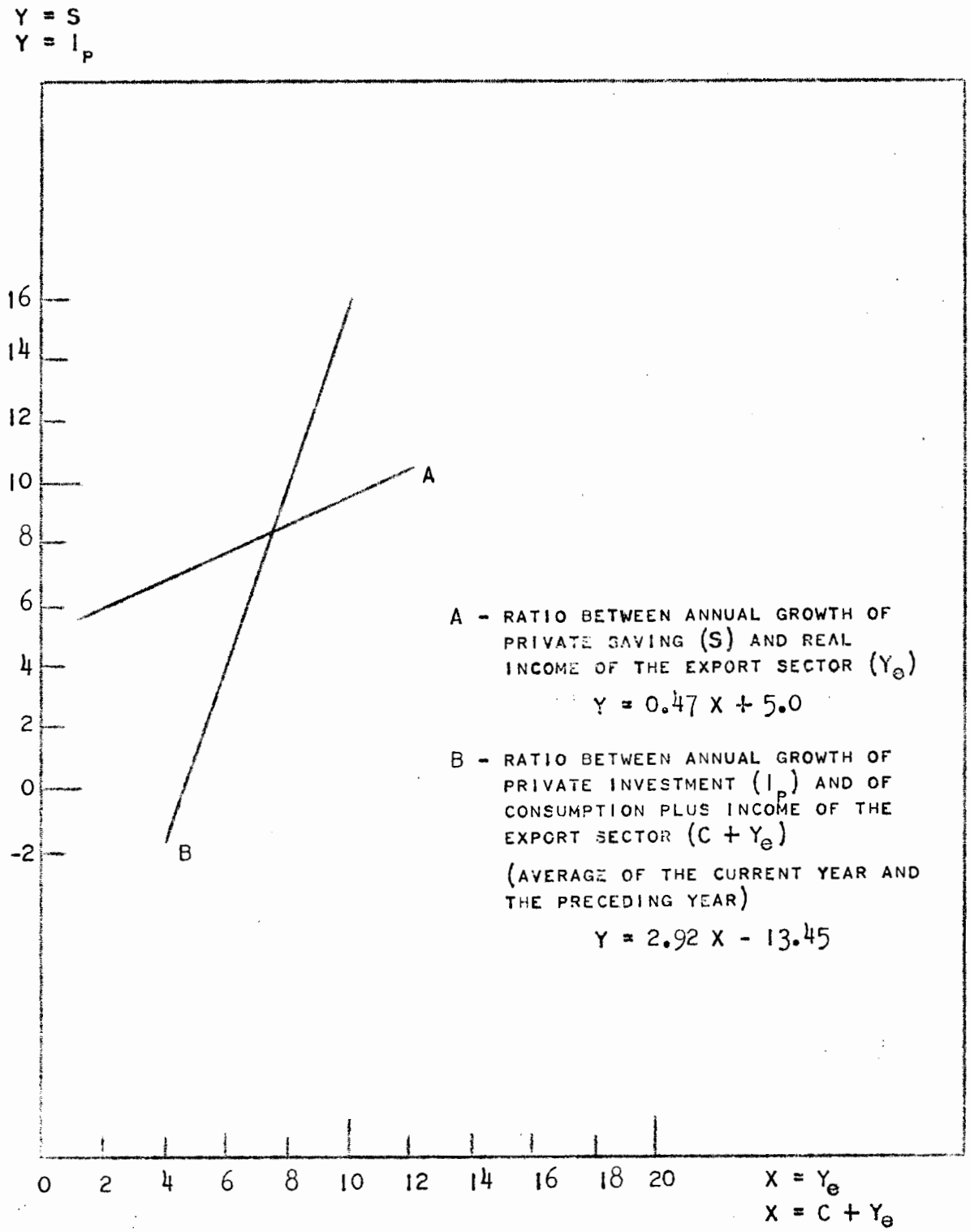


FIGURE II - IV

MEXICO : INDICES OF ANNUAL GROWTH OF AGGREGATE DEMAND (LESS GROSS INVESTMENT) AND OF PRIVATE INVESTMENT

SEMI-LOGARITHMIC SCALE

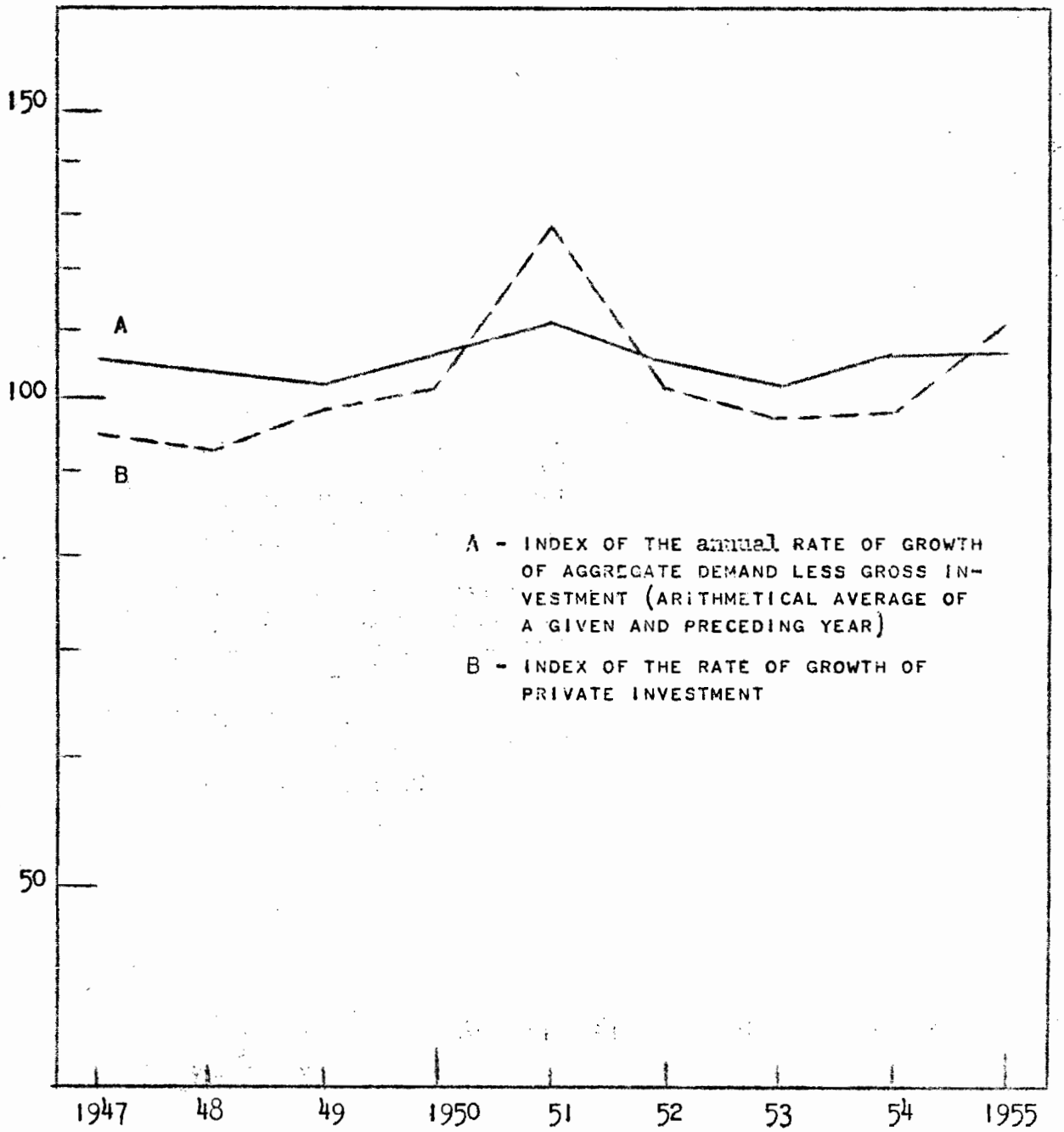
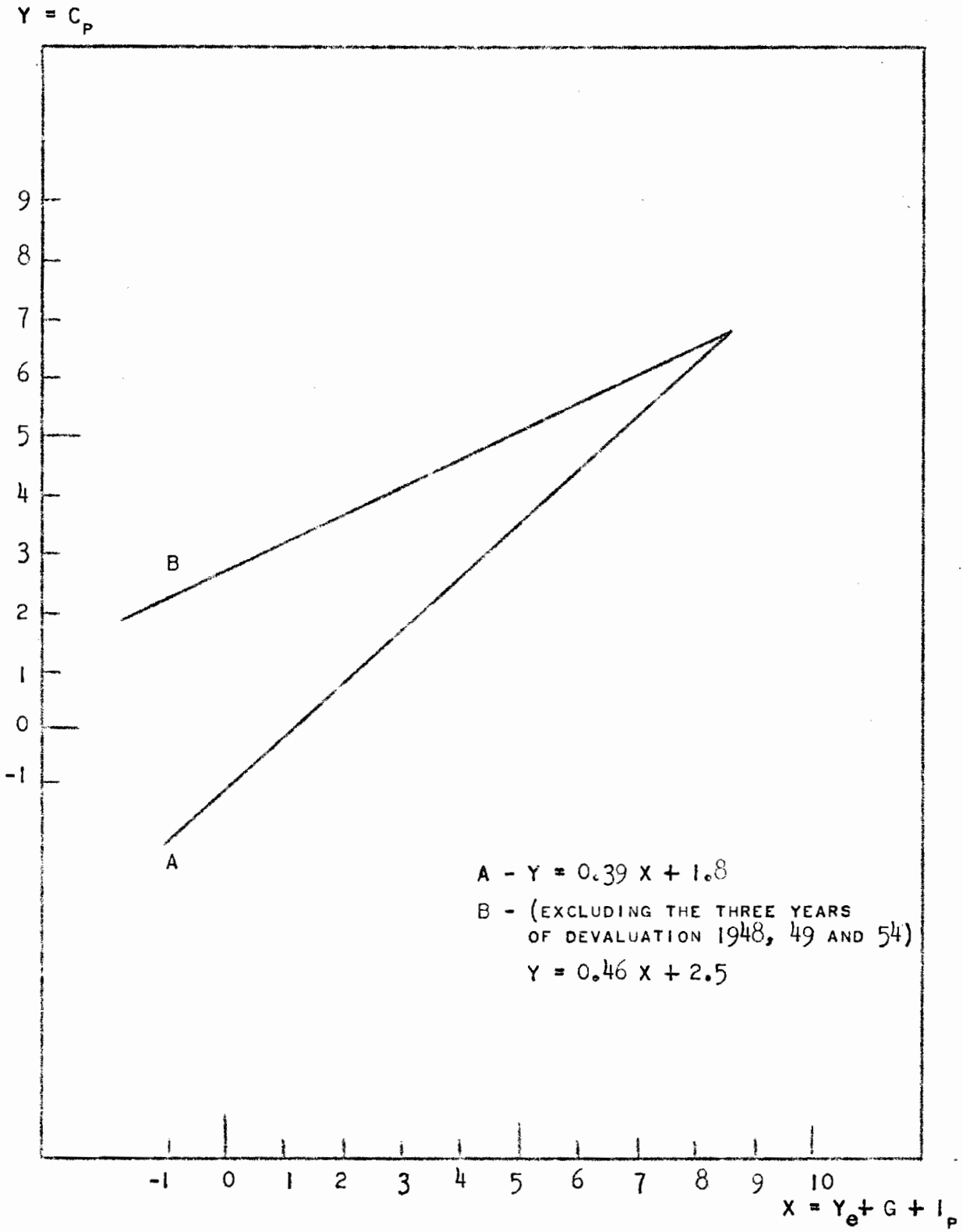


FIGURE II - V

MEXICO : CONSUMPTION FUNCTION



IV. PROJECTIONS FOR THE NEXT DECADE

The functional interrelationships and the causal relations mentioned in earlier sections may be used as a basis for projecting the development trend of Mexico's economy. Three basic relationships have been established: one between the rate of growth of private saving (S_p) and that of real income of the export sector; another between the rate of increase of private investment (I_p) and global demand less gross investment ($D - I$), and lastly between the rate of increase of private consumption (C_p) 21/ and those of the dynamic demand factors. (Y_e, G, and I_p) 22/

There are therefore two exogenous variables, Y_e and G. The probable behaviour of the former during coming years is carefully studied in chapter III. Three hypotheses are formulated in that chapter for the development of the capacity to import deriving from Mexican exports; these three give an annual rate of increase of 0.6, 3.3 and 5.3 respectively. Nevertheless, it may be assumed that the income of the export sector will probably increase somewhat more than the capacity to import deriving from exports, especially if the increase of the latter is very slow, as occurs in the first of the three hypotheses. If this should happen, it may be expected, on the basis of recent years' experience, that there will be further reductions in export taxes or even that other fiscal measures will

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21/ Remembering the small share of public consumption (C_g) in C, the rates of increase of C_p and C will be considered to be equal for projection purposes.

22/ If S_p is private saving, Y_e the income of the external sector, I aggregate investment, I_p private investment, D aggregate demand, G public expenditure and C_p private consumption, the three functions are:

$$\text{(I)} \quad \frac{\Delta S_p}{S_p} = 0.47 \frac{\Delta Y_e}{Y_e} + 5.0$$

$$\text{(II)} \quad \frac{\Delta I_p}{I_p} = 2.92 \frac{\Delta (D-I)}{D - I} - 13.45$$

$$\text{(III)} \quad \frac{\Delta C_p}{C_p} = 0.46 \frac{\Delta (Y_e + G + I_p)}{Y_e + G + I_p} + 2.5$$

/be requested

be requested in special cases. Because of this, it was assumed that the rate of increase of Y_e would not be less than 1 per cent in the most unfavourable hypothesis, 4 per cent in the intermediate, and 6 per cent in the best.

Given a hypothesis on the income of the export sector,[23] it is necessary to determine what would be the required rate of increase of G if the system is to achieve the highest rate of increase compatible with equality between saving and private investment, that is, the maximum rate of increase to which the system would tend within the framework of prevailing structural relations. The logical stages of the projection are:

(1) Having formulated a hypothesis for the rate of increase of Y_e, the rate of increase of S_p is deduced (equation I);[24]

(2) Equal increases of S_p and I_p are assumed;[25]

(3) From the known rate of increase of I_p, the rate of increase of (D - I) is deduced (equation II);

(4) If the increase of Y_e is deducted from the increase of aggregate demand less investments, the increase of consumption is obtained;[26]

(5) The rate of increase of private consumption being known,[27] the rate of increase of the sum $Y_e + I_p + G$ is deduced (equation III);

(6) Since the rates of increase of Y_e and I_p are known, that of G is obtained residually from (5), and

(7) Adding the increases of C_p, G and I_p, the growth of the product is obtained.

23/ Another important implied assumption is that total public expenditure is the same as fiscal revenues.

24/ See footnote 22.

25/ The implicit equation of equilibrium is: $\frac{\Delta I_p}{I_p} = \frac{\Delta S_p}{S_p}$.

26/ Equation of definition: $(D - I) - Y_e = C$

27/ Another implied assumption is that yearly variations of aggregate consumption basically reflect those of private consumption. See footnote 14.

/The appendix

The appendix to this chapter gives the calculation of a projection on the basis of these equations, taking as a hypothesis a 4 per cent annual increase of income in the export sector. From this projection it may be seen that the maximum rate of growth of the product, given the established assumptions, will be 8.4 per cent.[28] That rate, because of the behaviour of the consumption curve, would require a disproportionately large increase of public expenditure. The interest of that projection lies in the fact that it indicates the limit of the product's growth-rate trend, given the indicated hypothesis regarding the income in the export sector.

It should, however, be emphasized that the possibility of raising the rate by expansion of public expenditure is a simple logical inference of the model, and its practical interest is limited. The public sector spends on both consumption and investment. In principle, both types of expenditure may strengthen demand in the case of insufficient private expenditure; but, if public investment is to supplement private investment adequately, it will have to be financed by that part of private saving not absorbed by investors. If it is financed through taxes, which reduce consumer spending, or by credit expansion, the effect might differ greatly from that desired. On the other hand, in order that public sector consumption may counteract the insufficiency of private consumption, it would have to be financed by resources which do not affect the latter, and should supplement consumption in those sectors where there is adequate elasticity of supply. These comments are sufficient to show that the expansion of public expenditure is not in itself a means of achieving higher rates of growth. Furthermore, maladjustment between the composition of demand and the supply structure may persist and even become greater if an indiscriminate increase of public expenditure is attempted.

It may be assumed that within five or ten years the rate of growth will tend to vary between the maximum point mentioned and different points representative of situations of under-utilization of the development

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28/ It is possible to admit even higher rates if external resources or those of the public sector should permit private investment to increase more than private saving. Nevertheless, the hypothesis of a transfer of public resources is difficult to accept, for reasons given in the text.

/potential.[29]

potential.[29] Assume that development takes place with stages of acceleration and reduction of the rate of increase, with 8.4 per cent as the average of the highest points and zero as that of the lowest. In that case the average rate of increase would be about 4.2 per cent. It can be equally assumed, however, that the economic authorities could maintain an active compensatory policy and that, with each decline in the rate of increase, they could take steps to raise the level of demand. In that case, it may be expected that the lowest points would be above zero. The development cycle would then have closer limits and the average rate of growth would be higher.

It may be assumed that the economic authorities would establish a general criterion, for example, that if the rate of growth of the economy falls to the level of the rate of the trend of the capacity to import, measures should be taken to increase demand. In this case, if the rate of the trend of the capacity to import were 4.7,[30] that of product growth would vary between 8.4 and 4.7; its average value would be 6.5 per cent.

The 6.5 per cent hypothesis would cover a situation of permanent supervision by the economic authorities, with a well-operated compensatory policy, while that of 4.2 per cent might be considered as a trend if there were almost no policy of this type.[31] The average of the two values may be accepted as a reasonable working hypothesis: 5.4 per cent.

29/ It may also be hoped that in occasional years, characterized by a greater increase of income in the export sector, the maximum limit of rate of increase will be raised. If this occurs, this rate may be assumed to be an average of maximum positions compatible with the average rate of increase of income of the external sector.

30/ In chapter III, approximately 4.7 per cent is accepted as a moderate hypothesis of the rate of annual growth of the capacity to import during the next decade. That hypothesis includes a projection of tourist income.

31/ In the two cases there is an implied assumption that an import substitution policy will be followed, for the reasons given in the introduction to this chapter.

V. EXTERNAL INSTABILITY

Chapter I showed the development of the share of imports in aggregate supply, and the analysis of the import function was further explored. While the product increased 79.5 per cent between 1946 and 1955, imports at constant prices grew by 64 per cent. The rate of annual growth of the former was 6 per cent, and of the latter, 5.1 per cent. From these data it can be seen clearly that there was a reduction in the share of imports in internal supply. To obtain this reduction, considerable exchange rate adjustments had to be made. Imports actually made are less than what would have been the import demand without the devaluations of the Mexican currency. Chapter I also attempted to determine the shape of the import function, excluding from the analysis those years most affected by devaluation.[32/] Line A of figure II-IV shows the shape of this function.

What are the possibilities of achieving external equilibrium with an average rate of growth product of 5.4 per cent annually? It has already been stated that the most probable rate of growth of the capacity to import, as explained in chapter III, is approximately 4.7 per cent.

Accepting the import function mentioned in the preceding section, the growth of import demand corresponding to a rate of product growth of 5.4 per cent would be 8.7 per cent.[33/] With the capacity to import increasing by 4.7 per cent and import demand increasing 8.7 per cent, the tendency to disequilibrium would of necessity be very strong.

Increasing the product by 5.4 per cent, its growth in ten years would be 69 per cent, while the increase in the capacity to import would reach 58 per cent (4.7 per cent annually). From a comparison of these data it may be seen that the import coefficient should decline nearly 7 per cent during the next decade, that is almost the same as that observed between 1945 and 1955. This

32/ See chapter I, section III, paragraph 2 (a).

33/ The regression equation is $\frac{\Delta M}{M} = 1.79 \frac{\Delta P}{P} - 1$ where M is imports and P the product.

/comparison, however,

comparison, however, has only a very limited application, since it is known that to obtain a small reduction of the import coefficient it was necessary to make extensive exchange rate adjustments in the recent past. To form an idea of the extent of the adjustment which would have to be made in the future, the growth of potential import demand must be compared with the capacity to import. Given the import function mentioned, the former would increase by 130 per cent in the decade, and the latter 58 per cent. In other words, in order to achieve equilibrium, it would be necessary to substitute nearly half the potential import demand.

There are other equally relevant factors to which attention should be drawn.

The import function used reflects the extent to which import demand depends on variations in the level of the product. There are, however, other factors which also affect the level of import demand. The most significant of these are the variations in the price levels of imported goods, as related to the domestic price level. If it is remembered that imports in the last ten years increased somewhat less than the product, although the income-elasticity of import demand is much higher than unity, the great importance of the price effect on import demand can be clearly seen.

To show the importance of that price effect, the experience of two typical devaluation years will be examined: 1949 and 1954. Starting from the import function, it is possible to determine the theoretical growth of imports in these two years assuming no change in relative prices. According to this hypothesis, imports should have increased 6.7 per cent in 1949 and 14.4 per cent in 1954. The fact is that there was a reduction of 10.2 per cent during the former year, and of 4.9 per cent in the latter. This is an indication of the magnitude of relative price variation effect. The extent of this change will now be examined.

If the import price index (in pesos) is compared with that of wholesale prices (domestic price level), it will be seen that relative import prices increased 28.6 per cent in 1949 and 24.4 per cent in 1954 (see table II-2). The decline in imports below the theoretical value, corresponding to a stable price situation, was 15.9 and 12 per cent in

/1949 and

1949 and 1954 respectively. Thus to obtain a reduction of 1 per cent in imports, relative prices had to be increased by 1.8 per cent in 1949 and 1.9 per cent in 1954.[34/]

Next, the situation in 1955, the base year of the projections will be examined. Comparing the position of relative prices in that year with the average of the years used to determine the shape of the import function - 1947, 1950-53, and 1955 - it is seen that, in 1955, the relative prices of imports were 13.8 per cent higher than that average. If it is remembered that the theoretical growth of imports in 1955 should have been 12.8, whilst in fact it was only 7.3 per cent, it may be deduced that the 13.8 per cent increase in the relative price level caused a reduction of only 4.9 per cent in import demand. From this fact it may be inferred that the change in the relative price level in relation to the previous year had a greater effect on import demand than had the change in that level with respect to the average price level used to determine the shape of the function. Thus, while a reduction of 1 per cent in import demand in 1949 and 1954 required an increase of 1.8 and 1.9 per cent respectively in relative prices compared to the preceding year, the data for 1955 show that a considerably greater increase in the relative price level was required compared to the preceding period. In fact, the required increase was 2.8 per cent in a year of strong development like 1955.

Assuming that the 1955 relative price level continues as a future average, and that the price-effect on the level of demand will be the same as in that year, the rate of growth of import demand would fall from 8.7 to 3.8 per cent.

34/ Since the increase of the product was greater in 1954 than in 1949, and income-elasticity of import demand seems to be greater at higher rates of product growth, the difference between the two values shown in the text is explainable.

/Table II-2

Table II-2

MEXICO: COMPARISON BETWEEN IMPORT AND WHOLESALE PRICE INDICES

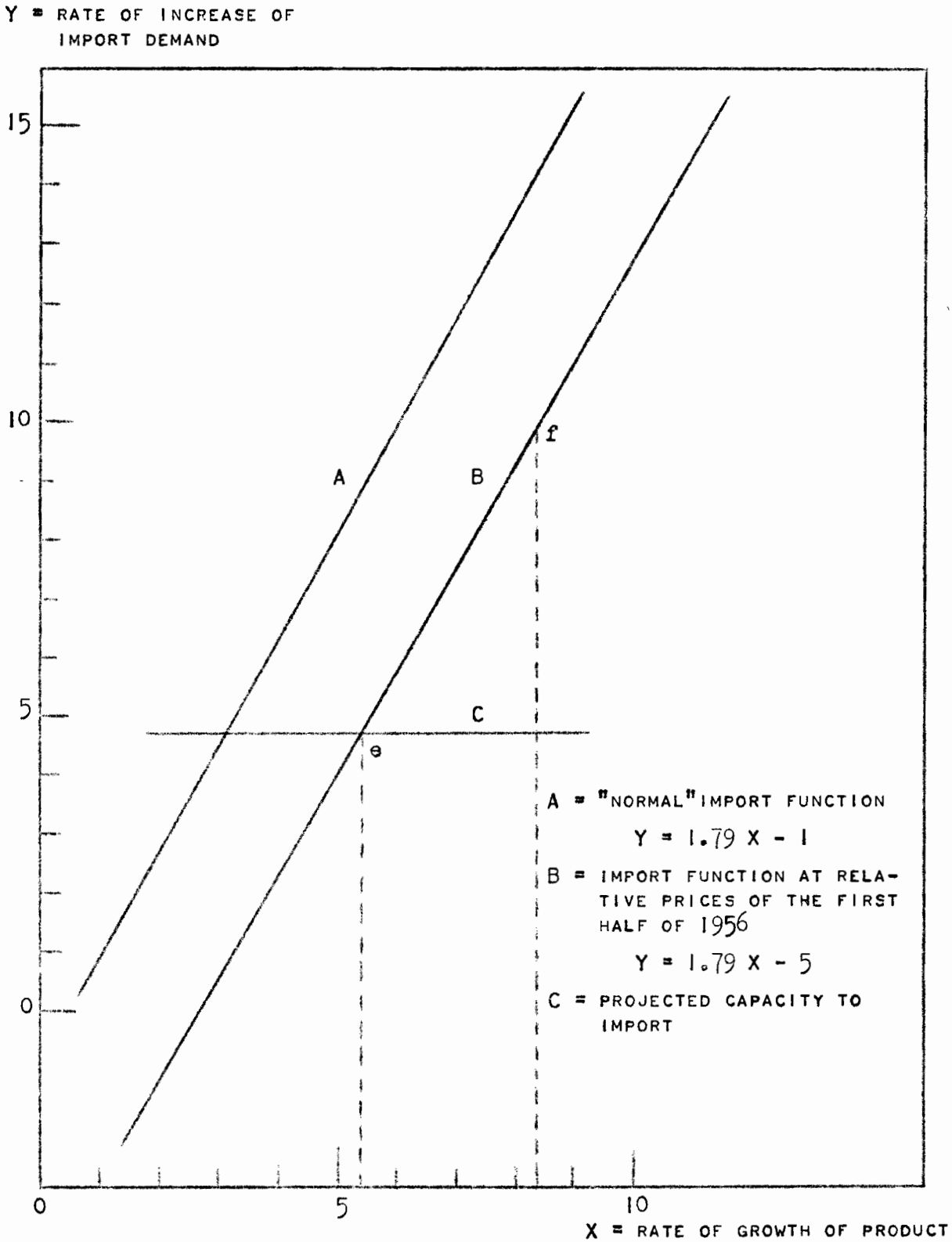
Year	Import price index	Wholesale price index	$\frac{100\ A}{B}$	Annual changes of C
	(A)	(B)	(C)	(D)
1945	41	67	62	
1946	48	79	61	-1.6
1947	56	81	70	+14.8
1948	66	85	77	+10.0
1949	89	90	99	+28.6
1950	100	100	100	+1.0
1951	112	121	93	-7.0
1952	109	133	82	-11.2
1953	107	136	78	-4.9
1954	144	148	97	+24.4
1955	166	168	99	+2.1

Source: ECLA, on the basis of official statistics.

/The 1955

FIGURE II - VI

MEXICO : IMPORT FUNCTION



The 1955 relative price levels, however, were exceeded in the first half of 1956, before the relative stability of the second half of the previous year was achieved. If it is accepted that the relative price level when that stability was achieved was 10 per cent higher than the average mentioned - assuming the same price-effect as in 1955 - the rate of growth of import demand corresponding to a product increase of 5.4 per cent would be 5.2. In that case, it would be even higher than the 4.7 per cent of the capacity to import. But it can be assumed that the price-effect would be proportionately greater if the average rate of product growth were lower than that observed in 1955. If, for example, the relation is reduced from 2.8 to 2.5, which is reasonable, the rate of growth of import demand would be 4.7 per cent, that is exactly the same as the capacity to import (see figure II-VI, point e).

The above remarks show that it is theoretically possible to achieve external equilibrium under the hypothesis that the product and the capacity to import increase at average rates of 5.4 and 4.7 per cent respectively, and always assuming that the relative price position observed at the beginning of 1956 remains stable. This possibility is strictly theoretical, since it rests on a static presentation of the problem. The effect of changes in relative prices is not permanent. It has already been shown in chapter I that the parity situation of the Mexican peso has declined in real terms during the past twenty years, through successive devaluations. If at a given relative price level lasting equilibrium were achieved between the capacity to import and import demand, the problem would be solved definitely. But the relative price levels required today to maintain the equilibrium will probably not be the same tomorrow, for the simple reason that the rising trend of the import coefficient is intrinsic to the dynamics of development in the present stage of Mexico's economy, as was shown in the general introduction to this study.

Furthermore, it should be remembered that Mexico's development, because of the variations in export income and the effect of various internal factors, does not proceed at a steady pace. The previous section showed that it is most probable that in the coming years the

/rate of

rate of growth will vary between roughly-defined limits. It has also been noted that the high points of these variations may be around a rate of 8.4 per cent. A rate of growth of this order requires an increase of imports of about 10 per cent, at 1956 relative prices, (see figure II-VI, point f). If the increase in the capacity to import is approximately 4.7 per cent, the resulting external disequilibrium will of necessity be great. From this example it can be seen clearly that the accumulated deficit in the balance of payments may become very considerable during the accelerated growth stages. Consequently, the more irregular the rate of growth, the more necessary will it be to supplement the import substitutions policy by short-term compensatory measures to protect the balance of payments.

VI. PRODUCT, CONSUMPTION AND INVESTMENT IN 1965

Based on the already formulated hypotheses and the defined structural relations, a projection was made of Mexico's product for 1965. The 5.4 per cent rate gives an accumulated growth of 69.2 per cent in ten years. Given the rate of growth of aggregate demand and the product-capital ratio of 1955 (0.51), it may be deduced that the average value of the product-capital ratio should be close to 0.50.[35]

The net investment rate required to achieve a product increase of 5.4 per cent - if 0.50 is the product-capital ratio - is 10.8 per cent. If the product-capital ratio is 0.50, assuming a capital depreciation rate of 3 per cent[36], replacement investment would be 6 per cent of the product. The gross investment rate would consequently be 16.8 per cent. If consumption is calculated as the difference between product and investment, the accumulated annual growth would be 63.2 per cent, corresponding to an annual rate of 5 per cent. Table II-3 gives the general data of the projection of product and consumption. These data are used as a working hypothesis in chapter IV below, where - given a hypothesis of the development of the capacity to import - structural adjustments required for this rate of growth are estimated.

35/ See footnote 9.
36/ Taking into account the broad renewal of domestic capital during the past decade, it was considered advisable to reduce the depreciation rate.

/Table II-3

Table II-3

MEXICO: PROJECTION OF PRODUCT AND CONSUMPTION a/

	1955	1965	Percentage growth	
	(Millions of pesos at 1950 prices)		Total	Annual
Product	58,817	99,518	69.2	5.4
Gross investment	8,068	16,719	107.2	7.6
Consumption	50,749	82,799	63.2	5.0

a/ Based on the hypotheses and assumptions given in the text

APPENDIX

$$\frac{\Delta S_p}{S_p} = 6.9 \text{ if } \frac{\Delta S_p}{S_p} = 0.47 \frac{\Delta Y_e}{Y_e} + 5.0 \text{ and } \frac{\Delta Y_e}{Y_e} = 4.0$$

If $\frac{\Delta I_p}{I_p} = \frac{\Delta S_p}{S_p}$, then $\frac{\Delta I_p}{I_p} = 6.9$.

In turn $\frac{\Delta (D - I)}{D - I} = 7.0$ when $\frac{\Delta I_p}{I_p} = 6.9$, given that

$$\frac{\Delta I_p}{I_p} = 2.92 \frac{\Delta (D - I)}{D - I} - 13.45.$$

Since the growth of C is equal to that of D - I less the growth of Y_e, the value of $\frac{\Delta C_p}{C_p}$ may be calculated by making $\frac{\Delta C_p}{C_p} = \frac{\Delta C}{C}$. In 1955, C_p = 48,282 million pesos and Y_e = 5,972 million pesos, both at 1950 prices. Assuming an increase of 7 per cent for the sum of these two values, since $\frac{\Delta Y_e}{Y_e} = 4.0$, $\frac{\Delta C_p}{C_p} = 7.4$.

Finally since $\frac{\Delta C_p}{C_p} = 0.46 \frac{\Delta (Y_e + G + I_p)}{Y_e + G + I_p} + 2.5$, when $\frac{\Delta C_p}{C_p} = 7.4$ then $\frac{\Delta (Y_e + G + I_p)}{Y_e + G + I_p} = 10.6$. In 1955, the values of Y_e, G and I_p were 5,972, 4,824 and 5,711 million pesos respectively. Since the increases of Y_e and I_p are already known, it is possible to calculate the increase of G, which would be 20.4 per cent. Given the increases of C_p, I_p, G and Y_e, the increases of the product and aggregate demand can also be calculated. Assuming that $Y_e = D_e$, then $\Delta P = \Delta C_p + \Delta I_p + \Delta G$, and $\Delta D = \Delta P + \Delta Y_e$.