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LA THÈSE A ÉTÉ
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INCOME DISTRIBUTION AND REDISTRIBUTION: A CASE STUDY OF
MEXICO.

by

José G. Barrera-Flores

A thesis
presented to University of Ottawa
in partial fulfillment of the
requirements for the degree of
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in
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BIOGRAPHICAL SKETCH

The author was born in Reynosa, Mexico, on December 12, 1949. He followed the B.A. program in economics at the Universidad Autonoma de Nuevo Leon in Monterrey, Mexico, between 1966 and 1971. He completed the Master's program of economics of El Colegio de Mexico in Mexico City in 1973. During the academic years of 1973 to 1976, and 1979 to 1981 the author was enrolled in the Ph.D. program of economics. At the same time he was a research and teaching assistant in the Department of Economics at the University of Ottawa. In 1976 he was an economic advisor to the Ministry of the Presidency of Mexico, and from 1977 to 1979 he was deputy-director of planning of the Ministry of Transport and Communication of Mexico. From 1977 to 1979 he was a part-time professor in the master's program of economics of the University of the Americas in Mexico City, being the coordinator of the program from 1978 to 1979.

To my mother and father.

To my wife and daughter.

To my brothers and sisters.

ABSTRACT

The main purpose of this thesis is to analyse Mexican income distribution and to propose income redistribution strategies. In order to analyse the income distribution data of Mexico, four income distribution models are tested to derive several Income Inequality Indicators (III's). Through the use of these III's, an analysis of the data at the national, urban-rural, sectoral, educational and spatial levels is carried out. Using these same socioeconomic characteristics poverty groups are identified.

An attempt to explain the statistical findings is provided, taking into account the forces determining the strategy of development, the regional and sectoral heterogeneous structures and the distribution of resources among the population. Based on this analysis we propose a general model of redistribution through growth aimed at providing investment resources for the poor to enable them to have a permanent source of income. After identifying specific target groups, five strategies of income redistribution are proposed: a program of rural development, improvement of the regional balance of the economic activities, a comprehensive employment plan, an educational plan and measures for control of the population.

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INTRODUCTION

1980 marked the beginning of the Third Development Decade. This event has brought new hopes for increasing the income of the poor of the world, for diminishing the disparities between North and South and for decreasing the unequal growth of income between regions within countries, and among socioeconomic groups. Economic growth in third world countries has brought little benefit to a large part of their populations, and a review of evidence on an international level confirms a trend of growing inequality. The old idea of growth at the top, with hope for an eventual "trickle-down" effect has not solved the problem of poverty or decreased income concentration within the "successful" and unsuccessful developing countries.

Development planning has long been considered the instrument for transforming stagnant, low-income developing countries. It would help to efficiently allocate scarce development funds, to industrialize, urbanize, and modernize the infant economies to enable them to progress along a steady growth path. However the models of development that were created, while emphasizing leading sectors, industries and regions as "growth poles", have led to economic outcomes

with growing income concentration. The majority of the social groups working outside the favoured "poles" have not received the benefits of the witnessed growth of their countries, and have been left with no strong representation in the political arena, while facing unemployment and poverty.

Along the same lines, four decades ago Mexico adopted a development model that emphasized industrialization and what was then seen as the modernization of the country. This model considered that in order to improve the standard of living of the Mexican people, wealth had first to be created and then distributed. Indeed, in one respect the model proved successful, since wealth and income were created, and the country became modernized. The bonanza however, came to a privileged few, while great masses failed to benefit from the growth achieved. In fact, it is argued that for some, "modernization" brought about a gradual deterioration in their already precarious situation. More recently it has been argued that Mexico is in need of a new model of development that would respond to the strong contradictions that have been created: the coexistence of highly modern technology with primitive modes of production; the flamboyant rich urban areas vs. rural areas of extreme poverty, or misery belts surrounding the larger cities; the consumption of imported sumptuous goods vs. people living below the minimum requirements of nutrition; a small cultural elite vs. millions of illiterates with little hope of future development.

The problem of distribution and growth has become an ever-increasing theme of study at the international level, considering that after more than two decades of development many countries have not experienced any improvement for the majority of their population. The study of income distribution in Mexico would help to assess the achievements of an economy which has grown at a miraculous rate of over 6% per year during the last four decades, with a growth of almost 3% per year in per capita terms. These are very high rates by international standards, which after forty years should have had an impact on society as a whole through better living standards. Unfortunately the impact has been modest, and Mexico now faces the need of changing her pattern of economic development in order to offer social justice to the present population of over 70 million people, a population which is expected to reach more than 100 million within the next two decades. The newly-expanded oil industry has placed Mexico in a unique position among developing countries: through the use of some of the revenue generated by the oil, Mexico has a chance to reshape its economy in order to address its current inequalities. An important historical decision must be made, deciding the route that the nation must follow in order to ensure a more balanced distribution of the benefits of its new wealth.

Considering the limitations of the information, as shown in the main part of this thesis, by means of an in-

4
depth study of income distribution in Mexico it will be possible to quantify the extent of the income concentration; to analyse its origins and causes; to evaluate the objectives of growth and income distribution that the country has set; and to aid in the formulation of redistribution policies aimed at improving the living conditions of the majority of Mexicans.

In summary, the contents of the thesis will be as follows:

In the first chapter a review of the literature of income distribution and economic growth is carried out, offering an evaluation of the different theories proposed to explain the observed facts. At the same time we review the literature relating income redistribution with economic growth, evaluating its relevance to developing countries. We conclude the chapter by offering a theoretical framework for the analysis of personal income distribution in developing countries.

The second chapter presents the methodology of analysis of the income distribution data used in the study. It includes an evaluation of the properties of the most frequently used income inequality indicators and income distribution models. An evaluation of the econometrics of income distribution used in order to obtain inequality indicators, as well as an example of the method chosen, is provided at the end of the chapter.

The analysis of the income distribution data of Mexico is carried out in chapter three. In the first part of the chapter we review the increasing number of studies written about the subject, discussing the techniques and data sources used in each. In the second part we evaluate and select the available sources of personal income distribution data of Mexico. In the third part, following the methodology proposed in chapter two, we analyse the income distribution data at the national, urban-rural, sectoral, educational, and spatial levels. We conclude the chapter with an attempt to identify the poor of the country through the use of the same socioeconomic characteristics.

Chapter four attempts to provide an explanation of the results found during the analysis of the income distribution data within the theoretical framework proposed in chapter one. With this purpose part one covers a historical perspective of the distributive problem in Mexico up to 1940, while the second part covers the following four decades. We emphasize the relationship between the heterogeneous productive system of the economy and the employment and income generation of the economic sectors. At the same time we study the role of the government and the demographic dynamics as part of the framework of analysis proposed. We consider that this analysis is important to support the redistribution policies proposed for changing the existent structure.

In chapter five we propose income redistribution strategies for Mexico based on the analysis previously carried out. In part one we present a working hypothesis about income redistribution and economic growth in Mexico as a means of introduction for a new model of redistribution and growth. Part two of the chapter proposes the model and identifies the poverty target groups upon which the strategies of income redistribution suggested in part three will mainly impact. The strategies include policies to improve the socioeconomic conditions in the rural area; policies to promote equilibrated regional growth, and for the creation of employment; the need to offer education to every Mexican and a proposal to control population growth that would have an impact on income distribution in the long run.

The study concludes in chapter six with a presentation of a summary and conclusions derived from the analysis.

I

INCOME DISTRIBUTION AND ECONOMIC GROWTH: A REVIEW OF THE LITERATURE

The purpose of this chapter is to review the literature of income distribution and economic growth. We consider that up to now there has been a lack of a well-built and complete theory to aid in fully explaining the relationship between growth and personal income distribution. This review of the existing theories of income distribution and literature on income redistribution will provide an understanding of the main forces determining the distributive structure of any country in general, and in particular of Mexico. The explanation of the observed patterns of distribution and the causes of its skewness can help determine the use of possible strategies and policies that can be proposed to improve a particular income distribution.

In section 1.1 of this chapter we present an international comparison of data for 76 countries, relating income distribution and economic growth. This statistical information describes the extent of the problem, and provides us with a basis for introducing the various theories that have been offered in order to explain the observed facts. The review of the theories and an evaluation of them is presented in section 1.2. In section 1.3 we review those studies

that relate income redistribution with economic growth, and offer an evaluation of their relevance to developing countries. Finally, in section 1.4 we present a summary of the theories and studies discussed, and offer a general framework for the analysis of income distribution in developing countries.

1.1 INCOME DISTRIBUTION AND ECONOMIC GROWTH: AN INTERNATIONAL COMPARISON

Since Kuznets' famous article (1955) on economic growth and income inequality, interest has been aroused in comparing the levels of inequality of countries at various stages of development, as well as in offering a generalized explanation of the changes in income distribution that occur during the process of development. Along these lines Kuznets (1963), Adelman and Morris (1971), Paukert (1973), Jain (1975) and Ahluwalia (1976) among others, have collected, processed and analysed data of many countries. Their findings partially prove the hypothesis offered by Kuznets that the process of economic growth would deteriorate income distribution up to a point where the distribution would then improve.

A cross-section of several countries, measuring economic growth with income per capita and the level of inequality by means of an income inequality indicator such as

the Gini Coefficient, shows a quadratic relationship between the two variables. This is to say that the data follow an "inverted-U" shape as stated originally by Kuznets. This does not imply, however, that each particular country would or indeed does follow this trend, or that it is the "natural" pattern of growth and equality for any of them (see footnote (1) at the end of the chapter).

Pulling data from Jain (1975) and Paukert (1973), we present an international comparison of inequality and growth for 76 countries which are divided into 9 groups. Among them is one group of six socialist countries, and eight groups with seventy non-socialist countries, grouped according to their income per capita. The data are presented in table 1.1 and show the income shares before taxes of the first four quintiles and percentiles (80 to 95 and 96 to 100), as well as the Gini Coefficient. In table 1.2 we present the nine group averages as well as two ratios which indicate income inequality: $Q5/Q1$ and $Q5/(Q1+Q2+Q3)$.

One of the conclusions that we can draw from this statistical information is that the socialist countries show a less unequal income distribution compared with that of any of the other eight groups. We must, of course, bear in mind the lack of strict comparability between the data of socialist and non-socialist countries because of the fact that in socialist countries income is composed mainly of wages and salaries due to the socialization of the means of produc-

TABLE 1.1 INCOME DISTRIBUTION IN 76 COUNTRIES: AN INTERNATIONAL COMPARISON

Country and Per Capita Income Level	Lowest 20%	Percentiles of Income Recipients					GINI	Per Capita Income 1970 U.S.\$
		21-40%	41-60%	61-80%	81-95%	96-100%		
Less than U.S. \$100								
Bangladesh (1966-67)	7.9	11.7	15.8	22.3	25.6	16.7	.342	76
Benin (1959)	5.5	10.3	13.9	18.6	20.3	31.4	.342	76
Chad (1958)	7.7	11.6	15.2	20.7	23.3	21.5	.369	70
India (1967-68)	4.7	8.4	13.0	20.8	28.1	25.0	.478	94
Indonesia (1971)	6.8	10.5	13.4	17.3	18.3	33.7	.463	70
Malawi (1969)	5.7	9.3	13.1	19.0	23.4	29.5	.470	64
Niger* (1960)	7.8	11.6	15.6	23.0	19.0	23.0	.340	95
Tanzania (1969)	2.3	5.5	10.1	18.8	29.8	33.5	.597	94
Group Average	6.0	9.9	13.8	20.0	23.5	26.8	.441	79.9
U.S. \$101-200								
Bolivia* (1968)	3.5	8.0	12.0	15.5	25.3	35.7	.530	175
Botswana (1971-72)	1.6	6.0	11.3	20.8	32.2	28.1	.574	132
Kenya (1969)	3.9	5.6	8.8	14.8	20.7	46.2	.637	127
Madagascar (1960)	5.2	7.8	11.0	15.9	19.1	41.0	.562	127
Nigeria* (1959)	7.0	7.0	9.0	16.1	22.5	38.4	.510	130
Pakistan (1970-71)	8.4	12.2	16.0	21.9	24.2	17.3	.330	163
Philippines (1971)	3.9	8.0	12.9	21.2	29.2	24.8	.494	164
Sierra Leone (1963)	1.1	6.1	11.1	18.9	26.6	36.2	.612	150
Sri Lanka (1973)	7.3	12.0	16.1	21.8	24.2	18.6	.353	164
Thailand (1962)	5.7	7.5	11.1	18.2	26.0	31.5	.510	167
Uganda (1970)	6.2	10.4	14.9	21.9	26.6	20.0	.401	127
Group Average	4.9	8.2	12.2	18.8	25.2	30.7	.501	147.8
U.S. \$201-300								
Ecuador (1970)	1.8	3.4	7.3	15.5	29.0	43.0	.683	250
Egypt (1964-65)	4.6	9.5	14.6	22.9	29.2	19.2	.434	202
El Salvador (1969)	3.7	8.7	14.0	22.8	30.2	20.6	.466	281
Honduras (1967-68)	1.6	4.8	9.5	18.8	32.4	32.9	.619	266
Korea (Rep.) (1971)	9.9	13.8	17.3	21.8	22.4	14.8	.272	250
Morocco* (1965)	7.1	7.4	7.7	12.4	44.5	20.6	.500	221
Rhodesia* (1963)	3.2	4.9	8.3	14.4	21.4	47.8	.663	258
Senegal (1960)	3.2	6.2	10.4	17.7	25.7	36.8	.587	205
Tunisia (1970)	4.2	7.2	12.0	21.1	32.0	23.5	.502	260
Group Average	4.4	7.3	11.2	18.6	29.7	28.8	.525	247.3

TABLE 1.1 INCOME DISTRIBUTION IN 76 COUNTRIES: AN INTERNATIONAL COMPARISON (CONT'D)

U.S. \$301-400	7.1	11.6	18.9	25.8	33.7	561	310
Colombia (1970)	2.9	7.1	11.6	18.9	25.8	33.7	310
Piji* (1968)	4.0	8.0	13.3	22.4	30.9	21.4	385
Guyana (1955-56)	4.3	10.3	15.7	23.2	27.7	18.8	323
Irag (1956)	2.1	4.4	8.8	17.8	31.8	35.1	309
Ivory Coast (1970)	3.9	6.7	11.2	19.7	30.1	28.4	324
Malaysia (1970)	3.5	7.7	12.5	20.3	27.7	28.3	361
Peru (1970-71)	1.8	5.5	10.6	19.5	31.2	31.4	302
Turkey (1968)	2.9	6.5	11.0	19.0	27.8	32.8	350
Zambia (1959)	5.4	7.6	11.1	17.7	24.5	33.7	368
Group Average	3.4	7.1	11.8	19.8	28.6	29.3	336.9
U.S. \$401-700							
Barbados (1969)	4.0	10.7	15.8	22.6	26.1	20.8	656
Brazil (1970)	2.4	5.3	9.8	18.0	28.8	36.0	468
Chile (1968)	4.8	8.2	12.2	19.0	24.8	31.0	659
Costa Rica (1971)	5.7	7.3	10.7	17.7	25.6	33.0	525
Gabon (1968)	3.2	5.3	8.8	15.2	22.2	45.3	468
Jamaica (1958)	2.2	6.0	10.8	19.8	31.0	30.2	641
Lebanon (1960)	5.1	7.2	10.8	17.5	24.8	34.6	589
Panama (1972)	4.6	10.6	15.5	21.9	25.2	22.2	646
South Africa (1965)	1.8	4.9	10.2	21.1	38.9	23.1	662
Surinam (1962)	9.3	12.0	15.5	21.2	24.2	17.8	650
Group Average	4.3	7.8	12.0	19.4	27.1	29.4	596.4
U.S. \$701-2000							
Argentina (1961)	6.9	9.7	13.3	19.2	23.4	27.5	984
Finland (1962)	2.7	9.0	14.7	23.2	29.5	20.9	1998
Greece* (1957)	9.0	10.3	13.3	17.9	26.5	23.0	1090
Hong Kong (1971)	5.6	10.0	14.3	21.1	25.7	23.3	747
Israel* (1957)	6.8	13.4	18.6	21.8	28.2	11.2	1655
Italy* (1948)	6.1	10.5	14.6	20.4	24.3	24.1	1585
Japan (1972)	8.2	12.7	17.0	22.8	24.6	14.7	1635
Puerto Rico (1963)	4.6	9.1	14.0	21.9	28.4	22.0	1738
Spain (1964-65)	6.0	10.5	15.4	22.6	27.0	18.5	985
Trinidad/Tobago* (1958)	3.4	9.1	14.6	24.3	26.1	22.5	720
Uruguay (1967)	4.4	9.8	15.2	23.1	28.5	19.0	809
Venezuela (1971)	2.7	5.5	9.6	16.8	24.9	40.5	932
Group Average	5.5	10.0	14.5	21.3	26.4	22.3	1239.8

TABLE 1.2 INCOME DISTRIBUTION BY GROUPS OF COUNTRIES: AN INTERNATIONAL COMPARISON

Income	No.	Q1	Q2	Q3	Q4	Q5	P81-95	P96-100	Q5/Q1	Q5/(Q1+Q2+Q3)	GINI
Below 100	8	6.0	9.9	13.8	20.0	50.3	23.5	26.8	8.38	1.69	.441
101- 200	11	4.9	8.2	12.2	18.8	55.9	25.2	30.7	11.41	2.21	.501
201- 300	9	4.4	7.3	11.2	18.6	58.5	29.7	28.8	13.30	2.55	.525
301- 400	9	3.4	7.1	11.8	19.8	57.9	28.6	29.3	17.03	2.60	.533
401- 700	10	4.3	7.8	12.0	19.4	56.5	27.1	29.4	13.14	2.34	.515
701-2000	12	5.5	10.0	14.5	21.3	48.7	26.4	22.3	8.85	1.62	.422
2001-3000	8	5.1	10.8	15.9	23.2	45.0	27.1	17.9	8.82	1.41	.397
3001-More	3	5.3	11.2	16.4	23.9	43.2	27.4	15.8	8.15	1.31	.379
Socialist	6	9.9	14.5	18.3	23.1	34.2	22.9	11.3	3.45	.80	.244

Note: Q1 represents the income share of the first quintile, Q2 the second, etc.

Source: Calculated from Table 1.1.

tion. On the other hand, considering only the non-socialist countries, the data provide a clear answer regarding the question of whether there is greater income inequality in developed or developing countries. The Gini Coefficient of 54 countries with less than US\$1500 (1970) is estimated to be .497, while the Gini Coefficient for countries with income per capita over US\$1500 is .391. The main reason for this difference is the high share of income received by the richest 20%, and particularly the top 5% in developing countries, 28.6%, as compared to 17.7% in developed countries.

Considering the eight non-socialist groups, we observe that the "inverted-U" shape holds for the 70 countries presented: the Gini Coefficient increases from .441 to .533 (the average value of the group of countries with income per capita below 100 and between US\$301 and US\$400 respectively), and then decreases to .379 (for the group with income per capita above US\$3001). The same pattern is observed if we consider the other two indicators $Q5/Q1$ and $Q5/(Q1+Q2+Q3)$.

Even though the Kuznets' hypothesis is partially proven, it hardly implies that the pattern of each country will follow it. There are however, several questions which need to be answered, namely: What forces are involved in creating a particular pattern of growth and equality?; Why is it that at each level of development there are some countries whose income distribution pattern is in sharp contrast to the pre-

vailing pattern?; and, What are the factors causing some countries to deviate from this pattern? In order to answer these questions, many theories have been formulated and many studies carried out, the most important of which are reviewed in the next two sections of this chapter.

1.2 INCOME DISTRIBUTION THEORIES

The purpose of this section is to review the most popular theories of personal income distribution that have been used to explain the observed distributions found in empirical studies. The majority of personal income distribution theories attempt to explain the observed facts found in many countries, and try to answer two particular questions raised in most studies: (a) Why do the distributions have a positive skewness, with the upper tail of the distribution usually well-fitted by the Pareto distribution?, and (b) Why do the dispersion and skewness of the income distribution vary among different countries and over time, within particular countries as well as across sectors, occupations, regions and age groups?

A sound and complete theory should provide a solid guide to understanding the mechanics of the generation of personal income distribution in all countries. Among the long list of theories attempting to do so we find two gener-

al types: the microeconomic and the macroeconomic theories of income distribution. Microeconomic theories take the approach of explaining income distribution on an individual basis, considering the variables (economic or other), that affect the generation of income of each individual. Macroeconomic theories, on the other hand, consider the variables (economic or other), that affect the generation of income at the aggregate level: national, regional, sectoral, etc..

Although most of the theories have been exposed to empirical tests, and have been used in several countries, we shall evaluate them, taking into account their relevance to developing countries in general, and in particular to the Mexican case. The evaluation will consider how well the theories lend themselves to an understanding of the generation of income distribution and the identification of the structural variables that could be changed for the purpose of redistribution. In the first part of this section we review the microeconomic theories of income distribution, while concentrating on the macroeconomic theories in the second. We conclude the section with some remarks as to the relevance of income distribution theories to developing countries.

1.2.1 Microeconomic Theories of Income Distribution

Within the theories attempting to explain personal income distribution from the individual point of view, we find that a great number of factors have been considered. In all cases the factors considered attempt to explain earnings and investment income, the former being the payment for labour, the latter covering the factor capital. In most cases the theories concentrate only on the supply side of the market, i.e., on the sale of the factors of production owned by the individual, without considering either demand or the institutional forces which influence the market. Under these simplistic assumptions, the agent becomes a price taker, and is able to sell all the desired quantity of labour (defined as well as human capital) and physical capital. In this way the income generated by each individual is determined by the ownership of the factors of production, and the income distribution depends solely on the distribution of the factors of production, i.e. $Y = f(h, k)$.

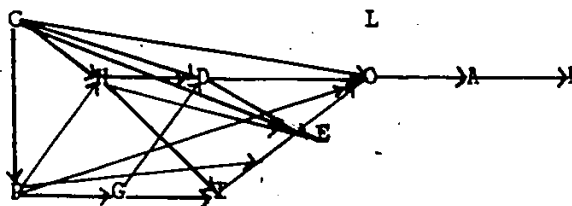
Based on this simple approach, we can review those theories which emphasize a) earnings, b) investment income, and c) both a) and b), along with certain institutional factors (2).

A) Earnings Distribution

i) Socio-Cultural (Institutional) Factors

Earnings have been studied from different points of view, at times considering the socio-cultural or institutional factors that could play a role in determining an individual's opportunities when competing in the labour market; or at times considering the abilities that the individual has acquired, either innately or through education or training.

A good summary of this approach is given by Lydall (1976), where he summarizes the ideas presented by other authors, who use only one or several socio-cultural variables (e.g. the influence on income distribution of genetic endowment (IQ), race). Lydall has taken into account many of these factors in order to explain the skewness and dispersion of income distribution. He identifies the following factors which are likely to influence the distribution of earnings of employees: age, sex, race, religion, geographical location, education, occupation, abilities of various kinds and degree of managerial responsibility. The interrelationship of these factors is presented below (Lydall, 1976, p.29).



The letters represent the factors likely to influence earnings: C for cultural influences → national, social, religious, racial; P for parental characteristics, genetic and cultural, including socioeconomic status; G for genetic endowment; H for home environment; I for cognitive ability (measured through IQ); D for D-factor drive, dynamism, determination, doggedness, energy, self-discipline; E for education and full-time training; O for occupation; A for age, a proxy for such factors as experience, learning by doing, and on-the-job training, as well as for the effects of changes in ability, health, and strength; R for responsibility or hierarchy effect; and L for luck, both permanent and transitory, affecting all factors except C and P.

Lydall adds that if it is accepted that all the above-mentioned factors affect earnings, either directly or indirectly, it is then possible to offer a simple explanation for the shape of the observed distribution, although not for its absolute variance. The explanation given states that since a number of the factors are likely to combine multiplicatively rather than additively (due to the fact that many of them are positively skewed), there are ample grounds for expecting the distribution of earnings to be po-

sitively skewed. Lydall believes that the R-factor can account for the Pareto-like upper tail "Hierarchy effect", considering that if managerial hierarchies are built on the principle that each manager directly supervises the same number of people in the next rank below him, and if his earnings bear a constant proportion to the aggregate earnings of those whom he directly supervises, then the distribution of earnings of managers will conform to Pareto's Law (Pareto's Law is studied in detail in chapter two).

Along these lines, Brittain (1977) suggests that one cause of the inequality of income is the degree of privilege conferred by one's socioeconomic background and other parental influences. At the same time, it is believed that human wealth, or earning power, may be due in large part to the process of inheritance, both explicit and implicit; and that individuals have different advantages and handicaps in the race for success in life, since every child starts with the economic status of his parents. Ability, upbringing, initiative and luck all affect the outcome of the race, but the influence of an individual's starting position persists throughout his life. Brittain also considers that there are two other key and related influences, educational attainment and the marital selection process.

The findings of the study show a strong influence of the socioeconomic background on the economic status of both men and women, and a substantial effect of educational at-

tainment, independent of background. The implications of these findings are two-fold: (a) that the strong role of inherited advantage and disadvantage strengthens the case for the redistribution of rewards, to moderate that component of inequality which is due to circumstances over which the individual has no control; and, (b) that the indicated independent effect of education, though subject to more qualifications, suggests that policies designed to equalize educational attainment may yet prove more effective in reducing inequality than indicated by recent experience.

ii) Human Capital Theory

The human capital theory takes a different approach, with emphasis on education as the main factor explaining earnings, thereby rejecting the possible role of institutional factors such as ability, family background, age, or market imperfections, while at the same time not assigning any importance to chance as a possible explanatory variable. In essence, this theory assumes that each individual invests in himself a quantity (measured in dollars) of training and education such that the marginal rate of return on investment equals the marginal rate that must be paid to obtain funds.

Becker (1975), Mincer (1976) and Thurow (1975) have been the major exponents of this approach, where the models built have shown in empirical studies the close relationship between the number of years of schooling and the level of

earnings. The models are constructed assuming that a young individual (individual A), after basic education, has an economic ability to produce. At this point, individual A can commence work with an income corresponding to his productive ability; can begin full-time education with no earnings during the educative program, along with certain extra expenses such as fees; or can forego part of the income by accepting employment which provides on-the-job training, the foregone income being equal to the training cost if it is a general (i.e. useful in any other firm) training program. There is also the possibility of receiving specific on-the-job training with no foregone income. The individual can stop the training at any time and enter the labour market with an income that will cover not only his foregone earnings and actual expenses, but also the accumulated interest of these costs, compounded at the rate of return of the particular individual.

A number of criticisms can be made of this approach, but perhaps the most obvious is the difficulty of accepting a theory which considers only the supply side of a market. At the same time, it assumes that every worker knows all present and future facts about the perfect, and always in equilibrium, labour, education and capital markets. This knowledge is used in order to make a decision about how much education or on-the-job training will maximize the present value of the individual's future earnings, using the market rate of return.

iii) Stochastic and Ability Theories

The stochastic theories rely on random effects, or chance, to explain income distribution. Recently, however, there has been a change of approach involving the use of stochastic models. The origins of this approach date back to Gibrat (1931) in order to provide a stochastic foundation to the lognormal specification as a model of income distribution. The purpose behind this approach is to represent the positively skewed distribution through the use of a probability distribution function. Due to the fact that the lognormal distribution was a "good" representation of the observed distributions (3), it created the need for a theory explaining the lognormal shape of the distribution.

With this objective in mind, several theories have been presented, most of them related to the distribution of abilities. The origin of the ability theory may be traced to the seminal paper by Boissevain (1939). This theory was later integrated into what is known as the doctrine of "non-competing groups", created by social, legal, inherited ability and other barriers to labour mobility. It provided support for the idea that differences in workers' productivity and hence their earnings were due to differences in abilities. It was believed that abilities (mental and physical) were distributed normally, just as various physical traits, such as weight and height of the human body were distributed normally. A natural inference from this was

that incomes were also distributed normally, however statistical evidence did not support it. It did, though, provide the basis for a theory explaining the lognormal shape. The logic of the theory is that since the lognormal distribution is the result of multiplicative random effects (4), and considering that there are many factors that could affect income distribution (including ability), then a large number of small multiplicative random effects would tend to produce a lognormal distribution, while a large number of small additive random effects should tend to produce a normal distribution.

More recently, the use of stochastic processes has changed from the use of the lognormal and the multiplicative random effects to the representation of the observed distribution with probability distribution functions. From a well-fitted income distribution model certain income inequality indicators are derived, representing the income distributions of sectors, regions or socio-cultural characteristics. Income inequality indicators are the representations of phenomena that must be explained by a theory that analyses the generation of the income distribution observed.

The lack of a complete theory however, has not been a barrier for some authors to use regression analysis in order to "explain" the changes in income inequality indicators with regressors such as the rate of inflation, rate of

growth of GNP, rate of unemployment, expenditure in education, etc.. Thurow (1970), Metcalf (1972), Salem and Mount (1974), inter alia, have used this procedure for the analysis of income distribution in the U.S.A., and Bartels (1977) has used it for the Netherlands. While we believe that the regressors used have an impact on the distribution of income in a direct or indirect way, the lack of a theoretical framework to explain these relationships makes the interpretation of the partial regression parameters difficult if not meaningless. This is even more important when the objective is to propose income redistribution policies or strategies.

B) Investment Income Theories

It is the belief of some authors that the most likely factors that perpetuate economic inequality are intergenerational transfers and independent accumulation. This means that the explanation of investment income through wealth distribution within a society would give us a better idea as to why income inequality reaches certain levels. Brittain (1978) has studied the factors underlying wealth inequality, dividing them into two types: inheritance (intergenerational) and independent accumulation. Inheritance includes both gifts and bequests, and the going rate of return on them. He does not consider intragenerational transfers to be important, since a bequest by a deceased male to his widow is not viewed as affecting the distribution of wealth. Independent accumulation can be of two types, saving out of

earnings, and the going return on it, and extraordinary returns on investment. —

After reviewing several studies and using data for the United States and the United Kingdom, Brittain concludes that the role of inheritance is important in the accumulation of wealth of moderately wealthy to very wealthy men. At the same time, after reviewing the studies based on some aspects of the life-cycle hypothesis, invoked by some to suggest that wealth inequality may be due in large part to the wealth-age relationship, it is concluded that these studies do not succeed in seriously downgrading the role of inheritance in wealth building.

Brittain concludes that in general there is no solid evidence that routine saving of earnings has much to do with the generation of large fortunes, and adds that it appears more likely that the larger fortunes are built primarily out of extraordinary rates of return and capital gains on rare and highly successful ventures, as well as intergenerational transfers. The conclusion is that while extraordinary gains and intergenerational transfers are difficult to separate, both are probably more important than routine life-cycle saving in generating the large share of the top wealthy ranks.

In particular, the idea of using savings as a variable to explain income distribution has been summarized by Reder (1969), where the rate of savings would determine if the

wealth and income of an individual would grow faster or slower. The mechanics behind this assume that at some initial moment (t_0), there is a given stock of wealth and a given distribution thereof among wealth-owning units. The wealth is valued at a given set of competitively determined long run prices that remain unchanged throughout the time period under discussion. The i th recipient's wealth at t_0 (w_0^i) will accumulate at a rate $w_0^i [1 + r^i - c^i]$, where r^i is the rate of return, and c^i the rate at which the individual consumes his wealth. Where $r^i = c^i$, the recipient's wealth will be constant over time. In this way, if some individuals have higher a 's ($a = r - c$) than others, their wealth and income will grow faster. This, however, is quite a simple explanation of savings as a determining variable of income.

C) The Vita Theory

A more complete microeconomic theory of income distribution, attempting to introduce all the micro factors used to study personal income distribution, was presented by Canterbury (1979) through the so-called Vita theory. This is an integration of labour market theory, a modified human capital theory, and the results of the discrimination and migration literature. The theory assumes that one labour market exists for each general human capital classification, and the individual's quantity of human capital determines which labour market the individual enters. An individual

"qualifies" for a particular labour market by the state of his or her vita at that point in time. In this way, the Vita theory is a description of the process by which individuals attempt to move towards a higher income. With a noncompeting labour market for each human capital type, placed in rank order (beginning with the highest expected capital return, the individual can potentially move to a significantly higher income interval by changing his or her vita, and then shifting from one occupation or labour market to another. Such shifts nonetheless often involve discrete changes in capital as well as barriers to entry and discrimination.

Labour supply is determined by several factors influencing the human capital of an individual throughout his or her life. The factors introduced to explain human capital are $k = f(G, h, S_1, S_2, S_3, E, r)$, where G is the genetic code including IQ, sex, race and initial state of health; h is the number of hours worked; S_1 is the number of hours of education within the sole control of the individual; S_2 is the number of hours of schooling provided by the state; S_3 is the number of hours of initial on-the-job training within the sole control of private industry; E is the family environment conducive to earnings potential; and r the number of years of experience.

Canterbery considers that there is a labour market for each human capital type (HC_1) in each region (j): having 1

to n types of HC's and 1 to D regions, defined by the geographic limits set by a reasonable community service. In this way all labour markets are represented by a partitioned row vector HC' :

$$HC' = [HC1_1 \quad HC1_2 \quad \dots \quad HC1_n ; HC2_1 \quad \dots \quad HC2_n ; \dots \quad HCD_1 \quad \dots \quad HCD_n],$$

in which n general human capital types are matched with n labour markets in D geographic areas, for a total of $n \cdot D$ labour markets. The labour supply in any geographical area can be identified as unionized, licensed, or non-controlled, having an effect on the wage rate in the first two cases, either by controlling the supply of labour or negotiating a wage rate floor for its members.

In each particular market, the labour supply is equal to the number of available vita that match requirements for that market, i.e.,

$$V = [V1_{1n} \quad V1_{2n} \quad \dots \quad V1_{\gamma n} ; V2_{1n} \quad \dots \quad V2_{rn} ; \dots \quad VD_{1n} \quad \dots \quad VD_{sn}].$$

The n th HC-type labour supply is γ in quantity in area 1, r in 2, and s in D , with an s by n matrix of labour force population in area D . There are numerous zero elements available to be filled by new entrants.

On the other hand, the quantity of HC_1 demanded is determined by a specific proportion of total output of product j : $Z_1 = \sigma_1 q_j$; and if HC_1 is paid its value in production, the wage rate is $W_1 = \sigma_1^{-1} p$, where p is the price of the product or service produced. These definitions consider that in the short run the state of technology, industrial

competition and product prices (P 's) are given. Technological progress can directly alter the demand for a particular labour type by changing labour quantities requirements. In general, the wage rates are given in a partitioned vector, π with π professional labour market wages, m managerial wages, v craft union wages, p industrial union (administered) wages, and n residual wages of the unskilled and nonorganized.

The Vita theory also assumes that when a differential of wages between regions exists for the same type of human capital, this will partially explain migration, according to some studies attributing between 50 and 70% of migration to a purely economic motive.

After the consideration of all these elements, an income generating function for the J th individual is proposed: $Y = h \cdot w[k, K, p, m(k, K, \theta), M(EN, K, k), R]$. In this case w is the personal capital rate; h is the number of hours worked; k is the human capital; K is the non-human capital determined by I_0 (initial endowment) and savings; p is the average price of the product or service produced by this individual's labour (or expected price); m is an index of mobility depending on k , K and θ , θ being a variable that measures risk and uncertainty regarding income opportunities at alternative geographical locations; M is an index of monopolistic power that would equal zero for individuals with ordinary or average human and non-human capital endowments

under free entry conditions. M depends on EN , k and K , EN being an index of entry in which larger values represent ease of entry; and R is a discrimination (racial, sexual, ethnic and others) index. The personal income partials of this income generating function are:

$$(\partial y / \partial k) > 0$$

$$(\partial y / \partial K) > 0$$

$$(\partial y / \partial p) > 0$$

$$[(\partial y / \partial m) \cdot (\partial m / \partial k)] > 0$$

$$[(\partial y / \partial m) \cdot (\partial m / \partial K)] > 0$$

$$[(\partial y / \partial m) \cdot (\partial m / \partial \theta)] < 0$$

$$[(\partial y / \partial M) \cdot (\partial M / \partial EN)] < 0$$

$$[(\partial y / \partial M) \cdot (\partial M / \partial k)] > 0$$

$$[(\partial y / \partial M) \cdot (\partial M / \partial K)] > 0$$

$$(\partial y / \partial R) < 0$$

Canterbery concludes, after testing his theory with U.S. data, that the acceptance of the Vita theory raises profound social and economic questions. The crucial and cumulative impacts of the initial state conditions suggest that a program of equal schooling for "equal opportunity" may leave income distribution virtually unaltered, even while contributing to economic growth. Thus, more equal distribution could only be achieved by such direct redistributive policies as an inheritance tax proposal or negative income tax.

1.2.2 Macroeconomic Theories of Income Distribution

History of economic thought tells us that one of the very first problems studied by economic theory was income distribution within a macroeconomic context, and in fact, many economists would still argue that the subject is an essential part of the core of the discipline. Dealing with this problem, a number of alternative theories of functional income distribution have been developed, most of them belonging to the core of several schools of economic thought, i.e. the Classics, the Marxists, the Neoclassics and the Keynesians. In all cases we observe them with different approaches, variants and offsprings. There is in all of them, however, a lack of a clear connecting theory of the functional to the personal income distribution (5). This factor alone should be reason enough to leave these general theories out of our review, yet other economists, such as Cline (1975), have also argued that the theories would be of dubious use in explaining personal income distribution in developing countries. Hereafter therefore, we review the theories of personal income distribution considered to be the most influential in the literature, most of them related to the reality of developing countries.

A) The Kuznet's Hypothesis and Dual-Surplus Labour Models

Kuznets (1955) has argued that at least two groups of forces are combined in such a way that inequality is likely



to worsen in the early stages of growth and only later begin to improve again. The first group relates to the concentration of savings in the upper income brackets, producing a greater proportional accumulation of assets by the rich than by the poor, assuming that only the upper income groups save. A skewed distribution of savings represents at the same time a skewed distribution of property incomes and assets. The second group of forces relates to the structure of income distribution by industry, which shifts the trend towards inequality. This conclusion is reached by Kuznets after taking into account that growth is accompanied invariably by industrialization, and assuming that the average income per capita of the rural population is usually lower than that of the urban, and that inequality in the distribution for the rural population is somewhat narrower than is that for the urban population. These two groups of forces tend to concentrate distribution over time, up to a point where the reversal starts, once the country achieves maturity, and the low income groups become politically strong enough, first to stabilize, and then to reduce income inequalities. Below we review several empirical studies which attempt to prove Kuznet's hypothesis.

For several years during the fifties and sixties, the dual-surplus labour models provided an explanation of economic development in the LDC's. These types of models, originally developed by Lewis (1954) and Fei and Ranis

(1964), have been strongly criticized from many different angles (6), yet they remain a way of explaining personal income distribution in developing countries. Lewis has indicated that income distribution would become more concentrated with growth, because the profit share was assumed to be greater in the modern sector than in the traditional one, and the weight of the modern sector would rise over time. Cline (1975), however, remarks that once one considers the distribution of income among poor traditional sector workers and more affluent modern sector workers, it is quite possible for the overall distribution of income to improve with growth, in spite of the secular rise in the share of modern sector profits in aggregate income.

Cline adds that the withdrawal of traditional sector labour in the face of constant traditional sector output (under the strong assumption of zero marginal product of labour) will raise traditional worker income relative to modern worker income, and under reasonable conditions, can raise the total income share relative to the population share for the poorest (traditional sector) class. From this critique we can conclude that the secular trend of personal income distribution under surplus labour conditions is indeterminate in the absence of specifications of the case.

Within the current of the dual-surplus labour theory, there have been several offsprings. One of the most recent models has been proposed by Webb (1977) and Frank and Webb

(1977b). With this model, constructed primarily to explain income distribution in developing countries, the authors conclude that contrary to the idea of having an eventual end to surplus labour and equalization of opportunities and income, there is a trend to increase the distance between the two sectors (modern and traditional), increasing the existing inequality. The model works with urban and rural sub-sectors, and assumes an infinitely elastic supply of labour from the traditional to the modern sector. It also creates a growing concentration of income due to the growth of wages in the modern sector and subsidized credit and overvalued currency, which encourage capital intensive modes of production in the modern sector.

The elements explaining the growth of wages are determined by increased unionization and the political strength of labour groups, an increase in the supply of skilled and educated labour, and imported technology demands for skilled workers. In this model, government plays an important role through the incidence of direct taxation on income, the incidence of government expenditure and the role of government as a productive agent. In the last case the government exercises a strong influence on labour markets through the wage levels and fringe benefits offered to workers.

Another modified version of the dual-surplus labour models is presented by Ahluwalia and Chenery (1974). They recognize that labour is available from the traditional

(subsistence) sector for employment in the capitalist sector. The model distinguishes small scale capitalists, i) farmers and ii) small businessmen, from iii) larger-scale producers using more capital and modern technology, contrary to the simple distinction between the modern and traditional sectors in familiar surplus labour models.

The model takes into account some of the more important features affecting distributional patterns in underdeveloped countries, among them: a) the dualistic nature of production in developing economies, in which capitalistic modes of production characterized by the use of hired labour coexist with traditional modes characterized by self-employment and family labour; b) the concentration of the ownership of capital, which is generally more extreme than the concentration of income; c) the differential access of socioeconomic groups to employment possibilities and therefore to wage incomes generated in the capitalist sector (these differences may reflect geographical and social barriers to mobility or differences in educational and skill characteristics); d) the differences in savings behaviour of different socioeconomic groups, which reinforce concentration patterns in assets over time; and e) the differences in natural rates of population growth between different socioeconomic groups.

The linkages among the three groups in the model (i, ii, and iii) show the incomes of the poverty groups as being

determined by wages from the modern (high income) sector, wages from small-scale producers, self-employment income (based on their own stock of physical and human capital), and net transfers from the rich via the fiscal system. A combined effect of policy on all these elements determines the net effect upon the incomes of the poorer groups.

B) Theoretico-Empirical Studies

There has been an increasing number of theoretico-empirical studies of income distribution (7) carried out for particular countries or with international comparisons. These studies are time series, cross-country or a combination of both, and attempt to determine a pattern that would aid in an understanding of the behaviour of income distribution. Among the cross-country studies we find that Kuznets (1963) indicates that the size distribution of family income is more unequal for underdeveloped than for developed countries, although the degree of difference has generally been found to be much greater towards the top of the distribution. Adelman and Morris (1971), with a compilation of 44 developing countries, examine the "inverted-U" curve, relating inequality to per capita income. They find a statistically significant inverted-U pattern with a low R of .12, despite statistical significance of the coefficients. The regression estimated is $I = 7.23 + 0.0258Y - 0.000014Y^2$; where I is a measure of inequality: the ratio of the income share of the top 20% to the bottom 20% of recipients; and Y

is the 1970 per capita income in dollars. Adelman and Morris, applying a statistical technique in order to differentiate the countries in two groups - more concentration and more even distribution - use 31 socioeconomic variables. They find that the most important ones are: a) an index of equality of access to secondary and university education (favouring equality); b) natural resource abundance (favouring concentration at the top); c) the government share in investment (with a large share shifting income from the top to the middle classes); and d) the extent of dualism (with greater dualism associated with greater concentration). The study, in spite of a good statistical treatment for many countries and identification of relevant variables, lacks a complete theory relating the socioeconomic variables introduced in the research.

The time series studies, on the other hand, for one or several countries, have concentrated on Kuznets proposition of a particular evolution of distribution over time: the worsening and then improving level of inequality according to the economic growth of a country. The conclusion arrived at is that the time series data cast strong doubt upon the worsening and then improving hypothesis, which appears to hold only if cross-section data alone are used. The studies considered include Brazil in Fishlow (1972); Argentina, Mexico and Puerto Rico in Weisskoff (1970), and thirteen developing countries in Ahluwalia (1974).

We could say that even when these kinds of empirical investigations are informative and may, under many assumptions, shed some light on the possible evolution of distribution for groups of countries, they are not particularly useful if one is considering the analysis of income distribution with enough depth to propose income redistribution policies for a particular country.

C) The CEPAL-PREALC Approach

In contrast to these strictly statistical investigations, there is an approach which takes into account the technological structures and differentiated labour markets, in order to explain employment and income distribution in Latin America. This approach has been developed by CEPAL (Comision Economica para America Latina - Economic Commission for Latin America, United Nations) and PREALC (Programa Regional del Empleo para America Latina - Regional Program for Employment in Latin America, International Labour Organization). The CEPAL-PREALC studies offer a theoretical-empirical framework, explaining the different coexistent productive structures (structural heterogeneity), the labour markets associated with them, and the concentration of income resulting from this type of economic structures observed in most countries in Latin America.

According to Di Filippo and Jadue (1976), the concept of structural heterogeneity dates back to the first studies of CEPAL in 1949 and 1952. The concept represents a situ-

ation where economic sectors have different levels of productivity and "modernity" both among and within them, with complex ties of exchange, domination and dependence within the national socioeconomic structure (8). This situation differs from the dual case, where modern and traditional structures coexist with little exchange and influence between them.

The differentiated structures, measured through levels of productivity, reflect the levels (speed) of absorption of technical progress over time. Thus, in the same economy it is possible to find techniques of production that range from primitive agriculture to modern manufacturing plants, as if they were in an advanced economy. The great number of technological strata can be grouped, for analytic purposes, into primitive, average, and modern. The levels of productivity and income are lower, equal or higher than the national average. In the last case we find the industries and services with productivity similar to the average of the modern economies. This view of the economy differs from the dual model's view, mainly because technological progress is assumed to be generated and concentrated only by the modern sector, increasing the gap or heterogeneity, rather than decreasing it as is assumed by the dual-surplus labour models.

On the other hand, PREALC (1974), using the experiences of several studies carried out by the ILO in various African and Latin American countries, following the framework

developed by CEPAL, as well as introducing, for a realistic analysis, the key elements of population growth and rural-urban migration, is able to propose a model explaining economic growth, employment and income distribution. In order to perform the analysis of an economy with heterogeneous labour markets there is a segmentation of the economy into urban and rural, with two kinds of labour markets in each case: the formal modern urban sector market (MUS); the informal urban sector (IUS); the traditional rural sector (TRS); and the modern rural sector (MRS).

In the MUS the labour market concentrates the demand for labour on the organized, highly technical enterprises and the supply of educated, trained people, including professionals. The IUS includes the labour demand of the small companies, with low productivity and using simple technological processes. The TRS concentrates on those with small farms, and the landless (jornaleros), having low income levels; the poverty and income differentials of this sector with respect to the MUS and IUS cause the permanent rural-urban migration. Finally, the MRS includes the labour demand of larger farms working with or without advanced technological processes. It is assumed that this sector works with characteristics similar to the modern urban sector.

Infante (1981), following the same approach as the CEPAL-PREALC studies, examines the relationship of the wage level in the four sectors of the economy, arguing that there

is a close relationship among them. In this case, the informal urban sector market is the key element in explaining the relationship. The MUS works with a "labour reserve" in the urban area, which pulls the wage level to the productivity of the informal urban sector. The wage level of the IUS becomes an adjusted variable of that market, where the market size, and the number of workers outside the MUS, from urban and rural areas determines the wage level. This is in turn closely related to the productivity of the traditional rural sector.

1.2.3 Summary and Conclusions

We consider that the list of studies presented, aimed at explaining, theoretically or empirically, personal income distribution, are either partial, or contain assumptions which do not conform to the Mexican reality. Among the micro theories we find that those explaining earnings (such as those considering institutional factors, human capital theory or the stochastic-ability theories), or those explaining investment income, are only partial theories which, even when potentially relevant in some cases, would still omit some factors. The Vita Theory, we believe, would be useful in underdeveloped countries if one is interested in understanding the mechanics of the generation of income of particular groups in the economy. This, of course, would aid

in the formulation of policies, aimed perhaps at regions or identified target groups.

At the same time the objective of the macroeconomic studies reviewed indicates a preference to deal with: a) the hypothesis of a "predetermined" national pattern of growth - testing the Kuznets hypothesis - with the obvious implication of non-intervention in the economy to correct the outcome, in terms of the benefits received by growth; and b) the construction of theories, some more complicated or general than others, aimed at explaining the generation of income for groups of people, introducing aggregated variables. Among these theories we consider that the CEPAL-PREALC approach provides us with a framework of analysis closer to the Mexican reality than do the others. It allows us to introduce key elements for the understanding of the Mexican economy, such as population growth, rural-urban migration, labour market conditions, the heterogeneity in the productive sector, capital formation, etc., all of which certainly play an important role in the generation of income distribution.

Clearly there is a lack of a complete theory that considers both the microeconomic and macroeconomic variables in order to explain the generation of the distribution of income. The problem becomes even greater when we take into account the particular conditions of Mexico over the last several decades and in the years to come. We do, however,

believe that for our objectives of income distribution and redistribution for Mexico, we could consider the CEPAL-PREALC approach as a base, keeping in mind the need for a more complete theory.

1.3 INCOME REDISTRIBUTION AND GROWTH

A large number of studies has been done studying changes in income distribution. Some of these have concentrated on the effect that equalization would exert upon growth, either through empirical-theoretical studies or through the mere simulations of redistribution, produced by means of certain specific policies or by hypothetical changes. We review this type of studies in section 1.3.1. In section 1.3.2 we present the general models of redistribution found in the literature, while in the following section, 1.3.3, we study the large list of policies and strategies that have been proposed for income redistribution. The distinction made in the literature concerning policies and strategies is based on the idea that a strategy is a set of policies intended to fulfill specific objectives and ends (9). In the last part of the section, 1.3.4, we present a summary of the conclusions reached about income redistribution and economic growth in developing countries.

1.3.1 Effects of Redistribution on Growth

We have seen above (1.2.2) that it is not quite clearly convincing which pattern a country has to follow in terms of income distribution along the economic growth path. If, however, it is assumed that income concentration increases in the early stages of growth, there follows the question about the effects of equalization on growth. Along these lines there have been several types of studies carried out (10). Some analyse the effects of redistribution on savings and from them the effects on capitalization and growth, as well as the effects that the redistribution would bring in the composition of the aggregate demand.

These types of studies fix hypothetical levels of equality, and from there analyse the growth effects, combining saving functions, detailed consumption functions for demand profiles by income class, input-output relationships, and factor coefficients by sector. The logic behind this is that since redistribution would raise the weight of basic goods and lower that of luxury goods in total demand, there may be induced growth effects of equalization due to the differential a) import propensities, b) economies of scale, and c) factor requirements among sectors. Among several authors following this approach, Cline (1972) has performed a study for several Latin American countries, including Mexico. More recently, several studies for Mexico and others for different Latin American countries have been carried

out. Cline (1972) as well as three other studies are reviewed in section 3.1.

Within this same framework of simulation studies, there are a number of works focussing on the distributional impact of policy instruments and strategies, rather than on the growth effects of a somehow exogenously imposed redistribution. The purpose of these studies is to determine the impact of a variety of instruments on income distribution through a general model (Ahluwalia and Chenery, 1974), or through the representation of a particular economy as Adelman and Robinson (1978) perform with the Korean case.

Adelman and Robinson use a dynamic computable general equilibrium model, reaching solutions by *tatonnement* in a three-stage process, and determining the impact on the relative and absolute incomes of the poor and on the levels of inequality through various policy combinations. The policy combinations combine urban, rural and urban-rural policy packages (programs) with instruments grouped into ten areas: relative factor prices, relative product prices, technology, direct rationing of products and services, direct rationing of the factors of production, direct transfers, public works, inflation, redistribution of wealth, and intergenerational transfers. The effectiveness of the programs, 26 in total, is classified according to the changes in three indicators: the income of the bottom decile, the percentage of households in poverty, and the Gini Coefficient. The rating

of the strategies ranges from harmful to ineffective, effective, moderately effective and very effective, rating among the most effective a program directed towards the rural area, an employment creation program and a combination of both.

This is indeed a very complete study, concluding that the use of single instruments in an isolated way will not effectively change income distribution in a country, and that, to be effective, a policy package must necessarily involve substantial changes in the distribution of national income, wealth and power.

1.3.2 General Models of Income Redistribution

Before considering the study of general models of income redistribution (11), we can classify the objectives of income redistribution into four different types: 1) elimination of poverty; 2) reduction of inequality; 3) maximization of the weighted average of the growth rates of different income groups (the Ahluwalia-Chenery approach: $G = w_1 g_1 + w_2 g_2 + w_3 g_3 + w_4 g_4$, where w_i are the weights of the groups and g_i their rate of growth of income); and 4) GNP growth maximization with an income distribution such that the weights are the shares in national income.

Using the weights approach, we can represent the first objective, elimination of poverty, if we assume

$w_1 = w_2 = w_3 = 0$ and $w_4 = 1$ (we assume the 4th group as the poorest members of the society). In this case all the surplus of the economy is directed towards the elimination of poverty. We can represent the second objective with $w_1, w_2 < w_3, w_4$, meaning that the shares in the national income have less weight at above average, and more weight at below average income.

We can associate these objectives with four general models of income redistribution, representing complete forms of growth and distribution. The first one is called the "High Growth-Trickle Down" model, which assumes that economic growth eventually spreads benefits and reduces income disparities. This model pursues objective four of high growth with conventional weighting, and thus also aims at achieving objective one, of eliminating poverty, as a consequence of raising absolute incomes throughout society, including the incomes of the poorest.

The second model is known as a Radical Redistribution that could eventually follow the socialist model. This model initially redistributes all existing assets (i.e. through land reform), nationalizes industrial property and makes radical reforms of institutions (i.e. education, health). Eventually incomes are determined directly and separately from productive decisions, and rationing becomes the principal distributive tool. The objectives achieved through this strategy are the elimination of poverty and the reduction of inequality.

The third model is an Incremental (at the margin) Redistribution, where some policies are used with no real impact. Due to opposition against the radical form of redistribution, the incremental redistribution is often recommended as a less drastic alternative. Given the need to alleviate poverty, incremental redistribution proposes taxing the better-off to redistribute to the worse-off. This has been the policy in many countries for many years, rarely having marked effects on the distribution of income.

The fourth model, called Redistribution Through Growth or Growth and Equity, involves taking the extra income that would accrue to the better-off and redirecting it to the poor. This approach originates with the ILO-World Bank (12), with the objective of improving income distribution in developing countries by providing investment resources to the poor; thus, the redistribution would give them a permanent source of income rather than merely a temporary increase in consumption. This model corresponds to objective three (raising the growth rate of the incomes of the poor) meaning a lower rate of growth of incomes at the upper end, and a higher rate of growth at the lower end, without any absolute reduction of income as occurs in other forms of redistribution.

To be successful, this model requires that the policy not significantly reduce the growth rate of GNP. Based on this assumption, Stewart and Streeten (1976) criticize it

because of the improbability that such redistribution could occur without seriously affecting the growth rate, and because the policy is probably as politically unrealistic as the earlier forms of redistribution. To support this claim they mention that the specific recommendations for Kenya (ILO, 1972) have not met with any serious attempt of implementation.

1.3.3 Policies and Strategies of Income Redistribution

A) A Summary of Policies

Out of the many strategies generally used to redistribute income we find a long list of policies that combine to form these strategies. In order to study these policies, we must classify them according to a particular criterion. Several criteria have been proposed in the literature, among them: structural-non-structural, short run-long run, general or target-oriented, and, perhaps the simplest of all: a classification of policies according to their impact on income distribution before or after taxes and government expenditure.

Below we propose a simple taxonomy of income redistribution policies, considering four different areas of impact:

- 1) The first one considers the general equilibrium approach, identifying those policies that affect the general functioning of the economy. Under this approach we can define the

variables in structural and non-structural terms; 2) The second approach is sectoral, identifying the size of the problem and solutions for each of the various sectors; 3) The third approach sees the ownership of the factors of production as the core of the problem, and proposes policies in this area; 4) The fourth and last approach, the "marginal", takes as its starting point market income and consumption, attempting to decrease the former and increase the latter through fiscal policy.

The general equilibrium approach states that a) relative factor prices, b) relative product prices and c) technology are the main elements involved in understanding the distributive problem, as well as in determining the pattern of growth of the economy. The first element, a) relative factor prices, influences factor proportions, the employment of factors and factor incomes, and hence the structure of demand and the structure of production. Relative factor prices are influenced by policy actions such as monetary, fiscal, trade and investment policy. On the other hand, b) relative product prices, or sectoral terms of trade, are influenced by a wide range of government policies such as indirect taxes and subsidies, and foreign trade policies. Finally, c) technology determines the substitutability among the factors of production and influences the amount of employment needed in production. These three elements, along with inflation (considered as an outcome-instrument of the

economic system), represent the basic structural variables that may be used to redistribute income.

Within the general equilibrium framework, the list of policies that can affect income distribution is a long one: monetary policy (including price and allocation of savings, types of financial institutions and allocation of credit); trade policy (including tariffs and quotas on imports); foreign exchange policy; investment policy (including subsidies to industrialists); and fiscal policy (including direct and indirect taxation and subsidies). These policies, in principle, determine a country's general development strategy (e.g. industrial development through import substitution or exports, or agricultural development).

If we add to these policies the type of technology used, we determine the forces that influence the relative factor prices (i.e. factor proportions, employment of factors and factor incomes - or market income distribution); the sectoral terms of trade and the rate of inflation, which in turn determine the demand structure and the production structure. All these variables are, of course, operating simultaneously in an interactive fashion, and are the determinants of the economic structure of a country.

Under this approach, the direct rationing of products and services (i.e. the allocation of government services in housing, health or education), direct rationing of the factors of production (i.e. rationing of credit or foreign ex-

change) and direct transfers and employment generation programs in public works are considered to be anti-poverty measures involving no major changes in the structure of the economy.

The second approach considers the modern-traditional and urban-rural sectors of the economy, as well as population growth in identifying the problems of poverty and income distribution. Based on this division of the economy, and studying the impact of population growth on them, we may identify two or more sectors (structural duality or heterogeneity) with particular characteristics and problems reflected in the distribution of income of each division. Each sector of the economy is interrelated with the rest through migration, the labour market, wage structure, etc., and national income distribution is obtained through the proportional aggregation of the sectoral income distributions.

The policies corresponding to the second approach have as their main objectives the generation of employment and higher incomes in the urban modern sector and the improvement of conditions in the rural marginal sector. As to the first objective, the generation of employment and higher incomes, among the policies mentioned are changes to labour intensive technologies, minimum wage policies, profit-sharing laws, pension plans, union legislation, and better social security systems. However if new jobs are not created,

the improvement of the relative factor prices in this sector has little impact on the overall income distribution, since the workers in the modern urban sector are the labour elite, with privileged positions in the national income distribution.

With respect to the rural marginal sector, the main policies are the subsidizing of fertilizers and pesticides for small farmers; agricultural extension services and subsidized seeds; rural infrastructure, credit and agricultural price policies. It is generally believed that in the long run better transport facilities, an increase in cultural homogeneity, and a decrease in population growth will help income redistribution in this sector, through a decrease in sectoral and regional disparities and a reduction of the pressure on the system to generate jobs.

The third approach emphasizes the ownership of the factors of production, human and physical capital, and the types of institutions and government regulations that influence the factor market and factor incomes. This approach states that income redistribution policies should aim towards a better distribution of resources, in this way improving individuals' capacities to generate income by themselves, rather than receiving transfers or subsidies that would increase their consumption, but never their ability to generate income.

Among the policies included under this approach we find redistribution of land (land reform), livestock, urban real estate, and commercial manufacturing capital; wealth taxation; and changes in the regulation of the intergenerational transfers (i.e. inheritance taxation), or the redistribution of human capital through alphabetization, technical training campaigns, and better education, health and nutrition for all.

Any of these three approaches or types of policies will encourage changes in the economic structure in the short or long run, which in turn determines the real market income (market income over prices) of the population. The fourth approach however, includes policies that do not directly affect the generation of market income, but rather reduce it or increase "imputed income", here considered as part of consumption. These policies are not able to change the economic structure which generates the observed income distribution.

Within this framework we define the policies that affect the real market income through a decrease of it (income taxation) or that will increase consumption (or imputed income). An important policy to increase the consumption of particular groups is the allocation of government expenditure, and whose main elements to take into account are: public services (i.e. water supplies, sanitation, site and service projects); subsidized goods and services (i.e. food,

housing), and labour intensive public works programs, (which are merely a disguised form of direct subsidization). Of course, this type of policies will never change the structure of the economy, and will never be able to increase the ability of the poor to generate income.

B) A Summary of Strategies

In continuation, we now study the strategies of income redistribution created as policy packages intended to fulfill particular objectives for specific target groups. Following mainly the model of redistribution with growth, or growth and equity, certain strategies have been proposed whose main idea has been to change the actual economic structure, thereby improving the capacity of the poor to generate income, rather than merely increasing their consumption. The impact of some of these strategies (13) can be directed towards particular groups, in the rural or urban areas, towards those working in a particular sector of the economy, or in a particular city or region. The chosen groups are called "target groups", and their proper identification can help determine the success of a specific income redistribution strategy.

This type of strategies can be classified in the following way:

S1) Employment Generation. Based on their own studies showing widespread and growing unemployment in the face of GNP growth, the ILO places primary emphasis on increasing

the availability of capital to the informal sector and concentrating expenditures on employment-creating activities;

S2) Redirecting Investment. This approach (formulated by Chenery et al at the World Bank), gives primary emphasis to the central role played by capital formation (education, health, credit, etc.). It is believed that command over this type of wealth will increase the income of the poor;

S3) Direct Attack on Poverty. This strategy emphasizes that the basic needs of food, water, clothing, shelter, medical care, education and participation in decision-making must be viewed in relation to an overall economic and social system of food and goods production, employment generation, education, health and nutrition;

S4) Human and Physical Resource Development. This approach assumes a redistribution of productive assets (i.e. land and physical capital), along with a massive program to develop human resources which would improve the supply. On the demand side, an intensive industrialization and growth strategy, based on human resources, is proposed;

S5) The Agriculture Development Approach. This approach, which also assumes land reform, bases its strategy on the dual role that the agricultural sector plays. On the one hand, agriculture must supply, at stable and low prices, the wage goods necessary for employment creation, and on the other, it should generate employment, through the use of

technical change (i.e. biological research, new seeds, improved fertilizer practices, irrigation, etc.);

S6) Integrated Rural Development. Based as well on land reform, this approach proposes several policies aimed at increasing the income of the poor in the rural area. Among the most important policies proposed we find: a) a labour intensive production, which is most likely to be adopted by small farmers; b) the use of off-season labour surplus in building minor development works and infrastructure; c) labour-intensive light industry processing of agricultural products, production of intermediate goods for agricultural production, and production of light consumer goods based on local raw materials; and, d) regional planning, aimed at bridging the gap between smaller villages and the capital city;

S7) The New International Economic Order. This "strategy", considered a precondition for the success of any of the other strategies, suggests that the international sphere must change. In this respect, several propositions are made: a) a redistribution of international credit in order that LDC's command more capital resources; b) a facility for LDC's to diversify upstream into processing, transporting and insuring their exports, thereby gaining a greater share of value added; c) a reduction of developing countries' tariffs and elimination of quotas on labour intensive goods produced in LDC's; d) greater amounts of foreign aid,

made automatic through international taxation on the seabeds, or on non-renewable resources; and, e) a restructuring of international institutions to allow a greater say by the LDC's.

Two other strategies of long run economic impact should also be considered, namely:

S8) Population Control. This strategy assumes that once the population increase is reduced, the capacity of the economic system to provide basic needs and employment will solve the problem of inequality. This, in turn, will have an impact on the economy in twenty years or more, assuming that the entrants to the labour force in the next 15 to 20 years have already been born, and a good number of them will be underemployed in the urban area (informal sector) or the rural area (marginal sector);

S9) Intergenerational Transfers. In this approach, the purpose is one of regulating the social, institutional and political rules and methods determining the inheritance of wealth, access to education, and access to jobs. It is believed that these are the long run determinants of the transmission of income inequality over generations.

Finally, there is one further strategy that has been used mainly in conjunction with the incremental redistribution model, aimed at redistributing consumption rather than the capacity to generate income, through the use of fiscal policy:

S10) Redistribution of Consumption. This strategy redistributes income through the taxation of the rich and transfers to the poor. The type of taxation (progressive, regressive or proportional), and the policy of allocating government expenditure (welfare programs, public works) are the elements determining the strategy.

Based on these ten strategies there have been propositions of growth and equality in many studies. O. Mehmet (1978), among others, presents a combination of several strategies for developing countries based on employment generation S1), development of human resources S4), and integrated rural development S6), all of which assume a change in the international economic order S7). These are the basic elements which, according to Mehmet, would improve social justice in developing countries. Webb (1977), in a study for Peru, proposed a strategy that in the long run would reduce the inequality of income redistribution, and would reduce poverty through targeting programs for the very poor. He proposed a maximization of growth and trickle-down (a modification of the first model) with a policy of redirecting investment S2), slowing down population growth S8) and the implementation of various fiscal policies S10).

Adelman and Robinson (1978) analysed the effects of 26 policy packages for the Korean case. The 26 packages ranged from public works, as part of an incremental model, to what they termed "market socialism", that would be a modification

of the radical model. For these purposes, they used most of the ten strategies mentioned above, as well as more specific policies such as nationalization and increases in rural-urban migration. By the same token most of the other studies on the subject present a combination of strategies and/or policies applied to a particular case study, assuming different degrees of structural changes, according to the ideology or beliefs of the author(s).

1.3.4 Summary and Conclusions

This review of the studies of income redistribution has shown that the topic is far from being clear, and lacks a well-defined methodology for the formulation and implementation of income redistribution policies as well as an examination of their impacts. The first type of studies reviewed, analysing the impact of theoretical redistribution policies, is still in the first stages of development, and the practical use of this type of analysis is not very clear. Among these studies, the ones using alternative policy packages (à la Adelman-Morris), offer at least a way of changing the observed income distribution. On the other hand, the studies assuming hypothetical distributions (à la Cline), appear to be mere exercises with strong doubts as to their use.

The "Trickle-Down" model of growth and distribution has shown over the past few years that developing countries can grow without necessarily developing. That is to say, poverty has not decreased, large segments of the population have not obtained any benefit from the growth pattern, and opportunities for improvement in the near future are virtually non-existent. At the same time we have argued that taxes and subsidies are no solution within the "Incremental" model of redistribution.

The two remaining models, the "Radical" and the "Redistribution through Growth" models, represent the only real alternatives that a developing country faces in order to offer social justice to its population. The decision, however, is a difficult one because of the socio-political implications.

The use of the taxonomy proposed allows us to classify the policies presented to affect income distribution into four approaches: general equilibrium, sectoral, ownership of the factors of production and marginal (mainly fiscal policies). We have seen that policies are combined to create strategies of income redistribution, using principally policies from the list of sectoral and ownership of the factors of production approaches. And finally, we find that the literature strongly concentrates on strategies that could be presented as part of the model of Redistribution with Growth.

1.4 CONCLUDING REMARKS ABOUT INCOME DISTRIBUTION AND ECONOMIC GROWTH IN DEVELOPING COUNTRIES

Based on the several approaches of studies of income distribution and redistribution reviewed, we are now able to present a theoretical framework which includes, we believe, the most important variables at the macro and microeconomic levels, and introduces an observed phenomena in most developing countries: the lack of regional and sectoral integration of the economy.

At the macroeconomic level we can identify the general economic forces that determine the global strategy of development, and therefore influence the distribution of "market" income, and, taking into account the role of inflation, the distribution of "real" market income (defined hereafter as ID_1 and ID_2 , respectively) (14). The strategy of development followed determines the sources of capital formation, the key sectors and regions of growth (including industrialization through import substitution or exports), the role of government in the economic process, and the relative factor and product prices.

All these elements are working simultaneously and represent, in an aggregate form, the main determinants of factor earnings in nominal and real terms. Given this general framework of reference, we can see how the economic development strategy affects regional and sectoral groups, which in turn allows us to identify their role within the process of

the generation and distribution of income. If we introduce the historical roots of the process of growth, we are then able to identify the groups that are taking advantage of the strategy chosen, and at the same time those groups which show no growth at all. This uneven pattern of growth of certain groups tells us their distance from the rest, and indicates the distribution of income at the national level, among sectors, as well as within sectors, regions and among the owners of the factors of production.

The process of incorporating new technology over time in the economy, along with the general economic strategy chosen, has created, in many developing countries, and in Mexico in particular, a strong heterogeneous economy with remarkable differences within and among its sectors. We can define, for simplicity purposes, four sectors of the economy, retaining the same characteristics presented by CEPAL-PREALC (section 1.2.2): Modern Rural, Marginal Rural, Modern Urban and Informal Urban sectors. It is considered that these sectors of the economy are interrelated through the factor and product markets.

In this context, population growth and the sectoral income differences play an important role, explaining the movement of people from the marginal rural sector to the informal urban sector (rural-urban migration). The generation of employment in the modern urban sector, along with the rate of migration and population growth in the urban area,

combine to define the number of people that work in the informal urban sector.

Within each particular productive sector in the urban area there are specific elements that determine the proportion of the sector classified as modern or informal. For this purpose, the main elements to take into account are the level of concentration of production, the type of technology used, the size of the market, and the role that the sector plays in the global strategy.

This approach, i.e. the division of the economy into sectors, allows us to identify, within the context of a macroeconomic model as seen above, the sectors and rural-urban areas that have or have not changed with the pattern of development followed, while at the same time allowing us to measure the distance between them.

It is possible to relate this view of the distributive problem to the ownership of the factors of production (the micro approach). It is considered that for each individual owning a factor of production, there is some retribution depending on the amount of physical capital (assets) and human capital sold, and on the current price market. There is a market for human capital of each type in each region. While the supply is determined by the number of individuals with that type of human capital in that region, the demand is given by a proportion of total production in that region (assuming a proportionate weight of the production for the

different types of fixed coefficient technologies used). It is assumed that for each labour market there are institutional considerations that affect the determination of the wage rate. Human capital, in turn, depends on the years of experience, training, education and family environment of the individual; while physical assets depend on inheritance, extraordinary profits, and to some extent on the rate of savings.

The distribution of the factors of production aids in the understanding of income distribution, if we introduce the variables that determine the demand for them, the type of markets, and their level of retribution. In particular, the demand of the factors of production accounts for the technology used in a structurally heterogeneous production system; this system is in turn working within a model of development reflected by the type of socioeconomic institutions and the type of socioeconomic policies determined by the interested political forces within the country and elsewhere.

We believe that these three sets of elements are the most important ones in helping to understand the process of the generation and distribution of income (ID_1 and ID_2): the macroeconomic policies, determining the strategy of development; the historical, demographic, technological and socio-cultural forces, determining the regional and sectoral heterogeneous structure; and the factors determining the

distribution of resources among the population. Simple observation tells us that these three types of forces are quite different for every country, it being difficult to foresee a pattern of growth and distribution that would indicate the path for all countries, as some authors have done and many others have tried to corroborate. What is more likely is that if we understand the behaviour of the relevant factors in a particular country, we will then be able to understand the generation of income and its distribution, and we will then be able to propose a redistribution through changes in the determining forces.

We conceive income redistribution through a combination of policies that will form new strategies and will reshape the structure of the actual model of development. In this sense, the policies and strategies suggested must be in the historical and political context of development, and will inevitably face the opposition of those political forces enjoying the prevalent structure. We can, however, conceive of a redistribution model where, in the short run, consumption is increased for some groups through government expenditure financed through taxed income. This kind of model, however, will not affect the nominal or real income distributions (ID_1 or ID_2) in the short or long run, but the net or effective income distributions (ID_3 and ID_4).

FOOTNOTES

1. A more detailed presentation of Kuznet's hypothesis, as well as a critique of it, are given below in the next section.
2. We are purposely excluding the marginal productivity theory of distribution in this review. We have taken this decision based on the same criteria used by Thurow (1975), where he shows that this is an amorphous theory which has never been spelled out in sufficient detail to be provable or disprovable. In an appendix of his book he offers a "Do-it-yourself Guide to Marginal Productivity", challenging anyone to build a version of this theory and test it against the theories outlined in his book.
3. In section 2.2 we present the properties of several income distribution models, including the lognormal, and in chapter 3 we present the estimated parameters and goodness of fit test in order to compare them using Mexican data.
4. For a detailed explanation of the generation of the lognormal distribution, see Aitchison and Brown (1966).
5. There are many good books and articles summarizing and evaluating the functional theories of income distribution. For this purpose see Kaldor (1956) and Bronfenbrenner (1971), among others.

6. For a good summary and criticism of these types of models, see K. Griffin (1969).
7. Part of the review of empirical studies of income distribution is based on the article by Cline (1975).
8. For a definition, origin and broad study of this concept, see Di Filippo and Jadue (1976).
9. We follow Stewart and Streeten (1976) for the definitions of strategies and objectives within this context.
10. Part of section 1.3.1 is based on Cline (1975).
11. Part of this section is based on the work of Stewart and Streeten (1976).
12. The ILO (1972) report on Kenya and Chenery et al (1974) are the first studies proposing this strategy. The idea itself is attributed to H.W. Singer, Chief of Mission to Kenya, according to Jolly (1976).
13. Some of these strategies are presented in Weaver, Jameson and Blue (1978).
14. We can define as well "Net" income distribution as $ID_3 = ID_2$ minus personal taxes and "Effective" income distribution as $ID_4 = ID_3$ plus imputed income of the expenditure of the government.

II

METHODOLOGY OF ANALYSIS OF INCOME DISTRIBUTION DATA

The measurement of personal income distribution is an old chapter of economics. It is generally considered to have begun in 1896 with the work of Vilfredo Pareto, where he formulates the famous Pareto's Law. This law is based on empirical observations for different countries and years, and shows a consistent and permanent relationship between both income and the number of persons with that and higher income. When these two variables are plotted on double logarithm paper, we discover that the data follow a line of negative slope once the higher income levels are reached. In this way, the slope of the line gives an indication of inequality: the greater the value of the slope of the fitted line, the smaller the concentration of income of the population being studied.

From this pioneer work of Pareto (1896), the study of income inequality measurement has developed in two separate branches: 1) income distribution models, where the variable income is represented through the use of a probability distribution function (pdf), and from this the income inequality measures are derived, and 2) the representation of income distribution by one or several parameters that measure ine-

quality without the use of a probability distribution function. Both of these approaches have been developed considerably, offering on the one hand a great number of inequality measures without any relation to a particular distribution function, and on the other, different types of distribution functions that fit the observed distribution of income, using the parameters of the probability distribution function in order to derive income inequality indicators (III's) (1).

It can be argued that the three main purposes of income inequality indicators are: 1) to compare income distributions over time or between populations; 2) to provide a measure of the degree of inequality, offering an idea as to the level of income concentration; and 3) to analyse the impact of public policy on income distribution and/or the incomes of the poor. With this in mind, and considering the objective of analysis of income distribution in Mexico, in this chapter we will examine income inequality measurement, in order that a methodology of analysis might be proposed for the study of Mexican income distribution.

For this purpose, the first part of the chapter contains a review of the various types of indicators most frequently used in order to represent income inequality. The second part of the chapter considers the alternative distribution functions that are frequently used for the same purpose. In both cases an analysis and evaluation of the properties of these income inequality indicators and income

distribution models are offered, keeping in mind the objectives of our research. The third part presents the method of calculation of the III's, as well as that of parameter estimation of the income distribution models used, including the method of parameter computation and the tests of goodness-of-fit selected. Finally, the last section of the chapter contains the method of analysis chosen, as well as an example of it, using Mexican data.

2.1 INCOME INEQUALITY INDICATORS

Statistical information concerning personal income is usually gathered in classes (also known as group data), with the purpose of arriving at more accurate results in surveys of income and expenditure. Since the data is presented in table form, it is often difficult to obtain a precise idea as to its particular income concentration. At times it would appear to be more convenient to represent this information in a manageable whole, and with this in mind, many indicators of income distribution have been proposed, including graphical indicators, vectors and matrices, and statistical measures. Several of the more frequently used measures are presented and analysed below with the purpose of the evaluation and selection of those considered most helpful to our study.

2.1.1 Graphical Indicators

A graphical representation can be made in order to transform the statistical information into an aggregate representation using a frequency curve, upon which every point depicts a combination of income and its relative frequency; the curve representing this relationship is known as a Density Function. At the same time, the use of a Histogram occurs where the area of a rectangle represents a relative frequency, the income bracket being its base. In the former, the variable income is a continuous variable, while in the latter income is grouped by classes. One weakness with graphical representations is that while they illustrate the characteristics of the middle income ranges, they do not do so for the higher incomes that do not appear in the chosen scale.

An ingenious way of presenting the statistical information is given by Pen (1971), through a parade in which everyone who receives income takes part. In Pen's Parade, income before taxes represents the height of the person, thus in this way the person with average income will be of average height. At the head of the parade there are some individuals walking upside down, representing those with negative income (e.g. businessmen who have suffered losses), followed by the poor with only a few centimetres of height, and finally, at the end, the very rich, measuring several kilometres high.

Lorenz (1905) offered a means of presenting income distribution data that has become very fruitful. The Lorenz Curve, as it is known, indicates the proportion of total income which is received by the bottom x percent of individuals or income units. The curve shows graphically the degree of dispersion of incomes. On the horizontal axis we have the percentage of cumulated population, aggregated from the poorest to the richest, while on the vertical axis, we find the cumulated percentage of income received by any particular percentage of the population.

If the curve follows a 45 degree line, then all incomes are equal, with every 10 percent of the population receiving 10 percent of the income. At the opposite extreme, where all income is received by one person, the Lorenz Curve takes on an inverted L-shape. The distributions of income lie somewhere between these two extremes, where the first 10 percent of the population receives less than 10 percent of total income. In this way we can assess the degree of income inequality through the closeness of the curve to the 45 degree line (see figure 2.1).

Pareto (1896) represented the income distribution graphically through the use of double logarithmic paper. Following Pareto's specifications, on the horizontal axis we plot the logarithm of income, and on the vertical axis the logarithm of the number of individuals with that and higher income. In general, we find that the data approximate a

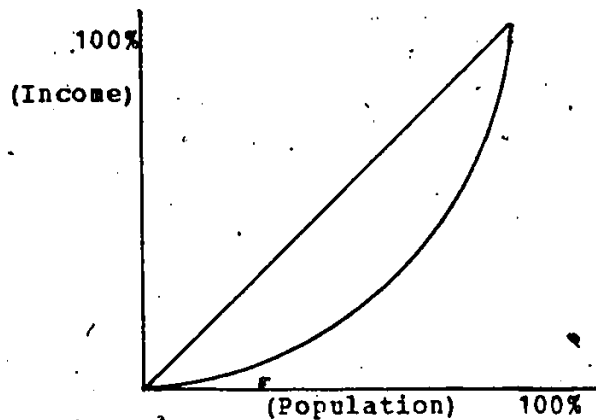


Figure 2.1 LORENZ CURVE

line of negative slope when the higher incomes are reached, the slope of this line being termed Pareto's Index. In this case, the steeper the line, the less unequal the distribution of income (2).

Two modifications of this idea are explored by Corrado Gini and Mary J. Bowman (3). Gini proposed a chart whereby the horizontal axis would represent the logarithm of the percentage of aggregate income as opposed to income alone as Pareto had used, while Bowman used semi-logarithmic paper using the logarithm of the size of income. In both cases the slope is related to income inequality.

2.1.2 Vectors and Matrices

The specific characteristics of each income distribution can be represented by means of a vector. In this case each element of the vector would represent information concerning one part of the distribution. This however, creates

the problem of the selection of those parts of the distribution that need to be taken into account, as well as the weights or relative importance that each element will assume in order to indicate inequality.

A dynamic framework has been suggested for the analysis of economic mobility in a society⁽⁴⁾, based upon transition probability matrices of finite Markhov processes. The Mobility Matrix (M) indicates how many people have moved within the distribution and by how much. Each cell (M_{ij}) in the Mobility Matrix is the percentage of individuals in group i who have moved to group j in the period T to $T+1$, where groups could be defined by income classes. It is convenient to order the groups by the level of mean income, from highest to lowest. Since everyone in each group must be accounted for in the next period, it follows that the rows of the Mobility Matrix must sum to one. For example, in matrix

$$M1 = \begin{pmatrix} .65 & .25 & .10 \\ .25 & .60 & .15 \\ .05 & .20 & .75 \end{pmatrix}$$

(M1) we see that in the first row 65% of the richest group maintains its mean income, 25% of the group moves to the group with the next lowest mean income, and 10% moves to the lowest mean income. In this way, matrix (M1) defines how people change position in the distribution of income over time, and allows for the identification of individual movement through income classes.

If matrix $(M_1) = I$ (the identity matrix), we find no mobility in the society, since no individual moves from his initial class over time. The larger the off-diagonal elements, the greater the mobility in the society. In this sense, this measure of mobility takes the identity or perfect immobility matrix as its point of reference.

In order to summarize the entire Mobility Matrix in a single number, there are several propositions: a) the average time spent in a class, which is equal to the expected value of the amount of time spent in a class; b) the mean first passage time, equal to the expected value of the length of time required to go from class i to class j for the first time; c) the determinant of the matrix, where the value of the determinant ranges from -1 to 1 . If we discover a complete reversal of the frequency distribution from T to $T+1$, the determinant is equal to -1 ; while at the other extreme we have the case of perfect immobility where the determinant is equal to 1 ; and d) the aggregate mobility measures, which weigh the value of the off-diagonal elements by their distance from the diagonal, measured by the difference between the row and the column subscripts, i.e.:

$$\sum_{ij} (i - j)^2 M_{ij}$$

Among the drawbacks involved in this dynamic framework is the problem of finding the type of information required for the analysis, and the fact that it offers no insight into the degree of concentration within a particular society.

2.1.3 Statistical Indicators

There are several characteristics or properties of distributions which describe essential features, among them the location, degree of dispersion, and degree of asymmetry or skewness. These properties have largely been used to describe income distributions through the use of different III's. Below we present several statistical indicators, classified according to the properties that they describe.

A) Measures of Location. The most important measure of location is the arithmetic mean of the distribution, while others frequently used are the median and the mode. Even when the measures of location do not directly provide an indication of inequality, they can be combined to form a new indicator of income differentials. Champernowne (1974), for example, uses two combinations of location parameters as measures of inequality: the ratio of the geometric mean to the arithmetic mean income (GMI/AMI); and the ratio of the harmonic mean to the arithmetic mean income (HMI/AMI). As yet, however, a strong case has not been presented as to the usefulness of this type of measures in the analysis of income distribution.

B) Measures of Dispersion. Another characteristic of the distribution is its dispersion. A great number of inequality indicators have been used to measure the differences in income values, which is basically an indication of the dispersion of the variable income. Some of the dispersion

measures use only part of the distribution or information available, while others use all of it.

In the category of the former we find the Interquartile Range, which is defined as the difference between $Q_3 - Q_1$, where Q_1 , Q_2 and Q_3 are the points which divide the mass of the distribution into four equal parts, Q_2 being the median. The Range and Relative Range form part of these kinds of partial indicators, the former measuring the distance between the maximum and minimum income of the distribution in absolute terms, and the latter standardizing the measure by dividing it by its mean. Obviously, if the information is grouped, there would be insufficient information in order to use these two measures. In general, all types of specific incomes and quartiles have been used, offering in this way an idea of the dispersion of income through their differences and ratios of income shares.

Among the more frequently used measures of dispersion in the analysis of income distribution, using all the distribution or information available, the following are the most common.

1) Absolute Mean Deviation. This statistical measure is comprised of the deviation above and below the mean income in absolute terms. It is insensitive to transfers of income from individuals who lie on the same side of the mean income, this due to the definition of the measure, which sums the deviation of the measure from the mean. For exam-

ple, if individuals A and B both lie on the same side of the mean, a transfer from A to B will reduce the deviation of the income of A from the mean, but at the same time will increase the deviation of B by exactly the same amount, leaving the sum of the deviations unchanged

ii) Relative Mean Deviation. If the Absolute Mean Deviation is divided by the arithmetic mean, the result is the Relative Mean Deviation. Obviously this measure possesses the same characteristic as the Absolute Mean Deviation, that is, it is equally insensitive to transfers of income, if the individuals involved lie on the same side of the mean income.

iii) Variance. If we add the square deviations of income from the mean, rather than from the absolute terms, then divide by the number of incomes considered, the result is the Variance. In this case, the deviations are squared (as opposed to the case of absolute deviations, where they are considered of equal importance), thus, large deviations from the reference value (mean income) are weighted more heavily, resulting in a measure more sensitive to changes in extreme incomes.

iv) Standard Deviation and Coefficient of Variation. From the Variance we can obtain two indicators of inequality commonly used: a) the square root of the Variance, or the Standard Deviation; and b) the standardized Standard Deviation, or the Coefficient of Variation; in this

case the standardization is achieved by dividing by the arithmetic mean. These two measures, as in the case of the Variance, give more importance to extreme incomes than to the rest.

v) Standard Deviation of Logarithms. If it is desired to consider the difference of all the values with respect to a reference value that represents perfect equality (the average income), while at the same time attaching greater importance to income transfers at the lower end, we use the Standard Deviation of the Logarithm of income. This measure, often called the Standard Deviation of Income Power, also eliminates the effect of different currencies or inflation; the change of units does not affect the measure due to the use of logarithms which adds a constant that disappears when the differences are being calculated.

vi) Relative and Absolute Mean Difference. Thus far, all the measures of dispersion presented have used the differences of all the income values with respect to a reference, the mean income. There are however, some measures that take into account the differences of all pairs of incomes. If we sum all the differences of the pairs of incomes ($\sum_{i,j} |x_i - x_j|$), and divide this total by the number of combinations (n^2), we obtain the Absolute Mean Difference. If we further divide this measure by the average income, the result is the Relative Mean Difference. C. Gini (1912) introduced these indicators while attempting to measure by how

much the different magnitudes of income (or other variables) differ among themselves, rather than from their arithmetic mean.

vii) The Gini Coefficient. In the same paper (1912), C. Gini also introduced a statistical indicator, commonly called the Gini Coefficient, which is equal to one-half the Relative Mean Difference.

$$G = \frac{1}{2n^2\bar{x}} \left[\sum_{i,j} |x_i - x_j| \right]$$

It is also possible to show that this indicator can be calculated as well through the use of the Lorenz Curve (see fig. 2.2).

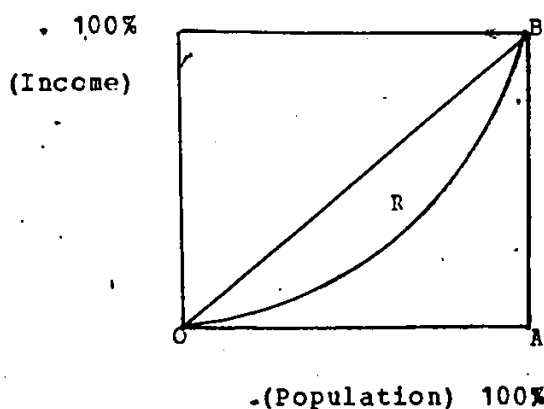


Fig. 2.2 GINI COEFFICIENT

In this diagram, the Gini Coefficient is the ratio of the area between the line of perfect equality and the Lorenz Curve (R), over the triangular region below the diagonal (OAB).

Clearly, the Gini Coefficient avoids the problems found with previously mentioned indicators: the arbitrary choice of a central position (e.g. the mean) from which differences are computed, and the squaring procedure of the differences.

Some modifications of the Gini Coefficient have been suggested, such as the replacement of the 45 degree line of equality with a new function. Following this idea, Paglin (1975) presented an index where the basis of comparison was given by the distribution of age of the population under study, thereby decreasing the area between the Lorenz Curve and the perfect equality line. This resulted in the Paglin-Gini Index, which has been the subject of much criticism, from different points of view, in the literature (5).

C) Measures of Asymmetry. The degree of asymmetry or skewness provides yet another characteristic used to describe distribution. If the distribution is completely symmetric, all central moments of odd number will vanish. As a measure of the degree of skewness, one of these central moments could be used; if the third moment is used, for example, the units of the variable are of the third order, so it can be standardized by dividing by the third power of the Standard Deviation (SD), i.e.

$$\text{Skew} = \frac{\sum (x_i - \bar{x})^3}{n \sqrt[3]{SD}}$$

In general, we can say that the distribution has a positive skewness if the cubes of the large positive deviations from the mean outweigh the cubes of the negative deviations, so that the measure takes a positive value, and vice versa.

Two other indicators of skewness have been used for the analysis of income distribution: one by Bartels (1977), the

Personian Coefficient of Skewness, defined as the difference between the mean and the mode divided by the Standard Deviation; and the other proposed by Champernowne (1952), called the Skewness Coefficient, and defined as one minus the median over the mean.

It is important to point out, however, that all these measures of asymmetry indicate only one characteristic of the distribution, and thus they in no way provide the essential ideas of inequality measurement. At the same time, in this case the concept of perfect equality is ambiguous, since perfect symmetry does not necessarily imply equality of income.

2.1.4 Other Indicators of Inequality

Several other indicators of inequality have been proposed, among them: A) Atkinson's Index, B) Theil's Index, and C) Economic Distance Ratios. These indicators are discussed in detail below.

A) Atkinson's Index. Since the conventional summary measures inevitably introduce distributional values, it would seem preferable to consider such values explicitly. Along these lines, Atkinson (1970) proposed an income inequality measure which introduces these distributional objectives through the use of an explicit parameter, which represents the weight attached by society to the inequality in

the distribution. Its value may range from zero, where society would be indifferent as to the distribution, to infinity, where society would be concerned only with the position of the lowest income group. The value of ϵ between these two extremes depends on the importance attached to redistribution towards the lower income groups. In this way, Atkinson's Index is represented mathematically as follows:

$$I = 1 - \left\{ \sum_{i=1}^n (y_i/\bar{y})^{1-\epsilon} f_i \right\}^{1/1-\epsilon}$$

where y_i denotes the income of those in the i th income range, with a total of n ranges; f_i denotes the proportion of the population with incomes in the i th range; and $\bar{y}$ denotes the mean income.

While this indicator facilitates the determination of the proportion of present total income required to achieve the same level of social welfare as at present if incomes were equally distributed, its use is made difficult by the fact that it is necessary to either know or assume the value of ϵ , which represents the weight that society assigns to inequality in the distribution (6).

B) Theil's Index. Theil (1967) has proposed a measure of inequality based on the concept of entropy in information theory. In this case, the entropy of the income distribution is given by:

$$H(Y) = - \sum_{i=1}^n Y_i \log (1/Y_i)$$

where Y_i represents the income share of class i . When each Y_i equals $(1/n)$, we find absolute equality, and the maximum

value of $H(Y)$ is $\log n$. On the other hand, if we had complete inequality, all income would go to one class, therefore y_i would be equal to one for a certain i , and equal to zero for the rest of the classes: $H(Y) = \sum_{i=1}^n \log 1 = 0$.

Theil's index takes values from 0 to $\log N$, being regarded as a measure of equality of income distribution. Theil's Index is, however, being presented as a measure of inequality, obtained by subtracting $H(Y)$ from its own maximum value:

$$T = \log N - H(Y) = \sum_{i=1}^n y_i \log N y_i$$

C) Economic Distance Ratios. Thus far, all the indicators presented have taken into account only the particular distribution being studied. More specifically, the various inequality measures examined take a parameter of the same distribution as their reference point, making them "Intra-Income" distribution indicators. It is, however possible to define distance measures between two distributions, wherein the parameter of reference is another distribution, in other words, an "Inter-Income" inequality indicator. Thus, while "Intra-Income" indicators account for the degree of income inequality within a given population of economic units, the "Inter-Income" indicators measure the degree of inequality between income distributions. In order to do so, the population of economic units must be partitioned according to a given socioeconomic characteristic, e.g., ethnic groups, regions, social classes, sex, etc..

C. Dagum (1980c) presents a class of ratios that measures the income differential between two income distributions, or the degree of affluence of one population with respect to another, and terms it the class of Economic Distance Ratios. From this class of ratios, two in particular are of interest: d_0 and d_1 . The first ratio, d_0 , measures the frequency of economic units from the more affluent population (i.e. the population with the larger mean income) with income greater than that of the members of the other populations. The economic distance ratio d_0 between the income distributions $F_1(X)$ and $F_2(Y)$ is defined as the probability that income Y is greater than income X , given that the mean $M_2 = E(Y)$ is greater than the mean $M_1 = E(X)$:

$$d_0 = P(Y > X \mid M_2 > M_1)$$

In order to count the units fulfilling this condition, the indicator function $I(Y - X)$ is used: it assumes the value 1 for all $Y > X$, the value $1/2$ for all $Y = X$, and the value 0 for all $Y < X$:

$$d_0 = E(I(Y - X) \mid M_2 > M_1).$$

On the other hand, the ratio d_1 is the weighted sum of the income difference $Y - X$ for all $Y > X$, given that $M_2 > M_1$. The weighting factor is the joint probability distribution function $f_1(X)f_2(Y)$. Hence, d_1 is the mathematical expectation of $Y - X$, subject to the conditions that $Y > X$ and $M_2 > M_1$:

$$d_1 = E(Y - X \mid Y > X, M_2 > M_1),$$

which, using the indicator function $I(Y - X)$ defined above, becomes:

$$d_1 = E(Y - X) I(Y - X) | M2 > M1.$$

In sum, while d_0 is a head-count measure, d_1 takes into account the amount of income by which the economic units differ.

It is possible to generalize d_1 for all r real and different from zero:

$$d_r = \{E(Y - X)^r I(Y - X) | M2 > M1\}^{1/r}, r \neq 0.$$

The values of d_0 and d_1 can be standardized and normalized taking the following form:

$$D_0 = 2d_0 - 1$$

$$D_1 = (E(Y) - E(X)) / (2d_1 - E(Y) + E(X))$$

The economic distance ratios D_0 and D_1 can be applied under the parametric assumption of an income distribution model (parametric form) or directly applied to the observed income distributions (distribution-free form).

2.1.5 Selection of Income Inequality Indicators

Different criteria have been used in the selection of appropriate inequality measures of distribution, inter alia: Dalton (1920), Yntema (1933), Sen (1973), Champernowne (1974), Bartels (1977), Cowell (1977) and Dagum (1982). These criteria have been given in order to fulfill particular interests in the measurement of inequality: by the same

token, we have selected those indicators that fit our particular needs.

The preference of using a single summary measure of concentration rules out the use of some of the graphical measures (see section 2.1.1) and vectors and matrices (section 2.1.2). We will, however, take into account the Lorenz Curve, considered essential for our analysis of the Mexican data. In particular, the use of certain segments of the Lorenz Curve provides information of the percentage of income received by specific groups of the society (e.g. the poorest 20, 40 and 60% of the population).

On the other hand, because we consider it important to have all the statistical information of the distribution available and not only part of it, the partial statistical measures of dispersion are not considered useful for our purposes (section 2.1.3.B). At the same time, for the reasons stated above, the measures of location and asymmetry (2.1.3.A and C) were assessed to be inappropriate for our study.

Following this pre-selection we are left with the measures of dispersion presented above (2.1.3.B) as well as Atkinson's Index, Theil's Index, and The Economic Distance Ratios. In order to evaluate them we take into account the seminal article of Dalton (1920), and state four principles that have been regarded as minimum conditions for any III. Briefly stated they are: P1. The Principle of Transfers,

which says that if a transfer of income takes place from the richer to the poorer, inequality is diminished; P2. The Principle of Proportional Addition to Incomes. This principle states that proportionate additions to, or subtractions from all incomes will leave inequality unaffected. This implies a scale independence for the III; P3. The Principle of Equal Additions to Incomes, which states that equal additions to all incomes diminish inequality and equal subtractions increase it; and P4. The Principle of Proportionate Additions to Persons. This principle states that inequality is unaffected if proportionate additions are made to the number of persons receiving incomes of any given amount.

Based on the works mentioned above, three other principles have been regarded as necessary properties for any III. They are: P5. The Principle of Symmetry, which indicates that the III should be invariant to any permutation of income among the income-receivers; P6. The Principle of Normalization. This principle states that the III should have definite finite limits of 0 and 1, with zero (one) value for perfect equality (inequality); and finally P7. The Principle of Operationality. This principle asks for an unambiguous conclusion regarding the extent of inequality for each distribution compared. However, Bartels (1977) shows that any III can fulfill P2 and P6; the first requirement can be attained by dividing the particular measure by an appropriate parameter (e.g., the mean), in this way standardizing the

measure in order to eliminate inflationary influences. The second property can be achieved using the maximum and minimum values of the statistical measure providing it with values in the 0 to 1 range. This leaves us with five properties to fulfill for the III's presented.

Considering these III's and their properties, we present in table 2.1 a comparison of them. The Relative Mean Deviation and the Standard Deviation of Logarithms do not fulfill the property of transfers while Atkinson's Index does not provide us with an unambiguous III (P7.) due to the need to specify the value of the parameter, indicating the inequality-aversion. The Coefficient of Variation, as explained above, gives more importance to extreme incomes than to the rest of the distribution. We do not find any reason to weigh heavily the larger deviations from the mean. Theil's Index is an III fulfilling all the properties required, however we consider that there is not a clear income inequality meaning of the concept of entropy.

Based on this evaluation we have decided to use the Gini Coefficient, which, besides fulfilling the properties required, is the most widely accepted income inequality indicator in the studies of income distribution. At the same time, there is a clear statistical interpretation and an easy geometrical representation through the Lorenz Curve. On the other hand, due to the different purpose of the Economic Distance Ratios, they do not correspond to an evalua-

TABLE 2.1 PROPERTIES OF I I I'S

I I I	PROPERTY				
	P1	P3	P4	P5	P7
1. Relative Mean					
Deviation	NO	YES	YES	YES	YES
2. Coefficient of					
Variation	YES	YES	YES	YES	YES
3. Standard Dev.					
of Logarithms	NO	YES	YES	YES	YES
4. Gini Coefficient	YES	YES	YES	YES	YES
5. Theil's Index	YES	YES	YES	YES	YES
6. Atkinson's					
Index	YES	YES	YES	YES	NO

tion based on the properties mentioned, yet they remain useful measures of the income differential between two populations, considering their degrees of affluence and their distributions.

2.2 INCOME DISTRIBUTION MODELS

Income Distribution Models (called here as well probability density functions or pdf's) have been specified since Pareto (1896) in order to describe the observed frequency curve of income. This approach allows us, once the specification of the model and the estimation of the parameters has been done, to associate to the distribution studied

some of the income inequality indicators explained in the preceding section. The most common indicators associated are the Lorenz Curve, and with this the Gini Coefficient; however, as the location parameters and the moments can be calculated, we can use them as well in order to represent the most important characteristics of the distribution (i.e. the Standard Deviation, the Coefficient of Variation).

The variation of parameters of the pdf's allows for a flexible variation in the shape and a good fit to the observed frequency curve of income. For this purpose there have been several specifications of models of income distribution since Pareto in 1896 initiated the analysis of income distribution for different countries and Italian cities. The Pareto model is considered to be the best one describing high income groups, however it is inadequate in dealing with the lower and middle income groups. The original data studied by Pareto covered only high income groups which were the ones paying taxes. Later, the attempt to represent the whole distribution led to the specification of pdf's of different types, the lognormal and gamma being the most frequently used. The lognormal distribution model fits relatively poorly for the whole distribution of income, and the gamma relatively well in the middle of the distribution but describes poorly the upper and lower tails of the observed data.

Besides a good description of the observed distribution data, economists have tried to find a model which fulfills requirements or properties of different types. Bartels (1977) performed the study and evaluation of more than 10 models, while C. Dagum (1980a) has done it for more than 20 income distribution models.

Following this line of ideas, we present in section 2.2.1 a set of properties that would be convenient for any IDM to fulfill. At the same time, we present a classification and evaluation of IDM'S. Finally, in section 2.2.2 we offer some characteristics of the income distribution models selected.

2.2.1 Properties of Income Distribution Models

The existent list of IDM'S is a long one, and an evaluation of all of them is a difficult task. For this purpose we consider some of the models studied by Bartels (1977) and Dagum (1980a). In order to select models that could be used to analyse income distribution data several properties have been defined. Following the authors mentioned we present a set of properties that are generally considered as useful to be fulfilled by an IDM. They are:

P1. Good fit of the whole income range. This property excludes the truncated pdf's because of the need for an ac-

curate measurement of income inequality of the whole range of the observed income distributions. The pdf's should possess positive skewness ($\text{mean} > \text{mode}$) since most of the empirical frequency curves of income concentrate recipients on the left hand side of the income range. The pdf should fit both unimodal and zero modal distributions, the former case being the most observed one, while the latter is found in developing countries with low income per capita.

P2. Convergence to the Pareto distribution. It is generally agreed that the Pareto model fits best for high income groups. Hence, it is desirable to have a model with convergence to the Pareto model for the high income groups.

P3. Economic significance of the parameters. The parameters of the IDM should offer an explicit economic meaning.

P4. Derivation of the mathematical form of the Lorenz Curve from the IDM and conversely. Considering the advantages of the Lorenz Curve for analytical purposes this property allows for its derivation from a well-fitted IDM.

P5. Explicit mathematical solution of the Gini Coefficient. This property is quite useful considering the widely accepted use of the Gini Coefficient due to its properties (see 2.1.5). This allows us to have a III directly derived from the IDM for analytical purposes.

In order to classify the IDM'S, and from them carry out a selection, we take into consideration that Dagum (1980a)

has shown that almost all the models of income distribution can be deduced from three generating systems. Following his article we find that the three systems of IDM'S according to their generating functions are: 1) The Pearson's System, 2) D'Addario's System, and 3) The Generalized Logistic-Burr's System.

1) The Pearson's System. A large number of probability density functions are derived from a differential equation specified by K. Pearson at the end of the last century. While some of them have been widely used for different purposes in different fields, others have been widely used as IDM'S by several economists. Among the most popular pdf's used as IDM'S from this system we find the Beta, Gamma, Normal, and Student t. None of these members converges to the Pareto distribution.

2) D'Addario's System. In 1949 D'Addario specified a probability generating function from which pdf's are generated. Some of them have been used as IDM'S, most frequently the Pareto types I and II, the Lognormal, the Displaced Lognormal and the Weibull. Of these models none of the non-Paretian ones converges to the Pareto Law.

3) Generalized Logistic-Burr's System. Contrary to the other two systems, where probability density functions are generated, this system uses a differential equation whose solution generates cumulative distribution functions (cdf's). There have been several cdf's used as a specifica-

tion of IDM'S such as: Pareto types I, II, and III, Sech², Singh-Maddala and Dagum types I, II, and III. All of these models fulfill the property of convergence to Pareto's Law.

Based on the properties presented above, an evaluation of several IDM'S is offered in table 2.2. We have included in this table 13 IDM'S which are well-known and have been frequently used. From table 2.2 we can conclude that Dagum types I, II, and III and Singh-Maddala are the only models that fulfill our requirements. In order to compare these models, as well as the lognormal and gamma, which we thought could be convenient to compare, we have estimated their parameters in order to determine their goodness-of-fit. The results of this comparison are found at the end of this chapter and in chapter 3. For this purpose we have selected some goodness-of-fit indicators, presented in section 2.3, in order to choose the model to be used to derive the selected income inequality indicators.

TABLE 2.2 PROPERTIES OF I D M'S

MODEL	AUTHOR*	SYSTEM	PROPERTIES				
			P1	P2	P3	P4	P5
Pareto I, II, III	Pareto (1896)	S3		X	X	X	X
Champernowne	(1952)	**	X	X			
Dagum I, II, III	(1977) (1980a)	S3	X	X	X	X	X
Lognormal	Gibrat (1931)	S2	X		X	X	X
Gamma	Salem & Mount (1974)	S1	X		X	X	X
Singh-Maddala	(1976)	S3	X	X	X	X	X
Beta	Thurrow (1970)	S1	X		X		
3-Par. Lognormal	Metcalf (1972)	S2	X		X		X
Weibull	(1951)	S2	X			X	X

note: *Among several authors

**This IDM does not belong to any generating system

2.2.2 Characteristics of the IDH's Selected

In this section we present several characteristics of the Paretian, Lognormal, Gamma, Singh and Maddala and Dagum models. It includes the presentation of the mathematical expectation $E(Y)$, and the Gini Coefficient (G), which we consider important, taking into account the properties discussed in section 2.1. At the same time, we present the pdf's of the first four models and the cdf of the Dagum model. For this purpose we follow Dagum (1980b) where the details of the corresponding proofs are given. It should be noted that the Pareto model is characterized by one parameter (α), while the Lognormal and Gamma are characterized by two parameters, (μ and σ) in the former and (λ and α) in the latter. The Singh-Maddala model involves three parameters (a_1, a_2 , and a_3 or AA, BB, and CC, respectively) and the Dagum model is characterized by three or four parameters. Case 1 ($\alpha=0$) of the Dagum model involves three parameters (β, λ and δ); while cases 2 ($0 < \alpha < 1$) and 3 ($\alpha < 0$) involve four parameters (α, β, λ , and δ).

It should be noted that in the following formulae N denotes the normal cdf with zero mean and unit variance; Γ denotes the Gamma function, and B the Beta function.

A) Pareto Model

$$f(y) = \alpha y_0^\alpha y^{-\alpha-1}, y \geq y_0 > 0$$

$$= 0 \quad y < y_0$$

$$E(Y) = \frac{\alpha}{\alpha-1} y_0$$

$$G = 1/(2\alpha-1)$$

B) Lognormal Model

$$f(y) = \begin{cases} \frac{1}{\sqrt{2\pi\sigma y}} \exp\left(-\frac{1}{2\sigma^2}(\log y - \mu)^2\right), & y > 0 \\ 0, & y \leq 0 \end{cases}$$

$$E(Y) = \exp(\mu + 1/2 \sigma^2)$$

$$G = 2N(\sigma/\sqrt{2}; 0, 1) - 1$$

C) Gamma Model

$$f(y) = \begin{cases} \frac{\alpha^\lambda}{\Gamma(\lambda)} y^{\lambda-1} e^{-\alpha y}, & y > 0 \\ 0, & y \leq 0 \end{cases}$$

$$E(Y) = \lambda/\alpha$$

$$G = -1 + 2B(1/2; \lambda, \lambda+1)$$

D) Singh-Maddala Model

$$f(y) = a_1 a_2 a_3 y^{a_2-1} (1 + a_1 y^{a_2})^{-a_3-1}$$

$$E(Y) = \frac{1}{a_2 a_1^{1/a_2}} B(1/a_2, a_3 - 1/a_2)$$

$$G = 1 - B(a_3, 2a_3 - 1/a_2) / B(2a_3, a_3 - 1/a_2)$$

E) Dagum Model

$$F(y) = \alpha + (1-\alpha) (1 + \lambda y^{-\delta})^{-\beta}$$

This model generates three cases for describing observed income distributions.

a) Case 1 ($\alpha=0$)

$$E(Y) = \beta \lambda^{1/\delta} B(1 - 1/\delta, \beta + 1/\delta), \delta > 1$$

$$G = -1 + B(\beta, \beta) / B(\beta, \beta + 1/\delta)$$

b) Case 2 ($0 < \alpha < 1$)

$$F(Y) = (1-\alpha) \beta \lambda^{1/\delta} B(1 - 1/\delta, \beta + 1/\delta)$$

$$G = (2\alpha - 1) + (1-\alpha) B(\beta, \beta) / B(\beta, \beta + 1/\delta)$$

c) Case 3 ($\alpha < 0$)

$$E(Y) = y_0 + B\lambda^{1/\delta} B(1-1/\delta, \beta+1/\delta), \quad \delta > 1$$

$$G = \frac{\mu(1; \alpha=0) G(\alpha=0)}{y_0 + \mu(1; \alpha=0)}$$

where y_0 is a minimum income and $\mu = E(Y)$ for Case 1.

2.3 THE ECONOMETRICS OF INCOME DISTRIBUTION

2.3.1 Income Distribution Models and Income Inequality Indicators

In the surveys of income and expenditure, the information is gathered by classes of income. Because of this, we encounter a series of problems that must be solved in order to obtain income inequality indicators (III's). One of these problems is that it is necessary to assume the same income for all agents in each class, meaning perfect equality of income within each class, and obviously creating a bias in the calculation of any indicator of income inequality.

Another problem arising from the use of grouped data is that the comparison of distributions of income over time can be quite cumbersome. This is due to the fact that the calculated values of the III's are not comparable when the number of classes is different for each distribution. Stark

(1972, Appendix 3), performing an exercise with United Kingdom data, reduces the number of classes from 15 to 8, finding changes in the ranking of the distribution using one III; he concludes that it is misleading to make comparisons between distributions with different numbers of classes. Kalifa (1977, chapter 3) concludes the same, performing a similar exercise, while analysing the impact of changes in the number of classes in several III's.

The use of a well-fitting income distribution model solves both of these problems. The indicator derived from the Income Distribution Model (IDM) is not affected by the number of classes in the survey. In other words, the indicator obtained is not biased as a result of the grouping of data, even though this grouping neglects part of the existing variation. The solution to the above-mentioned problems is also very convenient when we have information with no more than 8 or 9 classes, as well as when the data has been collected with different numbers of classes, as in the case of the Mexican data to be analysed. An evaluation of the data itself is presented in section 3.2 below.

A useful property can be employed when a well-fitting IDM is obtained, whereby one can interpolate within income classes and extrapolate in the lowest and/or highest classes, meaning that one can calculate the number of recipients and their income in arbitrarily selected income brackets.

The possibility exists of using a probability density function to simulate an income distribution, a useful tool either for forecasting or fixing a target income distribution. In the first case, if we have estimated a number of income distributions with a particular IDM, we could then use the parameters to forecast an income distribution and, of course, we could associate the III to the forecasted distribution. With respect to the possibility of fixing a target distribution, this could be done as a planning tool, where the Target Income Distribution (TID) is fixed, to be achieved within a certain time period. The TID could be represented as well in terms of an associated III over time (e.g. the decrease by one percentage point of the Gini Coefficient every two years or the number of percentage points of income to be reached every 3 years by the poorest 20% of the population).

If we have fixed a target income distribution, and we know the actual one, we are able to use an indicator of the distance between them. The economic distance ratios D_0 and D_1 are indicators that could be used to measure the distance from the observed distribution to the target one.

2.3.2 Other Methods of Calculation of III

A) The Use of Functional Forms for the Estimation of the Lorenz Curve and the Gini Coefficient

As has been pointed out earlier, the purpose of fitting a probability distribution function into the observed frequencies is to derive some income inequality indicators, among them the Lorenz Curve and the Gini Coefficient. However, if the purpose is only to obtain the Lorenz Curve, and from it the Gini Coefficient, the possibility exists of estimating a function that would represent the Lorenz Curve. Kakwani and Podder (1973 and 1976), and Maddala and Singh (1977) among others, have used this method whereby a general functional form is fitted to the observed Lorenz Curve.

Kakwani and Podder (1973) use several ad-hoc forms, among them: $N = P e^{\beta(1-P)}$ and $N = P^{\alpha} e^{\beta(1-P)}$ where P represents the proportion of units that receives income up to x , and N represents the proportion of total income received by the same units. They estimate the parameters (α and β) using the least squares method and the asymptotic efficient method. In 1976 Kakwani and Podder introduce a "new coordinate system" for the Lorenz Curve, and are able to use different functional forms, among them the CES type production function as well as the Cobb-Douglas function. The estimation of the parameters is done using four methods, including that of least squares.

On the other hand, Maddala and Singh (1977) propose the following functional form for the Lorenz Curve, using a generalization of the Pareto distribution:

$$\frac{dF}{dX} = \frac{1}{\alpha_1(1-F)^{-\alpha_2} + \alpha_3 F^{-\alpha_4}}$$

$$\alpha_1 > 0, \alpha_3 > 0, 1 < \alpha_2 < 2, 0 < \alpha_4 < 1$$

If $\alpha_3 = \alpha_4 = 0$, then we have the Pareto Distribution.

As $L = \int_0^F X(F) dF$, we obtain:

$$L = -a_1 a_2 F + (1 - a_1 + a_1 a_2) F^{a_4} + a_1 (1 - (1 - F)^{a_2}),$$

where a_1 , a_2 , and a_4 are defined by α_1 , α_2 , and α_4 . Using the least squares method, the parameters a_1 , a_2 and a_4 are estimated, and the Gini Coefficient is then calculated.

In both cases the shape of the underlying density function is somewhat nebulous. In the case of Kakwani and Podder, the Lorenz Curve has no known pdf counterpart, while with Maddala and Singh the functional form used is generalized from the Pareto function, which has been severely criticized when used for the whole range of incomes. There is another shortcoming to this approach, in that often more indicators of the particular distribution under study are needed in order to determine its characteristics (e.g. standard deviation, coefficient of variation, or some kind of moments). With the use of this approach, however, we are unable to calculate these indicators. These are two important drawbacks which can be overcome through the use of well-fitted income distribution models.

B) Direct Calculation of III

There is always, of course, the possibility of estimating III's in a direct form, i.e., we take the definition of the III, and using the observed information we are able to calculate any III. This method, however, is characterized by the same problems mentioned previously when dealing with grouped data, namely: the need to assume perfect equality of income within each group; the misleading use of III's when the distributions have different numbers of groups; the difficulty of inter- or extrapolating the needed information in a precise way; and the difficulty of simulating an income distribution for the purpose of forecasting or targeting. We considered these difficulties reason enough to use a well-fitting income distribution model to derive income inequality indicators that would aid in the analysis of personal income distribution in Mexico.

2.3.3 Estimation of Parameters of Income Distribution Models

A) Selection of Method of Parameter Estimation

In order to estimate the parameters of a particular income distribution model, a method of estimation must be chosen (7). There are various methods available, among them the method of moments, the maximum likelihood method, Pearson's minimum Chi-square method, and the least squares method.

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What follows is a definition and evaluation of each of these methods, which will serve as the basis for the selection of the method chosen to estimate the vector of parameters of several income distribution models.

i) The Method of Moments. The method of moments, which estimates a population parameter from the corresponding sample statistic, is not considered attractive for parameter estimation involving grouped data. This results mainly from the fact that the availability of data in grouped form may involve a large bias in moment estimation, as well as the fact that parameters are not in all cases explicitly related to moments.

ii) Maximum Likelihood Method. The maximum likelihood method assumes that the sample values are fixed, but this sample can be generated by various parent populations, each having its own parameters. Among all the possible sets of parameters, the one chosen is that which gives the maximum probability (maximum likelihood) that its population would generate the sample actually observed.

For example, let n_i denote the number of observations in the i th group of g groups, and P_i denote the probability of income in the i th income interval I_i , i.e.:

$$P_i = \int_{I_i} f(y) dy$$

where $f(y)$ denotes the underlying density function. P_i is a function of the population parameters. The likelihood function associated with $n_1, n_2, \dots, n_g$ ($\sum_i n_i = n$) is given by:

$$L(n_1, n_2, \dots, n_g | \text{population parameters}) = n! \prod_{i=1}^g \left(\frac{P_i^{n_i}}{n_i!} \right)$$

The maximum likelihood method is defined by the estimators which maximize the presiding likelihood function.

iii) Pearson's Minimum Chi-Square Method. The Pearson's Chi-Square estimator, sometimes referred to as a generalized least squares method, minimizes the squares of the discrepancy between the theoretical and the observed frequency, assigning weights of $1/p_i$ to each term:

$$\sum_{i=1}^g \frac{\left(\frac{n_i}{n} - p_i \right)^2}{p_i}$$

As p_i is smaller at the extremes of the distribution (i.e. the very low and upper classes), this method gives heavier weights to these classes, thus allowing for better-fitting estimates for the extremes of the distribution.

iv) Least Squares Method. The least squares method provides estimators which minimize the sum of the square differences between the predicted and observed probabilities:

$$\sum_{i=1}^g \left(\frac{n_i}{n} - p_i \right)^2$$

Of the four methods described above, we select the least squares method for our use. The method of moments is not considered convenient for the reasons mentioned earlier, i.e. the biasedness of the parameters due to the grouped data. The maximum likelihood and Pearson's Chi-square methods optimize a weighted average of a function of the predicted frequencies. The weight is inversely proportional to

the predicted frequencies, hence giving in general (for unimodal distributions) more weight to the tails than to the mode of the distribution. As there appears to be no particular justification for this system of weights, it was decided to take the unweighted sum of the errors.

B) Computation of Parameters and III's

The computation of parameters of the selected IDM was carried out using "A Program Package for Unconstrained Function Minimization" (OPTPAK), developed by Birta (1978). OPTPAK uses nine multi-dimensional minimization algorithms, developed separately in order to locate the argument x^* , which yields a minimum value for some given scalar function $f = f(x)$, where $x = (x_1, x_2, \dots, x_n)$; x being an n -vector. The purpose of having several algorithms within the same computational package is a consequence of the fact that there is no single algorithm that would qualify as the superior choice under all shapes of the various functions.

The general form that OPTPAK solves is:

$$\min_{\alpha} f(x^k + \alpha s^k)$$

where α is a scalar, and x^k and s^k are known vectors. In this way we minimize the square differences of two vectors. In our case, one vector is the observed income distribution, while the other is provided by the non-linear theoretical function or income distribution model. The solution in this case is the vector of parameters of the income distribution model.

Kloek and van Dijk (1977), using Dutch and Australian data, have estimated vectors of parameters for several income distribution models, among them the Lognormal, Gamma and Champnowne (1952), with the maximum likelihood and minimum Chi-square methods. In all cases they estimate the parameters with a computational method developed by Powell (1964), called: "An Efficient Method for Finding the Minimum of a Function of Several Variables without Calculating Derivatives". It is important to note that "Powell" is one of the several algorithms that the computational package OPTPAK uses. In other words, after OPTPAK finds a vector of parameters, through the use of one of the nine algorithms available (e.g. "Powell"), the result is taken as a starting point for the use of another algorithm, and the process is repeated several times in search of the parameters that minimize the sum of the square errors between the observed and estimated distributions. In most cases, OPTPAK needs from 7-10 iterations (algorithms) to find the final parameters, after which the sum of the square errors does not decrease. This also illustrates that the use of only one algorithm is by no means the most efficient method of computation. Based on the vector of parameters estimated through this program, the calculation of the III's selected for the analysis, as well as some measures of location and goodness-of-fit tests were carried out.

C) Goodness-of-Fit and Hypothesis Testing.

Once the estimation of the parameters has been accomplished, it is necessary to determine its quality, or goodness-of-fit for the purpose of comparing the different income distribution models and selecting the one from which certain income inequality indicators can be derived. In the case of this analysis, the closeness of the fit of the income distribution model as compared to the actual frequencies has been accomplished using the Kolmogorov-Smirnov test (K-S), and the Mean Square Error (MSE).

The Kolmogorov-Smirnov test takes the maximum value of all the absolute differences between the observed cumulative distribution and the estimated one. Each of these absolute differences corresponds to each class, i.e.:

$$K-S = \text{maximum } |F(x) - \hat{F}(x)|$$

Massey Jr. (1951), among others, provides an explanation as well as some applications of the K-S test, including hypothesis testing. For this purpose he constructs a table presenting the critical values $d_{\alpha}(N)$ of the maximum absolute difference between the sample and population cumulative distributions. With the use of this table, and knowing both the sample size (N) and the level of significance (α), we are able to accept or reject the hypothesis that we have a well-fitting estimated function. If at any given level of income the maximum absolute deviation between the observed and estimated values exceeds the values of K-S

(i.e. $d^\alpha(N)$), with a particular level of significance and a given sample size, we reject the hypothetical or estimated distribution.

The Mean Square Error is defined as:

$$MSE = SSE/DF.$$

where SSE is equal to the Sum of the Square Errors, and DF stands for the Degrees of Freedom. In turn, the Degrees of Freedom are defined as:

$$DF = N - K - 1,$$

where N equals the number of income classes and K represents the number of parameters of the model. The subtraction of one is due to the constraint that the sum of the income class frequencies is equal to one.

Dagum (1980b) used the K-S goodness-of-fit test, while we find the use of other goodness-of-fit tests in several studies. McDonald and Ransom (1979) for example, use the SSE and the minimum Chi-Square (χ^2) to compare income distribution models and methods of estimation. Through the use of these two indicators, they consistently find that based on the SSE test, the least squares method fits the best, while based on the Chi-Square test, the Pearson Chi-Square method fits best. These results are not dissimilar to what one would expect to find, mainly because the objective functions of the methods of estimation are to minimize the SSE and the Chi-Square, respectively.

In the case of our analysis, as we have considered only one method of estimation (i.e. the least squares method), the use of the goodness-of-fit tests (e.g. K-S, MSE) will help us to evaluate the closeness of fit of several income distribution models, and from there select that which fits the best.

2.4 THE METHODOLOGY OF ANALYSIS OF INCOME DISTRIBUTION DATA

Having examined the various aspects of the econometrics of income distribution, we turn now to the methodology followed in the analysis of income distribution data in Mexico, namely, the calculation of selected income inequality indicators for the analysis of personal income distribution, this being one of the major goals to be achieved in the research.

In order to calculate the selected III's, and from there to be able to carry out the analysis of Mexican income distribution, 3 steps have been followed: 1) selection of information on Mexican income distribution; 2) selection of III's; and 3) selection of a method of calculation for the III's.

More specifically, the selection of information was based on an evaluation of the available data (this is discussed in more detail in 3.2 of chapter 3). As to the se-

lection of the III's, in section 2.1 of this chapter an analysis of the properties of various III's frequently found in income distribution studies was made, followed by an evaluation and selection of those III's considered most appropriate for our purposes. Among those selected were the Lorenz Curve, the Gini Coefficient, the percentage of income received by certain segments of the population, and the Economic Distance Ratios D_0 and D_1 .

Finally, the selection of the method used to calculate the income inequality indicators was based on: a) an examination of the properties of several alternative methods; and b) the problems encountered in the available information, namely, the presentation of information in grouped form and the different number of groups in each survey. This characteristic of the data forced us to discard the possibility of directly calculating the income inequality indicators (see 2.3.2 B), as well as placing in doubt the use of functional forms for the estimation of the Lorenz Curve and from there the Gini Coefficient (see 2.3.2 A). The method selected is to derive the various income inequality indicators from well-fitting income distribution models (see 2.3.1), which solves the problems created by the form of data presentation, while at the same time providing us with several other properties as discussed previously (see 2.2).

Once the method of calculation of the III has been chosen, there remains the selection of the method of estima-

tion, the method of computation and the goodness-of-fit test of IDM's. In all three cases, the selection was made following an analysis and evaluation of various alternatives (see 2.3.3). The decisions made were to use the computational package OPTPAK for the estimation of the vector of parameters of the selected income distribution models, through the use of the non-linear least squares method of estimation; and finally, to use the Kolmogorov-Smirnov test and the Mean Square Error as indicators of goodness-of-fit for the alternative income distribution models (a procedure of hypothesis testing is provided for the K-S case).

Finally, the selection of several income distribution models was carried out on the basis of the properties of each IDM presented in section 2.2 of this chapter. Reviewing the most frequently used income distribution models, those selected for this study are the Lognormal, the Gamma, the Singh and Maddala and the Dagum models.

In this way, the actual calculation of the income inequality measures was carried out, with the income distribution model that performed the best according to the goodness-of-fit tests and the properties examined earlier.

As a means of illustrating the methodology used in this study, an example is provided below which shows the method and interpretation of results. In this example, we are using data of three Mexican cities, with information of 1977: Monterrey (MTY), Guadalajara (GUA) and Mexico City (MC). The

number of households of these cities is: 318,187, 332,982, and 2,313,253, respectively. The information of income distribution is provided in 14 classes of income, with the number of households in each class that received income during the period of January to June of 1977. This information is shown in Table 2.3.

The first step is to estimate the parameters of the four selected income distribution models (i.e. Lognormal, Gamma, Singh and Maddala (SIMA) and Dagum). The parameters of each model for the three distributions (MTY, GUA and MC) are presented in Table 2.4.

At the same time, Table 2.4 shows the goodness-of-fit tests used (MSE and K-S) for each model, so we can select the model which performs the best, in order to derive the income inequality indicators of the distribution in study. The critical values of the Kolmogorov-Smirnov statistic at 5% and 1% significance levels, for a sample size $n=5000$ are (in %) 1.923 and 2.301 respectively. The Dagum model accepts the goodness-of-fit at the 5% significance level for Guadalajara and Mexico City, and at 1% for Monterrey. Of the other models only the Singh and Maddala model accepts the hypothesis for two cases: Mexico City at 5% and Guadalajara at 1%.

Once we have selected an estimated income distribution model, we are able to obtain the selected income inequality indicators needed for the analysis. The values of the III's

TABLE 2.3 INCOME DISTRIBUTION IN MONTERREY, GUADALAJARA AND
MEXICO CITY, (1977)

	MONTERREY	GUADALAJARA	MEXICO CITY
INCOME CLASSES			
(MONTHLY PESOS)	ACCUMUL.	ACCUMUL.	ACCUMUL.
- 0	-	0.10%	-
1 - 700	0.68%	1.02	0.78%
701 - 1000	0.92	3.38	1.46
1001 - 1350	1.64	5.46	2.46
1351 - 1800	4.39	8.40	5.29
1801 - 2400	10.22	13.28	8.90
2401 - 3150	18.73	25.88	16.93
3151 - 4300	38.44	42.06	34.80
4301 - 5725	50.44	56.85	51.97
5726 - 7500	64.85	72.29	65.73
7501 - 10150	76.21	83.33	78.26
10151 - 13400	85.36	89.68	86.61
13401 - 18000	92.40	95.05	92.87
18001 - More	100.00	100.00	100.00
MEAN INCOME	8052.33	6747.50	7824.50

Source: 1977 Survey, SPP. Table A.21 of Appendix A.

derived from the Dagum model, along with some other location parameters are shown in Tables 2.5 and 2.6. The definition and explanation of these III's were given above. In Table 2.5 we use IP20 for "percentage of income of the poorest 20% of the population", and IR10 for "percentage of income of

TABLE 2.4 ESTIMATED PARAMETERS AND GOODNESS-OF-FIT
INDICATORS

MODEL	MONTERREY	GUADALAJARA	MEXICO CITY
DAGUM			
ALPHA	0.0000	0.0000	0.0000
BETA	2.6966	1.0533	1.8333
LAMBDA	2.5249	36.0150	15.5630
DELTA	-1.7856	-2.2673	-2.0379
MSE	.000428	.000207	.000111
K-S	.022150	.016083	.012694
SIMA			
AA	.0179	.0246	.0137
BB	2.9425	2.3740	2.9520
CC	.5218	.9186	.5936
MSE	.000472	.000208	.000118
K-S	.030476	.019312	.013186
GAMMA			
ALPHA	0.3498	0.4179	0.4139
LAMBDA	2.1231	2.3014	2.4747
MSE	.000730	.000323	.000410
K-S	.088708	.066134	.085786
LOGNORMAL			
MU	1.68195	1.60497	1.69488
SIGMA	0.73079	0.69763	0.66216
MSE	.000471	.000227	.000212
K-S	.045648	.025321	.046955

the richest 10% of the population". The Economic Distance Ratios D_0 and D_1 are given for each pair of cities in parametric (P) and distribution free (DF) in Table 2.6. The parametric case was estimated using the Dagum Model.

TABLE 2.5 INCOME INEQUALITY INDICATOR VALUES

	GINI	IP20	IP40	IR20	IR10	MEAN
MTY	.5077	4.86	13.11	56.76	42.37	8052.33
GUA	.4468	5.09	14.85	50.55	35.29	6747.50
MC	.4662	5.33	14.64	52.92	38.21	7824.50

TABLE 2.6 ECONOMIC DISTANCE RATIOS D_0 and D_1

	GUA				MC			
	D_0		D_1		D_0		D_1	
	P	DF	P	DF	P	DF	P	DF
MTY	.103	.103	.286	.254	.004	.004	.091	.083
GUA					.107	.108	.204	.188

Through the use of these III's we have furnished ourselves with a fundamental tool for the analysis and comparison of the income distribution of these three cities, being able, at the same time, to identify the income differential between them.

FOOTNOTES

1. Throughout this study the words 'measures' and 'indicators' will be used interchangeably.
2. A more detailed explanation of Pareto's Index is presented in Section 2.2 below.
3. See M.J. Bowman (1945) for a review of several techniques of graphical analysis of personal income distribution. On page 612, a discussion of the meaning of the slope of the Pareto graph is found.
4. See R. Szal and S. Robinson, (1977) for a summary of this approach.
5. For five articles criticizing the Paglin-Gini index, see the American Economic Review of June, 1977.
6. For a complete treatment of social welfare functions and income inequality, see A. Sen (1973), or C. Bartels (1977), in particular chapters 4 and 5.
7. Parts of this section on parameter estimation are based on McDonald and Ransom (1979), Bartels (1977) and Koutsoyiannis (1977). For the properties of the different methods of estimation, see Koutsoyiannis (1977), or any other appropriate book in statistical methods or econometrics.

III

INCOME DISTRIBUTION IN MEXICO

The study of income distribution in Mexico is a relatively new subject with a growing importance and social significance. Studies covering functional income distribution began appearing in the 1950's, while the first personal income distribution study was published in 1960. Since then, an increasing number of studies using different data sources and following different techniques of analysis have been presented, the result offering contradictory conclusions. After reviewing with detail the studies of income distribution in Mexico in the first part of the chapter, we offer an evaluation of the available income distribution data in the second part. The evaluation of the data includes a comparison of sources, providing the basis for the selection of data to be used in the analysis given in part three of the chapter. The analysis of the income distribution data is carried out following the methodology proposed in the previous chapter for the national, urban-rural, sectoral, educational, and spatial levels. In this section, as well, a comparison of income distribution in Mexico at the international level is presented. Finally, an attempt to identify the poor is given in part four, based on the analysis per-

formed in part three. After proposing a definition of poverty, an attempt to identify the poor at the urban-rural, sectoral, educational, and spatial levels is provided.

3.1 INCOME DISTRIBUTION IN MEXICO: A REVIEW OF THE LITERATURE

The purpose of this section is to review the most important studies of income distribution of Mexico. We will describe what these studies have concluded and assess the validity of such conclusions. While some of the studies analyse functional income distribution, and from this infer the personal distribution, others analyse the data of personal income distribution for one year or over time, using the national and/or any other socioeconomic characteristics available in the information. For the analysis, the studies use different sources of information, different income inequality indicators, and different techniques for their calculations. This, of course, at times causes varying conclusions and only partially covers the problem. Still other studies, mainly in more recent years, use the information of personal distribution in relation to particular topics of interest, such as consumption, savings and the potential effects of income redistribution on import or capital requirements, employment, or the rate of growth of the economy. In order to review these studies, we divide them into three

parts: A) studies analysing functional income distribution; B) studies analysing personal income distribution; and C) studies related to personal income distribution. Of all the studies, only one, Solis, (1970), falls into two categories, analysing both functional and personal income distribution.

3.1.1 Studies Analysing Functional Income Distribution

The first study that we find in this area is the one of Noyola Vazquez and Lopez Rosado (1951), analysing the official minimum wage for the period 1938-39 to 1948-49 for five regions of Mexico and several industries and state-owned companies. The authors state that there has been a rise in nominal wages in this period, mainly as a response to the effect of inflation on wages. They add that once the effect of price increases is introduced, real wages decreased even when the real per capita income increased 23%. They estimate that rural wages have decreased 46% while urban wages have decreased 39%. They conclude that the apparent contradiction between a decrease in real wages and an increase in income per capita is explained by the fact that, as always, inflation has favoured the non-wage earners.

Later, Espinosa de los Reyes (1958), analysing the functional income distribution from 1939 to 1955, observes the trend of a reduction of the labour share from 30.5 in 1939 to 25.3% in 1955, while profits increased from 26.2 to

44.0% in the same period. The remainder, other forms of income, decreased from 43.3 to 30.7%. The author states that the worsening of the distribution is an obstacle to the future stages of national development, and considers that new policies should be proposed, all of them based on the existent legal framework and institutions. He adds that several factors will improve the distribution of income, among them technological advancement, a stronger labour organization, and stronger state intervention.

Solis (1970), considering a longer period, studies the functional income distribution of Mexico from 1939 to 1967. He finds that from 1939 to 1946, the share of wages and salaries decreases, while the share of profits increases. This process is inverted, although only slightly, for the 1946 to 1950 period. From 1950 to 1957 the labour share is quite variable, but from 1957 to 1967 there is a constant improvement. Solis concludes that from 1939 to 1946 the profits share improved, favouring the industrialization process started in the period; from 1946 to 1957 there is not a clear pattern of behaviour; and from 1957 to 1967 the labour share increases, strengthening the internal market. 1957, he adds, is the year in which the period of growth with price controls begins.

Finally, Cole and Sanders (1970) find that from 1940 to 1966 factorial income distribution changed in such a way that all income categories except profits lost their size of

share, with the loss to wages and salaries being the largest. The other categories were: remuneration to working proprietors, rent and interest and mixed income (mainly income of agriculturists who work their own land). The profit share increased from 28.6 to 34.8% from 1940 to 1966, with two possible causes, according to the authors, explaining the change: the general price increases experienced by the Mexican economy, and the steady growth in worker productivity. This productivity growth was not reverted towards the workers, thereby accruing profits.

During the period of study the general price index rose from 23.9 in 1940 to 72.5 in 1950, to 137.5 in 1960, and to 150.9 in 1965, using 1954 prices as a base. On the other hand, between 1940 and 1960, real wages in manufacturing grew by 23 percent, while output per worker increased 64 percent. Based on these facts, the authors conclude that the existence of widespread underemployment provided the leverage that allowed productivity gains and price increases to be turned into profits. Cole and Sanders conclude that profits can serve as an inducement to investment and as a source of investible funds, and that economic development strategies sometimes call for a redistribution of income towards profits, at least during the early stages of development. They conclude as well that policies promoting an increase in labour's proportion of national income could expand the market for manufactures, thereby encouraging new

investment, as well as fuller utilization of existing capacity. At the same time, the government will have to assume even more of the responsibility for economic development in order to promote the welfare of the majority of the population, who have benefited little from the economic growth of the past three decades.

3.1.2 Studies Analysing Personal Income Distribution

Navarrete (1960) is the pioneer author in the analysis of personal income distribution in Mexico. The main interest of her study is the relationship between equality and growth. In order to measure the degree of inequality, Navarrete evaluates the data from the 1950 census (special part) and the 1956 survey, both from the Ministry of Industry and Commerce. She finds that there is a strong difference (approximately 20%) between the disposable income derived from the national accounts and the family income registered in the census and survey. The data are adjusted accordingly, with non-reported income by the poor groups (mainly income in kind), and the very rich groups (mainly capital income). With these data Navarrete analyses the distribution by regions and by persons, concluding that the different levels of average income by region are due to different levels of industrialization, and that the poorest 20% of the families and richest 2.4% show a deterioration of their share in the 1950 to 1956 period.

A. Labra (1967) studies the level of concentration of income by sectors with the 1963 data from the Bank of Mexico Survey. He uses the Lorenz Curve to measure and compare the distribution of the agricultural, industrial, and commerce and services sectors. Labra concludes that the upper-middle groups of the commerce and services sectors are the ones profiting from Mexican economic growth. He adds that the relatively lesser inequality in the industrial sector is explained by the labour organizations, which do not exist in the agricultural sector. At the same time he finds that the services sector is affected by the labour absorption created by the lack of jobs in the industrial sector.

Prieto Vazquez (1969) uses the original data of 1950, 1956, 1958 and 1963, as well as the corrections given by Navarrete (1960) to the 1950 data in order to analyse personal income distribution. He concludes that the poorest 10% of the population suffered decreases in their relative income from 2 to 1% in the 1950 to 1963 period, while the richest 10% decreased their share from 43 to 32%, with the second richest decile taking the difference, increasing their share from 14 to 25%. Prieto Vazquez analyses, as well, the income distribution by sector of activity, and size of locality of the head of the household, using the original tabulation and average income per capita respectively for the 1963 data.

Another study by Navarrete (1970) uses the data of 1950, 1958 and 1963 and makes some corrections following the same methodology used in Navarrete (1960). Using the Lorenz Curve, the Gini coefficient and the rate of growth of real income of the periods for each decile of population, the author concludes that there is a clear tendency towards income concentration. Navarrete forecasts the Gini coefficient for 1980 under three sets of assumptions, and without any particular strategy of redistribution, believes that the strong concentration trend of 1950-63 (Hypothesis I) will not continue, while the return to the distribution observed in 1950 (Hypothesis II) is improbable, and that a combination of both (Hypothesis III) is more likely.

L. Solis (1970) uses the 1963 survey to analyse the distribution of income by sectors (agriculture, industry and services) and by areas (rural-urban). For these purposes he estimates several income inequality indicators: the standard deviation, the coefficient of variation, the Pareto coefficient, the Lorenz Curve and the Gini Coefficient. He concludes that the income level is higher in urban populations than in rural areas, and that income concentration is greater in the rural than the urban area. At the same time he finds that inequality is smaller in the industrial and service sectors than in the agricultural sector. He considers, then, that rural-urban migration helps to improve the distribution at the global level.

In a very well-known article, R. Weiskoff (1970) examines the income distribution of Puerto Rico, Argentina and Mexico for the 1950-65 period, in an attempt to shed some light upon the controversy of the pattern of growth and equality of developing countries. For the analysis he estimates the Gini coefficient, the coefficient of variation, the standard deviation of the logarithm and the asymmetry of the logarithm of income. For the Mexican case, data for 1950 and 1956 from Navarrete (1960) and the survey of the Bank of Mexico (1963) are used. The author concludes that the families ranked from the 51 to the 95 percentiles improve their share in the period, while the 50% poorest and the 5% richest lose part of their shares. He adds, however, that according to the Gini coefficient and the variance of the logarithms of income, the concentration increased, while if measured with the coefficient of variation the opposite holds true.

Carlos Tello (1971) analyses personal income distribution with the data of 1950, 1958 and 1963, presented by Navarrete (1970). The author's main interest is to give some explanations for the higher levels of concentration observed. After studying the Mexican economic growth of the past few decades, he concludes that the most important variables are: the concentration of ownership of the means of production (measured through industrial concentration and ownership of land holdings); the existence of weak labour organizations and the type of occupation of the workers.

García Rocha (1974) estimates the Gini coefficient and the standard deviation of the logarithm of income with the use of the lognormal distribution function for the years 1963 and 1968. In addition, for the 1968 survey he fits the lognormal function to the distributions by age groups, concluding that the concentration increases with each age group. Comparing 1963 and 1968 with 1950 and 1958, he observes that from 1950 to 1963 income distribution improved, while worsening from 1963 to 1968. After an evaluation of the data of 1968, he concludes that the data is not reliable (in section 3.3 we compare the estimation of parameters, goodness-of-fit and inequality indicators derived from the lognormal and several income distribution models).

Van Ginneken (1975), from the ILO, uses decomposition analysis of Theil's index in order to find the factors associated with personal income distribution. The information used is the income survey carried out by the Bank of Mexico in 1968. The factors found to be most strongly related to income distribution were, in order of importance: education, urban-rural differences, the age, and the type of sector and occupation of the head of the household. Van Ginneken remarks that these factors do not explain the personal income distribution, but rather represent the most associated factors, adding that the relevance of the analysis is given by the determination of areas of income redistribution policies.

One interesting conclusion of the author is that because he considers personal abilities, knowledge (education) and economic power as the explanatory variables of income distribution, and because education and political power are mainly concentrated in the urban areas, an urban-rural classification is a better explanatory variable than a regional classification. Another conclusion derived from the results of the study is that the heads of the poor families live mainly in rural areas, work in the agricultural or construction sector, have a low level of education and are jornaleros (working on a daily basis) or non-wage earners.

Another study carried out by Van Ginneken (1976) also uses data from 1968 and examines the income inequalities of the rural and urban areas. The main objective is to find the weights of the inequalities of the rural and urban areas in the national income distribution. Using the decomposition of Theil's index of inequality, the author is able to find the components of the country-wide inequalities of income. The weights found for the inequality between urban and rural areas, inequality within urban areas and inequality within rural areas are 31, 57 and 12% respectively.

Income per family between the rural and urban areas in 1968 differed by 3.19 times, explaining part of the country-wide disparity. On the other hand, the greatest weight is given to the inequality of the urban area, with 57%; the main factors, according to the author, explaining the ine-

quality within the urban area are the differences in sectoral productivity (defined as gross domestic product per economically active person); the differences in employment status or in occupations; the sizes of the urban areas, reflecting differences in industrial production; and the differences in education. Finally, the inequality of the rural area, with a weight of only 12%, is explained by the distribution of landholdings by size of farm; the type of activities of agriculture or non-agriculture; and the number of landless labourers having no regular employment, who stand at the lowest level of income in the rural areas.

This study, although restricted only to the analysis of the rural-urban income inequalities, provides some insights into the type of factors generating the country-wide income distribution. There is, however, a dubious outcome in the study: the findings of the weights determining the national income distribution. This is due to a shortcoming of the methodology used, because the within-urban and within-rural of the constituents of Theil's index are determined partly by their respective shares of the country-wide income. These constituents, as explained by the author, could be weighted by population rather than by income shares. If population shares were chosen, the results would change the overestimated and underestimated components of the within-urban and within-rural inequalities, respectively.

Salvador Kalifa (1977), in probably the most complete study of personal income distribution of Mexico, analyses the original data of 1950, 1956, 1958, 1963, 1968 and 1970, after a detailed evaluation of previous studies. He calculates, in a non-parametric way, the Gini coefficient, Theil's index, coefficient of variation and the standard deviation of income logarithms in order to perform the analyses at the national level, as well as at the urban-rural, sectoral, occupational and interstate levels. Kalifa concludes that there was no important change in concentration between 1950 and 1970; that the relative share of the most needy classes has declined in relation to the middle and upper middle classes; that the share of the top 10 percent of the population has not registered any significant change since 1958; and that the poor have not benefited from economic progress.

In relation to the urban-rural sectors, the author concludes that average urban income has grown faster than its rural counterpart in all the periods considered, thereby increasing the disparity which exists between the two sectors; and that the poorest 10 percent in the rural sector experienced both an absolute and a relative deterioration in their income. Kalifa finds that the sectoral distribution has changed in such a way that the poorest 20 percent in the agricultural-livestock, transformation, construction, electricity and transport sectors had a lower income share in

1968 than in 1963; and the agriculture-livestock and service sectors were among those with the greatest income concentration in 1963 and 1968.

With respect to the occupational income distribution, Kalifa concludes that the white collar employees perform best, with relatively low concentration coefficients, high average incomes, and modest income growth; while blue collar workers and agricultural labourers have a low income concentration. With respect to the states, Kalifa finds with few exceptions that those states having a high degree of industrialization and high income levels show a more unequal distribution in 1958 and 1970 than those states with lower income levels; and that there is an increase in inequality of almost two-thirds of the total number of states between 1958 and 1970. He analyses some of the economic policies from 1940 to 1970 and from 1970 to 1975, as well as their effects on income distribution, offering some recommendations in order to improve equality in Mexico.

David Felix (1977), analysing the income inequality of Mexico from 1895 to 1975, arrives at the conclusion that from 1895 to 1910 and from 1940 to 1975, the two sub-periods of rapid growth, there is increasing concentration of income and wealth. He remarks, however, that the two periods differed significantly in the type of concentration: the material gains of the 1895-1910 period went almost entirely to the top 20% of families, with the top 5% gathering the

lion's share; while the gains from the 1940-1975 growth flowed in varying degrees to the upper 60% of Mexican families. Felix arrives at these conclusions analysing the trends in wage rates, literacy, internal migration and land ownership for the first period; for 1940-1950 he works from indirect measures such as trends in real wages, rural-urban labour force shifts, and wage and profit shares of national income; and for 1950-1970 he uses data from Navarrete (1960) and the Bank of Mexico surveys from 1963 and 1968.

Martin Carnoy (1979), discusses the relationship between education (measured through levels of schooling) and the distribution of earnings (wages and salaries only), using the census data of 1960 and 1970. The method followed estimates the variance of log earnings and the Gini coefficients for the two years, and then, in an attempt to determine explanatory variables, the author "decomposes" changes in earnings distribution into those changes which are due to the changes between 1960 and 1970 in the mean values of the variables in the earnings functions (the distribution of characteristics of the labour force), and those changes in the regression coefficients associated with each variable (changes in the payoffs to various characteristics of the labour force).

One of the several findings of the study is that the observed distribution of wages (employees only) probably became somewhat more equal in the ten year period as measured

by the Gini coefficient, and more unequal as measured by the variance of the log of earnings. Carnoy finds as well that the observed changes in the composition of labour force characteristics have a negligible effect on the estimated earnings distribution. The change in the value of the coefficients to various characteristics explains the increase in estimated inequality.

An important conclusion of the study, observed through decomposing the change in earnings distribution, is that the greatest contribution to the increase in inequality came from the increased disparity in regional earnings, and in economic sector earnings. In other words, increased estimated inequality in the decade can best be explained by increased differences in earnings between the well-paid economic sectors and the poorly paid ones, and in increased differences in earnings between the rich and poor regions of the country. The author states that changing the distribution of wages and salaries through an educational policy, even if successful, would affect only part of the total income distribution, unless other measures were taken to equalize the distribution of wealth. At the same time he adds that the contribution to increased earnings inequality made by changes in schooling coefficients, as well as changes in the distribution of labour with different amounts of schooling was negligible; however, schooling may have had a slight equalizing effect on earnings distribution through

the positive contribution to greater equality of the labour market segment coefficients.

G. Vera has contributed in recent years with four studies of personal income distribution in Mexico: Vargas and Vera (1977), Nunez, Vera and Vera (1979), Vera (1979) and Vera^a (1980). In the first study, the authors use information of the 1975 CENIET (Centro Nacional de Informacion y Estadisticas del Trabajo) survey, in order to identify the variables explaining the variation of income in Mexico. The statistical method used (the Automatic Interaction Detector - AID) identifies education as the most important explanatory variable of income distribution. The second variable is the size of the locality where the family lives. Out of a long list of variables only three more are relevant according to the method used: size of the family, number of persons of the family working, and the age of the head of the family.

It is interesting to note that sex, employed or unemployed, type of occupation, type of sector, affiliation or not to a union, and receiving social security or not are relatively unimportant variables. The study concludes that the families with higher incomes are those whose heads have a university degree, while the heads of the poorer families have less than six years of schooling and live in towns of less than 10,000 inhabitants. The authors compare these results with the ones presented by Van Ginneken (1975), who

used the decomposition analysis of Theil's index for 1968 data. The authors find basically the same results, concluding that in the 7 year span between the two surveys, the variables associated with the income distribution have not changed.

In Nunez, Vera and Vera (1979) the authors concentrate on the analysis of poverty using the information of the 1968 Bank of Mexico survey, processed by the Ministry of the Presidency (1974) (the differences in both presentations are discussed in the next section). Using monthly income per capita of the head of the family, analysed by different categories, they find among several results that: 1) income inequality in the urban sector is greater than in the rural sector, derived from the fact that the urban poor's income per capita was 20.8% of the total urban, while the rural poor's income was 47.2% of the total rural (they define poor as the families with the lowest 25% of income per capita); 2) the poor obtain most of their income selling their labour force; 3) income per capita increases with family size, while the participation of income derived from capital decreases; 4) income per capita varies according to the age of the head of the household; 5) administrative workers and technicians are the employees with more income; 6) there is a clear direct relationship between the size of the city and the income difference of the poor with respect to the total; and finally, 7) income per capita increases with the number

of years of education of the head of the family in both the urban and rural areas.

The final conclusion of the study is that poverty in Mexico is determined by institutional factors, the principal ones being access to education and to the labour market. At the same time the authors believe that rural marginality must be eradicated, otherwise rural-urban migration will continue, since it is still better to be poor in the urban area than in the rural area.

Vera (1979) compares the surveys of 1963 of the Bank of Mexico, 1968 of the Ministry of the Presidency, and 1975 of CENIET. The author uses the tabulations of the surveys rather than calculating and comparing inequality indices. Among the conclusions reached are: 1) from 1963 to 1968 the concentration of income increased, while, from 1968 to 1975 it decreased; 2) for the entire period the level of concentration increased; 3) the number of poor people increased, and even when the number of rich people decreased, those remaining are even richer; 4) from 1968 to 1975 the families whose head had no education became poorer; and 5) in general the poor families are those whose head had little education or none, worked in agricultural activities, and received income from wages and salaries.

Finally, in Vera (1980) the purpose was to explore the effect of the size of the family, and variables related to it, upon income distribution. The author studies the family

life cycle, through the age of the family head, the size of the family, and the income distribution, concluding that there is a positive association between family income and family size. In particular, he finds that in small families lower incomes are more frequent, while in large families the frequency of higher incomes is greater. Finally, after showing that income concentration per person is smaller than per family, Vera concludes that while comparing family income distribution by groups, nationally or internationally, it is important to consider the age structure and life cycle, which also affect the distribution.

With the objective of determining the factors associated with Mexican income distribution, Artur Mann (1979) analyses the statistical variations of income concentration among the Mexican states using multiple regression analysis. Income concentration is measured through the Gini coefficient, while the most significant explanatory "proxy" variables are: population density (inhabitants per square kilometer); discrimination (percentage of population speaking an Indian language); labour mobility (percentage of population born in their state of residence); participation of the labour force; and the level of education (rate of literacy). He finds an R of 72% in the multiple regression analysis performed, and, after studying the impact of the explanatory variables, the author proposes two types of policies: formation of human capital with more expenditure on education, and more investment in the rural and/or agricultural areas.

Finally, in the last study presented analysing personal income distribution, Hernandez and Cordova (1979) analyse the data of the Ministry of Programming and Budgeting (Secretaria de Programacion y Presupuesto - SPP) of 1977. They briefly compare the results of Kalifa (1977) (for 1950, 1958, 1963, 1968 and 1970) and CENIET (1975) with the 1977 survey data, using, among other indicators, the Lorenz Curve and the Gini coefficient. The data of 1977 are directly analysed from the tables published by SPP, particularly those related to the socio-demographic characteristics of the head of the household, the source of income, characteristics of the expenditure, regional distribution, and identification of poverty groups. Among several conclusions, Hernandez and Cordova identify education as a variable strongly correlated to the level of income; find that almost a third of the households (32.3%) receive an income at the official minimum wage or less; and conclude that it is important to reallocate economic activity due to the fact that it is extremely concentrated in very few regions. On the other hand, they propose, as redistributive policies, wage policies, price controls and state production of basic needs as short and medium term instruments, to complement the proposed main policy of redistribution of the means of production.

3.1.3 Studies Related to Personal Income Distribution

Cline (1972) analyses the potential effects of income redistribution in six Latin American countries: Argentina, Brazil, Chile, Colombia, Mexico and Venezuela. Following the literature of the apparent conflict between growth in per capita income and equity of income distribution, the study is aimed at clarifying, theoretically and empirically, the degree to which growth must be sacrificed in order to attain increased equity. After evaluating the data on income distribution for each country, he uses the 1963 Bank of Mexico Survey, in order to estimate the savings effects of changes in the observed Mexican income distribution with two possible new vectors of distribution: 1) the English income distribution of 1965; and 2) a vector such that enough income is redistributed from the upper brackets to the lower ones in order to ensure a minimum income of half of the total average family income for all lower brackets.

The method used by Cline calls for an estimation of the consumption function, and from there the savings function. Using the simulated levels of income, new aggregate personal savings are determined. From a simple Harrod-Domar growth relationship, and estimating the Incremental Capital-Output Ratio and the fraction which disposable personal income constitutes in GNP, an approximate idea of the growth costs implied by the redistribution is obtained.

For Mexico, the decline in the percentage annual growth rate of the economy, resulting from redistribution of income, is 1.17 (1.77) if the redistribution assumes the English distribution, or .86 (1.35) if the second vector of income distribution is assumed. The numbers in parentheses are obtained with a different specification for the savings function. The author examines the changes in income redistribution on the composition of demand, the import effect, and the scale effects, as an implication of probable factor requirement changes following income redistribution.

Along the same lines, Haan (1977) of the ILO in Mexico City estimates the impact of possible exogenous changes of income distribution on the level and rate of growth of production and employment. He builds a simulation model for this purpose, where the most relevant characteristics include a lack of capital restrictions, foreign exchange and employment. There are four income redistribution alternatives (or vectors) to the one observed in 1968 with the study of the Bank of Mexico. The income is redistributed through direct taxes and subsidies from the rich to the poor; final demand, except private consumption, is fixed; and the model assumes no changes in the relative prices of goods and services or the propensity to consume for each income bracket.

The exogenous changes in income distribution are analysed through the changes in consumption, with the structure

found in the 1968 Bank of Mexico survey of income-expenditure; from there, the relationship with employment and growth is studied through the input-output matrix of 1970. Some of the most important results are: 1) a lower savings-output ratio, capital-output ratio and import-output ratio; 2) a higher labour-output ratio; and 3) with the strongest redistribution of income alternative, the rate of growth of GNP decreases from 6.9 to 6.5%.

Stewart Jr. (1978), following the Cline (1972) study, concentrates, in the Mexican case, on the impact of income redistribution on growth, and the import and capital requirements. The author uses new estimating techniques and the distribution of Czechoslovakia (apart from the two used by Cline) as alternative redistribution vectors, in order to determine the sectoral allocation of investment which responds to changes in the sectoral allocation of other elements of final demand.

The results of the model show that a redistribution to a more equal income allocation resulted in a small reduction in the Incremental Capital-Output Ratio, and in the ratio of imported intermediate products to total intermediate products. This means that a redistribution might enhance the rate of growth slightly when the country is operating under a trade constraint. When savings is the constraint, the estimated reduction in the ICOR indicates that the potential reduction in the rate of growth, due to diminished savings, will be partially offset.

Following the same approach, the Secretaría de Hacienda y Credito Publico (1981) has studied the potential effects of a redistribution of income upon growth, consumption and employment, with primary concentration upon the latter. With the 1968 Bank of Mexico survey and the input-output matrix of 1970, the study estimates the impacts of a redistribution of income of 10% from the top 10% richest to the 40% poorest, doubling their income share from 10 to 20%. After estimating the new structure of consumption through income elasticities of groups of goods, and using the input-output coefficients, the results show that employment (measured as Economically Active Population/GDP), increases by almost 2%. However, in absolute terms, the employment level increases by only 0.7% due to a decrease in production.

Another conclusion of the study is that there are four sectors, taking 43% of the GDP, which do not favour employment; these sectors are: food processing, transportation, commerce and housing rental. The conclusion is that if the redistribution policies are combined with new labour-intensive techniques in these sectors, the impact on employment would be much stronger.

Reynolds and Corredor (1976) examine the structure of family income distribution and savings for the years 1963 and 1968 with data of the Bank of Mexico. At the same time, they study relationships between family income, savings, and the acquisition of financial assets and liabilities, as well

as some implications of alternative assumptions about the distribution of increments to the GNP for patterns of aggregate savings. The authors believe that because the data are subject to a probable severe downward bias for both income and savings estimates, and because the upper income groups under-report income to a greater extent than lower income groups, the estimated savings function is likely to have a flatter slope than the real one.

Using data from a special survey of the Bank of Mexico for the city of Monterrey, they find that the results of the study reinforce the position that the differential between interest rates charged on financial liabilities and interest rates paid on financial assets of households varies according to the position of the households in the structure of income. They find as well that the lower income groups carry a relatively greater debt than the highest income group, acquire a greater percentage of their consumer durables on credit, and pay relatively more in interest charges.

N. Lustig (1979) examines a series of hypotheses about the Latin American industrialization process, connecting income distribution, the structure of consumption and economic growth, using Mexico as an empirical testing ground. One hypothesis tested sustains that after the easy phase of import substitution (light or "traditional" goods) was exhausted (around the mid-fifties), industrialization proceeded with the substitution of consumer durables (or modern

goods) as a result of the prevailing demand structure shaped by a concentrated distribution of income. This pattern of resource allocation, however, was argued to contain a set of problems that eventually would threaten overall economic growth.

In particular, Lustig tests this hypothesis, suggesting that: 1) an important part of the Mexican population is outside the market (mainly for manufactured goods), since they themselves produce a considerable proportion of what they consume; 2) concentration of income is responsible for the slow growth rates of "traditional" industries (processed food, beverages and tobacco, shoes and clothing, furniture, chemical products); and 3) under-consumption tendencies exist for consumer durables and these tendencies, if they exist, could be overcome by a concentration of income at the top, or by the incorporation of the middle income groups.

Examining the 1968 Bank of Mexico survey, the empirical results show that a large part of what families consume (over 97% of total expenditure) comes from the market. Even the poorest of the urban area buy almost everything from the market, while the poorest of the rural area (60%) covered approximately 10% of the value of their total expenditure with auto-consumption (in 1968 40% of the population lived in the rural area). Another result of the study is that generally speaking, redistributing the increases in income towards the poorer families would in fact dynamize demand

for "traditional" goods and stimulate their production, if the main bottleneck to their expansion was indeed caused by narrow markets. At the same time, it is shown that the lower income groups do participate in the consumption of electrodomeestics (though not of automobiles), especially the less-expensive ones, e.g. radios, stoves, etc..

Finally, Arroio, Castell and Fello (1979), without any statistical analysis of the data available, present a diagnostic of income distribution based on land concentration, and the process of industrialization started at the beginning of the 1940's. The few figures presented about income distribution are not directly connected with the explanation given in the study. A strategy of income redistribution is proposed wherein the two main elements are: 1) a development project for the capital goods sector, in order to increase the level of integration of the productive sector and the generation of employment; and 2) a rural development program in order to direct resources towards the more marginal groups of the society, and in order to increase national production of foodstuffs, decreasing the international dependency on food.

3.1.4 Comparison and Conclusions

Of the total number of studies (30) reviewed, 3 of them analyse only functional income distribution, 18 analyse only personal income distribution and 8 use personal income distribution data as a departure for other types of studies. The remaining study, Solis (1970), participates in the first two types of studies. We can observe a trend in terms of preferences about the subject: first the studies of functional income distribution appeared; then the analysis of the data, each time in a more complete way and using more advanced statistical techniques; and finally, the use of these results to study particular areas of interest.

With respect to the studies analysing the functional income distribution from 1939 to 1967, they agree on the negative effect on the labour share and on real earnings. This could lead to the reasonable conclusion that income concentration increased in this period. We find this, however, a very partial result difficult to infer to the national level, when we realize that the urban workers were a minority throughout the period in question.

In relation to the studies analysing the data of personal income distribution, table 3.1 reveals some of their characteristics, followed by the list of studies and the sources of information available. From the table we can see the different types of sources, levels, income inequality indicators and estimating techniques used. We can see that

the Lorenz Curve is clearly the most popular technique used, while the Gini coefficient is the measure of concentration most frequently calculated. Yet even the estimation of this measure is at times done by income classes or at times by deciles, resulting in a difference in estimated values. This caused a divergence of conclusions in some cases and the problem of incomparability among the different studies. We can say that perhaps the only conclusion generally accepted was the obvious one of a high level of income concentration in the country, but the quantification, trend, and analysis by levels was not clearly agreed upon. Based on this experience, we opted to use the original data, after an evaluation and selection is offered in the next section. We use the method presented in Chapter 2, with the statistical advantages discussed, in order to analyse the distributive problem of Mexico, at different levels, considering the data from 1950 to 1977.

Finally, with respect to the studies related to personal income distribution data, we can observe the interest in determining the effects of the distributions observed. Four of the eight studies concentrate on potential effects of income redistribution, without even suggesting how to get to the proposed distributions. This can be considered a very complex exercise without much effect to back up a particular redistribution strategy.

TABLE 3.1 STUDIES OF PERSONAL INCOME DISTRIBUTION OF MEXICO: A COMPARISON

Author	Source(s)	Level(s)	Technique(s)
1. Navarrete (1960)	1950 (Navarrete) 1956 (Navarrete)	National	Lorenz Curve Gini Coeff.
2. Labra (1967)	1963 (BM)	National Sectoral	Lorenz Curve
3. Prieto V. (1969)	1950 (Navarrete) 1950 (SIC) 1956 (SIC) 1958 (SIC) 1963 (BM)	National Sectoral (1963)	Lorenz Curve
4. Navarrete (1970)	1950 (Navarrete) 1958 (Navarrete) 1963 (Navarrete)	National	Lorenz Curve Gini Coeff.
5. Solis (1970)	1963 (BM)	National Sectors Rural-Urban	Lorenz Curve, Gini, Pareto Coeff., Standard Deviation, and Coeff. of Var. and Asymmetry
6. Weisskoff (1970)	1950 (Navarrete) 1956 (Navarrete) 1963 (BM)	National Rural-Urban (1963)	Lorenz Curve, Gini Coeff. of Variation, Standard Dev. of Log. and Coeff. of Kuznets
7. Tello (1971)	1950 (Navarrete) 1958 (Navarrete) 1963 (Navarrete)	National	Lorenz Curve

TABLE 3.1 STUDIES OF PERSONAL INCOME DISTRIBUTION OF MEXICO: A COMPARISON (CONT'D)

8.	Garcia Eocha (1974)	1963 (BM) 1968 (BM)	National Age (1968)	Lorenz Curve, Gini and Standard Dev. using Lognormal Distribution model.
9.	Van Ginneken (1975)	1968 (BM)	National Education, Occupation, Region, Age	Gini and Decompo- sition Analysis of Theil's Index
10.	Van Ginneken (1976)	1968 (BM)	National Rural-Urban	Gini and Decompo- sition Analysis of Theil's Index
11.	Kalifa (1977)	1950 (SIC) 1950 (Navarrete) 1956 (SIC) 1956 (Navarrete) 1958 (SIC) 1963 (BM) 1968 (BM) 1968 (Presidency) 1970 (Survey, SIC)	National Urban-Rural (1958, 1963, 1968, 1970); Occupational (1963, 1968), State (1958, 1970)	Lorenz Curve, Gini, Theil's Index, Coeff. of Var. and Standard Deviation of Income Logarithms
12.	Felix (1977)	1950 (Navarrete) 1956 (Navarrete) 1958 (Navarrete) 1963 (Navarrete) 1968 (BM)	National	Lorenz Curve, Gini.
13.	Carnoy (1979)	1960 Census (SIC) * 1970 Census (SIC) *	National (includes only earnings)	Lorenz Curve, Gini and Variance of the log of earnings
14.	Vargas and Vera (1977)	1975 (CENIEF)	National	Automatic Inter- action Detector

TABLE 3.1 STUDIES OF PERSONAL INCOME DISTRIBUTION OF MEXICO: A COMPARISON (CONT'D)

15.	Nunez, Vera & Vera (1979)	1968 (Presidency)	Urban-Rural, City Size, Family Size, Age, Occupation, and Education	Lorenz Curve
16.	Vera (1979)	1963 (BM)	National, Sector and Source of Income, Education of Head of Household (1968, 1975)	Comparison of income class tabulations
17.	Vera (1980)	1977 (SPP)	Family Size	Lorenz Curve Gini
18.	Mann (1979)	1970 Census (SIC)	National Regional	Gini, Multiple Regression
19.	Hernandez & Cordova (1979)	1977 (SPP)	National, Education, City Size, Age and Household Size.	Lorenz Curve Gini

* with a 2% sample

Studies:

1. Navarrete, Ifigenia M. de, (1960): LA DISTRIBUCION DEL INGRESO Y DESARROLLO ECONOMICO DE MEXICO. Mexico: UNAM.
2. Labra M., Armando, (1967): "La Concentracion del Ingreso en Mexico: Un Enfoque Sectorial", COMERCIO EXTERIOR, September, pp. 722-729.
3. Prieto Vazquez, Jesus, (1969): "La Distribucion del Ingreso en Mexico", COMERCIO EXTERIOR, September, p. 686-696.
4. Navarrete, Ifigenia M. de, (1970): "La Distribucion del Ingreso en Mexico: Tendencias y Perspectivas", in EL PERFIL DE MEXICO EN 1980. Mexico: Siglo XXI Editores, pp. 17-70.
5. Solis, Leopoldo, (1970): LA REALIDAD ECONOMICA MEXICANA: RETROVISION Y PERSPECTIVAS. Mexico: Siglo XXI Editores.
6. Weisskoff, Richard, (1970): "Income Distribution and Economic Growth in Puerto Rico, Argentina and Mexico", REVIEW OF INCOME AND WEALTH 16(4), pp. 303-332.
7. Tello, Carlos, (1971): "Notas para el Analisis de la Distribucion Personal del Ingreso en Mexico", EL TRIMESTRE ECONOMICO, 38 (150), pp. 629-657.
8. Garcia Pocha, Adalberto, (1974): "La Distribucion del Ingreso en Mexico", DEMOGRAFIA Y ECONOMIA, 8(2), pp. 115-140.
9. Van Ginneken, Wouter, (1975): "Analisis de Decomposicion del Indice de Theil Aplicado a la Distribucion del Ingreso Familiar en Mexico", DEMOGRAFIA Y ECONOMIA 9(1), pp. 93-112.
10. Van Ginneken, Wouter, (1976): RURAL AND URBAN INCOME INEQUALITIES IN INDONESIA, MEXICO, PAKISTAN, TANZANIA AND TUNISIA. Geneva: International Labour Office.
11. Kalifa-Assad, Salvador, (1977): "Income Distribution in Mexico: A Reconsideration of the Distributive Problem", unpublished Ph.D. Dissertation, Cornell University.
12. Felix, David, (1977): "Income Inequality in Mexico", CURRENT HISTORY, March, pp. 111-114 and 136.
13. Carnoy, Martin, (1979): CAN EDUCATIONAL POLICY EQUALIZE INCOME DISTRIBUTION IN LATIN AMERICA? in collaboration with Jose Labo, Alejandro Toledo and Jacques Velloso. Great Britain: Saxon House.

14. Vargas Galindo, Sergio, and Gabriel Vera Ferrer, (1977): "Análisis Estructural del Ingreso Familiar en México". Cuadernos de la Encuesta de Ingresos y Gastos Familiares, Análisis I. México: CENIET.
15. Nunez, F., G. Vera and C. Vera, (1979): "Seis Perfiles de la Pobreza en México (1968)", Centro Nacional de Información y Estadísticas del Trabajo, Secretaría del Trabajo y Previsión Social, México. Serie Estudios No. 5. pp. 11-39.
16. Vera, Gabriel, (1979): "Caracterización de la Distribución del Ingreso en México a partir de las Encuestas de Ingresos y Gastos Familiares 1963, 1968 y 1975", Centro Nacional de Información y Estadísticas del Trabajo, Secretaría del Trabajo y Previsión Social, México. Serie Estudios No. 5, pp. 41-67.
17. Vera, Gabriel, (1980): "El Tamaño de la Familia y la Distribución del Ingreso en México: Un Ensayo Exploratorio", Centro Nacional de Información y Estadísticas del Trabajo, Secretaría del Trabajo y Previsión Social, México. (mimeographed)
18. Mann, Artur, (1979): "Un Modelo de la Distribución del Ingreso en México", EL TRIMESTRE ECONOMICO, pp. 169-182.
19. Hernandez Laos, Enrique, y Jorge Cordova Chavez, (1979): "Estructura de la Distribución del Ingreso en México", COMERCIO EXTERIOR 29(5), May, pp. 505-520.

Sources of Mexican Income Distribution Data

A. Ministry of Industry and Commerce (Secretaria de Industria y Comercio: Direccion General de Estadistica, S.I.C.)

- 1950 Census, S.I.C. "VII Censo General de Poblacion, Parte Especial", Mexico, 1951.
- 1956 Survey, S.I.C. "Encuesta de Ingresos y Egresos Familiares", Mexico, 1957.
- 1958 Survey, S.I.C. "Ingresos y Egresos de las Familias en la Republica Mexicana", Mexico, 1960.
- 1960 Census, S.I.C. "VIII Censo General de Poblacion: Ingresos por Trabajo de la Poblacion Economicamente Activa y Jefes de Familia", Mexico, 1961.
- 1960 Survey, S.I.C. "Las 16 Ciudades Principales de la Republica Mexicana: Ingresos y Egresos Familiares, Agosto-Diciembre, 1960", Mexico, 1960.
- 1970 Survey, S.I.C. "Ingresos y Egresos de las Familias en la Republica Mexicana, 1969-1970", Mexico, 1971.
- 1970 Census, S.I.C. "IX Censo General de Poblacion", Mexico, 1971.

B. Bank of Mexico (B.M.)

- 1963 Survey, B.M. "Encuesta sobre Ingresos y Gastos Familiares en Mexico 1963", Oficina de Estudios sobre Proyecciones Agricolas, Bank of Mexico, 1966.
- 1968 Survey, B.M. "La Distribucion del Ingreso en Mexico, Encuesta sobre los Ingresos y Gastos de las Familias, 1968", Fondo de Cultura Economica, 1974.
- 1968 Survey, (Presidency). "Estudios de Ingresos y Gastos de las Familias", A regrouping of the original Bank of Mexico data done by the Ministry of the Presidency, 1974. (mimeographed)

C. Other Sources

- 1960 Navarrete, I. M. de, LA DISTRIBUCION DEL INGRESO Y DESARROLLO ECONOMICO DE MEXICO. Mexico: UNAM, 1960. Adjusts the data of 1950 Census (S.I.C.) and 1956 Survey (S.I.C.), due to underdeclaration of income, creating 1950N and 1956N.

- 1970 NaVarrete, I. M. de, "La Distribucion del Ingreso en Mexico: Tendencias y Perspectivas", in EL PERFIL DE MEXICO EN 1980, MEXICO: Siglo XXI Editores, 1970, pp.17-70. Uses 1950N and adjusts 1958 Survey (S.I.C.) and 1963 Survey (B.M.), published, due to underdeclaration of income, creating 1958N and 1963N.
- 1975 CENIET, Encuesta de Ingresos y Gastos Familiares, Centro Nacional de Informacion y Estadisticas del Trabajo, Secretaria del Trabajo y Prevision Social, 1977.
- 1977 SPP, Encuesta Nacional de Ingresos y Gastos de los Hogares, 1977. Primera Observacion. Secretaria de Programacion y Presupuesto, 1979.
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3.2 MEXICAN INCOME DISTRIBUTION DATA: EVALUATION AND SELECTION

3.2.1 Existing Sources of Income Distribution Data

The collection of data on Mexican income distribution began in 1950 with the national census, with a total of eleven sources (eight surveys and three censuses) having been carried out up to 1979. We find as well three other sources which regroup or adjust the original data. These 14 sources are listed in table 3.1. Recently, several attempts have been made to evaluate the existing information (1), indicating the differences and similarities of the data collected with the same objective: to determine the income structure of Mexican society. In the case of the eight surveys, there is another well-defined objective: to determine the expenditure structure of Mexican families.

We have grouped the sources into those produced by the Ministry of Industry and Commerce, those produced by the Bank of Mexico, and other sources. The National Bureau of Statistics (Dirección General de Estadística) was part of the first institution until December of 1976, being transferred to the the Ministry of Programming and Budgeting (Secretaría de Programación y Presupuesto-SPP), which was in charge of the SPP 1977 survey, listed in other sources. Even when the National Bureau of Statistics and the Bank of Mexico have been practically the only institutions generat-

ing income distribution data (with the exception of the 1975 CENIET survey) in Mexico, we still find differences in the criteria used to produce information. These changes in criteria have made it difficult, and at times impossible, to compare the data without problems, or without challenging the results of a particular study.

Furthermore, if we introduce the additional problems created by the regrouping of original data, (the case of the 1968 Bank of Mexico-Presidency survey), or the adjustment of data with allocation of undeclared income by groups (the case of the 1950, 1956, 1958 and 1963 surveys adjusted by Navarrete (1960 and 1970)), we face the possibility of rejecting the idea of studying the changes in Mexican income distribution for the 1950 to 1980 period. A close look at the data will inform us as to this possibility.

3.2.2 Evaluation of the Information

In order to evaluate the Mexican income distribution data, we first study the original eleven sources, followed by the other three.

A) Original Sources

In general, we can say that there are several types of differences when comparing original sources of income distribution, among them: the type of receiving unit; the definition and composition of income and expenditure; the sam-

pling methodology; the territorial coverage; and the treatment of the non-answered questionnaires. In table 3.2 we present some of these characteristics for the eleven original sources. We can see that two of the sources, the 1960 census (S.I.C.) and the 1970 census (S.I.C.) use "economically active population" as the receiving unit; the 1977 survey uses "household"; while the rest use "family". In the 1977 SPP survey, the receiving unit is clearly defined as "household", however with respect to this terminology CENIET (1979) concludes that because housing unit is used in the sampling methodology, it is not clear which of the two is actually used.

Even though the receiving unit is defined as "family" for eight of the original sources, it by no means follows that the definition is exactly the same. We can observe the differences in the definitions in table 3.3 which, although similar in definition, vary; the concept of "household" is broader and both are definitely difficult to compare when the concept of "economically active population" is used as the receiving unit. In relation to the geographic coverage, all of the sources attempt to have a geographical coverage of the national territory, except the 1960 survey (S.I.C.), which covers only the 16 largest cities of the country, with an actual covering of 25% of the national population. This is a major shortcoming if we consider the strong differences in income per capita per size of cities, or if we are inter-

TABLE 3.2 CHARACTERISTICS OF ORIGINAL DATA SOURCES

Name	Sample Size	Geographic Coverage	Receiving Unit	Income
1. 1950 Census SIC	-----	National Territory	FAM	Disposable
2. 1956 Survey SIC	5600	"	FAM	Gross
3. 1958 Survey SIC	5000	"	FAM	Gross
4. 1960 Census SIC	-----	"	EAP	Gross
5. 1960 Survey SIC	7138	16 Largest Cities (25% of National Pop.)	FAM	Gross
6. 1963 Survey BM	5000	National Territory	FAM	Disposable
7. 1968 Survey BM	5939	"	FAM	Disposable
8. 1970 Census SIC	-----	"	EAP	Gross
9. 1970 Survey SIC	5000	"	FAM	Gross
10. 1975 Survey CENIET	9554	"	FAM	Mix of Gross and Disposable
11. 1977 Survey SPP	15360	"	HOUSEHOLD	Disposable

Sources: CENIET (1977), chapter 3; Kalifa (1977), pp. 108-119; and
SPP (1979a), chapter 1.

ested in identifying the poor, of which a good part are in the rural area. With respect to the definition of income used, we can see the differences in table 3.3, where the concept varies, mainly from the type of source: Ministry of Industry and Commerce (S.I.C.) or Bank of Mexico (B.M.). In the first case we find variations of gross income, and in the second of disposable income (monetary and in kind after taxes and deductions). The definition used by CENIET (1975) is a mixture of the two, while SPP (1977) uses practically the same definition as the Bank of Mexico. This means that in some cases we have information about ID_2 and in others about ID_4 (see section 1.4), with the CENIET case presenting a combination of the two.

B) Other Sources

Navarrete (1960 and 1970) corrects the original data of 1950, 1956, 1958 and 1963, in order to reconcile the values of personal disposable income of the national accounts with family income of the censuses and surveys. The methodology of adjustment calls for an estimation of the difference (from 18 to 27% in the four years) and then its allocation to the poorest and richest groups. The adjustment for the poorest groups, considering under-reported income in kind, is given by an index of income in kind built for the 1956 survey. The index adds income to the poorest groups of the four years, correcting the income of those families which declared a deficit with respect to their expenditure. For

TABLE 3.3 DEFINITIONS OF RECEIVING UNIT AND INCOME OF ORIGINAL SOURCES

Source	Definition of Receiving Unit	Definition of Income
1950 Survey	Family: No clear definition	Disposable personal monetary income; from labour, capital and mixed, apparently after deduction of taxes and social security deductions.
1956 Survey	Family: Father, mother, own or adopted children and any other person who lives in the house and is kin to either the head of the household or wife.	Income from work, capital or any kind of regular assistance that the family receives as a donation, apparently before taxes.
1958 Survey	Family: same as 1956 Survey	Nominal income from labour, capital and assistance before taxes and other deductions, which appear as expenditures.
1960 Census	Family: assumed to be the same as the 1970 Census.	Assumed to be the same as the 1970 Census.
1960 Survey	Family: Assumed to be the same as in 1956 and 1958 Survey.	Assumed to be the same as in the 1956 Survey.
1963 Survey	Family: Husband, wife, children and other relatives, "god-children", "protégés", and other people received into the family, living together permanently in one housing unit and sharing the same kitchen, and supported by the head of the household's income and that brought in by other members of the group. Servants and lodgers are not included.	Disposable family income including money, received by the family under different headings or produced by the family for its own consumption, after deducting income and property tax, the social security contributions, and union dues, from those people who have to pay them.

TABLE 3.3. DEFINITIONS OF RECEIVING UNIT AND INCOME OF ORIGINAL SOURCES (CONT'D)

1968 Survey	Family: The equivalent to a consumption unit made up of all the persons who usually live in the same house or lodging, related by blood, marriage or adoption and who share, even if only partially, income, food and expenditure. Servants and lodgers are not included.	Includes everything received in money or in kind by the members of the family unit, after income and property taxes, union dues and social security contributions, pensions, etc.
1970 Census	FAP who declared income. FAP is that part of the population of 12 or more years who worked at some time in the year 1969 either for an income or aiding in an income-generating activity by any member of the family.	Total gross cash income normally received by the people in a month of the year 1969. All the person's income is taken into consideration without deducting taxes, social security contributions, pensions, etc.
1970 Survey	Family: same as that of 1958	Same as that of 1958
1975 Survey	Family: All those persons who usually live together, in the same house or lodging, and who share, even if only partially, income, food and expenditures, whether they are related by blood, marriage or adoption. Also included are those individuals who, even though they share no relationship with the head of the household, affect the spending structure of the family.	Monetary income or in kind that the individual obtained through various sources. It includes a mixture of income before and after taxes.
1977 Survey	Household: Group of people, nationals or foreigners, living in a housing unit sharing common expenditures, not necessarily members of a family.	Income, monetary and in kind, after taxes and social security and union dues. An imputation for autoconsumption, rent of own house, presents and payment in kind is included.

Sources: CENIET (1977), chapter 3; Kalifa (1977), pp. 108-119; and SPP (1979a), chapter 1.

the richest groups, the allocation is based on the assumption that savings are realized by the rich families, and that the declared surplus (savings) is proportional to the under-declaration of income (mainly from capital). Thus, the more they saved, the more they underdeclared income. Based on this criteria, income was allocated to poor and rich groups for the four years, thereby making them comparable.

Even when under-declaration is a real problem, the fact that an arbitrary method of adjustment is developed does not solve the problem. The method used by Navarrete "estimates" personal disposable income using concepts not contained in the national accounts. This makes up the "difference" (from 18 to 27%) of allocation an estimation. The index of income in kind for 1956 is used only in the family groups with "deficits". We consider that for the urban-rural cases the index of income in kind, if existent, should be somehow different. Finally, the under-declaration of the rich is "proportional" to the savings declared. So many assumptions limit the validity of the new income distribution data, and make it difficult to use without serious precautions. Another problem of the Navarrete methodology is that the urban-rural data for 1958 and 1963, the state data for 1958, and the sectoral and occupational data for 1963 are not adjusted.

With respect to the 1968 Presidency Survey, the characteristics presented in tables 3.2 and 3.3 for the 1968 Bank of Mexico survey are assumed to be the same, because the data from the original archives was used. Due to specific needs of the Ministry of the Presidency, the data was regrouped and reorganized in collaboration with the Development Research Center of the World Bank. Thus, the comparability of the information is considered to be the same as the 1968 Bank of Mexico survey.

3.2.3 Selection of Sources

After weighing the problems of comparability among the different sources, due to the fact of different definitions of concepts used, different coverage, and methodologies for correction of data, we decided to use the original sources covering the national territory. At the same time, in order to have some level of comparability with respect to the receiving unit, we opted not to include the censuses of 1960 and 1970 because they both use "economically active population" as the receiving unit. Thus, the list of sources to be considered is:

- 1950 Census S.I.C.
- 1956 Survey S.I.C.
- 1958 Survey S.I.C.
- 1963 Survey Bank of Mexico
- 1968 Survey Bank of Mexico
- 1970 Survey S.I.C.

1975 Survey CENIET

1977 Survey SPP

This selection still leaves us with the problem of comparability between the 1977 survey (SPP) and the rest of the sources, because of the definition of the receiving unit. The 1977 survey uses the concept of "household", with somewhat broader coverage than "family", which is used by the rest of the sources. Even with the concept of "family" we still find different definitions. A still bigger problem is present because of the concept of income used in the different sources.

Although some comparability exists between the 1958 and 1970 surveys, between the 1963 and 1968 surveys and, in certain ways, between 1968 and 1975, and 1968 and 1977, the overall comparability is by no means existent. We should keep this shortcoming in mind when comparing the income inequality indicators derived from these data, for different years during the analysis of the income distribution of Mexico.

A recommendation should be made that for future surveys, a more careful methodology be followed, considering that even when one of the purposes is to improve the data sources, the purpose of a consistent comparison over time remains. Perhaps another recommendation would be for a greater emphasis on more reliable information for the very poor (the first 15 to 20 percentiles) and the very rich (the top 5 to 10 percentiles).

3.3 ANALYSIS OF PERSONAL INCOME DISTRIBUTION DATA

In this section we apply the methodology described in chapter 2 to the national, urban-rural, sectoral, educational and spatial levels. As expressed in the last section, we use the original data, which is presented in tables A.1 to A.21 in appendix A. We present the parameter values of the different models used, performing a comparison based on the goodness-of-fit tests chosen. We then use the income inequality indicators derived in order to offer some results regarding the degree of income concentration in Mexico, as well as comparing Mexican income concentration at the international level. Finally, an attempt to identify the poor of the country is made. Based on the evaluation of the data, and the properties of the income inequality indicators, and taking into account the lack of a solid economic-theoretic foundation, the results provide us with only an approximate assessment of the trend and situation of the distributive problem in Mexico.

3.3.1 Comparison of Income Distribution Models

In section 2.4 (The Methodology of Analysis of Income Distribution Data), we expressed the need to choose an income distribution model that would fit the observed income distribution. We chose, for this purpose, four income dis-

tribution models that, given their properties, would help us to derive various income inequality indicators. To this end, we estimated the parameters of the models chosen: Dagum, Singh-Maddala, Gamma and Lognormal. Table 3.4 shows the estimated parameters of the four models, as well as the Sum of the Square Errors of the Cumulative function (SSEF), the Sum of the Square Errors of the density function (SSEf), and the values of the goodness-of-fit test selected: the Mean Square Error of the density function (MSE) and the Kolmogorov-Smirnov test (K-S).

The figures in table 3.4 show the estimated parameters and indicators for the models, fitted to information at the national level of the eleven sources selected, including 1968 (Presidency), as well as the 1950 and 1956 Navarrete data. Upon comparing the SSEF, SSEf, MSE and K-S for the 11 cases, we observe that in general the Lognormal model fits better than the Gamma model, the Singh-Maddala (SIMA) model better than both, and the Dagum model better than the other three. There is one case, 1950C, where the Singh-Maddala model fits better, and three cases where this model compares in goodness-of-fit with the Dagum model: 1950 using Navarrete data, the 1968 Presidency presentation and 1970. In the first case, even when the K-S and MSE values are smaller using the SIMA model, SSEF is smaller with the Dagum model while in the 1968 Presidency and 1970 cases the goodness-of-fit values are practically the same. At the same time we

TABLE 3.4 COMPARISON OF INCOME DISTRIBUTION MODELS*

MODEL	1950C	1950N	1955S	1956N	1958	1963
PAGUM	0.0	0.0	0.0	0.0	-16.5120	0.0
ALPHA	20.0990	21.9160	0.4808	0.5191	0.6551	1.3416
BETA	.00225	.00261	0.2959	0.3553	0.3516	0.3916
LAMBDA	-1.6682	-1.6108	-2.0566	-2.0068	-2.0989	-1.5443
DELTA	.001421	.000725	.000190	.000017	.000179	.000417
SSE OF P	.004037	.002097	.000552	.000453	.000600	.000890
SSE OF F	.000505	.000349	.000092	.000076	.000150	.000178
MSE	.029482	.018312	.010796	.008717	.007892	.014705
K-S						
SINGH-						
MADDALA						
AA	6.221.9	1536.6	7.3427	5.6343	10.1380	2.3494
BB	4.1349	3.6429	2.0148	1.9628	2.6099	1.7753
CC	0.3415	0.3815	0.9405	0.9530	0.6565	0.8488
SSE OF P	.001391	.001090	.000825	.000649	.000711	.000475
SSE OF F	.002968	.002041	.001637	.001378	.002015	.000995
MSE	.000371	.000340	.000223	.000230	.000403	.000199
K-S	.022702	.017594	.018544	.016491	.017685	.015721
GAMMA						
ALPHA	16.11858	10.51990	3.91037	3.47077	3.97760	1.62590
LAMBDA	3.14040	2.47246	1.82579	1.78397	2.39805	1.44330
SSE OF P	.078965	.029882	.008092	.008972	.009981	.013373
SSE OF F	.016776	.014450	.004263	.003263	.005323	.006014
MSE	.001864	.002064	.000609	.000466	.001065	.001002
K-S	.099410	.095466	.051728	.053390	.058838	.070929
LOGNORMAL						
ALPHA	-1.69555	-1.57583	-0.96910	-0.87296	-0.67281	-0.36025
SIGMA	0.64334	0.70382	0.82667	0.84314	0.70901	0.96384
SSE OF P	.030231	.011038	.001270	.001614	.004113	.001898
SSE OF F	.009186	.005994	.000611	.000581	.001729	.001278
MSE	.001021	.000857	.000087	.000083	.000346	.000213
K-S	.083406	.053790	.018537	.021440	.034921	.026303

TABLE 3.4 COMPARISON OF INCOME DISTRIBUTION MODELS * (CONT'D)

MODEL	1968M	1968F	1970	1975	1977
DAGUM					
ALPHA	0.0	0.0	0.0	0.0	-0.1620
BETA	0.6059	1.0278	1.1239	0.5664	0.3329
LAMBDA	2.3712	1.0696	0.9194	7.4071	20.0390
DELTA	-1.7693	-1.8054	-1.7776	-1.8619	-2.2998
SSE of F	.000137	.003579	.000783	.000207	.000038
SSE of F	.000421	.007035	.002045	.000551	.000074
MSE	.000140	.000879	.000292	.000055	.000009
K-S	.006100	.031050	.016653	.008452	.003366
SINGH-					
MADDALA					
AA	0.9155	1.0198	1.0286	0.1960	0.1557
BB	1.9772	1.8778	1.9085	1.2446	1.3088
CC	0.7972	0.9159	0.9152	2.0041	2.3849
SSE of F	.000354	.003530	.000818	.000266	.000062
SSE of F	.000798	.007034	.002103	.000614	.000120
MSE	.000266	.000879	.000300	.000061	.000013
K-S	.011060	.030036	.016830	.011075	.005265
GAMMA					
ALPHA	0.85404	1.46051	1.15403	0.44164	0.31483
LAMBDA	1.38243	1.78176	1.50989	1.10516	1.26162
SSE of F	.008041	.029451	.005899	.006765	.003350
SSE of F	.006499	.009268	.003441	.001111	.000568
MSE	.001625	.001030	.001147	.000101	.000057
K-S	.053304	.098266	.056110	.040618	.031239
LOGNORMAL					
MU	0.21313	0.05433	0.04760	0.57759	1.09190
SIGMA	0.93660	0.93100	0.91664	1.17598	1.09170
SSE of F	.000539	.004839	.000723	.003443	.004452
SSE of F	.000332	.007797	.001756	.001409	.000784
MSE	.000083	.000866	.000585	.000128	.000078
K-S	.011973	.038877	.025363	.026298	.033905

*All parameters are estimated with data in thousands of pesos, with the exception of 1977, which uses data in tens of thousands of pesos.

find that in three cases, 1956S, 1968BM and 1968P the Dagum and SIMA models have a better goodness-of-fit as determined by the K-S statistic, whereas these two models and the Lognormal perform at approximately the same level when evaluated by the sum of square errors of both the cdf and the pdf.

In particular, in tables 3.5 and 3.6 we present as an example the estimation of the density and cumulative functions with the four models, using the 1975 survey CENIET data. The tables show the goodness-of-fit of the models for each income class. At the same time, in table 3.6 we indicate the interval where the observed and estimated distributions differ the most, placing the Kolmogorov-Smirnov value. Comparing the estimated values of the density and cumulative functions of the four models, we see that the Dagum and SIMA models fit well to the data in all the income intervals, with a better performance for the first model; we see as well that the Gamma and Lognormal models fit rather poorly in almost all the intervals.

The result of a better performance of the Dagum model with respect to the SIMA model, and the SIMA with respect to the Gamma and Lognormal models is in accordance with the results of: a) Singh and Maddala (1976), proving that their model fits better than the Gamma model; and b) Dagum (1977), showing that his model performs better than the Singh-Maddala model. According to this result, we have derived the selected income inequality indicators based on the Dagum mod-

TABLE 3.5 COMPARISON OF ESTIMATED VALUES BY INCOME BRACKETS: THE DENSITY DISTRIBUTION
(DATA OF 1975. - CENIE)

Income Bracket	Obs. Dens.	DAGUM		SINGH - MADDALA		GAMMA		LOGNORMAL	
		Est. Dens.	SEf	Est. Dens.	SEf	Est. Dens.	SEf	Est. Dens.	SEf
0	0.20	0.25	.0025	0.13	.0053	0.23	.0014	0.01	.0400
1- 500	15.00	14.92	.0062	14.59	.1645	15.79	.6159	13.99	1.0117
501- 700	5.70	6.09	.1512	6.41	.4972	6.21	.2559	7.35	2.7230
701- 950	7.80	7.28	.2687	7.57	.0526	7.26	.2869	8.29	.2439
951-1250	8.70	8.09	.3716	8.24	.2077	7.96	.5482	8.51	.0342
1251-1700	9.00	10.61	2.6027	10.57	2.4521	10.44	2.0752	10.25	1.5675
1701-2200	10.40	9.65	.5597	9.45	.9111	9.69	.5031	8.71	2.8626
2201-3000	12.20	11.45	.5587	11.17	1.0571	12.03	.0308	9.99	4.8475
3001-4000	8.50	9.37	.7519	9.27	.6004	10.45	3.8061	8.30	.0385
4001-5200	6.80	6.87	.0043	6.98	.0315	7.97	1.3647	6.46	.1141
5201-7000	6.10	5.70	.1590	5.95	.0219	6.44	.1122	5.89	.0440
7001-9200	3.40	3.55	.0229	3.76	.1322	3.39	.0001	4.09	.4814
9201-12550	2.80	2.57	.0511	2.70	.0096	1.57	1.5055	3.08	.0786
12551-More	3.40	3.40	.0000	3.40	.0000	3.40	.0000	3.40	.0000
SSE of f			5.5097		6.1439		11.1060		14.0900

Obs. Dens. = Observed density multiplied by 100.
 Est. Dens. = Estimated density multiplied by 100.
 SEf = Square Error multiplied by 10,000.
 SSEf = Sum of Square Errors multiplied by 10,000.

Because the figures are rounded, some discrepancies could be noticed in the columns of the square errors (SEf).

TABLE 3.6 COMPARISON OF ESTIMATED VALUES BY INCOME LEVELS: THE CUMULATIVE DISTRIBUTION
(DATA OF 1975 - CENIET)

Income (pesos)	DAGUM		SINGH-MADALA		GAMMA		LOGNORMAL		
	OCP	ECP	SEF	ECP	SEF	ECP	SEF		
0	0.20	0.25	.0025	0.13	.0053	0.24	.0014	0.01	.0398
500	15.20	15.17	.0008	14.72	.2288	16.02	.6760	14.00	1.4528
700	20.90	21.26	.1294	21.13	.0514	23.23	1.7637	21.35	.1997
950	28.70	28.54	.0251	28.70	.0000	29.49	.6279	29.64	.8849
1250	37.40	36.63	.5899	36.94	.2101	37.45	.0027	38.16	.5710
1700	46.40	47.25*	.7144	47.51*	1.2266	47.89	2.2276	48.41	4.0305
2200	56.80	56.90	.0095	56.95	.0234	57.58	.6134	57.12	.1000
3000	69.00	68.35	.4223	68.13	.7658	69.61	.3693	67.11	3.5571
4000	77.50	77.72	.0472	77.40	.0130	80.06	6.5447	75.42	4.3356
5200	84.30	84.58	.0709	84.38	.0060	88.03	13.8890	81.80	5.8564
7000	90.40	90.28	.0135	90.33	.0050	94.46*	16.4980	87.77*	6.9158
9200	93.80	93.84	.0012	94.09	.0858	97.85	16.4380	91.86	3.7481
12,550	96.60	96.41	.0363	96.80	.0381	99.43	7.9944	94.94	2.7414
	100.00	100.00	.0000	100.00	.0000	100.00	.0000	100.00	.0000
SSEF			2.0723		2.6564		67.6480		34.4330

OCP = Observed Cumulative Population, multiplied by 100.

ECP = Estimated Cumulative Population, multiplied by 100.

SEF = Square Error, multiplied by 10,000.

SSEF = Sum of Square Errors, multiplied by 10,000.

Because figures are rounded, some discrepancies could be noticed in the columns of the square errors (SEF).

* Indicates the bracket where the maximum difference between OCP and ECP exists: the Kolmogorov-Smirnov indicator (K-S), with values of .8452, 1.1075, 4.0618, and 2.6298, respectively.

el, in order to carry out the analysis, at the national level, of the income distribution data of Mexico. At the same time, based on the result of the performance of the models presented, we estimate the parameters and income inequality indicators of the urban-rural, sectoral, educational and spatial levels of analysis, using only the Dagum model.

3.3.2 Analysis of Income Distribution Data: The National Level

In tables A.1 to A.11 of Appendix A, we can observe the data of income distribution by income classes for the selected sources. These sources include the original ones as well as the data for 1950 and 1956 adjusted by Navarrete (1960 and 1970), and the 1968 Presidency presentation. The purpose of including these three sources is to take into account the data used by many authors (as seen in section 3.2) and to try to compare our results with theirs. In order to analyse the data we first compare the income inequality indicators selected, and then compare the income shares of different segments of the population.

The historical perspective of the income distribution of Mexico is observed in tables 3.7 and 3.8. In the first table we present the values of the Gini coefficient, the observed mean income (in current prices), the estimated median, the percentage of families with income below the average and two income ratios indicating the number of times that

the income of the richest quintile is greater than that of the poorest quintile and first three quintiles, respectively. Based on the Gini ratio we can see that there is not a definite tendency towards either an increase or decrease in the level of concentration of income in Mexico during the period analysed. On the other hand, if we compare the years which have more easily comparable information, we see that: i) the difference of the Gini values between the observed data of 1950 and 1956 and the one corrected by Navarrete (1950N and 1956N) is .02 and .01 respectively; ii) after 1958 the income concentration is greater than in 1958, with a peak in 1963; and iii) for the years 1963, 1968 and 1977 the level of concentration decreases, comparing either the data of the Bank of Mexico or the Ministry of the Presidency for 1968. However with these results it is difficult to conclude anything definite with respect to the overall trend of concentration during the period 1950 to 1977.

Table 3.7 shows as well that the changes in trend and levels observed in the concentration of income, measured through the Gini coefficients, are almost the same if we use the ratio $Q5/(Q1+Q2+Q3)$ (Q1 is the poorest quintile, Q2 the second poorest, etc.). However, if we compare the ratio $Q5/Q1$, we see that it increases from 11.25 in 1950 to 19.88 in 1977, meaning that in 1950 the average income of a Mexican belonging to the richest quintile was 11.25 times greater than the average income of a Mexican belonging to the

TABLE 3.7 INCOME DISTRIBUTION IN MEXICO: A HISTORICAL PERSPECTIVE

YEAR	GINI	OBS. MEAN INCOME	% OF FAM. WITH INCOME BELOW AVERAGE	EST. MEDIAN	Q5/01	Q5/ (Q1+Q2+Q3)
1950	.5197	354.44	77.4	192.60	11.25	2.39
1956	.4912	601.26	69.9	389.62	12.21	2.12
1958	.4704	835.61	72.4	527.15	9.94	1.96
1963	.6126	1278.02	72.4	700.00	21.80	3.62
1968	.5842	1986.69	70.0	1230.64	19.85	3.14
1970	.5533	1783.41	72.4	1050.17	17.72	1.49
1975	.5916	3260.34	71.1	1831.73	31.73	3.30
1977	.5299	4623.34	66.9	3026.12	19.88	2.51
1950N	.5419	385.84	77.4	240.27	12.49	2.60
1956N	.5024	692.74	71.1	430.76	13.48	2.22
1968P	.5518	1851.59	73.2	1060.00	18.17	2.72

Source: Statistical appendix, Tables A.1 to A.11.

TABLE 3.8 INCOME DISTRIBUTION IN MEXICO (PERCENT OF INCOME)

DECILES	1950	1956	1958	1963	1968	1970	1975	1977
I	2.19	1.71	2.26	1.21	1.10	1.14	0.50	0.96
II	3.00	2.62	3.09	1.80	2.07	2.24	1.46	1.88
III	3.66	3.59	3.93	2.45	2.85	3.12	2.44	2.95
IV	4.35	4.62	4.85	3.22	3.68	4.03	3.51	4.13
V	5.14	5.79	5.87	4.14	4.61	5.05	4.73	5.58
VI	6.14	7.47	7.13	5.31	5.76	6.29	6.19	7.10
VII	7.51	8.92	8.70	6.91	7.32	7.91	8.09	9.12
VIII	9.61	11.40	10.99	9.34	9.68	10.33	10.87	11.91
IX	13.73	15.73	15.07	14.07	14.27	14.90	15.92	16.67
X	44.67	38.45	38.11	51.55	48.66	44.99	46.29	39.78

PERCENTILES

1 - 40	13.20	12.54	14.13	8.68	9.70	10.53	7.91	9.92
41 - 80	28.40	33.28	32.69	25.70	27.37	29.58	29.88	33.63
81 - 100	58.40	54.18	53.18	65.62	62.93	59.89	62.21	56.45
91 - 95	10.67	11.43	10.98	11.39	11.33	11.49	12.29	12.14
96 - 100	34.00	27.02	27.13	40.16	37.33	33.50	34.00	27.64

Number of Families per decile for:

1950	-	449,977
1956	-	500,199
1958	-	640,538
1963	-	732,964
1968	-	815,100
1970	-	889,175
1975	-	1,020,892

Number of Households per decile for: 1977 - 1,111,514.

TABLE 3.8: INCOME DISTRIBUTION IN MEXICO (PERCENT OF INCOME) (CONT'D)

DECILES	1950N	1956N	1968P
I	2.02	1.57	1.09
II	2.81	2.52	2.19
III	3.43	3.49	3.12
IV	4.11	4.51	4.05
V	4.88	5.67	5.09
VI	5.87	7.04	6.36
VII	7.22	8.79	8.02
VIII	9.33	11.28	10.47
IX	13.50	15.67	15.06
X	46.83	39.46	44.55
PERCENTILES			
1 - 40	12.37	12.09	10.45
41 - 80	27.30	32.78	29.94
81 - 100	60.33	55.13	59.61
91 - 95	10.64	11.49	11.56
96 - 100	36.17	27.97	32.99

Number of Families per decile for: 1950N - 510,500
 1956N - 577,943
 1968P - 827,765

poorest quintile. For 1977 the number of times had increased to 19.88. This, under any standards of social justice, is difficult to justify. On the other hand, table 3.7 shows that a slight tendency exists towards a reduction in the percentage of families (households in 1977) with income below the average. This indicates, in gross terms, a reduction in the degree of skewness over time.

With respect to the degree of concentration observed measured through the Gini coefficient, our results are the same as those of Kalifa (1977) with data up to 1970, and Hernandez and Cordova (1979) including data for 1975 and 1977. These are however, systematic lower estimates by the authors with respect to our own, ranging from .03 to .10. This difference is explained by the technique of calculation used by them, which calculates the "lower bound" of the Gini coefficient according to the terminology used by Gastwirth (1972). This means that the real value of Gini has been underestimated by the authors. In our case the method used, as we have shown in chapter 2, avoids this problem, calculating values of the Gini coefficient that are closer to the real ones.

Even though the level of concentration measured through the Gini coefficient does not indicate a definite trend, we can observe in table 3.8 that there have been some groups that have benefited more than others from the economic growth of Mexico. The first four deciles of the population,

for example, classified according to their levels of income, have decreased their participation in the distribution of income. The share of the poorest 40% of the population has decreased from 13.20 to 9.92%. In particular, the first two deciles have suffered the most in terms of their relative participation, meaning that the poorer one is, the less one will benefit from the national economic growth.

At the other extreme, the richer decile has decreased its share from 44.67 to 39.78%, showing that the "rich" are losing their relative position. However, if we divide this group into two, we can see the composition of the changes: a decrease is observed in the 96-100 percentile group, from 34.00 to 27.64%, and an increase in the share of the 91-95 percentile group is noted, from 10.67 to 12.14%.

With respect to the "middle class", represented by the fifth to eighth deciles (41 to 80 percentiles), their income share has improved from 28.40 to 33.63%, with increases observed as well for each of those deciles of population.

From the analysis of the data we can conclude that the economic growth of the country during the last three decades has benefited a growing "middle class" group, composed of the 41-95 percentiles, which has increased its income share, while the very rich group (96-100 percentiles) and the poor (1-40 percentiles) have decreased their income shares. This conclusion would not be modified if we introduced the data for 1950 and 1956 of Navarrete and the 1968 Presidency presentation.

In section 3.3.4 we present the analysis of the data of income distribution at the urban-rural, sectoral, educational and spatial levels. This breakdown of information allows us to partially understand the most important variables influencing the Mexican pattern of income distribution. The origins, and an attempt to explain the Mexican economic system generating the observed distributions, is presented in the next chapter.

3.3.3 Income Concentration: Mexico at the International Level

We have seen above in chapter one, using tables 1.1 and 1.2, that at the international level there is a pattern of income concentration at different levels of income per capita. Even when it does not mean that each country will follow this pattern, and considering that the data are not of the best quality for the purposes of comparison, we present in table 3.9 an attempt to compare the income distribution of Mexico with that of other countries. We present the distribution of income by quintiles, selected percentiles, selected ratios of quintiles and the Gini coefficients for the countries within the same income level as Mexico in 1970 (401 to 700 U.S. dollars of 1970). At the same time these indicators are presented for each group of countries at different levels of income and for Mexico for the eight years analysed previously.

If we consider the average values for Mexico, table 3.9 shows that Mexican income distribution is more concentrated than any group of countries, as well as any country from its group, except Brazil, Gabon, Jamaica and South Africa, if we use the Gini coefficient as the income inequality indicator. If we compare the ratio $Q5/Q1$, we obtain the same result in terms of concentration, and almost the same one when using the ratio $Q5/(Q1+Q2+Q3)$, with the exception of the group of countries with an income level between 301 and 400 dollars, where the value is slightly greater than the Mexican one.

The comparison in terms of income shares of the quintiles of population shows that Mexico has smaller income shares than all the country groups in each of the first four quintiles and a greater income share for the last quintile (especially for the 96-100 percentiles of population, which is the strongest factor explaining the extreme concentration of income). With respect to the member countries of its group, Mexico shows a higher level of inequality than all of them, with the exception of the four countries mentioned previously. These four countries, along with Mexico, have the dubious honour of being among the champions of inequality in the world, as we can see in table 1.1; where, at the same time we can see that Mexico ranks sixtieth among the 77 countries in terms of inequality measured with the Gini Coefficient. This is a rather ungraceful position.

TABLE 3.9 INCOME DISTRIBUTION: AN INTERNATIONAL COMPARISON WITH MEXICO

COUNTRY	Q1	Q2	Q3	Q4	Q5	P81-95	P96-100	Q5/Q1	Q5/(Q1+Q2+Q3)	GINI
Barbados (1970)	4.0	10.7	15.8	22.6	46.9	26.1	20.8	11.73	1.54	.426
Brazil (1970)	2.4	5.3	9.8	18.0	64.8	28.8	36.0	27.00	3.70	.609
Chile (1968)	4.8	8.2	12.2	19.0	55.8	24.9	31.0	11.63	2.21	.507
Costa Rica (1971)	5.7	7.3	10.7	17.7	58.6	25.6	33.0	10.28	2.47	.521
Cabon (1968)	3.2	5.3	8.8	15.2	67.5	22.2	45.3	21.09	3.90	.644
Jamaica (1958)	2.2	6.0	10.8	19.8	61.2	31.3	30.2	27.82	3.22	.577
Lebanon (1960)	5.1	7.2	20.8	17.5	59.4	24.8	34.6	11.65	2.57	.537
Panama (1972)	4.6	10.6	15.5	21.9	47.4	25.2	22.2	10.30	1.54	.426
South Africa (1965)	1.8	4.9	10.2	21.1	62.0	38.3	23.1	34.44	3.64	.581
Surinam (1962)	9.3	12.0	15.5	21.2	42.0	24.2	17.8	4.52	1.14	.324
COUNTRIES GROUPED BY INCOME										
Below 100	6.0	9.9	13.8	20.0	50.3	23.5	26.8	8.38	1.69	.441
101-200	4.9	8.2	12.2	18.8	55.0	25.2	30.7	11.41	2.21	.501
201-300	4.4	7.3	11.2	18.6	58.5	29.7	28.8	13.30	2.55	.525
301-400	3.4	7.1	11.8	19.8	57.9	28.6	29.3	17.20	2.60	.533
401-700	4.3	7.8	12.0	19.4	56.5	27.1	29.4	13.14	2.34	.515
701-2000	5.5	10.0	14.5	21.3	48.7	26.4	22.3	8.85	1.62	.422
2001-3000	5.1	10.8	15.9	23.2	45.0	27.1	17.9	8.82	1.41	.397
3001-MORE	5.3	11.2	16.4	23.9	43.2	27.4	15.8	8.15	1.31	.379
MEXICO										
1950	5.2	8.0	11.3	17.1	58.4	24.4	34.0	11.25	2.39	.5197
1956	4.3	8.2	13.0	20.3	54.2	27.2	27.0	12.51	2.12	.4912
1958	5.3	8.8	13.0	19.7	53.2	26.1	27.1	9.94	1.96	.4704
1963	3.0	5.7	9.4	16.3	65.6	25.5	40.1	21.80	3.62	.6126
1968	3.2	6.5	10.4	17.0	62.9	25.6	37.3	19.85	3.14	.5842
1970	3.4	7.2	11.3	18.2	59.9	26.4	33.5	17.72	1.49	.5533
1975	2.0	5.9	10.9	19.0	62.2	28.2	34.0	31.73	3.30	.5916
1977	2.8	7.1	12.6	21.0	56.5	28.8	27.7	19.88	2.51	.5299
AVERAGE	3.6	7.2	11.5	18.6	59.1	26.5	32.6	18.09	2.57	.5441

Source: Tables 1.1 and 1.2; For Mexico: Tables 3.7 and 3.8.

3.3.4 Income Distribution in Mexico: Other Levels of Analysis

Thus far, we have attempted to measure the degree of income concentration in Mexico at the national level. We have been able to identify certain trends as well as some groups that have profited from the economic growth of the country. The next step is to identify certain groups by socioeconomic characteristics, in order to offer an explanation of the national income distribution based on their behaviour. At the same time, the study of income distribution at the urban-rural, sectoral, educative and spatial levels provides us with a good understanding of the dynamics of the economy generating the observed income distributions at the national level. The analysis at these levels permits us, as well, to identify groups which could become "target groups" within a strategy of income redistribution.

A. The Urban-Rural Level

The economic growth of Mexico has been characterized by a shift in priorities since the 1940's, from the agricultural to the industrial sectors. This change has affected the level of economic activities carried out in the urban and rural areas. Their importance within the national economic development strategies and their relative productivity changed, with severe implications for people in the rural

areas. The first information that we have about income distribution in the urban and rural areas (1958), shows that income concentration in the urban area is greater than in the rural area, with Gini Coefficient values of .4695 and .3746, respectively (see table 3.10). According to the definition, the urban area includes all the localities with more than 2,500 inhabitants, while the rural area includes all the localities with 2,500 inhabitants or less. The statistical information is grouped according to this definition, with the exception of 1968, where the urban area includes all the non-agricultural sectors, while the rural area represents the agricultural sector.

In 1958 we find a strong difference in income per capita of people in the urban and rural areas: the urban income is more than double the rural income per capita (2.09). Without doubt this explains parts of the dispersion of income observed at the national level as well as the strong incentive of people to migrate from the rural to the urban areas. If we consider the five years for which we have data (see table 3.10): 1958, 1963, 1968, 1970 and 1975, we see that in the first four years mentioned the concentration of income is greater in the urban than in the rural areas, while in the last year, 1975, the level of concentration is practically the same. Again, due perhaps to comparability problems of the different sources, we cannot distinguish a trend of concentration within each area. Using the informa-

TABLE 3.10 URBAN - RURAL INCOME DISTRIBUTION IN MEXICO

GINI DECILES	1958		1963	
	URBAN	RURAL	URBAN	RURAL
	.4695	.3746	.5766	.5255
I	2.10	3.41	1.22	1.01
II	3.23	4.09	1.94	1.47
III	4.10	4.92	2.73	3.67
IV	4.98	5.86	3.63	4.74
V	5.95	6.91	4.67	5.85
VI	7.09	8.14	5.96	7.13
VII	8.58	9.67	7.66	8.77
VIII	10.76	11.73	10.22	11.15
IX	14.76	15.14	14.98	15.49
X	38.45	30.13	47.00	40.72
FAMILIES	2575727	2896751	4786656	3242986
(%)	(47.07)	(52.93)	(55.76)	(44.24)
MEAN INCOME	1136.17	543.20	1706.33	738.29
UR/RU M.I.*	2.09		2.31	

POPULATION PERCENTILES**	UPPER	LEVEL	INCOME (PESOS)
10	313.57	194.31	300.91
20	418.59	234.40	445.34
30	516.32	280.29	605.64
40	619.40	305.36	789.48
50	737.41	391.23	1009.79
60	883.47	461.80	1289.99
70	1082.57	551.99	1678.89
80	1397.46	682.78	2303.80
90	2075.79	933.39	3681.25
95	3014.46	1242.79	5648.88

ECC. DISTANCE DO .483 .431

* Urban Mean Income/Rural Mean Income

** Upper level income for the percentage of population indicated.

For 1958, the states of Michoacan, Chihuahua and Puebla are not included in the urban-rural breakdown.

TABLE 3.10 URBAN - RURAL INCOME DISTRIBUTION IN MEXICO (Cont'd)

	1968		1970		1975	
	URBAN	RURAL	URBAN	RURAL	URBAN	RURAL
GINI	.5040	.4660	.5742	.4467	.5615	.5657
DECILES			PERCENT OF INCOME			
I	1.49	2.17	1.36	2.30	0.82	1.17
II	2.58	3.11	2.07	3.05	2.25	1.72
III	3.57	4.01	3.23	3.98	3.14	2.52
IV	4.57	4.94	3.94	5.02	4.04	3.54
V	5.68	5.99	4.77	6.24	5.03	4.78
VI	6.99	7.23	5.79	7.66	6.23	6.34
VII	8.66	8.81	7.20	9.44	7.81	8.36
VIII	11.09	11.07	9.37	11.86	10.20	11.27
IX	15.42	15.12	13.67	15.93	14.73	16.38
X	39.95	37.55	48.60	34.52	45.75	43.92

FAMILIES	5092000	3059000	5302683	3589069	6397933	3810992
(%)	(62.47)	(37.53)	(59.64)	(40.36)	(62.67)	(37.33)

MEAN INC.	2578.18	1002.09	2383.71	896.73	4756.94	1838.41
UR/FU M.I.*	2.57			2.66		2.59

POPULATION PERCENTILES**	UPPER LEVEL INCOME (PESOS)		UPPER LEVEL INCOME (PESOS)		UPPER LEVEL INCOME (PESOS)	
	10	20	30	40	50	60
10	585.58	296.12	575.38	238.91	886.61	263.81
20	866.67	395.82	792.15	315.73	1387.58	393.47
30	1141.39	496.77	984.46	405.09	1835.61	564.92
40	1434.46	605.92	1192.55	506.96	2309.12	777.28
50	1768.89	730.99	1440.84	624.82	2858.20	1038.57
60	2178.54	884.04	1763.41	766.63	3550.24	1369.20
70	2728.75	1088.79	2227.68	949.69	4514.68	1815.63
80	3593.50	1404.97	3010.41	1218.08	6082.93	2500.26
90	5385.05	2066.08	4848.43	1422.47	9597.78	3906.07
95	7831.35	2957.47	7635.36	2393.13	14680.75	5770.72
POC. DISTANCE DO	.499		.536		.526	

* Urban Mean Income/Rural Mean Income
 ** Upper level income for the percentage of population indicated
 For 1968, urban stands for the non-agricultural sectors; rural stands for the agricultural sector.

TABLE 3.11 ESTIMATED PARAMETERS AND GOODNESS-OF-FIT INDICATORS:
THE URBAN - RURAL LEVEL

PARAMETERS*	1958		1963			
	URBAN	RURAL	URBAN	RURAL		
ALPHA	-0.0015	-2.2657	-0.1395	.0898		
BETA	1.8838	0.0761	0.5423	1.6723		
LAMBDA	0.2431	0.3985	1.9339	.1410		
DELTA	-1.9667	-3.1641	-1.8027	-1.9536		
INDICATORS						
SSE OF F	.000272	.000259	.000110	.000636		
SSE OF F	.001007	.000780	.000307	.001955		
MSE	.000252	.000260	.000077	.000489		
K-S	.00934	.01040	.00732	.01762		
PARAMETERS*	1969		1970		1975	
	URBAN	RURAL	URBAN	RURAL	URBAN	RURAL
ALPHA	-0.0165	-0.0730	0.0466	-0.6019	-0.8440	0.0322
BETA	0.9281	0.8977	19.1722	0.2016	0.1263	1.5403
LAMBDA	3.2623	0.5261	0.1357	1.5823	11.9712	3.7467
DELTA	-1.9650	-2.9810	-1.5943	-2.5885	-2.2531	-1.7391
INDICATORS						
SSE OF F	.000198	.000005	.000577	.000102	.000611	.000413
SSE OF F	.000673	.000006	.002011	.000371	.001429	.000606
MSE	.000337	.000003	.001006	.000186	.000178	.000076
K-S	.00875	.00171	.01707	.00630	.01662	.01323

*Parameters estimated with data in thousands of pesos.

tion of 1958, 1970 and 1975 we find that the concentration in the rural area increased, while if we use the 1963 and 1968 data, we find that the concentration decreases. In the case of the urban area we observe the same trend if we use this division of sources. There is however, a definite trend in terms of the difference of income per capita between the urban and rural areas, wherein the difference is increasing. While in 1958 the difference in urban income per capita was 2.09 times greater than the rural income per capita, this ratio had grown to 2.59 times in 1975. If this trend continues, we will see increasing income differentials between the urban and the rural populations. The upper level income of the richest 95% of the population in the urban area compared to that of the upper level income of the poorest 10% in the rural area increased from 15 to 55 times, meaning that while a group of people in the urban area is growing at a high rate, a group of people in the rural area is growing at a very low rate, if at all.

If we take into account the increasing income per capita between the people of the urban and rural areas, as well as the distribution within each group by means of the Economic Distance Ratio D_o , we are able to state that the Economic Distance has increased from .483 to .526 for the period 1958 to 1975, with an initial decrease to .431 in 1963 as shown in table 3.10

At the same time, in table 3.11 we present the parameters and indicators of goodness-of-fit of the urban and rural distributions for the five years analysed.

B. The Sectoral Level

In the preceding section we saw the effect of the selected strategy followed at the national level on the urban and rural areas, causing an increasing difference between the income per capita in both areas. If we compare the 1963 and 1975 data of the sectoral income distribution we can see, as well, the effect of the national economic strategy on the various sectors. First we see in tables 3.12 and 3.13 (the parameters and goodness-of-fit indicators are in table 3.14) a strong change in composition of the number of heads of families working in the different sectors during the short 12 year period (1963-1975), showing the dynamic changes that occurred in the economy during the past several years. Agricultural sector labour decreases its share from 42.71 to 31.04% from 1963 to 1975; while industry increases its participation from 16.09 to 20.49% during the same years. During this period transport and communication increased its share and services from 2.86 to 4.95%, while construction held its share, and commerce lost 2 and 3 percentage points, respectively, in each case. For 1975 the data is presented with a breakdown including government, which was included in the 1963 survey in the services sector.

TABLE 3.12 SECTORAL INCOME DISTRIBUTION IN MEXICO: 1963

	AGRICULTURE	INDUSTRY	CONSTRUCTION	COMMERCE	SERVICES	TRANSP/COMMUN.
GINI	.6600	.5575	.4665	.6263	.6071	.3644
DECILES			PERCENT OF INCOME			
I	1.52	1.45	2.54	1.35	0.98	2.93
II	1.92	2.65	3.25	1.67	1.65	3.91
III	2.36	3.33	4.00	2.35	2.41	4.97
IV	2.85	4.03	4.86	3.11	3.27	6.11
V	3.46	4.84	5.82	4.02	4.30	7.34
VI	4.27	5.86	7.00	5.17	5.59	8.70
VII	5.41	7.24	8.53	6.73	7.30	10.31
VIII	7.28	9.40	10.74	9.15	9.89	12.39
IX	11.17	13.65	14.74	13.87	14.80	13.84
X	59.76	47.55	38.52	52.89	49.81	29.50
PAM.	3130833	1179112	346713	804570	1658967	209447
(%)	(42.71)	(16.09)	(4.73)	(10.98)	(22.63)	(2.86)
MEAN INC	818.20	1637.78	949.70	1763.30	1725.60	1440.80
POPULATION PERCENTILES*			UPPER LEVEL INCOME (PESOS)			
10	197.56	428.53	265.73	283.42	269.98	479.50
20	244.36	563.28	333.23	417.38	417.67	624.62
30	296.73	690.43	406.76	565.50	584.75	779.50
40	359.24	830.18	489.52	737.53	779.00	945.13
50	438.40	997.91	586.78	947.95	1014.45	1126.25
60	545.96	1216.28	707.96	1222.55	1317.04	1332.68
70	707.27	1530.64	872.37	1615.60	1741.46	1584.68
80	992.18	2060.02	1129.67	2271.45	2431.44	1931.94
90	1709.11	3299.42	1676.89	3794.77	3976.26	2555.39
95	2990.89	5170.98	2429.35	6096.10	6220.24	3275.21

* Upper level income for the percentage of population indicated.

TABLE 3.13 SECTORAL INCOME DISTRIBUTION IN MEXICO: 1975

	AGRICULTURE	INDUSTRY	CONSTRUCTION	COMMERCE	SERVICES	TRANSP.	GOV'T.
GINI	.7213	.5224	.4379	.6045	.5952	.4545	.5074
DFCILES			PERCENT OF INCOME				
I	0.61	0.72	1.55	0.99	0.84	2.37	1.54
II	1.24	2.78	3.90	1.81	1.93	3.29	3.02
III	1.74	3.73	4.77	2.58	2.75	4.16	3.83
IV	2.28	4.63	5.59	3.40	3.60	5.07	4.63
V	2.91	5.59	6.49	4.36	4.54	6.09	5.54
VI	3.76	6.76	7.57	5.55	5.71	7.29	6.62
VII	4.95	8.28	8.95	7.14	7.29	8.82	8.09
VIII	6.89	10.56	11.00	9.57	9.69	11.03	10.28
IX	11.03	14.83	14.72	14.27	14.32	14.96	14.45
X	64.59	42.12	35.46	50.33	49.33	36.92	42.00
FAM	3169186	2091356	408391	893825	1554415	505594	412294
(%) *	(31.04)	(20.49)	(4.00)	(8.75)	(15.23)	(4.95)	(4.04)
MEAN INC 2015.86	3904.22	3133.85	3737.62	4539.50	3492.13	4736.17	
POPULATION PERCENTILES**			UPPER LEVEL	INCOME (PESOS)			
10	232.03	925.82	992.17	634.63	817.56	990.16	1384.02
20	348.87	1398.24	1283.83	974.86	1284.71	1293.08	1853.86
30	466.64	1777.18	1526.39	1323.85	1728.26	1598.84	2278.09
40	601.85	2165.90	1776.06	1713.97	2209.72	1929.16	2729.76
50	770.05	2610.43	2060.51	2180.34	2778.08	2307.67	3256.98
60	998.85	3165.79	2413.08	2779.74	3504.96	2771.17	3925.11
70	1342.35	3934.04	2894.83	3627.76	4532.31	3391.88	4860.03
80	1953.57	5172.53	3657.12	5027.62	6229.48	4351.63	6383.25
90	3509.06	7909.86	5288.57	8233.59	10118.48	6361.97	9789.34
95	6100.18	11796.70	7511.14	12997.05	15886.30	9077.44	14677.75

* The difference of 11.50% in families is given by "unsufficiently specified" (0.26%) and "unemployed" (11.24%).

** Upper level income for percentage of population indicated.

TABLE 3.14 ESTIMATED PARAMETERS AND GOODNESS-OF-FIT INDICATORS: THE SECTORAL LEVEL

1963

PARAMETERS*	AGEI.	IND.	CONSTR.	COMMER.	SERVICES	T & C**	GOV'T.
ALPHA	-0.0720	0.0217	-0.2690	-0.0961	-0.1322	-0.3628	-
BETA	0.4124	9.3229	0.6344	0.7788	0.5151	0.2294	-
LAMBDA	0.0051	0.0795	0.4007	1.0892	2.1511	9.4024	-
DELTA	-1.3643	-1.6101	-2.0517	-1.5905	-1.7372	-3.3823	-

INDICATORS

SSE of P	.000806	.000491	.000278	.000614	.001132	.000360	-
SSE of f	.001427	.001199	.000822	.001624	.003304	.001069	-
MSE	.000204	.000100	.000164	.000135	.000275	.000097	-
K-S	.01658	.01037	.01052	.01311	.02276	.01077	-

1975

PARAMETERS*	AGEI.	IND.	CONSTR.	COMMER.	SERVICES	T & C**	GOV'T.
ALPHA	0.0137	0.0577	0.0459	-0.0140	0.0161	-0.0693	0.0243
BETA	2.7185	2.6923	6.9884	1.1117	1.3620	1.0567	3.6704
LAMBDA	0.2105	1.8816	0.4996	2.9540	3.6603	4.6605	1.8061
DELTA	-1.3208	-1.8322	-2.0673	-1.6128	-1.6420	-2.0872	-1.7977
SSE of P	.000435	.000620	.002592	.000354	.000213	.001242	.002185

SSE of f	.000809	.001327	.006798	.000717	.000639	.003846	.004060
MSE	.000101	.000221	.001133	.000239	.000080	.000770	.001015
K-S	.01103	.01329	.03141	.01500	.01086	.01914	.03083

* Parameters estimated with data in thousands of pesos.

** Transport and Communications

With respect to the sectoral income distribution, we observe that, measured through the Gini coefficients, the agricultural sector has the highest level of concentration of all the sectors, followed by commerce, services and industry in both years. At the end, with less concentration, we find construction and transport and communication for 1963; and government, transportation and finally construction in 1975. During this period we notice that agriculture and transport and communication are the only two sectors with an increasing level of concentration of income. In the next chapter we will attempt to provide an explanation of these changes, in particular of those occurring in the agriculture sector.

Tables 3.12 and 3.13 show, as well, the strong differences in productivity within and between sectors of the Mexican economy. The structure of incomes of the sectors is practically the same in both years; income per family in industry, commerce, services and transport and communication is about double that of agriculture in both years, while the mean income of the family whose head was working in construction increased more than in any other sector. At the same time we find that in 1975 the government sector is the one with the highest mean income per family, revealing the preferential economic status of the people working in this sector. On the other hand, each sector presents a high level of concentration of income, showing the high differences in productivity within each sector of the economy.

This contrast in productivity or income at the overall level provides for some incredible contrasts: owners of capital or high level executives of the urban-modern technologically advanced firms working within the priority sectors of the economy vs. the non-qualified labour force sellers of the non-priority sector of the economy (agriculture). While the upper level income of the 95% richest families in the industrial sector in 1963 was 26 times greater than the upper level income of the 10% poorest families of the agricultural sector, this number increased to 51 times in 1975.

C. The Educational Level

One of the Mexican socioeconomic characteristics showing a strong relationship with income is the level of education. It has been argued theoretically that human capital is one of the most important variables explaining income distribution; even when we consider it to be only one of many variables to take into account empirically, Mexican data support a strong relationship between human capital (measured through the number of years of schooling) and the level of income received by the head of the family (1975) or the head of the household (1977). The structure of the level of education in Mexico shows a gross base of 30.65% of the heads of the family with no education at all (0 years of schooling) in 1975 (or 27.63% of the heads of the household in 1977); 53.46% (55.16%) with one to six years of schooling; 7.35% (7.85%) with seven to nine years; and 7.67%

(8.37%) with ten or more years. The level of income ranges from \$1,589.00 monthly pesos per family in 1975 (\$2,392.00 in 1977) for the group with no education, to \$9,997.00 (\$15,240.00) for the group of people with thirteen or more years of schooling. The difference between the mean income is in both cases approximately 6.3 times (see tables 3.15 and 3.16 for the data of income distribution by levels of education, and table 3.17 for the parameters estimated and goodness-of-fit indicators).

There are several characteristics observed in the information of income distribution in Mexico by levels of education: in general, the level of concentration of income decreases within each group with higher levels of education, when measured through the Gini Coefficient. In 1975 the level decreases from .5987 for the group with no studies to .4001 for the group with thirteen or more years of studies (in 1977 the values range from .5234 to .4324). When we compare the data of the upper level income of the poorest 10% with the richest 95% we face a staggering ratio of 148, according to 1975 data, and of 111 according to 1977 data.

The strong relationship between income and education in Mexico offers the chance for an individual to highly improve his or her position in the economic scale, by spending a few extra years within the educative system. This, however, would not mean that income distribution would improve necessarily for the country as a whole if everyone increased his

TABLE 3.15 INCOME DISTRIBUTION IN MEXICO BY LEVEL OF EDUCATION: 1975

GINI	1	2	3	4	5	6
	.5987	.5426	.4635	.4380	.4038	.4001
DECILES						
I	0.76	0.48	1.58	1.61	2.35	1.87
II	1.29	2.12	2.83	3.02	3.57	3.60
III	2.10	3.25	3.95	3.94	4.66	4.84
IV	3.13	4.32	5.08	4.84	5.76	5.98
V	4.43	5.48	6.29	5.82	6.92	7.16
VI	6.05	6.82	7.69	7.00	8.24	8.46
VII	8.18	8.55	9.42	8.54	9.82	10.02
VIII	11.24	11.05	11.80	10.79	11.98	12.15
IX	16.65	15.61	15.90	14.94	15.55	15.64
X	46.17	42.32	35.47	39.50	31.15	30.28
FAMILIES	3,129,475	2,708,431	2,749,521	750,264	302,438	480,389
(%)*	(30.65)	(26.53)	(26.93)	(7.35)	(2.96)	(4.71)
MEAN INC.	1589.07	2882.82	3355.31	5388.51	6458.50	9997.27
POPULATION						
PERCENTILES**						
10	163.52	373.93	759.15	1415.17	2075.86	2877.24
20	277.86	698.26	1146.07	1970.25	2854.53	4217.31
30	432.77	973.33	1520.69	2470.99	3605.86	5374.79
40	627.47	1254.01	1911.77	2995.20	4380.98	6510.97
50	869.36	1569.26	2345.96	3594.98	5227.67	7722.76
60	1177.47	1954.27	2861.31	4339.07	6213.54	9118.53
70	1595.50	2473.58	3529.26	5356.83	7463.44	10880.68
80	2238.98	3287.66	4524.33	6972.65	9277.81	13433.58
90	3565.33	5027.42	6507.70	10465.38	12772.85	18325.65
95	5331.34	7422.64	9047.89	15304.86	17094.49	24299.74

* Difference given by 'non-specified' level of education (0.87%).

** Upper level income for the percentage of population

Levels of Education: 1 = No Studies; 2 = One to three years of schooling;

3 = four to six years; 4 = seven to nine years; 5 = ten to twelve years; and

6 = thirteen or more years.

TABLE 3.16 INCOME DISTRIBUTION IN MEXICO BY LEVEL OF EDUCATION: 1977

GINI DECILES	1	2	3	4	5	6	7
I	.5234	.4645	.3983	.3862	.3781	.3566	.4324
II	1.26	1.53	1.96	1.89	2.45	2.50	2.13
III	2.01	2.56	3.76	3.93	4.12	4.15	3.55
IV	2.97	3.70	4.92	5.12	5.19	5.36	4.52
V	4.11	4.95	6.00	6.22	6.19	6.48	5.48
VI	5.45	6.32	7.11	7.31	7.21	7.60	6.48
VII	7.05	7.89	8.36	8.54	8.37	8.83	7.67
VIII	9.07	9.81	9.88	10.03	9.80	10.28	9.17
IX	11.89	12.38	11.95	12.04	11.77	12.19	11.32
X	16.64	16.55	15.43	15.39	15.10	15.28	15.11
HOUSEHOLDS	39.55	34.11	30.63	29.53	29.80	27.33	24.57
(%)	3070965	4441714	1689485	358660	513444	404848	526040
MEAN INC.	(27.63)	(39.96)	(15.20)	(3.23)	(4.62)	(3.64)	(4.73)
	2392.00	3498.33	5724.00	6263.83	7853.67	9780.38	15240.74

POPULATION PERCENTILES**

UPPER LEVEL INCOME (PESOS)	10	20	30	40	50	60	70	80	90	95
	401.78	621.72	888.11	1199.77	1567.24	2016.26	2603.83	3477.00	5202.17	7400.98
	737.14	1136.25	1570.80	2045.72	2578.33	3203.29	3992.30	5123.60	7262.96	9867.18
	1792.96	2543.83	3182.17	3810.17	4485.32	5271.67	6277.50	7756.60	10641.50	14225.00
	2082.33	2956.68	3677.38	4375.82	5119.41	5978.45	7068.81	8658.91	11727.97	15493.92
	2854.14	3816.00	4634.33	5444.14	6321.66	7352.15	8681.16	10651.48	14527.99	19369.79
	3236.16	4473.49	5538.07	6570.06	7653.41	8879.19	10396.60	12546.27	16549.78	21300.24
	2106.86	7030.95	8664.83	10339.70	12213.47	14483.53	17508.34	22163.79	31799.57	44521.20

* Difference given by "non-specified" level of education (0.99%).

**Upper level income for the percentage of population indicated

Levels of Education: 1) No years of schooling; 2) incomplete primary school (1 to 5 years of schooling); 3) complete primary school (6 years of schooling); 4) incomplete secondary school (7 or 8 years of schooling); 5) complete secondary school (9 years of schooling); 6) incomplete and complete high school (10 to 12 years of schooling); 7) incomplete and complete university and postgraduate levels (13 or more years of schooling).

or her level of education. One reason is that we would still face the concentration of distribution of other factors of production in Mexico, / such as land or industrial capital, among others. Higher levels of education for everyone would probably mean higher levels of production (and income) for everyone, along with improved opportunities for the population in terms of competitiveness in the labour markets, and perhaps more political pressure for social justice. Education, however, as the urban-rural dichotomy and the strong differences in productivity within and between the productive sector remains as an important variable explaining the high levels of concentration observed at the national level.

D. The Spatial Level

One last factor which we consider to be important in explaining personal income distribution at the national level, and for which we have obtained data, is the "location" of economic activities. The 1977 survey presents data of income distribution divided into 9 categories, three of them corresponding to the three largest cities in the country: Mexico City, Guadalajara and Monterrey. The other six categories group the municipalities according to the number of inhabitants, from less than 2,500 to more than 500,000 (excluding the three cities mentioned). Once again, as we saw in the analysis of the other levels, the location factor provides us with a definite relationship of income with re-

spect to the size of the municipality. Mean income of the household increases from \$1,460 monthly pesos for group 1 (municipalities with less than 2,500 inhabitants), to \$5506 monthly pesos for group 6 (municipalities with more than 500,000 inhabitants). The income is even higher for Monterrey (the industrial capital of the country and richest city with \$8,052.00), Guadalajara (\$6,747.50) and Mexico City (\$7,824.50) (see tables 3.18 and 3.19).

This contrast in mean incomes explains the strong incentives that exist to migrate from the smaller municipalities to the larger ones, while at the same time providing another explanation of the concentration of income at the national level. While 50.26% of the Mexican population lives in hundreds of municipalities with less than 100,000 inhabitants, 20.81% lives in the metropolitan area of Mexico City, 3.00% in Guadalajara and 2.86% in Monterrey. This distribution of population responds to economic opportunities offered by the cities where the new jobs created by the industrialization process exist, and where the industrial plants are built to supply the existent demand; the result has been a process of activity concentration created by this vicious circle. This process has given rise to the strong spatial contrasts in terms of income at the national level.

Two characteristics are noted in analysing the income distribution at the spatial level. First, the level of income concentration decreases with the number of inhabitants

TABLE 3.18 INCOME DISTRIBUTION IN MEXICO: THE SPATIAL LEVEL - 1977

	1	2	3	4	5
GINI	.5570	.5189	.5013	.4566	.4288
DECILES	PERCENT OF INCOME				
I	0.01	1.64	1.14	1.72	1.52
II	0.02	2.42	2.35	3.06	3.30
III	1.52	3.30	3.47	4.14	4.52
IV	5.26	4.27	4.62	5.19	5.66
V	6.71	5.38	5.88	6.32	6.83
VI	8.16	6.72	7.34	7.62	8.15
VII	9.88	8.46	9.16	9.25	9.77
VIII	12.33	10.97	11.72	11.55	11.99
IX	16.62	15.47	16.13	15.55	15.73
X	39.49	41.37	38.19	35.60	32.53
HOUSEHOLDS	137336	1248637	4200739	1151716	883315
(%)	(1.24)	(11.23)	(37.79)	(10.36)	(7.95)
MEAN INC.	1460.50	2024.00	2548.83	5568.83	6472.67
POPULATION	UPPER LEVEL INCOME (PESOS)				
PERCENTILES*					
10	-	441.72	474.31	1436.59	1733.05
20	-	623.54	778.16	2092.99	2617.41
30	593.40	823.47	1079.15	2698.47	3381.07
40	813.62	1048.97	1398.04	3321.86	4137.84
50	1000.66	1313.62	1756.10	4014.51	4955.05
60	1209.00	1642.16	2185.32	4843.74	5909.63
70	1477.87	2085.64	2746.89	5933.04	7133.89
80	1877.99	2774.95	3592.17	7583.81	8940.66
90	2741.40	4227.18	5300.13	10945.82	12490.55
95	3882.29	6204.53	7520.72	15336.05	16943.73

*Upper level income for percentage of population indicated.

TABLE 3.18 INCOME DISTRIBUTION IN MEXICO: THE SPATIAL LEVEL - 1977
(CONT'D)

	MTY.	GUA.	M.C.
GINI	.3960	.5077	.4468
DECILES	PERCENT OF INCOME		.4662
I	1.93	1.92	1.73
II	3.37	2.94	3.36
III	4.67	3.73	4.39
IV	5.95	4.52	5.37
V	7.27	5.42	6.42
VI	8.73	6.52	7.63
VII	10.42	7.99	9.18
VIII	12.60	10.20	11.37
IX	16.05	14.39	15.26
X	29.01	42.37	35.29
NO. OF HOUSEHOLDS	528978	318187	332982
(%)	(4.76)	(20.81)	(23.00)
MEAN INC.	5506.83	8052.33	6747.50
			7824.50
POPULATION PERCENTILES*	UPPER LEVEL INCOME (PESOS)		
10	1539.03	2367.84	1980.96
20	2306.38	3136.65	2784.20
30	3039.83	3863.05	3484.93
40	3780.31	4646.91	4197.86
50	4566.06	5566.82	4992.12
60	5449.92	6735.50	5951.79
70	6526.77	8372.85	7228.32
80	8018.52	11042.71	9191.14
90	10722.59	17020.05	13254.19
95	13865.86	25614.61	18625.83
			22699.71

*Upper level income for percentage of population indicated.

The spatial groupings are defined as follows: 1) municipalities with less than 2,501 inhabitants; 2) municipalities with 2,501 to 10,000 inhabitants; 3) municipalities with 10,001 to 100,000 inhabitants; 4) municipalities with 100,001 to 250,000 inhabitants; 5) municipalities with 250,001 to 500,000 inhabitants; 6) municipalities with more than 500,000 inhabitants, excluding the metropolitan areas of Monterrey, Guadalajara and Mexico City; MTY., GUA., and M.C. are the metropolitan areas of Monterrey, Guadalajara and Mexico City, respectively.

TABLE 3.19 ESTIMATED PARAMETERS AND GOODNESS-OF-FIT INDICATORS:
THE SPATIAL LEVEL

PARAMETERS*	1	2	3	4	5	6
ALPHA	0.2586	-0.1806	-0.0168	-0.0038	0.0118	0.0393
BETA	5.7664	0.4835	0.5890	0.9930	0.8121	0.4524
LAMBDA	0.0730	1.3111	2.4155	7.5304	20.4934	65.9068
DELTA	-2.1167	-2.0126	-2.1872	-2.1992	-2.4742	-2.9870

INDICATORS	
SSE of F	.000121
SSE of f	.000204
MSE	.000034
K-S	.00688
	.00782
	.000233
	.000418
	.000153
	.00782
	.000909
	.001561
	.000782
	.000098
	.01219
	.001249
	.002096
	.000262
	.01928

PARAMETERS*	MTY.	GUA.	M.C.
ALPHA	0.00	0.00	0.00
BETA	2.6966	1.0533	1.8333
LAMBDA	2.5249	36.0150	15.5630
DELTA	-1.7856	-2.2673	-2.0379

INDICATORS	
SSE of F	.001477
SSE of f	.003853
MSE	.000428
K-S	.02215
	.00725
	.001864
	.000207
	.01608
	.000514
	.000998
	.000111
	.01269

* Parameters estimated with data in thousands of pesos. The spatial groupings are defined as follows: 1) municipalities with less than 2,501 inhabitants; 2) municipalities with 2,501 to 10,000 inhabitants; 3) municipalities with 10,001 to 100,000 inhabitants; 4) municipalities with 100,001 to 250,000 inhabitants; 5) municipalities with 250,001 to 500,000 inhabitants; 6) municipalities with more than 500,000 inhabitants, excluding the metropolitan areas of Monterrey, Guadalajara and Mexico City; MTY., GUA., and M.C. are the metropolitan areas of Monterrey, Guadalajara and Mexico City, respectively.

for the six groups. The Gini values decrease from .5570 for the first group to .3960 for the sixth, while the three metropolitan areas have Gini values of .4662, .4468 and .5077 for Mexico City, Guadalajara and Monterrey, respectively. The migration towards these cities has created huge "misery belts" around them, yet as we see in section 3.4, the misery of this group of Mexicans is by no means comparable to the really poor located in the first three of the six groups presented by municipality size.

3.3.5 Summary of Conclusions of Income Distribution in Mexico

A summary of what we consider to be the most important conclusions reached in the analysis of the distributive problem of Mexico is presented below. It is necessary to emphasize that all the conclusions regarding the analysis of Mexican income distribution should be taken only as an approximation, due to the problems found during the evaluation of the data, namely, a strict lack of comparability between the information of the various sources.

The most important conclusions reached are as follows:

- a) We found that there is no clear tendency towards a change in the level of concentration of income in Mexico during the years 1950 and 1977, when measured through the coefficient of Gini. However, we witness an increase in the difference of average income between the richer

and the poorer families during the 1950 to 1977 period: the average income of the richest quintile of population in 1950 was 11 times greater than the average income of the poorest quintile. The ratio had increased to 20 for the year 1977;

b) The income share of the poorest 40% of the population has decreased from 13.20% to 9.92%; at the same time, the richest 5 percentiles of the population decreased their share from 34.00% to 27.64%. The gains went to the hands of the group composed of the 41-95 percentiles of population, i.e. the growing "middle class" of Mexican society. The industrialization process incorporated and expanded the middle class, which increased its share in the national income. Another reason for the decrease in the national share of the upper five percentiles is also due to the wide intersectoral dispersion of income per deciles (see tables 3.12 and 3.13);

c) The concentration of income is greater in the urban than in the rural area for the 1958 to 1970 period, while for 1975 we observe the same degree of concentration. There is, however, an increasing difference between the income per capita of the urban and rural areas, from 2.09 to 2.59 times during the 1958 to 1977 period;

- d) There have been strong changes in the composition of the sectoral structure during the 1963 to 1975 period, when measured through the number of heads of families employed in the various sectors. The degree of concentration of income is the highest for the agricultural sector, followed by the commerce, services and industrial sectors, with an increasing level of concentration in the agricultural sector. While the level of concentration within each sector is high (with an income share of 45% or more for the richest quintile of population in any sector), the mean income of the heads of the family working in industry, commerce, services and transport and communication are double the mean income of the ones in agriculture. This illustrates a strong difference in income between and among the sectors of economic activity;
- e) There is an incredible disproportion of educational levels among the Mexican population. Income concentration decreases when the educational level increases, measured through the number of years of schooling. We find as well that the mean income per capita increases greatly at higher levels of education. The mean income is 6.3 times higher for the last group (13 or more years of education) than for the first group (no education at all); and

f) The distribution of population in Mexico is such that in the three largest cities of the country (Mexico City, Guadalajara and Monterrey), 25% of the population resides, while 50% lives in municipalities of less than 100,000 inhabitants. We observe that income per capita increases strongly when a person is living in a larger municipality; at the same time the level of income concentration decreases with the number of inhabitants of the municipality, with the exception of the case of the three mentioned metropolitan areas. There is a large difference between income received by a Mexican residing in a small municipality and a Mexican living in a larger one; an obvious explanation for the amount of internal migration in the country.

3.4 AN ATTEMPT TO IDENTIFY THE POOR

In the previous section we discussed the degrees of concentration of income at the national level, and we offered, as well, some possible explanations by analysing the income distribution data at other levels. This analysis has helped us to identify the population groups that have not benefited from the economic growth of the country. We were able to find the existing distance between the rich and the poor living in the urban and rural areas, working in defined

sectors of economic activity, with given levels of education and located in certain sizes of municipalities. Our purpose now is to identify the characteristics of the poorest members of the society, based on the same socioeconomic characteristics mentioned earlier.

3.4.1 Definition of Poverty

Several concepts of poverty have been used in different studies in Mexico. Hernandez and Cordova (1979), for example, define poverty as the percentage of families with income below the average income, which helps in carrying out intertemporal comparisons, avoiding the problem of different inflation indices for different income groups according to their consumption patterns; Kalifa (1977) on the other hand, using data only for 1963, defines poverty in absolute terms as that group of people with less than \$1,000 pesos (of 1963); and Vera (1979) considers the poor to be the group of people within the first 25% of the population in the Lorenz Curve.

Because we are using intertemporal income data, as opposed to information regarding basic physical needs (e.g. nutrition, shelter, health) or basic cultural needs (e.g. education, leisure and recreation, security), and considering the difficulty of defining poverty in absolute terms (e.g. \$2,000 monthly pesos per family) due to the inflation

factor, we have opted to include in the group of poor all those families (households in 1977) with income less than that of the 40th percentile.

This share of the population responds to the analysis performed at the national level in section 3.3.2, where we found that the first 40% of the population in the Lorenz Curve did lose their share during the 1950-1977 period. Even when the first two deciles lost their share of income, and the third and fourth maintained their share, the group as a whole was the only one (except for the richest 5%), that lost participation in the distribution of income over time. Our purpose now is to identify the socioeconomic characteristics of this group and determine, if possible, a trend among its sub-groups. This identification, even when suggested previously, provides a useful tool for policy formulation, determination of "target groups", overall redistribution strategies and socioeconomic policies.

3.4.2 Poverty Groups in Mexico

In order to offer a breakdown of the poorest groups, and given the definition of poverty opted for, we determine first the upper level income of the 40% poorest members of the society for each of the years studied. These values, in current prices, are presented for the years selected in table 3.20, where the upper level income defining the national

poverty groups ranges from \$162.39 monthly pesos (per family) in 1950 to \$2,317.42 pesos (per household) in 1977. The table includes data for 1950 and 1956, even though a breakdown of these groups is not offered for these years due to a lack of information. The upper level income of monthly pesos is used each year to determine the number of families within the income distribution of each socioeconomic characteristic, and with this their relative weight in the total population. The poverty groups are first studied for the urban-rural areas, then for the sectors of economic activity, and finally for the levels of education and upon consideration of their location.

A. The Urban-Rural Level

In 1958 40% of Mexican families had a monthly income under \$435.00 pesos; out of these 2,236,168 families (72.9%) were in the rural area while the remainder, (27.1%) were living in the urban area. The percentage of poor living in the rural area decreased to 66.5% for the year 1975, following a trend first towards lower participation in 1963 of 63.3% and 61.7% in 1968, and then increasing to the level mentioned for 1975 (see table 3.21). Out of the urban-rural dichotomy, the opposite is observed for the urban area. Table 3.21 shows as well similar trends for the percentage of the population within the urban-rural areas, with income under the income limit of each year. The difference between these values and the share of the total is given by the

TABLE 3.20 LEVELS OF INCOME BY PERCENTAGE OF POPULATION:
THE NATIONAL LEVEL

% OF POP- ULATION	1950	1956 UPPER LEVEL	1958 INCOME (PESOS)	1963
10	91.53	130.84	218.34	222.91
20	114.65	187.27	285.79	315.41
30	137.27	247.36	357.07	421.45
40*	162.39	313.53	435.83	546.42
50**	192.60	389.62	527.15	700.00
60	231.90	482.26	639.64	900.33
70	288.29	604.87	790.71	1185.91
80	382.64	791.30	1024.59	1659.11
90	601.06	1172.84	1515.02	2746.54
95	926.12	1676.50	2179.07	4371.11

% OF POP- ULATION	1968	1970 UPPER LEVEL	1975 INCOME (PESOS)	1977
10	395.46	327.26	333.31	673.30
20	590.06	491.18	658.10	1157.97
30	778.99	660.44	1002.06	1703.53
40*	985.69	846.23	1384.49	2317.42
50**	1230.64	1061.96	1831.73	3026.12
60	1544.61	1329.35	2388.48	3383.33
70	1988.93	1691.83	3145.29	5001.85
80	2723.34	2260.00	4334.00	6667.59
90	4405.99	3472.04	6876.25	9997.79
95	6899.04	5142.13	10390.67	14219.78

* Share of population and "National Income Limit" defining the poverty groups.

** Median income.

TABLE 3.21 POVERTY GROUPS IN MEXICO: THE URBAN - RURAL AREAS
(40% OF POPULATION WITH LOWEST INCOME)

	1958	1963	1968	1970	1975
OF FAMILIES	2236168	2931856	3260400	3556700	4083570
TOTAL NO.					
RURAL (%)*	56.3	57.1	65.0	64.4	66.2
(% OF TOTAL)	(72.9)	(63.3)	(61.7)	(65.7)	(66.5)
URBAN (%)**	23.5	26.3	24.3	22.8	19.9
(% OF TOTAL)	(27.1)	(36.7)	(38.3)	(34.3)	(33.5)
INCOME LIMIT (PESOS)	435.83	546.42	985.69	846.23	1384.49

* Percentage of population within the rural income distribution with an income less than the "National Income Limit".

** Percentage of population within the urban income distribution with an income less than the "National Income Limit".

changes in the relative weights of the areas due to internal migration.

Who are these poverty groups? In the rural area they represent the "traditional sector", formed by a great majority of landless peasants and small landholders; while in the urban area it is formed by people from the "informal sector", mainly unemployed, or workers with very low-paying jobs. We can say that some of the poor in the urban area have just arrived from the rural area, and it will be some time before they begin to profit from the better opportunities offered to them in the cities. We will study this socioeconomic process in the next chapter.

B. The Sectoral Level

While we found that most of the poor live in the rural area, it is no surprise to find that most of them work in the agricultural sector. Table 3.22 shows that 60.0% of the families working in the sector in 1963 and 70.7% in 1975 received an income under \$546.62 and \$1,384.49 pesos, respectively. Their relative participation in the total increased slightly from 63.1 to 63.4%. The rest of the sectors showed some changes in terms of their participation in the total; commerce, industry and transport and communication displayed an increase in their participation, while construction and services (including government in 1975) decreased their share.

TABLE 3.22 POVERTY GROUPS IN MEXICO: THE SECTORAL LEVEL
(40% OF POPULATION WITH LOWEST INCOME)

	1963	1975*
TOTAL NO. OF FAMILIES SECTORS	2931856	4083570
AGRICULTURE** (% of total)	60.0 (63.1)	70.7 (63.4)
INDUSTRY (% of total)	18.7 (7.4)	19.7 (11.5)
CONSTRUCTION (% of total)	45.8 (5.3)	24.2 (2.8)
COMMERCE (% of total)	28.7 (7.8)	31.6 (8.0)
SERVICES (% of total)	27.7 (15.4)	22.2 (9.8)
TRANSP. AND COMMUN. (% of total)	14.6 (1.0)	23.0 (3.3)
GOVERNMENT (% of total)	-	10.0 (1.2)
INCOME LIMIT (pesos)	546.42	1384.49

* The distribution of families does not include "unsufficiently specified", with 0.3% and "unemployed", with 11.2%.

** Percentage of population within each sectoral income distribution with an income less than the "National Income Limit".

Among these sectors, industry and services are the ones with the more notable changes; industry increased its share from 7.4 to 11.5%, while services decreased its share from 15.4 to 11.0% (including the 1.2% of government). A possible explanation for the industrial sector is that its participation in the general economy increased, and with it its share. This may be the explanation, considering that the share of families with income under the national income limit increased only slightly from 18.7 to 19.7%.

These data show that the poorest families in the country have as their heads persons working in the agricultural sector (63.4% in 1975), while the rest are working in the industrial sector (11.5%), commerce (8.0%) or services (11.0%). We mentioned earlier who the poor are in the rural area; now we find them placed in the agricultural sector. The poor in the urban area are now placed in the industrial, commerce and services sectors, where most of them work in the informal sector, receive less income than the minimum wage, are non-unionized, and are employed by firms using low amounts of capital.

C. The Educational Level

If we were able to clearly place the poor groups of Mexico in terms of the urban-rural dichotomy and the sectors of the economy where the head of the family works, the level of education is without any doubt a striking characteristic of the poor. Poverty is concentrated in 1975, with 97.7%,

in the families whose head had six or less years of schooling. 50.3% of the poor had no education at all, while 29.5% and 17.9% had between 1 and 3 years of schooling, and between 4 and 6 years, respectively. The result is practically the same using the information of 1977 (see table 3.23). While these numbers reveal the strong relationship between poverty and education, the values showing the percentage of population within each group with income lower than the national income limit show an even stronger relationship: while only 2.8% of the families whose head had between 10 and 12 years of schooling were below the poverty line, 65.0, 44.1, 26.4 and 9.6% were in the same situation when the education of the head of the family was 0, 1 to 3, 4 to 6, and 6 to 9 years of schooling, respectively. Again, when 1977 data are used the results are practically the same.

D. The Spatial Level

Table 3.24, showing the location of the poor in Mexico by municipality size, as well as including the three largest metropolitan areas, presents two clear characteristics: first, the smaller the municipality, the greater the chance that a household is under the poverty line; second, the poor people of the country are not living in the "misery belts" of the three largest metropolitan areas. These remarks are in accordance with the identification of the poor in the urban-rural areas.

TABLE 3.23 POVERTY GROUPS IN MEXICO: THE EDUCATIONAL LEVEL
(40% OF POPULATION WITH LOWEST INCOME)

1975		1977	
FAMILIES	4,083,570	FAMILIES	4,446,056
YEARS*		YEARS**	
0***	65.0	0***	65.1
(% of total)	(50.3)	(% of total)	(45.1)
1 - 3	44.1	1 - 5	45.1
(% of total)	(29.5)	(% of total)	(45.1)
4 - 6	26.4	6	17.0
(% of total)	(17.9)	(% of total)	(6.5)
7 - 9	9.6	7 - 8	12.7
(% of total)	(1.8)	(% of total)	(1.0)
10-12	2.8	9	6.1
(% of total)	(0.2)	(% of total)	(0.7)
13-OR MORE	2.9	10-12	4.6
(% of total)	(0.3)	(% of total)	(0.4)
INCOME LIMIT	1384.49	13-OR More	10.4
		(% of total)	(1.2)
		INCOME LIMIT	2317.42

* Number of years of schooling of head of family

** Number of years of schooling of head of household

*** Percentage of population within each income distribution with an income less than the "National Income Limit".

Note: The distribution of the total does not include "insufficiently specified", with 0.9 and 0.8% for 1975 and 1977, respectively.

TABLE 3.24 POVERTY GROUPS IN MEXICO: THE SPATIAL LEVEL
(40% OF POPULATION WITH LOWEST INCOME)

	1977
NO. OF FAMILIES	4,446,056
1*	85.0
(% of total)	(2.6)
2	71.9
(% of total)	(20.2)
3	62.4
(% of total)	(59.1)
4	23.7
(% of total)	(6.2)
5	16.6
(% of total)	(3.3)
6	20.0
(% of total)	(2.4)
MONTERREY	9.5
(% of total)	(0.7)
GUADALAJARA	15.3
(% of total)	(1.1)
MEXICO CITY	8.4
(% of total)	(4.4)
INCOME LIMIT	2317.42

The spatial groupings are defined as follows: 1) municipalities with less than 2,501 inhabitants; 2) municipalities with 2,501 to 10,000 inhabitants; 3) municipalities with 10,001 to 100,000 inhabitants; 4) municipalities with 100,001 to 250,000 inhabitants; 5) municipalities with 250,001 to 500,000 inhabitants; 6) municipalities with more than 500,000 inhabitants, excluding the metropolitan areas of Monterrey, Guadalajara and Mexico City.

* Percentage of population within each income distribution with income less than the "National Income Limit".

The percentage of families below the poverty line decreases from 85.0% to 20.0% from the first to the sixth group of municipalities, while only 9.5, 15.3 and 8.4% of the households of Monterrey, Guadalajara and Mexico City, respectively, are in the same situation. This means that the poor of the big cities are not the poorest of the country. In fact, 89.9% of the poor live in municipalities with less than 100,000 inhabitants, while in the three larger metropolitan areas of the country (possessing 25% of the national population), only 6.2% of the poor reside. This location of the poor is merely a reflection of the type of economic strategy followed in the last decades at the national level: most of the economic activity and growth has been carried out in very few economic centres.

3.4.3 Summary of Conclusions

Based upon the statistical information about income distribution presented at different levels, we were able to identify the poorest groups of Mexican society. Their socioeconomic characteristics, along with their location could prove valuable assets for policy formulation in the country. We have used as the definition of poverty that group of people, at the national level, within the first 40% of population represented by the Lorenz Curve, i.e., the poorest 40% of national families. Among the characteristics of these groups we find:

- a) the overwhelming majority of the poor of the country (more than 70%), live in the rural area, i.e., in localities under 2,500 inhabitants. We observe as well that there has been a slight increase in the proportion of the poor in the rural area since 1958;
- b) most of the heads of the poorer Mexican families were working in the agricultural sector (63.1% in 1963), with a slight increase in participation to 63.4% in 1975. For this year the rest of the poor were families whose heads worked in the industrial sector (11.5%), services (11.0%), or commerce (8%);
- c) Almost all the poor families (95%) had as their head a person with six years or less of schooling. Among them, 50% had no education at all, 30% had between 1 and 3 years of schooling, and 18% had between 4 and 6 years of schooling;
- d) there is a close relationship between the size of the municipality and the percentage of poor below the poverty line: the smaller the municipality size, the greater the percentage of population living beneath the poverty line. In fact, the concentration of the poor is such that 90% of them live in municipalities with a size of under 100,000 inhabitants. On the other hand, while in the three largest metropolitan areas of the country, Mexico City, Guadalajara and Monterrey, 25% of the national population resides, the percentage of poor living in them is only 6.2%;

e) overall, the majority of the poor of the country live in the rural area, and in particular in municipalities of less than 100,000 inhabitants, work in the agricultural sector, and have very little education or none at all. These characteristics provide us with solid arguments for proposing strategies and policies of income redistribution for Mexico.

- FOOTNOTES

1. See for example CENIET (1979); Kalifa (1977), chapter 3;
or SPP (1979a).

IV

INCOME DISTRIBUTION AND ECONOMIC GROWTH IN MEXICO

In the previous chapter, the distribution of income in Mexico between 1950 and 1977 was investigated, thereby identifying the areas, economic sectors, and types of municipalities in the country where higher levels of concentration exist. The results obtained illustrate that the economic process has done little to solve the needs of the "have-nots", while the "haves" have benefited from improved living conditions. This situation has created such strong differences between some population groups, in both economic and general life-style terms, that it is difficult to imagine a nation possessing these contrasts.

With this in mind, the purpose of the present chapter is to attempt to integrate the results of the analysis of the income distribution data presented to the theoretical framework proposed in chapter one. In order to achieve this goal, the set of variables and their interrelationships, given as a possible explanation of income distribution in developing countries, are presented within the Mexican context, integrating them with the observed income distributions. The first part of this chapter presents an historical perspective of the distributive problem in Mexico up to

the year 1940. This includes an analysis of these economic variables for which we have data and which are considered important within the theoretical framework proposed. We take 1940 as the year which marks the beginning of a new economic and social strategy in Mexico, and which is characterized by a very high rate of growth of economic activity. We could, furthermore, consider the entire period from 1936 to 1945 as the turning point in Mexican economic growth.

The second part of the chapter covers the 1941 to 1980 period, profiting from the statistics on income distribution available since 1950. The understanding of the process of economic growth that has generated the observed income distribution is an important aim, in order to propose a working hypothesis that could aid in supporting various income redistribution strategies proposed for the near future. An analysis of the agricultural, industrial and services sectors is given, relating income distribution, the productive level of concentration and the employment generation. An explanation of the role of the government and the demographic dynamics is offered as well, in an attempt to round off the theoretical framework suggested. In the third part of the chapter we summarize the results that the economic growth has brought about in terms of income distribution, marginality, labour occupation, capital distribution and regional growth.

4.1 MEXICAN INCOME DISTRIBUTION AND ECONOMIC GROWTH: THE ORIGINS

The modern process of economic growth beginning in 1940 has been characterized by an economic strategy that has neither offered nor provided economic justice for every Mexican. While this process is relatively new, its roots can be traced back to at least the first decades of the last century. Indeed, the economic, social, cultural and political elements of modern Mexico clearly reflect the heritage of the past.

4.1.1 Independent Mexico (1810-1910)

The year 1810 marks the beginning of the period of independent Mexico, which witnessed the end of almost three centuries of Spanish rule. This period lasted for one hundred years, with three very well-defined sub-periods: a) the 1810 to 1821 period of Independence Wars, which finally brought Mexico its status of independence; b) the 1821 to 1876 period of Independent Mexico, characterized by political instability and general economic stagnation, where different groups, ideologies and countries tried to impose their own interests; and c) the 1876 to 1910 Porfirian Period (after dictator Porfirio Diaz, who ruled Mexico throughout this period), where the nation finally initiated a slow

but sustained growth, through political stability, an improved transportation system integrating the economy, and foreign investment attracted by the growing market, the existing resources and the Porfirian-established peace.

Throughout this century of independent Mexico, the mixture of Indian and white blood, and thus the creation of a new race, continued; the recognition of Mexico as a new and autonomous state was granted by the European powers of the time and the United States, and the creation of a new nationalistic identity for the Mexican population was born. At the same time, several institutions changed or lost their comparative importance, while others remained unaffected by the 100 years of relative turmoil of a new-born state. Nevertheless, there is an institution, perhaps the most closely related to the general social organization of a country in this state of development, that was not characterized by any drastic change throughout the period: the land tenure or agrarian system.

McCutchen (1971), studying the land systems of Mexico from the colonial times to 1920, argues that even at the end of this period, in a large part of the country, the land was held much as it was in Spain before the discovery of the New World - in that age when in western Europe the feudal system of land tenure still survived in spite of the decay of feudalism as a recognized institution. In other parts of Mexico (the more distinctly Indian districts), the customs govern-

ing the possession of land belonged to about the same period chronologically, but corresponded to that stage of aboriginal culture that was found in Mexico upon the advent of the white race.

In other words, for four centuries the appropriation and use of the land in Mexico was a coexistence of a new mode of production brought by the Spaniards and the one already existent. Needless to say, the distribution in terms of quantity and quality was heavily lopsided towards the victorious conqueror (conquistador). At the beginning of this period there were a few Encomiendas, large estates given to an encomendero (literally "entrusted one"), and consisting of groups of villages where the Indians continued to hold their lands in common. The purpose of the Encomendero was to administrate Crown land, exploit its wealth and spread the Christian faith among the inhabitants. By the year 1810 there were almost 5,000 large holdings (1). This number includes 3,749 haciendas (large settlements practically self-sufficient, with less than one hundred to more than a thousand people, whose owner was a conquistador or government official of Spanish origin), and 1,195 large cattle ranches (estancias). In both cases the Indians saw their social status changed from owners of communal lands to serfs bound to the land-holder, upon whose property they lived.

The 1810 to 1821 period of Independence Wars brought about a change in ownership of the haciendas and cattle ranches from the Spaniards to the native-born Mexicans, but did not bring about corresponding changes in the system of production. The Mexican hacendados did not want to reform the existing structure of production and ownership of the land. Some of them, however, the Liberals, wanted to distribute the landholdings of the church, considered to be not only extensive but practically unproductive. From 1857 to 1859 a process of nationalization of church property was carried out, creating political instability and internal war. This process, however, was continued throughout the Porfirian years, the land being sold to large foreign and national companies, or the successful Mexican hacendados. By the year 1910 there were as many as 8,245 haciendas scattered all over the country.

During the colonial times soldiers or public officials were generally paid with relatively small landholdings, and, with time, became colonizers. These farmers were the poor whites, working with their hands and creating as many as 6,700 ranches by the year 1810. During the first century of independent Mexico the importance of the ranches grew as a means of colonization in the northern part of the country. By 1910 there were 48,000 ranches spread throughout the country.

It is estimated that by the year 1910 there were 11.6 million people living in the rural area of Mexico, representing 77% of the national population. At the same time, there were approximately 2.3 million heads of family of which less than 57,000 were property holders (2.4%). The remaining heads of family were people living in the pueblos (towns) of Indians working "communal" land (now under different names), or were merely working on the haciendas as peons (where the head of the family and his descendents were born and would probably spend their entire lives) serving the hacendado. These numbers give us an idea as to the kind of society existing only a few decades ago in rural Mexico, where most of the population had no means of living and a very few were controlling everything, from land to the personal lives of their "workers".

The economic activities carried out in the country started to grow steadily by 1890, when foreign investment was attracted by a strong policy of development of communications, and the relative peace created during the Porfirian period. Between 1895 (the first year for which statistics on sectoral production exist) and 1910, the manufacturing industry grew at 4.9%, construction at 6.3%, electricity at 18.7% and mining at 5.9%, while agriculture grew at 4.4% and cattle raising at 1.2%. The total rate of growth of the period was 4.0% (2). Even when the manufacturing industry was in an incipient state, by the year 1895 it represented

14% of the GDP and by 1910 16%. The total participation of the secondary sector in the period grew from 21 to 26%, while the tertiary was constant and the primary sector decreased from 41 to 36% in 1910.

In other words, while 77% of the national population was in the rural area, total production there was not only relatively small but decreasing. Moreover, if we add the conditions of land ownership explained above, we can suggest that income distribution in 1910 was more concentrated than it was for any of the eight years analysed in the previous chapter, covering the period 1950 to 1977. This suggestion is based on the fact that 77% of the population participated in the generation of 36% of the GDP and 97% of the people (75% of the national total) had practically no control over the means of production, and were living under extreme conditions of poverty.

4.1.2 Revolutionary Mexico (1910-1940)

During the time span of 1910 to 1940 we find some strong changes in the socioeconomic structures of Mexico. In the decade from 1911 to 1920 the country witnessed a Revolution that halted the growth that the economy had observed since 1890, but at the same time offered freedom to millions of Mexicans who were serving the hacendados, and started a

distribution of land that until now had been concentrated in a mere few thousand hands. This bloody fight, where over one million Mexicans died, was the setting for a new type of life in the country, especially in the rural area where the majority of the population lived.

The Revolution created a labour market that had been nonexistent because of the need of the hacendados to discourage any kind of vertical or horizontal mobility of the peons; at the same time millions of the peons profited from the agrarian reform initiated during the first years of the Revolutionary period, through the direct exploitation of land that they themselves had been working for generations. The income of these Mexicans grew, opening new markets for the still small manufacturing industry. However, during these early years of the Revolution the economic activity decreased in most of the sectors. The statistical information for 1921, the first year of data after 1910, shows a reduction in the gross domestic product in real terms as compared with 1910. Agriculture, cattle raising and mining are the sectors with stronger reductions in production. Nevertheless, from 1921 to 1940 the economy began to recover, and although growth was halted during the Depression years, the structural changes initiated during 1910 were consolidated.

The structural, social and economic changes that occurred in Mexico during the 1910 to 1940 period have been stud-

led by many authors, among them Solis (1970), Reynolds (1970), Singer (1969) and Hansen (1971). They agree that during this period of revolution, recovery and institutional reform, there were many economic and social variables which changed, in such a way that upon interaction, brought about sustained growth during the following four decades (1940-1980). Perhaps the single most important element that strongly helped to transform life in the country was the disappearance of peonage, which brought personal freedom to millions of people in the rural area. The possibility of social, geographical and occupational mobility and the stability of a transformed political system offered the majority of the population the chance to participate more actively in the economy, resulting in an increased urban labour supply. In sum, the opening of a closed society, while stalling the economic dynamism of Mexico, brought about institutional changes that provided a framework for the economic growth after 1940.

During the period 1910 to 1940, 1.6 million Mexicans were recipients of land distributed by the government through the agrarian reform (3). This process of distribution of land, begun in 1915, became more and more important with time, in such a way that during the period 1935 to 1940 the number of recipients increased from .8 to 1.6 million. The use of uncultivated land, among other factors, increased agricultural production to a rate of growth of almost 5% per

year during the period, making it one of the most dynamic sectors of the economy. However, this rapid rate of growth was not the same for every household in the rural area. Reynolds (1970), after a detailed analysis of input productivity and regional production of the agricultural, cattle-raising, forestry and fishery sectors, concludes that with an unbalanced fashion of development in the rural area, where a large though declining subsistence sector remains (as in the Mexican case), an increasing rural inequality pattern is difficult to avoid. Thus, while by 1940 the 1.6 million "ejidatarios" (recipients of land) were cultivating 49% of the total cultivated land (4), the remainder of those in the rural area were still living in the same conditions of poverty existent in 1910. As we see in the next section, these "fortunate" ejidatarios improved their relative position during this period, but remained stagnant during the economic "miracle" of the following four decades. Of course they were, and still are, in a better relative and absolute position than the less fortunate that did not receive land through the agrarian reform and remained in the countryside.

In the urban areas, the Revolution started a process that brought about urbanization through growing rural-urban migration; increased demand for labour by developing the secondary and tertiary sectors, with lesser emphasis on the manufacturing industry; and a third element that became a key factor within the political system of the new govern-

ment: the organization of a labour movement. If the agrarian reform had stopped the social unrest in the rural area, organized labour in unions, and these in turn in confederations of workers, provided an organized political movement that brought political stability to the urban area. In fact, the new political party -government supported- was formed by four groups: the agrarian forces, the union forces, the military groups and the then small group of professionals, government workers, and merchants. The new democracy was heavily supported by the first two forces.

This new democratic style, originating in the 1920's, has provided more than five decades of a very peculiar form of government and political stability in the country. It has been flexible enough to accept the strong structural changes of a dynamic society and ingenious enough to remove the military groups from the party and the government. Up to this moment every single election of major importance for over 50 years has been won by the same party formed by the agrarians, the labourers and the "popular" sector.

The role of government, within this political context, has been very important in promoting economic growth. Singer (1969) has divided this role in two categories: as public investor and as provider of assistance to the private sector. This role began in the twenties and has become an inherent form of participation of the government. While the share of public investment has been increasingly important,

the allocation of these resources has determined the style of development that the country has witnessed. Public funds have provided the communications that the economy needed to become more integrated, the resources to provide education to an increasing population and the supply of goods that the private sector could not produce. At the same time, the government has provided assistance of many kinds (i.e. exemption from taxation, subsidies) to private entrepreneurs, nationals and foreigners that participate in the economy.

Iturriaga (1951), studying the evolution of the structure of the Mexican social classes from 1895 to 1940, has concluded that the process of evolution observed is the outcome of three factors: 1) the new land tenure system offered by the Revolution; 2) the urban growth and 3) the continuous industrialization of the country. The author, after defining three types of social classes according to occupation, analyses the evolution of the high, middle and lower classes. A summary of his study is presented in table 4.1, showing that the 45 years of the period preceding the start of the Mexican "miracle" set the pattern for the social structure observed to date.

A high rate of growth of the middle class is observed, while the high concentration of the lower class in the rural area is remarked. By the year 1940 most of the population was still considered to be part of the lower class (83%), with 73% of them living in the rural area. The composition

of the lower class (11.9 million) in the rural area according to the occupation of the head of the family is concentrated in the peons and agricultural workers with 64.0%, while the ejidatarios and the small land-holders were 26.4 and 4.2% respectively (5). If we add that of the 19.6 million Mexicans in 1940, 15% were Indians (2.9 million) and were living in the rural area, and that of these 1.2 million did not speak Spanish (composing over 40 groups of aborigines) (6), we have a good picture of those Mexicans that were not participating in the structural changes realized in the country during the "Revolutionary Mexico" period.

In sum, the period from 1910 to 1940, through the revolutionary years, the institutional reforms and the creation of the foundations of a new society is an important period in Mexican history. It has provided the basis for a more democratic society, the elements for a process of economic growth and the confirmation of Mexico as a sovereign state. But this system did not solve the problems of social justice for everyone. As we have shown up to 1940, and will examine in more detail in the next section, it left behind a great number of Mexicans living in a backward system, and over time this revolutionary system has created social and economic discrepancies that seem difficult to explain when simply analysed through cold statistical numbers of income distribution.

Table 4.1 CHANGES IN CLASS STRUCTURE IN MEXICO (1895-1940)

Social Classes	1895		1940	
	Absolute	%	Absolute	%
Total Population	12,698,330	100.00	19,653,552	100.00
High	183,006	1.44	205,572	1.05
Urban	49,542	0.39	110,868	0.57
Rural	133,464	1.05	94,704	0.48
Middle	989,783	7.78	3,118,958	15.87
Urban	776,439	6.12	2,382,464	12.12
Rural	213,344	1.66	736,494	3.75
Low	11,525,541	90.78	16,329,022	83.08
Urban	1,799,898	14.17	4,403,337	22.40
Rural	9,725,643	76.61	11,925,685	60.68

Source: Jose Iturriaga (1951): La Estructura Social y Cultural de Mexico. Mexico: Fondo de Cultura Economica, p. 28.

4.2 **MEXICAN INCOME DISTRIBUTION AND ECONOMIC GROWTH:**
1940-1977

During the last four decades the Mexican strategy of economic growth has followed a model used in many developing countries, namely, a strategy adopting the industrial sector as the most dynamic sector of the economy. The main idea behind this strategy is to promote a sector that could become a dynamic-leader sector in order to promote economic independence, higher levels of income and an improvement in income distribution. The mechanics behind this are simple: based on a certain amount of protection provided by the government, the industrial sector would help the process of capital formation of the economy; would substitute imports, with a subsequent improvement in the balance of trade; would help the integration of the economy with a dynamic impact on the rest of the economy, and all of society would benefit through the creation of employment and the increase in production and consumption.

While the industrial sector was the key to this strategy, the rest of the economy would be fulfilling the role of economic supporter: the agricultural sector, for example, providing the foreign exchange for industrial capital formation as well as the cheap labour force, foodstuffs and other consumption goods; the services sector helping through financial and commercial activities along with the absorption of labour force from the rest of the economy.

A similar pattern of growth has been observed in several economies and reported in various studies (7), showing the economic process as an unequal one of development of the economy. The Mexican economy, following this pattern, has been rather successful, characterized by a rapid growth in her gross national product since 1940 (see table 4.2). The rate of growth of the GNP has been an impressive 6.1% during four decades, which illustrates that the strategy has been successful in terms of increasing the amount of goods and services produced by the economy. The leading sectors of the economy have changed over the years mainly in response to internal guidelines or international markets.

Unfortunately, the benefits of this increased production have not been equally distributed, with most being concentrated in the hands of a small percentage of the population. This type of growth has not proved to be the salvation of the poor, rather their relative position has deteriorated, bringing with it an increasing difference between the rich and poor in the country. As we will see as well, another outcome of this strategy of development has been the gross discrepancies in the ownership of the means of production. The redistribution of physical and human capital was one of the main aims of the Mexican Revolution, yet this goal remains to be achieved. Finally, the system of production has developed in such a way, in response to the strategy of development followed, that it is difficult

TABLE 4.2 GROSS DOMESTIC PRODUCT IN MEXICO, 1940-1978

YEAR	GDP IN MILLIONS OF PESOS	GDP IN MILLIONS OF PESOS OF 1960	GDP PER-CAPITA IN PESOS OF 1960	GDP PER-CAPITA IN US CURRENT DOLLARS
1940	7774	46693	2376	73
1950	39736	83304	3170	175
1960	150511	150511	4138	331
1970	418700	296600	5851	661
1978	2104550	440600	6690	1403
GROWTH PER YEAR (%)				
1940/50	17.7	6.0	2.9	9.1
1950/60	14.2	6.1	2.7	6.6
1960/70	10.8	7.0	3.5	7.2
1970/78	22.4	5.1	1.7	9.9
1940/78	15.9	6.1	2.8	8.1

Source: Bank of Mexico (1979)

to deny that Mexico works under a heterogeneous system of production. The concept of heterogeneity is used in both senses within and among the sectors of production.

These three sets of elements, those defining the type of economic strategy adopted, the ownership of the means of production and the level of integration and homogeneity of the system of production, are the elements proposed in chapter one as the main forces determining the market income distribution in a developing economy. The remainder of this section aims to use this theoretical framework in an attempt to explain economic growth and income distribution in Mexico (8).

4.2.1 The Strategy of Economic Growth: Some Characteristics

Below we analyse the growth of the agricultural, industrial and services sectors of the Mexican economy, the purpose being the exposure of the characteristics observed in the sectoral growth, which, when interacted, partially explain the observed income distribution at the national level. At the same time we show some of the reasons which have led to the creation of strong discrepancies in the levels of productivity within and among the various economic sectors.

A) The Agricultural Sector

For years the agricultural sector in Mexico was subordinated to the industrial sector, in accordance with the economic strategy chosen in 1940. The purpose of this was the role of the sector as a producer of cheap raw materials and foodstuffs for the constantly growing domestic demand, as well as the production of agricultural goods to be sold on the international market, with the purpose of generating highly needed foreign exchange in order to import the capital goods required for industrial growth. There was, as well, another important role that the agricultural sector played within the pattern of development: surplus labour with no absorption within the sector moved to the urban areas, thereby providing cheap labour force to various industrial activities and to the services sector. In its early stages, this migration did not cause significant problems in the urban areas, but eventually the numbers of unemployed and underemployed were such that, because of the impossibility of the modern sector to absorb them all, a whole new "economy" within the urban area was created. This new "economy" has received a wide variety of names, the most popular being the informal sector.

The agricultural sector managed to grow at a very high level during the first years of this period: 6.4% during the 1945-1955 period, and 3.8% during the 1955-1965 period. However, the rate of growth began to decline during the 60's

and the entire sector has been in deep trouble since 1965, growing at a rate of only 2.4% per year during the 1965-1978 period. In particular, crop production grew at 1.5% per year while cattle raising grew at 4.0%, showing that the initial programs designed to support this sector were no longer positively influencing crop production (see table 4.3).

These more important programs, carried out mainly by the government, were at first successful at creating a strong though select commercial farming sector, yet left the rest of the agricultural sector relatively unaffected. Receiving financial aid, commercial farming uses the most productive land, advanced and efficient techniques of production, irrigation systems, fertilizers and employs salaried workers, producing for the market. On the other hand, the campesino sector works with small farms, using out-dated techniques of production involving family labour, and with practically no irrigation systems. Of course, there are some productive units which use a mixture of these two systems, and are important in terms of their participation in the total production.

The total production of the modern agricultural sector was 69.7% in 1970, being produced by 9.8% of the total number of productive units of the country. Of the total productive units of the country, a mere 0.6% produced 30.3% of the total production, giving an idea of the level of concentra-

TABLE 4.3 GDP OF AGRICULTURAL SECTOR, 1945-1978
(MILLIONS OF PESOS OF 1960)

YEAR	TOTAL	CROP PRODUCTION	CATTLE RAISING	FORESTRY	FISHERY
1945	11211	6152	4254	702	103
1955	20841	13562	6180	889	210
1965	30222	19921	9008	955	338
1978	41339	24232	15008	1540	559
GROWTH PER YEAR (%)					
1945/55	6.4	8.2	4.0	2.4	7.4
1955/65	3.8	4.0	3.8	1.0	4.9
1965/78	2.4	1.5	4.0	3.7	3.9

Source: Bank of Mexico (1979)

tion in production within this sector; on the other hand the campesino sector (marginal or informal) produced only 15.3% of the total production in 1970 with 78.2% of the total number of productive units; Of them, 43.4% produced only 2.3% of the total production. With respect to the rest of the production, 15.0% was produced by 12.0% of the total number of productive units (see table 4.4).

The dynamics of the sector have affected its abilities to create employment. In order to increase the production of grains (i.e., soya bean, wheat, sorghum), the official prices were increased in 1973, increasing the number of hectares dedicated to these products, and decreasing labour requirements, due to the labour intensity required for these products. From 1960 to 1978, crop production for cattle raising had increased from 2.6 to 11.4%, reflecting the new orientation of the sector towards satisfying the needs of the American market and those Mexicans of higher income levels, the principal consumers of Mexican cattle production (9).

The abilities of the agricultural sector in terms of the level of employment absorption for the 1960-1975 period have been studied by Rendon (1976). She divides the analysis into two periods: 1940-1960 and 1961-1975; in these periods we find two different conditions in terms of capabilities. The first period had a yearly rate of growth higher than 3%, due mainly to the increase in the cultivated

TABLE 4.4 AGRICULTURAL PRODUCTION IN MEXICO, 1950-1970
(CONSTANT PRICES)

LEVELS OF PRODUCTION	NUMBER OF PRODUCTIVE UNITS (IN THOUSANDS)		SHARE OF TOTAL PRODUCTION (%)	
	1950	1960	1950	1960
TOTAL	2437	2448	100.0	100.0
1. LESS THAN \$1000	1335 (54.8)	1241 (50.7)	6.2	4.2
2. \$1000 TO \$5000	648 (26.6)	821 (33.5)	16.2	17.1
3. \$5000 TO \$25000	429 (17.6)	307 (12.5)	41.2	24.4
4. \$25000 TO \$100000	16 (0.6)	67 (2.8)	9.6	22.0
5. MORE THAN \$100000	9 (0.4)	12 (0.5)	26.8	32.3
			100.0	100.0

Source: STYPS (1979) Table #8, Page 56.

land (including the irrigated land), and due, as well, to the increase in productivity. During the second period, 1961-1975, the rate of growth decreased to only 1.4% per year, due mainly to decreases in the dynamism of the sector, which decreased the rate of growth of new land and productivity, and due, as well, to the increasing use of mechanization and changeovers to types of crops that generated less labour demand.

At the same time, the mechanization of production has not helped to create employment in the sector, reducing its ability to offer employment to the ever-increasing number of Mexican campesinos (their number almost doubled from 1950-1970); and increasing the pressure to migrate to the urban areas in the search for better living conditions. It is estimated that 1.75 million people migrated between 1950 and 1960, and 2.75 million from 1960 to 1970; a pressure too great for the urban centres to handle, considering that they themselves had a natural rate of growth of little over 3% per year.

The heterogeneity that the agricultural sector has shown in terms of resources, techniques and productivity can be translated in terms of income distribution. Thus, for 1975, the top 10% of the population received 64.6% of the total income generated by the sector, while the poorest 80% received only 24.4% of the income (see table 3.13). It is difficult to say that in real terms some of the poorer mem-

bers of the sector have not improved their situation, however we can say that due to the economic process followed by the sector, many campesinos became wage-earners within the sector, and when the situation did not improve, they migrated to the urban areas, changing their status from "campesino marginado" to "member of the informal sector". In both cases they are at the bottom of the Lorenz Curve (first 40%), either in the rural or urban sectors, or in the agricultural or any of the sectors where they "participate" in the economy once in the city: construction, commerce, services, etc., but as we have shown, in much better conditions in the city, and with the possibility of improving their situation.

B) The Industrial Sector

The policy of import substitution industrialization (ISI) began at the end of the 1930's, one of the economic programs with better possibilities of success in Mexico, given the techniques, amounts of investment and size of the market needed for the production of final goods. During the 1950's, when the size of the market had increased enough, production turned to durable consumption goods, and finally, during the 1960's, the process of import substitution turned towards intermediate and even some capital goods.

During this process the techniques used were capital intensive as opposed to labour intensive, placing pressure on the balance of payments and increasing the technological dependency with respect to the rest of the world. In order

to protect the new national industry from the foreign market, the government used quotas and permits for importation, thus allowing for a captive market with high prices and low quality of production. At the same time, the reduction in imports was to save foreign exchange for imports of capital goods and factors of production.

This type of industrial economic pattern created a heterogeneous production structure, with high levels of concentration in almost all the industrial activities: the existence of a few companies using advanced technology, alongside a great number of economic units that retained the traditional techniques. This, of course, was not the solution for the creation of employment in an economy with explosive population growth.

The growth of the industrial sector has been impressive by any standards: 7.1% average yearly growth during the 50's, 8.8% during the 60's, and 6.4% from 1970 to 1978 (10). However, the growth of the sector was not homogeneous, since the process of concentration continued in such a way that the larger national and international companies began displacing the smaller and medium-sized companies, resulting in a productive structure with little integration and varying techniques, organization and productivity, while some activities were more dynamic than others. The larger companies within the most dynamic sectors used capital intensive techniques, while in less dynamic sectors or smaller companies

we find traditional techniques with greater labour absorption.

The industrial concentration is part of the process of the sector where the larger companies control most of the capital, use the newest techniques, and profit from the financial market. A greater concentration in the manufacturing sector was witnessed during the 1970-1975 period, while those companies with more than 350 workers (0.6%) increased their total participation in production from 45.1% to 49.6%, constituting almost one-half of total production (see table 4.5). The smaller companies, those with 1 to 50 workers, reduced their participation from 15.6% to 12.9%. The medium-sized companies (51 to 350 workers) decreased their participation as well in the total production, from 38.5% to 36.5%. It is worthwhile mentioning that even when the larger companies had a growth rate of employment in the period of 4.9%, while the smaller companies had a rate of -1.6%, the levels of investment and productivity of the larger companies were higher, and therefore their possibilities of employment generation were also higher; however, their relative levels of employment generation with respect to investment were lower.

The high level of heterogeneity of the industrial sector has provided varying levels of working conditions. On the one hand, we find workers in large companies with relatively high levels of income, good working conditions and

TABLE 4.5 STRUCTURE OF PRODUCTION AND EMPLOYMENT IN THE
INDUSTRIAL SECTOR, 1970-1975

SIZE (# of Workers)	PRODUCTIVE UNITS		PRODUCTION		EMPLOYMENT		GROWTH PER YEAR 1970/75
	1970	1975	1970	1975	1970	1975	
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	1.7
RUPFW*	48.2	52.8	0.8	1.0	6.0	6.2	2.1
UP TO 50	47.4	42.6	15.6	12.9	25.7	21.7	-1.6
51 TO 350	3.8	4.0	38.5	36.5	35.8	34.1	0.7
351 OR MORE	0.6	0.6	45.1	49.6	32.5	38.0	4.9

* Productive Units Without Paid Workers

Source: STYPE (1979), Table #14, Page 60.

job security, and on the other we find workers in smaller companies with lower levels of the same. According to the Ministry of Labour (STYPS, 1979), there is an important level of labourers (some 15-20%) of the total number of workers employed who are occupied under conditions of eventual work: short contracts, sub-contracts or work done within the home. This important number of workers is highly vulnerable to recession periods and in general to periods of decreases in demand, being the first workers to be affected by adverse economic conditions. These workers are part of that mass of Mexicans considered to be urban marginals, at the bottom of the scale of workers in the industrial sector.

It is possible to say that the past and more recent conditions under which the industrial sector has evolved have created a heterogeneous sector, with a highly concentrated market structure and a reduced level of competition, as well as with a selection of capital intensive techniques which have not helped to fulfill the expectations of reducing the unemployment and underemployment of the country. Thus, the impact on income distribution within the sector is such that in 1975 the top 10% of the economically active population received 42.1% of the income, while the poorest 80% received 43.1% (see table 3.15).

In summary, the yearly rate of growth of employment in the manufacturing sector decreased from 2.5% during the 1965-1970 period, to 2.3% during the 1970-1975 period, show-

ing that even with the rate of growth of the industrial sector, its heterogeneity and growth pattern have decreased the possibilities of labour absorption, offering no solution to the ever-increasing number of unemployed and underemployed in the economy.

C) The Services Sector

The services sector, which includes commerce, transport and communications, government and other services, has shown a high rate of growth of 6% since 1950, and a rate of participation in the GDP of approximately 55%. It is, however, another sector of marked heterogeneity in production. A case in point is commerce where, in 1970, 4.2% of the businesses had 70.2% of the invested capital, paid 85.7% of total wages and employed 38.1% of the workers employed in commerce. On the other side of the distribution, 95.8% of the businesses employing 1 to 5 workers had 29.8% of the invested capital, paid 14.3% of total wages and employed 61.9% of the workers in commerce. While this subsector had a contribution of 31.6% in 1950 to the GDP, and 31.8% in 1970, the economically active population was of only 8.4 and 9.9%, respectively (11).

The subsector "other services", including tourism, banking, professional services and domestic services showed, as well, a high level of concentration, where in 1970 all the units with more than 5 workers (7.2% of the total) had 61.5% of the invested capital, 44.7% of employment, and 80.3% of total wages paid.

In general, the services sector grew in response to the need for well organized services for the modern sector in both the rural and urban areas, but at the same time it allowed the growth of small economic units with less than five workers needing low levels of organization or capacity. This became the easiest way to subsist in an economy that was unable to provide the jobs and income for an ever-increasing labour supply.

In 1970 the services sector had 32.6% of the total economically active population, with a rate of growth of 6.3% during the 1960-70 period. The heterogeneity of the sector can be assessed if we examine the income levels of the workers: 35% had an income lower than the official minimum wage, with 39% and 32% for the services and commerce subsectors, respectively. These, of course, are the workers of small commercial units, small restaurants and the like, workers with no education, capital or means of obtaining higher levels of income. The sector employs 69.5% of the female economically active population and a high level of workers younger than 24 or older than 45 years of age.

The low level income workers of the sector are working under conditions of no job security, medical services or ways of improving their technical abilities, and there is a close relationship between the number of workers per economic unit and the existing job conditions. At the same time, the number of workers without pay remuneration (WWP) (12)

has increased. For example, in the subsector "other services" in 1970, there were 121,526 economic units employing WWP (representing 57% of the total), while in 1975 there were 140,125 (63.1%); if we add these units to the ones with 1 to 5 workers and the uni-personal units (no workers), their relative participation increases slightly from 92.6% in 1970 to 92.8% in 1975.

On the other hand, the commerce subsector, while employing 9% of the economically active population, employed 15.9% of those workers between the ages of 12 and 19, 13.5% of the female labour force, and 10.2% of the 60 year or older labour force. It is observed, as well, that 15.4% of this work force had no schooling, 66.4% had between 1 and 6 years of schooling, while the remainder had 7 or more years of schooling. It is estimated that in the commerce subsector a total of 31.2% were underemployed.

Thus, for 1975, the top 10% of the heads of families working in commerce received 50.3% of the income of the subsector, 49.3% in other services, 36.9% in transport and communication and 42.0% in government; while the poorest 80% of the heads of families took 35.5, 36.4, 48.2 and 33.5% of the income, respectively (see table 3.13). In sum, it is the services sector that has proved to be the absorbing sector of the economy of the increasing labour force, providing some form of employment both to those members of the urban population that are not fortunate enough to obtain employ-

ment in the promising industrial sector, and to the rural migrant to the city, arriving with hopes for better living conditions for himself and for his family.

4.2.2 The Role of the Government in the Strategy

The role of the government within the model of economic growth has been very important, not only in directing the resources of the economy towards industrialization, but in filling the production gaps that the private sector has been unable to achieve. The economic strategy, as we mentioned earlier, was to promote the growth of the industrial sector and thus, goods that were previously imported would now be produced domestically. In principle, this type of unbalanced growth of the economy would eventually bring about growth of the other sectors, thereby generating employment so that everyone would participate in the economy, and enjoy increased levels of welfare.

Protection for the "infant" industry was provided by the government through the use of import prohibitions, quotas or very high tariffs; the consumer, in turn, was forced to pay for the inefficiency, as well as for the high rate of profits that national producers were obtaining in order that the industrialist could capitalize and keep the economy growing. At the same time the government gave fiscal priorities that would allow the private sector to import capital

goods. The fiscal, monetary and commercial policies were managed in order to promote savings, investment, and in general capital formation. The government-produced goods and services were sold at low prices in order to subsidize industrialization, such as in the case of electricity, transportation and oil. The economic infrastructure was increased to offer further support to the markets, as well as to provide greater economic integration of the economy in general. At the same time, economic policy was directed towards obtaining a control of wages and a stable foreign exchange market.

One of the results of this strategy was the creation of oligopolistic industries in most of the industrial sector, initially directed towards the small market of consumers with high levels of income. Another side effect was the geographical concentration of physical and human capital around the consumer centres; this created a tremendous disequilibrium in spatial terms, where most of the economic activity was carried out in only a few cities. This regional imbalance of economic activity was reinforced by the allocation of federal expenditure by state. Wilkie (1970), studying the federal expenditure as a tool to promote social change, argues that the strategy of allocation has not brought any improvements in terms of the regional balance. Based on a poverty index created by the author, Wilkie shows that the relative level of poverty in each state has been

the same since 1910, with the highest concentration of poverty located in the southern states.

Perhaps the most important element to consider, which has affected the lives of more Mexicans in the last decades than any other, is the continuing efforts of the government to educate the population. The effort has been such that in 1974, some 21% of the national budget was allocated to provide education to 11.6 million students in primary school, 2.6 million in secondary, and .5 million in higher education, with as many as 480,000 teachers (13).

However, while the number of illiterate Mexicans has decreased, the rate of population growth has made the education program difficult to carry out. There has also been a disproportional allocation of resources on the education of the population in the urban areas with respect to the population of the rural areas. Thus this policy of increasing human capital formation has contributed partially to the creation of spatial disequilibrium and lack of opportunities for many. It has been estimated that, even when the levels of illiteracy have decreased greatly during the last decades, in 1977 almost six million Mexicans were illiterate, in other words, almost 20% of all Mexicans over 15 years of age (14). This problem was, again, distributed in such a way that the rural area was in worse condition than the urban, and of course, within this, some regions worse than others: while the national average of school years was 4, in

the rural area it was only 1.5, proof once again that the education policy, as many others, was not oriented towards the most appropriate patterns of development. This meant, as well, another incentive to migrate to the urban area, where at least the next generation would have the opportunities to improve their social ranking.

In spite of this, there is an increasing number of young Mexicans with higher levels of education, as we can see in Tables 4.6 and 4.7. While the first table shows the relationship of a better level of education to a lower age group, the second table illustrates the lack of balance in the education policy. Table 4.7 reveals that the greater the municipality size, the higher the level of education of the heads of households in Mexico. Obviously, these statistics by no means represent the major effort that the society can make towards solving the educative problem.

In a very complete work by Carmelo Mesa-Lago (1978), studying social security systems in several Latin American countries, the author shows that the expenditure of the government on social security has been strongly biased by the political groups that have been represented in the Mexican political arena. The study shows how the majority of the social security benefits (including medical services, pensions, etc.) are not only received by the people in the urban area, but only a few of them, belonging to preferred groups, are the ones enjoying the resources spent by the

TABLE 4.6 LEVEL OF EDUCATION AND AGE OF HEAD OF HOUSEHOLD IN MEXICO, 1977

AGE OF HEAD OF HOUSEHOLD (%)	YEARS OF SCHOOLING				TOTAL	NO. OF HOUSEHOLDS
	0	1-5	6	7+		
Less Than 20	16.4	34.5	32.7	16.4	100.0	85336
20-24	10.7	40.1	23.5	25.7	100.0	661515
25-34	15.5	38.7	18.7	27.1	100.0	2683538
35-44	23.9	44.0	15.9	16.2	100.0	2745355
45-54	31.1	43.1	12.2	13.6	100.0	2216896
55-64	37.9	38.4	13.4	10.3	100.0	1350492
65+	53.0	31.5	8.6	6.9	100.0	1335503
Not specified	39.9	36.6	2.7	20.8	100.0	15564
TOTAL	27.7	40.0	15.2	17.1	100.0	11094199

Source: 1977 Survey, SPP.

TABLE 4.7' LEVEL OF EDUCATION, MUNICIPALITY SIZE AND METROPOLITAN AREAS
IN MEXICO (% OF HEADS OF HOUSEHOLDS)

MUNICIPALITY SIZE	YEARS OF SCHOOLING					TOTAL	No. of Households
	0	1-5	6	7- +			
1- 2500	52.0	44.6	1.4	2.0		100.0	137336
2501- 10000	41.2	47.4	7.3	4.1		100.0	1248637
10001-100000	38.1	46.5	8.4	7.0		100.0	4200739
100001-250000	21.6	38.6	20.3	19.5		100.0	1151716
250001-500000	15.6	36.1	22.0	26.3		100.0	883315
500001- +	23.2	35.7	20.3	20.8		100.0	528978
METROPOLITAN AREAS							
MEXICO CITY	12.6	29.2	25.2	33.0		100.0	2313253
GUADALAJARA	15.3	33.3	20.2	31.2		100.0	332982
MONTEREY	12.2	33.0	18.6	36.2		100.0	318187
TOTAL	27.7	40.0	15.2	17.1		100.0	11115142

Source: 1977 Survey, SPP.

government. The preferred groups of Mexicans have traditionally been the bureaucrats, the workers of the public enterprises, and later, the workers of the modern urban sector (which includes the unionized, well-paid and government protected workers). In all cases the dependents and immediate family are included in the services provided. This shows that besides the high level market incomes received by some Mexicans, they also profit from the services provided by the government in the form of social security, with exactly the opposite effects to those desired.

In general, we can say that the role of the government has been successful in promoting economic growth, but due to the pattern of development and the unforeseen impacts of it, the economic situation has not improved for many Mexicans in either relative or absolute terms. The economic policies should be changed to develop the entire economy, as opposed to promoting growth in only specific sectors, which has already resulted in the observed levels of disequilibrium in different aspects of Mexican economic life. A rate of growth of 6 to 7%, or even higher, should not be the goal but rather a powerful medium for achieving a more just society, where almost half of the population lives in extreme poverty and has few opportunities to improve in the near future.

4.2.3 Population Dynamics: A Key Factor

The dynamics of the population has been one of the most important elements to introduce in an explanatory scheme of Mexican economic growth and income distribution. We mention here the difficulty of the economic structure in absorbing the economically active population; the high rates of population growth have brought with them considerable disequilibrium in the labour market, and have produced, together with the other characteristics of the economic structure explained above, the present conditions of Mexican income distribution.

In order to explain the increase in the labour force in the last decades, we must identify some of the factors involved: a) the actual rate of growth has been the result of a rapid decline in the mortality rate, while the birth rate has remained constant. The result was an impressive 3.4% rate of growth per year during the 1950-1970 period, and even though decreasing during the 1971-1978 period, the rate of growth was estimated at a still high rate of 3.3% (15). In other words, the population of Mexico jumped from 19.6 to 25.8 to 65.8 million people from 1940 to 1950 to 1978. Absorbing all this increase in population would be considered an enormously difficult task for almost any economy. The economically active population has grown from 8.3 million in 1950 to 18.2 million in 1978, this being the result of the

rate of growth of the population itself, as well as an increasing participation of the female labour force over the last few decades; b) the female incorporation into the labour force is another element to consider, which has acted to increase their participation in the EAP from 13.6% in 1950 to almost 20% in 1978. This has been the result of socio-cultural changes in Mexico during the past several decades which have allowed for an increase in the education and social participation of women; and c) the rate of population growth has meant that the age pyramid is such that by 1970 32.1% of the EAP was under 24 years of age and 25.6% was between the ages of 25 and 35. The result in the labour market has been a great pressure that has not been properly satisfied, and it is expected to increase in the next few years when today's children enter the labour force.

These, then, are several problems that the high rate of population growth has brought to the Mexican economy. There is, however, the hope that by changing the economic strategy, following democratic policies or carrying out projects to alleviate the economic injustices, the problem of millions of Mexicans could eventually be solved. This is, however, a practically impossible task, when we consider the groups of Indians that have not been integrated into the Mexican culture, let alone into the economy. Gonzalez Casanova (1970), researching the problem of marginality in Mexico, presents this problem as one of internal colonialism,

which, far from being solved, is increasing in absolute terms. He defines this situation as one where the Indian communities are Mexico's internal colonies within the national territory with characteristics of a colonized society. Regarding the linguistic problem, he finds that the number of Indians aged five or older who are monolingual or bilingual with predominantly Indian culture increased from 2.450 to 3.030 million from 1950 to 1960. By the year 1960 they represented 10.1% of the national population (11.2% in 1950) aged five or older, where 3.7% did not speak Spanish and 6.4% were bilingual (16).

This is without doubt one of the more serious problems that the country has to solve in order to offer economic and social justice to every Mexican. It is not possible to eliminate the poverty of these Mexicans if they are not taught to speak Spanish and become integrated into the Mexican nation. The inability to speak Spanish or share the same culture relegates these groups to an inferior position in society, and limits their opportunities to participate in the growth of the country. These groups, of course, are included in the poverty group (poorest 40%) analysed above, and their characteristics are notorious: they live in the rural area, work in the agricultural sector, and have no education.

The dynamics of the population over the next several years continues to create pressures on the economy. It is

estimated by the government that if the historical trend continues for the next 20 years, with a 3.2% growth rate per year, the Mexican population will reach 132 million, an astonishing number with equally astonishing implications. However, the government has begun to promote the control of population growth through different means. Based on this policy, the government has set alternative "targets" of rates of growth for determined years (17). The alternatives estimate 100, 104 and 109 million Mexicans by the year 2000, depending upon the rates of growth assumed from 1982 to the year 2000 of 1, 1.5 and 2%, respectively. The three alternatives estimated a reduction in the rate of growth from 3.2% in 1978 to 2.5% in 1982, a certainly optimistic rate.

A recent study carried out during 1976-1977, supported by the International Statistical Institute in Mexico as part of the World Fertility Survey Project shows, among other things, that the use of contraceptives is becoming a popular device with 41.5% of the "exposed" women in the 15-49 age bracket using some method (18). Once again the "education factor" emerges as an important element to consider. Even when 89% of the women interviewed declared to have knowledge of a method of contraception, only 75% with no education compared to almost 100% of those with secondary education or higher had heard of a method. In general, the study reveals a direct association of lower fertility with a greater size of the locality of residence, a higher level of education,

and a higher level of the husband's occupation. Of all fertility differentials, however, the most important is the level of education.

If we consider the trends in education, urbanization and in general better living conditions, as well as the promotion of contraceptive methods by different agencies of the government, we could assume that the rate of growth of the Mexican population is going to decrease. However, by the year 2000 (only 20 years from now) the number of Mexicans between the ages of 15-64 will jump from 36.3 million (the figure of 1980), to somewhere between 67.9 and 70.7 million. The 67.9 million figure is the most optimistic alternative of the government, while 70.7 is based upon the historical trend, although there is certainly not a great difference. The difference lies in the number of Mexicans between the ages of 0 and 14, with 30.0 or 56.7 million for both estimates. In sum, the pressure upon any kind of socioeconomic organization adopted will be such that the creation of jobs, education, social infrastructure and the like is not going to be easy. This without doubt will test the existent social institutions and will impact upon the already deteriorated income distribution.

4.3 THE RESULTS OF THE PATTERN OF DEVELOPMENT

From the model of development followed, where we encounter different types of problems in terms of structural heterogeneity of the productive sectors, ownership of the means of production, varying levels of education, spatial concentration of the economic activities, different levels of participation in the dynamics of the economy, etc., we find problems that are merely representations of the same phenomena: urban and rural marginality, unemployment and underemployment in the labour market, regional and urban-rural imbalances, and, once translated into monetary terms, a general representation of all of them - income distribution.

4.3.1 Rural Marginality

Marginality is a term that has been used to express the total or partial exclusion of part of the population from the benefits of economic development. In the Mexican case the marginal groups could be divided into rural and urban, and identified by living conditions, type of employment, and in general by the income they receive.

In the rural area, during the period 1960-1977, approximately two-thirds of the population were below the level of the official minimum wage (19), considered to be the people within the rural marginal group. From this group of Mexi-

cans, we can identify two groups which have different characteristics: one is that group of individuals with very small productive economic units (i.e. ejidatarios, very small producers) and those that do not have any land at all. The first group forms the majority of the economic units of the agricultural sector as we have seen above. Most of them produce only at the subsistence level and have a very low level of income. It is considered that these farmers are the ones who will remain in the rural area with little intention of migrating, due to the fact that they are at least able to subsist, and are therefore in a relatively better position than the other group of rural marginal: the landless.

The landless is a group estimated at more than 3 million people living under conditions of extreme poverty. Some of them continually migrate from region to region during the crop season. While they are harvesting a crop they remain in a particular state for one or two months, and at the end of the season they migrate to another region in order to harvest still another crop (20). These rural marginal are at the bottom of the income levels with no social security, no job protection, and working under the worst job conditions.

The sometimes inhuman standards of living of these groups, along with the relatively better conditions in the urban areas have provoked, quite understandably, an in-

creased propensity to migrate from the rural to the urban areas. It has been estimated that between 1950 and 1970, some 4.5 million people migrated to the urban areas, and, keeping with the trend, in 1975, 57 out of 100 persons incrementing the rural population moved to the urban areas (21). This high rate comes as no surprise if we consider that the landless would have a much better chance of improving their living conditions in terms of health, housing and, perhaps most important of all, basic education that could change the future for their children. On the other hand, the ejidatarios and small producers find themselves in a situation where they have partially solved their economic problem by working their "own" land; but over time their children cannot sub-divide the already small properties, forcing them to become either migrant workers or to look for better conditions by migrating to the urban areas or to the United States (22). The poorest 40% income group of the rural area described in the previous chapter using tables 3.10 and 3.21 correspond to part of the rural marginal group presented here.

4.3.2 Urban Marginality

The workers of the informal sector in the urban areas (urban marginal) share most of the characteristics of the rural marginal, such as income under the official minimum

wage, no job security, no social benefits, medical insurance or a union that could defend their rights. Some of them are working on an individual basis with most of the characteristics described above. While the conditions of these workers are similar to the ones in the rural marginal sector, the urban marginal are able to benefit from the services provided by the government in the urban area: free education, free medical services, subsidized food and public transportation, etc., along with the possibility of obtaining services seldom available in the rural areas such as electricity, running water, television, etc.. This, of course, combined with the expectations of obtaining higher incomes even though underemployed, is a great attraction for people to migrate to the urban areas. In fact, we have already shown in the previous chapter the striking differences in income received in the urban and rural areas at all social levels (see table 3.10).

During the 1940's and 1950's it was possible for the migration process to be successful, since the modern sector was growing in such a way that many people went from working in traditional activities to modern activities, but eventually the natural population growth of the urban areas plus the rural-urban migration were such that the informal sector became increasingly evident, creating a considerable social and political problem difficult to solve.

It has been estimated that 38.2% of the eight million urban workers were within the category of urban marginal in 1978 (23), meaning that over three million workers had an income or such labour conditions that made them part of the urban informal sector. Two important characteristics of these workers are that two million were working as wage earners, (31.7% of the total wage earners), while .8 million were working on an individual basis (62.1% of the total working on an individual basis).

There are certain sectors where the heterogeneity of production is such that it has concentrated high levels of workers under these conditions: domestic services (78.9%), agriculture around urban areas (67.8%), construction (59.4%) and commerce (49.3%). These economic activities concentrated 56.6% of the total number of workers of the informal urban sector with 13.6, 9.8, 10.2, and 23.0%, respectively.

The personal characteristics of the workers under these conditions provide definite conclusions as to their identity, and considering age, education and sex we can identify a large number of them. With respect to age, 70% of the people under 20 years of age and 40% over 50 years of age work under these conditions. 45.5% of the women and 35.0% of the men are considered workers in the informal sector. The ever-present education variable shows that the higher the level of education, the lower the probability of being in the informal sector. In fact, while 81.3% of the workers in

the informal sector had finished 6 years or less of schooling, 49.5% of the workers in the "formal" sector had that characteristic; in other words, only 19.7% of the former had secondary education or better, while the latter had 50.5% with that characteristic. These characteristics complement the qualities shown in section 3.4 when studying the 40% poorest of the urban area.

4.3.3 Unemployment and Underemployment

There is clearly a close relationship between unemployment and underemployment and the concept of marginality explained above, in both the urban and rural cases. However, if we maintain the definition of underemployed as all those workers with less than the official minimum wage (OMW), we find that the economic growth of the country did not fulfill its expectations. It is estimated that in 1950 37.4% of those employed received less than the OMW, 44.9% in 1970 and 47.5% in 1978 (24). This in itself is an indicator of the disequilibrium in the labour market during the economic growth of the past three decades, where, as mentioned above, the modern sector was unable to generate enough jobs for the increasing labour force.

There is, however, another indicator that the situation is becoming progressively worse: the unemployment rate (individuals who were so unfortunate as to be unable to gain

employment even at less than the OMW). The estimations of this rate are 1.3% in 1950, 4.9% in 1970, and 7.0% in 1978, which indicate the tremendous rate at which this problem is growing. In particular, the unemployment rate of the three largest metropolitan areas has fluctuated between 6.8 and 8.1% from 1973 to 1978.

Considering the national unemployment rate of 7.0%, there were, in 1978, 1.4 million people unemployed. There is, however, the estimate of .7 million people that are not included in the 7% rate, because they have been discouraged from looking for a job, due to their personal characteristics of age, sex, or education. These individuals consider the probabilities of obtaining employment as very low and therefore remove themselves from the labour market. The growing rate of unemployment shows that the system is becoming less and less capable of absorbing the increasing labour force, and is one of the failures of the economic strategy chosen which has to be corrected in order to offer better opportunities to millions of Mexicans - certainly not an easy task.

4.3.4. Concentration of Capital

The ownership of Capital as an element explaining income distribution in Mexico has been pointed out above. Statistical information regarding the concentration of capi-

tal has not been collected, however the 1977 Survey (SPP) presents the sources of the household monetary income generated. Table 4.8 shows the total monetary income as well as five types of sources by income levels. In Mexico, most of the households' income (70.1%) is generated as payment to labour, while the entrepreneurs' income participates with 22.3% and proprietors' income with 1.0%. The rest of the income originates in Transfers (5.4%) and Other Income (1.2%). Entrepreneurs' Income and Proprietors' Income are the two sources clearly identified with the ownership of capital, its distribution being highly concentrated, as indicated in Table 4.8. In particular, Entrepreneurs' Income, of which 4.8 million households (out of 11.1) received income in 1977, had a concentration such that the top 8.5% of the households received 35.7% of the total income generated from this source, while on the opposite side, 41.3% of the households receiving this type of income received only 11.3% of the total.

The Proprietors' Income, which includes rents and interests, had a similar concentration, where the top 15.1% of the households received 71.7% of the total from this source, while the bottom 48.5% of the households obtained only 7.4% of this type of income. These statistics show that if income is badly distributed in Mexico, the ownership of capital is not any better distributed. It is important to remark that even when land ownership, as seen above in terms

TABLE 4.8 SOURCES OF MONETARY INCOME BY INCOME LEVELS IN MEXICO, 1977

INCOME LEVELS		MONETARY INCOME*	PAYMENT TO ENTREPRENEURS' INCOME**	PROPRIETORS' INCOME**	OTHER INCOME	TRANSFERS
1- 4200	HH	10.5%	5.7%	5.7%	13.0%	14.6%
	TI	0.9	0.5	0.4	1.0	2.2
6201- 6000	HH	6.3	4.8	3.8	3.1	7.2
	TI	1.2	0.8	0.3	0.3	2.3
6001- 8100	HH	6.7	5.8	3.8	4.8	6.1
	TI	1.7	1.3	0.2	0.5	2.5
8101- 10800	HH	8.5	8.1	6.3	3.7	9.1
	TI	2.9	2.5	0.9	0.4	4.5
10801- 14400	HH	9.4	9.3	3.1	3.4	9.5
	TI	4.3	3.8	0.4	0.6	6.3
14401- 18900	HH	10.2	10.7	6.9	7.6	9.1
	TI	6.2	6.1	1.1	1.7	8.1
18901- 25800	HH	12.6	14.5	10.1	8.8	10.1
	TI	10.0	10.9	2.7	2.2	7.8
25801- 34350	HH	10.4	11.7	8.8	10.8	8.6
	TI	11.1	11.6	1.4	4.6	9.6
34351- 45000	HH	8.7	10.0	9.0	7.1	9.5
	TI	12.3	13.1	3.8	4.8	13.2
45001- 60900	HH	7.0	8.0	11.3	9.1	6.8
	TI	13.3	14.3	6.8	5.6	11.3
60901- 80400	HH	4.2	5.1	6.3	8.8	4.2
	TI	10.7	11.7	4.1	14.8	10.1
80401- 108000	HH	2.9	3.4	9.4	8.2	1.9
	TI	9.6	9.8	6.2	20.0	6.0
108001+ *	HH	2.6	2.9	15.1	11.6	3.3
	TI	15.8	13.6	71.7	43.5	16.1
TOTAL	HH	100.0	100.0	100.0	100.0	100.0
	TI	100.0	100.0	100.0	100.0	100.0

* Includes Profits

** Includes Rents and Interest

HH % of Households

TI % of Total Income Received by the Households in six months

Source: 1977 Survey, SPP

of quality and quantity, shows a high level of concentration, a fact seen as well in the industrial and commercial capital, more information regarding this subject could lead to a more complete understanding of its causes and effects.

4.3.5 Regional Imbalances

The differences in income, possibilities of securing a job, obtention of services and in general expectations of increasing the personal level of welfare in the rural and urban areas have been such in Mexico that the process of rural-urban migration has become the only way out of a poor way of life. This process has been oriented towards the more "successful" urban areas of the country, which have had the opportunities to create jobs during the last decades, having modern activities as the motor of their growth. It is estimated that over 12 million Mexicans have migrated to the urban areas since the beginning of the century, with a high 30% (approximately 3.9 million up to 1978) arriving to the metropolitan area of Mexico City. This immigration, plus the natural rate of growth of the population in the city has created an overcongested area of 13.2 million people. The next two cities of importance, Guadalajara and Monterrey, add up to 4.1 million inhabitants and represent, along with Mexico City, approximately 25% of the national population (25).

On the other side of the distribution, 38% of the population (22.7 million), lives in over 95,000 localities of less than 2,500 inhabitants each. This situation characterizes a highly urban concentrated population and the dispersion of the rural population. The remainder, only 37% of the population, lives in urban areas out of the three largest cities, and in particular, only 17% in cities with more than 50,000 and less than a million people. More specifically, according to the Secretaria de Asentamientos Humanos y Obras Publicas (SAHOP), (1978), the geographical distribution of the urban centres shows a strong disequilibrium. Out of 180 cities with more than 15,000 inhabitants in 1978, 85 of them (with 29% of the population living in this type of cities) were localized under 500 metres above sea level, where 80% of the natural resources (including fresh water and energetics) exist. The other 95 cities had the rest (71%) of the population, with only 20% of the resources.

SAHOP (1978) argues that after 1940 the policies supporting the industrialization of the country through import substitution brought about better equipment, infrastructure and services to those industrial centres representing an important share of the markets. These policies, helping the growth of the economic activity, coincide with the urbanization process of the country. Public investment, following the trend, shows a strong concentration in the central area of the altiplano (an area of 500 metres above sea level),

especially around Mexico City. Public investment includes systems of potable water, housing, and infrastructure such as transportation systems. Urbanization, industrialization and in general growth of the economic activity was such that by 1978, 60% of the national population lived in the central part of the altiplano (composing less than 20% of the national territory), and possessed 80% of the industrial activity. In this small area the market size played an important role in industrial growth, but in particular the economic activity in a very small area (the Federal District and the state of Mexico) had 44% of the gross domestic product. On the other hand, there were states, especially in the south, that had a very small participation in the GDP, with seven states contributing less than 1% each to the GDP (26).

This type of regional imbalance, and in particular the differences between urban-rural Mexico, between the central part of the altiplano and the rest of Mexico, between regions (or groups of states), between the metropolitan area of Mexico City and the rest of the country, and between the municipalities according to size are the result of the economic strategy chosen - urbanization, location of industry, government expenditure policies, etc. This is an outcome of a process which at the same time has affected the generation of the Mexican income distribution. We have shown in the previous chapter (see table 3.18) the strong relationship

between average income and municipality size as a variable affecting the national income distribution.

4.3.6/ Income Distribution and Economic Growth: A Summary

Another dimension of the same problem, studied through marginality, unemployment, regional imbalances, etc., is presented through income distribution, considered as the monetary representation of the economic participation of the population in the economic system. As we have seen, the structural heterogeneity of the productive sectors, the rate of growth of the population, the role of the government, and the distribution of the ownership of the means of production, among other things, forced the Mexican economy into a strategy that has not responded satisfactorily to the desires of the majority of the population.

During the analysis performed in chapter 3 we identified the differentials of income of the rural and urban areas, the sectors of production, the levels of education and the types of municipalities, in order to explain income distribution at the national level. It has been our purpose to show that the interrelation of forces such as the general strategy of growth, the historical conditions, the distribution of human and physical capital and the rate of growth of the population here presented have produced the outcome witnessed in the past 30 years, being represented in different ways, including income distribution.

Thus we can say that the low levels of income, high levels of unemployment and underemployment, high levels of population working in "informal" conditions, individuals with low levels of education, poor housing, nutrition and health, are all characteristics of the same social reality.

The poverty groups identified above are not merely those groups that have been unfortunate in the competitive milieu, but rather their income is the result of the interaction of the identified variables conforming to a model of socioeconomic development. The integration of these groups, some of them with quite different cultural and ethnic backgrounds, into the economy, is quite a difficult goal that the Mexican authorities will have to attain in the near future.

The sum of the factors presented have resulted in those changes in income distribution from 1950 to 1977 discussed previously: the poorest 40% of Mexicans have lost their relative economic position, the richest 5% have decreased their share, and the middle 55% have increased their participation, with no significant trend to an overall increase or decrease in the already high level of concentration of income. Palliatives to this problem could create increasing political pressure on the organized political groups that "defend" the interests of some 30 million Mexicans.

FOOTNOTES

1. The statistical information related to land ownership up until 1910 is obtained from McCutchen (1971).
2. Data from the Bank of Mexico (1979), Producto Interno Bruto y Gasto 1970-1978, Oficina de Cuentas de Produccion.
3. From Hansen (1971), Table 2.8, p. 34.
4. Ibid., Table 4.1, p. 139.
5. From Iturriaga (1951), Table 10, p. 36.
6. Ibid., Table 25, p. 93 and Table 29, p. 99.
7. Among many studies, Mehmet (1978) reports on this process for several countries.
8. Some of the ideas presented in this section are taken from Hansen (1971), Singer (1969), Solis (1970), STYPS (1979) and Reynolds (1970).
9. From STYPS (1979), Volume 1, Table 12, p.59.
10. From Bank of Mexico (1979), Producto Interno Bruto y Gasto 1970-1978, Oficina de Cuentas de Produccion.
11. This, and the remaining data pertaining to the services sector is from Bank of Mexico (1979), Producto Interno Bruto y Gasto 1970-1978, Oficina de Cuentas de Produccion, and STYPS (1979), pp.32-44.
12. WWP (workers without pay) are usually family members working informally in a small economic unit (i.e. small stores, restaurant, cottage industry).

13. The information regarding education is taken from Secretaria de Educacion Publica (1977), Plan Nacional de Educacion.
14. This figure represents the official government estimate of the Plan Nacional de Educacion (1977). However, there exist estimations that the national illiteracy rate is as high as 35% for all ages according to G.T. Kurian (1978): "Mexico", Encyclopedia of the Third World, Vol II. New York: Facts on File.
15. From Consejo Nacional de Poblacion (1978): Mexico Demografico. Breviario.
16. Official information regarding the indigenous population of Mexico after 1960 has been difficult to obtain, and therefore many contradictory figures exist. For example, the Encyclopedia of the Third World (op. cit.) cites as much as 30% Indian population, 7% monolingual (non-Spanish speaking) out of the national population.
17. From Consejo Nacional de Poblacion (1978): Mexico Demografico. Breviario.
18. World Fertility Survey (1980): "The Mexico Fertility Survey, 1976-1977. A Summary of Findings", No. 17, International Statistical Institute.
19. From STYPS (1979).
20. It is important to emphasize the lack of more information concerning this group of Mexicans, known as "trabajadores golondrinas" (swallows).

21. For a detailed study of rural-urban migration in Mexico see Silvers and Crosson (1980): Rural Development and Urban-Bound Migration in Mexico. Washington: Resources for the Future.
22. The experience of leaving the rural area and the way in which the migrants adapt and climb the socioeconomic ladder in Mexico are explained in the very well documented work of Balan, Browning and Gelin (1973): Men in a Developing Society. Geographic and Social Mobility in Monterrey, Mexico. University of Texas.
23. The data related to urban marginality is originally presented in "El Sector Informal Urbano" of STYPS, 1979, and partially reproduced in STYPS (1979).
24. The data related to employment and unemployment are obtained from STYPS (1979) and SPP: Encuesta Continua de Mano de Obra. Serie 1, Vols. 1 to 5.
25. Secretaria de Asentamientos Humanos y Obras Públicas (SAHOP) (1978), Plan Nacional de Desarrollo Urbano.
26. Mann (1979) and Kalifa (1977) study the income distribution by state, showing among other things the relationship between average income, income distribution and industrialization.

3v

REDISTRIBUTION OF INCOME IN MEXICO: POLICY RECOMMENDATIONS

The recommendation of policies of income redistribution is not an easy task, for Mexico or for any other country. We have argued that in the generation of market income, social, political and economic forces intervene, determining the strategy of development, the regional and sectoral structural heterogeneity and the distribution of resources among the population. These types of forces represent the core of the social organization of a country, and any proposition to change it will encounter opposition, as evidenced when a structural change is carried out in any society. Nevertheless, this chapter aims to recommend certain policies of income redistribution for Mexico, based on the analysis of income distribution data and the relationship between income distribution and economic growth presented above. In section 5.1 we offer a working hypothesis of income redistribution and economic growth for Mexico, whose main purpose is to help define the Objectives, General Model, and Strategies (following the nomenclature given in chapter 1) that Mexico could follow in order to attack the problem of income concentration and high levels of poverty of certain groups. The General Model, Objectives and Target

Groups are proposed in section 5.2, while the Strategies are proposed in section 5.3.

5.1 INCOME REDISTRIBUTION AND ECONOMIC GROWTH IN MEXICO: A WORKING HYPOTHESIS

An attempt to interpret the dynamics of the Mexican economy of the last 40 years, and its impact on the generation of income, is presented below. This attempt summarizes the economic variables that we consider the most important in explaining Mexican income distribution. It provides the basis for understanding the mechanism which generates the existent unequal distribution, while at the same time may allow us to forecast the behaviour of income distribution in the near future. It is understood that this attempt is considered only an hypothesis about the process of income generation of the Mexican economic system.

We identified, theoretically, the acting forces that are the most important in understanding the generation and distribution of income in developing countries, specifically: the macroeconomic policies, determining the general strategy of development of the country; the technological, socio-cultural, historical and demographic forces, determining the regional and sectoral heterogeneous structure and the factors determining the distribution of resources among the population (see chapter 1). This theoretical framework

was used to analyse Mexican income distribution (see chapter 4), showing that a structural heterogeneity exists in the productive system, which in turn implies the coexistence of different sectors of the economy with different levels of technology, relationships with the domestic and world markets and dynamism of growth.

This structural heterogeneity, found both within and between the productive sectors, can be aggregated into three levels of technologies: primitive, intermediate and modern. In the first we find extremely low levels of productivity and income; in the second, productivity and income approximate the average productivity of the country; while in the third we find levels of productivity and income as high as those in developed economies. This situation allows for the coexistence of economic units with varying levels of technology: from primitive agricultural production to petrochemical and nuclear plants using the most advanced world technologies. The levels of industrial concentration and heterogeneity have increased over time, showing that contrary to the idea that there is a trend to homogenize productivity levels, the modern sector of the economy will generate and concentrate the technological progress, thereby increasing the discrepancies within the economy.

For the purpose of analysis we have divided the economy into four sectors, all interrelated and with well-identified labour markets. The sectors are: modern urban, rural

modern, urban informal and rural marginal. In the modern urban sector we find a relatively small number of workers with high levels of productivity, income and social security services and organized into unions which belong to a confederation of workers represented in the Mexican congress and in the ministry of labour. On the other hand, the urban informal sector is characterized by a majority of workers with very low levels of productivity, income and social security, poorly organized and without representation within the official political system. In particular, most of the modern urban sector includes the workers of the modern secondary and tertiary sectors, including the workers of the government and the professionals. The informal urban sector includes the workers of very small companies, independent workers, small commerce, and different types of services. In general, the income of the workers depends on the size of the labour market and the number of workers competing in it.

The rural marginal sector includes the small-ownership proprietors, ejidatarios and landless peasants with the lowest level of productivity and income in the economy, characterized by very low levels of technological advancement, low levels of investment, no technical assistance and for years possessing an unfavourable system of prices. These characteristics could be identified as the most important ones of the "agrarian" system (contrary to the "modern agricultural" system). The low levels of income and lack of public servi-

ces, including education, have produced extremes of poverty and pressure to migrate to the urban areas. Finally, the modern rural sector includes the economic units producing for commercial purposes using credit, technical assistance, and cheap labour from seasonal rural workers during harvest time. The productivity and dynamics of this "modern agricultural" system conforms to that of the modern urban sector.

Perhaps the most important connecting sector of the Mexican system is the informal urban sector, which allows the passage of the poor from the rural to the urban areas, through the process of migration. This process originated due to the lack of land in the agrarian sector, population pressure in the competitive labour market of the modern rural sector and the hope of improved conditions once in the urban area.

Population growth has been an important factor in explaining the observed income distribution of the last several decades. It has brought such pressure in the labour markets that the lack of a high level of absorption of labour in the modern sectors has created an increasing number of underemployed in the urban and in the rural areas, and more recently a growing number of unemployed Mexicans. The millions of jobs that the system has created have not provided a solution for a population that doubles every twenty-five years or less. Even when Mexican migration to the United

States has helped to partially relieve the population pressure in the Mexican economy (estimates range from 8 to 12 million Mexicans who have migrated in this century), the impact of the demographic explosion on the labour market will continue at least until the end of the century. Even if the campaign for population control is successful, the entrants to the labour market in the next 20 years have already been born.

Two final elements have been presented as important factors defining Mexican income distribution: the spatial disparities of the economic activities and the inequality of the distribution of capital among Mexicans. This spatial disequilibrium of the economic activities is such that the reorder of the population distribution in Mexico as a response to job opportunities in a few economic centres has meant the concentration of 25% of the population in the three largest metropolitan areas of the country: Mexico City, Guadalajara, and Monterrey. On the other hand, almost 40% of the national population lives in over 90,000 localities of less than 2,500 inhabitants. The process of industrialization was carried out in the larger cities in order to satisfy the urban markets, which in turn created jobs that attracted people from the rural area and from smaller cities. For years the process was successful, with higher levels of income for the people in those centres, until the incapability of the modern urban sector to absorb the grow-

ing population gave rise to the now enormous informal sector with growing misery belts. On the other hand, the 40% of the population of the rural area has not directly benefited from the "successful" process carried out during the past few decades, but rather has only observed the growing economic differences in relation to the population of the urban areas.

Finally, the pattern of development witnessed in Mexico has meant an increasing importance, in terms of production, of the modern agricultural system; it has meant, at the same time, industrial concentration and greater participation by the larger economic units in tertiary production. This can be interpreted as higher concentration of capital resulting from the Mexican economic process. There is however, a growing participation of Mexicans in the educative system, meaning a lower rate of illiteracy and a more widely spread human capital distribution. It is considered that the problem of illiteracy is far from solved however, since we find almost 20% of all Mexicans over 15 years of age illiterate. While the national average of school years is only 4, that of the rural area (not surprisingly) is only 1.5; evidence of yet another of the many policies which have brought about an uneven pattern of development for the country.

In summary, we consider that the interaction of the socioeconomic forces outlined above and explained in the previous chapter have determined the general model of develop-

ment of the Mexican economy and the generation and distribution of income over time. These forces are the macroeconomic policies that aided the industrialization process in only a few urban areas of the country; the levels of technological absorption which among other things determined the structural heterogeneity in the productive system and partially determined the rate of absorption of the existent labour force; the policies that gave rise to the growth of two types of agricultural systems: the agrarian and the modern agricultural; the population dynamics, including the emigration to the United States, that brought about strong pressure for the economy to satisfy growing job demands, along with providing increased goods, services and social infrastructure; and the educational policy which reduced the illiteracy rate, but still left millions of Mexicans in some regions, and especially in the rural area, illiterate. We believe that these are the main elements to take into account as the basis for the formulation of strategies of income redistribution for Mexico. Any policy recommendation should be directed towards changing these forces which define the structure of the Mexican economy.

5.2 A MODEL, OBJECTIVES AND TARGET GROUPS OF A REDISTRIBUTION OF INCOME IN MEXICO

A) A Model and Objectives of Redistribution

We have argued that the socioeconomic policies that form redistribution strategies have to be proposed within the historical and political context of the development of a country. The proposed strategies will be aimed at reshaping the structure of the actual model of development in order to reach the desired objectives. In this way, different models of income redistribution, representing complete forms of growth and distribution aimed at particular objectives, can be proposed: the high growth-trickle down; the radical model; the incremental model; and the redistribution through growth model (see 1.3.2). Of these four models the first, following the idea of growth now and distribution later, has not provided the solution for Mexico. The incremental model, implying taxing the better-off in order to redistribute to the worse-off, attacks the problem superficially, ignoring any structural changes that could get to the roots of the problem. Aside from the lack of a solution through this route there exists the economic impossibility of subsidizing more than 40% of the population when the economy is still in need of more capital formation. From the two models remaining we consider that a serious effort should be made based on the model of redistribution with growth.

The model of redistribution with growth is aimed at reaching the objectives of elimination of poverty and reduction of inequality through the maximization of the weighted average of the growth rates of different income groups: $G = \sum w_i g_i$, where w_i are the weights of the groups and g_i their rate of growth of income. This model assumes the need to provide investment resources to the poor, offering them a permanent source of income rather than merely a temporary increase in consumption through subsidies. The general objective of redistribution means a lower rate of growth of income at the upper end, and a higher rate of growth at the lower end.

In theory the model requires that the strategies followed not significantly reduce the growth of the Gross National Product and that at the same time there is not an absolute reduction in income for particular groups. However, if we consider the difficulty in justifying a society that has only a few members enjoying its progress, we should not be overly concerned with a reduction in the rate of growth if most of the members are not increasing their income. It can be argued that a rate of growth of the GNP of 3 to 4% per year during the last 4 decades, with only a fair distribution of the progress, would have been preferable to the 6% rate of growth observed with the impact on the distribution presented above. On the other hand, if it is difficult to justify the incredible disproportion of incomes between the

richest and the poorest, an absolute reduction in income for those groups that have traditionally been strongly favoured by the economy can be proposed. An income tax to help finance investment for the poor is certainly required. The unfair economic outcome of a system in terms of distribution in the past is by no means a justification for the present one.

Based on the analysis performed and on the general objective of redistribution, which states that the income of the poorer groups should grow faster than the income of the richer ones, we propose five specific objectives for the Mexican case. The first objective refers to the increment of income to the population of the rural area which we have identified as the poorest in the country, especially the Mexicans in the agrarian agricultural sector; the second purports a more equilibrated regional distribution of economic activities in the economy; the third proposes the creation of employment in all the sectors and regions of the country in order to decrease the existent underemployment and unemployment; the fourth objective purports to offer education (with a minimum of 4, 6 or 9 years) to every Mexican depending upon availability of resources; and finally the last objective would have an impact in the long run on the economic distributive process through a reduction in population growth.

Perhaps the most important element to consider within this context of income redistribution is the generation of employment. Job creation would mean the possibility to millions of Mexicans to generate their own income without having only an increase in consumption for a short period as would be the case of a subsidy. The investment resources of the economy should be directed towards the sectors and regions more in need of income.

These specific objectives represent the goals of five strategies proposed in the next section, considering that in general they would help to provide investment resources for the poor. The quantification of this general objective could be done following the methodology presented in section 2.3.1 where we studied the possibility of fixing an income distribution target (IDT) as a planning tool in the building of an economic plan. Corresponding to the last observed income distribution of Mexico (1977) is a Lorenz Curve that estimated a percentage of income of 9.9, 33.6 and 56.5% for the 1-40, 41-80 and 81-100 population percentiles. A possible target to fix, that would correspond to our general objective of redistribution, is a change of percentage income to 20.0, 35.0 and 45.0 for the same population percentiles. This implies doubling the income for the poorest 40% of the population, a slight increase for the 41-80% population percentiles and a decrease to 45% of the percentage of income received by the richest 20% of the population. For this,

the decision-makers should include in their strategy of development the appropriate economic policy to realize the change of the income structure within a finite time horizon.

Corresponding to this proposed Lorenz Curve is a target income distribution that could be estimated. As the target income per capita for the next decade is known from the PLAN GLOBAL de DESARROLLO of SPP (1980), we are able to calculate the distance from the observed to the target income distribution using the Economic Distance Ratios. We could monitor the distance over time in order to evaluate the effectiveness of the economic policies carried out.

B) The Target Groups

We have indicated previously the disparities in income that exist between the rural and urban areas, between the large municipalities and the small ones, between the agricultural sector and the rest of the economic sectors, and between those Mexicans with little or no education at all, and the more educated ones. We have argued that this is the result of the pattern of development followed where a large group of Mexicans were left behind during the process of rapid growth. In particular, the population working in the "agrarian system" were identified as the poorest members of the society: living in the rural area, in municipalities with less than 2,500 inhabitants, working in the agricultural sector and having practically no education.

However, based on a more detailed examination of the poverty groups according to the analysis performed in section 3.4., we are able to identify three groups of people that present common characteristics. They are relatively homogeneous with respect to the effect that a given set of policy instruments might have upon them, therefore making them target groups of income redistribution; they are: a) The Indian Groups; b) The Small Farmers and Landless of the Rural Area; and c) The Unemployed and Underemployed of the Urban Area.

a) The Indian Groups. In the rural area there are almost six million Indians living in the most precarious conditions. They represent over 20% of the poorest of the country. While their basic human needs are not fulfilled, most of them do not speak Spanish, representing a strong barrier for cultural or economic integration.

b) Small Farmers and Landless. In section 4.3 we found that the small farmers and landless were the two poorest groups in the rural area. These groups were considered to be the most numerous ones of the rural marginals. They certainly have many characteristics in common, such as level of education, place of residence, and sector of employment; but they should be considered separately in terms of policies regarding their situation, since the migratory characteristic, lack of land and pattern of settlement distinguish them from one another.

c) The Unemployed and Underemployed of the Urban Area. These groups conform to the urban marginal, which represent one third of the poor of the country. Most of the underemployed work in small industry, commerce and services, and live in municipalities of 10,000 to 100,000 residents.

These groups are generally much better off than the marginals in the rural area due to the use of the services and subsidies available in the cities.

In summary these three groups of Mexicans represent the majority of the poorest members of the society. The strategies directed towards improving the income distribution of the country should regard them as prime targets. An integrated effort within a new general strategy of development which would offer education, jobs and more services to these groups would be considered as a serious attempt to solve the problem of Mexican income distribution.

5.3 STRATEGIES OF INCOME REDISTRIBUTION

The following five strategies (according to the definition of strategy given in chapter one) are the core of a new model of distribution and growth proposed for Mexico. They represent five different fronts of action that the government could follow in order to offer better economic possibilities and social justice to the Mexican population.

A) Rural Development

One of the more controversial issues of Mexican politics is the social unrest in the rural area. Not surprisingly, this is a reflection of the socioeconomic characteristics found in this part of the country. For over half a decade the agrarian reform has been the political palliative to a deep socioeconomic problem: the agrarian reform has attempted to change an unjust social organization in the rural area based on an unjust land-tenure system. Up to 1977 (1) the agrarian reform in Mexico was a political instrument used to threaten terratenientes (the larger land-owners) with nationalization and fragmentation of their land for subsequent distribution to the landless peasants. Over the years this process (as explained in chapter four) created thousands of small farmlands with low productivity levels. Present authorities have put a stop to this process, arguing that the amount of Mexican territory cannot increase, instead emphasizing support for the existent producers, small and large, to increase their productivity.

Rural development (2) should be considered within a systemic approach, introducing elements that, in an integrated form, would impact upon the general welfare of the peasant population. The implementation of an integrated rural development plan should contain projects aimed to: a) Improve efficiency in the the use of scarce land and water resources; b) Provide capital resources in order to finance

the inputs of production (i.e. machinery, seeds, fertilizers); c) Create employment opportunities; d) Develop human resources; and e) Reform the legal and institutional framework presently stalling the development of the peasant economy.

While this set of projects would directly and indirectly raise the per capita income of the poor in the rural area, we believe they would encounter strong opposition. Some of them for example, emphasize structural changes that would break with the hegemony of local or regional groups. Interestingly these are precisely the groups profiting from the existent structure (3).

B) Regional Balance

There is a strong dichotomy between the rural and the urban areas in Mexico, yet it is the difference between the large urban centres and the smaller ones that is most impressive. In fact, most of the industrial production of the country is carried out in only three cities: Mexico city, Guadalajara and Monterrey. The creation of employment in these cities brought about strong pressure for migration to these cities from the rural area and from the smaller cities. The need to equilibrate the growth of the economic activities in general, and the industrial ones in particular, is clear.

In order to rearrange the economic activities of the country, the Mexican government is carrying out (as of 1978)

a national plan of urban development. Among the main objectives we find: a) to stop the growth of the three biggest cities; b) to promote the growth of 15 cities in 10 selected regions of the country; and c) to help provide urban services in small chosen communities, defined as the capitals of microregions.

The first objective is apparently an easy task, if permissions for new industrial plants and other economic units are not provided; however reality indicates the difficulty of implementing such policies. The second objective follows a policy of discriminating hundreds of cities in order to create, over the next several decades, twenty huge metropolitan areas as opposed to any other possible distribution arrangement. The third objective would attempt to stop rural-urban migration by offering services in the rural area for the more than 90,000 communities in Mexico. This, however, contradicts the idea of migration due mainly to income differentials.

The list of instruments proposed to reach these goals is a long one, including fiscal policies, economic stimulus given by the government, and improvement in the regional allocation of government resources. Still, while it will take years to fulfill these objectives, they will ultimately help to redistribute the economic activities, job creation and income of the Mexican population.

C) Comprehensive Employment Plan

The striking figures of almost 50% underemployment (workers with less than the official minimum wage) and 7% unemployment in Mexico in 1978 must be reduced. They not only represent the failure of the system but low levels of social welfare and increasing political unrest.

In 1979 the Federal government presented the first serious organized effort to attack the employment problem through the Programa Nacional del Empleo 1980/82. This program, after recognizing the need to change the productive system of the country, fixes certain goals and targets for the years 1980 to 1982. The estimation of new jobs during this period was 2.241 million, and an estimated increase in the labour force of 2.180 million people. It seems that for the first time in decades the Mexican economy would be able to create more jobs than the increase in the labour force, hence decreasing the number of unemployed and underemployed; yet this absorption means only 61 thousand jobs, and at this rate it would require a few hundred years for the economy to offer a job to every Mexican.

It is obvious that the effort in this direction should be much greater. The task is not simple, but the identification and promotion of economic activities generating jobs is necessary. The shift of emphasis to the rural area and a more equilibrated creation of economic activities would certainly have a higher impact on job creation. The relative

importance of the Federal government in the economy should be considered as an important tool of job creation. It is possible for the government to select its projects based on job creation, taking a microeconomic approach of benefit-cost analysis (4). Some projects can be ranked according to this procedure with their financing approval dependent upon the actual number of jobs created.

D) Educational Planning

Mexicans have an average of 3.5 years of schooling, which besides being very low, is ill-distributed. In 1979 while 28% of the heads of households had no years of schooling at all and 40% had less than five years, 5% had attended university. For years education in Mexico has been elitist, forgetting many parts of the rural area while spending on huge public universities (5). Ideally, every Mexican should be literate and the 20% illiteracy rate should be unacceptable.

An educative plan for Mexico should restructure the allocation of resources, giving priority to those Mexicans with no education. The rural area should be a prime target while agricultural education and training programmes should be considered terminal rather than feeding higher levels of education (6). There is no reason to disregard the Mexicans living in small communities by offering education only in the larger cities.

D) Population Control

If population growth has put pressure on the economic system for many years, in the next two decades the pressure will surely increase. The number of nationals between the ages of 15 to 64 will jump from 36 to 68 million between 1980 and the year 2000, meaning that the number of potential job seekers is going to almost double in this period. If job creation during the past decades has not been satisfied by the economic system, there is little hope for a solution in the next few years should the population grow as projected. The indications of a reduction in population growth in the short run are encouraging, but the country obviously will not be prepared to again double its population from 100 to 200 million from the year 2000 to the 2030. If the actual problem is not easily solved, these numbers are unreal.

A very serious effort to stop the population growth should be initiated. It is considered to be the most important problem of the future, and certainly through the unfair economic system the implications on income distribution are clear. The incapability of the system to offer jobs and social justice for millions of Mexicans should not be tested anymore.

In conclusion, then, we believe that through these five strategies, along with their particular objectives to fulfill, the distributive problem in Mexico could be affected.

This implies a reshaping of the actual system, in order to offer social and economic justice to the millions of Mexicans that have been left out of the witnessed progress of the country. The impact of the strategies upon the identified target groups should lead to the fulfilment of the overall objective of a higher rate of growth for the poorer groups than for the richer ones. This is the objective proposed within the model of redistribution through growth suggested.

FOOTNOTES

1. For a complete summary of the changes in the politics of the agrarian reform of Mexico during the present administration see Secretaria de Programacion y Presupuesto, Direccion General de Documentacion y Analisis (1978): "Reforma Agraria". Cuadernos de Filosofia Politica de Jose Lopez Portillo. No. 5. Mexico.
2. We follow here the works of Stavenhagen (1977) and Mehmet (1978). While Stavenhagen emphasizes the peasant household as the basic economic unit influencing the types of policies to follow, Mehmet mentions the need for a systemic approach.
3. In 1980 a first big effort in this direction was begun in Mexico. The Sistema Alimentario Mexicano (Mexican Foodstuffs System) aims to reorganize the food system, including the production, distribution and commercialization. Even when the impact is more oriented towards medium and large productive units, the creation of jobs in the rural area and price controls will benefit one of our target groups: the small farmers and landless.
4. This approach is presented by several authors. See for example Mehmet (1978).
5. See Cynthia Hewitt de Alcantara (1979) studying the educative system of Mexico since the 1920's.
6. For a detailed discussion of educational planning see Mehmet (1978).

VI

SUMMARY AND CONCLUSIONS

The problem of income distribution and economic growth in Mexico has become an increasing theme of study during the last years. This interest developed after decades of high growth in income per capita and no observed improvement in the living conditions of many Mexicans. In this perspective, the objective of this study has been to perform an analysis of income distribution and redistribution of Mexico, establishing a methodology for comparative analysis with future data, quantifying the extent of the concentration, evaluating the objectives of growth and income distribution that the country has set and attempting to formulate redistribution policies to improve the welfare of the majority of the Mexican population.

In order to achieve this objective it has been proposed a theoretical framework and a methodology of analysis of income distribution data according to observed socio-economic characteristics in Mexico. After analysing Mexican income distribution data and the economic growth of the country since 1940, we identified the objectives, the target groups and strategies of redistribution of income in Mexico. The main conclusions of this study include:

1. After reviewing the most popular micro and macro theories of personal income distribution a theoretical framework has been proposed considering elements of different theories. While the micro theories attempt to explain personal income distribution from the individual point of view, the macro theories attempt to explain the generation of income at the aggregate level (i.e. national, regional, sectoral). Based on an evaluation according to their relevance for developing countries we find that the CEPAL-OREALC approach provides a framework of analysis closer to the Latin American reality. It allows us to introduce key elements for the understanding of the Mexican economy, such as population growth, rural-urban migration, labour market conditions, the heterogeneity in the productive sector, etc.

2. A comprehensive evaluation of the literature of income redistribution and economic growth lead us to conclude that the topic is far from being clear, and lacks a well-defined methodology for the formulation and implementation of income redistribution policies as well as an examination of their impacts. An analysis of the different income redistribution models shows their associated objectives; at the same time we classify the policies and strategies of income redistribution. The policies are classified in four groups: 1.) Policies affecting the general functioning of the economy; 2.) Policies proposing solutions to the different sectors of the economy; 3.) Policies af-

fecting the ownership of the factors of production; 4.) The "marginal" policies proposing solutions through fiscal policy. The strategies of income redistribution discussed are: 1.) Employment Generation; 2.) Redirecting Investment; 3.) Direct attack on Poverty; 4.) Human and Physical Resource Development; 5.) The Agriculture Development Approach; 6.) Integrated Rural Development; 7.) The New International Economic Order; 8.) Population Control; 9.) Intergenerational Transfers; 10.) Redistribution of Consumption.

3. To understand the process of generation and distribution of income we have to consider the macroeconomic policies determining the strategy of development; the historical, demographic, technological and sociocultural forces determining the regional and sectoral heterogeneous structure; and the factors determining the distribution of resources among the population. In this sense, income redistribution is conceived as a combination of policies that will form new strategies and will reshape the structure of the actual model of development.

4. The methodology of analysis of income distribution data calls for a derivation of Income Inequality Indicators (III's) from a well fitted Income Distribution Model (IDM). This method solves the problem created by the way Mexican data is presented: grouped data with a different number of classes on different distributions and sometimes with less than 8-9 classes. The calculation of an III with this type

of data using a distribution free form introduces a systematic bias in the value of the III's. At the same time, the method chosen allows for an inter- or extrapolation of income classes in order to calculate the number of recipients and their income in arbitrarily selected income brackets.

5. Three III's were selected: the Gini Coefficient, the Lorenz Curve and the Economic Distance Ratios. The first two are Intra-Income Inequality Indicators, while the third one is an Inter-Income Inequality Indicator. The selection was based on an evaluation of more than 20 III's according to several desired properties.

6. The selection of Income Distribution Models was carried out after an evaluation of the most frequently used IDM's according to desired properties. The IDM's chosen in order to estimate their parameters and compare their goodness-of-fit were: the Lognormal, Gamma, Singh-Maddala and Dagum type I, II and III models. The goodness-of-fit test used were the Kolmogorov-Smirnov test and the Mean Square Error, while the parameter estimation was performed using the non-linear Least Square Method, chosen for its advantages over the Method of Moments, the Maximum Likelihood Method and Pearson's Minimum Chi-square Method.

7. A comparison of the IDM's chosen, using Mexican data for eight years, shows that the Lognormal model fits better than the Gamma model, the Singh-Maddala model better

than both, and the Dagum model better than the other three. According to this result, we have derived the selected Income Inequality Indicators based on the parameters estimated with the Dagum model.

8. The chosen data are from eight original sources covering the national territory and using family as the receiving unit, except in one case which uses household as the receiving unit. The sources were selected from 11 original sources (eight surveys and three censuses) and 3 sources regrouping or adjusting the original data. The years covered are 1950, 1956, 1958, 1963, 1968, 1970, 1975 and 1977.

9. A number of studies (30) of income distribution in Mexico have been reviewed showing that there is a clear trend in terms of preferences about the subject: first the studies of functional income distribution appeared; then the analysis of the data, each time in a more thorough way and using more advanced statistical methods; and finally the use of these results to study particular areas of interest in the field. Most of the studies (19) analyse personal income distribution using different IIT's, methods of calculation and data. This caused a divergence of conclusions in relation to the quantification, trend and analysis by levels of income concentration of the country. All the studies, however, agreed upon the high level of concentration.

10. There is no clear tendency towards a change in the level of concentration of income in Mexico between the years

1950 and 1977, when measured through the Coefficient of Gini. It should be apparent, however, that while the 40% poorest members of the society and the 5% richest have decreased their income shares, the middle and upper middle classes have strengthened their position.

11. Income concentration is greater in the urban than in the rural area for the 1958 to 1970 period, while for 1975 the same degree of concentration was observed. At the same time, we find the highest degree of concentration of income in the agricultural sector, followed by the commerce, services and industrial sectors, with an increasing level of concentration in the agricultural sector. It should be observed that the urban families work in the agricultural sector and rural families work in the non-agricultural sector. Income concentration decreases when the educational level increases, measured through the number of years of schooling. And the level of income concentration decreases with the number of inhabitants of the municipality, with the exception of Mexico City, Guadalajara and Monterrey.

12. There is an increasing difference in income per capita between the urban and rural areas. The mean income of heads of family working in industry, commerce, services and transport and communication is double the mean income of the ones in agriculture. The mean income per capita increases greatly with higher levels of education. It is found that the mean income of the group with 13 or more

years of education is 6.3 times higher than the group with no education. Besides, the income per capita sharply increases when a person is living in a larger municipality.

13. At the international level, Mexican income distribution ranks sixtieth among 77 countries measured with the Gini Coefficient. Out of 10 countries in the same income level group in 1970 (401 to 700 U.S. dollars of 1970) four have a higher income concentration (Brazil, Gabon, Jamaica and South Africa) while 6 have less concentration (Barbados, Chile, Costa Rica, Lebanon, Panama and Surinam).

14. The overwhelming majority of the poor of the country (more than 70%) live in the rural area, with a slight increase since 1958. Most of the heads of the poorer Mexican families were working in the agricultural sector (63.1% in 1963 and 63.4% in 1975). At the same time, almost all the poor families (95%) had as their head a person with six years or less of schooling; among them, 50% had no education at all, 30% had between 1 and 3 years of schooling, and 18% had between 4 and 6 years of schooling. Finally, we find that the smaller the municipality size, the greater the percentage of population living beneath the poverty line; the concentration of the poor is such that 90% of them live in municipalities with a size of under 100,000 inhabitants.

15. There is an apparent contradiction between the proposed targets and the realisation of the Mexican model of socio-economic development. The observed characteristics of

structural heterogeneity of the productive system, the distribution of ownership of the means of production, the varying levels of education, the spatial concentration of the economic activities and the population growth, showed a strong rigidity in face of the implementation of the Mexican model. Several phenomena associated with the above mentioned characteristics such as urban and rural marginality, unemployment and underemployment in the labour market continued to be observed with similar or accentuated intensity whereas new socio-economic problems such as regional and urban-rural imbalances appeared. They can be represented and evaluated in terms of income distribution, and income inequality within and between income distributions.

16. Finally, we have suggested the model of redistribution through growth in order to increase the income of the poorer members more rapidly than that of the richer ones. We propose strategies aimed to provide investment resources for the poor, including a program of rural development, the need for a better regional balance of economic activities, a comprehensive employment plan, a non-elitist education plan and measures for population control. The target groups of the model and strategies proposed are: the indian groups, the small farmers and the landless, and the unemployed and underemployed.

Appendix A

STATISTICAL TABLES

TABLE A.1 FAMILY INCOME DISTRIBUTION IN MEXICO, 1950 (BY INCOME CLASSES)

Income Classes (monthly pesos)	Families		Total Family Income (Thousands of pesos)		Average Monthly Family Income (pesos)
	Absolute	Relative Accumul.	Absolute	Relative Accumul.	
To	75	190,624	4.24%	4.24%	50.00
76 - 149	1,319,989	29.33	33.57	9.31	112.50
150 - 199	967,465	21.50	55.07	10.59	174.50
200 - 299	710,006	15.78	70.85	11.11	249.50
300 - 399	428,335	9.52	80.37	9.39	349.50
400 - 499	277,689	6.17	86.54	7.83	449.50
500 - 599	118,625	2.64	89.18	4.09	549.50
600 - 799	221,708	4.93	94.10	9.72	699.50
800 - 999	88,077	1.96	96.06	4.97	899.50
1000 - 1499	92,525	2.06	98.12	7.25	1,249.50
1500 - 2999	64,307	1.43	99.55	9.07	2,249.50
3001-More	20,424	0.45	100.00	16.09	12,563.78
Total	4,499,774	100.00	1,504,889.15	190.00	354.44

Source: 1950 Census, S.I.C.

TABLE 2.2 FAMILY INCOME DISTRIBUTION IN MEXICO, 1950 (BY INCOME CLASSES)

Income Classes (monthly pesos)	Families		Total Family Income (Thousands of pesos)		Average Monthly Family Income (pesos)
	Absolute	Relative Accumul.	Absolute	Relative Accumul.	
To 75	191,000	3.74%	9,600.00	0.49%	50.26
76 - 150	1,320,000	25.86	149,200.00	7.57	113.03
151 - 200	993,000	19.45	173,800.00	8.82	175.03
201 - 300	887,000	17.38	121,800.00	11.26	250.06
301 - 400	557,000	10.91	195,000.00	9.90	350.09
401 - 600	550,000	10.77	275,000.00	13.96	500.00
601 - 1000	363,000	7.11	290,400.00	14.74	800.00
1001 - 1500	123,000	2.41	153,800.00	7.81	1,250.41
1501 - 3000	76,000	1.49	171,000.00	8.68	2,250.00
3001 or more	45,000	0.98	330,100.00	16.77	7,335.56
Total	5,105,000	100.00	1,969,700.00	100.00	385.84

Source: Lavariete (1960 And 1970)

TABLE A.3 FAMILY INCOME DISTRIBUTION IN MEXICO, 1956 (BY INCOME CLASSES)

Income Classes (Monthly pesos)	Families		Total Family Income (Thousands of pesos)		Average Monthly Family Income (pesos)
	Absolute	Relative Accumul.	Absolute	Relative Accumul.	
To	219,631	4.39%	15,445.67	0.51%	70.33
101 -	860,781	17.21	135,626.58	4.51	157.56
201 -	876,999	17.53	230,497.97	7.67	262.83
301 -	589,123	11.78	212,616.01	7.07	360.90
401 -	515,470	10.31	236,191.15	7.86	458.21
501 -	850,028	16.99	534,280.95	17.77	628.55
751 -	434,769	8.69	377,689.32	12.56	868.71
1001 -	478,124	9.56	678,137.50	22.50	1,418.33
2001 -	97,507	1.95	241,474.71	8.03	2,476.49
3001 or More	79,557	1.59	344,661.84	11.47	4,332.26
Total	5,001,989	100.00	3,006,621.70	100.00	601.26

Source: 1956 Survey, S.I.C. The table does not include data for the states of Baja California, Quintana Roo or the Federal District, since the survey does not report family income class for those states.

TABLE A.4 FAMILY INCOME DISTRIBUTION IN MEXICO, 1956 (BY INCOME CLASSES)

Income Classes (monthly pesos)	Families		Total Family Income (Thousands of pesos)		Average Monthly Family Income (pesos)
	Absolute	Relative Accumul.	Absolute	Relative Accumul.	
TO	223,411	3.97%	15,752.67	0.39%	70.51
101 - 200	869,602	15.05	137,214.58	3.43	157.79
201 - 300	916,060	15.85	241,251.58	6.03	263.36
301 - 400	655,904	11.35	237,299.01	5.93	361.79
401 - 500	588,552	10.18	270,427.15	6.75	459.48
501 - 750	1,049,112	18.15	660,384.95	16.49	629.47
751 - 1000	543,131	9.40	473,155.32	11.82	871.16
1001 - 2000	646,968	11.19	923,098.50	23.06	1,426.80
2001 - 3000	151,688	2.62	381,114.71	9.52	2,512.49
3001 - MORE	134,998	2.34	663,957.84	16.58	4,918.28
Total	5,779,426	100.00	4,003,656.70	100.00	692.74

Source: Navarrete (1960). The table does not include data for the states of Baja California or Quintana Roo.

TABLE A.5 FAMILY INCOME DISTRIBUTION IN MEXICO, 1958 (BY INCOME CLASSES)

Income Classes (monthly pesos)	Families		Total Family Income (Thousands of pesos)		Average Monthly Family Income (pesos)
	Absolute	Relative Accumul.	Absolute	Relative Accumul.	
TO	200	454,704	7.10%	7.10%	
201 - 300	1,002,897	15.66	22.76	1.39%	164.04
301 - 400	777,777	12.14	34.90	5.02	267.80
401 - 500	811,022	12.66	47.56	5.33	366.88
501 - 750	1,269,190	19.81	67.37	7.01	462.79
751 - 1000	791,955	12.36	79.73	14.85	626.16
1001 - 2000	898,946	14.03	93.76	13.04	881.64
2001 - More	398,890	6.24	100.00	24.14	1,437.46
				29.92	3,919.47
Total	6,405,381	100.00	5,352,428.48	100.00	835.61

Source: Survey, S.I.C.

TABLE A.6 FAMILY INCOME DISTRIBUTION IN MEXICO, 1963 (BY INCOME CLASSES)

Income Classes (monthly pesos)	Families		Total Family Income (Thousands of pesos)		Average Monthly Family Income (pesos)
	Absolute	Relative Accumul.	Absolute	Relative Accumul.	
To	300	18.37%	249,219	3.10%	215.59
301 - 600	1,842,835	25.14	805,871	11.70	437.30
601 - 1000	1,584,495	21.62	1,231,087	24.84	776.96
1001 - 1500	798,162	10.89	990,169	35.41	1,240.56
1501 - 3000	1,099,332	15.00	2,309,102	60.06	2,100.46
3001 - 4500	333,654	4.55	1,218,089	73.06	3,650.76
4501 - 6000	140,150	1.91	729,113	80.84	5,202.38
6001 - 10000	120,606	1.64	924,146	90.71	7,662.52
10001 - More	64,233	0.88	869,626	100.00	13,538.62
Total	7,329,642	100.00	9,367,422	100.00	1,278.02

Source: 1963 Survey, Bank of Mexico.

TABLE A.7 FAMILY INCOME DISTRIBUTION IN MEXICO, 1968 B.M. (BY INCOME CLASSES)

Income Classes (monthly pesos)	Families		Total Family Income (Thousands of pesos)		Average Monthly Family Income (pesos)
	Absolute	Relative Accumul.	Absolute	Relative Accumul.	
To 300	438,000	5.37%	95,120.28	0.59%	217.17
301- 600	1,257,000	15.42%	528,400.20	3.26%	420.37
601- 1000	1,628,000	19.97%	1,248,734.59	7.71%	767.04
1001- 3000	3,325,000	40.79%	5,451,529.30	33.66%	1,639.56
3001- 6000	1,061,000	13.02%	4,111,084.99	25.39%	3,874.73
6001-10000	275,000	3.37%	1,584,302.21	12.25%	7,215.64
10001- More	167,000	2.05%	2,774,325.84	17.13%	16,612.73
Total	8,151,000	100.00%	16,193,497.41	100.00%	1,986.69

Source: 1968 Survey, Bank of Mexico.

TABLE A.3 FAMILY INCOME DISTRIBUTION IN MEXICO, 1968 (BY INCOME CLASSES)

Income Classes (monthly pesos)	Families		Total Family Income (Thousands of pesos)		Average Monthly Family Income (pesos)
	Absolute	Relative Accumul.	Absolute	Relative Accumul.	
Total	687,657	8.31%	137,345.55	0.90%	199.73
300 - 400	524,411	6.34	181,788.37	1.19	346.65
401 - 500	697,436	8.43	322,695.49	2.11	462.69
501 - 750	721,472	8.72	437,766.57	2.86	606.77
751 - 1000	1,165,246	14.08	958,969.68	6.26	822.98
1001 - 1250	940,112	11.36	1,033,664.79	6.74	1,099.51
1251 - 1500	923,964	11.16	1,339,637.96	8.74	1,449.88
1501 - 2000	748,436	9.04	1,461,650.67	9.54	1,952.94
2001 - 3000	639,853	7.73	1,639,996.39	10.70	2,563.08
3001 - 4000	444,545	5.37	1,515,403.14	9.89	3,408.89
4001 - 5000	289,969	3.50	1,320,775.28	8.62	4,559.18
5001 - More	494,818	5.98	4,977,151.43	32.47	10,058.55
Total	8,277,646	100.00	15,326,845.32	100.00	1,851.59

Source: 1968 Survey, Ministry of the Presidency.

TABLE A.9 FAMILY INCOME DISTRIBUTION IN MEXICO, 1970 (BY INCOME CLASSES)

Income Classes (Monthly pesos)	Families		Total Family Income (Thousands of pesos)		Average Monthly Family Income (pesos)
	Absolute	Relative Accumul.	Absolute	Relative Accumul.	
Tc	500	1,871,147	21.04%	21.04%	341.92
501 - 750	1,080,210	12.15	33.49	4.36	640.22
751 - 1000	1,363,418	15.33	48.52	7.64	888.57
1001 - 2000	2,462,668	27.70	76.22	22.81	1,468.98
2001 - 3000	942,835	10.60	86.82	14.92	2,510.04
3001 - More	1,171,474	13.18	100.00	46.24	6,257.63
Total	8,891,752	100.00	15,857,652.60	100.00	1,783.41

Source: 1970 Survey, S.I.C.

TABLE A.10 FAMILY INCOME DISTRIBUTION IN MEXICO, 1975 (BY INCOME CLASSES)

Income Classes (Monthly pesos)	Families		Total Family Income (Thousands of pesos)		Average Monthly Family Income (pesos)
	Absolute	Relative Accumul.	Absolute	Relative Accumul.	
To 0	16,547	0.2%	0.00	0.00%	----
1 - 500	1,533,407	15.0	331,185.24	1.00	215.98
501 - 700	578,756	5.7	350,743.50	1.05	606.03
701 - 950	794,472	7.8	658,363.06	1.98	828.68
951 - 1250	883,555	8.7	977,629.84	2.94	1,099.01
1251 - 1700	918,944	9.0	1,359,274.40	4.08	1,479.17
1701 - 2200	1,063,504	10.4	2,091,954.91	6.29	1,967.04
2201 - 3000	1,249,808	12.2	3,263,161.20	9.80	2,610.93
3001 - 4000	865,596	8.5	3,046,612.27	9.15	3,519.67
4001 - 5200	695,026	6.8	3,186,179.89	9.57	4,584.26
5201 - 7000	625,835	6.1	3,770,286.63	11.33	6,024.41
7001 - 9200	345,941	3.4	2,763,248.71	8.30	7,987.63
9201 - 12250	282,537	2.8	2,975,512.99	8.94	10,531.41
12251 CP+	348,397	3.4	8,510,452.38	25.57	24,385.46
Total	10,208,925	100.00	33,284,567.00	100.00	3,260.34

Source: 1975 Survey, CENIET.

TABLE A.11 HOUSEHOLD INCOME DISTRIBUTION IN MEXICO, 1977* (BY INCOME CLASSES)

Income Classes (monthly pesos)	Households		Total Household Income (Thousands of pesos)		Av. Monthly Household Income (pesos)
	Absolute	Relative Accumul.	Absolute	Relative Accumul.	
To 0	31,723	0.29%	0	0.00%	-----
1- 700	1,130,208	10.17	486,026.83	0.94	430.00
701- 1000	699,869	6.29	610,763.00	1.19	872.67
1001- 1350	744,240	6.70	885,211.33	1.72	1,189.33
1351- 1800	947,669	8.53	1,404,972.83	2.91	1,577.50
1801- 2400	1,047,939	9.43	2,214,748.17	4.31	2,113.50
2401- 3150	1,133,454	10.20	3,164,942.67	6.16	2,792.33
3151- 4300	1,400,719	12.60	5,140,355.83	10.00	3,669.83
4301- 5725	1,151,005	10.35	5,683,206.67	11.06	4,937.67
5726- 7500	972,235	8.75	6,334,451.00	12.33	6,515.33
7501-10150	777,612	7.00	6,853,327.30	13.34	8,813.33
10151-13400	469,312	4.22	5,481,627.50	10.67	11,680.17
13401-18000	319,520	2.87	4,931,271.83	9.59	15,433.33
18001-More	289,638	2.60	8,107,197.00	15.78	27,990.83
Total	11,115,142	100.00	51,388,102.50	100.00	4,623.33

* Data are originally presented in semestrial terms (every 6 months).

Source: 1977 Survey, SPP.

TABLE A.12 URBAN - RURAL FAMILY INCOME DISTRIBUTION IN MEXICO, 1958
(BY INCOME CLASSES)

INCOME CLASSES (monthly pesos)	URBAN		RURAL	
	FAMILIES Relative	FAMILIES (2,575,727) Accumul.	FAMILIES (2,896,751) Relative	FAMILIES (2,896,751) Accumul.
To 200	2.60%	2.60%	10.55%	10.55%
201-300	6.31	8.91	24.90	35.45
301-400	8.64	17.55	15.07	50.52
401-500	11.57	29.12	13.90	64.42
501-750	20.91	50.03	19.24	83.66
751-1000	17.10	67.13	8.11	91.77
1001-2000	21.78	88.91	6.64	98.41
2001-3000	6.10	95.01		
3001-More	4.99	100.00	1.59*	100.00*
TOTAL	100.00		100.00	
MEAN INCOME		1136.17		543.28

* Includes the 2001-3000 income class. The urban-rural breakdown does not include the states of Chihuahua, Michoacan or Puebla.

Source: 1958 Survey, S.I.C.

TABLE A.13 URBAN - RURAL FAMILY INCOME DISTRIBUTION IN MEXICO, 1963
(BY INCOME CLASSES)

INCOME CLASSES (monthly pesos)	URBAN		RURAL	
	FAMILIES Relative	FAMILIES (4,086,656) Accumul.	FAMILIES Relative	FAMILIES (3,242,986) Accumul.
TO 300	9.95%	9.95%	28.97%	28.97%
301 - 600	19.38	29.33	32.40	61.37
601 - 1000	21.02	50.35	22.38	83.75
1001 - 1500	15.03	65.38	5.67	89.41
1501 - 3000	20.68	86.06	7.84	97.26
3001 - 4500	6.76	92.82	1.77	99.02
4501 - 6000	2.91	95.74	0.65	99.67
6001 - 10000	2.77	98.50	0.23	99.91
10001 - More	1.50	100.00	0.09	100.00
TOTAL	100.00		100.00	
MEAN INCOME		1706.33		738.29

Source: 1963 Survey, Bank of Mexico.

TABLE A.14 URBAN - RURAL FAMILY INCOME DISTRIBUTION IN MEXICO, 1968
(BY INCOME CLASSES)

INCOME CLASSES (monthly pesos)	URBAN		RURAL	
	FAMILIES Relative	FAMILIES (5,092,000) Accumul.	FAMILIES Relative	FAMILIES (3,059,000) Accumul.
To 300	2.36%	2.36%	10.40%	10.40%
301 - 600	7.23	9.58	29.06	39.46
601 - 1000	15.97	25.55	26.64	66.10
1001 - 3000	47.82	73.37	29.09	95.19
3001 - 6000	18.74	92.11	3.50	98.69
6001 - 10000	4.97	97.07	0.72	99.41
10001 - More	2.93	100.00	0.59	100.00
TOTAL	100.00		100.00	
MEAN INCOME		2578.18		1002.09

The urban-rural breakdown is defined by the non-agricultural and agricultural sectors, respectively, as defined in the survey.

Source: 1968 Survey, Bank of Mexico.

TABLE 2.15 URBAN - RURAL FAMILY INCOME DISTRIBUTION IN MEXICO, 1970
(BY INCOME CLASSES)

INCOME CLASSES (monthly pesos)	URBAN		RURAL	
	FAMILIES Relative	FAMILIES (5,302,683) Accumul.	FAMILIES (3,589,069) Relative	FAMILIES Accumul.
To 500	8.13%	8.13%	29.00%	29.00%
501 - 750	8.01	16.14	11.13	40.13
751 - 1000	16.17	32.31	18.26	58.39
1001 - 2000	32.85	65.16	14.09	72.48
2001 - 3000	14.76	79.92	20.09	92.57
3001 - More	20.00	100.00	7.43	100.00
TOTAL	100.00		100.00	
MEAN INCOME		2383.71		896.73

Source: 1970 Survey, S.I.C.

TABLE A.16 URBAN - RURAL FAMILY INCOME DISTRIBUTION IN MEXICO, 1975
(BY INCOME CLASSES)

INCOME CLASSES (monthly pesos)	URBAN		RURAL	
	FAMILIES Relative	FAMILIES (6,397,933) Accumul.	FAMILIES Relative	FAMILIES (3,810,992) Accumul.
TO	5.16%	5.16%	26.28%	26.28%
501 - 700	1.95	7.11	9.40	35.68
701 - 950	3.79	10.90	11.86	47.54
951 - 1250	6.25	17.15	10.99	58.33
1251 - 1700	9.23	26.38	8.23	66.76
1701 - 2200	11.99	38.37	8.34	75.10
2201 - 3000	14.64	53.01	9.71	84.81
3001 - 4000	11.74	64.75	5.39	90.20
4001 - 5200	9.42	74.17	4.23	94.43
5201 - 7000	9.37	83.54	2.83	97.26
7001 - 9200	5.77	89.31	1.02	98.28
9201 - 12250	5.27	94.58	0.45	98.73
12251 OR MORE	5.42	100.00	1.27	100.00
TOTAL	100.00		100.00	
MEAN INCOME		4756.94		1838.41

Source: 1975 Survey, CENIET.

TABLE A.17 INCOME DISTRIBUTION BY SECTOR IN MEXICO, 1963 (BY INCOME CLASSES)

INCOME CLASSES (Monthly pesos)	AGRICULTURE		INDUSTRY*		CONSTRUCTION	
	FAMILIES (3,130,833)	Relative Accumul.	FAMILIES (1,179,112)	Relative Accumul.	FAMILIES (346,713)	Relative Accumul.
TO 225	15.67%	15.67%	2.43%	2.43%	3.34%	3.34%
226 - 400	30.70	46.37	6.21	8.64	26.18	29.52
401 - 530	11.71	58.07	7.88	16.52	7.23	36.75
531 - 700	10.98	69.05	14.67	31.19	21.70	58.45
701 - 950	10.98	80.08	16.55	47.74	16.12	74.57
951 - 1250	4.99	85.02	12.78	60.52	8.38	82.95
1251 - 1700	3.19	88.21	14.33	74.85	7.61	90.56
1701 - 2200	4.35	92.56	6.88	81.73	3.28	93.83
2201 - 3000	3.47	96.03	5.69	87.42	2.48	96.32
3001 - 4000	1.55	97.57	4.79	92.21	1.39	97.71
4001 - 5200	1.00	98.58	3.82	96.03	0.55	98.26
5201 - More	1.42	100.00	3.97	100.00	1.74	100.00
TOTAL	100.00		100.00		100.00	
MEAN INCOME	818.20		1637.78		949.70	
						335
INCOME CLASSES (Monthly Pesos)	COMMERCE		SERVICES		TRANS/COMMUN.	
	FAMILIES (804,570)	Relative Accumul.	FAMILIES (1,658,967)	Relative Accumul.	FAMILIES (209,447)	Relative Accumul.
TO 225	5.88%	5.88%	6.32%	6.32%	0.00%	0.00%
226 - 400	11.68	17.57	13.99	20.31	3.50	3.50
401 - 530	10.46	28.03	4.35	24.66	10.42	13.92
531 - 700	11.18	39.21	12.00	36.66	10.88	24.81
701 - 950	10.16	49.37	12.40	49.06	15.14	39.94
951 - 1250	11.74	61.11	7.99	57.05	17.08	57.02
1251 - 1700	10.61	71.72	11.77	68.81	16.63	73.65
1701 - 2200	6.14	77.86	8.72	77.54	10.43	84.08
2201 - 3000	8.91	86.77	7.06	84.60	10.53	94.61
3001 - 4000	4.48	91.25	5.59	90.18	2.63	97.24
4001 - 5200	2.46	93.77	3.67	93.86	1.08	98.32
5201 - More	6.29	100.00	6.14	100.00	1.68	100.00
TOTAL	100.00		100.00		100.00	
MEAN INCOME	1763.30		1725.60		1440.80	

*Industry includes mining and open-cast mining, manufacturing industry and electricity.
Source: 1963 Survey, Bank of Mexico.

TABLE N. 18 INCOME DISTRIBUTION BY SECTOR IN MEXICO, 1975
(BY INCOME CLASSES)*

INCOME CLASSES (Monthly Pesos)	AGRICULTURE		INDUSTRY**		CONSTRUCTION	
	Families Relative	Families (3,169,186) Accumul.	Families Relative	Families (2,091,356) Accumul.	Families Relative	Families (408,391) Accumul.
0	0.49%	0.49%	5.51%	5.51%	2.41%	2.41%
1 - 500	32.48	32.97	1.80	7.31	2.33	4.74
501 - 700	12.06	45.03	2.80	10.11	5.88	10.12
701 - 950	13.67	58.70	6.64	16.75	12.00	22.12
951 - 1250	9.77	68.47	9.86	26.61	11.79	33.91
1251 - 1700	8.57	77.04	15.44	42.05	23.35	57.26
1701 - 2200	4.71	81.75	15.72	57.77	15.51	72.77
2201 - 3000	5.79	87.54	12.07	69.84	10.01	82.78
3001 - 4000	3.29	90.83	9.92	79.76	5.47	88.25
4001 - 5200	2.96	93.79	7.61	87.37	4.81	93.06
5201 - 7000	2.82	96.61	5.23	92.60	2.75	95.81
7001 - 9200	0.88	97.49	3.93	96.53	2.75	98.56
9201 - 12250	0.59	98.08	3.47	100.00	1.44	100.00
12251 - MORE	1.92	100.00	100.00	4	100.00	
TOTAL	100.00		100.00	3904.22	3133.85	
MEAN INCOME	2015.86					

* There are 26,098 heads of families "unsufficiently specified", and 1,147,766 unemployed.
** Industry includes the oil industry, mining, electricity and the manufacturing industry.

Source: 1975 Survey, CENIET.

TABLE A.18 INCOME DISTRIBUTION BY SECTOR IN MEXICO, 1975
(BY INCOME CLASSES)* (CONT'D)

INCOME CLASSES (Monthly Pesos)	COMMERCE		SERVICES		TRANSPORTATION	
	FAMILIES Relative	FAMILIES (893,825) Accumul.	FAMILIES Relative	FAMILIES (1,554,415) Accumul.	FAMILIES Relative	FAMILIES (505,594) Accumul.
0	-	-	-	-	-	-
1 - 500	6.39%	6.39%	4.92%	4.92%	0.36%	0.36%
501 - 700	4.40	10.79	2.83	7.75	0.32	0.68
701 - 950	8.41	19.20	4.29	12.04	9.89	10.57
951 - 1250	11.11	30.31	8.26	20.30	13.76	24.33
1251 - 1700	9.19	39.50	8.64	28.94	6.99	31.32
1701 - 2200	10.66	50.16	10.57	39.59	10.37	41.69
2201 - 3000	13.39	63.55	13.97	53.48	23.39	65.08
3001 - 4000	8.28	71.83	12.20	65.68	13.30	78.38
4001 - 5200	8.50	80.33	8.72	74.40	5.67	84.05
5201 - 7000	7.57	87.90	8.57	82.97	7.33	91.38
7001 - 9200	2.68	90.58	5.66	88.63	3.22	94.60
9201 - 12250	5.37	95.95	3.70	92.33	2.53	97.13
12251 - More	4.05	100.00	7.67	100.00	2.87	100.00
TOTAL	100.00		100.00		100.00	
MEAN INCOME	3737.62		4539.50		3492.13	

* There are 26,098 heads of families "unsufficiently specified",
and 1,147,766 unemployed.

Source: 1975 Survey, CENIET.

TABLE A.18 INCOME DISTRIBUTION BY SECTOR IN MEXICO, 1975
(BY INCOME CLASSES)* (CONT'D)

INCOME CLASSES (MONTHLY PESOS)	GOVERNMENT	
	FAMILIES RELATIVE	(412,294) ACCUMUL.
1 - 500	2.86%	2.86%
501 - 700	-	2.86
701 - 950	1.57	4.43
951 - 1250	2.87	7.30
1251 - 1700	8.46	15.76
1701 - 2200	13.18	28.94
2201 - 3000	17.66	46.60
3001 - 4000	9.15	55.75
4001 - 5200	13.98	69.73
5201 - 7000	12.61	82.34
7001 - 9200	9.65	91.99
9201 - 12250	3.46	95.45
12251 or more	4.55	100.00
TOTAL	100.00	
MEAN INCOME		4736.17

* There are 26,098 heads of families "unsufficiently specified",
and 1,147,766 unemployed.

Source: 1975 Survey, CENIT.

TABLE A.19 INCOME DISTRIBUTION BY LEVEL OF EDUCATION OF THE HEAD OF THE FAMILY, 1975 (BY INCOME CLASSES)

INCOME CLASSES (MONTHLY PESOS)	1 FAMILIES RELATIVE	1 FAMILIES (3,129,475) ACCUMUL.	2 FAMILIES RELATIVE	2 FAMILIES (2,708,431) ACCUMUL.	3 FAMILIES RELATIVE	3 FAMILIES (2,749,521) ACCUMUL.
0	0.04%	0.04%	0.52%	0.52%	0.04%	0.04%
1 - 500	33.78	33.82	13.24	13.76	3.68	3.72
501 - 700	8.63	42.45	5.91	19.67	5.08	8.80
701 - 950	10.69	53.14	8.92	28.49	7.52	16.35
951 - 1250	10.32	63.46	12.81	41.30	5.84	22.19
1251 - 1700	7.79	71.25	11.65	52.95	10.76	32.95
1701 - 2200	7.32	78.57	12.34	65.29	14.22	47.17
2201 - 3000	8.86	87.43	11.32	76.61	16.53	63.70
3001 - 4000	3.87	91.30	9.02	85.63	11.58	75.28
4001 - 5200	4.08	95.38	5.05	90.68	8.32	83.60
5201 - 7000	1.71	97.09	4.00	94.68	7.78	91.38
7001 - 9200	1.00	98.09	1.80	96.48	3.73	95.11
9201 - 12250	1.26	99.35	1.50	97.98	2.62	97.73
12251 - or more	0.65	100.00	2.02	100.00	2.27	100.00
TOTAL	100.00		100.00		100.00	
MEAN INCOME		1589.07		2882.82		3355.31

Source: 1975 Survey, CENIET.

TABLE 1.19 INCOME DISTRIBUTION BY LEVEL OF EDUCATION OF THE HEAD OF THE FAMILY, 1975 (BY INCOME CLASSES) (CONT'D)

INCOME CLASSES (MONTHLY P.F.SCS)					5		6	
	4		5		5		6	
	FAMILIES RELATIVE	(750,264) ACCUMUL.	FAMILIES RELATIVE	(302,438) ACCUMUL.	FAMILIES RELATIVE	(480,389) ACCUMUL.	FAMILIES RELATIVE	(480,389) ACCUMUL.
0	-	-	-	-	-	-	-	-
1 - 500	1.52%	1.52%	0.71%	0.71%	0.54%	0.54%	0.54%	0.54%
501 - 700	1.00	2.61	0.05	0.76	-	0.54	-	0.54
701 - 950	1.44	4.05	0.17	0.93	-	0.54	-	0.54
951 - 1250	4.12	8.17	1.21	2.14	1.56	2.10	1.56	2.10
1251 - 1700	5.77	13.94	2.83	4.97	1.70	3.80	1.70	3.80
1701 - 2200	10.06	24.00	6.39	11.36	1.43	5.23	1.43	5.23
2201 - 3000	18.87	42.87	9.12	20.48	7.40	12.63	7.40	12.63
3001 - 4000	10.36	53.33	18.26	38.74	4.60	17.23	4.60	17.23
4001 - 5200	15.60	68.83	8.50	47.24	10.53	27.76	10.53	27.76
5201 - 7000	12.00	80.83	19.82	67.06	17.24	45.00	17.24	45.00
7001 - 9200	6.45	87.29	12.24	79.30	15.55	60.55	15.55	60.55
9201 - 12250	5.41	92.69	10.27	89.57	15.08	75.63	15.08	75.63
12251 or more	7.31	100.00	10.43	100.00	24.37	100.00	24.37	100.00
TOTAL	100.00		100.00		100.00		100.00	
MEAN INCOME		5388.51		6458.50		9997.27		9997.27

Levels of education: 1 = no studies; 2 = one to three years of schooling;
3 = four to six years; 4 = seven to nine years; 5 = ten to twelve years; and
6 = thirteen or more years.

Source: 1975 Survey, CENIST.

TABLE A.20 INCOME DISTRIBUTION BY LEVEL OF EDUCATION OF THE HEAD OF THE HOUSEHOLD, 1977 (BY INCOME CLASSES)

INCOME CLASSES (MONTHLY PFCSS)												
	1	2	3	1	2	3	1	2	3	1	2	3
	HOUSEHOLDS RELATIVE	HOUSEHOLDS RELATIVE	HOUSEHOLDS RELATIVE	HOUSEHOLDS RELATIVE	HOUSEHOLDS RELATIVE	HOUSEHOLDS RELATIVE	HOUSEHOLDS RELATIVE	HOUSEHOLDS RELATIVE	HOUSEHOLDS RELATIVE	HOUSEHOLDS RELATIVE	HOUSEHOLDS RELATIVE	HOUSEHOLDS RELATIVE
	ACCUMUL.	ACCUMUL.	ACCUMUL.	ACCUMUL.	ACCUMUL.	ACCUMUL.	ACCUMUL.	ACCUMUL.	ACCUMUL.	ACCUMUL.	ACCUMUL.	ACCUMUL.
0	0.70%	0.16%	0.17%	0.70%	0.16%	0.17%	0.70%	0.16%	0.17%	0.70%	0.16%	0.17%
1 - 700	22.03	9.00	1.66	22.73	9.16	1.83	22.03	9.00	1.66	22.73	9.16	1.83
701 - 1000	11.54	6.91	1.60	34.27	16.07	3.43	34.27	16.07	1.60	34.27	16.07	3.43
1001 - 1350	9.81	8.60	2.22	44.08	24.67	5.65	44.08	24.67	2.22	44.08	24.67	5.65
1351 - 1800	11.30	11.11	4.24	55.38	35.78	9.89	55.38	35.78	4.24	55.38	35.78	9.89
1801 - 2400	12.06	11.26	7.87	67.44	47.04	17.76	67.44	47.04	7.87	67.44	47.04	17.76
2401 - 3150	9.15	12.09	11.72	76.59	59.13	29.48	76.59	59.13	11.72	76.59	59.13	29.48
3151 - 4300	8.95	13.76	18.55	85.54	72.89	48.03	85.54	72.89	18.55	85.54	72.89	48.03
4301 - 5725	5.71	10.46	16.28	91.25	83.35	64.31	91.25	83.35	16.28	91.25	83.35	64.31
5726 - 7500	3.91	7.46	14.07	95.16	90.81	78.38	95.16	90.81	14.07	95.16	90.81	78.38
7501 - 10150	2.89	4.54	10.62	98.05	95.35	89.00	98.05	95.35	10.62	98.05	95.35	89.00
10151 - 13400	1.05	2.72	5.24	99.10	98.07	94.24	99.10	98.07	5.24	99.10	98.07	94.24
13401 - 18000	0.69	1.51	3.59	99.79	99.58	97.83	99.79	99.58	3.59	99.79	99.58	97.83
18001 - More	0.21	0.42	2.17	100.00	100.00	100.00	100.00	100.00	2.17	100.00	100.00	100.00
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
MEAN INCOME	2392.00	3498.33	5724.00	2392.00	3498.33	5724.00	2392.00	3498.33	5724.00	2392.00	3498.33	5724.00

Source: 1977 Survey, SPP.

TABLE A.20 INCOME DISTRIBUTION BY LEVEL OF EDUCATION OF THE HEAD OF THE HOUSEHOLD, 1977 (BY INCOME CLASSES) (CONT'D)

INCOME CLASSES (MONTHLY PESOS)	4		5		6	
	HOUSEHOLDS RELATIVE ACCUMUL.	HOUSEHOLDS (358,660) ACCUMUL.	HOUSEHOLDS RELATIVE ACCUMUL.	HOUSEHOLDS (513,444) ACCUMUL.	HOUSEHOLDS (404,848) RELATIVE ACCUMUL.	
0	-	-	-	-	-	
1 - 700	2.07%	2.07%	0.69%	0.69%	0.17%	
701 - 1000	0.94	3.01	0.41	1.10	0.55	
1001 - 1350	1.42	4.43	0.87	1.97	1.11	
1351 - 1800	4.16	8.59	0.75	2.72	2.91	
1801 - 2400	4.41	13.00	3.08	5.80	3.59	
2401 - 3150	8.45	21.45	7.34	13.14	9.44	
3151 - 4300	18.10	39.55	13.26	26.40	19.45	
4301 - 5725	18.99	58.54	16.42	42.82	30.72	
5726 - 7500	12.73	71.27	18.33	61.15	49.58	
7501 - 10150	15.01	86.24	16.87	78.02	67.81	
10151 - 13400	6.67	92.95	10.39	88.41	83.25	
13401 - 18000	4.52	97.47	5.17	93.58	92.03	
18001 - More	2.53	100.00	6.42	100.00	100.00	
TOTAL	100.00		100.00		100.00	

MEAN INCOME

€263.83

7853.67

9780.38

Source: 1977 Survey, SPP.

TABLE A.20 INCOME DISTRIBUTION BY LEVEL OF EDUCATION OF THE HEAD OF THE HOUSEHOLD, 1977 (BY INCOME CLASSES) (CONT'D)

7

INCOME CLASSES (MONTHLY PESOS)	HOUSEHOLDS RELATIVE	(526,040) ACCUMUL.
0	0.07%	0.07%
1 - 700	0.32	0.39
701 - 1000	-	0.39
1001 - 1350	0.48	0.87
1351 - 1800	0.60	1.47
1801 - 2400	1.37	2.84
2401 - 3150	3.11	5.95
3151 - 4300	6.28	12.23
4301 - 5725	11.14	23.37
5726 - 7500	15.88	39.25
7501 - 10150	15.35	54.60
10151 - 13400	17.23	71.83
13401 - 18000	28.17	100.00
18001 - More		
TOTAL	100.00	
MEAN INCOME		15240.74

Levels of Education: 1) No years of schooling; 2) incomplete primary school (1 to 5 years of schooling); 3) complete primary school (6 years of schooling); 4) incomplete secondary school (7 or 8 years of schooling); 5) complete secondary school (9 years of schooling); 6) incomplete and complete high school (10 to 12 years of schooling); 7) incomplete and complete university and postgraduate levels (13 or more years of schooling).

Source: 1977 Survey, SPP.

TABLE A.21 INCOME DISTRIBUTION IN MEXICO BY MUNICIPALITY SIZE, 1977, (BY INCOME CLASSES)

INCOME CLASSES (MONTHLY PESCS)	1			2			3		
	HOUSEHOLDS RELATIVE	(137,336) ACCUMUL.	HOUSEHOLDS RELATIVE	(1,248,637) ACCUMUL.	HOUSEHOLDS RELATIVE	(4,200,739) ACCUMUL.	HOUSEHOLDS RELATIVE	(4,200,739) ACCUMUL.	
1 - 700	33.43%	33.43%	23.48	0.33%	23.81	0.56%	16.93	0.56%	
701 - 1000	15.23	49.66	14.10		37.91		9.95		17.49
1001 - 1350	15.85	65.51	14.11		52.02		10.40		27.44
1351 - 1800	13.45	78.96	10.63		62.65		14.07		37.84
1801 - 2400	8.29	87.25	3.51		76.16		12.32		51.91
2401 - 3150	4.80	92.05	7.64		83.80		11.18		64.23
3151 - 4300	3.36	95.41	5.83		89.68		9.45		75.41
4301 - 5725	2.37	97.78	3.93		93.61		6.06		84.86
5726 - 7500	0.54	98.32	3.23		96.84		4.17		90.92
7501 - 10150	0.84	99.16	1.63		98.47		2.87		95.09
10151 - 13400		100.00	0.78		99.25		1.08		97.96
13401 - 18000			0.53		99.78		0.54		99.04
18001 - More			0.22		100.00		0.42		99.58
TOTAL	100.00		100.00		100.00		100.00		100.00
MEAN INCOME		1460.50			2024.00				2548.83

INCOME CLASSES (MONTHLY PESCS)	4			5			6		
	HOUSEHOLDS RELATIVE	(1,151,716) ACCUMUL.	HOUSEHOLDS RELATIVE	(883,315) ACCUMUL.	HOUSEHOLDS RELATIVE	(528,978) ACCUMUL.	HOUSEHOLDS RELATIVE	(528,978) ACCUMUL.	
1 - 700	0.09%	0.09%	0.19%	0.19%	0.19%	0.20%	0.20%	0.20%	
701 - 1000	2.19	2.28	2.53	2.72	1.47	1.67	1.47	1.67	
1001 - 1350	2.98	5.26	1.44	4.16	2.53	4.20	2.53	4.20	
1351 - 1800	3.34	8.60	2.77	6.93	2.28	6.48	2.28	6.48	
1801 - 2400	5.02	13.62	3.67	10.60	6.31	12.79	6.31	12.79	
2401 - 3150	12.06	25.68	5.38	16.48	7.73	20.52	7.73	20.52	
3151 - 4300	12.78	38.46	10.59	27.07	12.59	33.11	12.59	33.11	
4301 - 5725	15.46	53.92	16.22	43.29	14.06	47.17	14.06	47.17	
5726 - 7500	13.11	67.03	14.16	57.46	15.79	62.96	15.79	62.96	
7501 - 10150	12.69	79.72	14.75	72.20	12.13	75.09	12.13	75.09	
10151 - 13400	8.22	87.94	11.95	84.15	13.72	88.81	13.72	88.81	
13401 - 18000	5.99	93.93	7.54	91.69	6.65	95.46	6.65	95.46	
18001 - More	3.81	97.74	4.79	96.48	3.33	98.79	3.33	98.79	
TOTAL	2.26	100.00	3.52	100.00	1.21	100.00	1.21	100.00	
MEAN INCOME	100.00		100.00		100.00		100.00		344
Source:		5568.83		6472.67		5506.83			

Source: 1977 survey, SPP.

TABLE A.21 INCOME DISTRIBUTION IN MEXICO BY MUNICIPALITY SIZE, 1977
(BY INCOME CLASSES) (CONT'D)

INCOME CLASSES (MONTHLY PESOS)	MONTEFREY		GUADALAJARA		MEXICO CITY	
	HOUSEHOLDS RELATIVE	HOUSEHOLDS ACCUMUL.	HOUSEHOLDS RELATIVE	HOUSEHOLDS ACCUMUL.	HOUSEHOLDS RELATIVE	HOUSEHOLDS ACCUMUL.
- 0	-	-	0.10%	0.10%	-	-
1 - 700	0.68%	0.68%	0.92	1.02	0.78%	0.78%
701 - 1000	0.24	0.92	2.36	3.38	0.68	1.46
1001 - 1350	0.72	1.64	2.08	5.46	1.10	2.46
1351 - 1800	2.75	4.39	2.94	8.40	2.73	5.29
1801 - 2400	5.83	10.22	4.88	13.28	3.61	8.90
2401 - 3150	8.51	18.73	12.60	25.88	8.03	16.93
3151 - 4300	19.71	38.44	16.18	42.06	17.87	34.80
4301 - 5725	12.00	50.44	14.71	56.85	17.17	51.97
5726 - 7500	14.41	64.85	15.44	72.29	13.76	65.73
7501 - 10150	11.36	76.21	11.04	83.33	12.53	78.26
10151 - 13400	9.15	85.36	6.35	89.68	8.35	86.61
13401 - 18000	7.04	92.40	5.37	95.05	6.26	92.87
18001 - More	7.60	100.00	4.95	100.00	7.13	100.00
TOTAL	100.00	8052.33	100.00	6747.50	100.00	7824.50
MEAN INCOME						

The spatial groupings are defined as follows: 1) municipalities with less than 2,501 inhabitants; 2) municipalities with 2,501 to 10,000 inhabitants; 3) municipalities with 10,001 to 100,000 inhabitants; 4) municipalities with 100,001 to 250,000 inhabitants; 5) municipalities with 250,001 to 500,000 inhabitants; 6) municipalities with more than 500,000 inhabitants, excluding the metropolitan areas of Monterrey, Guadalajara and Mexico City.

Data originally presented in semestral terms.

Source: 1977 Survey, SPP.

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