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THE GROWTH OF THE MEXICAN ECONOMY

A Report from James G. Maddox

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Mexican economic activities were at boom proportions during 1955. The highlights of the year were summarized in the annual report of the Bank of Mexico. It pointed out:

1. That the gross national product for 1955 -- the total value of goods and services produced by the Mexican economy -- reached the all-time high of 84 billion pesos;
2. That the Federal Government ended the year with a surplus of 486.1 million pesos, of which almost one-half was used for debt reduction;
3. That the net reserves of gold, silver, and foreign exchange of the Bank of Mexico, on December 31, 1955, had a total value of US\$410 million -- almost double the figure of a year earlier;
4. That exports in 1955 were 23 per cent above the level for 1954; and
5. That agricultural production was up 10 per cent and industrial production 10.8 per cent as compared with 1954.

These figures are impressive. They leave no doubt that 1955 was a banner year. They take on much added significance, however, when it is realized that they simply reflect some of the latest developments in a prolonged period of unusually rapid growth in the Mexican economy. Mexico has had, of course, its ups and downs in its rate of economic development; 1955 was an unusually good year. But it was not an isolated phenomenon. There have been other good years -- many of them. Indeed, the whole period since 1940, from which date we have quite good data thanks to the excellent work of the Combined Mexican Working Party as published in The Economic Development of Mexico,¹ has been characterized by a rapid expansion of the Mexican economy.

It is with the period from 1940 to 1955 that this report

is primarily concerned. Its major objectives are: to review the rate of growth in the Mexican economy during this period; to compare the Mexican experiences with those of a few other countries; and to offer some tentative suggestions as to the major forces that have been responsible for the excellent record which Mexico has made. It is in every respect a general survey. It not only raises many more questions than it answers, but it should also serve as a guide to further study.

THE MEXICAN REVOLUTION

As a preliminary to centering attention on recent economic developments, it may be wise to remind ourselves that Mexico has been undergoing a profound social revolution since 1910. At that time, there was a sudden but sustained break with past traditions and forms of social organization. The Revolution -- always written with capitals T and R to set it off from the countless political uprisings that plagued Mexico for centuries -- is one of those relatively rare, complex social-political-economic movements that has brought fundamental changes into almost every nook and cranny of Mexican life, and continues to be one of the most potent political forces in contemporary Mexico.²

As I view The Revolution, at the end of its 45th year, I believe that its first 30 years -- the period from about 1910 to 1940 -- can correctly be characterized as "the period of reform." During this first generation of revolutionary activities, the air was filled with dreams of a better life, and these dreams were backed up by social action of a live and virulent kind, which often erupted into violence and bloodshed. The basic objective was to improve the lot of the common man. The main method of procedure was to replace a semifeudalistic, agricultural society, in which the few nonagricultural enterprises were mainly owned and controlled by foreigners, with the beginnings of a modern capitalistic system of production which would be predominantly under Mexican control. This meant that the focus of attack was on changing the institutional framework of society, rather than on building up the productive plant of the economy. The former was visualized as a necessary prerequisite to the latter.

Out of this "period of reform" came such important institutional changes as the following:

1. A nation-wide program of land reform, which broke up many of the large landholdings and forced others, often through a change of ownership, into more progressive patterns of management;
2. A publicly supported system of education, which has many different facets but which is putting major attention on primary education, and is now providing some sort of training for about one-half of the children between 6 and 14 years of age;

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3. The development of a powerful political party, through the control of which the government in power is able to name its successor, thus bringing stability and continuity into the political process;
4. The growth of a government-financed and government-controlled labor movement, which is not only an important adjunct to the political party but is also an aid to the government in many of its economic development programs;
5. The nationalization of the railroads and the petroleum industry;
6. The establishment of a central bank with powers to regulate the supply of money;
7. The assumption of responsibility by the Federal Government for constructing a national highway system, on which great progress has been made; and
8. The widespread use of the power of the State in many facets of national life.

From some points of view, these and related accomplishments virtually made a new country out of Mexico. Old problems, of course, remain, and evidences of a culture that was 4,000 to 5,000 years old at the time of the Spanish conquest are to be seen at every glance, not only in prehistoric ruins but in the physical and social characteristics of a goodly share of the Mexican population. Nevertheless, many of the inheritances of the past are in a new social, political, and economic setting, as a direct result of the institutional changes wrought by The Revolution. Many of the old problems will be worked out in an environment that was hardly dreamed of 50 years ago, when the country was under the domination of a few rich, landholding families while the mass of the population lived in abysmal ignorance, poverty, and peonage to creditors.

Along about 1940, a new emphasis became apparent in The Revolution. The pendulum appears to have swung away from institutional reform, and government policy has been more clearly concentrated on relatively orthodox ways of increasing the productive capacity of the economy. Less attention has been given in recent years to how the pie is sliced, and more emphasis is being put on producing a bigger pie. In some quarters this trend has been characterized as a "turn to the right," or a "selling out of the aims of The Revolution." More generally, however, it appears to be accepted as a constructive respite from the bitter strife of the past. Assuredly, the past few years have witnessed an almost phenomenal rate of growth in the Mexican economy, and if this can be continued into the future The Revolution may take on a cloak of an entirely different color from that which characterized its earlier years.

GROWTH IN NATIONAL PRODUCTION

The total output of a country is commonly measured from two points of view: (1) the sum of the value of the final products produced in the country; and (2) the sum of the costs incurred in producing these products. The first of these measures is commonly called "the gross national product"; the second is called "the national income." Gross national product represents the output of goods and services in terms of its market value. National income, on the other hand, is the aggregate earnings of labor and property that arise from current production. In Mexico, it is computed after deducting indirect business taxes and depreciation. Gross national product is, therefore, a larger figure than national income, and there is some reason to believe that in Mexico, where statistical services are not highly developed, it may be slightly more accurate than estimates of national income. Primarily for this reason, I have chosen the gross national product figures, published annually by the Bank of Mexico, as the best measure of the total output of the Mexican economy. Although their accuracy could no doubt be improved -- a problem which is receiving the constant attention of the Bank -- it is quite probable that the year-to-year changes in these estimates of gross national product provide reasonably reliable indications of the rate of growth of the Mexican economy.

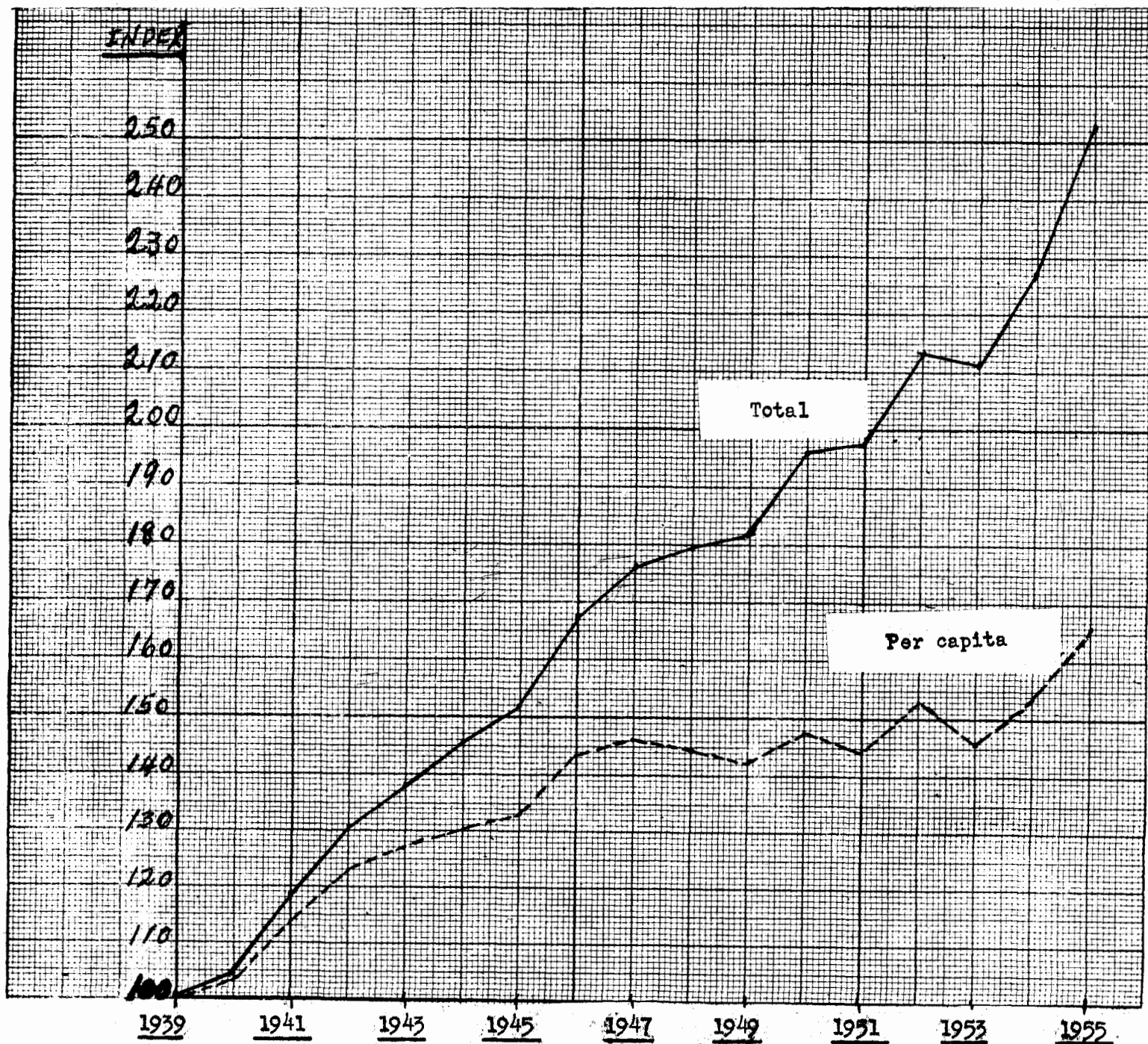
The estimates of gross national product for Mexico, from 1939 to 1955, are shown in Table A of the Appendix. When expressed in current prices they indicate the total value in pesos of the annual output of goods and services of the Mexican economy. When expressed in terms of constant prices -- as in the third column of Table A of the Appendix -- they provide an index of the physical volume of goods and services produced by the economy. The increase in gross national product in current prices was phenomenal, during the 17-year period under review. It was almost 12-1/2 times larger in 1955 than in 1939. This, however, was due mainly to a rapid rise in the general level of prices. For this reason the rate of change in the physical volume of production, which has been calculated by dividing the annual gross product figures by the index of wholesale prices of 210 commodities in Mexico City, gives a much better indication of the growth of the economy.³

That the physical volume of production has also grown at a rapid rate is attested by a simple comparison between the 1939 and 1955 figures shown in Table A. The latter at 17,220 million pesos was more than 2-1/2 times the former. In other words, these data indicate that the volume of goods and services produced by the Mexican economy increased by more than 2-1/2 times during the 17 years between 1939 and 1955. The rate of growth averaged about 6 per cent per year for the entire period. At the same time, however, population was increasing rapidly, and when this is taken into account it is apparent that output per capita increased at a much lower rate (see Chart I). Indeed, the widening gap between total output and per-capita output, as shown in Chart I, points up one of the major problems with which Mexico is faced -- that of a

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CHART I

Indexes of total and per-capita Gross National Product
in Mexico: adjusted for price changes
(1939 equals 100)



rapidly increasing population. The Mexican rate of population growth has been close to 3 per cent per year since the middle 1940's. This is one of the highest rates to be found among any of the major countries of the world. If the output of the economy had done no more than keep pace with population, Mexico would still have been quite a bustling country. But obviously the results were better than this. Per-capita output rose at a quite rapid rate from 1939 until the end of the war; at a much more modest rate from 1946 to 1951; and at a varying but significant rate after 1951.

The year-to-year changes are shown in Chart I (based on Table B of the Appendix), and the summary by periods is as follows:

	<u>1939-1945</u>	<u>1946-1950</u>	<u>1951-1955</u>
1. <u>Gross National Product</u> <u>Adjusted for Price Changes</u>			
A. Average per year in millions of pesos	8,640	12,254	15,008
B. Average percentage increase per year during period	7.1	5.3	5.3
2. <u>Estimated Population</u>			
A. Average per year in thousands	20,714	24,194	28,072
B. Average percentage increase per year during period	2.29	3.02	2.82
3. <u>Gross National Product</u> <u>Per Capita</u>			
A. Average per year in pesos	415	506	534
B. Average percentage increase per year during period	4.8	2.2	2.4

These data showing the growth of the Mexican economy become more meaningful when we compare them with what has happened in a few other countries. Because of differences in the general level of prices, variations in the quality and type of products and services produced, and divergencies in the degree of modernization or technology among countries, it is virtually useless to try to make international comparisons of the physical volume of production per capita. Yet it is possible to compare rates of growth among different countries without running into serious difficulties. To do this we temporarily forget how the level of output per capita in Mexico compares with that in other countries, and ask ourselves instead: how does the rate of change in production

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per capita compare with that of other countries? Thus we are not asking: do the people of Mexico have as much per capita on which to live as do the people of the United States, Argentina, or some other country? We are asking instead: regardless of the comparative amounts available, is Mexico increasing its output as rapidly as other countries? The answer to this question can be given in a straightforward and reasonably accurate manner. The data in Table 1 -- they have been plotted in Chart II -- gives the answer for Mexico as compared with Argentina, Brazil, Colombia, and the United States.⁴

The interesting and important point brought out by the data in Table 1 and Chart II is that the rate of growth in the Mexican economy has far outstripped that of Argentina, Brazil, and Colombia, and in certain periods, particularly in the immediate postwar years and again since 1953, Mexico has been expanding production per capita more rapidly than the United States. This does not mean, of course, that the average Mexican is living at a higher level than the people of these other countries. Argentina, Colombia, and the United States clearly have a higher output of goods and services per capita than Mexico. The average Brazilian may have about the same, or a little less than the average Mexican. It does mean, however, that the Mexicans for quite a number of years have been improving their level of living at a more rapid rate than has been the case in the other three Latin American countries, and in some years they have made greater progress than have the people of the United States.

It seems clear that Argentina, Brazil, and Colombia did not benefit immediately from the boom of the war years, as was the case with Mexico and the United States. Indeed, the wartime shortages of capital goods for export from the United States and Western Europe to these countries, coupled with the elimination of a large part of the European market for coffee, wheat, beef, and a few other commodities, probably account in large part for the fact that Argentina, Brazil, and Colombia made almost no economic progress until the end of the war. Since 1945, however, both Brazil and Colombia have made rapid progress -- considerably more rapid than either Mexico or the United States. They have not yet, however, recovered completely from the handicaps of the war years. Argentina enjoyed an unusually rapid rate of growth for three years following the end of the war, but then, through a combination of drought and erroneous government policies, her output per capita declined until 1953 when it was at a point about where it was nine years earlier. It was Mexico alone among the four large Latin American countries -- these four countries account for about 70 per cent of the total population of Latin America -- which increased output per capita rapidly, and almost continuously, from the beginning of the war until the present time.⁵

Not only is this an enviable record of which the Mexicans can be justifiably proud, but also it arouses our curiosity as to how it was done, and whether it has been built on a solid foundation that is likely to provide a base for still further expansion in the future. Although we may fall short of getting a neat and definitive answer to these questions, one step along the route is to find the

TABLE 1

Indexes of Physical Volume of Production Per Capita (Gross National Product in Constant Prices) in Argentina, Brazil, Colombia, Mexico, and the United States*

(1939=100)

Year	Argentina	Brazil	Colombia	Mexico	United States
1939	100.0	100.0	100.0	100.0	100.0
1940	99.0	98.1	100.0	103.1	108.0
1941	101.9	100.6	99.6	113.4	123.5
1942	102.0	95.2	97.5	122.4	137.8
1943	100.2	95.5	95.8	126.8	151.3
1944	110.0	97.9	100.0	130.4	161.1
1945	104.1	102.3	102.5	132.3	156.3
1946	115.4	109.7	110.0	142.9	137.5
1947	130.0	115.7	111.7	145.7	133.9
1948	132.9	119.5	112.3	144.4	138.3
1949	123.4	119.9	119.5	142.2	134.6
1950	119.1	125.6	118.2	147.5	145.1
1951	119.6	131.2	122.5	144.3	152.4
1952	108.5	133.5	128.2	152.3	155.3
1953	112.1	135.9	135.6	145.9	159.6
1954	115.3	144.4	144.5	153.2	153.8
1955	---	---	---	165.5	160.3

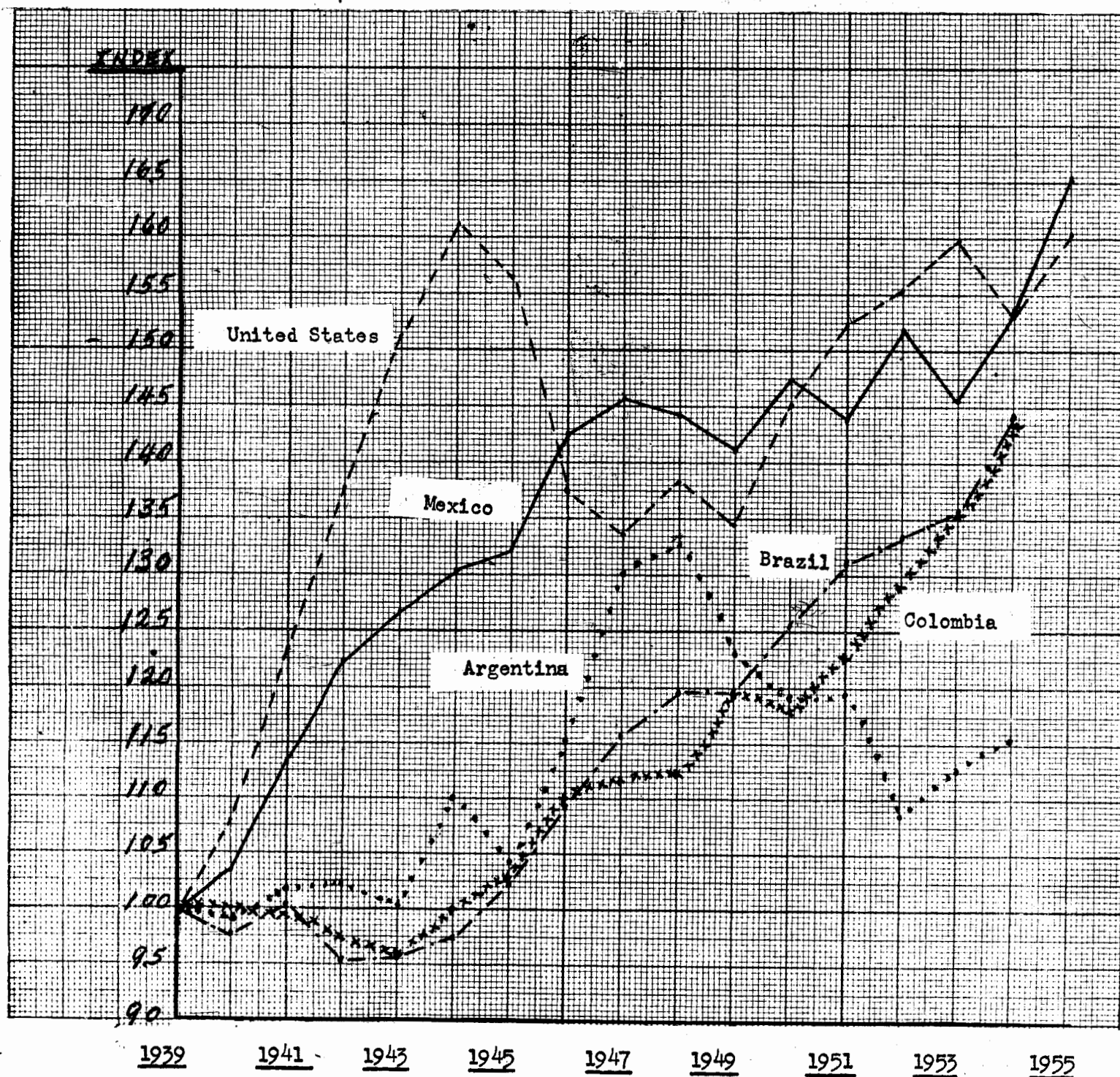
*Calculated from the data in Table D of the Appendix. The slight differences in the figures for Mexico from those shown in Table B of the Appendix arose from rounding the calculations in Table C where the output of the Mexican economy was expressed in 1950 prices instead of in 1939 prices as in Table B.

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CHART II

Indexes of the physical volume of production per capita
in Argentina, Brazil, Colombia, Mexico, and the
United States, 1939 - 1955

(1939 equals 100)



answer to the question: in what sectors of the Mexican economy did the most rapid rate of growth take place? Was it in mining, manufacturing, agriculture, commerce, or some other activity? When you pose this question to intellectual Mexicans who are interested and informed about economic conditions in their country, a large proportion of them will suggest that it has been the growth of the manufacturing industry that accounts for the lion's share of the expansion in the economic system. This is also the most common answer given by those United States businessmen who are living and managing businesses in Mexico. Yet, strangely enough, when we examine the best data available on this point we fail to find a verification of these opinions.

The Combined Mexican Working Party, in its report to the International Bank for Reconstruction and Development to which reference has already been made, estimated the value of the net product produced in Mexican territory, or what it called "net domestic product," by major economic activities for each of the years from 1939 to 1950. The Department of Economic Studies of the Bank of Mexico has supplied me with similar estimates for the years 1951 through 1954.⁶ An arrangement of these data by periods is presented in Table 2. They indicate that all sectors of the Mexican economy expanded at remarkably even rates, during the 1939-54 period. The output of manufacturing, for instance -- the activity to which most observers point as having grown most rapidly -- accounted for 17.6 per cent of the total net domestic product in the 1939-45 period, 18.2 per cent of the total during the 1946-50 period, but declined to 16.1 per cent for the four years 1951-54 (see Table 2). These differences are so minor that they could easily be accounted for by errors of estimation. About the only clear trend that one can find in the data in Table 2 is a decrease in the relative importance of mining in the total economy. This incidentally is borne out by opinions among people familiar with the mining industry, and by amendments to the tax laws a few months ago which were aimed explicitly at giving the mine operators a better break than they have had heretofore. Agricultural output appears to have held its own quite well, although one might reasonably have expected it to decrease in relative importance as the economy grows and develops. Its output was a slightly lower percentage of the total in the five immediate postwar years than earlier, but it snapped back again in the 1951-54 period to account for 19.8 per cent of total domestic product, which was about the same proportion as it represented in the 1939-45 period.

When one examines more or less similar data for Argentina, Brazil, and Colombia, he finds a different picture. There was a tendency for Argentina's agriculture to decline in relative importance and for "general services" to make up an increasing proportion of gross product, while manufacturing, mining, and construction did not change greatly, during the decade of the 1940's and the first half of 1950. In Colombia, between 1945 and 1953, there were clear and significant increases in the proportion of total gross product represented by manufacturing, construction, and transportation and public utilities, while the relative importance of

TABLE 2

Value of the Net Product Produced in Mexican Territory by Economic Activities*

(Amounts in millions of pesos at current prices)

Activity	Seven-year period 1939-45		Five-year period 1946-50		Four-year period 1951-54	
	Annual Average	Per Cent	Annual Average	Per Cent	Annual Average	Per Cent
Commerce	2,994.5	28.0	9,531.6	31.9	16,935.1	29.1
Agriculture	2,126.7	19.9	5,536.2	18.5	11,519.4	19.8
Manufacturing	1,880.4	17.6	5,423.9	18.2	9,360.9	16.1
Mining	322.1	3.0	772.6	2.6	1,438.8	2.5
Construction	207.5	1.9	575.1	1.9	1,040.4	1.8
Petroleum	154.9	1.4	455.4	1.5	826.7	1.4
Electric power	54.5	0.5	142.8	0.5	293.4	0.5
All others	2,967.1	27.7	7,417.1	24.9	16,800.7	28.8
Total	10,707.7	100.0	29,854.6	100.0	58,215.3	100.0

*Data for the years 1939-50 are from Table 2 of The Economic Development of Mexico, The Johns Hopkins Press, Baltimore, 1953. For the years 1951-54 the data are from the Department of Economic Studies of the Bank of Mexico.

agriculture declined. In Brazil, industry and transportation grew much more rapidly than other sectors of the economy, from 1940 to 1953.⁷

That all sectors of the Mexican economy appear to have grown during the past 15 years at more uniform rates than was the case in the other large Latin American countries, that agriculture in particular did not decline relative to industry and commerce, and that informed opinion usually points to industry as being the most rapid growing point in the economy are factors that tend to cast doubt on the accuracy of the data in Table 2. Moreover, the estimates of output by sectors of the economy are not viewed by the statisticians of the Bank of Mexico as being as accurate as their estimates of total gross product. No doubt, the accuracy of the data could be improved. Nevertheless, I am somewhat loath to believe that they present a distorted, or highly erroneous, picture. In other words, I suspect that the major sectors of the Mexican economy did grow at relatively uniform rates during the past decade and a half. There are, at least, four reasons for accepting this point of view. First, the statisticians who made the estimates are qualified technicians. Second, the opinions of even well-informed people can be quite biased with respect to this problem because of the inordinate amount of publicity given to the growth of industry. The inauguration of a new factory or even the visit of an important industrialist from the United States or Europe attracts wide publicity in Mexico City newspapers. Third, the Mexican government has been unusually active in promoting economic development during the past two decades, and the ruling political party in Mexico is an amalgam of pressure groups, several of which are organized along broad occupational lines. There is a constant tug of war among the leaders of these groups, each of whom strives to see that his contingent gets a "fair share" of government aid. The political process, in other words, tends to funnel government assistance into all sectors of the economy. This is the practical political expression of the idea of "balanced economic growth," a term widely used by economists to refer to something quite different -- namely, a general (and desirable) tendency for the factors of production to be so distributed among the many different types of activities as to earn equal marginal rates of return. Fourth, agriculture, the one major segment of the economy which might reasonably have been expected to decline in relative importance, has been quite profitable during most of the past 17 years, and has received a tremendous amount of government assistance in the form of new capital for irrigation developments, machinery, and fertilizer, as well as important stimuli to farmers to improve technology through the adoption of better varieties of seeds, improved livestock, and more modern cultural practices.

Even though industry may not have grown in relative importance as rapidly as many people seem to think, there is, nevertheless, abundant evidence that Mexico is rapidly building the basic foundations of an industrial society. When one examines the growth of such industries as iron and steel, electrical power, cement, and petroleum, all of which are basic to the development

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of an industrial economy, he finds that they have expanded rapidly in Mexico during the past decade and a half. The general picture with respect to these industries is summarized in Table 3, and little discussion is necessary to show the rapidity with which they have grown. The capacity to produce pig iron increased more than 400 per cent between 1940 and 1954; the output of iron and steel grew in about the same proportion. Electrical generating capacity increased almost 300 per cent, and the capacity to produce cement expanded over 4-1/2 times. The production of crude oil more than doubled between 1940 and 1955, and this rate was surpassed in the production of products derived from petroleum. Generally, these "heavy industries" require large accumulations of capital, and the fact that they are expanding rapidly is an indication that Mexico is not content to center its emphasis solely on the expansion of "consumer goods," such as textiles, processed food, and leather products -- areas in which the early phases of industrialization are usually most rapid in underdeveloped countries.

It is also important to note that Mexico has significantly expanded her transportation system, particularly in the field of highway construction. The kilometers of Federal and State roads in the country for four periods in the recent past were as follows:

<u>Type</u>	<u>1940</u>	<u>1945</u>	<u>1950</u>	<u>1954</u>
Graded	1,643	2,399	1,865	2,465
Coated	3,505	6,842	5,972	6,393
Paved	<u>4,781</u>	<u>8,163</u>	<u>13,585</u>	<u>17,494</u>
TOTAL	9,929	17,404	21,422	26,352

Perhaps as important as the increase in total kilometers shown by these data is the fact that it is the paved roads which have been expanded most rapidly. Truck and automobile transportation has grown by leaps and bounds, partly because the Mexican railroad system has been one of the laggards in the country's rapid rate of economic expansion. The total mileage of railroads has not increased during the past 15 years, although there have been improvements in rolling stock and roadbeds, particularly since 1945; and an index of freight and passenger traffic, computed by the Department of Economic Investigations of Nacional Financiera, S.A., rose from 307 in 1944 to 359 in 1954. Although considerable capital has been poured into the nationalized railway system during the past few years, and evidences of increased efficiency in administration may be becoming slowly apparent, it is truck transportation which has been most important in keeping pace with Mexico's growing industry. The number of registered trucks, for instance, increased from just over 50,000 in 1941 to almost 180,000 in 1953. When one compares Mexico's highway system -- the extent and general condition of roads -- with that of the United States, it is, of course, greatly inferior. On the other hand, when compared with other Latin American countries it is quite good. Moreover, large amounts of public

TABLE 3

Rates of Growth in Selected Areas of Mexican Industry*

(Index:1940=100)

Item	1940	1945	1950	1955
1. Capacity of pig iron production (tons)	109,500	423,400	423,400	478,280**
Index	100	387	387	437
2. Production of pig iron (tons)	92,140	210,429	227,432	320,000
Index	100	228	247	347
3. Production of steel (tons)	149,414	229,993	390,356	670,000
Index	100	154	261	448
4. Electrical generating capacity (thousands of kw.)	681	720	1,235	1,949
Index	100	106	181	286
5. Electrical power generated (millions of kw-hr)	2,529	3,068	4,423	6,962
Index	100	121	175	275
6. Capacity of cement production (thousands of tons)	679	1,150	1,974	3,067**
Index	100	169	291	452
7. Cement production (thousands of tons)	485	808	1,388	2,086
Index	100	167	286	430
8. Production of crude oil (millions of barrels)	44.4	43.9	73.9	89.7
Index	100	99	166	202
9. Production of petroleum derivatives (millions of barrels)	32.1	39.2	55.9	84.7
Index	100	122	174	264

* Data from Nacional Financiera, S.A.

**Data for 1954.

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funds are being put into the improvement of transportation facilities. A recent government pronouncement indicated that, within the next two years, there will be 8,000 more kilometers of road than at present, much of which is already under construction. Although results rarely measure up to plans and prognostications, there can be little doubt that there is a strong and continuing drive to expand the highway system.

Perhaps it would be well at this point to summarize the major findings of our study of Mexican economic growth during the period since 1939. They can be grouped into the three following statements:

1. The Mexican economy has grown at a quite rapid rate -- a rate which surpasses that of the other large Latin American countries and compares favorably with the rate of growth in the United States;
2. The rapid growth which Mexico has experienced appears to have been rather evenly distributed throughout all sectors of the economy; and
3. There is good evidence that Mexico is building the foundations for an industrial society, in that considerable emphasis is being placed on the development of heavy industries and an improved system of transportation.

It might also be worth pointing out that we have measured growth in terms of increases in per-capita output. This comes about as near to identifying "economic growth" with "material progress" as can be done statistically for the country as a whole. In other words, not only has the Mexican economy grown at a rapid rate, but also the Mexican people have made rapid material progress. There yet remains for discussion the problem as to how this increased output was in fact shared by the different groups and classes in society, but our calculations indicate that had it been distributed equally the "average" Mexican would have had about 66 per cent more goods and services at his disposal in 1955 than he had in 1939. This is progress!

TOWARD AN EXPLANATION

The interesting and important question is: how did the Mexicans do it? If we could get the answer to this question, we might have, at least, an indication as to what other countries could do to step up their rates of economic growth. This problem is of such complexity that it deserves much more study than I have yet been able to give it. Only a few tentative points can be made, at this time.

The first of these, a quite simple point, is that Mexico's rapid progress during the past several years did not arise from the

discovery of some heretofore unknown or unutilized store of natural resources. The Mexican case is entirely different from that of Venezuela, for instance. In the latter country, outside capital and technical knowledge have made available large pools of oil and, more recently, mountains of iron ore, which are being sold abroad for dollars and a few other currencies that in turn are being used to expand rapidly the internal economy of Venezuela. In other words, the necessary capital for economic growth and the funds with which to purchase needed technical knowledge are coming from newly discovered or newly utilized natural resources which have been brought into production by capital and technical knowledge from outside of Venezuela. We can be quite sure, in contrast, that the fountainhead or mainspring of the rapid progress which Mexico has enjoyed for the past several years did not come from sudden accretions to her utilizable supply of natural resources. This, of course, is not to deny that new land has been brought into cultivation, that new oil and gas fields have been discovered, and that increased quantities of fish are being taken from coastal water. The Mexican resource base has been expanded during the past decade and a half. This required capital and technical knowledge, most of which was generated by the Mexican economy out of current production. The output from these new resources has not been large enough, in relation to the capital that was used up in bringing them into productive use, to leave a great surplus for expanding other parts of the economy. Indeed, the total output from such "new" natural resources has been quite small in relation to total production. To put the matter quite simply: most, if not quite all, of the 2-1/2-fold increase in output of the Mexican economy, which occurred between 1939 and 1953, came from the natural-resource base that was known and being utilized, in one form or another, at the beginning of the period.

The increased output, therefore, must have arisen either (1) from an increase in the total amount of land, labor, and capital being utilized by the economy -- that is, by an increase in total inputs; or (2) from a given amount of these inputs being able to turn out an increased output. The latter result indicates an improvement in productive efficiency, and could arise from two main sources. First, the managers of business firms, farms, and other types of organizations, both public and private, could change the proportions of land, labor, and capital which they use in their particular operations, and through such changes obtain a greater output from the same total amount of inputs. A simple illustration of this way of increasing efficiency is the substitution of machinery for labor with the result that output is increased while the total input of both labor and capital remains the same or is decreased. Second, the quality of the input factors -- land, labor, and capital -- can be improved so that a given unit of either of them will turn out an increased output. This type of increased efficiency is illustrated by hybrid seed corn. Essentially the same quantities of hybrid and open-pollinated seed are used to plant an acre of land, but the planting of a good, well-adapted hybrid will oftentimes increase yields per acre by as much as 10 to 20 per cent over that of open-pollinated varieties. The

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same kind of result is obtained by improving the health or the skill of workers so that each manhour of labor is more productive than formerly.

Increased efficiency of the first type (that which pertains to improvements in the manner in which the factors of production are combined) is likely to result mainly from improved knowledge in management and administration on the part of the people who direct both private and public organizations. An increase in efficiency of the second type (that which arises from improvements in the quality of the factors of production) may result from new scientific knowledge such as that gained from research work to develop hybrid seed corn, an electronic calculating machine, or a new drug, or it may come from such mundane activities as popular education and programs of public health which improve the skills and strength of the laboring people. It can also arise from purely social and political changes which increase the incentives of large groups in the population.

In the case of Mexico, the increased output of the economy has arisen both from increased inputs of land, labor, and capital, and from increased efficiency in the utilization of these factors of production. In other words, total inputs have increased and the output per unit of input, or efficiency, has also increased. Moreover, the increases in efficiency have, no doubt, been of the two types just described. It would be desirable, if it were possible, to separate the impact of the two sets of forces. Was most of the gain simply due to an increase in the number of workers, to bringing more land into cultivation, and to the accumulation of more and more capital, or did it arise from a given quantity of land, labor, and capital turning out an increased product? The difference is significant, because the answer would not only focus attention along different lines of inquiry in any attempt to make a thoroughly comprehensive analysis of Mexico's progress, but it could also throw light on the courses of action that should be followed in the future both by Mexico and other underdeveloped countries. If, for instance, the growth in the economy has been due primarily to bringing more land into cultivation, to a larger labor force, and to increased supplies of capital, the major question of inquiry would be: where did these increased supplies of land, labor, and capital come from? The policymaker would be mainly interested in: how they can be increased in the future? On the other hand, if increased efficiency in the utilization of the available factors of production has been of major significance in explaining the increased output of the economy, we need to study the forces and influence that have tended to improve the quality of human beings as agents of production and to learn how new techniques have improved the state of the productive arts. The policymaker would be interested in lines of action that improve the quality, not the quantity, of the labor force, and in ways and means of encouraging the growth of improved technologies.

Theoretically, it should be possible to separate the effect of

increased inputs of land, labor, and capital from increased efficiency in the use of these factors, and thus arrive at a judgment as to which has been most important in explaining the growth of total output. The problem is essentially that of finding the amounts of the factors of production -- land, labor, and capital -- that have been utilized by the economy, over a period of years, so that they can be combined into one index of total inputs. If we could construct such a "total input index," we could then compare its rate of change over the past several years with the rate of change in total output. If the latter increased more rapidly than the former, the difference would be a measure of the increase in efficiency. After having spent considerable time on the problem of constructing an index of total inputs, I have concluded that the task, though not impossible, cannot be done in an acceptable form with the data now available, and that even to do it in a poor manner will take more time and resources than I can possibly devote to it. The major stumbling block is the lack of an accurate annual measure of the amount of capital used up by the economy in processes of production. I hope to interest some of the Mexican economists in this general problem. It is possible, therefore, that at a later date a reliable answer may be available. In the meantime, we can get some shadowy glimpses of what the answer may be when, and if, the proper research is completed.

For instance we have the work of Clarence A. Moore, with respect to the agricultural sector of the economy, which throws some light on the problem.⁸ The central question of Moore's study was: "How much of the increase in agricultural production in Mexico is to be explained by the use of additional resources, and how much of it has come from improvements in the state of the productive arts?" This is precisely the question which needs to be answered for the economy as a whole, but Moore's study pertains only to agriculture. He found that the annual average production of crops in Mexico was about 60-per-cent greater in the period 1945 to 1949 than it was 20 years earlier, that is, during the 1925 to 1929 period. In contrast to this 60-per-cent increase in the output of crops, the amount of cropland harvested rose only about 23 per cent and the amount of labor utilized in agriculture increased by only about 16 per cent. In other words, output rose much more rapidly than did the inputs of either land or labor. On the other hand, the amounts of capital equipment and supplies used in agricultural production increased more than 300 per cent. Moore combined the inputs of land, labor, and capital into one "total input" index, and compared its rate of change with the 60-per-cent increase in output. He reached the conclusion that "the greater quantity of [total] inputs in 1945-49 accounts for 26 per cent of the 60-per-cent greater agricultural output. The remaining 34-per-cent increase in output is attributed to better techniques that improved the productiveness of the resources in the aggregate."

Although Moore's findings are rather heavily dependent on some "heroic" assumptions with respect to the amount of capital utilized in agricultural production during the 25-year period which he studied, they are not unreasonable. There can be little doubt

that efficiency in agriculture has increased. There needs to be much more research, with better data than are now available, before we conclude too firmly that improved efficiency accounted for 34 per cent of the increased agricultural output in Mexico between the 1920's and the 1940's, but until such research results are available we can safely conclude from Moore's calculations that increased output is not solely a matter of increasing the land, labor, and capital utilized in agriculture. Better knowledge on the part of farmers in the methods of utilizing these inputs, and steps for improving their quality both through the education of agricultural people and by research to develop better machinery, fertilizers, insecticides, and similar types of capital used by farmers, can pay large dividends in increased output. Apparently, they have paid such dividends in Mexico.

If we turn our attention to the total Mexican economy -- not to just the agricultural sector as in the preceding paragraphs -- we also have some information which throws at least a faint light on the relative effects of increased total inputs versus increased efficiency in accounting for the rapid growth of output. According to estimates of the Economic Commission for Latin America, a United Nations agency, the output per worker for the Mexican economy as a whole increased almost 12-1/2 per cent between 1945 and 1952 (Table 5).⁹ The number of workers increased, but total output increased more rapidly. Data from The Economic Development of Mexico indicate that agricultural output per hectare of harvested land may have increased 30 to 35 per cent during the 1940's. Since land is a relatively minor input in nonagricultural activities, we can safely conclude that total output increased considerably more rapidly than did the combined inputs of land and labor. Unfortunately we don't know the annual inputs of capital. We do have, however, as shown in Table 5, estimates of the capital stock available for use in the Mexican economy. These estimates are not considered highly reliable, and they do not take account of changes in inventories. However, it may be of some significance that the total amount of capital per unit of output, as shown by the output-capital ratio, did not change much during the period from 1945 to 1952 (Table 5). In other words, the total amount of capital increased at about the same rate as the total output of goods and services.

If output increased more rapidly than the inputs of land and labor, we are safe in saying that the gain in output was due to increases in efficiency or to greater inputs of capital. Since the stock of capital does not appear to have changed greatly in recent years in relation to output, there is a strong presumption that a substantial part of the increases in total output arose from greater national efficiency in production. Surely increased capital and greater efficiency are the two important factors for further study. Moreover, these two things are closely related. Increased efficiency arises in part from better entrepreneurial knowledge in the technical aspects of production, in the management of individual enterprises, and in the private administration of resources. It also arises, in part, from greater knowledge,

TABLE 5

Total Output in Relation to Amount of Capital and Number of
Active Workers in the Mexican Economy*

(Pesos at 1950 prices)

Year	Output** (1)	Capital*** (2)	Output- Capital ratio# (3)	Output per Worker## (4)
1945	32.3	58.5	0.55	4,681
1946	34.5	61.4	0.56	4,859
1947	35.4	65.0	0.54	4,849
1948	37.1	68.8	0.54	4,882
1949	38.9	73.0	0.53	4,924
1950	43.2	77.3	0.56	5,268
1951	45.1	83.8	0.54	5,306
1952	45.8	89.6	0.51	5,264

* From Table 55 of Economic Survey of Latin America 1951-52, Economic Commission of Latin America, United Nations.

** In thousands of million pesos.

***In thousands of million pesos.

Column (1) divided by column (2).

Column (1) divided by estimates of the economically
active population. Expressed in pesos.

improved physical strength, and increased incentives among workers. No small part of it may also be due to improvements in public administration, which result in such things as better systems of transportation and communication, and political and social changes which give workers greater incentives. Moreover, it must not be overlooked that educational and research institutions which lie back of the improvements in the knowledge of entrepreneurs and workers can play an important part in increasing national efficiency.

To strengthen most of these forces tending toward greater efficiency requires the investment of new capital, not only in the plant and equipment of individual business firms and farms, but also in schools, roads, health services, and ways of increasing communication. Even such relatively simple and clear-cut technological advances as a farmer planting improved varieties of seeds and using chemical fertilizers and insecticides involve some expenditure of capital. The use of a few ponds of the proper chemicals to kill insect pests, for instance, can sometimes bring about a very great increase in crop yields, the value of which will be many times the cost of the chemicals. Nevertheless, if the farmer doesn't have the working capital with which to buy the chemicals, he can't take advantage of the productive power that is indirectly built into them. Many technological improvements in industry and transportation require heavy new investments in equipment, which sometimes make existing supplies of capital obsolete and of little value. Thus, the rate at which new capital becomes available can have an important influence not only on the total capital stock but also on the rate at which new knowledge is put to work. Although not much more can be said at the present time about the extent to which increased national efficiency has contributed to Mexico's economic progress, the manner in which new capital has been formed in Mexico and the uses to which it has been put can be studied and are worthy of attention.

Two points about capital formation in Mexico are important: first, the proportion of the total output of the Mexican economy which is saved and invested in capital goods is high, relative to the average level of income in the country; second, the government has exercised a strong influence on capital formation, not only as a direct investor of capital but also in promulgating fiscal and monetary policies which have had an important bearing on the amount of funds available for private investment.

The Combined Mexican Working Party estimated, for instance, that gross investment rose from 9.7 per cent of the gross national product in 1939 to 14.4 per cent ten years later.¹⁰ It then declined slightly in 1950, but rose again to 12.8 per cent in 1952 and to 14.2 per cent in 1954. When one considers that the average per-capita income in Mexico during the last year or two has been roughly equal to about US\$200, this represents a high willingness to save. Poor people usually spend most of their money for current consumption. In the United States, where the average per-capita income is 8 to 10 times as high as in Mexico, gross investment in

recent years has been running at only 13 to 14 per cent of gross national product. The rate of investment in Mexico is among the highest in Latin America, though it may be exceeded by a few countries, such as Brazil and Colombia.

If one compares the per-capita rates of growth in gross product, consumption, and investment, the picture is even more dramatic than that suggested by the preceding figures. For instance, during the period from 1945 to 1952, the annual per-capita rate of growth in the gross product of the Mexican economy was 2.4 per cent. The growth in per-capita consumption during this period averaged only 1.6 per cent per year, whereas per-capita investment rose by 8.1 per cent annually.¹¹ Clearly, the Mexican people have not been "living up" their increased production. They have saved a large proportion of it, and plowed it back into production goods that expand the capacity of the economy to produce.

What lies back of this high rate of investment? Is the average Mexican willing to deny himself the pleasures of current consumption, in order to put away a "nest egg" for the future, to a greater extent than are the citizens of many other countries? The answer appears mainly in the negative. Production increased so rapidly during the early 1940's, and again in the past two years, that consumption patterns may have lagged, with the result that many people saved an unusually large proportion of their incomes. In general, however, the high rate of investment appears to be mainly the result of deliberate government policy. This policy has had two aspects: first, there has been government action, mainly in the monetary and fiscal fields, aimed at increasing private savings and investments; second, the government itself has been an important investor.

The principal method for encouraging private investments has been a deliberate policy of inflation which has squeezed the real incomes of the lower economic classes while it raised the income of the rich and relatively well-to-do groups. It is from the latter that the bulk of the savings usually arises. Thus, the government policy of inflation raised the incomes of the people who ordinarily save a significant proportion of their income -- namely, the higher income groups -- much more rapidly than it raised the incomes of the low income groups. The result was a relatively high rate of savings and investment for the total economy. To put the matter bluntly: the poor guy has been taking it in the neck because the prices of the things he buys have been rising more rapidly than his income, while the rich guy has been making a lot of dough and saving about the same percentage of it as he did before his income rose, with the result that a high percentage of total production has been saved and invested.

Let's allow the Economic Commission for Latin America to speak on this subject. Their analysis of the situation is good and their language is more elegant than mine:¹²

"For analytical purposes, it is convenient to consider

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two groups within the geographic income sector: one comprising all salary and wage earners and small entrepreneurs (including farmers) and another consisting of those receiving profits, interest, and rent. In the former group, the low-income sector of the population predominates, whereas in the second group incomes are relatively high. It was believed advisable to use 1939 as a point of departure in the analysis, since the longer interval provides a better perspective for making comparisons.

"A remarkable trend is observed from these data. Whereas wages, salaries, and incomes of the small entrepreneurs increased at an annual rate of 4.4 per cent between 1939 and 1952, profits, interest, and rent rose 10.1 per cent. The proportion of the latter to the geographic income thus rose from 34.5 per cent in 1939 to 51.2 per cent in 1952, whereas the former declined from 65.5 per cent to 48.8 per cent over the same period....

"It would be well to enquire into the repercussions of these changes in the distribution of the geographic income on savings and investment. Unfortunately, no data are available to enable the same grouping to be made as in the case of the gross product. It was therefore necessary to resort to a method which seems appropriate to the objective pursued, namely, of assuming that all private investment was made by the group receiving profits, interest, and rent. Obviously, although all private investments were not made by this group, the major portion must have been. Hence, it is probably being assigned a slightly higher volume of savings and lower level of consumption than was actually the case. This, however, tends to strengthen rather than invalidate the following conclusions....

"During the first three years 1939-41, some 19 per cent of the available goods and services were directed to investment by this group, and the remainder to consumption. During 1942-46, the proportion fluctuated at about 15 per cent, and since then has tended to rise. During 1950 and 1951 the earlier levels were regained. By 1952 they were finally surpassed, with 22.6 per cent of the available goods and services of this group directed toward investment.

"Although the imperfection of the data is fully recognized, together with the crudity of the procedure, it does seem that the remarkable expansion of income in this group should have generally led its members to increase their saving-coefficient. This was not the case. On the contrary, for a considerable time they delayed the re-establishment of the relative share of investment in the expenditure of their income.

"Nevertheless, Mexico obtained a substantial increase in private investment, and thereby in output, by this means. Investment rose at an annual rate of 10.7 per cent between 1939 and 1952. However, in attaining this result, consumption by the group receiving profits, interest, and rent increased almost proportionately, that is, at an annual rate of 8.6 per cent. Over the same period, the volume of consumption of the low-income group, assuming that it expanded in a measure with their income, rose by 5 per cent annually on the average....

"...Employees, laborers, and small entrepreneurs accounted for 69.7 per cent of total consumption in 1939, and only 59.9 per cent in 1952."

This policy of squeezing the poor and enriching the rich in order to encourage savings and investments on the part of the latter doesn't sound much like the revolutionary cries of two and three decades ago, when The Revolution was breaking up large haciendas and giving the land to the peons and nationalizing the oil industry. Apparently The Revolution, like the old gray mare, ain't what she used to be. Then too, it may be that if the historians of The Revolution analyze the problem of income distribution as carefully as they have the distribution, or redistribution, of social and political rights, we may find that The Revolution was never quite what it appeared to be.

Be that as it may, the evidence certainly indicates that the monetary and fiscal policies of the past decade and a half have favored the upper-income groups, and that as a result of this Mexico has obtained a substantial increase in private investment. But it has not only been by this indirect method that government has encouraged investment. Through a series of important autonomous agencies, as well as through several of the long-established departments, the Federal government of Mexico has also been an important investor of funds. During the first half of the 1940's government investment ranged from 40 to 48 per cent of total investment. It dropped in relative importance from 1946 to 1949, but rose again and has been accounting for 40 to 44 per cent of the total during the past three to four years. This again is a point on which the analysis of the Economic Commission for Latin America, for the period 1939-52, can well be quoted:¹³

"State expenditure increased in relation to the gross product, rising from 12.4 per cent thereof in 1939 to 14.3 per cent in 1952. However, within that expenditure, the amount set aside for investments developed much more rapidly than current expenditures. Whereas the former accounted for 26.9 per cent of total expenditure in 1939, by 1952 it averaged 54.5 per cent. Current account expenditures conversely decreased from 73.1 per cent to 45.5 per cent, respectively, during the years specified. This indicates that the Mexican Government improved the coefficient for savings remarkably. In fact, Mexico is

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one of the countries in which the State has shown a strong investment capacity, as may be seen above.

"It might be considered that the government reached this position by requisitioning a substantial proportion of the geographic income of the group receiving profits, interest, and rent. That was not the case. The share of net income, accruing to the State from the group receiving profits, interest, and rent, was comparatively low and fluctuated widely. From 11.7 per cent in 1939, direct taxes fell to 8.4 per cent in 1942; they rose again to 12.5 per cent in 1943 (as a result of the fiscal reform), dropping, however, to less than 8 per cent in 1947 and 1948. In 1949 they increased again, reaching 12.7 per cent, subsequent to the new fiscal measures in 1949, but were reduced immediately afterward. It would seem that the increases in direct taxes are being rapidly annulled by the inflationary increment to the geographic income...."

Thus, we see from the analysis of the Economic Commission for Latin America that not only government expenditures tended to be a modestly increasing proportion of gross national product, but also -- and more important -- the proportion of total government expenditures represented by investments rose significantly during the 1940-52 period. Moreover, we see here again, in this sphere of government activity, that the upper-income groups were not hard hit by the taxes which the government raised to do its investing. Government policy, therefore, even though involving the state in a multitude of economic activities which in many countries are left to private enterprises, has nevertheless been cast in a basically orthodox and conservative mold. Politicians still get elected by pledging themselves to carry forward The Revolution, but The Revolution is no longer very revolutionary.

In our search for explanations of Mexico's rapid rate of economic growth we reached the conclusion that a large part of it arose from greater inputs of capital and from gains in efficiency. These appear to be two of the mainsprings, and there is a strong presumption that increases in efficiency may account for a significant part of the total. As was pointed out, however, new investments are often the carriers of new technologies, from which much of the increased efficiency arises. We, therefore, explored the rate at which new investments were made in the 1940's and looked briefly at the way in which government policy, both direct and indirect, influenced investment. By following a policy of inflation, the government encouraged private investment, while, at the same time, an increasing proportion of direct government expenditures was funneled into investment channels. Both types of government action tended to be relatively hard on the lower-income classes, while they favored the upper-income groups.

To complete this picture, we need to look into the types of investments which were made and thus gain some idea of the

relative priorities which the Mexicans placed on different sectors of the economy as recipients of new capital. The following figures show total investments in Mexico as estimated by the Combined Mexican Working Party for the period 1939 through 1950:¹⁴

<u>Types of Investments</u>	<u>Amounts in Millions of Pesos</u>	<u>Per Cent of Total</u>
Industrial equipment	7,435	23.4
Transportation and Communications	6,686	21.2
Residential, Commercial and Industrial Construction	5,772	18.2
Agriculture	5,009	15.8
Motor Vehicles	2,139	6.8
Community Works	1,620	5.1
Petroleum	1,068	3.4
Electric Power	1,058	3.3
Public Buildings	682	2.2
Mining	<u>182</u>	<u>0.6</u>
TOTAL	31,651	100.0

These estimates indicate that industry, transportation, construction, and agriculture received the lion's share of investment capital during the decade of the '40's. Into these four sectors of the economy went 79 per cent of the gross investment. Although there is no really satisfactory way of determining whether this was the optimum allocation of new capital to obtain the most rapid rate of economic growth, it has a strong appeal to one's common sense. It looks like a reasonably good pattern.

The fact that industrial equipment ranked highest among the various categories of investments no doubt offers an opportunity for criticism on the part of those who believe that a country is acting unwisely to funnel scarce capital into industry, which has to be protected by high tariffs and other similar mechanisms. It is unlikely, however, that the free-trade purist will find solace for his beliefs in the policies of many underdeveloped countries. The fact that Mexico has put substantial sums into the development of a transportation system, which benefits all sectors of the economy, and that a significant proportion of the total went into agriculture and construction activities indicates that Mexico has not gone completely overboard in its drive to industrialize. Investment in construction is in part a reflection of the rapidly growing population, with the resultant increase in demand for

residential housing; it is partly a result of the rapid movement of rural people to urban areas; and it also reflects the growth of industry. A rather large proportion of the total investment is, therefore, associated with industrialization and urbanization. At the same time, agriculture was not neglected, though I strongly suspect that it may still be one of the most "capital-starved" areas of the economy. A considerable proportion of the agricultural investment went for large-scale irrigation projects, but more than half was for machinery, small irrigation projects, and land clearing. Although there is great need for more capital to modernize and improve Mexico's agriculture, the same can be said of virtually all sectors of the economy. Moreover, much of Mexican agriculture would be an inefficient user of new capital unless farmers were better educated. The small farms of the indigenous population, many of which are badly eroded and are cultivated by traditional methods, would probably yield high returns on small amounts of capital invested in fertilizers, insecticides, improved seeds, erosion control devices, small machines, and improved hand tools, provided their operators knew how to use these things. The problem, however, of "retailing" the small amounts of necessary capital to the hundreds of thousands of small farmers, and of teaching them how to make effective use of their new resources, is a Herculean task. It probably involves greater costs of an educational nature than would be represented by the direct capital for productive supplies and facilities. This sector of the population is certainly not in a strong position to compete with other groups for capital. Nevertheless, Mexico is far ahead of most of its Latin American neighbors in operating an agricultural credit system, which is aimed at ameliorating this problem of capital shortage among small farmers. Much of this has been done through specialized government credit agencies. It is not, however, only in the agricultural field that direct government investment has been important.

Of the total gross investment of 31,651 million pesos during the 1940's, almost 43 per cent (or about 12,500 million pesos) was made by government agencies. The percentage distribution of this public investment was as follows:

Transportation and communications	44.63
Agriculture and resources	19.44
Electric power and petroleum	17.56
Social and municipal construction	12.65
Miscellaneous	<u>5.72</u>
TOTAL	100.00

Since transportation and communications facilities as well as the petroleum industry are wholly government-owned, and since there was an increase in the public ownership of electric-power generating capacity from 7 to 28 per cent between 1943 and

1950, the public investments shown above represented nearly all of the new capital that went into these sectors of the economy during the decade of the 1940's. In the case of agriculture, public investment was about three-fifths of the total. This means, therefore, that private investment was primarily responsible for the growth in industry, construction, motor vehicles, and mining; whereas public investment was mainly responsible for the growth in transportation and communication facilities, in the electric power and petroleum industries, and for a major part of the expanded agricultural plant. However, the indirect effects of public investment, particularly in such areas as transportation, communications, and certain welfare activities -- such as schools, hospitals, and various types of technical training facilities -- probably had a much greater influence on the growth of the economy than is suggested by the relative proportions of public and private investment. This is an area needing much further study and research.

Before leaving the topic of investment, perhaps a few words should be said about the relative importance of domestic savings versus foreign borrowings as the source of investment funds. Has the money used for investment purposes come mainly from the Mexican economy, or has it been borrowed from abroad? A precise answer to this question cannot be given, because of inadequate data, but the general picture is clear. Most of the investment funds came from domestic savings. The best available data on this general question is that of the Combined Mexican Working Party, as published in The Economic Development of Mexico. It indicates that 89 per cent of the total investment in Mexico during the period from 1939 to 1950, including that from external as well as domestic sources, arose from domestic savings. About four per cent arose from an increase in foreign liabilities. This leaves seven per cent which is unexplained because of errors and omissions in the total balance of payments. If, however, all of the errors and omissions could be corrected, there is no reason to believe that the relationship between 89 per cent from domestic sources and four per cent from an increase in foreign obligations would be greatly changed.

It is probable, however, that this kind of comparison somewhat understates the influence of foreign investment. The increase in foreign obligations during any given period, such as that from 1939 to 1950, represents the net result of capital inflows minus capital outflows. The latter are made up mainly of profits paid to shareholders outside of Mexico, of repayments of principal on money borrowed from abroad, and of annual interest payments. Some of this outflow of capital, therefore, pertains to investments that were made before 1939. Moreover, much of the foreign investment made during the 1940's probably acted as an important stimulant to domestic savings. Finally, as the Combined Mexican Working Party points out, "foreign capital has often helped to finance investment projects of crucial importance for the country's economic development. If foreign financing had not been obtained for electric power development, railroad rehabilitation, key industrial projects, and the eradication of the foot-and-mouth disease,

it is probable that progress would have been slower in these fields and in others as well."

To strike a balanced judgment as to the effect of foreign investments on Mexican economic growth is difficult. Foreigners, particularly North Americans, are prone to look at gross capital inflows and to forget the rather lush profits that are withdrawn and the amortization and interest payments that have to be met each year. Mexicans, on the other hand, are quite conscious of these capital outflows, and sometimes overlook the importance of the new technologies and improved methods that often accompany the inflow of private foreign capital. It seems to me, however, that regardless of one's nationality bias the case is quite clear that by far the greater part of the stimulus given to Mexico's economy through increases in the supply of capital has come from within Mexico and not from foreign sources.

ECONOMIC GROWTH AND THE SOCIAL CLIMATE

In the preceding sections of this report I have attempted to review the rate of economic growth in Mexico since 1939, and to point out some of the major economic factors that account for the country's rapid rate of progress. High on the list are the rapid rate at which new capital has been formed and put to work, and increases in efficiency in the processes of production. I suspect that a large part of the increased national efficiency has come from better education, improved health, and greater incentives among the lower classes of society. Another significant part, however, has come from both greater incentives and improved knowledge on the part of private businessmen and public servants. Both of the latter groups have borrowed many ideas from abroad, particularly the United States, and have put them to work in their factories and offices. Of course, some of Mexico's growth has come from foreign capital and foreign technicians and businessmen. In the main, however, the Mexicans have done the job themselves, with their own capital and their own hands. Many ideas that have figured significantly in Mexico's economic growth have come from abroad, but this does not mean that they have lacked a national imprint. Much foreign knowledge has been imported by Mexicans who have gone abroad to study, or has been brought in by foreign specialists who have come to Mexico, financed by Mexican public or private funds, to work on problems selected by Mexicans. Thus the Mexicans can honestly say that they have accomplished the job themselves, and as a result there is a pride of accomplishment when Mexicans review the economic achievements of recent years.

The Mexican experience of the past 40 to 50 years cries out for constructive analysis of what I believe to be the most difficult of all problems in the social sciences, namely, the relationship between economic growth on the one hand and social and political change on the other. Into this rugged terrain, I can venture only a short way and set up a few markers. My thought is that they may help the neophyte, and may stimulate the professional to the research necessary to dispel my ignorance.

One point worth noting is that The Revolution virtually destroyed or greatly weakened the major centers of power in one type of society -- a society which was aristocratic and feudalistic in major outline -- and replaced them with new power centers. The old centers of power were: the large landowners; a few politically-adroit army officers; and a sprinkling of wealthy industrialists and bankers. The Catholic Church might also be included with this group, but its real power had been broken by Juarez in the latter half of the last century, so that by 1910 the Church was in a secondary power role. Among the large landholders and the few industrialists and bankers were some foreigners. One element, therefore, in the struggle to destroy the old power centers is epitomized by the familiar battle cry of "throw the foreigners out." There was, therefore, something similar to the traditional anticolonialism, so common in other parts of the world, in the Mexican picture.

The old power centers were, of course, replaced by new ones -- it took quite a lot of bloodshed and turmoil to complete the change -- but the new ones lacked the aristocratic and feudalistic characteristics of their predecessors. The new political leadership was mainly from the middle and lower class groups in society. In the early stages of The Revolution, many of the leaders were swashbuckling, greedy strongmen, who neither understood, recognized, nor assumed any real degree of social responsibility. They soon lost out to keener minds, who began to bring order out of chaos. Some of the latter may have been motivated mainly by greed, but in any event they found it financially, socially, and politically profitable to assume responsibility for order, and at the same time to inaugurate social changes which would move the country away from a possible recapture of power by the aristocrats. The important point to note in this connection is that there was neither a shift of power from one group of aristocrats to another, as had commonly been the case in the past, nor a significant change in the traditional value judgments of the old ruling groups. There was, instead, a fairly complete rupture with aristocratic ideas and ideals. The crude men of humble backgrounds -- though not always humble of spirit or even true to their heritage -- occupied the seats of the mighty.

There were at least three developments associated with the rise of nonaristocratic groups to political power which had important effects through changing the social environment and opening the doors to economic growth.

One of these was the rise of a new entrepreneurial class. Moreover, it is important to note that many members of this new entrepreneurial class were friends, supporters, and cronies of the new political leaders, and their growing economic strength was often related to the close relationship which they maintained with the politicians. Government contracts, as well as various types of laws, regulations, and government jobs, were often used to strengthen, and sometimes to enrich, the businessmen who were friendly to the new political leaders. This does not necessarily

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mean that there were extremes of dishonesty. Somebody had to manufacture and supply the many different things which a government buys for its ordinary operations, just as somebody had to build the new roads, schoolhouses, hospitals, power plants, and other projects which were financed by government funds. The new political leadership was careful to see that these plums fell into the hands of their friends. This was an important avenue by which a new type of personality gained positions of economic power. In general, this new entrepreneurial class came out of the middle and lower classes of society. Few of its members had inherited the traditional, status-burdened concepts of the old landholding group, in which change either in technological processes of production or in economic and social relationships was suspect and something to be handled with care and "proper" guidance. As a result, risk-taking entrepreneurship received an important "shot-in-the-arm" from the change in political power.

A second closely-associated development was the growing political muscle of the great underprivileged class of rural peons. Under the leadership of a few militant men, some of whom might have been considered nothing more than bandits in more politically mature countries, the peon group virtually forced the new middle-class rulers of the country into programs of land reform, rural education, and road-building. These new public activities did not all come at once; neither were they carried forward with equal enthusiasm by every administration, but during the 30-year period between 1920 and 1950 they had a tremendous effect in opening up rural Mexico to new ideas, and particularly in opening the doors of opportunity to that great group of "underdogs" who in the days of the aristocratic, feudalistic society had had almost no opportunity for advancement. The combined impact of a new, venturesome, risk-taking type of entrepreneur, with the awakening to new opportunities among the "underdogs," provided an economic environment which was much more open, free, and competitive than had been true of the earlier society. This was not too unlike the rise of the Industrial Revolution in Western Europe a hundred years earlier, in which the remnants of an aristocratic, feudalistic society, with strong elements of mercantilism, were swept away by the rise of a new industrial and commercial class, and in which great motive power for economic growth was provided by reliance on private initiative and the "struggle for economic survival." There was a difference, however, and an important one -- which is the third factor, along with the rise of a new type of entrepreneur and the ferment among the lower classes society -- that did much to provide a social environment conducive to economic progress.

This third element was the influence of a group of socially-minded intellectuals on government policy. The handiwork of the intellectual bureaucrat and brain-truster is always difficult to put your finger on; you never quite know how much to attribute to him and how much to the big boss who is in the limelight. Nevertheless, it appears that the intellectuals of Mexico have made at least two important contributions: they were largely responsible for the State becoming active in a whole series

of both economic and social welfare activities -- in this they usually had the active support of the lower classes in society; and they have been the main fountainhead of a peculiar brand of Mexican nationalism, which for years has been a problem to diplomats of the U.S. State Department and is now a source of frustration to both U.S. and UN technical assistance agencies, but which has probably been an asset to Mexico's economic growth. The two accomplishments of the intellectuals are, of course, closely inter-related, and their value is also highly debatable. Some people see in them an impediment or at least a threat to economic growth.

However, it seems to me that the entrance of the State into both economic and social welfare activities has encouraged progress. It appears to have done this in two ways: first, and most important, it has contributed to national efficiency in production by providing transportation and communication facilities and by improving the general education, the technical skills, the physical health and strength, and the incentives of a sizable proportion of the working class; second, it has put public funds, both in the form of loans and as direct investments, into some areas of economic activity which have greatly enhanced the productivity of the economy. Among the latter, perhaps the least debatable are the loans to agricultural producers and the investments in irrigation facilities. The government has also, of course, put significant financial and managerial resources into railways, the petroleum industry, and electric power, which many people will say should have been left to private enterprise. I don't yet know enough about the quality of performance in these government-owned enterprises to pass judgment on them. However, in one or two close neighbors of Mexico private enterprise has not particularly distinguished itself in the electric-power and railroading fields. I suspect, for example, that the publicly-owned utilities in Mexico are serving the economy much more effectively than their privately-owned counterparts in Guatemala.

The rise of Mexican nationalism, which has been a noticeable characteristic of The Revolution and appears to spring largely from intellectuals, is even more difficult than State activity to pin down and relate to economic growth. State ownership of the petroleum industry, the railroads, and of a considerable share of the electric-power industry is one way in which this nationalism has been expressed. But Mexican nationalism also has an intangible element -- a spirit -- which is difficult to name and define, and even more difficult to evaluate. It is both a national pride of accomplishment and a tenacious belief that Mexico and the Mexicans can solve their own problems; that they need a minimum of outside help and that any help must come to them pretty much on their own terms, mainly as loans and not as gifts; and that they will steer the ship of state with a Mexican crew and a Mexican compass.

One sometimes finds this view being justified by romantic allusions to the great inheritances which Mexico received from the highly developed Indian civilization before the Spanish conquest, and the consequent higher status that Mexico holds because of this

ancient influence. Mexican nationalism is also sustained by the memory that the United States annexed Texas, occupied Mexico City, and took a large slice of Mexican national territory, for which it paid very little. Nor have Mexicans forgotten that the French occupied and ruled the country with an imported Austrian emperor for four years during the early 1860's. Finally much of today's nationalism dates back to the revulsion against the Porfirio Diaz regime of 1876-1911, during which foreigners had their "golden era." It was against that regime that The Revolution beginning in 1910 was immediately and specifically directed.

However, the really strong source of Mexican nationalism does not stem from these and related events of history but from the present-day confidence and pride of Mexican politicians, businessmen, and intellectuals. Some of it may be false pride, and may sometimes act as an impediment to the acceptance of outside assistance that is available through the various avenues by which technical know-how crosses international boundaries. Nevertheless, nationalism has been an important force behind Mexico's economic growth. It is an ever-present attitude which has stimulated government to take steps to prove that Mexico can lift itself by its own efforts. It has encouraged young men to go outside of the country to study and to return to Mexico to put their knowledge to work in "their" country. It has stimulated the belief of many Mexicans in their own ability, and has aided people in all walks of life to join together around ideas and movements that were aimed at improving the country. In this sense also it has been an influence in bringing the many little "isolated Mexicos" into a more common orbit of national life, and has made possible a national approach to many different kinds of problems, ranging from how to achieve political stability to improvement of the educational system and planning a network of national highways. Mexico is not the "split-up and divided-among-itself" kind of country that it was 40 or 50 years ago. Nationalism has had economic significance not only because it has encouraged Mexicans in all walks of life to try harder, to have greater self-confidence, and thus ultimately to accomplish more, but also because it has made it possible for the government to make a nation-wide approach to many problems that were traditionally tackled in a sporadic and scattered manner.

In summary, therefore, it seems to me at the present stage of my study of Mexico that the major social and political factors which appear to have a direct causal relationship with the more recent period of rapid economic progress are:

1. The destruction of an old, aristocratic, and feudalistic type of society, the economic base of which was agriculture and a type of agriculture in which the main operating unit was the large landholding, owned by a tradition-bound wealthy family and operated by ignorant poverty-stricken laborers;
2. The rise to political power -- mainly by means of

internal civil war -- of leaders from the middle and lower classes of society, who had a much more modern set of value judgments about the functions of government than did their predecessors from the ranks of the aristocracy;

3. The rise to economic power of a new and more venturesome class of entrepreneurs, many of whom gained their wealth and economic positions by a close working relationship with the new political leaders;
4. The political gains made by the underprivileged peons, and the widening economic opportunities that became available to them through government programs emanating from their increased political strength; and
5. The rise of a mild form of nationalism, which encouraged the government to enter into a wide area of economic and social welfare programs, which strengthened self-confidence and the willingness to try new ideas, and which helped Mexico to become a nation instead of a series of more or less isolated communities.

These five factors, each of which is really a complicated set of interrelated forces, seem to me to have been in the nature of active, pushing, stimulants to economic growth. They were not mere passive, or necessary, conditions to progress. True enough, they prepared the seedbed for economic progress, but they also planted the seeds and cultivated the plants. They were not only dynamic elements, but their dynamism also brought new technologies, new incentives to production, and new opportunities to both the managerial and working classes to improve their positions by producing and becoming still more productive. Unless I miss the essence of periods of quite rapid economic growth, as contrasted with those periods in which an economy expands at about the same rate as population increases, it is precisely to rapid improvements in technology, to enlarged incentives, and to expanded opportunities on the part of the productive elements in society that we must look for explanations. Of course, technologies, incentives, and opportunities cannot alone fabricate goods and services. They must have a natural-resource base on which to operate, and they must have capital goods and equipment with which to utilize the natural resources. We have explored in previous pages some of the main characteristics of the process of capital formation in Mexico, and we have pointed out that there had not been sudden and large accretions to the utilizable supply of natural resources which could account for the rapid growth of the Mexican economy. As a matter of fact, Mexico's storehouse of known natural resources in relation to her population is not nearly as propitious for economic growth as in many other countries.

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In the Mexican experience we may very well have an important example of how basic realignments in social and political institutions contribute to economic progress. For those who want to pursue this interesting and important topic of research, the five factors which I have listed may offer a starting point. It might also be worthwhile for those who design and administer technical assistance programs to ask themselves if the types of social and political changes that appear to have stimulated rapid economic growth in Mexico are important prerequisites to the economic development of other backward countries.

James G. Maddox

FOOTNOTES

1. Published for The International Bank for Reconstruction and Development by The Johns Hopkins Press, Baltimore, 1953.
2. The Mexican Revolution has been the subject of numerous books. One of the best is The United States and Mexico, by Howard F. Cline, Harvard University Press, Cambridge, 1953. It will lead the interested student to many other sources of information.
3. Although the wholesale price index of the 210 commodities for Mexico City is not a really adequate "deflator" for the gross national product series, it is the best available, and probably corrects reasonably well for the rise in the general price level.
4. The indexes of physical volume of production per capita in Table 1 were calculated from the data in Table D of the Appendix, the sources of which are given in the footnotes to Tables C and D. They represent deflated gross national product series that were put on a per-capita basis and then reduced to the simple index numbers, with base year 1939, shown in Table 1. Except for Mexico and the United States the basic data came from United Nations sources.
5. I have been able to find reasonably comparable data, for the entire period from 1939 to 1954, only for the four Latin American countries discussed in the preceding paragraphs. However, in the Economic Survey of Latin America 1953, United Nations, New York, there are per-capita gross product figures for 1945-53

for four additional Latin American countries, namely, Chile, Cuba, El Salvador, and Guatemala. I have been told recently by an economist with the Economic Commission for Latin America that these figures are being revised. As they were published, however, in 1954, they indicate that El Salvador and Guatemala had a faster rate of growth from 1945 to 1953 than Mexico. Such was not the case, however, with Chile and Cuba. The relatively high price of coffee may have been an important factor affecting the rate of growth in Brazil, Colombia, El Salvador, and Guatemala.

6. The principal difference between "net domestic product" and "gross national product" is that indirect business taxes and depreciation have been subtracted from the latter to obtain the former. Those interested in the methods of calculation should refer to the footnotes of Table 2 of The Economic Development of Mexico.
7. For the data pertaining to Argentina, see Boletín Económico de América Latina, Vol. 1, No. 1, Naciones Unidas, Santiago de Chile, January 1956. For that pertaining to Brazil, see El Desarrollo Económico del Brazil por Comisión Económica para América Latina, Naciones Unidas, E/CN.12/364, July 18, 1955. For the data pertaining to Colombia, see The Economic Development of Colombia, by the Economic Commission for Latin America, United Nations, E/CN.12/365, August 10, 1955.
8. "Agricultural Development in Mexico," by Clarence A. Moore, Journal of Farm Economics, February 1955.
9. Published in the Economic Survey of Latin America 1951-52, United Nations, New York.
10. See Table 12 of The Economic Development of Mexico. The data for years later than 1950 are from annual reports of Nacional Financiera, S.A.
11. See Chapter I of Part I of Economic Survey of Latin America 1951-52, Economic Commission for Latin America, United Nations, New York.
12. Ibid., pp. 86-88.
13. Ibid., pp. 88-89.
14. Arranged from Tables 16 and 17 of The Economic Development of Mexico.

STATISTICAL APPENDIXTABLE A

Changes in Gross National Product and Wholesale Prices,
Mexico, 1939-55

Year	Gross National Product* (Millions of Pesos)	Index of Wholesale Prices in Mexico City** 1939=100	Gross National Product Adjusted for Price Changes		
			Millions of Pesos	Per Cent Change from Previous Year	Index 1939=100
1939	6,800	100.0	6,800	---	100.0
1940	7,300	102.5	7,122	4.7	104.7
1941	8,800	109.3	8,051	13.0	118.4
1942	10,700	120.6	8,872	10.2	130.5
1943	13,700	145.7	9,403	5.3	138.3
1944	17,700	178.5	9,916	5.5	145.8
1945	20,500	198.7	10,317	4.0	151.7
1946	26,100	228.7	11,412	10.6	167.8
1947	29,000	242.3	11,969	4.9	176.0
1948	31,700	260.0	12,192	1.9	179.3
1949	35,200	284.8	12,360	1.4	181.8
1950	41,500	311.2	13,335	7.9	196.1
1951	51,800	386.0	13,420	0.6	197.4
1952	58,300	400.0	14,575	8.6	214.3
1953	56,300	392.5	14,344	-1.6	211.0
1954	66,478	429.4	15,482	7.9	227.7
1955	84,000	487.8	17,220	11.2	253.2

* Bank of Mexico Annual Reports 1954 and 1955.

**An index, which includes 210 articles, calculated by the Bank of Mexico.

TABLE B

Population in Relation to Gross National Product,
Mexico, 1939-55

Year	Estimated Population* (In Thousands)	Gross National Product Adjusted for Price Changes			
		In Millions of Pesos**	Per Capita		
			Pesos	Index 1939=100	Per Cent Change from Previous Year
1939	19,413	6,800	350	100.0	---
1940	19,654	7,122	362	103.4	3.4
1941	20,208	8,051	398	113.7	9.9
1942	20,657	8,872	429	122.6	7.8
1943	21,165	9,403	444	126.9	3.5
1944	21,674	9,916	457	130.6	2.9
1945	22,233	10,317	464	132.6	1.5
1946	22,779	11,412	501	143.1	8.0
1947	23,440	11,969	511	146.0	2.0
1948	24,129	12,192	505	144.3	-1.2
1949	24,833	12,360	498	142.3	-1.4
1950	25,791	13,335	517	147.7	3.8
1951	26,540	13,420	506	144.6	-2.1
1952	27,283	14,575	534	152.6	5.5
1953	28,053	14,344	511	146.0	-4.3
1954	28,850	15,482	537	153.4	5.1
1955	29,675	17,220	580	166.0	8.0

* For the years 1939-53, the data are from Población, by Julio Durán Ochoa, published by Fondo de Cultura Económica, Mexico, 1955. For 1954 and 1955 they are estimates of the Ministry of Economy.

**From Table A.

TABLE C

Estimates of Total Physical Volume of Production (Gross National Product in Constant Prices) in Argentina, Brazil, Colombia, Mexico, and the United States*

Year	Argentina**	Brazil***	Colombia#	Mexico##	United States###
1939	42,674	200.3	4,204	21,184	157.5
1940	42,895	200.3	4,295	22,121	171.6
1941	44,896	210.0	4,367	25,000	198.2
1942	45,674	203.5	4,376	27,577	223.6
1943	45,563	209.0	4,394	29,273	248.9
1944	50,881	219.4	4,691	30,836	268.2
1945	48,983	234.6	4,911	32,081	263.1
1946	55,198	257.7	5,383	35,510	233.8
1947	63,253	278.3	5,592	37,275	232.2
1948	65,961	294.1	5,751	38,010	243.9
1949	62,829	302.1	6,253	38,512	241.5
1950	62,291	324.1	6,322	41,500	264.7
1951	64,219	346.5	6,702	41,774	282.9
1952	59,740	360.9	7,164	45,334	293.3
1953	63,010	376.1	7,751	44,647	306.5
1954	65,987	409.2	8,447	48,207	300.5
1955	----	---	---	53,606	318.8

* The data: for Argentina from Boletín Económico de America Latina, United Nations, Vol. 1, No. 1, January 1956; for Brazil from El Desarrollo Económico del Brazil by the Economic Commission for Latin America, United Nations, July 18, 1955; for Colombia from The Economic Development of Colombia by the Economic Commission for Latin America, United Nations, August 10, 1955; for Mexico calculated from Table A of the Appendix; and for the United States from Survey of Current Business, July 1955 and February 1956.

** In millions of Argentine pesos at 1950 prices.

***In billions of Brazilian cruzeiros at 1952 prices.

In millions of Colombian pesos at 1950 prices.

In millions of Mexican pesos at 1950 prices.

###In billions of United States dollars at 1947 prices.

TABLE D

Estimates of Per-Capita Physical Volume of Production
(Gross National Product in Constant Prices) in Argentina,
Brazil, Colombia, Mexico, and the United States*

Year	Argentina**	Brazil***	Colombia#	Mexico##	United States###
1939	3,083	4,964	472	1,091	1,203
1940	3,052	4,872	472	1,125	1,299
1941	3,143	4,992	470	1,237	1,486
1942	3,146	4,725	460	1,335	1,658
1943	3,088	4,740	452	1,383	1,820
1944	3,392	4,860	472	1,423	1,938
1945	3,210	5,076	484	1,443	1,880
1946	3,557	5,447	519	1,559	1,654
1947	4,007	5,745	527	1,590	1,611
1948	4,097	5,931	530	1,575	1,663
1949	3,803	5,950	564	1,551	1,619
1950	3,673	6,236	558	1,609	1,745
1951	3,686	6,512	578	1,574	1,833
1952	3,346	6,625	605	1,662	1,868
1953	3,457	6,744	640	1,592	1,920
1954	3,555	7,167	682	1,671	1,850
1955	---	---	---	1,806	1,929

* Data for Argentina and Colombia directly from the sources given in Footnote * of Table C; for Brazil and the United States calculated from data in Table C and population data from the Demographic Yearbook, United Nations; for Mexico calculated from data in Table B and C.

** In Argentine pesos at 1950 prices.

***In Brazilian cruzeros at 1952 prices.

In Colombian pesos at 1950 prices.

In Mexican pesos at 1950 prices.

###In United States dollars at 1947 prices.
