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PEOPLE AND WORKERS IN LATIN AMERICA:

Simulation Experiments with Population and the Labour Force in Selected Countries

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Chapter I

INTRODUCTION

The present study forms part of the work programme in the area of styles of development. In the course of work on a general simulation model designed to experiment with different possible development styles it became clear that employment is likely to remain one of the major problems facing the Latin American economy through the remainder of this century, if not longer. One of the major variables determining the magnitude of the employment problem is of course the size and distribution of the labour force and, behind this, of the population itself. Given the importance of this aspect it was judged advisable to develop a separate, although still quite simplified, population model so that different possible assumptions about population and labour force trends could be investigated and the results made available for use in the general model.

It is these experiments with the population model which are reported on in the present document. In addition, a brief general discussion of the population situation in the region is provided to place the experiments in their proper perspective. In a future stage of the work programme the labour force estimates will be used to investigate the varying aspects of the problem of integrating all of those seeking work into the higher productivity and higher income sectors of the economy.

As noted, the population experiments described are quite simple in concept, do not pretend to carry the analytical rigour required by professional demographers, and are not aimed at this audience. Estimates of all variables were made on the basis of the best data available at the time, but some of these must be regarded as only very approximate. Still, an effort has been made to deal with a number of the central determinants of population and the labour force, and although results can often not be specified with precision they

/are likely

are likely to be of some interest to economists and others concerned with the role of population and the labour force in the development process.

Four contries were selected for the experiments with the aim of giving something of the range of variety throughout the region: Argentina, a highly urbanized country with a relatively low rate of population growth; Venezuela, a highly urbanized country with a high rate of population growth; Brazil, with an average degree of urbanization and a moderately high (and also average for the region) rate of population growth; and El Salvador, a country which remains mostly rural and with a high rate of population growth.

A. General Population Trends and Structures

Total population trends

The simulation experiments reported on here are basically concerned with the 30 year period 1970-2000. This is already a period of such length that nearly all variables can change considerably, and for most purposes there is little point in considering longer intervals. Population trends however are perhaps the long-term variable per se. The underlying parameters often change relatively slowly, and even when they do change can require a prolonged period before working themselves out through the population structure. For this reason the aggregate population was projected first for a 100 year period under each of two limiting hypotheses. This shows a limits within which population movements are likely to lie, and serves as a general framework within which to orient the analysis, which is thereafter restricted to the 1970-2000 period.

The limiting hypotheses refer to age specific birth rates. At one extreme the projection shows what would occur if birth rates remained at about the 1970 levels. At the other extreme it is postulated that the age specific birth rates decline steadily and rapidly for 25 years, by which time (1995) they reach a level which implies approximately zero population growth in a stable population, and then remain unchanged at that level. Both hypotheses are extreme.

/There will

There will almost certainly be future declines in birth rates, which are now often very high, in most countries; and it is most unlikely that within 25 years birth rates will decline to the level consistent with zero population growth. Nevertheless, this does set limits and these, particularly the lower limit, are of some importance, specifically when dealing with the probable size of the labour force during the coming decades.

The results of these projections are presented in table 1, showing, for the limiting hypotheses, the rates of population increase and the absolute size of the population at intervals over the 100 year period.

For practical purposes the information provided by the minimum projection is of greater interest. Although in this projection birth rates in all countries have already declined by the end of the century to a level consistent with zero growth in a stable population, the population is in fact still increasing at a rate of about 1.3 per cent per annum for the region as a whole, and at higher rates in some countries. Even in the year 2035, when birth rates have been at the zero growth level for fully 40 years, the population continues to increase at 0.5 per cent per annum. That is, even with this extreme minimum hypothesis well over half a century would pass before the rate of population increase declined to the present day Western European level. About 100 years would pass before the population become stable and growth actually stopped.

During this period the size of the population would expand substantially. Even with the very rapid decline in birth rates assumed, the population of countries such as El Salvador or Venezuela doubles by the end of the century; the population of Brazil will exceed 175 million at the end of the century, and that of the region as a whole will be well above 500 million. When stability is eventually reached a small country such as El Salvador would have a population of well over 10 million, Venezuela over 35 million, similar to that of Argentina, Brazil about 265 million (similar to the 1970 population of the region as a whole), and the population of all of Latin America would approach 800 million people.

/Table 1

Table 1

SELECTED COUNTRIES: POPULATION GROWTH WITH LIMITING EXTREME HYPOTHESES

	Rate of population increase					Total population (millions)				
	1970	1985	2000	2035	2070	1970	1985	2000	2035	2070
	A. Minimum hypothesis: Birth rates decline to zero growth level in 1995 a/									
Argentina	1.3	0.9	0.6	0.2	0.1	23.8	28.1	31.4	36.3	37.7
Brazil	2.9	2.2	1.3	0.5	0.1	95.2	137.7	177.1	245.8	264.4
Venezuela	3.0	2.7	1.4	0.6	0.1	10.6	16.1	21.4	30.8	34.8
El Salvador	3.3	2.5	1.4	0.5	0.0	3.5	5.3	7.0	9.9	10.5
Latin America b/						276.7	405	520	720	780
	B. Maximum hypothesis: Birth rates remain at 1970 levels									
Argentina	1.3	1.3	1.2	1.2	1.2	23.7	29.0	35.0	53.1	80.6
Brazil	2.9	3.2	3.3	3.2	3.1	95.2	150.2	242.3	730	2 124
Venezuela	3.0	3.5	3.5	3.5	3.4	10.6	17.1	28.9	82.9	310
El Salvador	3.3	3.8	3.9	3.9	3.9	3.5	6.0	10.7	40.8	156
Latin America b/						276.7	437	704	2 121	6 175

a/ Age specific birth rates decline to the point where the gross reproduction rate is 2.2. In a stable population with the death rates expected to prevail in Latin America at the end of this century (and which are continued in the projections) this results in approximately zero population growth.

b/ The figures are for the 20 Republics. Pending the availability of further data no projection has been made for the regional total: the figures are estimates assuming the population of Brazil remains a constant proportion of the total.

/The practical

The practical importance of this projection is that it shows quite clearly that the concept of Latin America as an under populated region, with abundant land and other resources in relation to its population, is only a transitory phenomenon. Even with an extreme hypothesis regarding the decline in birth rates the population of the region will continue to grow rapidly for a prolonged period, and when it stabilizes will be nearly triple the 1970 population. The phenomenon of under population and relatively abundant resources will have passed in most countries in less than 50 years time.

Long term planning in the region will have to be oriented more in this direction. Land and other resources will become increasingly scarce - a minimum of around 800 million people will have to be provided for - and increasing attention will have to be given to the husbanding of these resources. This is likely to have major implications for a wide range of problems: patterns of urbanization and land settlement, natural resource extraction rates and export policy, agricultural development programmes, etc. It should be emphasized that no programme of family planning, or autonomous change, can reasonably be expected to change this situation. The projection is a minimum one, assuming a sharp and rapid decline in birth rates, and the real question is likely to be how far above this minimum the actual trend will lie.

The maximum projection is of interest less as a real possibility than as an illustration of the implausibility of things remaining as they are for a long period. If birth rates were to remain at their 1970 level the population of the region would surpass 700 million at the end of the century. This is 35 per cent more than with the minimum hypothesis, but is still not an impossible difference, and again indicates the very long term and slowly changing nature of population trends. Even with extreme hypotheses the results differ only moderately at first; it is only after several decades that the divergence begins to be striking and to finally reach enormous proportions. Should birth rates continue at the 1970 level for 100 years (with death rates unchanging at the levels expected in the

/year 2000)

year 2000) the population of a small country such as El Salvador would increase to over 150 million people, Brazil would have a population of over 2 billion, and the region as a whole would have a population of over 6 billion - half again as large as the present population of the entire world. Such magnitudes boggle the imagination. The question is not whether this will happen, but rather how and how soon changes will occur which will bring population growth of more manageable proportions.

Age structures at the national level

To return to the minimum projection, it is of interest to note not only the changes in the totals, but also the shifts in the age structure which occur. As was noted above, the population continues to increase fairly rapidly for some time after birth rates have declined to the zero growth level (in a stable population) and this is due to the age structure. The age structure also has major implications for the size and rate of growth of the labour force, the size of the dependent population, educational requirements, etc.

The youthful nature of the Latin American population has been widely commented on, but some of the implications are probably less generally known among non-specialists, particularly when these refer to changes over time; and they are of considerable importance. The major factor determining the age structure, as well as the total rate of increase, is the birth rate; but death rates can also have an important influence and the impact of the two underlying vital rates tends to be of a similar sort.

Birth rates obviously determine the size of the infant population, and changes in birth rates affect the relative size of this group and hence the age structure. Less obviously, a large proportion of total deaths also occur among the very young. In the late 1960s 40 per cent or more of all deaths in the region probably occurred among those less

/than 5

than 5 years of age,1/ and the percentage was probably even higher in earlier years. The bulk of these child deaths, in turn, occurs among infants of less than one year. This situation is a reflection both of the age structure of the population, and of the high child mortality rates which are often encountered, especially before death rates begin to fall substantially.

So changes in mortality rates tend to have a concentrated impact on the very young, and to affect the age structure in a way similar to the effect of changes in the birth rate. In either case it is first the size, and hence relative importance, of the youngest age group which is affected. With time this initial impact then works its way through the age structure in a wave like fashion.

It is useful to illustrate the variations which these kinds of influences have already produced in the region, and the extremes possible with the limiting hypotheses of the projections. Table 2 shows the age structures in the four countries dealt with in the projections.

In Argentina both birth and death rates have for some time been lower than in most of the region and this has already resulted in a distinctly different age structure. Structures in the other countries shown, while varying somewhat, are more similar. The differences are concentrated at the two ends of the age structure. Children (those less than 15 years of age) are a markedly smaller proportion of the population in Argentina, 29.1 per cent of the total. At the other end of the range children account for 47.5 per cent of the population of El Salvador. Adolescents and young adults (the 15-39 age groups) account for surprisingly similar proportions of the population, and the compensating differences are concentrated in the older age groups. In Argentina 33.4 per cent of the population is 40 or more years of age while in El Salvador the corresponding figure is only 16.9 per cent.

1/ There is considerable variation among countries. In Uruguay and Argentina the figure was only about 15 per cent, while in a few countries it was over 50 per cent. There was some concentration around 45 per cent, however, and this included several of the most populous countries. For comparison it may be noted that the figure in Canada and the United States was approximately 5 per cent.

/Table 2

Table 2

AGE STRUCTURES IN SELECTED COUNTRIES a/

Age group	1970				2070
	Argentina	Brazil	Venezuela	El Salvador	Typical with minimum projection b/
0- 4	10.0	16.3	17.3	18.5	7.1
5-14	19.1	26.4	29.5	29.0	13.9
15-19	9.0	10.8	10.8	10.3	6.8
20-39	28.6	27.2	24.8	25.3	26.8
40-65	26.2	16.3	14.7	13.8	30.0
65 and over	7.2	3.0	2.9	3.1	15.4

a/ The figures show the percentage of the total population of the country included in each age group.

b/ The minimum projection eventually results in an approximately stable population in each country and the age distribution is essentially the same in each case.

/The projections

The projections using the maximum hypothesis (unchanging age specific birth rates) yield age structures in 2070 similar to those of 1970 in the respective countries, and are not reproduced in the table. The projections with the minimum hypothesis of eventual zero population growth result in a quite different age structure however - essentially the same for each country - and this is shown in the table. The differences are of the same sort which already occur between the different countries in 1970, but more marked. Children plus adolescents account for only about 28 per cent of the total in a stable population, young adults about 27 per cent, and the older age groups about 45 per cent. To take the most extreme comparison, in El Salvador children and adolescents would decline from 58 per cent of the population in 1970 to 28 per cent, while those 40 or more years of age would increase from 17 per cent to 45 per cent of the population; the percentage of young adults would not change much.

These different age structures have numerous important implications. The dependent population (those under 15 and over 65) represented only 36.3 per cent of the population in Argentina in 1970 whereas the proportion ranged up to 50.6 per cent in El Salvador. Even with similar productivity levels per member of the working population this would mean that per capita incomes would be higher in Argentina. Also, the school age population is relatively much smaller in Argentina and so educational costs less demanding. In an eventually stable population the dependent population would be of the same relative importance as in Argentina in 1970, but the composition would be quite different: there would be relatively fewer children and more retired persons, with consequent social and economic implications.

The most active working age population was approximately evenly split between the younger and older age groups in Argentina in 1970, whereas in El Salvador the younger group outnumbered the older nearly two to one. Thus in Argentina the proportion of experienced workers was much greater than in the other three countries, with

/the various

the various consequences which this might bring.1/ Again the age structure in a stable population is in this respect more similar to the 1970 situation in Argentina - but with a significant further shift toward the older and more experienced part of the working age population.

Reflection will bring to mind other implications of the differences in age structures shown, varying according to one's principal interests.

The 1970 age structure shown in table 2 are already the result of changes over time in the different countries, and as these changes have important implications for parts of the following discussion they too need to be noted. The type and extent of change which has occurred in recent decades can be illustrated with the figures for Venezuela shown in table 3.

As shown, the relative size of the child population has increased substantially in recent decades: from 41 per cent of the total in 1936 to 46.8 per cent in 1970, with most of the increase occurring in the single decade of the 1950s. This again illustrates how the initial impact of changes in the underlying vital statistics tends to be concentrated on the youngest age group. There was some increase in birth rates, probably the result of improved health conditions, but the decline in mortality rates seems to have been more important, and this too had its most concentrated effect on the very young.

1/ As is shown later in the more specific country analyses, the age structure of the labour force itself varies from the age structure of the population due to differing labour participation rates. The date therefore provide only an approximate idea of the labour force distribution.

/Table 3

Table 3

VENEZUELA: AGE STRUCTURE OF THE POPULATION IN RECENT DECADES a/

Age group	1936	1941	1950	1960	1970
0- 4	15.0	15.8	17.6	19.2	17.3
5-14	26.0	25.6	24.8	26.8	29.5
15-19	10.4	10.4	9.9	9.1	10.8
20-39	30.0	29.4	29.1	27.4	24.8
40-65	15.4	15.3	15.2	14.8	14.7
65 and over	3.2	3.4	3.4	2.6	2.9

a/ The 1950 to 1970 figures are from CELADE. The 1936 and 1941 figures are census figures approximately adjusted so as to be directly comparable to the CELADE figures.

It is first the infant population (those less than 5 years of age) which begins to increase in relative importance - during the 1940s and 1950s this group grew sharply in relative size. Then in the mid-1960s birth rates began to decline and so the relative importance of the infant population in 1970 fell from its earlier peak, and the surge of the 1940s and 1950s was beginning to work its way through the age structure. During the 1950s and 1960s the 5-14 year group increased sharply in relative importance, and in the 1960s the adolescent population was similarly affected. But the surge has only begun to enter the adult population and so these groups have continued to decline in relative importance.

Again there are numerous implications which follow from these changes. In the 1950s and 1960s the rapidly rising elementary school population can be expected to have exerted increasing pressure on the educational system. In the 1960s this pressure will have spread to the secondary and university level.

/Of the

Of the impacts only just beginning one is of particular importance from the present point of view. The surge is only beginning to enter the age groups which make up the labour force. In the 1960s the number of new entrants to the labour force can be expected to have increased sharply, with consequent pressures for additional employment, and this pressure can be expected to continue for some years to come.

A second consequence which can be noted is that the surge is also just beginning to enter the child bearing age groups, and this will have an important impact on total births in coming years, quite apart from the trend in age specific birth rates.

This sequence shown for Venezuela can be regarded as fairly normal, although the changes are sharper than those which have occurred in some countries. First an improvement in health conditions leads to a sharp increase in the size of the infant population, largely as a result of the fall in infant mortality rates but also to some extent through a possible rise in birth rates. This surge will then begin to work its way through the age structure. Finally, at some point birth rates may decline and counteract this tendency toward increase.

In most of Latin America the substantial decline in death rates appears to have begun in the 1940s, while trends in birth rates have been more varied. Of the countries considered here, birth rates in Argentina seem always to have been lower than in most countries, and have been declining gradually for some time. In Brazil birth rates have also been somewhat lower than in a number of countries - although well above the Argentina level - and there was a slight decline during the 1950s and 1960s. In Venezuela birth rates have been at a high level and began to decline significantly only in the mid-1960s. In El Salvador they have also been high and through 1970 had not shown a marked tendency to decline.

The tendency for a substantial decline in mortality rates to occur well ahead of any compensating change in fertility rates also results in a speeding up of the rate of population growth, a fact

/that has

that has been more widely commented on. But it is worth repeating the figures for the region as a whole to emphasize the magnitude of the change. In recent decades, the average annual rates of population growth in Latin America were as follows:

1920-1930	1.9 per cent
1930-1940	1.9 per cent
1940-1950	2.4 per cent
1950-1960	2.8 per cent
1960-1970	2.8 per cent

As observed above it is in the 1940s that falling mortality rates introduced a sharp change, and this continued apace through the 1950s. In those two decades the annual rate of population increase rose by nearly half. The 1960s was a period of transition: the rate of increase was stabilized at a high level - a result of offsetting trends in different countries. The current expectation is for a decline, due to falling birth rates; but it is not expected that, for the region as a whole, the rates of population growth of the 1920s and 1930s will again prevail in this century.

Labour force trends

It is very important to keep in mind that due to the changes which brought it about this speeding up of the rate of population increase has been accompanied by a shift in the age structure of the population. To date this has meant primarily an increase in the number of children and adolescents, but in coming years this surge will work its way through the rest of the age structure. There is one aspect of this which is of special interest here and needs to be made explicit: the implications for the labour force and so for employment prospects.

/Table 4

Table 4 shows, for each of the four countries considered, how fast a hypothetical labour force has grown since 1950, and how fast it might increase in the future. The labour force is hypothetical as it assumes there is no change in labour participation rates. The figures thus illustrate how population growth and changes in the age structure alone affect the labour force.1/ To 1970 the population figures are those of CELADE. From 1970 on they are the figures which result from the minimum projection, which assumes that birth rates decline to the eventual zero growth level in 1995. This minimum projection is of greater interest as it shows the lowest rate of increase in the labour force which must be anticipated - and as can be seen even this rate will remain high for some time.

The figures in table 4 give, again, a rather different picture for Argentina than for the other countries considered. At the beginning of the period shown the labour force was already growing less rapidly in Argentina than elsewhere, and this divergence became steadily greater through the 1950s and the 1960s. Whereas in Argentina the rate of increase declined from the level of the early 1950s, in the other countries it increased substantially.

The problem of employment has not been of the same serious nature in Argentina as in some countries of the region - despite the fact that the rate of economic growth during the 1950s and 1960s was relatively low, and that the population was very largely urban so that employment problems tend to be more conspicuous. A major element keeping the employment problem under reasonable control in these circumstances was undoubtedly this tendency for the labour force to increase at a more moderate rate. If the trend in Argentina had been similar to that of the other countries shown the situation would have been much more serious.

1/ Possible effects of changes in labour participation rates are considered in the simulation experiments discussed later; but it is first useful to emphasize the tendency of basic underlying population changes.

/Table 4

Table 4

SELECTED COUNTRIES: HYPOTHETICAL ANNUAL RATES OF INCREASE IN THE LABOUR FORCE a/

	Argentina	Brazil	Venezuela	El Salvador
1950-1955	1.7	2.7	2.5	2.2
1955-1960	1.5	2.7	2.8	2.4
1960-1965	1.4	2.9	3.2	2.8
1965-1970	1.4	3.1	3.5	3.1
1970-1975	1.4	3.1	3.8	3.6
1975-1980	1.2	3.0	3.7	3.6
1980-1985	1.1	2.9	3.4	3.4
1985-1990	1.0	2.7	3.1	3.1
1990-1995	1.0	2.5	2.9	2.9
1995-2000	0.9	2.2	2.7	2.6
2010-2015	0.4	1.1	1.3	1.2
2030-2035	0.1	0.5	0.6	0.6
2065-2070	0.1	0.1	0.1	0.0

a/ The rates of increase shown are those which would result if no changes in labour participation rates occurred. A fixed set of labour participation rates by age group - the ILO estimates for 1960 for each country - are applied to the population figures for each year. Through 1970 the population figures are the CELADE estimates. After 1970 they are the figures which result from the minimum hypothesis projections. In both cases they exclude international migration.

/But Argentina

But Argentina is an exception, and the other countries are more typical of what has occurred in the region as a whole. There are two aspects of the labour force trends in these countries which are of particular interest here. First, there has been a steady rise in the rate of increase in the labour force over the past two decades. The rise was sharper in Venezuela and El Salvador than in Brazil, but it was substantial in each country. Further, the rates of increase in the early 1950s were no doubt already well above those of earlier decades. This speeding up of the growth of the labour force reflects, with some lag, changes in population growth rates. As discussed earlier, the substantial decline in death rates, with its impact on population growth, generally began around 1940, and can be expected to have begun to be more fully reflected in labour force changes toward the end of the 1940s. During the decades of the 1920s and 1930s this hypothetical labour force was probably increasing at only slightly over 2 per cent per annum in Brazil and Venezuela and at less than 2 per cent per annum in El Salvador.

This substantial speeding up in the growth of the labour force in recent decades - from around 2 per cent to 3 per cent or more per annum in most countries - has undoubtedly been a major factor behind the increasing awareness of the lack of adequate employment opportunities. This factor alone could often create difficulties: an economic structure capable of absorbing an annual 2 per cent increase in the labour force could become increasingly inadequate in this respect as the annual increments rose to half again that level. There are of course other important factors: increasing urbanization, so that employment problems become more visible; changes in the industrial structure toward more capital intensive and labour saving techniques; etc. But it is important to keep in mind that the basic underlying population variables have changed in such a way as to themselves make the employment problem substantially more difficult to deal with in recent years.

/The second

The second aspect of these labour force trends which is important here is that this pressure can be expected to continue for some time, and even on occasion to increase further during the 1970s and 1980s. As shown in table 4, with the assumptions used the rate of increase in the labour force reaches a peak in Brazil in the last half of the 1960s and the first half of the 1970s; while in Venezuela and El Salvador the peak - in each case considerably higher than in Brazil - is reached only during the decade of the 1970s.

From the 1980s on the rates of increase gradually decline, but it will be recalled that this is on the basis of a projection which assumes a rapid fall in birth rates - to an eventually zero growth level in 1995. Even with this extreme hypothesis the labour force will continue to grow rapidly through the 1970s and 1980s; and at the end of the century the rate of increase is still 2.8 per cent and 2.6 per cent per annum in Venezuela and El Salvador respectively, and only in Brazil has fallen back to 2.2 per cent. In absolute terms the numbers continue to rise well after the rate of increase has begun to decline. In Venezuela the absolute increase in the labour force toward the end of the century would be about double the yearly increase registered in the late 1960s; and even in Brazil the number to be absorbed each year would be nearly two-thirds larger. It is only well into the next century that the growth of the labour force (as here defined) begins to slow to the levels which now commonly prevail in the advanced industrial countries, and that the absolute numbers to be absorbed begin to decline.

Even with extreme hypotheses then the underlying population characteristics ensure that the labour force will continue to grow rapidly in most of the region through the rest of this century. In many countries this growth will actually speed up in the years immediately ahead. Employment policies must therefore be framed to deal with employment pressures about as great as those which have been experienced in recent years, and with the expectation that the situation in the 1970s and early 1980s is likely to be especially

/serious in

serious in this respect. To the extent that birth rates decline less rapidly than in this extreme hypothesis the period of maximum pressure will extend further into the future.

There is one qualification to this picture which needs to be mentioned here, even though it can only be adequately treated later with the aid of the simulation experiments. It is the urban employment situation which is usually of greatest concern to policy makers, and rural-urban migration can cause the rate of increase in the urban labour force to vary greatly, independently of the trend for the labour force as a whole.

Table 5 shows rates of growth of the urban population in recent decades, from which it can be presumed that the urban labour force in each of these countries has increased much faster than the figures shown in table 4. In Venezuela and Brazil in particular the urban labour force has grown very rapidly during the post-World War II period.

Both recent and future trends depend heavily on how far urbanization has gone and how fast it is progressing. In a country such as Venezuela, where urbanization has been rapid and has gone relatively far (only about one-fifth of the population is still rural), this has meant both a period of extremely rapid growth in the urban labour force and the probability that future increases will be more moderate; already in the 1960s the rate of increase in the urban population, although still nearly 5 per cent per annum, was well below that of the preceding two decades. In a country such as El Salvador, by contrast, the bulk of the population is still rural, and the possibility of a speeding up of migration and a consequent much faster growth of the urban labour force remains in the future.

As noted this aspect is discussed more fully in the context of the simulation experiments.

/Table 5

Table 5

SELECTED COUNTRIES: INTERCENSAL RATES OF POPULATION INCREASE

	National average	Rural	Urban		
			Total a/	Cities with 50 000 to 500 000 in 1960 b/	Cities with 500 000 or more in 1960 b/
Argentina					
1914-1947	2.1	1.4	2.7	2.9	2.6
1947-1960	1.8	(-) 1.0	3.0	2.8	2.7
1960-1970	1.6	(-) 2.9	2.8	...	...
Venezuela					
1936-1941	2.7	1.2	5.3	3.8	6.5
1941-1950	3.0	(-) 0.1	6.7	7.4	7.8
1950-1961	4.0	0.5	6.3	6.3	6.6
1961-1971	3.4	(-) 0.5	4.9	...	...
Brazil					
1940-1950	2.3	1.6	3.9	4.8	4.6
1950-1960	3.0	1.3	5.5	6.2	4.3
1960-1970	2.9	0.9	4.8	...	...
El Salvador					
1930-1950	1.3	1.4	1.1	2.5	-
1950-1961	2.8	2.5	3.3	4.0	-
1961-1971	3.5	3.3	3.8	...	...

a/ Urban population as defined in census data. This includes smaller cities not shown in either of the following two columns.

b/ The rates of growth in these columns refer to a fixed list of cities, with the composition of the list determined by the population in 1960. The rates of growth are therefore not effected by cities shifting from one category to another as the population increases. The data are from CELADE, Boletín Demográfico, Año IV, Nº 9.

/Urban-Rural

Urban-rural and regional differences

The discussion up to this point has concentrated on population characteristics at the national level, with some references to trends in Latin America as a whole. There are often, however, important differences within individual countries, and these are not only of interest in themselves, but are also important factors in determining trends at the national level. One of the important reasons for undertaking the simulation experiments discussed later was precisely to try to take into account these differences and to appraise their impact on the national aggregates. These urban-rural, and on occasion regional, differences are therefore discussed in more detail later; but it is useful here to point out several of the main features.

First, there is the widely noted fact that the urban population is generally increasing much faster than the rural population. Trends in the countries being considered are shown in table 5. In both Argentina and Venezuela migration to the cities has for some time more than offset the natural increase in the rural population: in Argentina the absolute size of the rural population has declined substantially since the mid-1940s and in Venezuela there has been a small net decline since 1941. In Brazil the rural population has continued to increase, at least through 1970, but the rate of increase since 1940 has been falling steadily and is ever further below the national average. Only in El Salvador is the situation somewhat different. In that country the rural population has grown faster in recent decades, in line with the rising rate of total population increase, and even grew somewhat faster than the urban population until around 1950.

With this single exception the urban population in each country, and in all recent intercensal periods, increased at a faster rate than the rural population. In El Salvador the difference is modest, but in the other three countries it is striking. At the extreme, in Venezuela the urban population increased throughout the 1940s and 1950s at an average rate of about 6 1/2 per cent per annum.

/Table 5

Table 5 also shows the rates of population increase in the larger cities in the different countries, an aspect which has also received considerable attention. As can be seen, the expansion of these larger cities is often, but not always, even faster than that of the urban population as a whole.

As was discussed earlier, at the national level there is substantial variation in the age structures of the different countries; and within a particular country somewhat similar variations can be observed between the urban and rural populations and on occasion on a regional basis. Table 6 shows the urban and rural age structures in each of the four countries. Table 7 shows the same data in a somewhat different form: how each age group is divided between the urban and rural areas.

The differences in age structure are quite consistent, and often substantial. The percentage of children (up to 15 years of age) is in each country a much larger proportion of the rural than of the urban population, the difference ranging from 11 percentage points in Argentina down to 5 in Venezuela. This gap may well widen for some time in some countries, primarily because the decline in birth rates, and the consequent reduction in the relative importance of the youngest age groups, tends to occur first in the urban areas.

The 15-19 age group is where the transition occurs. In Argentina this group, like children, is a smaller proportion of the urban than of the rural population; in the other countries it is relatively larger in the urban areas but the differences are rather small.

/Table 6

Table 6

SELECTED COUNTRIES: PERCENTAGE COMPOSITION, BY AGE GROUP, a/ OF THE URBAN AND RURAL POPULATIONS

Age group	Argentina		Brazil		Venezuela		El Salvador	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
0- 4)			13.1	17.1	17.3	19.9	15.6	18.1
5-14)	27.8	38.8	25.6	29.2	26.2	29.6	25.7	28.8
15-19	8.0	9.6	11.1	10.9	9.3	8.5	10.0	9.4
20-39	31.5	27.3	29.1	25.4	29.8	23.9	28.1	26.2
40-64	26.3	19.8	17.5	14.6	14.9	15.3	16.6	14.7
65 and over	6.4	4.5	3.5	2.7	2.5	2.7	4.0	2.8

a/ The calculations are based on the latest available census data. This is the 1970 census for Brazil and those taken around 1960 for the other countries.

/Table 7

Table 7

SELECTED COUNTRIES: PERCENTAGE DISTRIBUTION OF EACH AGE GROUP a/ BETWEEN URBAN AND RURAL AREAS

Age group	Argentina		Brazil		Venezuela		El Salvador	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
0- 4)	66.8	33.2	49.4	50.6	59.1	40.9	35.0	65.0
5-14)			52.7	47.3	59.6	40.4	35.9	64.1
15-19	70.2	29.8	56.3	43.7	64.4	35.6	39.9	60.1
20-39	76.4	23.6	59.3	40.7	67.6	32.4	40.2	59.8
40-64	78.9	21.1	60.3	39.7	61.9	38.1	41.4	58.6
65 +	79.8	20.2	62.2	37.8	61.2	38.8	46.6	53.4
Tot. pop.	73.8	26.2	55.9	44.1	62.5	37.5	38.5	61.5

a/ Calculations are based on the same data used for table 6.

/The adult

The adult population as a whole - those 20 or more years of age - is the counterpart of the child population and is a more important part of the urban population in each country, although there is a good deal of variation within this total. In Argentina it is the older half of the adult population which is of strikingly greater relative importance in the cities; in Brazil and El Salvador all of the adult population is uniformally, if more modesty, of greater relative importance in the cities; and in Venezuela the young adults are of much greater relative importance while the older half of the adult population is actually a slightly smaller proportion of the total in the urban areas. These variations reflect the shifting importance of the two principal factors underlying these differences in age structure: birth rates and the importance of migration. In Venezuela, for example, migration was very substantial during the 1940s and 1950s, and since it is primarily the young who migrate this resulted in an unusually large concentration of young adults in the urban areas.

There are also important differences from one country to another. Although there are consistent differences between the rural and urban age structures within each country, not all urban (or rural) age structures are alike; in particular, the rural age structure in Argentina is more similar to the urban than to the rural structures in the other countries. Further, when seen in this cross classified way the range is very great. The relative importance of children, for example, varies from less than 28 per cent of the urban population in Argentina to nearly half the rural population in Venezuela. Other differences can be seen by examining the data shown in table 6.

Table 7 shows the same data organized somewhat differently: the percentage of each age group which lives in the urban and rural areas of the country. The youngest age group is always of greatest relative importance in the rural areas (and least important in the cities). In Venezuela the rural percentage falls steadily through the young

/adult group

adult group and then rises again for the older adult population. In the other three countries the rural percentage continues to fall steadily throughout the age structure.

These different age structures tend to aggravate one of the major economic problems in the region, the much lower productivity and income levels in the rural areas. Since the dependent population is everywhere a substantially higher proportion of the total in the rural areas this pulls per capita incomes even further below urban levels than would anyway occur because of the lower productivity per worker. In addition, children comprise the great bulk of this dependent population and this aggravates the educational problem. Children, relative to the rest of the population, are concentrated in the rural areas, where adequate educational facilities are in any case more difficult to provide and where low incomes limit the local contribution.

This population structure is likely to be an important aspect of the difficulties of the rural areas: except for Argentina, only about half of the rural population is in the active age groups, even if these are stretched to include all those from 15 to 65 years of age.

It is also worth noting that women appear to migrate to the cities in significantly greater numbers than men, perhaps reflecting the type of employment most easily found in the urban areas - domestic and other low income service positions commonly filled by women are probably more readily available. For the different countries table 8 shows the proportion of women and of men, in each age group, which live in the urban areas. The proportions are essentially the same for the 0-4 age group, reflecting birth patterns, but thereafter a consistently higher proportion of the female population is found in the cities.

/Table 8

Table 8

SELECTED COUNTRIES: PROPORTIONS LIVING IN URBAN AREAS, BY SEX AND AGE GROUP a/

Age group	Argentina		Brazil		Venezuela		El Salvador	
	Males	Females	Males	Females	Males	Females	Males	Females
0- 4)			49.3	49.3	59.0	59.0	34.9	35.1
5-14)	66.2	67.3	52.1	53.3	58.4	60.7	35.3	36.6
15-19	67.4	72.9	53.9	58.4	62.1	67.0	37.5	42.2
20-39	74.6	78.3	57.5	61.0	67.6	67.5	37.8	42.6
40-64	76.4	81.5	57.7	62.9	59.5	64.4	37.4	45.3
65 +	76.4	82.9	57.7	65.9	53.4	66.4	39.0	51.3

a/ For each country the figures show the percentage of the male (or female) population of any given age group which lives in the urban areas. For example, in Argentina 66.2 per cent of all males in the 0-14 age groups live in the cities; the remaining 33.8 per cent (a figure not shown in the table) live in the rural areas.

/Similar differences

Similar differences in the age structure may also occur between different regions within a country, a situation which can be illustrated with data from Brazil. Table 9 shows the age structure in the state of Sao Paulo, a high income area, and in the Northeast region, a low income area; in both areas urban and rural age structures are shown separately so that the urban-rural and regional influences are not mixed. Table 10 again shows the same information in different form: for each age group the proportion of the nationwide total living in the different zones.

The figures in table 9 show the now familiar and consistent sort of variation. At one extreme is the age structure in the urban areas of Sao Paulo, with a relatively small proportion of children and with a large proportion of the population in the active age groups - and comparison with the figures in table 6 shows that this is a shift of that sort also by comparison with the figures for the urban areas of Brazil as a whole. The rural areas of Sao Paulo have an age structure very similar to that of the cities of the Northeast, an intermediate situation. And at the other extreme is the age structure of the rural Northeast, with a large dependent population and a much smaller proportion in the active age groups.

Table 10 shows the cities of Sao Paulo to have only 12 per cent of the infant population of the country to care for (those less than 5 years of age), but close to 18 per cent of the most active age groups (those 20-64) to provide income. The rural areas of the Northeast have 21 per cent of the infant population but only 16 per cent of the major income earning groups.

The consequences of such differences are similar to those which have been mentioned in earlier sections.

/Table 9

Table 9

BRAZIL: AGE COMPOSITION OF THE URBAN AND RURAL POPULATIONS IN SAO PAULO AND IN THE NORTHEAST, 1970 a/

Age group	State of Sao Paulo		Northeast Region	
	Urban	Rural	Urban	Rural
0- 4	11.6	15.1	15.6	17.7
5-14	23.6	28.2	27.5	29.1
15-19	10.4	11.0	11.4	10.7
20-39	31.4	26.9	26.5	24.6
40-64	19.3	16.1	15.7	14.8
65 and over	3.8	2.7	3.3	3.1

a/ Percentage figures calculated from unadjusted census data.

/Table 10

Table 10

BRAZIL: PERCENTAGE OF NATIONAL POPULATION IN SELECTED AREAS, BY AGE GROUP a/

Age group	State of Sao Paulo		Northeast Region	
	Urban	Rural	Urban	Rural
0- 4	11.9	3.8	13.2	20.9
5-14	13.3	3.9	12.7	18.8
15-19	14.5	3.7	13.0	17.0
20-39	17.5	3.7	12.2	15.7
40-64	18.2	3.7	12.2	16.0
65 and over	18.5	3.2	13.3	17.2

a/ The figures show the percentage of the population of any age group living in the designated area. For example, 11.9 per cent of those less than 5 years of age in Brazil live in the cities in the state of Sao Paulo. The percentages across do not sum to 100 as major areas of Brazil are not included in the table. Calculations are from the data of table 9.

B. The Simulation Experiments

The simulation experiments are designed to provide detailed projections, to the year 2000, of population and labour force trends in the selected countries. They are of course not predictions, but rather calculations of what will occur given specified assumptions about the variables which determine the model. The principal variables involved are birth and death rates to calculate population trends, and then labour force participation rates to derive the labour force. Each of these variables is specified by sex and by 5 year age groups. In addition, one of the central aims of the simulation experiments is to calculate the effect of urban-rural and regional differences, so each of these variables is given a set of values for each of the regions considered, and within each region for the urban and the rural areas. This makes necessary the consideration of internal migration, and so migration rates are another central variable; again these are specified by sex and by 5 year age group. For Venezuela and El Salvador the experiments distinguish only the urban and the rural areas, but for Argentina and Brazil regional divisions are also taken into account.

The first step was to estimate all of these values for the base year, 1970.1/ The CELADE estimates of population, by 5 year age groups, and of age specific birth and death rates, provided figures at the national level for each country. Then, with the use of census data, estimates were made of urban-rural and, where used, regional differences for each of the variables in the model. Values, by sex and 5 year age group, were calculated for each region and/or the urban and rural areas so that they were consistent with the CELADE aggregate estimates for the country. Labour force participation rates and the age structure of internal migration were estimated on the basis of census data alone.

1/ For Venezuela and El Salvador detailed data from the 1970 censuses were not yet available so estimates were originally made for 1960 and then calculations were made to reproduce the 1970 situation insofar as this was known.

/Starting with

Starting with these base year estimates, the simulation experiments calculate trends to the year 2000 with a given set of assumptions as to how the values of the underlying variables will change during that period. Five different simulation experiments were run for each country. Some of the more specific assumptions made for the individual countries are discussed later, but the experiments were designed to have a common pattern for each country, and their general nature can be given here.

The first experiment assumes relatively little change from the 1970 situation. Fertility rates decline only moderately, there is relatively little internal migration, and labour force participation rates remain nearly unchanged. Changes are generally of similar magnitude in different areas of the country; that is, there are no important relative shifts between different regions and/or the urban-rural areas.

The second experiment postulates very great changes, within a context of economic and social change which is largely concentrated on the more modern areas. In this context the variables are changed mostly in the more advanced regions and/or in the urban areas. Substantial internal migration is postulated, toward the more developed regions and/or toward the cities; urban fertility rates decline sharply - at least in the more developed regions to around the zero growth rate in a stable population; urban labour force participation rates shift to about the present European values (the 1968 French rates). The changes in the less developed regions and/or the rural areas are not as sharp, but are still more substantial than those postulated in the first experiment.

The third experiment again assumes that changes are concentrated on the more modern areas, but the changes in these areas, while still substantial, are not as great as in the second experiment. The changes in the less developed regions and/or the rural areas are similar to those postulated in the second experiment.

The fourth experiment assumes a different type of economic and social change: one concentrated largely on the less modern areas.

/There is

There is less migration here than in any of the other experiments, and a larger proportion of the population remains in the less developed regions and/or the rural areas. And it is primarily the variables in these areas which are changed: fertility rates decline substantially, and move much closer to those in the more developed regions and/or the urban areas; labour force participation rates shift approximately to the present structure in the more developed regions and/or the cities. In the context of this experiment, more moderate changes are projected for the more developed regions and/or the urban areas.

Finally, the fifth experiment assumes a more balanced change, spread through the more modern and the less modern areas. The population structure toward the end of the century, as between the different regions and the urban-rural areas, is intermediate between those projected in the third and in the fourth experiments; and the values assigned to the different coefficients are also intermediate between those used in these two experiments.

The values assigned to mortality rates have not been mentioned in this description of the simulation experiments. This simplified the discussion, and was done because mortality rates have less differential impact in the calculations than the other variables. In the CELADE population projections four alternative possibilities are normally presented. Each of the four postulates a different rate of decline in birth rates, but as there is less uncertainty about mortality trends the same mortality rates are used in each of the four projections. A similar procedure has been followed in the simulation experiments. Mortality rates are often different in different areas of the country, and these differences have been estimated for the base year, 1970. The CELADE projections to the end of the century are then used as the guideline. In the first three simulation experiments it is assumed that mortality rates in the different areas all decline in line with the CELADE projections; that is, the structure of relative mortality rates in different areas

/does not

does not change. In the fourth experiment it is assumed that, as part of the concentration on the less modern areas, mortality rates in these areas are gradually reduced to the level of those prevailing in the cities; by the end of the century mortality rates are uniform throughout the country. The fifth experiment here too represents an intermediate position between the fourth experiment and the others.

The results of these simulation experiments can best be analyzed by first examining separately, and in some detail, the set of results for each country. Later an attempt is made to draw more general conclusions by comparing the different country projections. It is simplest to begin with Venezuela and El Salvador, where only an urban-rural division is used, and then take up Argentina, where two regions are distinguished as well as the urban-rural breakdown, and finally Brazil, where three regions are used in the model.

/Chapter II

Chapter II

VENEZUELA

A. The Situation in 1970 and the Main Variables of the Simulation Experiments

Venezuela is a high income country in which modern type activities account for a relatively large proportion of total production and employment. One central aspect of this is a largely urban oriented economy, and this is reflected in the population structure: in 1970 three-quarters of the population lived in cities with 2,500 or more inhabitants.

This level of urbanization is the result of very substantial migration from the rural areas during the past several decades. As late as 1940 over 60 per cent of the total population was rural, but since that date there has been no increase even in the absolute size of the rural population and its relative importance has fallen steadily and sharply, to only about 22 per cent of the total in 1970.1/ This has been a period of very rapid population growth in Venezuela, and with the natural increase going entirely to the cities, the urban population in 1970 was 5 1/2 times what it had been thirty years earlier.

One important implication of this situation is that the massive internal migration of recent years cannot continue much longer, for the urbanization process is already quite far advanced.

1/ Rural here is according to the census definition: those living in communities of less than 1,000 persons. Until 1961 this was the basic census division. Beginning with the 1961 census there are three major groups: rural (less than 1,000), intermediate (1,000 to 2,500), and urban (more than 2,500). The intermediate area accounted for only 3 per cent of the population in 1970, and as the underlying population variables were very similar to those in the rural areas these two are joined and considered "rural" in the simulation experiments. The absolute size of the intermediate population declined from 1961 to 1971, indicating that internal migration was entirely toward the larger urban communities.

/Migration flows

Migration flows will increasingly have less impact on the structure of the urban population, but more on the rural population from which it is drawn. Up to the early 1960s migration appears to have accounted for perhaps half of the total increase in the urban population, but this proportion has already begun to fall, and is unlikely to be more than one-fifth by 1980. Migration on that scale in 1980, however, would involve a substantial decline in the absolute size of the rural population. Migration will therefore almost certainly be a steadily less important factor in the cities; but if it continues on a substantial scale will have an increasingly profound impact on the rural economy.

Another central variable which needs to be mentioned here is the birth rate. Fertility rates in Venezuela are still high, and have only begun to decline significantly in very recent years (since 1965 according to the CELADE estimates). The rate of population growth as a consequence is of course also high. There is an important difference in fertility rates in the urban and in the rural areas - the base year estimates of fertility rates in the countryside are nearly 40 per cent higher than those for the cities - but they are still high in both areas.

In the years immediately preceding 1970 we have estimated that the total fertility rate 1/ in the cities was about 5.4, while in the rural areas it was 7.5. Although it would vary somewhat with the level of death rates, a total fertility rate of around 2.2 would eventually result in zero population growth (after the prolonged period required to reach a stable age structure). Even in the cities

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1/ The total fertility rate is the number of children the average woman would have if age specific birth rates throughout her fertile life remained constant at the values estimated in a particular year. That is, it is the sum of the age specific birth rates for women aged 15 to 49, inclusive. It can be roughly thought of as the size of the average family which would result with any given level of fertility. This is a more precise measure of fertiity trends than a measure such as the gross birth rate (which is affected by the age structure of the population) and will be generally used throughout the analysis.

/birth rates

birth rates are far above this level and the rate of natural increase is therefore still high. But birth rates are well below those in the rural areas, and so migration to the cities can have an important impact on the average rate at the national level - assuming, as the model does, that migrants tend to adopt fairly rapidly the practices of the city, and that the urban values can therefore be applied to recent migrants.

The importance of this aspect is increased by the fact that migration tends to be heaviest among teenagers and young adults, and thus there is a disproportionate shift to the cities of the age groups where birth rates are high. That it is primarily the young who migrate is a fact which has been widely commented on, but it is rather surprising just how young many migrants in Venezuela appear to have been, and the structure of the migration is worth noting. The estimates refer to the 1950s, when as already noted migration to the cities was very large.1/

The first noteworthy feature is that considerably more women than men migrated to the cities. Although in 1950 there were significantly more males than females still living in the rural areas, during the 1950s there were actually about 10 per cent more female than male migrants. About 32 per cent of the 1950 rural female population was living in the cities 10 years later; the corresponding figure for males was only 27 per cent.

1/ The estimates were made by comparing data from the 1951 and the 1961 censuses. Essentially, the rural population of a given age group in 1951 was projected to 1961 by applying the estimated death rates for the 10 year period. This calculated population was then compared to the 1961 census figure and the difference was taken as an estimate of migration. The actual calculations were somewhat more complicated as the adjusted CELADE estimates were used as the basis for the calculations rather than the uncorrected census figures. As a check, similar calculations were made for the urban area to estimate the inflow for each age group. The two sets of calculations gave nearly identical results and so the estimates can be considered a reasonably accurate description of what actually occurred.

/The very

The very young accounted for the bulk of this large migration: about two-thirds of those who migrated were less than 25 years of age. This percentage is similar for both males and females, but the structure is somewhat different: females seem to have begun to move to the cities in large numbers before the age of 15, while the surge in male migration began only when they were about 5 years older. Also, while male migration virtually ceased after the age of 35, significant female migration continued into old age. An approximate and complete stucture by 5 year age groups, consistent with the data for the 1950s, is as follows:

PERCENTAGE OF THE RURAL POPULATION WHICH MIGRATES IN A FIVE-YEAR PERIOD a/

Age group	Percentage which migrates	
	Females	Males
0-4 to 5-9	10	10
5-9 to 10-14	22	13
10-14 to 15-19	26	24
15-19 to 20-24	20	25
20-24 to 25-29	16	19
25-29 to 30-34	15	14
30-34 to 35-39	15	11
35-39 to 40-44	14	10
40-44 to 45-49	14	9
45-49 to 50-54	14	8
50-54 to 55-59	13	8
55-59 to 60-64	12	8
60-64 to 65-69	12	8
65-69 to 70-74	12	8

a/ About 15 per cent of the entire rural population would migrate during a five-year period with these figures. The age group column shows the age at the beginning and at the end of the five-year period; that is, the first row shows migration by those who were in the 0-4 age group at the beginning, and therefore in the 5-9 age group at the end of the five-year period.

/It is

It is worth noting that because of the nature of the census data estimates of this sort overstate the amount of migration where this is taken to mean physical movement from one locality to another. If a community grows in size so that, whereas it was classified as rural in the preceding census, it is now classified as urban, the entire populace will be included in our estimates of "migration". For some purposes it is important to try to eliminate this aspect, and a very approximate calculation can be made on the basis of the above figures. It can be assumed that migration of males above 50 is zero, and that the figure which is shown (8 per cent) is therefore a rough estimate of the percentage of each age group which is included in the migration figure because the community in which they lived became reclassified as urban. If this 8 per cent is substracted from each age group the percentages of those who actually moved to an urban community would be about as follows:

Age group	Percentage which physically migrates	
	Females	Males
0-4 to 5-9	2	2
5-9 to 10-14	14	5
10-14 to 15-19	18	16
15-19 to 20-24	12	17
20-24 to 25-29	8	11
25-29 to 30-34	7	6
30-34 to 35-39	7	3
35-39 to 40-44	6	2
40-44 to 45-49	6	1
45-49 to 50-54	6	0
50-54 to 55-59	5	0
55-59 to 60-64	4	0
60-64 to 65-69	4	0
65-69 to 70-74	4	0

This more clearly shows the aspects already mentioned. Female migration is markedly larger than male migration at very early ages.

/And although

And although there is a definite concentration of migration among young women, it continues to be significant throughout all age groups. Male migration on the other hand begins somewhat later, and is almost entirely compressed into a 25 year age span. Looked at in this way, more than three-quarters of all migrants were less than 25 years old (more than 80 per cent of all males, but rather less than three-quarters of the females).

It has seemed advisable to discuss the structure of migration in some detail as this can be an important aspect of population trends in countries where substantial migration is occurring. On a simple urban-rural basis estimates of this sort are accurate enough to be very useful. For Venezuela calculations were made for both the rural (outmigration) and the urban area (inmigration) as a check, and there was very close correspondence between the two sets of figures. Similar calculations were made for the other countries and, with some variation from one country to another, the results support those obtained for Venezuela. Some of the special features are noted in the discussion of the other countries.

Finally, for most age groups death rates in Venezuela are substantially higher in the rural areas than in the cities. Up to the age of 35 we have estimated that death rates average around 60 per cent higher in the rural than in the urban areas; the differential then declines rapidly, and above the age of 50 we have assumed that death rates are the same in both areas.

These death rate differentials must be regarded as only very approximate estimates. Data is available by state, but not on an urban-rural basis, so the basis for the estimates was the comparison of figures for states which were more heavily rural with those which were largely urban. This was an element in the estimate of fertility levels as well, but here further data were available (figures for the number of children less than one year of age in the urban and in the rural areas can be obtained from the census, and adjusted for infant mortality these can be used as an estimate of births during the year) so the estimates are somewhat more precise. But direct data

/on age

on age specific birth as well as death rates by rural and urban area are lacking in Venezuela so the estimates used should be regarded with caution. Nevertheless, they do give an order of magnitude to the different conditions which prevail in the rural and in the urban areas. This is a factor of considerable importance, and the estimates are regarded as sufficiently good to be quite useful for purposes of the present analysis.

B. Results of the Simulation Experiments

Having described the general setting from which the simulation experiments begin in Venezuela, the significance of some of the assumptions of these experiments can be more readily appreciated. Since migration has been very large in recent years, all of the experiments assume some slowing down of this process; its continuation on the same scale could rapidly depopulate the countryside. The second experiment (great change from the 1970 situation) is closest to the recent past in this respect: in this experiment the rural population remains approximately constant, and in relative terms declines to less than half its 1970 size by the end of the century. The other experiments assume varying increases in the absolute size of the rural population although, except for the fourth experiment (concentration on a rural type development), they all result in a more or less substantial further declines in the proportion of the population which lives outside the cities. A development of the sort depicted in the fourth experiment would of course imply a very sharp departure from past experience in Venezuela, and must be regarded as unlikely.

With respect to birth rates on the other hand, it is the second experiment which postulates the sharpest departure from past trends. This experiment assumes that fertility rates in the cities fall rapidly until, in 1995, they reach a level consistent with zero population growth; and even in the rural areas age specific birth rates decline 40 per cent, although they remain well above the zero growth level (the total fertility rate declines to about

/4.56 in

4.56 in 1995). It is the first experiment (little change from the 1970 situation) which is most similar to the recent past in this respect, it being assumed here that birth rates fall about one-quarter during the 30 year period. The other experiments involve varying intermediate assumptions.

The principal results of the experiments are shown in table 11. For each experiment only the results at the end of the 30 year period - that is, those for the year 2000 - are shown; the 1970 situation is also shown for comparison.1/

Population trends

The total population will more than double by the end of the century even in the second experiment, with its extreme assumptions regarding the decline in urban birth rates and the shift in population to the cities, where birth rates are much lower. The population increase is much greater in the first experiment (relatively little change from the 1970 situation). In the last three experiments the increases are intermediate and, in view of the different sets of assumptions involved, remarkably similar: in each the population expands about 2.3 times, from 10.6 million in 1970 to 24.4 million at the end of the century.

1/ A sixth simulation experiment was run for Venezuela to determine the results if migration to the cities should continue at the rapid rate of recent years, while relatively little change occurred in the level of the other variables. This inve
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Male urban	47.6	51.2	55.2
Female rural	5.5	7.9	10.6
Female urban	14.2	16.6	29.8
Labour force distribution (%)	100	100	100
Male rural	22.4	15.8	9.7
Male urban	58.1	62.1	57.7
Female rural	2.1	2.0	1.5
Female urban	17.3	20.1	31.2
Labour force age structure (%)	100	100	100
10 - 19	17.5	15.0	10.8
20 - 39	50.4	53.5	56.5
40 - 64	28.6	27.5	30.7
65 and over	3.4	4.0	2.0

Table 11

VENEZUELA: RESULTS OF THE SIMULATION EXPERIMENTS a/

	1970	The year 2000				
		Experiment I	Experiment II	Experiment III	Experiment IV	Experiment V
Population (millions)	10.6	26.4	21.6	24.4	24.4	24.4
Rural	2.7	4.7	2.7	3.6	6.0	4.9
Urban	7.9	21.7	18.9	20.8	18.4	19.5
Population (1970 = 100)	100	248	204	229	229	230
Rural	100	175	100	132	223	153
Urban	100	273	238	262	231	246
Rate of increase (% p/a) b/	3.1	2.8	1.6	2.3	2.3	2.3
Rural	-0.8	1.7	-0.4	0.7	2.2	1.7
Urban	4.7	3.0	1.9	2.6	2.3	2.5
Population distribution (%)	100	100	100	100	100	100
Rural	25.3	17.9	12.4	14.6	24.6	20.2
Urban	74.7	82.1	87.6	85.4	75.4	29.8
Population age structure (%)	100	100	100	100	100	100
0 - 4	16.9	14.8	9.7	12.8	12.7	12.8
5 - 14	29.4	25.5	21.5	24.0	24.1	24.1
15 - 19	10.7	10.7	10.6	10.7	10.8	10.7
20 - 39	25.1	28.9	33.5	30.7	30.7	30.6
40 - 64	15.0	16.0	19.6	17.4	17.4	17.3
65 and over	2.9	4.1	5.0	4.4	4.4	4.4
Rural age structure (%)	100	100	100	100	100	100
0 - 4	18.4	16.3	14.1	15.3	14.1	14.9
5 - 14	32.2	27.6	26.7	27.5	26.9	27.4
15 - 19	9.2	10.1	10.0	10.1	11.2	10.9
20 - 39	21.6	26.1	27.4	26.8	29.4	27.5
40 - 64	15.1	15.2	16.7	15.6	14.4	14.9
65 and over	3.5	4.6	5.1	4.7	4.0	4.5
Urban age structure (%)	100	100	100	100	100	100
0 - 4	16.4	14.4	9.1	12.4	12.2	12.3
5 - 14	28.4	25.0	20.8	23.4	23.2	23.3
15 - 19	11.3	10.8	10.7	10.8	10.6	10.7
20 - 39	26.3	29.5	34.4	31.3	31.1	31.4
40 - 64	15.0	16.2	20.0	17.7	18.4	18.0
65 and over	2.7	4.0	5.0	4.4	4.5	4.4
Labour force (millions)	3.26	8.93	9.06	9.18	8.69	8.93
Rural	.80	1.58	1.01	1.24	2.01	1.61
Urban	2.46	7.35	8.05	7.94	6.68	7.32
Labour force (1970 = 100)	100	274	278	282	267	274
Rural	100	198	126	155	251	201
Urban	100	299	328	323	272	298
Rate of increase (% p/a) b/	3.4	3.3	3.0	3.3	3.1	3.2
Rural	-0.4	2.2	0.6	1.3	3.1	2.3
Urban	4.9	3.6	3.3	3.6	3.1	3.4
Male labour force (1970 = 100)	100	265	233	245	252	249
Rural	100	193	120	151	210	184
Urban	100	293	276	280	268	274
Female labour force (1970 = 100)	100	311	466	434	328	378
Rural	100	252	189	190	678	388
Urban	100	319	500	464	284	377
Labour participation rates (%)						
Total	30.6	33.9	41.9	37.6	35.7	36.5
Rural	29.7	33.6	37.4	34.8	33.5	32.7
Urban	30.9	33.9	42.5	38.1	36.4	37.5
Male rural	51.3	56.9	60.5	58.4	50.2	53.3

Table 11 (conc.)

	1970	The year 2000				
		Experiment I	Experiment II	Experiment III	Experiment IV	Experiment V
Rural labour force age structure (%)	100	100	100	100	100	100
10 - 19	22.9	20.6	18.8	20.0	14.5	17.9
20 - 39	41.3	45.9	45.4	45.9	55.8	49.8
40 - 64	30.1	27.0	28.8	27.5	26.0	27.0
65 and over	5.7	6.5	7.0	6.6	3.7	5.3
Urban labour force age structure (%)	100	100	100	100	100	100
10 - 19	15.8	13.7	9.8	11.3	12.6	11.7
20 - 39	53.4	55.2	57.9	57.3	54.5	56.3
40 - 64	28.2	27.6	30.9	29.6	29.2	29.4
65 and over	2.6	3.5	1.4	1.8	3.7	2.6
Male urban labour force age structure (%)	100	100	100	100	100	100
10 - 19	14.5	12.8	8.9	10.3	11.7	10.9
20 - 39	52.9	54.5	57.6	56.9	53.8	55.7
40 - 64	29.8	28.8	32.0	30.7	30.2	30.4
65 and over	2.9	4.0	1.5	2.1	4.3	3.0
Female urban labour force age structure (%)	100	100	100	100	100	100
10 - 19	20.1	16.6	11.6	13.2	15.2	13.7
20 - 39	55.3	57.5	58.2	58.1	56.9	57.8
40 - 64	22.7	24.0	29.0	27.4	25.8	27.0
65 and over	1.8	2.0	1.2	1.3	2.1	1.5

Note: The 1970 CELADE estimates of population, by sex and 5 year age group, provided the basis for the 1970 estimates shown. Rural/urban differences were estimated with the use of a few aggregate figures which were available from the 1971 census plus the detailed data from the 1961 census. The CELADE estimates of age specific birth rates and death rates were used as the starting point in all of the experiments - again with rural/urban breakdowns estimated from census data. Labour participation rates, by sex and 5 year age group, were estimated directly from the census data. The principal assumptions which determine the results of the experiments relate to migration rates, fertility rates, and labour participation rates. The different migration rates assumed can be roughly judged from the table on the basis of the population shift from the rural to the urban area in the different experiments. The assumptions about fertility rates were as follows. In the 1965-1970 period the total fertility rate was estimated to be 7.5 in the rural and 5.4 in the urban area. These figures were assumed to decline lineally until in the last period of the experiments (1995-2000) they were as follows: experiment I, 5.6 and 4.0 respectively; experiment II, 4.6 and 2.2; experiment III, 5.1 and 3.3; experiment IV, 4.0 and 3.3; experiment V, 4.6 and 3.3. Changes in labour participation rates to the end of the century were: experiment I, little change; experiment II, urban rates to the Western European level and some shift in rural rates; experiment III, urban rates about two-thirds of the way to the Western European level and some shift in rural rates; experiment IV, little change in urban rates and rural rates to the urban level; experiment V, midway between experiments III and IV. There were also assumptions about differential trends in mortality rates, but these have much less impact on the results than assumptions about the other variables. The trend in total mortality rates is that used in the CELADE projections.

a/ Only the results at the end of the experiments - that is the year 2000 - are shown as this is the single figure of most interest; the 1970 figures are shown for comparison. The trend is not necessarily smooth throughout the 30 year period however, and this is often of considerable importance. Several instances of this sort are noted in the analysis.

b/ The rates of increase shown are the annual rates of increase during the 5 year period up to the date shown. That is, in the first column they are the annual rates during the period 1965-1970; in the other columns during the period 1995-2000.

/This implies

This implies that the rate of population growth will remain high. Even in the second experiment the rate of population increase is still 1.6 per cent per annum at the end of the century - despite the fact that the total fertility rate in the cities has fallen to the zero growth rate (in a stable population), and that only one eighth of the population still lives outside the cities by that time. In the other experiments the rate of population growth remains a good deal higher (2.8 per cent at the end of the century in the first experiment and 2.3 per cent in the others), although in all cases it has declined significantly from the rate of 3.1 per cent which prevailed around 1970. As noted in more detail later, a major factor in this continuing high rate of population growth is the age structure of the population, the number of births remaining high for this reason even when substantial declines in age specific birth rates are postulated.

In Venezuela then the population is likely to continue to increase rapidly at least to the end of this century. Following upon the very rapid growth of recent decades, this will mean a fundamental change in this basic aspect of social and economic organization. In 1950 the population was only a little more than 5 million; during the second half of this century it can be expected to have increased nearly five-fold. At mid-century the country was sparcely populated, with a very generous resource base but with a limited internal market. By the end of the century this situation will have been reversed to an important extent. The domestic market will be very much larger, and should be able to support a reasonably diversified range of economic activities - the population will be similar to that of Argentina in the mid-1970s and the income level will probably be high. But the resource base will be a good deal less generous relative to the population it will then have to support. Although Venezuela will continue to be among the countries with relatively low population density, this will have increased to around 27 inhabitants per km^2; for comparison, this is about triple the present figure for Argentina, and somewhat more than the 1970

/density in

density in Mexico. And whereas in 1950 the country possessed enormous per capita petroleum resources, by the end of the century the more economically favourable reserves may well have been largely depleted.

In every simulation experiment the great bulk of this population increase is accounted for by the growth of the cities. To a large extent this follows simply from the fact that three-quarters of the population was already urban in 1970, but an additional factor is the continuing migration from the rural to the urban areas. Migration is least important in the fourth experiment (strongly rural oriented development), but even there the rate of population increase is slightly higher in the cities, and these account for over three-quarters of the total increase in population over the 30 year period. In the other experiments the growth of the cities represents even larger proportions of the total increase - up to 100 per cent in the second experiment, where there is no increase in the absolute size of the rural population.

The rate of population growth in the rural areas in Venezuela will almost certainly be relatively modest in coming years. Even in the first experiment, which assumes only a slow decline in birth rates in the rural areas and only modest migration (sharply less than in the recent past), the rural population increases at an average rate of slightly less than 2 per cent per annum. In the second experiment, with a greater decline in birth rates and with migration continuing to be substantial (but even here a bit slower than in the 1960s), there is no growth at all in the rural population.

This set of circumstances will make it much easier to improve conditions in the rural areas in Venezuela. First, the proportion of the total population which is rural was already relatively low in 1970, and can be expected to decline further in coming years. The problem is therefore of lesser relative magnitude than in most countries of the region. Second, the rate of increase in that population can be expected to be relatively moderate. Thus most of

the resources available can be devoted to improving conditions; less will be required simply to expand facilities for an increasing population. Rural conditions have already improved substantially in Venezuela in recent years, and an important factor in this improvement has no doubt been the fact that the size of the rural population has remained approximately constant for a considerable period, so that improvements were entirely reflected in increases in the level of per capita welfare.

Despite this relatively slow growth of the rural population, due in large part to migration to the cities, the rate of population increase in the cities themselves can also be expected to be substantially less rapid than in the immediate past. This apparent paradox is a reflection of the fact noted earlier: the transition from a rural to an urban society has already largely been completed in Venezuela so that migration, even though it continues, is of declining importance in determining the rate of increase of the urban population. The importance of this aspect is readily seen from the rates of increase in the urban population.

The urban population increases most in the first experiment (relatively little change from the 1970 situation), even though relatively little migration is assumed. In the second experiment by contrast, although migration is much heavier the urban population increases much less. This clearly shows that urban birth rates, rather than internal migration, have now become the primary determinant of the rate of increase of the urban population.

For the 30 year period as a whole, the average rate of increase in the urban population in the different experiments ranges from just under 3 per cent to 3.4 per cent per annum. This is substantially more than the rate of increase which will occur in the rural population, but substantially less than the rate of increase in the urban population itself in earlier years (well over 6 per cent per annum in the 1940s and 1950s, and slightly more than 5 per cent per annum during the 1960s. The rate of increase in the urban population has already begun to slow

/notably - since

notably - since around 1960 - and the deceleration will continue in the years ahead. The rate of increase declines more or less steadily from 1970 to the end of the century in all the experiments, finally reaching the rates shown in table 11.1/

In a sense then it may paradoxically be easier to improve both urban and rural conditions in Venezuela in coming years. The mass migration which converted the population from being mostly rural to largely urban has already taken place. As a result, a substantial decline in the rate of population increase in the cities has already occurred, and the decline will continue. This will mean that the pressure for new facilities simply to accommodate the increase in population will be less, and more of what is available can go to improving conditions in per capita terms. This moderating of the pressure to deal with the very rapid expansion of the urban population will also make it easier to divert funds to improving conditions in the rural areas; and as noted the slow or even zero growth of the rural populace will mean that this will largely, or entirely, contribute to improved per capita welfare in the countryside.

It does need to be noted however that the slower growth of the urban population is true only in relative terms. Due mostly to the prevailing high birth rates, even in the cities, the absolute increase in the urban population is likely to be steadily largely for some time to come. Even in the second experiment, for example, the urban population, after increasing about 3.2 million during the decade of the 1960s, increases 3.5 million during the 1970s and 4.0 million during the 1980s. But despite these rising absolute amounts, the rate of increase falls substantially over those years: from an average of 5 per cent per annum during the 1960s to 3.7 per cent during the 1970s and to 3 per cent during the 1980s. For some

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1/ Even if rapid migration to the cities should continue and there should be only a moderate decline in birth rates, as in the sixth experiment (not shown, see footnote page 41) the growth of the cities would not be a great deal faster. The average rate of increase for the 30 year period would be 3.6 per cent per annum (compared to 3.4 per cent in experiment I), and at the end of the century would be 3.1 per cent (3.0 per cent in experiment I).

/purposes it

purposes it is the absolute increase which is of primary importance, and this will be steadily larger; but for many purposes it is the relative increase which matters, and the rate of growth of the urban population can be expected to decline substantially.

The age structure

In addition to the overall increase, there are more or less significant changes in the age structure of the population in all of the simulation experiments. The smallest change occurs in the first experiment, which assumes the least decline in birth rates, but even here it is significant: children (those less than 15 years of age) decline from 46.3 per cent of the population in 1970 to 40.3 per cent at the end of the century, with offsetting increases in the age groups over 20. The greatest changes occur in the second experiment, which assumes the greatest decline in birth rates. In this experiment the proportion of children drops much more sharply - from the same 46.3 per cent in 1970 to only 31.2 per cent at the end of the century - and again offsetting increases occur in the over 20 age groups.

Even if birth rates should decline sharply and so produce a relatively large shift in the age structure, as in the second experiment, the Venezuelan population will remain a relatively young one at the end of the century. Although the proportion of children would decline substantially, it would remain somewhat higher than the figure for Argentina in 1970 (29.1 per cent), and considerably higher than the proportion which would prevail in an eventually stable population (21 per cent).1/ Further, it would be primarily the young adult population which would increase in relative importance. The 20-39 age group would increase from 25.1 per cent of the total in 1970 to 33.5 per cent at the end of the century, well above the proportion in Argentina in 1970 and still further above the proportion in a stable population. The over 40 age group would

1/ See again table 2, p. 8, Chapter I.

/increase less,

increase less, and would remain much less important than in a stable population, or even than in Argentina in 1970 (24.6 per cent as against 45.4 per cent and 33.4 per cent respectively). In sum, more than three-quarters of the population would still be less than 40 years of age, whereas in Argentina in 1970 the proportion had already declined to two-thirds, and in an eventual stable population would fall to less than 55 per cent. In all of the other simulations the population of course remains even more youthfull than in the second experiment.

There are significant differences in the shift in the age structure in the urban and in the rural areas. In general the rural population remains younger than the urban; in particular, in the rural area the proportion of children remains more than 40 per cent at the end of the century in all of the experiments, whereas in the cities it drops to slightly below 30 per cent in the second experiment. The high proportion of children in the rural area is partly due to the continuing higher birth rates, but also in part to migration, which drains off larger number of adolescents and young adults. Too much significance cannot be given to the different trends in age structure however due to the way migration is handled in the model. Migration is assumed to be a percentage of the age group concerned, and this is estimated on the basis of the structure of migration in the recent past. However, when the rural population declines to the relative size projected in most of these simulation experiments the age structure of migration, and consequently the age structure of the remaining rural population, may well assume quite distinctive forms. This has been the case in some of the high income industrial countries where the rural population has declined to a small proportion of the total (a disproportionate percentage of the rural population may be older adults) and, with variations for such factors as probably substantially higher rural fertility rates, may well occur in countries like Venezuela. A more detailed study would be necessary to illuminate this aspect and so the simulation experiments may not be a very accurate guide here.

/Returning to

Returning to the nationwide figures, it is worth noting some of the implications of this shift in the age structure. First, the relative importance of the dependent population (those less than 15 and those over 65) declines in all of the simulations; from 49.2 per cent of the total in 1970 it falls to figures ranging from 36.2 per cent in the second experiment to 44.4 per cent in the first experiment. The lower figure of the second experiment is approximately the same as the percentage in Argentina in 1970, and also that eventually reached in a stable population. The composition of the dependent population will still be quite different in Venezuela however - there will be relatively more children and fewer of the over 65 group.

Although the importance of children in the dependent population will remain relatively large, the shift is beginning (the proportion of children declines and of those over 65 rises in all of the simulations), and this means different rates of growth for different segments of the dependent populations; and this can have important consequences.

For the younger age groups perhaps the principal aspect is the rate at which the educational system will need to be expanded to accomodate those of school age. For this purpose, the 5-14 age group can be taken as an approximate measure of the pressure for primary school facilities. As noted, the relative size of this group declines in all of the experiments, so that to the end of the century the rate of increase will be less than for the population as a whole. It nevertheless may remain fairly high, and may fluctuate sharply.

The rate of increase of this segment of the population has already been slowing for over a decade: from a peak level of 5.7 per cent per annum during the second half of the 1950s, it declined to 4.7 per cent per annum during the 1960-1965 period, and further to 3.7 per cent per annum in the 1965-1970 period. This rapid slowing in the rate of increase will continue for a time as

/the initial

the initial population bulge passes out of this group;1/ in all of the simulation experiments the population in the 5-14 age group increases at a rate of less than 2 per cent per annum during the 1970s as a whole.

The trend thereafter depends heavily on the assumptions made about fertility rates. In the first experiment, where birth rates are assumed to decline only moderately, the rate of increase in the primary school age group again rises to 3.4 per cent per annum during the 1980s, and declines only moderately to 2.6 per cent during the last decade of the century. In the second experiment, where by contrast fertility rates are assumed to decline sharply, the rate of increase remains at slightly less than 2 per cent during the 1980s, and falls further to less than 1 per cent per annum during the 1990s. The other three experiments show rates intermediate between those in the first and second experiments.

Even the absolute size of the increase in the population of primary school age is apt to fluctuate substantially in Venezuela for a time. After an increase of well over one million during the decade of the 1960s, the increase will be sharply less in the 1970s; the range is from 550,000 in the second experiment to 660,000 in the

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1/ The intermediate term interactions between different age groups of the population are at times rather complicated, and of some interest. Essentially, the initial speeding up of the rate of population increase which began in the 1940s, and affected mostly the infant population at the outset, has by now passed beyond the groups here considered. In addition, the decline in fertility rates which began in the mid-1960s is beginning to have its effect. The initial bulge is only beginning to affect substantially the size of the young adult population, but as this effect grows more important with time the number of births will again rise (quite apart from fertility rates) and will soon cause a secondary wave effect in the child population. The net effect is that after the first sharp rise in the size of the child population there is a temporary lull, when the rate of increase and even the absolute size of the increase drops substantially, until the second, induced, bulge hits this age group.

/first experiment.

first experiment. The increase will then again be larger in the 1980s, the possibilities varying widely from 780,000 in the second experiment up to nearly 1.5 million in the first. And, finally, during the last decade of the century the increase is again smaller, only modestly in the first experiment, but down to 200,000 in the second.

At least until into the last decade of this century then the primary school population will continue to expand fairly rapidly, and if there is not much further decline in fertility rates the pace of expansion, after a respite during the 1970s, will again be sharply higher in the 1980s. Whatever the trend in fertility rates, the expansion will not be a smooth one, but will rather occur with sharp fluctuations and, if dislocations are to be avoided, will require corresponding adjustments either in the rate of expansion of the primary school system itself or the way in which students are absorbed into the system.

It is worth noting that the expansion will occur primarily in the urban area. During the 1960s there was only a very small increase in the population aged 5-14 in the rural area, and this will continue to be the case in the 1970s.1/ After 1980 the rural population of primary school age may decline or may expand more rapidly, depending upon the extent of migration.2/ As it seems likely

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1/ The rural population aged 5-14 increased less than 5 per cent during the 1960s, and all of this increase was in the first half of the decade. During the 1970s there will be a decline with the assumptions of the second and third experiments, and a small increase in the other experiments; even in the fourth experiment, where very little migration is assumed, the increase is only about 1 per cent per annum.

2/ In the second experiment, which assumes that the flow to the cities continues at nearly the 1960-1970 level, the size of this age group continues to fall in the rural area. In the third experiment, with slower but still substantial migration, the rural population of primary school age begins to increase again after 1980, but the rate of increase to the end of the century is still less than 1 per cent per annum. In the other experiments, where migration is assumed to be much less important, the rate of increase after 1980 ranges from 1.8 per cent to 2.5 per cent per annum.

/that an

that an important proportion of the rural population will continue to migrate to the cities in Venezuela, it is therefore also likely that there will be little or perhaps no increase in the primary school age group in the rural area. This will make educational planning easier, and nearly all expenditures will go to increasing the enrollment rate and improving the quality of schooling available; very little will be required to maintain conditions in the face of rising numbers to be educated.

Trends in the cities are of course quite different, resembling those for the country as a whole but in a somewhat exaggerated form. The expansion of the urban population of primary school age has been very rapid in the recent past. During the first half of the 1960s the increase was at the rate of 7.4 per cent per annum, declining during the second half of the decade to 5.3 per cent per annum. This sharp slowing will continue through the 1970s; the average rate for the decade will be about 2.5 per cent per annum.1/ The trend after 1980 varies greatly depending on the assumptions made. In the first experiment the urban population of primary school age increases at the faster rate of 3.7 per cent per annum during the 1980s, and declines again to 2.7 per cent during the last decade of the century. In the second experiment the expansion during the 1980s is at about the same rate as during the 1970s, before dropping to 0.7 per cent per annum in the 1990s. The other experiments as usual yield intermediate rates.

The comments made about the primary school age group at the national level apply here even more strongly. But although the rate of increase in the urban population of primary school age will continue fairly high for some time at least, and may even rise again for a time, the very high rates of increase experienced in the 1960s will not again occur. This is one of the important respects in which, the mass migration to the cities having passed its peak, pressures on the urban area will ease in the years to come.

1/ This is the rate in all of the simulation experiments except the fourth, where the increase during the 1970s is 2.1 per cent per annum.

/Although not

Although not part of the dependent population here being considered, it is useful to note in passing the trend of the 15-19 year age group, as it can be taken as indicative of the demand for secondary school education. This age group has been growing at an increasingly rapid rate in recent years. From 2.4 per cent per annum during the first half of the 1950s, the rate of increase rose rapidly to a peak of 5.5 per cent per annum during the 1965-1970 period. An even more rapid decline from that peak has now begun, and will continue until 1985; during the 1980-1985 period the increase will be at the rate of only 1 per cent per annum. This decline will of course occur independently of any assumptions made about birth rates. After 1985 assumptions about birth rates have an influence, but the rate of increase is again higher in all of the simulation experiments. In the second experiment it rises to 1.9 per cent per annum and remains at approximately that level to the end of the century. At the other extreme, in the first experiment it rises sharply to 3 per cent per annum during the second half of the 1980s, and further to 3.5 per cent during the last decade of the century. Here again can be seen the substantial fluctuations in the rate of increase in the potential school population, with the implications this will have for the educational system.

Returning to the dependent population, the other segment of that population is made up of those over 65 years of age, and this group continues to increase rapidly, at a rate of 4 per cent per annum or better throughout the 30 year period; as a result its relative importance rises fairly steadily to the end of the century in all of the simulation experiments.1/ Nevertheless, the over 65 group will not become of major importance during the period here considered.

1/ The absolute size of the over 65 group is not affected significantly by the assumptions made (even at the end of the century all of this group will have been born before 1935) and is the same in all of the experiments. The differences in relative importance which occur are due exclusively to differences in rates of growth of the younger age groups and hence of the total population.

/At the

At the end of the century it will still account for 5 per cent or less of the population, compared with over 7 per cent in Argentina in 1970 and over 15 per cent in an eventual stable zero growth population. Although the rate of increase in the older population has already speeded up (due to lower death rates through all age groups and hence larger numbers surviving into old age), the bulge that began with the infant population around 1940 will not reach the over 65 group until after the turn of the century. Only then will this older age group begin to experience the even higher rates of increase which have already passed through the child population, and the elderly population begin to be a much more important segment of the population.

The great bulk of the dependent population will thus continue to be children in Venezuela at least through the end of this century. And as the child population can be expected to decline substantially in relative importance, a decline can also be expected for the dependent population as a whole. This will mean that per capita incomes will rise over and above any increase which may occur in productivity levels per member of the labour force. Each member of the labour force will, in effect, have a declining number of dependents to be supported from what he produces. This may well be an important factor in producing rising levels of per capita income in Venezuela during the next several decades.

Turning away from the dependent population, the offsetting increase in the relative importance of young adults (those 20-39 years of age) in all of the projections also has major implications. As has already been noted at several points, the more rapid rate of population growth, which began in Venezuela around 1940, had its first impact on the size of the infant population, and this bulge then began to work its way gradually through the age structure.1/ The impact on the young adult age group only began to be fully felt

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1/ See pages 9-13, Chapter I for a general discussion.

around 1970, and it is during the period covered by the simulation experiments that this impact is at its peak. It is this which accounts for much of the rise in relative importance of this group in all of the experiments.

In absolute terms, the increase is very rapid and, since projected declines in birth rates require 20 years before they begin to affect this group, the rate is the same until 1990 in all of the experiments; only after that date is there some divergence. As noted, the bulge in population growth only recently began to reach this age group and during the 1965-1970 period the population aged 20-39 increased at the rate of 2.8 per cent per annum (already however well above the rate of increase in earlier years). During the 1970s the rate of increase will jump sharply to 4.2 per cent per annum, and then decline somewhat to 3.8 per cent per annum during the 1980s. During the last decade of the century the increase is considerably less rapid as the decline in birth rates which began in the latter 1960s begins to affect this group, and the bulge begins to move on to the older adult population. In the different experiments the rate of increase in the 1990s ranges from 2.3 per cent to 2.8 per cent per annum, varying with assumptions about birth rates.

This very rapid increase in the size of the young adult group means, first, that the number of births continues to rise substantially, even in the face of declining age specific birth rates.1/ The effect can be illustrated by the second experiment, where fertility rates fall most sharply. During the 5 year period 1965-1970 the total number of births in Venezuela was approximately 2.0 million. In the second simulation the number then rises steadily (although at a declining rate after 1980) to approximately 2.5 million in the 1985-1990 period - despite the fact that the total fertility

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1/ Around 85 per cent of total births are to women in these age groups.

/rate is

rate is assumed to decline from 6.06 in 1965-1970 to 3.59 in the 1985-1990 period. In all of the other experiments the number of births rises more rapidly, and continues to rise to the end of the century.1/

This aspect of the age structure - the increasing relative importance of the young adult group - thus ensures a relatively rapid rate of population growth to the end of the century even if there is a rapid decline in fertility rates. As has already been noted, the population continues to expand at the rate of 1.6 per cent per annum at the end of the century even in the second experiment, where birth rates are assumed to have fallen to the zero growth rate in the urban area; and the rate of increase remains substantially higher in the other experiments.

The second major implication of the growing importance of the young adult group relates to the labour force: the rapid increase in this age group more or less assures a rapid increase in the labour force to the end of the century regardless of possible declines in birth rates and in the rate of growth of the population as a whole. Labour force trends, including this aspect, are discussed in detail below.

Labour force trends and structures

The labour force in Venezuela will increase rapidly at least to the end of the century. From the point of view of the present study, this is perhaps the most important single conclusion to be drawn from the simulation experiments. Further, there is little or no uncertainty about this conclusion as, despite the quite different underlying assumptions, the different experiments yield surprisingly similar results. With 1970 = 100, the projected size of the labour force at the end of the century varies only from 267 (in the fourth

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1/ In the second experiment, with the continuing fall in fertility rates, the number of births declines to about 2.2 million during the last 5 years of the century. In the other experiments the number of births during that 5 year period ranges from 3.2 to 4.0 million.

experiment) to 282 (in the third experiment); for the period as a whole these figures correspond to average rates of increase varying only from 3.3 per cent per annum to 3.5 per cent per annum.

It was already pointed out in Chapter I of this study that the labour force in Venezuela has been expanding with increasing rapidity in recent years: from 2.5 per cent per annum in the early 1950s the rate of increase had risen to about 3.5 per cent per annum in the latter 1960s.1/ The rate of increase will rise further to around 3.8 per cent per annum during the 1970s (the range in the different experiments is from 3.7 per cent to 4.0 per cent per annum) before falling back to about 3.4 per cent per annum during the first half of the 1980s and to 3.2 per cent in the second half of that decade. The last decade of the century shows no further decline in any of the experiments except the second, with its assumption of rapidly declining fertility rates from 1970 onward, and even in that experiment the deceleration is modest.

For the country as a whole therefore it can be expected that the rate of expansion of the labour force will be at its peak during the 1970s. During the 1980s there will be a significant deceleration but the rate will remain high - at about the same average rate as during the 1960s, and much higher than in the years before 1960. And unless fertility rates have already fallen substantially during the 1970s, there will be no further slowing of the rate of growth of the labour force until after the turn of the century. At the national level then the pressure for additional employment opportunities is likely to remain strong at least until into the next century.

This pressure will very largely be felt in the urban areas, not only because the more open unemployment of the cities creates greater pressures than the more disguised unemployment in the rural area, but also because, in Venezuela, it is the urban labour force

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1/ See table 4, p. 15, Chapter I, and the discussion preceding and following that page.

/which will

which will increase most rapidly and account for the great bulk of the total increase. Even in the fourth experiment (development concentrated on the rural areas and very little migration) the rural labour force accounts for only a little over 22 per cent of the total increase to the end of the century, and in the other experiments the proportion is only from 3 to 15 per cent. In the fourth experiment the rural labour force expands at an average rate of 3.1 per cent per annum to the end of the century, but in the other experiments the rate ranges from 0.8 to 2.4 per cent. As a consequence the rural labour force is likely to decline substantially in relative importance: from nearly one quarter of the total in 1970 the proportion drops to about half that figure if migration continues to be fairly substantial, and even in the first and fifth experiments, where migration is assumed to be much slower, the proportion declines to about 18 per cent. These figures, in conjunction with the fact that available agricultural resources in Venezuela are still relatively abundant, indicate that employment pressures in the rural area are not likely to be a major problem. On the contrary, it is easier to envision a situation where labour shortages in the rural area could become evident by the end of the century.

The situation in the urban area is very different. It is in the cities that the great bulk of the increase in the labour force will occur. Even in the fourth experiment (rural oriented growth) the urban labour force is 2.7 times the 1970 figure at the end of the century. In all of the other experiments the urban labour force triples or more in size, implying average rates of increase of 3.7 to 4.0 per cent per annum to the end of the century.

By contrast with the situation at the national level, however, this increase, while very rapid, will not involve <u>rising</u> pressures for employment in the cities. During the 1960s the urban labour force increased at the rate of 4.8 per cent per annum, and in all of the experiments the rate of increase then declines steadily to the end of the century. In the second and third experiments, with

/migration continuing

migration continuing to be fairly rapid, the rate of increase falls only slightly during the 1970s, and does not drop below 4 per cent per annum until the second half of the 1980s; in the other experiments, with less migration, the rate of increase is already down to around 4 per cent per annum in the 1970s, and declines further in the early 1980s.

Thus, although the urban labour force will continue to expand at a rapid rate at least to the end of the century, and this is likely to mean continuing pressure for employment opportunities, the pressure can be expected to ease somewhat from that experienced during the 1950s and 1960s. This is a further aspect of the mass migration to the cities which has already been stressed at several points. During the 1950s and 1960s a major part of the increase in the urban labour force was accounted for by the inflow from the rural areas. As the transition from a rural to a basically urban population structure has now already occurred, this inflow is a steadily smaller proportion of the urban labour force. Therefore, even though the labour force from within the urban population itself is increasing at a faster rate (the population bulge is entering the young adult age group), the total increase is at the same time at a slower rate.1/

1/ Here too it needs to be noted that this slowing is true only of the rate of increase. The increase in the absolute size of the urban labour force is steadily larger in all of the experiments. During the five-year period 1965-1970 the urban labour force expanded by slightly more than one half million. (This was itself a sharply higher figure than the increase during the preceding five-year period.) The absolute size of the increase then rises until, during the 1995-2000 period, it is well over 900,000 even in the fourth experiment, and in the other experiments averages around 1.2 million. The number of new urban jobs required will therefore continue to rise at least to the end of the century. But this rising absolute number will be a steadily declining percentage of the total urban labour force.

/An interesting

An interesting feature of this change is that the source of the increase in the urban labour force will be quite different in the years ahead. During the 1950s, and to a lesser extent during the 1960s, a major part of the expansion in the urban labour force has been due to the arrival of migrants from the rural areas. During the 1970s and after, on the other hand, recent migrants will be relatively less important; the still rapid increase will increasingly be dominated by new entrants who have grown up in the urban areas. The expectations and responses of this group are likely to be different from those of new arrivals, and for this reason the pressures for adequate employment opportunities may take different forms in the years ahead.

One aspect to emphasize about the overall increase in the labour force is that, in every experiment, this increase is substantially greater than the increase in the population itself. At the extreme, in the second experiment, while the population slightly more than doubles by the end of the century the labour force expands 2 3/4 times. Further, the expansion of the labour force is quite similar in the different experiments, while the increase in the population as a whole varies much more with the assumptions made about trends in fertility rates. This points up the important fact that the population trend alone is not necessarily a good indicator of how the size of the labour force is changing. During periods of demographic transition, such as that being experienced in Venezuela, the two trends may well diverge markedly.

As a consequence of the more rapid growth of the labour force, the total activity rate in Venezuela can be expected to rise substantially. Whereas only 30.6 per cent of the population was a part of the active labour force in 1970, this percentage will rise steadily to the end of the century: to at least 33.9 per cent (in the first experiment) and perhaps much higher (to 41.9 per cent in the second experiment). Among other things, this will mean that per capita incomes will rise quite apart from any rise achieved

/in productivity

in productivity levels, for the inactive population to be maintained will be relatively smaller. If the average productivity per member of the labour force should remain constant, for example, there would still be an increase in per capita incomes at the end of the century: ranging from nearly 11 per cent in the first experiment up to 37 per cent in the second experiment. This is a major, and fairly immediate, economic benefit to be derived from a slowing of the rate of population growth.

Significant changes will also occur in the structure of the labour force in coming years. As already noted, there will be a continuation of the relative shift from the rural to the urban area. In addition, women will probably make up a rising proportion of the total; and, finally, the importance of adolescents is likely to decline, offset by a rise in the proportion of adults, particularly the young adult group. To make clear the meaning of these shifts, it is useful to discuss briefly the activity coefficients in Venezuela, and the assumptions made in the experiments about how these coefficients may change.

The initial labour participation rates in Venezuela show the sort of structure common (in broad outline if not in detail) to many countries in the region.1/ First, women form a relatively small proportion of the labour force. In the rural areas well under 10 per cent of the labour force is recorded as female, but too much meaning cannot be attached to this figure as it probably reflects in part rural conventions about who is considered to be an "active" member of the labour force.2/ Even in the urban areas however only 23 per cent of

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1/ The initial coefficients were estimated on the basis of the 1961 census data, the latest available at the time the estimates were made. It was then assumed that the age specific participation rates for each area remained unchanged until 1970.

2/ The rural labour force participation rates for women are nearly constant around the low level of 10 per cent throughout the 15-60 year age range. By contrast nearly all men from the ages of 20 through 70 are recorded as members of the labour force; and three-quarters of those over 70 and of those in the 15-19 year age group are recorded as active. This contrast almost certainly has a good deal to do with definitions and conventional ways of responding to the census, so the figures for the rural labour force must be used only with considerable reservation.

/the labour

the labour force is female and the great majority of urban women remain inactive; even in the 20-24 year age group (where the highest coefficient is registered) less than one-third are members of the labour force. The bulk of the women who work are young - women between the ages of 15 and 29 account for over half the total in the urban area - but this is due to the age structure of the population as well as to the higher participation rates among younger women.

Among males participation rates are in general rather high. This is particularly true in the rural area where, as noted, it is probably due in part to conventions of classification. In the urban area male participation rates for the 25-55 year age groups are closely similar to those in Western Europe, for example; but participation rates are notably higher for those under 25 and for those over 55. These higher rates probably reflect somewhat lower school attendance for adolescents and very young adults, and less general social security benefits which keep more of the older population in the labour force.

It is clear from the above what kinds of changes might occur in the labour participation rates. For males, participation rates for the young and for the older population may decline; and it is difficult to envision circumstances which might lead to significant increases for any age group. Labour participation rates for the male population as a whole are therefore likely to decline, although probably only moderately. Female participation rates, by contrast, are much more likely to rise, and the potential increase could be large.1/ On both scores - falling male participation rates and rising female participation rates - the relative importance of women in the labour force can be expected to increase.

1/ By comparison with Western Europe, for expample, the female participation rates in Venezuela are low for the entire 15-69 year age range. They are somewhat higher for the 10-14 and over 70 age groups, but the coefficients are in any case very low for these groups and they are not a significant factor in the total. For much of the age range the participation rates in Western Europe are about double those in Venezuela.

/These were

These were the directions of change postulated in the simulation experiments. As a possible "target" toward which participation rates might move, the rates which prevailed in France in 1968 were used.1/ In the second experiment (urban oriented development with great change in the population parameters) it is assumed that the urban participation rates reach the 1968 French level by the end of the century. In the third experiment they move most of the way to that level, and in the other experiments in the same direction but by lesser amounts. With respect to rural participation rates, the greatest change is in the fourth experiment (rural oriented development) where it is assumed that by the end of the century they become the same as the rates which prevail in the cities; that is, this type of development would tend to eliminate differences between the rural and urban areas. In the other experiments smaller changes are assumed. But again the rural labour force figures must be used with caution because of the partially arbitrary nature of the initial labour force coefficients.

These assumptions about labour force coefficients are one of the factors causing the structure (and also the size) of the labour force to change, and it is of some interest to determine the relative importance of this factor. Before going on to the consideration of changes in the structure of the labour force, the significance of changing coefficients in the growth of the labour force can be briefly mentioned.

At first glance it would seem that this could be of major importance, because higher participation rates for women might lead

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1/ The reasoning was that this was a reasonably diversified, industrialized urban economy, with a social structure perhaps closer to that of Latin America than some of the other industrialized economies of Western Europe. As such it might provide an indication of the direction in which labour participation rates could be expected to move. It must be admitted however that there is a considerable element of guesswork in the selection of the labour participation rates which are projected to prevail at the end of the century. This is particularly true of the female participation rates, where the range of variation from one country to another, even within Latin America, is very substantial.

/to a

to a major expansion of the total labour force. In the specific circumstances likely to prevail in Venezuela however, changes in participation rates are in fact of only secondary importance. This can be clearly seen from the results of the second experiment, where the greatest changes are assumed (participation rates move to Western European levels). If, instead of the figures shown in table 11, the labour force in the year 2000 is calculated on the assumption that all labour force participation rates remain unchanged at the 1970 levels, the difference is not great. The size of the labour force would be 2.6 times what it was in 1970, instead of the 2.8 times shown in the table. Even in the second experiment then only 12 per cent of the increase in the labour force results from the postulated changes in participation rates, and in the other experiments this percentage is considerably smaller.

The major reason for this modest impact is simply that, in Venezuela, the population of working age will increase very rapidly during the coming decades, and this insures a rapid increase in the labour force quite apart from the assumptions made about participation rates.

A secondary reason is that as participation rates change, they do not uniformly increase. As was noted above, male participation rates are relatively high for the very young and for the elderly, and a shift toward Western European levels means a decline in these rates and hence a slower growth of the male labour force. It is only the female participation rates which rise, but this rise can be substantial and the impact on the female labour force alone much greater. In the second experiment, for expample, half the increase in the female labour force is due to the rise in participation rates. But about 40 per cent of the increase due to rising female participation rates is offset by the decline in male participation rates. Women still account for less than one-third of the labour force at the end of the century even in the second experiment, and so the impact of such changes on the total labour force is limited.

/There will

There will also be significant changes in the structure of the labour force in the years ahead, and the trend of labour participation rates is likely to be of more importance in some of these changes. Apart from the continuing shift toward an urban labour force, the principal change is likely to be an increase in the relative importance of women. To a limited extent the migration to the cities alone brings about a change of this sort, for women are a considerably larger proportion of the labour force in the urban area. But the changes which may occur in participation rates can be much more important here. In the third experiment, for example, where urban participation rates move about two-thirds of the way to the Western European level, the proportion of women in the labour force rises from less than 20 per cent in 1970 to 30 per cent at the end of the century; and in the second experiment the rise is of course even greater. It is the change in participation rates which causes the great bulk of the increase in relative importance in these experiments.

The importance of women in the labour force can therefore be expected to increase, and if urban participation rates move closer to the levels which currently prevail in Western Europe the change will be quite substantial.

There will also be significant changes in the age structure of the labour force, due both to changes in the age structure of the population itself and to probable changes in labour participation rates. Much the most important factor here is the changing age structure of the population, and this has been discussed in some detail above and need not be repeated here. In brief, there is a decline in the relative importance of teenagers (those 10-19 years of age) and an increase in the relative importance of all other groups, especially of young adults (those 20-39 years of age).

Probable changes in labour participation rates reinforce the decline in relative importance of teenagers, as male participation rates for this group can be expected to fall. Participation rates of those over 65 are also likely to fall however and this, by contrast,

/goes against

goes against the population trend; the net result may be a decline or a small increase in the relative importance of this group in the labour force, depending on the assumptions (see table 11).

The importance of the two factors can be illustrated with the results of the second experiment, which assumes the greatest changes. If there were no change in labour participation rates in that experiment the importance of adolescents in the labour force would decline from 17.5 per cent of the total in 1970 to 12.6 per cent at the end of the century; all other groups would increase in relative importance, especially young adults. With the changes in participation rates which have in fact been assumed, the relative importance of adolescents declines fruther to 10.8 per cent at the end of the century, and there are further moderate increases in the relative importance of both the young and older adult groups. But there is a reversal in the case of those over 65. If there were no change in participation rates in the second experiment the relative importance of this group would rise from 3.4 per cent in 1970 to 4.4 per cent at the end of the century; but with the decline in participation rates assumed in the experiment the percentage actually falls to 2.0 per cent at the end of the century.

The age structure of the female labour force is affected most by probable changes in participation rates. In 1970 teenagers and young adults were a considerably larger proportion of the female labour force, and changing participation rates tend to shift the structure closer to that which characterizes the male labour force.

But as already noted, the changing age structure of the population itself is likely to be of substantially greater importance in determining the age structure of the labour force. Changing labour participation rates are likely to be the primary factor only in increasing the relative importance of women in the labour force as a whole.

Chapter III

EL SALVADOR

A. The Situation in 1970 and the Main Variables of the Simulation Experiments

The demographic situation in El Salvador is quite different from that in Venezuela described above. There has not been the same extensive development of modern type activities concentrated in the urban areas; more traditional type, particularly rural, activities have continued to occupy a major proportion of the population. This is reflected in the fact that in 1970 somewhat more than 60 per cent of the population continued to live in the rural area. Further, there has been very little change in this respect in recent years. In 1930 about the same porportion of the population was rural; after actually rising somewhat to 1950 the proportion then declined slowly during the 1950s and 1960s. El Salvador is the only one of the four countries considered in this study where rural-urban migration during the past several decades has not lead to a substantial decline in the relative importance of the rural population. Viewed from the urban side, this means that the rate of growth of the urban population in recent years reflects primarily the natural increase in the urban population; migration has contributed relatively little to the increase. While the urban population has been increasing somewhat faster than the rural population since 1950, the difference is modest; in the other countries considered the contrast between rural and urban rates of growth is much sharper.

A major implication of this situation is that a mass migration to the cities, such as has already cocurred or is currently taking place in many countries of the region, remains only a possibility for the future in El Salvador. The impact such a mass migration can have on the population structure has already been stressed in the analysis

/of Venezuela

of Venezuela - viewed there as a movement which has already taken place. One of the most important aspects of the simulation experiments for El Salvador will be to clarify the shifts which would occur in this country should such a migration occur during the remaining years of the century.

Fertility rates are high, and have not yet shown any substantial tendency to decline. The CELADE estimates show an increase from the early 1950s to the early 1960s; and although there was then a mild decline to the late 1960s this only meant a return to the fertility level which prevailed in the early 1950s. It is probable that fertility rates are significantly higher in the rural than in the urban areas, although only limited data are available here. Birth registration data (on a departmental rather than strictly rural-urban basis) do not indicate any consistent difference, but this can be explained by assuming under-registration in the rural area. The census data show that the ratio of infants (those less than one year of age) to women of child-bearing age is significantly higher in the rural than in the urban area, and it is on the basis of this data that the differential has been calculated. For the years immediately preceeding 1970 the total fertility rate was estimated at about 5.5 in the urban and 7.3 in the rural area. The situation here is similar to that in Venezuela: the rates are still high in both areas so that the natural population growth is rapid, but there is an important difference so that rural-urban migration can have a significant impact on the rate of total population increase.

As already noted, rural-urban migration has not been very large in recent years; certainly much less important than in many countries of the region. The structure of that migration however has been quite similar to that in Venezuela, already described in some detail. First, more women than men migrate. The 1961 census shows that 40 per cent of all women but only 36 1/2 per cent of the men lived in the cities; and the contrast is even greater if children are eliminated and the comparison is limited to groups where migration has had more

/of an

of an impact. Less than 38 per cent of young male adults (those 20-39 years of age) lived in the cities while 43 1/2 per cent of the females did; and while the percentage remained at about 38 per cent for males, for females it continued to rise with age, reaching 50 per cent for those 65 and over.

In terms of age structure it is again primarily the very young who migrate: nearly three-quarters of those who moved to the cities appear to have been less than 25 years of age. It should be noted however that during the period for which the structure of migration was estimated there was a significant movement of people out of the country, and this complicates the calculations.1/ The estimates for El Salvador therefore cannot be used with the same degree of confidence as those for Venezuela; but, especially as the two sets of estimates are similar in broad outline, they are quite adequate for present purposes.

Finally, it has been assumed that death rates are the same in the urban and in the rural areas. This may well be an incorrect assumption, but appeared to be the best hypothesis to adopt given the nature of the available data. There are no figures which would support the expected result - higher death rates in the rural areas - and the possibility that the reverse is true cannot be excluded.2/ It does not

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1/ The movement of people from the rural area can be calculated as already described for Venezuela. However, one does not know in what proportions those who left the rural area moved to the cities, or left the country. For the same reason the net increase by age group in the cities cannot be used as a check against the calculations of rural migration.

2/ There are no strictly urban-rural figures. Death rates, by age group, can be calculated for each "departamento". If the most heavily urban and the most heavily rural "departamentos" are compared the results actually indicate substantially higher death rates in the urban areas. Registered infant mortality rates (those less than five years of age) are almost twice as high in the predominantly urban departamentos. Death rates are then about the same in the two groups for those 5 to 40 years of age, but for those above 40 the rates are again substantially higher in the urban departamentos. These unexpected results can be explained away by assuming under-registration of deaths in the rural areas. It seems unlikely however that in reality (concl.)

/seem likely

seem likely that the differential is very great in El Salvador however, and, taking into account the lesser impact of death rates on the simulation calculations, the assumption of no difference is adequate for present purposes.

B. Results of the Simulation Experiments

Seen in the context of this demographic situation, the assumptions of the simulation experiments acquire more specific meaning. In El Salvador it is the first experiment which, in all aspects, most closely resembles the experience of the recent past: relatively little change in the underlying demographic variables and only a modest amount of rural-urban migration.

The second experiment, by contrast, implies a sharp departure from past trends. There is very substantial migration to the cities; birth rates decline substantially, especially in the urban area; and labour participation rates in the cities move to the Western European levels. The same departure from past trends is implied in the third experiment, although to a lesser extent.

The fourth experiment (concentration on the rural area and substantial change in the rural parameters) is in a sense a more realistic alternative in El Salvador. The rural economy is a more important part of the total than in many countries, and there has not been the same domination of modern type urban oriented activities. The bulk of the population is still rural and so it is easier to envision a policy orientation of this sort.

As the extent of rural-urban migration is likely to be a crucial feature in El Salvador, a sixth simulation experiment was run to consider this aspect in another context. The second and third

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2/ (concl.) death rates are much higher in the rural areas in El Salvador. The death rates calculated for the urban departamentos are quite high, by comparison with the national estimates of CELADE, so it seems unlikely that rural death rates could be much above those levels. The assumption used in the experiments is that death rates were the same in the two areas in 1970; but it is quite possible that they may actually be somewhat higher, at least for certain age groups, in either the rural or the urban area.

/experiments assume

expeperiments assume substantial migration, in the context of substantial, urban oriented, change. But there is also the possibility of substantial migration occurring while the underlying population parameters show relatively little change; this, for example, was the pattern followed in the mass shifts to the cities in Venezuela over the past several decades. The results of such a trend are examined in the sixth experiment, which assumes heavy migration but otherwise the assumptions of relatively little change of the first experiment.

The results of the usual five experiments, plus this sixth experiment in the case of El Salvador, are shown in table 12.

Population trends

It appears likely that the population at the end of the century will be about 2 1/2 times as large as it was in 1970. The increase will be somewhat less if birth rates decline sharply; but even in the second experiment - with mass migration to the cities and the assumption that urban birth rates fall to the zero growth level (in a stable population) by 1995 - the population substantially more than doubles. In the first experiment, which assumes little change from the 1970 situation, the population at the end of the century is 2.8 times what it was in 1970. From 3 1/2 million in 1970, the population will increase to more than 7 1/2 million even if there is a sharp fall in birth rates; to around 8 3/4 million with assumption of more moderate but still fairly substantial change (the third, fourth and fifth experiments); and to 9 3/4 million if there is relatively little change from the 1970 situation.

/Table 12

Table 12

EL SALVADOR: RESULTS OF THE SIMULATION EXPERIMENTS[a]

	1970	The year 2000					
		Experiment I	Experiment II	Experiment III	Experiment IV	Experiment V	Experiment VI
Population (thousands)	3 480	9 744	7 566	8 874	8 670	8 812	9 163
Rural	2 111	5 491	2 033	2 940	4 953	3 784	2 120
Urban	1 369	4 253	5 533	5 934	3 725	5 028	7 043
Population (1970 = 100)	100	280	217	255	249	253	263
Rural	100	260	96	139	235	179	100
Urban	100	311	404	433	272	367	514
Rate of increase (% p/a)[b]	3.2	3.6	2.0	3.0	2.9	3.0	3.3
Rural	3.04	3.4	-.2	1.1	2.6	1.9	0.05
Urban	3.5	3.9	2.9	4.1	3.3	3.9	4.4
Population distribution (%)							
Rural	60.6	56.4	26.9	33.1	57.1	42.9	23.1
Urban	39.4	43.6	73.1	66.9	42.9	57.1	76.9
Population age structure (%)							
0 - 4	18.4	18.1	11.7	16.0	15.4	15.8	16.9
5 - 14	28.6	27.9	23.5	26.5	26.1	26.4	26.9
15 - 19	10.2	10.6	10.8	10.6	10.6	10.6	10.5
20 - 39	25.6	26.9	32.7	28.8	29.3	28.9	28.1
40 - 64	14.0	13.4	17.2	14.7	15.0	14.8	14.2
65 and over	3.2	3.2	4.1	3.5	3.5	3.5	3.4
Rural age structure (%)							
0 - 4	19.2	19.5	17.5	18.2	15.9	17.2	18.3
5 - 14	29.7	29.4	28.6	29.1	27.1	28.2	29.2
15 - 19	10.2	10.4	9.8	10.1	10.7	10.4	9.8
20 - 39	24.7	25.3	24.7	25.4	28.6	26.8	24.1
40 - 64	13.3	12.4	15.2	13.7	14.3	13.9	14.5
65 and over	2.9	2.9	4.2	3.5	3.4	3.4	4.1
Urban age structure (%)							
0 - 4	17.0	16.3	9.6	14.9	14.7	14.8	16.4
5 - 14	26.9	25.9	21.6	25.2	24.9	25.0	26.2
15 - 19	10.3	10.7	11.1	10.8	10.6	10.7	10.8
20 - 39	27.1	28.9	35.7	30.5	30.1	30.5	29.3
40 - 64	15.1	14.7	18.0	15.2	15.9	15.4	14.1
65 and over	3.6	3.5	4.0	3.4	3.8	3.5	3.2
Labour force (thousands)	1 100.6	3 200.3	3 048.6	3 150.7	3 091.1	3 114.8	3 150.5
Rural	648.5	1 729.3	697.8	981.3	1 743.3	1 279.9	711.5
Urban	452.1	1 470.5	2 350.8	2 168.9	1 347.8	1 835.0	2 439.1
Distribution (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Rural	58.9	54.1	22.9	31.2	56.4	41.1	22.6
Urban	41.1	45.9	77.1	68.8	43.6	58.9	77.4
Labour force (1970 = 100)	100	291	277	286	281	283	286
Rural	100	267	108	151	269	197	109
Urban	100	325	520	479	298	406	539
Rate of increase (% p/a)[b]	3.2	3.8	3.1	3.5	3.5	3.5	3.5
Rural	3.1	3.5	0.2	1.4	3.3	2.3	0.3
Urban	3.4	4.1	4.0	4.5	3.6	4.3	4.6
Male labour force (1970 = 100)	100	281	234	251	244	250	259
Rural	100	258	106	148	214	175	108
Urban	100	325	474	445	299	390	543
Female labour force (1970 = 100)	100	306	485	456	462	444	417
Rural	100	365	191	192	876	446	133
Urban	100	325	629	563	294	443	532
Labour participation rates (%)							
Total	31.6	32.8	40.3	35.5	35.6	35.3	34.4
Rural	30.7	31.5	34.3	33.4	35.2	33.8	33.6
Urban	33.0	34.6	42.5	36.5	36.2	36.5	34.6
Male rural	54.8	54.4	57.9	56.8	50.1	53.0	56.6
Male urban	48.1	49.6	55.6	48.6	52.1	50.2	49.6
Female rural	5.3	7.4	7.4	7.4	19.5	13.2	7.3
Female urban	18.9	20.0	29.8	24.9	20.8	23.2	20.0
Labour force distribution (%)							
Male rural	54.0	47.9	20.6	27.9	41.1	33.4	20.3
Male urban	29.0	32.4	49.6	45.0	30.9	39.9	54.9
Female rural	4.9	6.1	2.3	3.3	15.3	7.7	2.3
Female urban	12.1	13.5	27.5	23.8	12.7	19.0	22.5

Table 12 (concluded)

	1970	The year 2000					
		Experiment I	Experiment II	Experiment III	Experiment IV	Experiment V	Experiment VI
Labour force age structure (%)							
10 - 19	23.1	22.5	14.7	17.5	16.1	17.3	18.7
20 - 39	47.8	49.9	55.8	53.9	54.1	53.6	52.5
40 - 64	24.9	23.6	27.3	25.8	25.9	25.7	24.8
65 and over	4.3	4.0	2.2	2.8	3.9	3.4	4.0
Rural labour force age structure (%)							
10 - 19	27.2	27.5	25.1	25.9	16.5	21.3	25.8
20 - 39	44.7	46.1	42.8	44.4	53.9	49.1	42.7
40 - 64	23.8	22.2	26.0	24.4	25.6	24.9	25.6
65 and over	4.3	4.2	6.1	5.3	4.0	4.6	5.9
Urban labour force age structure (%)							
10 - 19	17.1	16.7	11.5	13.8	15.7	14.5	16.7
20 - 39	52.2	54.3	59.7	58.2	54.2	56.8	55.3
40 - 64	26.5	25.3	27.7	26.4	26.3	26.3	24.6
65 and over	4.2	3.7	1.1	1.6	3.9	2.5	3.4
Male urban labour force age structure (%)							
10 - 19	15.8	15.4	11.1	13.2	14.4	13.6	15.3
20 - 39	51.5	53.7	59.2	57.7	53.4	56.2	54.6
40 - 64	28.0	26.8	28.6	27.3	27.8	27.4	26.2
65 and over	4.7	4.1	1.1	1.8	4.4	2.8	3.9
Female urban labour force age structure (%)							
10 - 19	20.4	19.8	12.4	14.8	18.7	16.4	20.0
20 - 39	54.0	55.9	60.6	59.1	55.9	57.9	56.9
40 - 64	22.7	21.8	26.0	24.8	22.7	24.0	20.8
65 and over	2.9	2.5	1.0	1.3	2.7	1.8	2.3

Note: The 1970 CELADE estimates of population, by sex and 5 year age group, provided the basis for the 1970 estimates shown. Rural/urban differences were estimated with the use of a few aggregate figures which were available from the 1971 census plus the detailed data from the 1961 census. The CELADE estimates of age specific birth rates and death rates were used as the starting point in all of the experiments - again with rural/urban breakdowns estimated from census data. Labour participation rates, by sex and 5 year age group, were estimated directly from the census data. The principal assumptions which determine the results of the experiments relate to migration rates, fertility rates, and labour participation rates. The different migration rates assumed can be roughly judged from the table on the basis of the population shift from the rural to the urban area in the different experiments. The assumptions about fertility rates were as follows. In the 1965-1970 period the total fertility rate was estimated to be about 7.3 in the rural and 5.5 in the urban area. These figures were assumed to decline lineally until in the last period of the experiments (1995-2000) they were as follows: experiment I, 6.7 and 4.7 respectively; experiment II, 6.2 and 2.2; experiment III, 6.2 and 3.3; experiment IV, 4.8 and 4.1; experiment V, 5.5 and 4.1; experiment VI, 6.7 and 4.7. Changes in labour participation rates to the end of the century were: experiment I, little change; experiment II, urban rates to the Western European level and some shift in rural rates; experiment III, urban rates about three-quarters of the way to the Western European level and some shift in rural rates; experiment IV, little change in urban rates and rural rates to the urban level; experiment V, midway between experiments III and IV; experiment VI, little change. There were also assumptions about differential trends in mortality rates, but these have much less impact on the results than assumptions about the other variables. The trend in total mortality rates is that used in the CELADE projections.

a/ Only the results at the end of the experiments -that is the year 2000- are shown as this is the single figure of most interest; the 1970 figures are shown for comparison. The trend is not necessarily smooth throughout the 30 year period however, and this can be of considerable importance. Some instances of this sort are noted in the analysis.

b/ The rates of increase shown are the annual rates of increase during the 5 year period up to the date shown. That is, in the first column they are the annual rates during the period 1965-1970; in the other columns during the period 1995-2000. These final rates are of course not necessarily the same as the average rate during the 30 year period as a whole. The difference is sometimes large, and again important instances are discussed in the analysis.

/This means

This means that rates of population growth will remain high. Even in the second experiment the rate of increase falls only from 3.2 per cent per annum in 1970 to 2 per cent at the end of the century. In the experiments with intermediate assumptions the rate remains approximately constant to 1990 - despite important declines in birth rates - and then declines only slowly during the last decade of the century (to around 3 per cent per annum). In the first experiment, with little decline in birth rates, the rate of population increase actually rises, to 3.6 per cent per annum at the end of the century. That the rate of population increase does not fall in line with the decline in birth rates assumed is in part due to the continuing decline in death rates; but the more important factor is the rapid increase in the number of women of child bearing age. Especially in the second simulation experiment, this age group is of rising relative importance, and this partially offsets the impact of falling age specific birth rates. This aspect is discussed in more detail below in the section dealing with changes in the age structure of the population.

In El Salvador then a continuing rapid increase in population to the end of the century is to be expected, and the population will become very large indeed relative to the geographic size of the country. In 1950 the population was about 1.9 million; during the second half of this century it is likely to rise to well over 4 1/2 times that figure. This is similar to the change to be expected in Venezuela, and again will mean great changes in economic and social organization. But whereas in Venezuela this sharp increase began when the country was sparcely populated and with a very generous resource endowment, in El Salvador the situation is quite different. The country has long been one of the most densely populated in the region; in 1950 there was already some population pressure and migration out of the country has at times been important. A very

/approximate appreciation

approximate appreciation can be conveyed simply by noting the number of people per square kilometre of territory: 90 in 1950, 164 in 1970, and more than 400 a likely figure for the end of the century.1/

It is by no means impossible to achieve rapid growth and high income levels in a country with high population density; several of the high income industrial countries of Western Europe, for example, currently have densities of around 300 people per square kilometre. Nevertheless, such high densities in a country which is still mostly rural and where income levels are relatively low - coupled, importantly, with the continuing high rates of increase which are to be expected - are likely to considerably complicate the problems of economic and social development. The figures cited are very high by comparison with other less developed countries. The density in El Salvador was about the same as that in India in 1970, for example, and the population is growing faster in El Salvador; the density in China is less than half that in El Salvador. It seems likely that difficulties arising from population pressures will be among the more serious ones faced in the coming decades. Some of these difficulties, but only insofar as they relate to rates of growth rather than the density itself, are noted below.

The way in which population trends evolve in the urban and in the rural areas will be of major importance in determining the course of economic and social development in El Salvador during the coming decades. In Venezuela the mass migration to the cities has already occurred, and so the great bulk of the future population increase can with considerable confidence be expected to occur in the urban area; and this has a number of important consequences which were noted in the analysis of the Venezuelan data (see pp. 44-48). In El Salvador the situation is very different: the population is still mostly rural,

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1/ The intermediate assumptions of experiments 3, 4 and 5 result in densities of 405-415 at the end of the century. Only the minimum projection of the second experiment results in a lower density (354) and the first experiment results in a density of over 450 at the end of the century.

/so that

so that mass migration to the cities remains a possibility for the future. Differing assumptions about migration rates and about birth rates in the rural and urban areas therefore produce widely varying results in this respect. The different simulation experiments provide very different scenarios of population trends in the two areas in coming decades, and which of these scenarios is in fact most closely followed must be a basic factor in the formulation of economic and social policy.

The great possible range of variation can be readily seen by the final population distribution in the different experiments. In the second and sixth experiments around three-quarters of the population is urban at the end of the century; in the third experiment about two-thirds; in the fifth some 57 per cent; and in the first and fourth only around 43 per cent. The differences reflect primarily different assumptions about migration rates, but also about birth rates in the two areas. The impact of these different assumptions can be seen more clearly through an analysis of rates of population growth, and as it is the population growth in the cities and in the rural areas which is the more important policy variable, this will be discussed in more detail.

The impact of a possible mass migration can be seen, in isolation, by comparing the first and the sixth experiments. The first experiment assumes very little migration (similar to the recent past), while the sixth assumes a mass movement to the cities; all other assumptions are the same in the two experiments. In the first experiment there is a steady rise in the rate of growth of the rural population (from 3.0 per cent per annum in 1970 to 3.4 per cent at the end of the century), while in the sixth experiment the absolute size of the rural population remains constant, migration to the cities completely offsetting the natural increase. As a consequence the entire population increase in the sixth experiment is concentrated in the urban area, and over the 30 year period as a whole the urban population increases at an average rate of 5.6 per cent per annum.

/At the

At the beginning of the mass migration the rate of urban population increase is 7.5 per cent per annum, declining to 4.4 per cent at the end of the century.1/ The differing rates reflect the very large impact that mass migration has in its early stages, but which is a steadily declining proportion of the urban population as the population shift to the cities progresses.

Comparison of the first and sixth experiments also shows clearly the potential impact of the different fertility rates in the urban and rural areas. Age specific fertility rates in each area are identical in the two experiments, but significantly lower in the cities than in the rural areas. In the first experiment the rate of total population increase gradually rises, to 3.6 per cent per annum at the end of the century. In the sixth experiment however the continuing shift to the cities (and assuming the migrants fairly rapidly adopt urban patterns) stabilizes the rate of increase at 3.3 per cent per annum. At the end of the century the total population is more than 6 per cent larger in the first experiment than in the sixth. This is the extent to which the often expressed conviction that urbanization is a major

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1/ This is with the assumption that the rural population remains steadily constant at the 1970 level. The natural increase is offset by migration and the number of these migrants also therefore remains approximately the same. As the urban population is steadily rising migrants thus represent a declining proportion of the total urban population and this is the major reason for the steady fall in the rate of increase of the urban population. The assumption of a constant rural population is a reasonable one for purposes of analysing the impact of a mass migration (this was approximately what occurred in Venezuela over a 30 year period, for example), but other assumptions could of course be made. It would be reasonable, for example, to assume a gradual rise in the rate of migration, particularly as there has been relatively little movement to the cities in El Salvador in the recent past so that the assumption of a constant rural population implies a sharp jump in migration rates. The effect of a gradual rise in the migration rate would mean a less rapid rate of increase in the urban populace at the beginning of the period and a more rapid increase later. This would in practice be a question of considerable importance and would have to be investigated in more detail for policy purposes.

/factor in

factor in lowering fertility rates, and hence the rate of population increase, might be realized in the conditions prevailing in El Salvador. The impact is important, but is limited by the fact that fertility rates in the cities themselves remain high.

The second simulation assumes the same mass migration to the cities as the sixth, but also a rather larger decline in rural fertility rates, and a sharp drop in urban fertility rates, to the zero growth level at the end of the century. The total increase in population is therefore a good deal less in the second experiment - for the 30 year period as a whole the average rate of increase is 2.6 per cent per annum compared to 3.3 per cent in the sixth experiment - and this is almost entirely the result of a smaller increase in the urban population. But the increase in the urban population, while much smaller than in the sixth experiment, is still very substantial: the urban population at the end of the century is four times its 1970 size. The second and sixth experiments in effect set the limits to the growth of the cities in the event a mass migration of the sort postulated should occur. At a minimum the urban population would increase four-fold, and the increase could be held to this size only if a steady and very large decline in urban fertility rates accompanied the shift. If there were no substantial fall in fertility rates the city population would multiply more than five-fold. For the 30 year period as a whole the average rate of growth of the urban population would range from 4.8 to 5.6 per cent per annum, with higher rates in the early years and lower ones later on.

Such a mass population shift in El Salvador in the 30 years following 1970 would approximately parallel the shift which occurred in Venezuela in the 30 years leading up to 1970. Around 1940 the Venezuela population was similar in size to that of El Salvador in 1970, with the same percentage split between the urban and rural areas. The rural population then remained constant because of very heavy migration to the cities, and the urban population increased at very high, but declining, rates; there was no decline in fertility rates

/until toward

until toward the end of the period. Such a sequence is one possible scenario for El Salvador in the years to come, and much could no doubt be learned of the major problems posed by such a mass shift through a study of the Venezuelan experience. There will be many differences of course. A central one is that Venezuela was sparcely populated at the time and El Salvador is not; and revenues were also more adequate in Venezuela than they seem likely to be in El Salvador. On both scores the process is likely to be more difficult to manage in the latter country.

Another possible scenario, at the opposite extreme, would envision relatively little migration, with the bulk of the population remaining in the rural areas. Two versions of this are presented: the first simulation experiment - relatively little change from the 1970 situation, one aspect of which is little migration - and the fourth experiment, where there is greater change but where development is concentrated on the rural areas and there is little movement to the cities for this reason. Insofar as population trends are concerned the major difference between the two is the greater decline in birth rates assumed in the fourth experiment, particularly in the rural area, and hence the less rapid population increase.

In each experiment there is only a small decline (around 4 percentage points) in the proportion of the population living in the rural area. These experiments thus establish limits to the rate of increase in the rural population in the event that there should be no important migration to the cities in the decades ahead. At a minimum, and assuming a substantial decline in rural fertility rates, the rural population would increase at an average rate of 2.9 per cent per annum over the period as a whole, and although this rate would be declining, it would still be at 2.6 per cent per annum at the end of the century; the rural population would multiply 2 1/3 times during the 30 years. At a maximum, with only a small decline in fertility rates, the rural population would increase at an average rate of 3.2 per cent per annum; at the end of the century it would be 2.6 times the 1970 size and would be increasing at a rate of 3.4 per cent per annum.

/These potential

These potential increases in the rural population are much smaller than those which would occur in the cities in the event of a mass population shift. But they are still very large, especially when considered in the context of the high population density, and hence limited availability of agricultural land, which already prevails in El Salvador.

Finally, there are the simulation experiments which represent intermediate outcomes between the extremes of massive movement to the cities or almost no migration at all: the third and fifth experiments. The third experiment is similar to the second in concept (development concentrated on the urban area), but with less extreme assumptions. The rural population continues to increase at a steady rate of 1.1 per cent per annum, increasing nearly 40 per cent to the end of the century and still accounting for about one-third of the population at that time. The urban population, although it receives less migration from the rural area and is a smaller proportion of the total at the end of the century, actually increases at a faster rate than in the second experiment due to the less drastic drop in birth rates assumed. Although the total urban fertility rate does decline by more than one-quarter during the period, the rate of population increase in the cities averages 5 per cent per annum for the period as a whole, and is still at the high level of 4.1 per cent per annum at the end of the century.

The fifth experiment is closer to the rural oriented development scenario. There is less migration than in the third experiment and the rural population increases fairly steadily at about 2 per cent per annum. The urban increase is correspondingly smaller, and about 43 per cent of the population is still rural at the end of the century.

There is thus a very wide range of possibilities in this aspect of future population trends. There is little doubt that the total population will increase at a rapid rate to the end of the century, but there is a great deal of uncertainty as to how the increase might

/be split

be split as between the urban and rural areas. Average rates of increase for the 30 year period as a whole in the rural area range from zero to 3.2 per cent per annum in the different experiments, with the rural population varying from 23 to 57 per cent of the total at the end of the century. The average rate of increase in the cities ranges from 3.4 to 5.6 per cent per annum, with the urban population at the end of the century from 2.7 to over 5 times its 1970 size.

Which of these wide range of possibilities actually materializes will be a basic factor in the economic and social development of the country, and migration trends will have to be closely watched for policy purposes. To the extent possible prediction of future trends will have to be made, as planning for the infrastructure and social services required to accomodate such shifts usually has to begin some years before the services actually become available.

Whichever form the evolution takes is likely to involve major challenges. If there is only a slow (or no) increase in the rural population, pressure on the land will not increase, and resources assigned to the rural area can be used largely (or entirely) for improving per capita conditions. But if this is the case it will mean that the cities are expanding at an explosive rate and there is likely to be considerable pressure to concentrate resources on dealing with the urban problems. And even in this case of mass migration the rural population will be 40 per cent or more of the total for at least 10 to 15 years and so cannot be regarded as a minor part of the population and so relatively easy to provide for. If there is little (or no) migration then the expansion of the cities will be less rapid and so easier to deal with. But this will mean that the rural population will continue to increase rapidly, and will remain the bulk of the total, with consequent rising pressures on the available land.

There will be difficulties either way - or with any combination of urban and rural expansion - but the problems that will arise and will have to be handled will be very different ones depending on which path is followed. As noted, urban-rural population trends will be a basic factor in the country's development and will have to be closely watched.

/The Age

The age structure

In 1970 El Salvador had the youngest age structure of the four countries considered in this study, and this structure will probably not change markedly by the end of the century. In 1970 children (those less than 15 years of age) accounted for fully 47 per cent of the entire population, while the older segment of the adult population (those 40 and over) accounted for only 17.2 per cent of the total. By way of comparison, these proportions would be very nearly reversed in an eventually stable population which was no longer increasing; but very little of such a shift is likely to occur in the next several decades in El Salvador.

The only marked change occurs in the second experiment, where both a mass migration to the cities and a sharp and sustained fall in urban birth rates are assumed. If that should occur the proportion of children would decline to just over 35 per cent of the total at the end of the century, but even then those 40 and over would increase only to 21.3 per cent. It is primarily the young adult group which rises in relative importance in the second experiment so that the population remains a predominantly young one. The shift that occurs is that whereas in 1970 children heavily outnumbered adolescents and young adults, this relative dominance is gradually reversed. But even with the rather extreme assumptions of the second experiment the more mature adult group and older persons will remain a minor segment of the population until well into the next century.

In the other experiments the changes are a good deal less substantial. In the first experiment (little change from the 1970 situation) the age structure changes hardly at all. In the other experiments (with intermediate assumptions) there is a mild decline in the proportion of children - to from 41.5 to 43.8 per cent of the total at the end of the century - and a mild increase in the relative importance of the other groups.

/There are

There are important differences in the age structure of the rural as compared to the urban area: essentially the rural population is somewhat younger, and less change occurs to the end of the century. Even in the fourth experiment (rural oriented development with substantial change in the rural parameters) children still account for 43 per cent of the rural population at the end of the century. By contrast, in the second experiment, with great urban change, the proportion of children in the cities falls to 31.2 per cent.

The probably only moderate shift in the age structure reflects both the fact that birth rates have only recently begun a rather slow decline, and that the bulk of the population is still rural, where birth rates are at particularly high levels. There are a number of implications which are worth noting.

First, the relative importance of the dependent population (those less than 15 and over 65) is likely to remain high. In 1970 slightly over half of the entire population fell in these dependent age groups, a percentage which would fall quite substantially (to 39.3 per cent) at the end of the century with the assumptions of the second experiment, but which would remain at very high levels (ranging from 45 to 49 per cent) with the more moderate assumptions of the other experiments. Nearly all of this dependent population will continue to be children through the end of the century; the over 65 age group will probably still be significantly less than 4 per cent of the population.

Apart from the general economic implications of having such a large dependent population to be cared for, the high proportion of children can be expected to exert continuing pressure on educational facilities. The more rapid population growth only began in the 1940s in El Salvador, but the school age population has been increasing at a rapidly rising rate since that date and, from the point of view of the country as a whole, the period of peak pressure has already passed. During the first half of the 1950s the rate of expansion of the primary school group (those 5 to 14 years of age) had already risen

/to 2.8

to 2.8 per cent per annum. The rate of increase then rose sharply to 3.7 per cent per annum during the second half of that decade, and remained at the very high level of approximately 4 per cent per annum throughout the 1960s.

During the 1970s the rate of increase will be substantially less, falling to 3 per cent per annum in the first half of the decade and to a somewhat lower figure in the 1975-1980 period (rates range from 2.4 to 2.9 per cent in the different experiments). From 1980 on there is greater divergence, depending on assumptions about birth rates: in the second experiment, with rapidly declining birth rates, the rate of increase in the primary school age group falls steadily, averaging around 2 per cent per annum during the 1980s and falling below 1 per cent per annum toward the end of the century; in the intermediate type experiments the rate of increase rises to around 3 per cent per annum during the 1980s before again declining (rates range from 2.2 to 2.7 per cent per annum at the end of the century); and in the first experiment, with only a slow decline in birth rates, the rate of increase is again sharply higher during the 1980s (about 3.7 per cent per annum) and declines only slightly from that level (to 3.6 per cent) at the end of the century. The fluctuating rates of increase in all of the simulation experiments except the second is a reflection of the changing age structure as the initial higher rate of population increase works its way through the age structure, setting in motion wave like changes. This aspect has been discussed in some detail in the analysis of the Venezuelan data and need not be repeated here.

In summary, from the national point of view, the period of most rapid increase in the primary school population was experienced in the 1960s; intermediate assumptions about birth rates indicate that, with some fluctuation, the rates of increase will continue at around 3 per cent per annum until toward the end of the century. But here again a major consideration must be how that increase is divided as between the urban and rural areas, and viewed in this way the period of greatest pressure may well still lie ahead.

/Of greatest

Of greatest interest in this respect is the urban area, as pressure for schooling facilities as well as for other amenities is usually expected to be stronger there. During the 1960s the urban primary school age population increased at an average rate of 4.2 per cent per annum, slightly higher than the figure for the country as a whole. Nevertheless, there is a good chance that this rapid rate of increase will continue on the average to the end of the century, and there may well be shorter periods when the increase is a good deal faster.

The average rate of increase for the 30 year period as a whole ranges from 3.1 per cent per annum in the fourth experiment (development centred on the rural area with very little migration to the cities) to the extremely high figure of 5.5 per cent per annum in the sixth experiment (mass movement to the cities and only a slow decline in birth rates); it is 4.8 and 4.2 per cent per annum respectively in the intermediate type third and fifth experiments. With the initiation of large scale migration there may well be a decade or so when the urban population of primary school age increases at rates of 6-7 per cent per annum. In the urban area alone there are likely to be fluctuations in the rate of increase considerably larger than those relating to the entire population, and these can be of substantial importance and will have to be carefully watched. Again this is an aspect which was discussed in the Venezuelan analysis and need not be repeated here.

In sum, the urban primary school age population will continue to increase rapidly until at least the end of the century, possibly at an average rate even higher than that of the recent past, and there may well be shorter periods of extremely rapid expansion. To give an idea of the change in mangnitude such rates of increase imply, some of the figures from the intermediate type third simulation can be cited. The urban population of primary school age in 1970 was just under 370 thousand. In the third simulation the figure rises to 780 thousand in 1985 and to approximately 1.5 million at the end of

/the century.

the century. That is, facilities existing in 1970 will have to be multiplied four-fold over the 30 year period to provide places for the same proportion of the urban primary school age group as was in attendance in that year. If the proportion attending primary school in the cities is to be raised, or if the facilities per student are to be improved, an even greater expansion will be required.

But although the relative importance of the dependent population is likely to remain high, the group which will increase most rapidly during the remainder of this century is the young adult age group (those 20-39 years of age). With 1970 = 100, the size of the group at the end of the century rises from 278 to 294 in the different simulations, implying average rates of increase for the 30 year period as a whole from 3.5 per cent to 3.7 per cent per annum, significantly above the likely rate of increase for the population as a whole. It is important to note that, despite the widely varying assumptions in the different experiments, there is little variation in the expansion of this age group, a reflection of the fact that there is a 20 year lag before changes in birth rates begin to affect the size of the group and so the different assumptions have no impact until toward the end of the century.

The rapid rate of increase in this age group is a rather sharp break with the experience of the recent past and will have a number of major consequences. As noted, the sharp rise in the rate of population growth only began in El Salvador in the 1940s. As the increase was at first concentrated to a major extent in the infant population, and then began to work its way through the age structure, it was only in the 1960s that the impact began to be fully felt in the young adult group. During the 1950s and early 1960s the number of young adults increased at the moderately high rate of 2.4 per cent per annum (already a good deal faster than in earlier years due to the decline in death rates). At that point the earlier sharp increase in the infant population began to enter this age group and the rate of increase began to move to a sharply higher level: during the second half of the 1960s it was 3.1 per cent per annum, and from 1970 there

/will follow

will follow a twenty year period when the increase averages the very high rate of 3.7 per cent per annum.1/ Only during the last decade of the century will the rate of increase decline again to somewhat lower levels, and at the end of the century it is still at 2.7 per cent per annum even with the assumption of sharply falling birth rates of the second experiment; in the intermediate type experiments the rate of increase is still at around 3.1 per cent per annum at the end of the century.

One major consequence of this rapid increase in the young adult population is that it increases the number of births, and this increase may even be strong enough to substantially offset the effect of declining age specific birth rates. It is primarily in this age group that birth rates are high (in 1970 about 80 per cent of all births were to women in the 2039 year age group), so that a rapid increase will, in itself, mean a large rise in the number of births.

The impact can be seen most strikingly in the results of the first simulation. Age specific birth rates decline steadily in that experiment - although slowly, and there is not much shift to the cities with their lower birth rates - but the decline is more than completely offset by the increase in the number of women in the fertile age groups. The number of births rises sharply throughout the 30 year period, and the rate of total population increase rises from 3.2 per cent per annum in 1970 to 3.6 per cent at the end of the century.2/

1/ The rate of increase will be 3.4 per cent per annum during the first half of the 1970s, 3.8 per cent from 1975-1980, 4.1 per cent from 1980-1985, and 3.6 per cent during the second half of the 1980s.

2/ The number of births rises steadily from about 145 thousand a year in 1970 to about 370 thousand a year at the end of the century, an average rate of increase of 3.2 per cent per annum for the period as a whole, despite the fact that age specific birth rates are steadily, if only slowly, declining. The rate of increase rises slowly through 1985 and then declines somewhat to the end of the century, coinciding with the trend in the rate of increase of the young adult population.

/The same

The same sort of influence is present in the other experiments although it is not so clearly indicated in the form of rising rates of population growth. In the intermediate type experiments, despite substantial declines in age specific birth rates, the rate of total population increase remains approximately constant until 1990 and then only declines slightly, to around 3 per cent per annum at the end of the century. Even in the second experiment, where there is a mass movement to the cities and urban birth rates decline sharply (to the zero growth level in 1995), the rate of population increase falls only to 2.6 per cent per annum in 1990 and to 2 per cent at the end of the century.

If birth rates fall substantially from 1970, this will begin to have an impact on the rate of increase in the young adult population in 1990, and from that point on this will be a further factor slowing the rate of population increase. But for at least the first two decades of the projections the young adult population will continue to expand at a very rapid rate, and this, through its impact on the number of births, will mean that the population itself will continue to increase rapidly.

The second major implication of the rapid increase in the young adult population is the importance this has for the rate of growth of the labour force. Labour force trends are of central importance to the analysis and, including this aspect, are discussed in detail in the following section.

Labour force trends and structures

At the national level, and in aggregate terms, the situation is very similar to that already described in Venezuela. The labour force will continue to expand rapidly until at least the end of this century; again, from the present point of view this is perhaps the most important single conclusion of the analysis. The expansion is somewhat larger than that to be expected in Venezuela, and there is even less margin of possible variation in this conclusion in El Salvador. Despite widely differing assumptions in the different

/experiments, the

experiments, the size of the labour force at the end of the century varies only from 277 to 291 (1970 = 100). The labour force is more or less certain to be somewhat more than 2 3/4 times its 1970 size at the end of the century. For the period as a whole this means an average rate of increase which varies only from 3.5 to 3.6 per cent per annum in the different experiments.

This very rapid rate of expansion of the labour force is a relatively recent phenomenon in El Salvador. During the 1950s the labour force grew at a substantially slower rate, around 2.2 per cent per annum. The 1960s witnessed a sharp jump, the rate of increase rising to about 3.2 per cent per annum. And from 1970 to the end of the century the rate is likely to remain fairly steady at the high level of 3.5 to 3.6 per cent per annum.1/ The only partial exception is the second experiment where - due to the assumed rapid decline in birth rates - the rate of increase, after rising to a peak of 3.7 per cent per annum around 1980, declines steadily, although only slowly, to the end of the century.

At the national level then the pressure for adequate employment opportunities will remain strong throughout the rest of the century. Further, the intensity of this pressure may well be of a different order of magnitude from that experienced in the past; as noted, from 1970 the labour force will increase at a substantially higher rate than during the 1960s, which in its turn was already markedly above that of earlier years. In absolute terms the number of new entrants to the labour force is strikingly larger as time passes, and the

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1/ The figures for the 1950s and 1960s were calculated on the assumption that labour force participation rates remained unchanged during those decades. ILO estimates actually indicate a small decline in male participation rates during the 1950s so that if those estimates are used the rate of increase during that decade is slightly lower and the contrast with the following decades somewhat more marked. From 1970 the rate of increase is not completely constant; there is a small rise to 1980, with the rate then falling back to about the 1975 level. This is not of great importance however; the important feature is that the labour force will continue to increase at a very high, and relatively stable, rate from 1970 to the end of the century.

/figures are

figures are useful as an indication of the nature of the problem. In 1955 the labour force was larger than in 1950 by nearly 100 thousand workers; that is there were about 20 thousand new entrants a year during that five year period. From 1965 to 1970 there were about 32 thousand new entrants a year and, using the figures from the intermediate type fifth simulation, the number will rise to 60 thousand a year during the early 1980s and to 97 thousand a year during the last half decade of the century. The flow of persons seeking employment for the first time will therefore both be quite large in relation to the total labour force and, in absolute terms, the numbers will be rising rapidly. If at any point the number of job opportunities should decline, or even not expand much, the volume of "unemployment" will thus rise sharply. There is not much margin of time available in which to work out solutions in circumstances such as these; the situation deteriorates very quickly.

While there is little doubt regarding labour force trends at the national level, there is a wide range of possibilities as to how the total increase might be divided as between the rural and the urban areas. The situation is quite similar to that already analysed for the population as a whole, but may well be of even greater importance insofar as the labour force is concerned. Employment pressures tend to be felt in quite different ways in the two areas; on the whole they are probably more intense in the cities.

Some 59 per cent of the total labour force was rural in El Salvador in 1970, and the rural labour force will cearly continue to be a major segment of the whole.1/ But just how important can vary widely depending on the assumptions made - at the end of the century the rural labour force ranges all the way from 22.6 to 56.4 per cent

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1/ Again it must be noted that conventions of classification are an important factor in the size of the rural labour force. In El Salvador nearly all men in the active age groups are classified as members of the labour force, while very few women are so classified. The rural labour force figures must be used with this reservation in mind.

/of the

of the total in the different simulations - and this involves great differences in how the increase is divided as between the rural and urban areas, and in the rates of growth of the labour force in the two areas.

The rural labour force always expands somewhat more slowly than the urban labour force; although birth rates are higher in the rural areas, this is more than offset by even a small amount of migration. But this does not necessarily mean that the need for additional employment opportunities will be heavily concentrated in the cities. The rural labour force of course increases most rapidly in those simulations where it is assumed there is not much migration (the first and fourth). In these two experiments the rural labour force increases at an average rate of 3.3 to 3.4 per cent per annum over the 30 year period as a whole,1/ and the absolute increase is larger than that in the urban area - despite the fact that the rate of increase is substantially higher in the cities even in these experiments. That is, if there is little movement to the cities (similar to the situation in the recent past), even though the urban labour force will increase faster in relative terms, the majority of the labour force will still live in the rural areas and it is there that the larger number of additional employment opportunities will still have to be found.

To the extent that migration to the cities becomes more substantial the situation changes. In the fifth experiment the average rate of growth of the rural labour force is 2.3 per cent per annum and for the period as a whole somewhat more than 30 per cent of

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1/ In the first experiment, with little change in any of the population parameters, the rural labour force increases at a rate which rises gradually from 3.1 per cent per annum in 1970 to 3.5 per cent at the end of the century. In the fourth experiment, where birth rates are assumed to fall substantially and labour participation rates move to the urban level, the rate is higher during the 1970s (3.4 per cent per annum) and thereafter is at 3.3 per cent. These latter figures must be qualified by the fact that the change in labour participation rates involves the problem that the 1970 rates reflect conventional rather than "real" classifications.

/the growth

the growth in the entire labour force will occur in the rural area. In the third experiment, with more substantial migration, the rural labour force increases at the rate of 1.4 per cent per annum and the relative importance of employment requirements in the rural area drops sharply - to about 16 per cent of the total for the period as a whole. And with the mass migration assumed in the second and sixth experiments there is essentially no increase in the rural labour force and the entire expansion occurs in the urban area.

In the absence of mass migration then the rural labour force will expand at moderate or even quite rapid rates and, given the population density, the increase will not be easily absorbed in productive agricultural employment. Considerable pressures might be generated in such a situation, probably in the form of demands for more land or other agrarian reform measures.

But it is in the urban area that the labour force will grow most rapidly and where the greatest pressures for employment are likely to be felt. For the period as a whole the lowest average rate of growth in the urban labour force is 3.7 per cent per annum in the fourth simulation (rural oriented development), and even this figure is higher than the rural increase in any experiment. This is the minimum increase, in an experiment which assumes almost no migration and in which there is an important decline in urban birth rates; in these conditions the urban labour force expands quite steadily to the end of the century, the rate rising to 3.8 per cent per annum during the 1975-1985 period and then declining only mildly to 3.6 per cent per annum at the end of the century.

From this minimum the rate rises with the varying assumptions of the other experiments. In the first experiment, with less of a decline in urban birth rates, but still little migration, the rate of increase is 4 per cent per annum and there is no decline even at the end of the century. In the other experiments migration is more substantial and as a result the urban labour force increases much more rapidly. With only moderate migration (the fifth experiment)

/the average

the average increase is 4.8 per cent per annum, and with relatively large scale movement to the cities (the second, third and sixth experiments) the rate averages from 5.4 to 5.8 per cent per annum. These are extremely high rates of increase to be sustained over a period of three decades; as can be seen in table 12, at the end of the century the urban labour force would be around 5 times its 1970 size.

The pressure for urban employment will thus be strong and persistent until at least the end of the century in El Salvador. During these years the urban labour force will be increasing rapidly, at a rate which will probably represent the culmination of a rising trend, and hence the period of maximum pressure. During the early 1950s the urban labour force expanded at perhaps 2.5 per cent per annum, and the rate has been rising steadily since; it was 3.4 per cent per annum in the latter 1960s, and was probably at about 4 per cent per annum in the early 1970s.

Thus, even if there is no important migration the urban labour force will be increasing at a rate well above that of the recent past; and at the same time it will be necessary to absorb a continuing rapid increase in the rural labour force, also faster than in the recent past, and in circumstances where the rural labour force continues to account for the bulk of the total and must in itself represent a major preoccupation. To the extent that migration to the cities becomes more substantial, the pressures in the rural area will ease, but this will then mean a considerable period of extremely rapid growth in the urban labour force, much more rapid than anything experienced in the past.

Just how fast the urban labour force might expand in such circumstances can be better appreciated by noting the absolute size of the increase in the third simulation (urban concentrated development with substantial migration and subantial declines in urban fertility rates). During the latter 1960s the increase in the urban labour

/force was

force was about 14 thousand a year; in the third experiment that figure rises to about 50 thousand a year by the mid-1980s and to nearly 90 thousand a year by the end of the century. Such a sharp increase in the number of new urban jobs required is almost certain to create severe economic and social pressures.

The situation is similar to that already analysed with respect to the population as a whole except that the pressures are apt to be somewhat more serious as the labour force will increase more rapidly than the general population during the remainder of the century. The pressure will be substantially greater than in the past, and the principal uncertainty is how it will be divided as between the rural and the urban areas. Again migration trends will have to be carefully watched as this is the factor that will determine the balance. If there is a mass movement to the cities the next several decades will be a period of transition from a basically rural to a basically urban structure. This would probably be similar in many respects to the transition which occurred in Venezuela during the 1940 to 1970 period, and again some indications of the problems likely to arise, and possible solutions, could no doubt be obtained from a careful study of that experience.

In El Salvador the total increase in the labour force varies little from one experiment to another, and the increase is always larger than the increase in the population as a whole. This is similar to the situation already described in Venezuela, and has implications which are similar, although of less importance here. First, population trends change more with varying assumptions in the different experiments, and so again the rate of population growth is not a very reliable indicator of the labour force trend. Second, as the labour force will grow faster, this will mean rising labour participation rates and some increase in per capita incomes quite apart from changes in productivity levels. In Venezuela this was shown to be of considerable importance, but is likely to be less so in El Salvador, essentially because the change in the demographic

/structure is

structure is likely to be smaller. The total labour participation rate rises in all of the experiments, but only with the extreme assumptions of the second experiment (mass movement to the cities and a decline in urban birth rates to the zero growth level) is the rise a large one. As a consequence, even if average productivity per member of the labour force should remain constant, for example, the per capita income at the end of the century in the second experiment would be somewhat more than one-quarter above the 1970 level; in the intermediate type experiments the increase would be around 12 per cent. These increases are significant, but smaller than the corresponding figures in Venezuela. The latter country is somewhat further along in the process of demographic transition, and at a stage where the benefits of this sort are likely to be of greater importance.

Subtantial changes are likely to occur in the structure of the labour force during the coming decades. Much the most important is likely to be the decline in the relative importance of the rural sector, an aspect which has been discussed in some detail above. In addition, there is likely to be a substantial increase in the relative importance of women in the labour force and, finally, a decline in the relative importance of adolescents, offset largely by an increase in the importance of young adults. Again, to make clear the meaning of these shifts it is necessary to note the current activity coefficients and assumptions in the experiments about how these coefficients may change. This aspect was discussed more fully in the Venezuelan analysis; the situation in El Salvador is similar in general terms and so is noted here more briefly, and in reference to the Venezuelan situation.1/

Women are here too a minor part of the total labour force, although in the urban area relatively more women work than is the case in Venezuela. In general labour participation rates are somewhat higher in El Salvador, but the difference is particularly great for

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1/ See pp. 62-67 for a more complete discussion related to Venezuela.

urban women: 18.9 per cent as against only 14.2 per cent in Venezuela. As a result, women account for close to 30 per cent of the urban labour force in El Salvador. From the age of 15 to the age of 45, 30 per cent or more of all urban women are active members of the labour force, significantly higher figures than in Venezuela. There is a similar high proportion of the very young - those 15-29 account for about half the female urban labour force - but again this is as much due to the age structure of the population as to higher participation rates in this age group.

Male participation rates are in general quite high. In the rural area they are particularly high, and probably reflect in part conventions of classification; but they are also consistently high in the cities. Among adolescents and older men participation rates are substantially higher than in Venezuela (where, as noted, they are in turn well above Western European rates) and probably reflect a greater need for these groups to enter, and remain in, the labour force.

The sort of changes which are likely to occur are thus quite clear. For males, labour participation rates for the young and for the older population may decline, and there is significantly more scope for such a decline in El Salvador than in Venezuela as the rates are initially a good deal higher. Labour participation rates for the male population as a whole might therefore decline importantly in certain circumstances. Female participation rates are much more likely to rise and, combined with falling male participation rates, the relative importance of women in the labour force can be expected to rise, perhaps substantially.

These are the directions of change postulated in the simulation experiments, again with the rates in France in 1968 taken as a possible "target". The second experiment assumes that urban participation rates fully reach the 1968 French levels at the end of the century; in the third experiment they move most of the way to that level; and in the other experiments in the same direction but by lesser amounts. The greatest change in rural participation rates is in the fourth

/experiment, where

experiment, where urban-rural differences in this respect are assumed to gradually disappear. Smaller rural changes are postulated in the other experiments.

Despite the rather considerable scope for change in the labour participation rates, such changes are not a significant factor in the overall growth of the labour force. In part this is because the important changes are in opposing directions: the greater number of women in the labour force as a result of rising female participation rates must be set against the decline in the number of males due to lower participation rates in the very young and in the older age groups. But the major factor is simply that the population of working age is growing so rapidly that this completely overwhelms any effect of changing labour participation rates. In the second experiment, where labour participation rates change the most, such changes account for less than 4 per cent of the total increase in the labour force to the end of the century; this is an even smaller impact than in the corresponding experiment in the case of Venezuela.

Changing labour participation rates can be of considerably greater importance in determining the structure of the labour force, although here too the impact is likely to be less in El Salvador than in Venezuela. The principal change may well be the shift in the urban-rural composition of the labour force, and participation rates are not a factor here; the extent of the shift will be dtermined by the extent of migration.

The second most important shift is likely to be the rise in the relative importance of women, and here changing participation rates can be of major importance. The relative importance of women in the labour force rises in all of the experiments, and except for the first experiment the rise is a substantial one. A large part of this rise reflects the movement from rural areas (where female participation rates are very low and male participation rates very high) to the cities (where female rates are much higher and male rates somewhat lower), but changing participation rates can produce substantial

/shifts within

shifts within each area as well. Thus, in the second and third experiments the proportion of women in the urban labour force rises from 29.4 per cent in 1970 to 35.7 per cent and 34.6 per cent respectively at the end of the century.1/ One important aspect of this is that the number of women in the labour force can rise very rapidly in certain circumstances. In the second experiment, for the thirty year period as a whole, the female urban labour force increases at an average rate of 6.3 per cent per annum, and while migration is an important factor, well over one-quarter of the total increase is the result of the assumed rise in female participation rates.

Finally, there are likely to be substantial changes in the age structure of the population, with adolescents and older workers (those 65 and over) declining and the other groups, particularly young adults, rising in relative importance. A shift of this sort occurs in all of the experiments and, except in the first experiment, it is of considerable magnitude. A variety of factors lie behind these changes, and they differ in force, and even in direction, in the two extremes of the age span.

With respect to adolescents, if there is a substantial decline in birth rates this will reduce somewhat the relative importance of this group in the population, and thus in the labour force itself; but this is not the major factor in El Salvador. More important are the possible changes in labour participation rates. First, to the extent the urban population becomes an increasing proportion of the total, adolescent workers will be of declining importance, as the percentage of adolescents in the labour force is smaller in the

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1/ In the fourth experiment (rural oriented development) the proportion of women in the rural labour force rises much more sharply - from somewhat more than 8 per cent in 1970 to 27 per cent at the end of the century - but the low initial figure probably reflects a conventional system of classification to an important extent and so the magnitude of the shift is no doubt exaggerated.

/cities than

cities than in the rural area.1/ Second, participation rates for male adolescents are quite high and may well decline; for example, participation rates are assumed to decline substantially for urban male adolescents in the second and third experiments, and for rural male adolescents in the fourth experiment. Finally, to the extent that female participation rates rise, this will affect primarily adult women and this too will reduce the importance of adolescents in relative terms. Combined, these different influences can result in a sharp decline in the proportion of adolescents. In 1970 adolescents were 23 per cent of the total labour force, and in the intermediate type third and fifth simulations this figure falls to about 17.5 per cent at the end of the century; the decline is greater still in the second and fourth experiments.

There is also likely to be a decline in the relative importance of workers 65 and over. The importance of this age group in the population as a whole will rise slowly, but the scope for decline in labour participation rates is so large that this can be expected to more than offset such an increase. Female participation rates are quite low, for this as for other age groups; but in 1970 over 80 per cent of all males 65 and over in the rural area and over 70 per cent of those in the cities were still members of the labour force. The male "target" labour participation rate (that of France in 1968) for this age group is less than 20 per cent, so the decline can be very large in certain circumstances, and this is what mostly accounts for the fall in the relative importance of older workers in the different experiments.

1/ It has been estimated that, for males, in 1970 more than 40 per cent of the 10-14 year age group and close to 90 per cent of those 15-19 were members of the labour force in the rural area, whereas in the cities the corresponding figures were only 11 per cent and 60 per cent respectively. For females, the percentage is approximately the same in the two areas for the 10-14 year age group, and is actually substantially higher in the cities for the 15-19 group (31 per cent in the cities as against only 14 per cent in the rural area). This again probably reflects in part the customary way of classifying rural women, but nevertheless it is a factor in the calculations, partially offsetting the decline in working male adolescents which results from a population shift to the urban area.

/Mature but

Mature but still fully active workers (those 20 to 64 years of age) can thus be expected to be increasingly dominant during the coming decades: from 72.7 per cent of the total in 1970 their relative importance is likely to rise to around 80 per cent at the end of the century. And the labour force will remain a very young one. At the end of the century young adult workers (those 20 to 39) are more than twice as numerous as any other single age group, and are likely to account for well over half of the total labour force. These total results however do reflect primarily the structure of the urban labour force; in the rural area adolescent workers were in 1970, and are likely to remain, of greater importance.

Chapter IV

ARGENTINA

A. The Situation in 1970 and the Main Variables

The demographic situation in Argentina is very different in fundamental respects from that in either of the two countries analyzed above. Argentina is a high income country, and although the agricultural sector is of key importance, particularly as a source of export earnings, the economy is nevertheless basically organized around modern type urban activities. This is reflected in the fact that the population is also predominantly urban, the cities accounting for well over three-quarters of the total in 1970. In this respect the population structure is similar to that of Venezuela. But whereas in Venezuela this reflects mass migration to the cities and a transformation from a predominantly rural to a predominantly urban population during recent decades, in Argentina recent changes have been less drastic and it reflects more a long standing situation. From the early years of the century the mejority of the population has been urban in Argentina, and although the degree of urbanization has increased steadily it has been a more gradual process than in Venezuela.

But the demographic aspect which most distinguishes Argentina from the other countries in this study is the rate of population growth. In each of the other countries (and in the region as a whole) the rate of increase has risen substantially during the post-World War II period, and currently stands at a high level. In Argentina by contrast, the rate of increase has declined during this period and in the years immediately preceding 1970 was at the moderate level of 1.4 per cent per annum. In this context the urbanization process itself takes on a rather different meaning. Although the migration flow to the cities has been less massive than in Venezuela, it has nevertheless been more than sufficient to drain off the entire natural increase in the countryside; the absolute size of the rural population has declined steadily throughout the post-war period.

/The changes

The changes which have occurred, as well as the existing situation, can be more fully appreciated with the greater number of subdivisions used. While for Venezuela and El Salvador the analysis distinguished only two areas - rural and urban - four separate areas are used in the simulation experiments for Argentina. The country is first divided on a regional basis, the north being separated from the rest of the country, and within each region there is then a rural-urban separation.1/ The basis for the regional division was broadly the lower level of per capita income which characterized the north, and the rather general belief that this reflects a meaningful difference in the forms of social-administrative-economic organization.

There are major differences in the population parameters in the different areas, and this is an important aspect of the Argentine situation. The most important underlying variable is the fertility rate, and here the differences can be clearly seen. In both Venezuela and El Salvador there are significant differences in fertility rates between the urban and the rural areas, but they remain high everywhere.2/

1/ The division can be considered only approximate, and is based in part on the familiar necessity to follow political rather than conceptually desirable dividing lines. The provinces of La Rioja, the northern part of Córdoba (not including the city of Córdoba) the northern part of Santa Fe, and the province of Entre Ríos form the dividing line and, along with all provinces further to the north, are included in the North region. All other provinces are included in what is here called the South. Some of the provinces in the South have relatively low per capita incomes, but the division has been made here so as to form two geographically united areas. Further divisions could be usefully made - in particular the Pampa region could be shown as a separate unit - but this has not been done, both for reasons of simplifying the analysis and because of the additional statistical effort this would have required. In both the North and the South communities with 1,000 or more inhabitants are considered urban and the rest rural.

2/ The total fertility rate around 1970 was estimated at 5.4 in the urban area in Venezuela and at 5.5 in the urban area in El Salvador.

/In Argentina

In Argentina the situation is quite different: fertility rates are in general lower, and there is greater variation from one area to another. In 1970 the total fertility rate is estimated to have been as follows in the different areas: 5.9 in the rural North, 3.8 in the urban North, 3.9 in the rural South, and 2.3 in the urban South.

There are several aspects here worth noting. First, the difference between the North and the South is substantial, both in the cities and in the rural areas. Within each region there is again the rural-urban difference, with birth rates in the cities a good deal lower. But it is clear that there are other factors involved in addition to urbanization. The total fertility rate in the cities of the North is nearly as high as in the rural area in the South, and is much higher than in the Southern cities. But the fertility rates even in the North of Argentina are well below those in Venezuela and El Salvador. Finally, the unusually low fertility rate in the urban South is of great importance. It is not much above the rate of zero population growth (in an eventual stable population), and given the large proportion of the total population which lives in this zone, values of the population parameters in the urban South weigh heavily in the figures for Argentina as a whole. Within the urban South, Greater Buenos Aires is in turn of predominant importance, and the total fertility rate here appears to be at, or even marginally below, the eventual zero growth level. At a distance from the Buenos Aires region, even within the South, urban birth rates are significantly higher.

The fertility rate estimates in Argentina can be accepted with reasonable confidence. The number of births, classified by the age of the mother, are available separately for each province, so that regional differences between the North and the South can be quite accurately estimated. Rural-urban differences within each region were estimated largely by calculating the ratio of infants to women of child-bearing age in primarily urban and primarily rural districts within the different provinces, and these estimates must be regarded

/as more

as more approximate. In the South however this is less of a problem as the more complete data are available for Greater Buenos Aires, which accounts for a major part of the southern urban population. As in the other countries, the area estimates were adjusted so as to be consistent with the aggregate CELADE estimates for Argentina for 1970.

With birth rates at relatively low levels, any given amount of internal migration will have a greater impact on population trends in the different areas, and migration in recent years has been fairly substantial in Argentina and has in fact had a large impact of this sort. Estimates for the four zones used in the experiments were made both for 1960 and for 1970 (from the respective census data) in order to be able to calculate recent trends, and these serve to illustrate the situation. During the 1960s, within each region, there was migration from the rural to the urban areas, and in addition there was an important movement of people from the North to the South. As a result, despite the low fertility rates, the population increase in the urban South accounted for nearly 90 per cent of the population increase in the country as a whole during the decade. There was also an important increase in the population of the urban North - the percentage increase was somewhat larger than in the urban South - while the population of the rural North declined by more than 10 per cent and there was a smaller decline in the rural South as well.

Migration has therefore been a major factor in the population growth of the urban South; during the 1960s new arrivals from the North and from the rural areas within the South itself appear to have accounted for well over half of the total increase. This proportion is even higher than the corresponding figure for Venezuela, but placed in the context of the size of the total increase, the impact is bound to have been considerably smaller. Whereas the urban population in Venezuela was increasing at an average rate of 5 per cent per annum during the 1960s, the population of the urban South in Argentina was expanding at a rate of only 2.1 per cent per annum,

/so that

so that even though more than half of the increase represented an influx from other areas, this was a much smaller proportion of the resident population.

Even if internal migration continues on a substantial scale the impact can be expected to decline further from its present moderate level. The bulk of the population already resides in the South, and in the urban areas, so that continuing large-scale migration would fairly rapidly depopulate the rural areas and/or the North. The situation here is similar to that already observed in Venezuela: the basic transformation to an urban society (and in Argentina one concentrated in the South) has already occurred. But whereas in Venezuela this meant that the growth of the cities will increasingly reflect the natural increase in the cities themselves, this will not necessarily be the case in the urban South in Argentina. The low fertility rates may well mean that although the impact of migration is declining, it may nevertheless remain an important factor in the population trend in the urban South.

Estimates of the structure of migration are more difficult to make in Argentina, and must be regarded as more approximate. First, because it is necessary to estimate the north-south flow as well as the movement to the cities; and second, as there is the complicating factor of international migration, in this case in-migration, predominantly from neighbouring countries in recent years. Nevertheless, the structure which emerges from the estimates is fairly similar to that described in some detail in the Venezuela analysis, and is adequate for present purposes.

More women than men migrate to the cities, and again this is reflected in the population structure. In 1970, some 80.6 per cent of all women lived in the urban areas (15 per cent in the North and 65.6 per cent in the South) whereas only 77.3 per cent of the men were urban residents (14.1 per cent in the North and 63.2 per cent in the South). It might be expected that regional migration, with the longer distances and greater changes involved, would be predominantly male, but this does not appear to have been the case in Argentina. In 1970

/some 73.6

some 73.6 per cent of all women lived in the South, as against 73.0 per cent of the men, and the estimates of regional migration during the 1960s indicate a slightly, but not particularly significant, excess of women. The differential movement by sex can be seen quite clearly by noting the percentage distribution among the different areas of the country of particular age groups. Several age groups, selected to show the pattern are as follows:

SELECTED AGE GROUPS: PERCENTAGE DISTRIBUTION BY SEX, AMONG THE DIFFERENT AREAS OF THE COUNTRY IN 1970

Age Group	Females				Males			
	Rural North	Urban North	Rural South	Urban South	Rural North	Urban North	Rural South	Urban South
0-4	17.4	17.6	9.6	55.4	17.9	17.3	9.8	54.9
15-19	12.9	18.0	8.7	60.4	15.9	15.6	10.6	57.9
20-24	11.3	15.7	8.5	64.5	12.5	14.2	10.7	62.6
30-34	8.6	13.8	7.4	70.2	9.8	12.8	9.5	67.9
45-49	7.8	12.4	6.8	73.0	9.5	11.9	9.4	69.2
60-65	7.3	11.6	5.9	75.2	9.4	11.2	9.4	70.0

The first age group basically shows the distribution of births, and is nearly the same for males and for females. By the time the 15-19 age span is reached there is already a sharp drop in the proportion of females in the rural North and a mild drop in the rural South; for males by contrast the drop in the rural North is mild and there is actually a rise in the rural South. That is, substantial movement out of the rural areas by women begins at an earlier age than for men; and much of this movement is regional as the large relative increase in the urban South is primarily at the expense of the North. At this age level many more females than males live in the cities: 78.4 per cent as against 73.5 per cent. The next age group shows a sharper movement of males from the rural North and the difference is narrowed somewhat, only to widen again in the higher age groups. Of particular note is the steady decline in the proportion of females living in the rural South, where the proportion of males does not

/change markedly.

change markedly. And it is the urban South where women concentrate to a substantially greater extent than men; the proportions in the urban North are much more similar. Other details can be seen through examination of the figures.

It is again primarily the young who migrate, but the age structure is somewhat different in Argentina than that in Venezuela and El Salvador. In general there is less migration both of young children and of older people; migration appears to have been concentrated more heavily in the 15 to 35 year age range. The heaviest migration of women occurs several years earlier than for men, as shown in the figures above, and similar to the situation in the other countries. But, contrary to the situation in Venezuela and El Salvador, women do not appear to continue to migrate in large numbers throughout the age range; after about 35 women do migrate more than men, but the proportions are not large for either sex.

There are significant differences depending upon the particular migration flow involved. Migration from the rural area in the North is more similar in structure to the movement from the rural areas in Venezuela and El Salvador: larger proportions of children are involved, and rather more older women continue to migrate. Migration from the rural South is of an intermediate sort (for Argentina), with fewer children and older adults involved. And, finally, migration from the North to the South is very heavily concentrated in the 15 to 35 year age range.

With respect to death rates, there are also substantial differences between the North and the South, particularly for women. For males we have estimated death rates for infants and children in 1970 to be somewhat more than 50 per cent higher in the North than in the South. The differential then declines with age until for those over 50 death rates appear to be about the same in the two regions. For females, death rates in 1970 are estimated to have ranged around 80 per cent higher in the North up to the age of 50, and the differential, while declining thereafter, remains important to the age of 70. These large differentials are not the result of

/particularly high

particularly high death rates in the North of Argentina - on the contrary these are in general lower than the death rates even in the urban area in Venezuela, and still further below the rates which prevail in El Salvador. Rather, the differential reflects the unusually low death rates which have been achieved in the South. Within the two regions the available data do not clearly indicate any significant difference in death rates as between the rural and the urban areas and, within each region, these are assumed to be the same in 1970.1/

B. Results of the Simulation Experiments

As is clear from the above discussion, the demographic structure in Argentina has evolved to a point where it is strikingly different from that in most of the region. The principal implication of this for the simulation experiments is that there is less room for varying the underlying population parameters than is the case in other countries included in this study. The population is already largely urban, and concentrated in the South, so while internal migration may continue to be an important factor there is no possibility of mass movements involving a basic change in structure. Fertility rates, especially in the urban South where the bulk of the population lives, are already much lower than in the other countries

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1/ The available data are similar in nature to the situation already noted with respect to birth rates. By province, registered deaths by age group are available and so a relatively good estimate can be made of regional differences. Data on rural-urban differences are not directly available however, and the estimates had to be based for the most part on figures for primarily urban and primarily rural districts within the different provinces. Even these figures show only total deaths, rather than by age group. As no clear pattern emerged from comparisons of this sort it was assumed that death rates in the rural and urban areas within each region were the same. Although this may not be accurate, it is an adequate approximation for present purposes. As has been noted before, death rates have less of an impact on the calculations than other variables, and this is especially true with the low level these have reached in Argentina.

/so there

so there is less scope for postulating possibilities of further decline in the future. And death rates are also already relatively low and so again the possibility of further decline is more limited. All of this means that, in absolute terms, future population trends in Argentina can be defined within more narrow boundaries; that is, the variation from one simulation to another will be smaller. But in relative terms, as will be seen, there is still the possibility of important differences, depending on the assumptions made.

The second and third experiments involve assumptions which are most similar to trends in the recent past in Argentina: concentration on urban modern type activities, with substantial migration, both regional and rural-urban, and continuing important declines in fertility rates. The third experiment is a close approximation to a continuation of the trends of the very recent past; the second experiment involves more extreme assumptions which would speed up this process of change.

Although it would imply a sharp departure from past trends, the fourth experiment is also in its way a more realistic alternative than in many countries. In Argentina this would involve concentration on the North and on the rural areas. The general resource base is probably sufficiently strong to enable this to be done without completely foregoing progress in the urban South. The North plus the rural South accounted for only 37.5 per cent of the total population in 1970, not an overwhelming proportion, and the general economic level of this area is already fairly high so that there is an unusually good base on which to build; the rural South in particular is characterized by high productivity levels and substantial capacity for further development. But as noted this would mean a departure from past trends.

The fifth experiment represents a compromise between the third and fourth, and is probably a more real possibility. The first experiment (little change from the 1970 situation) implies a trend in which the process of demographic change which has characterized the recent past essentially stops, or more exactly, continues but only at a much reduced pace.

/The results

The results of the different simulation experiments are shown in table 13.

Population trends

The population of Argentina is likely to increase about 35 per cent from 1970 to the end of the century; from somewhat less than 24 million to around 32 million. There is relatively little variation in this respect from one experiment to another. In the second experiment, with the greatest assumed declines in fertility rates and with substantial migration toward the areas where fertility rates are lowest, the increase is 30 per cent, to 30.9 million at the end of the century. At the other extreme, in the first experiment where there is little change in fertility rates and not much migration, the increase is only 42 per cent, to 33.8 million at the end of the century.

The rates of population increase involved are in all cases only moderate. For the 30-year period as a whole the range is only from an average of 0.9 per cent per annum in the second experiment to 1.2 per cent per annum in the first experiment. In all of the experiments there is a steady decline in the rate of population growth, from the 1.4 per cent per annum of the 1960s, and there is somewhat greater variation in the rates reached at the end of the century - from the 0.5 per cent per annum reached in the second experiment to the 1.1 per cent in the first experiment. But the predominant characteristic of the population trend in Argentina is still that, starting from an already relatively low level in 1970, there is a steady but slow decline to the end of the century in each of the diffe

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Table 13

ARGENTINA: RESULTS OF THE SIMULATION EXPERIMENTS a/

	1970	The year 2000				
		Experiment I	Experiment II	Experiment III	Experiment IV	Experiment V
Population (millions)	23.75	33.82	30.86	31.77	32.73	32.25
North rural	2.89	4.40	1.60	2.36	4.71	3.22
North urban	3.63	6.56	5.18	5.69	6.95	6.31
South rural	2.09	2.58	1.41	1.71	2.93	1.91
South urban	15.14	20.28	22.67	22.01	18.14	20.81
Population (1970 = 100)	100	142	130	134	138	136
North rural	100	152	55	82	163	112
North urban	100	181	143	157	192	174
South rural	100	124	68	82	140	91
South urban	100	134	150	145	120	137
Rate of increase (% p/a) b/	1.4	1.1	0.5	0.7	0.9	0.8
North rural	-1.1	1.5	-2.3	-0.9	1.4	0.2
North urban	2.9	1.8	0.1	0.7	1.8	1.3
South rural	-0.5	0.7	-1.8	-1.0	1.0	-0.7
South urban	2.0	0.8	1.0	1.0	0.4	0.9
Population distribution (%)	100	100	100	100	100	100
North rural	12.9	13.5	5.6	7.9	14.8	10.0
North urban	14.9 } 27.8	19.4 } 32.9	17.0 } 22.6	18.2 } 26.1	21.3 } 36.1	19.6 } 29.6
South rural	9.7	7.9	4.9	5.7	9.1	5.9
South urban	62.5 } 72.2	59.2 } 67.1	72.5 } 77.4	68.2 } 73.9	54.8 } 63.9	64.5 } 70.4
Population age structure (%)	100	100	100	100	100	100
0 - 4	10.1	9.7	7.4	8.2	8.7	8.5
5 - 14	19.1	18.0	15.5	16.4	17.2	16.8
15 - 19	9.0	8.4	7.9	8.0	8.3	8.2
20 - 39	28.5	28.4	30.2	29.5	29.0	29.2
40 - 64	26.2	25.4	27.9	27.1	26.3	26.7
65 and over	7.2	10.2	11.1	10.8	10.5	10.7
Age structure in north rural area (%)	100	100	100	100	100	100
0 - 4	15.3	14.9	10.7	12.4	12.2	12.4
5 - 14	27.5	26.0	21.5	23.3	23.9	23.8
15 - 19	9.0	9.9	8.2	8.8	10.0	9.4
20 - 39	21.6	26.1	21.8	24.0	29.4	26.6
40 - 64	21.0	16.6	24.7	21.4	17.8	19.5
65 and over	5.6	6.7	13.0	10.0	6.7	8.3
Age structure in north urban area (%)	100	100	100	100	100	100
0 - 4	12.8	11.9	8.8	9.6	9.9	10.2
5 - 14	22.4	21.7	20.0	20.5	19.2	20.5
15 - 19	11.1	9.6	9.0	9.3	9.4	9.5
20 - 39	29.0	29.3	28.5	29.5	32.1	30.5
40 - 64	19.9	21.4	25.2	23.7	23.1	22.7
65 and over	4.8	6.1	8.4	7.4	6.3	6.6
Age structure in south rural area (%)	100	100	100	100	100	100
0 - 4	11.4	11.2	7.3	8.4	9.4	8.3
5 - 14	20.4	20.4	16.2	17.4	18.9	18.0
15 - 19	7.6	8.5	6.8	7.4	8.6	7.8
20 - 39	24.1	26.9	22.8	24.8	30.6	27.0
40 - 64	29.2	21.0	27.3	25.3	21.5	23.0
65 and over	7.3	12.0	19.6	16.7	11.0	15.9
Age structure in south urban area (%)	100	100	100	100	100	100
0 - 4	8.2	7.6	6.8	7.3	7.3	7.4
5 - 14	16.5	14.8	14.0	14.5	14.5	14.5
15 - 19	8.7	7.6	7.7	7.7	7.3	7.6

Table 13 (cont.)

	1970	The year 2000				
		Experiment I	Experiment II	Experiment III	Experiment IV	Experiment V
Labour force (1970 = 100)	100	141	153	150	139	146
North rural	100	153	63	89	172	117
North urban	100	187	170	182	211	195
South rural	100	113	70	82	133	91
South urban	100	134	176	163	119	148
Rate of increase (% p/a) b/	1.4	1.2	1.2	1.2	1.1	1.1
North rural	-1.1	1.5	-2.1	-0.7	1.9	0.4
North urban	3.0	2.0	0.8	1.3	2.2	1.7
South rural	-0.7	0.6	-1.8	-1.0	1.2	-0.6
South urban	1.9	1.0	1.7	1.5	0.5	1.2
Male labour force (1970 = 100)	100	140	132	134	134	134
Female labour force (1970 = 100)	100	148	226	207	156	188
Rate of increase (% p/a)	1.4	1.2	1.2	1.2	1.1	1.1
Male labour force	1.3	1.1	0.7	0.7	0.9	0.8
Female labour force	1.8	1.4	2.2	2.0	1.6	1.8
Labour force distribution (%)						
By sex	100	100	100	100	100	100
Male	78.0	76.9	67.4	69.6	75.1	71.6
Female	22.0	23.1	32.6	30.4	24.9	28.4
By area	100	100	100	100	100	100
North rural	10.8	11.7	4.4	6.4	13.4	8.7
North urban	14.2	18.8	15.9	17.3	21.7	19.1
South rural	9.2	7.4	4.2	5.0	8.8	5.8
South urban	65.7	62.1	75.5	71.3	56.1	66.4
By sex and area	100	100	100	100	100	100
Male North rural	9.5	10.0	3.9	5.6	10.1	7.0
Male North urban	10.4	13.8	10.4	11.7	16.1	13.1
Male South rural	8.3	6.4	3.4	4.2	6.6	4.9
Male South urban	49.7	46.7	49.7	48.1	42.3	46.7
Female North rural	1.3	1.7	0.6	0.8	3.3	1.6
Female North urban	3.8	5.0	5.4	5.6	5.6	6.0
Female South rural	0.9	1.0	0.8	0.8	2.2	0.9
Female South urban	16.0	15.4	25.8	23.2	13.8	19.8
Labour participation rates (%): total	37.9	37.7	44.6	42.6	38.2	40.8
Male North rural	55.3	55.9	62.7	60.4	52.4	55.6
Male North urban						
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Table 13 (conc.)

	1970	The year 2000				
		Experiment I	Experiment II	Experiment III	Experiment IV	Experiment V
South urban labour force age structure (%)	100	100	100	100	100	100
10 - 19	12.4	10.7	7.4	8.2	10.4	8.9
20 - 39	50.0	48.0	49.6	48.8	46.1	48.0
40 - 64	34.5	37.2	40.5	40.2	38.9	39.8
65 and over	3.1	4.1	2.5	2.8	4.6	3.3
Male South urban labour force age structure (%)	100	100	100	100	100	100
10 - 19	10.6	9.2	7.0	7.6	9.0	8.1
20 - 39	49.0	47.0	49.3	48.4	45.2	47.5
40 - 64	37.0	39.5	41.2	41.1	41.1	40.9
65 and over	3.4	4.3	2.5	2.9	4.7	3.5
Female South urban labour force age structure (%)	100	100	100	100	100	100
10 - 19	18.0	15.2	8.1	9.3	14.7	10.8
20 - 39	53.1	51.1	50.0	49.7	49.7	49.2
20 - 64	26.7	30.2	39.3	38.3	31.8	37.0
65 and over	2.2	3.5	2.6	2.7	3.8	3.0

Note: The 1970 CELADE estimates of population, by sex and 5 year age group, provided the basis for the 1970 estimates shown. Rural/urban differences were estimated with the use of a few aggregate figures which were available from the 1971 census plus the detailed data from the 1961 census. The CELADE estimates of age specific birth rates and death rates were used as the starting point in all of the experiments - again with rural/urban breakdowns estimated from census data. Labour participation rates, by sex and 5 year age group, were estimated directly from the census data. The principal assumptions which determine the results of the experiments relate to migration rates, fertility rates, and labour participation rates. The different migration rates assumed can be roughly judged from the table on the basis of the population shift from the rural to the urban area in the different experiments. The assumptions about fertility rates were as follows. In the 1965-1970 period the total fertility rate in the North rural area was estimated to be 5.93, in the North urban area 3.81, in the South rural area 3.93 and in the South urban area 2.27. The 1995-2000 estimates (with lineal interpolation from the first to the last period) were: experiment I, 5.0, 3.4, 3.5 and 2.2 respectively in the four areas; experiment II, 4.2, 2.5, 2.6 and 1.8 respectively; experiment III, 4.5, 2.7, 2.8 and 2.0 respectively; experiment IV, 3.5, 2.6, 2.6 and 2.2 respectively; and experiment V, 4.0, 2.7, 2.7 and 2.1 respectively. Assumed changes in labour participation rates to the end of the century were: experiment I, little change; experiment II, to 1968 French levels in the urban areas, half way to the urban levels in the South rural area, little change in the North rural area; experiment III, 80% of the way to the 1968 French levels in the urban areas, one-quarter of the way to the urban levels in the South rural area, little change in the North rural area; experiment IV, little change in the urban areas, rates in the rural areas move to the urban level; experiment V, intermediate between experiments III and IV. There were also assumptions about the other variables. The trend in total mortality rates is that used in the CELADE projections.

a/ Only the results at the end of the experiments - that is the year 2000 - are shown as this is the single figure of most interest; the 1970 figures are shown for comparison. The trend is not necessarily smooth throughout the 30 year period however, and this is often of considerable importance. Several instances of this sort are noted in the analysis.

b/ The rates of increase shown are the annual rates of increase during the 5 year period up to the date shown. That is, in the first column they are the annual rates during the period 1965-1970; in the other columns during the period 1995-2000.

/differences in

differences in the population trend from one experiment to another is one illustration of the general point noted earlier: the population structure in Argentina has already evolved to a position where possible future changes are more limited and there is thus less variation in the results of the different simulations.

The population increase in Argentina during the coming decades will thus be markedly less than that experienced in most of the region. With respect to the countries already analyzed, the probable increase to the end of the century of around 35 per cent in Argentina compares with a population likely to multiply 2.3 times in Venezuela and 2 1/2 times in El Salvador. Not only is the total increase much smaller in Argentina, the trend is also more steady and there is less uncertainty due to possible changes in the underlying population parameters. Taking the extremes, for example (the first and second experiments), the maximum population projection at the end of the century is only 9.2 per cent higher than the minimum projection in Argentina; in Venezuela and El Salvador the corresponding figures are 21.6 per cent and 29 per cent respectively.

In the most general terms, Argentina could well occupy a unique position in Latin America at the end of the century in so far as population is concerned. Even in 1970 the country had one of the largest resource endowments per capita in the region, and as the population will increase less rapidly than in other countries this position will become steadily more favourable in relative terms. Using the gross, but still suggestive, indicator of inhabitants per square kilometer, the figure for Argentina in the early 1970s was 9, compared with 15 for the region as a whole. At the end of the century the figure will probably be around 30 for the region as a whole, but will have risen only to about 12 in Argentina, indicating a sharp improvement in the country's relative position in this respect. Of course this is not necessarily a good indicator of total resources, but it is clear that at least with respect to agricultural resources the country is very richly endowed, and in a world increasingly

/concerned with

concerned with the adequacy of food production, this is of great importance. Even without detailed analysis it seems clear that the per capita resource availability in Argentina at the end of the century is likely to be unusually favourable.

At the same time, the total population is fairly large, and given the relatively high level of per capita incomes already achieved, the national market is of substantial size. This market is currently large enough to support a fairly wide range of economic activities and if a reasonable rate of economic growth can be maintained the situation will improve. In general it is reasonable to believe that the national market is large enough to provide a firm foundation for a reasonably diversified and expanding economy.

These aspects taken together - an unusually favourable per capita resource base and a fairly large national market with per capita incomes already at relatively high levels - could well as noted place Argentina in a uniquely favourable position in terms of per capita welfare in the years to come.

Although the population trend at the national level can be estimated within fairly narrow margins of possible variation, there is more uncertainty about how the increase will be shared among the different areas of the country. The major variable which will determine the division is internal migration, but this will interact with the divergent rates of natural increase in the different areas. In the absence of migration the population would increase most rapidly in the North and in the rural South, where fertility rates are highest. To the extent there is migration it will be away from these areas and the population increase will be shifted to the urban South.

The possible extremes are illustrated by the second and fourth simulations. In the fourth simulation (rural and regional oriented development) there is a modest flow of migration from the rural to the urban area within the North, but no net migration out of the North to the South and no movement to the cities within the

/South itself.

South itself.1/ As a consequence the bulk of the total increase as well as the highest rates of increase occur in the North and in the rural areas. In this fourth experiment the relative importance of the North rises from 28 per cent of the total population in 1970 to 36 per cent at the end of the century; during the 30-year period it accounts for over 57 per cent of the total population increase.

There are two points worth emphasizing from this aspect of the fourth experiment. First, it shows clearly the extent to which the population growth in the urban South is a function of migration. In the absence of migration the population of the urban South increases only 20 per cent to the end of the century, an average rate of increase of 0.6 per cent per annum. Already in 1970 the rate of natural increase was less than 0.9 per cent per annum, and this declines slowly to 0.4 per cent per annum at the end of the century. Without migration the relative importance of the urban South declines significantly, from 62.5 per cent of the total population in 1970 to less than 55 per cent of the total at the end of the century. If calculated separately the figures for the Buenos Aires area would show an even more marked tendency of this sort as fertility rates are lower there than in the rest of the urban South.

The second point to note is that the rate of population growth is not extremely high in any area. The rate of natural increase even in 1970 in the rural North was only about 2.2 per cent per annum, and some decline has been assumed over the period. The most rapid overall increase, taking into account the effects of migration, is in the urban North where the population increases over 90 per cent to the end of the century, an average rate of increase of 2.2 per cent per annum. Even this figure is small compared with some of the possible increases noted earlier in the Venezuelan and El Salvador analyses.

1/ Although from a national viewpoint Argentina is highly urbanized, the situation is quite different in the two regions. Within the South only about 12 per cent of the population is still rural, but in the North the proportion is still well over 40 per cent. For this reason, even in the fourth experiment it has been assumed there will be a continuing modest amount of rural-urban migration within the North.

/At the

At the other extreme is the second experiment, which assumes great change within a context of continuing urban oriented development and so involves substantial migration, both from the rural areas to the cities and from the North to the South. As a result there is an increasing concentration of the population in the urban South. The absolute increase in population to the end of the century in the urban South is actually larger than the increase for the country as a whole, and the relative importance of the area rises steadily from 62.5 per cent of the total in 1970 to 72.5 per cent at the end of the century. There is also an important increase in the population of the urban North, offset by substantial declines in the size of the rural population, both in the North and in the South.

While this second experiment includes the most extreme assumptions about migration, and hence the concentration of population growth in the urban South, these assumptions represent a quite real possibility; the projections are in fact not very different from the actual trends of the 1960s. During that decade the population of the urban South increased about 2.7 million, compared to an increase of 3.1 million for Argentina as a whole, while the population of the rural North declined over 10 per cent and that of the rural South nearly 5 per cent.

If migration continues to be substantial then this sort of trend will continue, either as in the second experiment or in the more moderate form shown in the third experiment. Even with migration playing a major role however (migrants account for around two-thirds of the population increase in the urban South in the second experiment), it is important to note that the rate of population growth in the urban South is still **not** particularly high. In the second experiment it averages 1.4 per cent per annum for the 30-year period as a whole, and declines slowly but steadily throughout the period.

The impact on the rural areas is much greater. The population of the rural North declines at an average rate of 2 per cent per annum for the 30-year period as a whole, and that of the rural South by 1.3 per cent per annum. By the end of the century only 10.5 per cent

/of the

of the total population of the country would be rural, and even within the North the proportion would have fallen from its present 40 per cent to less than 25 per cent. This reflects a situation similar to that described earlier in Venezuela: since the population is already largely urban continuing large scale migration will have a large impact on the rural areas - in the case of Argentina the population actually declining fairly rapidly - whereas the impact on the urban areas will be smaller and of declining importance. This is especially true of the urban South and, combined with the low natural increase, means that the really rapid expansion of this area is past; the rate of population increase will decline, probably to a fairly low figure at the end of the century.

The other experiments yield varying intermediate type results. As can be seen from table 13, rates of growth and the relative importance of the different areas at the end of the century vary a good deal from one experiment to another and so migration trends will have a good deal of importance in Argentina. But in no experiment is there a consistently high rate of increase in any individual area and so the problems posed will not be of the same magnitude as in many other countries. A large part of the total population increase will continue to be in the urban South, both because it holds the majority of the population at the beginning of the period and because it is the traditional objective of much of the internal migration; but the rate of increase in this major area will be moderately low, and falling. The highest rate of increase is likely to occur, as has been the case in the recent past, in the urban North; but even there the highest average rate for the 30-year period as a whole is 2.2 per cent per annum in the fourth experiment, and here too the rate steadily declines in all of the experiments.

The principal regional population problem raised by migration in Argentina could well be of a quite different sort. Namely, continuing rapid migration could well depopulate the countryside - particularly in the South - to the point where labour shortages could

/impede adequate

impede adequate exploitation of the country's rich agricultural resources. Labour productivity in agriculture is already estimated to be close to the non-agricultural level in the South, and complaints of labour shortages have been made. If rapid migration continues this situation could become increasingly serious.

The age structure

In 1970 Argentina had, by a considerable margin, the most mature population age structure of any of the countries included in this study. During the remainder of this century the age structure will continue to evolve in this general direction, but the changes will probably be fairly moderate, and will occur only gradually over the thirty year period. At least at the national level, the shift will be quite steady and such fluctuations as may occur will not be of the same sharp nature of those likely to be experienced in some other countries.

For the country as a whole the changes likely to occur are clearly defined. Perhaps the most significant change will be a persistent decline in the relative importance of both children and adolescents (that is, all those up to the age of 20). With the assumptions of the second experiment - relatively large declines in fertility rates and substantial migration - the proportion of children and adolescents in the population would fall sharply, from 38.2 per cent of the total in 1970 to 30.8 per cent at the end of the century. With the less extreme assumptions of the other experiments the decline is less, but it occurs in all of the experiments and, except in the first experiment with its assumptions of little change from the 1970 situation, is fairly substantial. In the intermediate type fifth experiment for example the proportion of children and adolescents declines to 33.5 per cent at the end of the century.

Under most assumptions the relative importance of all other age groups rises. The single exception is in the first experiment, where there is a small decline in the relative importance of both the

young and the older adult groups, and only the over-65 group rises as a proportion of the whole.1/ But although the active adult age groups do rise somewhat in relative importance in all of the other experiments, the largest increase regularly occurs in the over-65 group. Those 65 years of age and over already accounted for 7.2 per cent of the total population in 1970, and by the end of the century this proportion will probably rise to around 10 1/2 per cent.

Just as the age structure in 1970 is already much more mature in Argentina than in Venezuela or El Salvador, so the continuing evolution to the end of the century is different from that analyzed earlier for those countries. In Venezuela and El Salvador the young adult age group (those 20-39 years of age) will increase rapidly during the coming decades, and assumptions of more rapid declines in fertility rates (and hence declining relative importance of children) will increase even further the relative importance of this group; these populations will consequently remain very young ones. In Argentina by contrast young adults will not increase rapidly, and declining relative importance of children will be offset primarily by rising relative importance of the older population.

But while at the national level the changes to be expected are clear, and will occur only gradually, there is a considerable divergence from one area to another within the country, and more uncertainty about future trends. It is first important to stress that, both because of differences in fertility rates and because of migration, the age structure was quite different from one area to another in 1970. The figures are shown in table 13, but are reproduced here for easier comparison.

1/ In the first experiment the changes in the age structure are for the most part very small. There is a substantial rise in the proportion of those over 65, and this is offset by small declines in the relative importance of all other age groups.

POPULATION AGE STRUCTURES IN 1970

(Percentage)

Age group	North rural	North urban	South rural	South urban
0-4	15.3	12.8	11.4	8.2
5-14	27.5	22.4	20.4	16.5
15-19	9.0	11.1	7.6	8.7
20-39	21.6	29.0	24.1	30.4
40-64	21.0	19.9	29.2	28.2
65 & over	5.6	4.8	7.3	8.0

It is clear at a glance that there are sharp differences from any one area to another, a mixture of urban-rural and North-South variations. The extremes are the rural North, where children and active adults are approximately equal in number (42.8 per cent and 42.6 per cent of the total respectively), and the urban South, where children are a much smaller minority and active adults are the dominant group by a wide margin (24.7 per cent and 58.6 per cent of the total respectively).

Because of the importance of migration in shaping these age structures, and the significance of regional as well as rural-urban movements, they do not follow closely the changes which would otherwise occur as a population becomes more mature. For example, the porportion of children in the rural North is moderately lower than the proportion in Venezuela; but whereas in a closed society this decline would normally first be offset by a rise in the relative importance of young adults, in the rural North the percentage of young adults is in fact very low, because this is the group which has migrated heavily. The proportion of older adults is by contrast a good deal higher than in Venezuela or El Salvador, even though much lower than in the South of Argentina itself.

As to future trends, it is intuitively clear from this situation that much will continue to depend on the extent of migration, and this is shown in the results of the simulation experiments. Too much emphasis should not be placed on these figures since, as was noted

/earlier in

earlier in the Venezuelan analysis, once the population in the areas from which the migrants come (in this case the rural areas and to a degree the North) has been reduced to a minor part of the national total, the age structure of the migrants may assume particular forms, and the simulation model may not give an accurate description of this aspect. Nevertheless, it does give an approximate idea of the major changes.

The general situation can be shown by considering the results of two of the simulation experiments, the first and the second. When substantial migration is assumed (the second experiment) it is primarily the young who move and so decline in numbers in the rural areas, while the older age groups tend to remain and so increase greatly in relative importance. In the rural North those 40 and over account for 37.7 per cent of the population at the end of the century in the second experiment, compared to only 24.3 per cent in the first experiment, with its assumption of little migration. In the rural South the contrast is similar: those 40 and over are 46.9 per cent of the total at the end of the century in the second experiment but only 33 per cent in the first. The differences in the urban areas are more in line with the differences at the national level, although for different reasons. In the urban North migration does not have much of a net effect as the movement into the area from the rural zone is approximately offset by the movement out toward the South. In the urban South the reason is that, although the total net migration flow is toward this area, the bulk of the population is already concentrated there and so further migration no longer has a major impact.

Other possible changes can be seen by examining the results of the different experiments in table 13. The point to stress here is that migration flows can be a major factor in determining how changes at the national level are reflected in the different areas of the country, even with respect to changes in the age structure.

/Analyzing some

Analyzing some of the implications of these changes makes clearer the general aspects described above. The first aspect to be noted is the size of the dependent population (those under 15 and those 65 and over). The dependent population was a considerably smaller proportion of the total in Argentina in 1970 than in any of the other countries included in this study, and the proportion may decline further to the end of the century.1/ Any decline will be smaller however, and of only a transitory nature; in an eventual stable, zero growth, population the dependent population would be about the same porportion of the total as in Argentina in 1970.

While the overall size will not change much, there will be substantial changes in the composition of the dependent population, and this will have important implications for social and economic policy. Those 65 and over will increase steadily in relative importance during the coming decades, while the proportion of children will decline, how much depending on assumptions about fertility rates.2/ The temporary nature of any decline in the dependent population is also due to this changing structure: the decline in the relative importance of children in the years ahead will eventually be offset by a further increase in the relative importance of older people.

There are again very wide variations in the size and composition of the dependent population from one area to another, and changes vary substantially with the assumptions of the different experiments. At the extremes, in 1970 the dependent population was 48.4 per cent of the total in the rural North but only 32.7 per cent of the total in the urban South; and within these totals children were much more predominant in the North than in the South. As an example of

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1/ In the first experiment (little change from the 1970 situation) the proportion rises somewhat, but in all of the other experiments it remains constant or declines.

2/ In 1970 children were 80 per cent of the dependent population. In the first experiment, with little change in fertility rates, the proportion falls to 73 per cent at the end of the century; in the second experiment, with substantial change, to 67 per cent.

/differences in

differences in trends, when relatively heavy migration is assumed the proportion of those 65 and over rises sharply, and to high levels, in the rural areas. These and other details are shown in the figures in table 13.

Children will continue to account for over two-thirds of the dependent population at the end of the century, even in Argentina, and within this group perhaps the most important aspect is the likely change in the school age population, with its implications for educational planning. The primary school population (those 5-14 years of age) has been increasing only slowly in recent years, and this will continue to be the case in the years ahead. Reflecting the steady decline in fertility rates, and the relatively low level these have reached, the rate of increase of the 5-14 year age group fell from 2.2 per cent per annum during the 1950s to 1.0 per cent during the 1960s, and will decline further to about 0.7 per cent per annum during the 1970s. Thereafter the rate will depend on changes in fertility rates, but is likely to remain low. At one extreme, with the assumption of little change from the 1970 situation in the first experiment, the primary school population increases more rapidly again during the 1980s (at a rate of 1.3 per cent per annum), after which the slowing trend is resumed (the increase during the 1990s is 1.0 per cent per annum). At the other extreme, with the assumptions of substantial change in the second experiment, there is a further, but quite small, increase in the size of the primary school age population during the 1980s, and then during the last decade of the century this age group declines slightly in number.

Requirements of additional educational facilities to meet the needs of an expanding primary school age population will therefore be relatively modest in Argentina in the years to come. They will be sharply less than the likely requirements in Venezuela and El Salvador. It is even possible that by the end of the century the primary school population will decline slightly in size, a situation similar to that experienced in a number of the high income industrial countries in recent years.

/As important

As important as the overall increase is the question of how that increase will be distributed among the different areas of the country, for in Argentina this can mean very different requirements in different places and in different circumstances. A wide range of possibilities is revealed in the simulation experiments and it would be tedious to describe all or even most of these. The point that needs to be stressed is that with different assumptions, but most particularly with different levels of migration, primary school requirements can change sharply, and this will need to be a basic consideration in educational planning. This can be illustrated by results from two of the simulation experiments, the second (continuation of the concentration in the urban South), and the fourth (rural and regional oriented development).

In the second experiment, even though at the national level there is no net increase in the primary school population from 1980 to the end of the century, there is a continuing increase in the urban South due to the migration flow. The increase is moderate (0.8 per cent per annum during the 1970s, 1.2 per cent during the 1980s and 0.4 per cent during the 1990s), but it would be necessary to add steadily to educational facilities in the area. In the rural areas by contrast the primary school age population declines steadily and substantially; by the end of the century it is only about half its 1970 size. In these circumstances it is unlikely that additional facilities would be required, even to raise attendance ratios. The situation in the urban North is different still with these assumptions: there is a substantial increase during the 1970s, a further marginal increase during the 1980s, and then a decline during the last decade of the century.

With the assumptions of the fourth experiment trends are quite different. In the urban South, with no migration inflow the increase is much less and so over the period as a whole only a very small

/increase in

increase in educational facilities would be required.1/ In the rural areas and in the urban North however there is for the same reason a steady, if varying, increase in the primary school age group and additional facilities would be required on a moderate scale.2/

Migration trends will thus have to be carefully watched in planning additional educational facilities. The situation will be easiest to predict in the urban South: there is sure to be a modest increase at least until 1990, and even substantial migration flows will not require much faster expansion in relative terms; the highest rate of increase in any of the experiments is only 1.2 per cent per annum during the 1980s in the second experiment. This is a clear example of the fact that, since there is already a considerable concentration of the population in the urban South, further migration will have a limited impact on the area. But in the other areas there is much greater variation depending upon the assumptions made. This is especially true of the rural areas, where without migration there will be a moderately rapid increase in the primary school population, but where substantial migration could readily result in a decline in the size of this age group.

At the other extreme of the dependent population, the number of those 65 and over will increase more rapidly than any other age group, and will be a steadily rising proportion of the dependent

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1/ The primary school age population remains approximately constant during the 1970s, increases at the rate of 0.5 per cent per annum during the 1980s, and declines slightly during the last decade of the century. At the end of the century the population of primary school age would be only 5 per cent larger than it was in 1970.

2/ In the rural North, for example, the rate of increase of this age group rises steadily from 0.5 per cent per annum during the 1970s to 1.7 per cent during the last decade of the century. In the urban North the rate of increase fluctuates but is on the average higher than in the rural North; and it is in this area that the greatest increase occurs with these assumptions. The rate of increase is less in the rural South due to the lower fertility rates, but there is a continuing rise in the primary school age population.

/population as

population as a whole. From less than 20 per cent of the dependent population in 1970, elderly persons will increase to perhaps 30 per cent at the end of the century. This is sharply higher than the corresponding figures in the other countries analyzed: in Venezuela, for example, elderly people are likely to comprise only somewhat more than 10 per cent of the dependent population at the end of the century, and in El Salvador only around 8 per cent. Argentina is one of the first countries in the region to be faced with the quite different requirements of an elderly dependent population of substantial size, and this is likely to be an increasingly significant factor in social and economic planning in the years ahead.1/

Here too the situation is quite different in the different areas of the country, and trends will vary greatly depending upon the extent of migration. In 1970 the relative importance of elderly people was substantially higher in the South than in the North of the country and, reflecting the impact of migration, the proportion was particularly low in the urban North. The proportion will rise in all areas, and will reach fairly high levels in the South, so it is there that most attention will have to be given to the problems raised. Migration will again have its principal impact on the rural areas, not by directly involving the elderly, but by draining away the younger age groups so that the former are a larger proportion of the remaining population. In the rural South the

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1/ It is of some interest to note that the rate of increase of the 65 and over group, although remaining consistently higher than that for the rest of the population, has already begun to slow, and the tendency will continue in the decades ahead. During the 1950s this group increased in number at the rate of 4.7 per cent per annum. During the 1960s the rate of increase had already declined to 4.1 per cent per annum, and is expected to fall further: to 3.1 per cent per annum during the 1970s and to 1.3 per cent per annum at the end of the century. This reflects the earlier beginning and more gradual nature of the population transition in Argentina. The slowing process has already worked its way through the entire age structure and begun to affect the oldest age groups.

/substantial migration

substantial migration assumed in the second experiment results in the 65 and over group comprising nearly 20 per cent of the total population at the end of the century. This is approaching the sort of age structure which migration to the cities has created in the agricultural areas in several of the Western European countries in recent years.

The other age group which needs to be mentioned, again largely because the situation contrasts sharply with that in the other countries studied, is young adults (those 20-39 years of age). This age group will expand as fast as the total population to the end of the century, and probably somewhat faster. But the difference will not be large and so the group does not increase much in relative importance in any of the experiments - in marked contrast to the results obtained for Venezuela and El Salvador. Equally important, the rate of increase is fairly moderate, much lower than that which will prevail in the other countries analyzed.1/ It is worth noting again that the increase in the number of young adults is essentially predetermined until 1990, and even during the last decade of the century the different assumptions in the simulation experiments have only a mild effect.

The two important implications of this situation have to do with trends in the number of births, and hence the rate of population growth itself, and with trends in the size of the labour force. The young adult population is the age group which accounts for the bulk of total births, and so if the number of young adults is increasing very rapidly the number of births will tend to follow, and this influence may offset rather substantial declines in age specific fertility rates. This was earlier seen to be the sort of situation which will prevail in Venezuela and El Salvador in the coming decades.

1/ The 20-39 age group will increase at the rate of 1.5 per cent per annum during the 1970s and 1.2 per cent during the 1980s. The rate during the last decade of the century varies somewhat with assumptions about fertility rates, ranging from 0.6 per cent in the second experiment to 0.8 per cent per annum in the first.

/In Argentina,

In Argentina, by contrast, young adults will be increasing in number much more slowly, and so the impact of a decline in fertility rates will be reflected to a larger extent in the trend of total births.

This is reflected most clearly in the second experiment, which assumes the greatest overall decline in fertility rates. In that simulation there is a small increase in the number of births during the 1970-1975 period, then a slight decline over the following 15 years, and a somewhat faster decline during the last decade of the century. This contrasts with the results of the second experiment in Venezuela, for example, where despite a much faster assumed decline in fertility rates the number of births continues to rise for a 20-year period; in 1990 they are about 25 per cent above the 1970 level in Venezuela but slightly below the 1970 level in Argentina. The contrast reflects the much more rapid increase in the number of young adults in Venezuela, which is more than enough to offset the greater assumed decline in age specific birth rates.

The relatively slow increase in the number of young adults in Argentina also means that the number of births will rise only moderately (and the rate of population increase will remain moderate) even if there is not much further decline in fertility rates. This is shown in the first experiment (little change from the 1970 situation) where the number of births increases throughout the 30 year period, but quite slowly; at the end of the century the number of births in a year is only about one-third more than in 1970. For comparison, in the corresponding first experiment in El Salvador, for example, the number of births at the end of the century is more than 2 1/2 times the 1970 level. The contrast, with similar assumptions about the trend in fertility rates, again reflects the fact that the number of young adults will increase much more rapidly in El Salvador.

As with other aspects of the age structure there are considerable differences from one area to another, and much depends on the amount of migration assumed. The main features of this situation have

/already been

already been described and need only be mentioned here. The trend of births in the urban South can be most confidently projected. Fertility rates in this area are already quite low and so there is relatively little scope for further declines in the future.1/ And as there is already a considerable concentration of population in the area, even substantial migration will not in the future have a major impact. As a consequence the birth trend is fairly similar in all but one of the experiments: a slow increase, most of which occurs in the first half of the period, with the number of births at the end of the century around 20 per cent higher than in 1970. The single exception is the fouth experiment; with these assumptions (rural and regional oriented development and a complete cessation of migration to the urban South) the number of births would be approximately constant throughout the period of the projection.

There is again much greater uncertainty in the rural areas. If there is substantial migration it is primarily the young who move and so the potential impact is especially large when considering the young adult group. The sharply diverging results which follow from the use of different assumptions can be illustrated with the projections for the rural North in the first and in the second experiments. In the first experiment there is relatively little migration out of the area, so the number of young adults increases fairly rapidly and this is reflected in the rise in the number of births. In the second experiment substantial migration from the rural North is assumed, resulting in a fairly rapid decline in the number of young adults and so also in the number of births. In 1970 there were about 94 thousand births a year in the rural North. With these different assumptions the number of births in a year either rises to 135 thousand at the end of the century (in the first

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1/ Again it should be noted that it is possible to envision circumstances in which fertility rates in the urban South might rise from present levels. Such a possibility has not been considered in any of the simulation experiments, but might mean a somewhat greater degree of uncertainty about the future level of births in this area.

/experiment) or

experiment) or falls to 35 thousand (in the second experiment). Assumptions about fertility rates in the rural North are quite similar in the two experiments so these sharply differing trends are a clear illustration of the possible impact of migration on the population structure of the rural areas, and of the need to watch migration flows carefully in the formulation of social and economic policies affecting these areas.

The second major implication of trends in the number of young adults is with respect to the labour force, but as labour force trends are of central importance to the analysis these are treated more fully below.

Labour force trends and structures

In marked contrast to trends in the other countries analyzed, the labour force in Argentina will increase only moderately in the years to come. There is some variation from one experiment to another, but the labour force will not expand by much more than one-half from 1970 to the end of the century, and with some assumptions the increase will be significantly less. For the 30 year period as a whole the average rates of increase in the simulation experiments range from 1.1 per cent to 1.4 per cent per annum, sharply lower than those which will prevail in the other countries analyzed.

Further, and again in contrast to the situation in the other countries analyzed, postulated changes in labour participation rates account for an important part both of the variation from one experiment to another, and of the total increase in those experiments where this is largest. If it is assumed that labour participation rates remain unchanged during the period of the projection the labour force increases less than 40 per cent from 1970 to the end of the century - an average rate of increase of only 1.1 per cent per annum - and there is very little uncertainty about the projection. Despite considerable differences in assumptions about changes in the other variables, if participation rates are held constant the

/increase in

increase in the labour force ranges only from 36 per cent to just under 40 per cent in the different experiments.

The issue of adequate employment opportunities will therefore probably not be of the same central importance in Argentina as in many countries of the region. Not only will the increase in the labour force be much less rapid under any assumptions, but if the rate rises above 1.1 per cent per annum (for the period as a whole) it will be due to rising participation rates. This introduces an element of flexibility as participation rates may indeed rise if adequate employment opportunities are available, but may simply remain around present levels if the employment situation is unfavourable. This element in the potential increase in the labour force is unlikely to exert the same degree of social and political pressure as an increase in the number of persons of working age.

This general situation is a continuation of an already well established trend in Argentina - throughout the post-war period the labour force has increased at a rate ranging only around 1.5 per cent per annum - and is a further reflection of the fact that the population transition began much earlier in Argentina than in most countries of the region, and has been of a more gradual nature. The precise form of this past trend is itself dependent on recent changes which have occurred in labour participation rates. If it is assumed that labour participation rates have remained constant, then the labour force was increasing at 1.7 per cent per annum in the early 1950s, and the rate then gradually declined to 1.4 per cent in 1970 (see table 4, Chapter I). Available estimates however show an important decline in labour participation rates during the 1950s, followed by a small rise during the 1960s, so that the actual rate of increase in the labour force may have been more or less constant; the estimates vary somewhat.

The simulation experiments indicate a continuation of this sort of situation. If labour participation rates should remain approximately constant there will be some further decline in the rate of increase in the labour force, how much depending on the other

/assumptions made.

assumptions made. In the first experiment (little change from the 1970 situation) the rate of increase would be about 1.1 per cent per annum at the end of the century, while with the substantial migration and lower fertility rates assumed in the second experiment it would decline further, to 0.7 per cent at the end of the century. But if labour participation rates move toward Western European levels the increase in the labour force will be a good deal larger. In the second experiment for example, where it is assumed that these levels are fully reached at the end of the century, the rate of increase is again higher during the 1970s (1.6 per cent per annum); and while the declining trend is then resumed, the rate remains at 1.2 per cent per annum at the end of the century. This second experiment shows how great a difference changing labour participation rates might make in Argentina: with no change the labour force would increase 36 per cent over the 30 year period (an average rate of increase of 1.0 per cent per annum), but with the changes actually assumed the increase is 53 per cent (an average rate of 1.4 per cent per annum). The somewhat different structure of labour participation rates in Argentina and the changes assumed are discussed more fully below.

As with nearly all other aspects of the projections in Argentina, there are substantial differences from one area to another and, depending upon the assumptions used, particularly with respect to migration, quite different trends are possible. During the 1960s migration was sufficiently large to result in an important decline in the labour force in the rural areas, while the urban labour force expanded correspondingly more rapidly. The rural-urban migration was greatest in the North, so that the rural labour force declined more there and it was in the Northern cities that the labour force expanded most rapidly.

There is least uncertainty about future trends in the urban areas: there will be a steady increase in the labour force under all assumptions, and there is no possibility of the very high rates of increase which will be characteristic of the urban labour force in

/many countries.

many countries. In most of the experiments the labour force continues to increase fastest in the urban North, but even there the highest average rate for the 30 year period as a whole is only 2.5 per cent per annum in the fourth experiment (regional oriented development). The smallest average increase for the urban North is 1.8 per cent per annum, so that the possible trends range within fairly narrow limits for this area. In the cities of the North then the labour force can be expected to increase fairly rapidly, so that serious general labour shortages would be unlikely to occur even with major regional oriented industrial development programmes; while at the same time there is little chance of the extremely high rates of increase which lead to rapid deterioration of the employment situation with any even temporary slowing of the growth rate.

In the urban South the rate of increase will probably be less, and there is somewhat more variation from one experiment to another. With the assumptions of the second experiment (growth concentrated on the urban South) the average increase for the 30 year period is 1.9 per cent per annum, and this is the only experiment in which the labour force expands slightly faster in the cities of the South than in those of the North (1.9 per cent vs. 1.8 per cent per annum). At the other extreme, in the fourth experiment, where there is no migration to the urban South, the average increase is only 0.6 per cent per annum. The increase in the labour force in the cities of the South will therefore probably be quite moderate, and the achievement of reasonable growth rates should prevent any serious deterioration of the employment situation. Even a modern oriented growth process, with the rapidly rising productivity levels which this is likely to imply, could probably be carried through in this area without the strains and contradictions which would be involved in most of the region.

The rural areas will at most account for only a minor part of the total increase and, because of the large potential impact of migration, there is much more uncertainty about trends in these areas.

/Even in

Even in the fourth experiment (rural and regional oriented growth) the rural labour force expands only slightly faster than that of the cities, and accounts for less than 28 per cent of the total increase in the labour force to the end of the century. And if there is substantial migration, as assumed in the second and third experiments, the absolute size of the rural labour force will decline steadily in the decades ahead. Especially in view of the substantial agricultural resources available, it is unlikely that rural employment opportunities will be a serious problem in Argentina in the coming decades. On the contrary, if rural-urban migration continues on a substantial scale it is quite likely that shortages of agricultural labour, at least in the South, will be of increasing concern. Labour productivity is estimated to be nearly as high in the agricultural as in the non-agricultural sector with the South itself, and concern has already been expressed that the flow of manpower to the cities has gone too far. If the flow continues such concern can be expected to increase.

The structure of labour participation rates is rather different in Argentina and needs to be described more fully; it is important both to an understanding of the possible labour force trends described above and to the composition of the labour force itself. There are the usual differences in participation rates between the rural and the urban areas in Argentina: the proportion of males who are active members of the labour force is substantially higher, at all age levels, in the rural areas than in the cities while the proportion of females who are members of the labour force, by contrast, is substantially lower in the rural areas. But these differences are for the most part less sharp in Argentina than in many countries of the region. In the rural areas in Argentina participation rates for males are not as high as in either Venezuela or El Salvador, for example, and participation rates for females are not as low, particularly for the younger age groups. In part this may reflect a more realistic classification in Argentina, but in part it is probably a reflection of real differences in economic

/circumstances; the

circumstances; the lower male participation rates are no doubt at least partially a reflection of relatively higher rural incomes, and the higher female participation rates are probably due to more opportunities for remunerated employment outside the home.

In the cities female participation rates are also higher for the younger age groups in Argentina, but this difference does not extend consistently through the rest of the age range, and even for younger women it is much less striking than the similar comparison for the rural areas. The most notable feature of urban participation rates in Argentina is the relatively low percentage of older persons who are members of the labour force. From middle age, urban female participation rates are lower in Argentina than in either Venezuela or El Salvador, but as these rates are quite low everywhere the difference is not so striking. For males it is much more so. In El Salvador urban male participation rates remain quite high until after the age of 70; in Venezuela they drop quite sharply after the age of 60; but in Argentina the decline begins from the age of 50 and is much more substantial. Further, within Argentina male participation rates decline more in the South than in the North. The extent of these differences can be appreciated from the following figures.

MALE URBAN PARTICIPATION RATES
(Percentage)

Age group	El Salvador	Venezuela	North Argentina	South Argentina
45-49	95	94	95	94
50-54	95	94	88	84
55-59	94	91	74	64
60-64	91	79	59	47
65-69	87	70	49	36
70 and over	68	49	33	22

These figures no doubt reflect the more widespread social security benefits available in Argentina, which enable more older people to withdraw from the labour force. And the extension of these

/benefits to

benefits to the rural areas is reflected in somewhat lower participation rates for older males in the rural areas as well. But the very low figures for older males in the cities, particularly in the South, may also be due in part to involuntary withdrawal from the labour force because of difficulties in finding adequate employment opportunities. That this is the case is suggested by the fact that participation rates for urban males in the 50 to 65 year age groups in Argentina are low not only by comparison with those in other countries of the region, but are well below the level of participation rates in Western Europe as well.1/ This provides an important further element of flexibility in the urban labour force: an important proportion of males 50 and over are not now active members of the labour force, but might be drawn into that labour force under appropriate conditions. Added to the potential increase in the number of women in the labour force, this presents the possibility of relatively large expansion of the total labour force in certain circumstances and explains why, when it is assumed that labour participation rates move toward Western European levels, this becomes an important factor in the total increase in the labour force in Argentina.

This structure of labour participation rates, and the changes which could occur in such rates, make them a potentially important factor in nearly all aspects of the labour force projections in Argentina. Their role in the total increase has already been noted, and one major implication of this role is its predominant importance

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1/ These labour participation rates are well below those prevailing in France in 1968, and which are used as the "goal" in the simulation experiments. The rates in France are, in their turn, well below those in some of the other Western European countries. That these low rates in Argentina are in part involuntary is also suggested by the past trend. From 1950 to 1960 participation rates for older males declined sharply. From 1960 to 1971 the participation rates for those 65 and over continued to decline, but for the 50 to 65 age groups there was a significant rise in participation rates, although they remained far below the 1950 levels.

/in any

in any change in the total activity rates (the percentage of the population which are active members of the labour force) which occurs in the coming years. The total activity rate in Argentina in 1970 was relatively high - nearly 38 per cent compared to rates of around 31 per cent in much of the region - and is again a reflection of the much earlier beginning of the population transition in that country. If labour participation rates should remain unchanged there will be no important change in the total activity rate to the end of the century, no matter which set of assumptions about the other variables is used. This reflects the fact that the age structure has evolved much further in Argentina so that the continuing decline in the relative importance of the non-working young is now approximately offset by the rise in the relative importance of the non-working older population. As shown in table 13, however, the total activity rate does rise substantially to the end of the century in several of the experiments, and this is very largely the result of assumed changes in participation rates. In the second experiment for example the total activity rate at the end of the century is 44.6 per cent, and the bulk of this increase is due to rising participation rates. If participation rates should move to the Western European level, as assumed in that experiment, an additional 5 per cent of the entire population would be drawn into the active labour force, an indication of the potential flexibility this element gives to the size of the labour force in Argentina.

The changes in the composition of the labour force in Argentina will probably be more moderate than in most countries in the years ahead, again a reflection of the more mature population evolution, and to the extent such changes occur changing participation rates will almost always be a major cause. The principal possibilities are changes in the composition by area, by sex, and by age group, and each of these can be analyzed briefly in turn.

In 1970 close to two-thirds of the total labour force was concentrated in the urban South, and although the concentration will continue important variations are possible, depending upon the

orientation of future development. As has been noted at several points, the rate of natural population increase in the urban South is low so that much depends upon the amount of migration; and with respect to the labour force in the area much also depends on changes in participation rates. At one extreme, in the second experiment (development concentrated on the urban South with a considerable inflow of migrants and with activity rates moving to the Western European level), the concentration increases and at the end of the century the urban South accounts for slightly over three-quarters of the total labour force. At the other extreme, with a regional and rural oriented development, with no further migration to the urban South, and with little change in participation rates in that area (as assumed in the fourth experiment), the degree of concentration declines and the urban South accounts for only 56 per cent of the total labour force at the end of the century. These contrasts emphasize the extent to which the growth of the labour force in the urban South will continue to depend on migration and/or rising labour participation rates; if there were no inflow of migrants and no change in participation rates the labour force in the area would increase only around 17 per cent over the 30 year period, and of course decline substantially in relative importance.

The urban North is likely to be the area with the most significant rise in its relative share of the labour force in the years ahead. In 1970 the area accounted for only 14.2 per cent of the total labour force, but as was noted earlier the labour force in the area increases moderately rapidly under all sets of assumptions, and it is relatively more important at the end of the century in every experiment. In the intermediate type fifth experiment, for example, the proportion of the total labour force accounted for by the urban North rises to just over 19 per cent.

The greatest uncertainty, here as in other population aspects, is encountered in the rural areas. These accounted for 20 per cent of the total labour force in 1970, and while this percentage would rise somewhat with the rural oriented development projected in the

/fourth experiment,

fourth experiment, it will decline by about half by the end of the century with a continuation of an urban oriented development, with its associated migration to the cities, as projected in the second and third experiments.

On the basis of past trends the most likely projection appears to be a continuation of the concentration of the labour force in the urban South - but not much further increase in the relative share of this area; an important increase in the proportion of the labour force located in the urban North; and a continuing decline in the relative importance of the rural labour force in Argentina.

The relative importance of women in the labour force will increase; but the change is likely to be less striking than it may well be in some other countries, simply because in 1970 women were already a somewhat higher proportion of the labour force in Argentina than in many countries of the region. From 22 per cent in 1970, the relative importance of women in the labour force could nevertheless rise to around 30 per cent by the end of the century. Such a rise is indicated in the second and third experiments and would be brought about both by a continuing shift to the cities (where female participation rates are higher) and by the assumed rise in female participation rates toward the Western European level. In this respect the situation is the same in Argentina as elsewhere: the important factors in a rising porportion of women in the labour force will everywhere be the shift to the cities, and the extent to which participation rates within a given area rise.

The impact of rising female participation rates is reflected in the activity rates shown in table 13. In the fourth experiment it is assumed that, as part of the rural oriented development, participation rates in the rural areas move to the rates prevailing in the urban areas; and as a result the female activity rate in the rural areas more than doubles by the end of the century. In the cities the greatest increase is in the second experiment, where it

is assumed that urban female participation rates rise to the Western European level, and as a consequence the female activity rate in the urban South, for example, rises from 18.8 per cent in 1970 to 30.6 per cent at the end of the century.

As can be seen from the table, male activity rates in the different areas are not likely to change much in the years ahead. To the extent that male participation rates move toward the Western European levels in the cities there are two opposing elements which approximately offset each other: participation rates of teenagers, and of those over 65, decline; but for the 50-65 year age groups participation rates rise.

At the national level any important change in the age structure will depend upon a change in participation rates, and this would be of the sort already described: the proportion of teenagers would decline as participation rates for this group fell, and the relative importance of older adults would rise as participation rates for the 50 to 65 year age groups increased. Such a shift is shown in the second experiment, where the proportion of teenagers falls from 13.7 per cent in 1970 to 8.2 per cent at the end of the century while the percentage of older adults rises from 34.7 per cent to 40.2 per cent. Most of this shift is caused by the change in participation rates, but it is reinforced by the assumed decline in fertility rates, which leads to a significant drop in the proportion of teenagers in the population as a whole at the end of the century.

There are, however, substantial differences from one area to another which are caused by factors other than participation rates. There are first already in 1970 major differences in the age structure of the labour force between the rural and the urban areas. The central feature of this difference is the much smaller proportion of young adults in the rural areas, largely a reflection of the heavy migration of the young to the cities. In the urban areas 50 per cent or more of the labour force is 20-39 years of age while in the rural North the corresponding figure is only 38.3 per cent and in the rural South only 35.2 per cent. The extent of migration assumed in the

/projections does

projections does not change the age structure of the labour force much in the urban areas but, again reflecting the impact migration can have on the rural areas, is of central importance there. In the experiments where it is assumed that rural-urban migration is sharply less than in the recent past (the first and fourth experiments), the proportion of young adults in the rural labour force rises to figures similar to, or even higher than, the proportion of that group in the urban labour force.

There are also important differences in the age structure of the labour force as between the North and the South in Argentina. If the rural North is compared with the rural South, and the urban North with the urban South (see table 13), in 1970 the proportion of teenagers in the labour force is substantially higher in the North and the proportion of older adults substantially lower. This difference is primarily a reflection of the underlying difference in the age structure of the population in the North and in the South, rather than of differences in labour participation rates in the two regions. As can be seen from an examination of the figures in table 13, these regional differences will remain to the end of the century, but are likely to be reduced significantly in magnitude.

Finally, the age structure of the female labour force is also quite different from that of the male labour force; in the urban South in 1970, for example, the very young accounted for a much larger proportion of the female labour force and older workers a correspondingly smaller proportion (see table 13).1/ The difference

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1/ The data are shown only for the urban South in table 13 and the analysis here is limited to that area. It accounts for the predominant part of both the male and female labour force and the urban labour force figures are also likely to be more meaningful. In comparative terms the differing composition of the male and female labour force in the urban North is similar to that in the urban South. In the rural areas the very young appear to account for an even more disproportionate share of the female labour force. For example, in the rural North in 1970 teenagers were 30.9 per cent of the total female labour force as compared to 16.6 per cent of the male labour force; but as has been noted before rural labour force figures, especially for women, must be used with greater reserve.

/is actually

is actually concentrated in a much narrower range than shown by the age classification used: those 15-24 years of age accounted for fully 37.6 per cent of the entire female labour force, compared to 26 per cent of the male labour force. The extent to which this situation changes will depend largely on the changes that occur in participation rates. If participation rates should move to Western European levels, for example, the composition of the female labour force by age group would become quite similar to that for males (see the results of the second experiment in table 13).

/Chapter V

Chapter V

BRAZIL

A. The Situation in 1970 and the Main Variables

The demographic situation in Brazil is in general quite similar to the situation in the region as a whole, although in part of course this simply reflects the weight the country carries in the calculation of the regional averages. Brazil is a medium income country, but this medium figure is the result of averaging quite disparate areas and sectors. The country possesses probably the largest and most diversified modern industrial sector in the region, but there is also still a large traditional-type agricultural sector. In area terms income levels are much higher in the south than in the north. These disparities, as well as the resulting averages, are similar to the situation in the region as a whole, and they are reflected in the population structure.

At the national level the demographic transition has proceeded in the manner described earlier for Latin America as a whole (see Chapter I, pages 12-14), and is now at a similar stage. The 1940s marked the transition from the lower rates of population growth of the pre-war period, and for that decade as a whole the population increased at the rate of 2.4 per cent per annum in Brazil. There was a large further increase to a peak average rate of 3.0 per cent per annum during the 1950s and then, due to the decline in fertility rates - which began as early as 1950 but has been very small - a mild decline to an average rate of increase of 2.9 per cent during the 1960s.

This demographic transition has been significantly different from the trend in each of the other countries analysed however. In Argentina the transition began much earlier and proceeded steadily, without any upward surge in population growth in the post-war period. In both Venezuela and El Salvador fertility rates were at substantially higher levels than those reached in Brazil and so the post-war surge was greater and the peak rates of population increase reached were

/much higher.

much higher. Rates of population growth remain higher in both countries than in Brazil, but in Venezuela the decline in fertility rates since the mid-1960s has been substantially faster and these are now approaching the Brazilian level. Although fertility rates never reached such high levels in Brazil, up to 1970 there had been only a very small decline from the peak rates of the early 1950s.

At the national level the degree of urbanization is also similar to that for the region as a whole, but the process has again been rather different than in the other individual countries analysed. In 1970 some 56 per cent of the Brazilian population was urban, a much higher proportion than in El Salvador, but much lower than in either Argentina or Venezuela. There has been a substantial amount of migration to the cities - only 36 per cent of the population was urban in 1950 - but the population in the rural areas has continued to increase, and in 1970 was about one-quarter larger than it had been in 1950. The urbanization process has thus been less rapid than in Venezuela (where there was a much sharper rise in the relative importance of the urban population and where, despite the rapid natural increase, the rural population has remained approximately constant since 1940) or than in Argentina (where in a different context the rural population has declined steadily throughout the post-war period); but, in contrast to the situation in El Salvador, migration to the cities has still been of very substantial magnitude.

But behind this picture of similarity at the national level to the situation in Latin America as a whole, there are major variations from one area to another within the country. The Brazilian totals are themselves averages of widely differing components, and the inidividual areas are found to be more similar to some of the other countries analysed than to the national or regional aggregates.

In an effort to analyse this entire situation as clearly as possible, six separate areas were defined for use in the simulation experiments for Brazil. First, there are three regions - the most highly developed, the intermediate, and the less developed - and

/within each

within each region there is the usual rural-urban division. The most developed region is basically the centre-south, where most of the modern industrial activity is concentrated and where there is also an important amount of modern type agriculture; the intermediate region is the extreme south of the country; and the less developed region is the extensive northern and interior parts of the country.1/ In 1970 the most highly developed region, as here defined, accounted for 28.7 per cent of the population, the intermediate region 18.7 per cent and the less developed region was much the largest with 53.5 per cent of the total.

The underlying population parameters vary greatly from one of these areas to another. With respect to fertility rates, the most important of the parameters, these are again found to be much higher in the rural areas than in the cities. But as was shown to be the case in Argentina, other factors clearly exert a strong influence and there is considerable variation among the cities and among the rural areas themselves on a regional basis. The highest fertility rates in 1970 were registered in the less developed region. Within that region the total fertility rate in the rural area is about 40 per cent higher than in the cities, and both are closely similar to the very high rates which prevailed in the corresponding areas in El Salvador and in Venezuela in 1970. At the other extreme, in the developed region the total fertility rate even in the rural area is estimated to have been only slightly higher than in the cities of the less developed region, and the total fertility rate in the cities

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1/ More precisely, the developed region has been defined as the states of Sao Paulo, Guanabara (Rio de Janeiro) and the Distrito Federal, plus the metropolitan area of Fluminense do Grande Rio (across the bay from Rio de Janeiro) and Belo Horizonte. In 1970 the state of Sao Paulo alone accounted for about two-thirds of the population of this developed region, but the region is not a completely unified geographical area and this must be borne in mind in interpreting the results. The intermediate region is comprised of the three southern states of Paraná, Sta. Catarina, and Rio Grande do Sul. All remaining areas of Brazil are included in what is here called the less developed region. It of course includes the much referred to Northeast, but much more besides; in 1970 the Northeast itself accounted for 56 per cent of the total population of the less developed region.

/themselves is

themselves is much lower still. In relative terms this regional comparison is closely similar to that already described between the North and the South in Argentina. But in absolute terms even in the developed region in Brazil fertility rates are much higher than the unusually low levels prevailing in the South of Argentina; they are in fact quite similar to the fertility rates in the North of Argentina. In the intermediate area fertility rates are in between the extremes of the other two regions, although here there is an even greater divergence between the rural and the urban areas, with the urban rates not too much higher than those in the developed region.

Viewed in terms of numerical ranking, the total fertility rate is higher in all of the rural areas than in any urban area; and rates decline on a consistent regional basis. That is, the rural less developed are had the highest total fertility rate in 1970, followed by the rural intermediate and the rural developed area and then by the three urban areas in the same regional order. The total range in magnitude is substantial: the total fertility rate in the rural less developed area is considerably more than double the total fertility rate in the cities of the developed region. The exact estimates are shown in the note to table 14; they can be regarded as relatively reliable as the census data show by state, and by rural or urban area within the state, the number of births classified by the age of the mother.

There are also large differences in mortality rates, following the same general area pattern as that shown by fertility rates. Mortality rates by age group on a rural-urban basis are not available in Brazil however and the estimates must be regarded as only very approximate. On the basis of such partial data as are available it appears that infant mortality rates, and perhaps also death rates for children and young adults, may be around twice as high in the less developed region as in the developed region of Brazil.

The degree of urbanization varies greatly from one part of the country to another, and the national averages, both for the 1970 situation and with respect to the speed of the urbanization process

/itself, are

itself, are again the sum of disparate parts. In the developed region over 80 per cent of the population was urban in 1970,1/ a proportion more similar to the high degree of urbanization reached in Argentina and Venezuela than to the national average in Brazil itself. Further, urbanization has proceeded very rapidly in this developed region. In the state of Sao Paulo, which is the best indicator, less than 53 per cent of the population lived in the cities in 1950, but 20 years later the proportion had risen to over 80 per cent. This is an even more rapid shift than occurred in Venezuela during the same period, and has involved a substantial decline in the absolute size of the rural population in the state.

In relative terms the degree of urbanization is quite similar in the intermediate and in the less developed regions. Contrary to the situation for the country as a whole, and in even greater contrast to the developed region, the majority of the population (about 56 per cent) was still rural in 1970 in both of these regions. Urbanization has been proceeding rapidly, although at a somewhat slower pace than in the developed region; the proportion of the population which is rural, in both regions, has declined from a 1950 level of over 70 per cent. But although the degree of urbanization has remained closely similar in the two regions, the underlying developments have been quite different. In the less developed region the movement to the cities probably reflects more the unfavourable conditions in the rural areas than the opportunities in the cities themselves, and there has been a substantial net movement out of the region. In the intermediate area on the other hand there has been substantial agricultural development, and the urban population in this region expanded more rapidly than in any other area of Brazil during the 1950-1970 period. The population of the intermediate region as a whole much more than doubled over that 20 year period while that of the less developed region, despite substantially higher fertility rates, increased only about 60 per cent.

1/ 85.7 per cent of the population in the developed region was urban in 1970, but this overstates the true extent of urbanization because of the way the developed region is here defined (see footnote page 103). The percentage of the population which is urban in the state of Sao Paulo alone - 80.4 per cent - is a better indicator here.

/The migratory

The migratory flows among the different areas here defined are quite clear. There has been a general movement from the rural areas to the cities, although as just noted the intensity has varied from one region to another. In addition, there has been an important net movement away from the less developed region and toward both the intermediate and the developed regions. Keeping in mind the differences in natural increase among the different areas, the approximate magnitude of these shifts can be appreciated from the change in population structure and rates of increase in the inidividual areas during the 1950 to 1970 period. The figures are as follows:1/

Area	Percentage distribution of the population		Average annual rate of increase	
	1950	1970	1950 to 1970	
Less developed rural	43.4	30.1	1.1	
Less developed urban	16.9	23.4	4.7	2.4
Intermediate rural	10.4	9.9	2.7	
Intermediate urban	4.4	7.8	6.0	3.9
Developed rural	9.5	4.1	(-)1.2	
Developed urban	15.4	24.6	5.4	3.7

As shown, the rural less developed area is still larger than any other, but the predominance is much less marked than it was in 1950. Although relatively modest proportions of the total in 1950, the cities in the less developed and in the developed regions, combined, accounted for over two-thirds of the total population increase during the 20 year period, and each now holds close to one-quarter of the total population of the country. These three areas are now the major population groupings.

Because of the more complicated pattern of migration involved the age structure of the migratory flows is more difficult to estimate

1/ These figures should be regarded as only approximate as the 1950 census data were not analysed in the same detail used to obtain the 1970 area classification.

/in Brazil.

in Brazil.1/ Estimates were made in the same general way as described in the preceeding country analyses, but they must be regarded as subject to somewhat greater margins of error and, indeed, the figures for the other countries were used as partial guidelines in making the Brazilian estimates. Nevertheless, the estimates are considered adequate for present purposes and although they are in general similar to those for the other countries analysed, there are also some significant differences in Brazil.

As in all other countries analysed, more women than men migrate to the cities and this is reflected in the population structure. In 1970 some 57.3 per cent of all women lived in the urban areas in Brazil whereas only 54.4 per cent of the men were urban residents. But whereas in Argentina it was found that there was a slight predominance of women even in regional migration, in Brazil, perhaps because of the even greater distances involved, somewhat more men migrate from the less developed to the other regions of the country. The intermediate and developed areas combined held 46.7 per cent of the male population in 1970 as against 46.2 per cent of the female. But this difference is small, and perhaps it would be more significant to conclude that even with the great distances involved in Brazil women are nearly as important as men in the regional migration flows.

The differential movement by sex can be seen more clearly from the percentage distribution among the different areas of the country of particular age groups, and this is again worth noting. The intermediate and developed regions are combined here for easier observation of the regional migration flow. The age groups shown are the same as those used in the analysis of Argentina so that comparison can be readily made.

1/ A contributing factor is that there are difficulties in using the 1960 census data. The 1950 census data were used for this reason, and the 20 year gap involved means much more uncertainty.

SELECTED AGE GROUPS: PERCENTAGE DISTRIBUTION, BY SEX, AMONG THE DIFFERENT AREAS OF THE COUNTRY

Age group	Females				Males			
	Rural less developed	Urban less developed	Rural intermediate and developed	Urban intermediate and developed	Rural less developed	Urban less developed	Rural intermediate and developed	Urban intermediate and developed
0-4	35.5	23.2	15.2	26.1	35.4	23.1	15.3	26.2
15-19	28.4	26.3	13.2	32.1	30.9	23.2	15.2	30.6
20-24	27.3	25.2	12.4	35.1	28.9	21.9	14.7	34.6
30-34	26.1	24.0	12.1	37.8	27.2	20.9	14.2	37.7
45-49	25.4	23.7	12.2	38.7	27.8	21.5	14.0	36.7
60-65	25.4	24.3	10.5	39.8	30.1	21.5	13.4	35.0

The 0-4 group reflects basically the distribution of births, and is approximately the same for males and for females. The 15-19 age group shows a sharp drop in the percentage of both sexes, but especially of females, in the rural less developed area. This very large exodus of females is partially offset by a rise in the percentage of females in the urban less developed area, but the percentage of males in the urban less developed area does not change. In the intermediate and developed region there is also a substantial drop in the percentage of females in the rural area; but there is no decline in the percentage of males in this area. Finally, there are large increases in the percentage of both males and females (but especially the latter) in the urban intermediate and developed area. These changes taken together show that before the age of 20 there is already large scale migration by women; much more than by males. There is already an important amount of regional migration (more by males than by females), but the predominance of females among very young migrants is due to the large numbers of teenage girls who move from the rural to the urban areas. These findings are similar to that in Argentina (see pages 106-108), but the regional shift is less for teenage females in Brazil and there is somewhat more migration of very young males. As in Argentina, at this age level many more females than males live in the cities: 58.4 per cent as against 53.8 per cent.

/From adolescence

From adolescence to the early 1930s there is a somewhat greater decline in the proportion of males in the rural less developed area, and this differential is accounted for by regional migration; it is offset by a correspondingly larger increase in the percentage of males in the cities of the intermediate and developed regions. Finally, after the early 1930s the direction of the shift is reversed for males: the percentage of males living in the less developed region, and especially in the rural area of that region, rises. For females, by contrast, the shift continues in the same direction, although at a slower rate. As a consequence, for those 60-65 years of age 64.1 per cent of the women live in the urban areas compared to only 56.5 per cent of the men; and even in regional terms there has been relatively more female migration by that time, 50.3 per cent living in the intermediate and developed regions compared to 48.4 per cent of the males.

The direct estimates of the age structure of migration show similar results. In relative terms there appears to have been less migration of the very young (under 15) in Brazil than in Venezuela or El Salvador, but otherwise the age structure of rural-urban migration is much the same. Regional migration of males appears to have been heavily concentrated in the 15 to 35 year age range, as in Argentina; but there has continued to be fairly heavy regional migration of females into the highest age groups.

B. Results of the Simulation Experiments

From the above discussion it is clear that the demographic structure in Brazil is at an intermediate stage of evolution when viewed as a whole, although there are marked variations from one area to another within the country. The implication of this situation for the simulation experiments is that a wide variety of assumptions are possible with respect to future trends. Migration has been substantial in recent years, but 44 per cent of the population was still rural in 1970 so there is still the possibility of a large shift to the cities in the years ahead. But the situation is not

/uniform throughout

uniform throughout the country; within the developed region urbanization has already reached a high level and the possibility of further movement out of the rural area is much more limited. Regional migration has also been substantial, but over half the population still lives in the less developed region and the possibility of large scale movement to other parts of the country remains. Birth rates never reached the high levels observed in Venezuela and El Salvador, but up to 1970 there had been relatively little overall decline from those levels, and the decline which occurred appears to have been restricted to the more developed areas of the country. There is thus considerable scope for assumptions about future trends in this variable as well; although again there are closer limits in the more developed areas. Future population trends can therefore not be closely defined with any degree of certainty in Brazil; in both absolute and relative terms different assumptions produce quite different results, with respect both to the increase in the total population and to its distribution among the different areas of the country.

With respect to the type of development followed (modern type, urban and regionally oriented), the assumptions of the second and third experiments are closest to the experience of the recent past. The assumptions of the second experiment are extreme and designed to explore the consequences of a really massive migration flow out of the rural areas and, to a lesser extent, out of the less developed region as a whole. But the assumptions about fertility rates in these two experiments imply a sharp break with past trends: in both experiments, but especially in the second, it is assumed that they decline much more rapidly than in the past. In view of the extreme assumptions involved in the second experiment, reference is generally made to the third experiment to illustrate the results of an orientation of this kind.

The first experiment is similar to past experience insofar as fertility rates are concerned - they are assumed to decline slowly. But little change of all sorts is assumed in this experiment, and this means much less migration and hence not much further change in the distribution of the population among the different areas of the country.

/The fourth

The fourth experiment (rural and regional oriented development) must be regarded as relatively unrealistic in the Brazil situation. Considerable attention has for some time been given to the problems of the North and to the development of the interior areas of the country, but the development process has continued to be concentrated in the centre-south and it is unlikely that this emphasis could be shifted to the less developed region. At the same time, the rural population is still too large to be the centre of a development designed to restrain population flows (as would be possible in Argentina, for example); and the urban industrial development has been sufficiently successful and has sufficient future potential to discourage the adoption of such a policy as the only viable alternative (as might possibly be the case in a situation such as that of El Salvador, for example).

The fifth experiment, an intermediate type, is perhaps the one most similar to the experience of the recent past in Brazil. This coincides with the "average", or intermediate type, population structure which characterizes the country. The experiment assumes there will continue to be substantial, but not extreme, migration flows and so a continuing shift in the population toward the more developed and urban areas. It does however differ from past experience in its assumptions about fertility rates: these are assumed to decline quite substantially in all areas by the end of the century.

The results of the different simulation experiments are shown in table 14.

Population trends

At the end of the century the Brazilian population will be somewhat more than double its 1970 size; from about 95 million it will rise to around 200 million over that 30 year period. With the assumptions of the first experiment (little change from the 1970 situation) the increase is considerably greater - to 225 million - but in all of the other experiments the results are fairly similar.

/Table 14

Table 14

BRAZIL: RESULTS OF THE SIMULATION EXPERIMENTS a/

	1970	The year 2000				
		Experiment I	Experiment II	Experiment III	Experiment IV	Experiment V
Population (millions)	95.20	225.44	193.52	201.78	203.89	205.01
Less developed rural	28.69	56.14	19.65	28.01	56.88	40.71
Less developed urban	22.25	57.87	58.05	62.19	47.33	56.81
Intermediate rural	9.41	21.34	14.02	15.87	22.09	19.84
Intermediate urban	7.45	19.43	27.30	25.58	16.58	22.79
Developed rural	3.94	8.99	4.02	4.72	8.20	8.76
Developed urban	23.45	61.67	70.47	65.41	52.82	56.10
Population (1970 = 100)	100	237	203	212	214	215
Less developed rural	100	196	69	98	198	142
Less developed urban	100	260	261	279	213	255
Intermediate rural	100	227	149	169	235	211
Intermediate urban	100	261	366	343	222	306
Developed rural	100	228	102	120	208	222
Developed urban	100	263	301	279	225	239
Rate of increase (% p/a) b/	2.9	2.9	2.0	2.3	2.3	2.3
Less developed rural	0.9	2.4	-1.2	0.0	2.0	1.1
Less developed urban	4.6	3.1	1.7	2.3	2.3	2.5
Intermediate rural	2.3	2.8	1.1	1.6	2.4	2.2
Intermediate urban	5.2	3.1	3.4	3.5	2.4	3.2
Developed rural	-3.3	2.8	-0.2	0.4	1.9	2.3
Developed urban	5.6	3.1	3.1	3.1	2.5	2.7
Population distribution (%)	100	100	100	100	100	100
Less developed rural	30.1	25.1	10.2	13.9	27.9	19.9
Less developed urban	23.4	24.9	30.0	30.8	23.2	27.7
Intermediate rural	9.9	9.8	7.2	7.9	10.8	9.7
Intermediate urban	7.8	8.7	14.1	12.7	8.1	11.1
Developed rural	4.1	4.1	2.1	2.3	4.0	4.3
Developed urban	24.6	27.4	36.4	32.4	25.9	27.4
Population age structure (%)	100	100	100	100	100	100
0 - 4	16.3	15.3	11.7	12.7	12.7	13.0
5 - 14	26.4	25.0	22.0	22.9	23.1	23.2
15 - 19	10.8	10.2	9.9	10.0	10.2	10.1
20 - 39	27.1	28.3	31.5	30.5	30.5	30.3
40 - 64	16.3	17.1	20.0	19.2	18.9	18.8
65 and over	3.1	4.2	4.9	4.7	4.6	4.6
Less developed rural, age structure (%)	100	100	100	100	100	100
0 - 4	19.2	19.1	17.6	17.7	14.6	16.3
5 - 14	28.3	29.5	32.8	31.2	26.4	28.8
15 - 19	10.6	11.0	13.2	12.2	11.1	11.6
20 - 39	24.7	24.8	21.2	22.9	29.3	26.2
40 - 64	14.5	12.4	10.8	11.9	14.9	13.3
65 and over	2.7	3.2	4.4	4.0	3.6	3.7
Less developed urban, age structure (%)	100	100	100	100	100	100
0 - 4	16.2	16.4	13.6	14.1	13.9	14.0
5 - 14	27.0	26.8	25.1	25.2	24.7	24.8
15 - 19	11.4	10.8	10.8	10.7	10.6	10.6
20 - 39	26.4	27.3	28.9	29.0	28.8	29.4
40 - 64	15.9	15.0	17.1	16.8	17.4	17.0
65 and over	3.1	3.7	4.6	4.3	4.6	4.2
Intermediate rural, age structure (%)	100	100	100	100	100	100
0 - 4	18.2	17.5	15.0	15.2	12.9	14.1
5 - 14	28.6	28.1	27.3	27.1	24.4	25.5
15 - 19	11.0	10.7	11.3	11.1	10.7	10.8
20 - 39	25.3	26.3	26.5	27.1	31.0	29.3
40 - 64	14.4	14.2	15.6	15.6	17.3	16.5
65 and over	2.5	3.3	4.2	4.0	3.8	3.8

/Table 14 (cont. 1)

Table 14 (cont. 1)

	1970	The year 2000				
		Experiment I	Experiment II	Experiment III	Experiment IV	Experiment V
Intermediate urban, age structure (%)	100	100	100	100	100	100
0 - 4	14.0	11.7	8.7	9.9	10.9	10.7
5 - 14	25.1	20.9	17.3	18.5	20.0	19.4
15 - 19	11.0	9.3	8.6	8.8	9.3	9.2
20 - 39	29.2	31.1	36.4	34.6	31.5	33.4
40 - 64	17.3	22.0	24.2	23.4	22.8	22.4
65 and over	3.4	5.1	4.8	4.8	5.4	4.8
Developed rural, age structure (%)	100	100	100	100	100	100
0 - 4	16.4	15.9	13.3	13.6	12.0	12.9
5 - 14	27.2	26.1	24.8	25.2	23.1	23.6
15 - 19	10.7	10.4	10.6	10.6	10.4	10.3
20 - 39	26.9	26.9	28.0	28.3	31.6	30.1
40 - 64	16.1	16.4	18.3	17.7	19.7	18.6
65 and over	2.7	4.2	5.0	4.6	3.1	4.5
Developed urban, age structure (%)	100	100	100	100	100	100
0 - 4	12.8	11.0	8.9	9.6	10.3	9.9
5 - 14	22.8	19.3	17.0	17.7	18.7	18.2
15 - 19	10.2	8.9	8.6	8.7	8.8	8.7
20 - 39	31.0	32.4	35.8	34.6	32.5	33.4
40 - 64	19.4	22.3	24.3	23.8	23.8	24.0
65 and over	3.8	5.5	5.4	5.5	5.9	5.8
Labour force (millions)	30.18	73.63	79.00	77.51	71.35	74.48
Less developed rural	8.78	16.80	5.86	8.42	18.76	12.70
Less developed urban	6.26	16.55	21.26	21.85	15.51	19.30
Intermediate rural	3.13	7.17	4.99	5.66	7.78	7.04
Intermediate urban	2.37	7.00	12.71	11.08	6.19	9.14
Developed rural	1.44	3.00	1.65	1.81	2.99	3.10
Developed urban	8.20	23.11	32.53	28.68	20.12	23.21
Labour force (1970 = 100)	100	244	262	257	236	247
Less developed rural	100	191	67	96	214	144
Less developed urban	100	265	340	349	248	308
Intermediate rural	100	229	160	181	249	225
Intermediate urban	100	295	535	467	261	385
Developed rural	100	209	115	126	208	216
Developed urban	100	285	397	350	245	283
Rate of increase (% p/a) b/	3.1	3.1	3.0	3.0	2.8	2.9
Less developed rural	1.1	2.4	-1.5	-0.1	2.5	1.2
Less developed urban	4.9	3.3	2.5	3.1	3.0	3.3
Intermediate rural	2.5	3.0	1.4	1.8	2.8	2.5
Intermediate urban	5.4	3.5	4.7	4.5	2.9	4.1
Developed rural	-3.1	2.8	0.4	0.8	2.5	2.7
Developed urban	5.8	3.4	4.1	3.9	2.8	3.3
Male labour force (1970 = 100)	100	240	225	228	214	224
Female labour force (1970 = 100)	100	259	403	366	322	335
Rate of increase (% p/a) b/	3.1	3.1	3.0	3.0	2.8	2.9
Male labour force		3.0	2.5	2.7	2.4	2.6
Female labour force		3.3	4.0	4.0	3.6	3.7
Labour force distribution (%)						
By sex	100	100	100	100	100	100
Male	79.4	78.2	68.3	70.6	71.9	72.1
Female	20.6	21.8	31.7	29.4	28.1	27.9
By area	100	100	100	100	100	100
Less developed rural	29.1	22.8	7.4	10.9	26.3	17.0
Less developed urban	20.7	22.5	26.9	28.2	21.7	25.9
Intermediate rural	10.4	9.7	6.3	7.3	10.9	9.4
Intermediate urban	7.9	9.5	16.1	14.3	8.7	12.3
Developed rural	4.8	4.1	2.1	2.3	4.2	4.2
Developed urban	27.2	31.4	41.2	37.0	28.2	31.2

/Table 14 (cont. 2)

Table 14 (cont. 2)

	1970	The year 2000				
		Experiment I	Experiment II	Experiment III	Experiment IV	Experiment V
By sex and area	100	100	100	100	100	100
Male less developed rural	25.7	19.8	6.5	9.5	18.8	13.5
Male less developed urban	15.5	16.6	16.8	18.2	15.1	17.7
Male intermediate rural	8.8	8.1	5.3	6.1	7.9	7.4
Male intermediate urban	5.7	7.1	10.8	9.8	6.3	8.5
Male developed rural	4.3	3.5	1.7	2.0	3.1	3.3
Male developed urban	19.4	23.0	27.3	25.1	20.7	21.7
Female less developed rural	3.4	3.0	0.9	1.4	7.5	3.6
Female less developed urban	5.2	5.9	10.1	10.0	6.6	8.2
Female intermediate rural	1.6	1.6	1.0	1.2	3.0	2.0
Female intermediate urban	2.1	2.4	5.3	4.5	2.3	3.8
Female developed rural	0.5	0.6	0.4	0.4	1.1	0.8
Female developed urban	7.7	8.4	13.9	11.9	7.5	9.5
Labour participation rates (%)						
Total	31.7	32.7	40.8	38.4	35.0	36.3
Male less developed rural	52.8	51.4	50.5	51.3	46.9	48.8
Male less developed urban	43.9	43.6	47.3	47.1	47.2	47.7
Male intermediate rural	53.9	54.3	57.2	57.4	50.4	54.2
Male intermediate urban	47.5	53.4	61.3	58.4	54.8	56.4
Male developed rural	61.1	56.1	60.8	60.1	51.3	55.2
Male developed urban	50.6	54.7	61.0	59.0	55.7	57.4
Female less developed rural	7.3	8.0	7.7	8.0	18.8	13.2
Female less developed urban	13.6	14.5	26.6	24.0	19.3	21.0
Female intermediate rural	10.7	11.5	11.9	11.9	19.7	15.6
Female intermediate urban	16.9	18.2	31.3	27.8	20.1	24.3
Female developed rural	8.5	9.5	18.0	13.5	20.5	14.8
Female developed urban	19.7	20.1	31.2	28.5	20.3	25.3
Labour force age structure (%): total						
10 - 19	19.8	17.9	12.4	13.7	16.2	14.7
20 - 39	50.5	51.5	53.8	53.3	54.1	53.4
40 - 64	27.1	27.5	31.6	30.6	27.7	29.5
65 and over	2.6	3.1	2.2	2.4	2.0	2.4
Less developed rural						
10 - 19	23.2	24.7	29.4	27.1	19.3	23.1
20 - 39	45.8	46.8	38.9	42.2	55.2	49.5
40 - 64	27.2	23.7	23.1	23.8	23.6	23.5
65 and over	3.8	4.8	8.6	6.9	1.9	3.9
Less developed urban						
10 - 19	17.5	16.4	13.0	13.3	18.4	13.6
20 - 39	51.8	53.7	55.1	55.3	52.6	54.9
40 - 64	28.3	27.1	30.4	29.7	26.7	29.4
65 and over	2.4	2.8	1.5	1.7	2.3	2.1
Intermediate rurel						
10 - 19	26.1	25.0	24.8	24.2	17.4	20.3
20 - 39	46.8	47.1	45.0	46.1	54.6	50.9
40 - 64	24.3	24.2	25.5	25.4	26.1	25.9
65 and over	2.8	3.7	4.7	4.3	1.9	2.9
Intermediate urban						
10 - 19	18.1	14.8	8.4	9.5	14.2	11.5
20 - 39	53.3	52.7	56.8	56.2	53.1	55.2
40 - 64	26.8	30.2	33.6	33.0	30.5	31.7
65 and over	1.9	2.3	1.2	1.4	2.3	1.6
Developed rural						
10 - 19	24.0	23.1	20.5	21.1	14.8	18.1
20 - 39	46.9	45.8	45.8	45.9	54.2	50.5
40 - 64	26.2	26.6	28.8	28.2	29.3	28.2
65 and over	2.9	4.5	4.9	4.8	1.7	3.2
Developed urban						
10 - 19	15.3	12.2	8.3	9.2	11.9	10.1
20 - 39	55.6	54.9	56.2	55.9	54.3	54.9
40 - 64	27.7	31.0	34.1	33.5	31.8	33.3
65 and over	1.4	1.9	1.4	1.5	2.0	1.7

/Table 14 (conc.)

Table 14 (conc.)

	1970	The year 2000				
		Experiment I	Experiment II	Experiment III	Experiment IV	Experiment V
Male developed urban						
10 - 19	11.4	9.5	8.1	8.5	9.2	8.8
20 - 39	56.7	56.1	56.7	56.6	55.3	55.7
40 - 64	30.3	32.4	33.9	33.4	33.3	33.7
65 and over	1.6	2.0	1.3	1.5	2.2	1.8
Female developed urban						
10 - 19	25.2	19.6	8.7	10.4	19.4	13.0
20 - 39	53.1	51.6	55.1	54.4	51.4	52.9
40 - 64	20.8	27.4	34.7	33.7	27.7	32.6
65 and over	0.9	1.4	1.4	1.5	1.5	1.5

Note: The 1970 CELADE estimates of population, by sex and 5 year age group, provided the basis for the 1970 estimates shown. Area differences were estimated from the 1970 census data. The CELADE estimates of age specific birth rates and death rates were used as the starting point in all of the experiments - again with area breakdowns estimated from census data. Labour participation rates, by sex and 5 year age group, were estimated directly from the census data. The principal assumptions which determine the results of the experiments relate to migration rates, fertility rates, and labour participation rates. The different migration rates assumed can be roughly judged from the table on the basis of the population shift from one area to another in the different experiments. The assumptions about fertility rates were as follows. In the 1965-1970 period the total fertility rate in the less developed rural area was estimated to be 7.53, in the less developed urban area 5.43, in the intermediate rural area 6.48, in the intermediate urban area 3.78, in the developed rural area 5.64, and in the developed urban area 3.45. The 1995-2000 estimates (with lineal interpolation from the first to the last period) were: experiment I, 6.6, 4.7, 5.7, 3.3, 4.9, and 3.0 respectively in the six areas; experiment II, 5.8, 3.5, 4.7, 2.2, 4.0, and 2.2 respectively; experiment III, 5.8, 3.7, 4.7, 2.6, 4.0, and 2.5 respectively; experiment IV, 4.2, 3.7, 3.5, 3.0, 3.2, and 2.8 respectively; and experiment V, 5.0, 3.7, 4.1, 2.8, 3.6, and 2.6 respectively. Assumed changes in labour participation rates to the end of the century were: experiment I, little change; experiment II, to 1968 French levels in the urban areas, female rates half way to the urban level in the rural developed area, no change in male rates in any of the rural areas and little change in female rates in the other two rural areas; experiment III, 80% of the way to the 1968 French levels in the urban areas, little change in the rural areas; experiment IV, little change in urban rates, rural rates shift to urban levels; experiment V, intermediate between experiments III and IV. There were also assumptions about differential trends in mortality rates, but these have much less impact on the results than assumptions about the other variables. The trend in total mortality rates is that used in the CELADE projections.

a/ Only the results at the end of the experiments - that is the year 2000 - are shown as this is the single figure of most interest; the 1970 figures are shown for comparison. The trend is not necessarily smooth throughout the 30 year period however, and this is often of considerable importance. Several instances of this sort are noted in the analysis.

b/ The rates of increase shown are the annual rates of increase during the 5 year period up to the date shown. That is, in the first column they are the annual rates during the period 1965-1970; in the other columns during the period 1995-2000.

/The essential

The essential difference between the first and the other experiments here is that the first experiment assumes only a small decline in fertility rates while each of the others assumes, in one form or another, a much more substantial decline. Up to 1970 there had been very little decline in fertility rates and a continuation of this trend would mean a population at the end of the century similar to that projected in the first experiment. If fertility rates should begin to decline much more rapidly the population at the end of the century will approximate the size projected in the other experiments.

These figures involve fairly rapid rates of increase for the rest of the century. In the first experiment there is only a marginal decline in the rate of population growth, this remaining at about 2.9 per cent per annum throughout the period. In the other experiments the average rate of increase over the 30 year period ranges only from 2.4 per cent per annum in the second experiment to 2.6 per cent in the fourth and fifth experiments. In all of these experiments the rate of increase declines steadily, but at the end of the century remains at the moderately high level of 2.0 per cent per annum even in the second experiment, and at the higher rate of 2.3 per cent per annum in the others.

These population trends for Brazil are likely to be of an "average" nature and similar to those for the region as a whole. The projected increases are significantly smaller than those for Venezuela or El Salvador, but still much higher than those for Argentina. The degree of uncertainty (that is, the difference between the minimum and maximum projections) is also of an intermediate sort, less than in Venezuela or El Salvador but more than in Argentina.

The second half of the 20th century will have seen a fundamental change in this most basic aspect of social and economic organization, and again this change will have been similar to that experienced by the region as a whole. From 1950 to the end of the century the Brazilian population will have been multiplied four-fold. At over 200 million the total population will be very large; significantly larger, for example, than the 1970 population of the entire South

/American continent.

American continent. In terms simply of the number of potential consumers, even for modern type production processes with large economies of scale, population has not been an important limitation to economic growth in Brazil for some time, and by the end of this century the population of the country will approximate the mid-century size of the two economic "super-powers", the United States and the Soviet Union. In terms of resource base the situation will of course be less favourable. Brazil, like Latin America as a whole, has long been regarded as an area with very large resources and unsettled areas in relation to the population; by the end of the century this concept will no longer accurately characterize either Brazil or the region.

At the end of the century the population density in Brazil will be about 24 people per square kilometer. This figure will not place Brazil among the more densely populated areas, either in the world as a whole or within the region, but it is likely to be too high to signify an abundance of as yet undeveloped resources. For example, the figure is considerably more than double the 1970 density in the Soviet Union or in North America, considered to be resource rich areas; it is still slightly below the 1970 world-wide average, but the world as a whole is no longer thought of as having an abundance of resources in relation to its population. As a point of comparison within the region, the Brazilian population density at the end of the century will be approximately the same as the 1970 figure for Mexico. How adequate the resource base will be is likely to depend to an important extent on the resources which can be developed in the as yet largely unexploited interior areas of the country.

There are large differences in the projected population increase from one area to another, and much more uncertainty about the size of the increase in individual areas than for the country as a whole. As noted earlier, there are major differences in fertility rates among the different areas so that rates of natural increase vary substantially. But the possibility of major migration flows can be of even greater importance and this is the factor which produces the uncertainty. The rural areas, combined, accounted for 44 per cent of

/the population

the population in 1970, and the less developed region as a whole for well over half of the population. Since these are the areas from which migrants will come, the potential flow is still very large and can still have a major impact on population trends in all areas of the country; and so different assumptions about the extent of migration can produce large changes in rates of population increase everywhere. This contrasts with the situation in countries such as Argentina or Venezuela, where the mass shift to the cities (and in Argentina to the South) has already occurred and where different assumptions about migration therefore no longer have a major impact on the area of destination (the cities, and in Argentina especially the South), although they remain of crucial importance to trends in the rural areas from which the migrants come.

There are two ways of looking at the possible population increase in the different areas, and each is important. There is first the question of the rate of increase in the individual areas, which matters as it indicates the relative change in the area and hence the extent to which additional facilities will be required, etc., within that area itself. The second way of looking at the increase is to determine how it is spread among the different areas, from the national point of view; that is in which areas will most of the population increase be concentrated?

Viewed in terms of rates of increase, the urban areas in general can be expected to expand a good deal faster than the rural areas. Although fertility rates, and hence the rates of natural increase, are lower, the inflow of migrants can be expected to continue to be of sufficient magnitude to more than offset this factor. But the extent of this differece will vary widely depending upon the extent of migration (see table 14). In the fourth experiment very little migration is assumed and the total increase to the end of the century is of the same order of magnitude in all of the different areas of the country; but at the other extreme, with the large scale migration assumed in the second experiment, there are very large differences, ranging from the rural less developed area, where the population declines about 30 per cent, to the urban intermediate area, where at the end of the century it is 3 2/3 times its 1970 size.

/Viewed in

Viewed in terms of the distribution of the population increase among the different areas, there are two areas - the cities of the less developed and of the developed regions - which between them always account for at least half the total population increase, and up to nearly 85 per cent in the second experiment. The rural less developed area and the urban intermediate area are the other areas which, with some sets of assumptions, account for a substantial proportion of the total increase. The rural areas in the intermediate and in the developed regions are never of major importance in this sense. This aspect is of particular interest in Brazil and it is worth showing the figures for the different simulation experiments.

PERCENTAGE DISTRIBUTION OF POPULATION INCREASE IN BRAZIL, 1970-2000

Area	Experiment I	Experiment II	Experiment III	Experiment IV	Experiment V
Less developed rural	21.1	(-)9.2	(-)0.6	25.9	10.9
Less developed urban	27.3	36.4	37.5	23.1	31.5
Intermediate rural	9.2	4.7	6.1	11.7	9.5
Intermediate urban	9.2	20.2	17.0	8.4	14.0
Developed rural	3.9	0.1	0.7	3.9	4.4
Developed urban	29.3	47.8	39.4	27.0	29.7

It is first of all clear that, looked at in either of the above ways, the population increase will affect primarily the urban areas: the rate of increase is faster, and most of the total increase is concentrated in these areas. Even in the two experiments which assume that migration flows will be much slower than in the recent past (the first and fourth experiments) the bulk of the population increase occurs in the cities, and when it is assumed that migration will continue to be substantial the cities account for three-quarters or more of the total increase. It is therefore primarily in the cities that additional employment opportunities will be required, housing and other infrastructure will have to be expanded, educational and health facilities provided, etc.

/Rates of

Rates of increase will be quite high. Even if very little migration is assumed urban populations will increase at an average rate of around 3 per cent per annum over the 30 year period as a whole; and when it is assumed that migration will continue to be important the figures range from 3 to 4.4 per cent per annum, depending upon the region and the precise assumptions used. But while these figures are fairly high, they are well below the rates experienced in the recent past. The rate of expansion of the cities in Brazil has passed its peak, and will probably continue to decline to the end of the century.

Possible trends can be illustrated with the results of the third experiment (modern type development, oriented toward the urban areas and the developed region, with large scale migration and substantial declines in urban fertility rates). During the 1950 to 1970 period the urban areas of the developed region expanded at a rate of 5.4 per cent per annum. In the third simulation experiment this rate is sharply lower - about 3.7 per cent per annum - during the 1970s and early 1980s, and then gradually declines further to about 3.1 per cent per annum at the end of the century.

There are two reasons for this anticipated much slower rate of population growth in the urban developed area. First, fertility rates have already begun to decline, and the third simulation assumes a significantly faster decline in the years ahead. But this is the less important factor; if it is assumed that fertility rates decline only slowly the rate of population increase during the 1970s remains nearly unchanged and then falls to about 3.3 per cent per annum at the end of the century.

The most important reason is that a substantial part of the migration to the cities of the developed area has in the past come from the rural areas within the same region. In 1950 nearly half the population of the state of Sao Paulo, the heart of the developed region, was still rural, and during the following 20 years there was a massive shift to the urban areas. This shift has now been largely completed (over 85 per cent of the population of the state was urban in 1970), and rural-urban migration within the developed region itself will no longer

/be a

be a major factor in the growth of the cities. With the rather sudden disappearance of this source of migrants the population growth of the urban developed area can be expected to slow substantially.

Trends in the cities of the intermediate and less developed regions are likely to be fairly similar in this respect. In 1970 more than half the population was still rural in both regions, but again there has been a substantial shift in recent decades: in 1950 over 70 per cent of the population was rural in both regions. So while there is still a great deal of scope for rural-urban migration in these regions - and this is assumed to occur in the third experiment - the relative impact on the urban areas will be progressively less. And of course in the less developed region the impact is reduced by the assumption of large net migration out of the region as a whole. So in these urban areas as well the future rate of population growth can be expected to be slower than that of the recent past.

In the urban less developed area however the pattern of the decline may be somewhat different due to the nature of the migratory flows: in the third experiment the rate of population growth during the 1970s is nearly as high as during the 1950 to 1970 period, but then declines rapidly to 1.7 per cent per annum at the end of the century.1/

1/ This is due to the pattern of migration assumed. It is generally believed that migration occurs first by movement from the rural areas to towns in the vicinity and only then from the towns to larger cities at greater distance. It has therefore been assumed that during the period of the projection there is a steady flow of migrants from the rural to the urban area within the less developed region, and also a steady flow from the urban area to urban areas outside the region (both flows are expressed in the model as percentages of the different age groups involved). During the early years of the projection the out migration from the urban area is more than offset by the inflow from the rural area and so the rate of population increase is relatively high. But as the shift to the urban area proceeds the relative importance of these two flows changes, with the result that the rate of increase in the population of the urban less developed area declines quite rapidly. These assumptions seem to be realistic, although simplified ones, and throw an interesting light on the likely population trends in the rural and urban areas of the less developed region. This is another situation where trends could change quite rapidly and is worthy of further study.

/The urban

The urban areas then can be expected to continue to expand at a fairly rapid rate, but at a rate substantially lower than that of the recent past. For the country as a whole the third experiment projects an average rate of increase in the urban population of 3.6 per cent per annum to the end of the century, compared to a rate of 5.2 per cent per annum actually experienced in the 1950 to 1970 period. There is a decline during the period of the projection from somewhat more than 4 per cent per annum during the 1970s to 2.8 per cent at the end of the century. A slower decline in birth rates would raise these figures slightly, and less rapid migration would reduce them.

On balance it seems quite clear from the simulation experiments that the period of most rapid urban population growth in Brazil has passed, that rates of increase in the years ahead will be substantially below these peak levels, and will very probably decline further to the end of the century. This will of course have major implications for economic and social policy as the pressures for urban employment, infrastructure, and social services can be expected to ease considerably in relative terms; that is, their expansion will not have to be as rapid as in the past.

Here too the situation appears in different terms in different regions of the country. In the developed region the lower rate of population growth will certainly make urban problems easier to deal with. But absolute increases could create increasingly serious problems in this region. The post-war economic expansion has been concentrated to a considerable extent in a few major metropolitan areas - particularly Sao Paulo and Río de Janeiro. These metropolitan areas, particularly the former, have grown to enormous size, and this size alone, quite apart from continuing expansion, creates a multitude of problems which are difficult and costly to deal with. If this concentration continues - that is if these major metropolitan areas continue to expand at a rate similar to that of the urban areas as a whole - absolute increases could well become increasingly important. It could become increasingly difficult to integrate an additional million inhabitants into the city of Sao Paulo, despite the fact that each additional million was a smaller proportion of the total and that the population was thus increasing at a declining rate.

/In the

In the less developed region the problems are of a different nature. Here income levels are much lower and problems of urban employment much more serious. The problem is in a sense more one of dealing with an accumulated backlog than of integrating the current population increase. A slower rate of population increase will mean that the inflow into this backlog is less rapid, and this may mean lesser social and economic pressures and a less distant solution to the major difficulties. But so long as there continues to be substantial increases in the urban population, and this will continue to be the case at least to the end of the century, the magnitude of the problems could well continue to mount.

Finally, it needs to be noted that a substantial proportion of the population will continue to be rural, most of which will be in the less developed region, so that conditions of rural poverty are likely to continue to bulk fairly large in the total. Even with the extreme assumptions of the second experiment nearly 20 per cent of the population is still rural at the end of the century; in the third experiment the proportion is nearly one-quarter; and in the intermediate type fifth experiment it is over one-third. The rural population is not likely to expand very rapidly, and could even remain approximately constant in size, so that it will be easier to improve conditions than in the past. Most, or perhaps all, of the resources put into the rural areas can be used to improve prevailing conditions rather than for providing for additional numbers at about the same level. But although declining, the rural population will remain too large a proportion of the total to be handled easily; the resources required to effect basic changes will continue to represent an important proportion of those available to the economy as a whole.

Viewed in regional terms, the population will increase substantially in all three regions, but more rapidly in the more developed parts of the country. Even in those experiments where little migration is assumed the increase is slower in the less developed region, and the disparity of course increases with increasing migration. The average rates of increase for the 30 year period as a whole are as follows:

/AVERAGE PERCENTAGE

AVERAGE PERCENTAGE INCREASE PER ANNUM 1970-2000

	Experiment I	Experiment II	Experiment III	Experiment IV	Experiment V
Less developed region	2.7	1.4	1.9	2.4	2.2
Intermediate region	3.0	3.0	3.0	2.8	3.1
Developed region	3.2	3.4	3.2	2.7	2.9

As a consequence the relative importance of the developed region can be expected to rise in the years ahead. From 28.7 per cent of the total population in 1970 the proportion rises, only slightly when little migration is assumed, but to 34.7 per cent in the third simulation, for example.

Nevertheless, it is important to emphasize that the less developed region, as this is here defined, will remain the most populous single region in Brazil. Even with the extreme assumptions of the second experiment the less developed region continues to account for 40 per cent of the population at the end of the century, and the proportion ranges up to half in those experiments where little migration is assumed. The population will continue to expand moderately rapidly as shown by the figures above. Even in the second experiment the population of the region increases by somewhat more than half to the end of the century, and with the more realistic assumptions of the third and fifth experiments the increase is three-quarters and 90 per cent respectively.

This is one of the more important conclusions to be drawn from this aspect of the experiments. The developed and intermediate regions combined will not, within this century, account for much more than half of the total population. The less developed region, again as this is here defined, will probably still account for 45 to 50 per cent of the Brazilian population at the end of the century. If income levels of the mass of the people are to be raised to higher levels this will of necessity involve a pattern of development which spreads to this region.

/The age

The age structure

The Brazilian population is a very young one, but with respect to the age structure as well as most other aspects it resembles the situation in the region as a whole and is intermediate when compared to the other countries analysed. Children (those less than 15 years of age) were 42.7 per cent of the total population in 1970, significantly less than the corresponding figure for either Venezuela or El Salvador. But the evolution of the age structure, which as shown in the Argentine analysis has already gone quite far in that country, has hardly begun in Brazil. The lower proportion of children, when compared to Venezuela or El Salvador, is not so much a reflection of a greater evolution in Brazil as it is of the fact that birth rates never reached the same high levels in this country and so the proportion of children never rose to quite the extent it did in countries such as Venezuela or El Salvador. The proportion of children, and the age structure in general in Brazil, did not change much during the 1950 to 1970 period.

Such changes as occur to the end of the century will depend primarily on the trend of fertility rates. If these continue to decline only slowly (as in the first experiment) there will be little change in the age structure: the proportion of children and adolescents will decline somewhat, and the proportion of the adult age groups will rise. To the extent that fertility rates decline more rapidly there will be fewer children and adolescents at the end of the century and the age structure will experience a correspondigly greater shift. The figures for the different experiments are shown in table 14. In general the shift is more moderate than that projected by the corresponding experiments in Venezuela; and even with the extreme assumptions of the second experiment the Brazilian population at the end of the century shows a considerably younger age structure than that of Argentina in 1970.

Again, the total figures are averages of very different age structures in the different areas of the country. The figures are shown in table 14 but are repeated here for easier comparison.

/1970 AGE

1970 AGE STRUCTURE, BY AREA

(Percentages)

Age group	Less developed rural	Less developed urban	Intermediate rural	Intermediate urban	Developed rural	Developed urban
0-4	19.2	16.2	18.2	14.0	16.4	12.8
5-14	28.3	27.0	28.6	25.1	27.2	22.8
15-19	10.6	11.4	11.0	11.0	10.7	10.2
20-39	24.7	26.4	25.3	29.2	26.9	31.0
40-64	14.5	15.9	14.4	17.3	16.1	29.4
65 and over	2.7	3.1	2.5	3.4	2.7	3.8

The differences are of the sort which have already been analysed in some detail in earlier parts of the study: the urban areas have consistently more mature population structures than the rural areas, and the more developed the region the more mature the population structure. The rural area in the developed region thus has a population structure closely similar to that of the urban area in the less developed region. Various comparisons can be made with the other countries analysed. Perhaps the most interesting to note is that even in the urban developed area in Brazil the age structure has not evolved to the degree of maturity shown by the age structure in Argentina; it is fairly similar to the age structure in the urban North area in Argentina, but much younger than that of the urban South.

In general the age structures of the different areas appear to have been much less affected thus far by migration in Brazil than was seen to be the case in Argentina; the differences shown reflect more completely differences in the underlying population parameters. That these have been very different is indicated by a single comparison: in the less developed rural area the proportions of children and active adults in 1970 was 47.5 per cent and 39.2 per cent respectively, while at the other extreme, in the developed urban area, the ratio was more than reversed and the corresponding figures were 35.6 per cent and 50.4 per cent. Such different ratios, as has been noted before, involve multiple implications for the economic and social conditions in the different areas.

/The projections

The projections for the individual areas of the country can vary substantially from the national trend due to the impact of migration. For example, with the large-scale migration assumed in the third experiment the proportion of active adults, which over the period of the projection are the groups most heavily affected, declines from an already low 39.2 per cent in the rural less developed area in 1970 to 34.8 per cent at the end of the century. In the fourth experiment by contrast (little migration from the area and also a substantial decline in fertility rates) the proportion rises to 44.2 per cent at the end of the century. The impact of migration is not as important in any of the other areas but similar, if smaller, variations - in the opposite direction of course in the urban areas - can be seen from its figures in table 14.

The major implications of shifts in the age structure have already been discussed in detail in the other country analyses and can be treated more briefly here; as the age structure and the shifts likely to occur are of an intermediate sort in Brazil these can be readily placed in context by reference to results in the other analyses.

The dependent population (those less than 15 and over 65) was 45.8 per cent of the total in Brazil in 1970, a much higher proportion than in Argentina (36.4 per cent) but significantly below approximately half the population which was dependent in countries such as Venezuela or El Salvador. As in these latter countries, the elderly group was not yet a very important part of the dependent population. There were major variations among the different areas of the country, with the dependent population ranging from 39.4 per cent in the urban developed area to 50.2 per cent in the rural less developed area; but while the elderly age group was in general more important in the urban areas, it was everywhere less than 10 per cent of the dependent population as a whole.

The over 65 age group will rise in relative size in the years ahead but will continue to be of minor importance to the end of the century - some 10-12 per cent of the dependent population at the national level and up to perhaps 17 per cent in the urban developed area. Such

/figures would

figures would still be well below those found in Argentina in 1970 and in Brazil, as in most countries of the region, it will only be into the next century that the elderly population is likely to become a major aspect of the dependent population, with the shifts in social and economic policy which this will require.

So the trend in the dependent population as a whole will be determined very largely by the trend in fertility rates, and hence the number of children. At the area level, however, migration is a further factor which can significantly influence this trend. The end results can be seen from table 14. If there is only a slow decline in fertility rates (as in the first experiment) there will be very little change in the dependency ratio at the national level; but, combined with the impact of the modest amount of migration assumed, there may still be significant changes in individual areas. In all of the other experiments larger declines in fertility rates are assumed and so the dependency ratio declines further, to somewhat more than 40 per cent at the national level in the intermediate type third and fifth experiments, for example.

The most important single aspect of the dependent child population is probably the number of primary school age children and the implications this has for educational planning. The primary school age population in Brazil will continue to increase fairly rapidly to the end of the century, but the rate of increase will be lower than in the recent past and may decline steadily, so that the pressures for additional primary school facilities can be expected to ease somewhat.

The primary school age population (those 5 to 14 years of age) has increased quite rapidly in Brazil during the post-war period. From 3.0 per cent per annum in the early 1950s the rate of increase rose to a peak of 3.7 per cent per annum during the second half of that decade, before falling fairly rapidly to 2.5 per cent per annum during the late 1960s. This rise and fall is typical of the transition to sharply higher rates of population increase which began in most countries of the region in the 1940s and which set up wave-like movements through the age structure. But the rise and fall is more moderate than that which occurred in Venezuela, for example, and again reflects the fact that fertility rates did not reach the same high levels in Brazil.

/If fertility

If fertility rates continue to decline only slowly (as in the first experiment) the rate of increase will rise again, to 2.9 per cent per annum, during the 1980s and then fall slightly to 2.7 per cent per annum at the end of the century. If fertility rates decline more rapidly, as assumed in one form or another in all of the other experiments, then the rate of increase will become gradually more moderate, reaching 1.8 per cent per annum at the end of the century in the intermediate type third and fifth experiments for example.

At the national level then the period of greatest pressure on primary school facilities occurred during the 1950-1965 period, and has now passed. Even if there is not much further decline in fertility rates the primary school age population will not again increase as rapidly as during the period, and if there is an important decline in fertility rates the pressures will continue to moderate further to the end of the century.

Again there are major differences from one area to another, and the deceleration from past rates of increase is likely to be even greater in some of the major areas. As already noted, detailed estimates of the population structure in 1950 have not been made and so complete figures of past trends cannot be given. But on the basis of approximate estimates it appears that over the 1950 to 1970 period the elementary school age population increased at an average rate of around 6 per cent per annum in the urban areas - somewhat faster in the more developed regions and somewhat slower in the less developed region; in the rural areas the rate of increase in the intermediate region was close to 3 per cent per annum, but it was less than half that in the less developed region and was negative in the developed region.1/

1/ Complete data are readily available for the intermediate area and these show rates of increase of 6.8 per cent and 2.9 per cent for the urban and rural areas, respectively. Data for the state of Sao Paulo can be used as an indication of trends in the developed region: they show a rate of increase of 6.4 per cent per annum for the urban area and a 15 per cent decline in the rural school age population over the period. For the less developed region data for Northeast region (as defined in the census data) should give a reasonable idea, and these show rates of increase of 5.5 per cent and 1.2 per cent for the urban and rural areas. In all cases these estimates were obtained from unadjusted census figures.

/These high

These high rates of increase will drop to sharply lower levels in the urban areas in the years ahead. During the 1970s the rate is only about 3.2 per cent per annum for the urban areas as a whole even if large scale migration is assumed (as in the third experiment), and is of course lower still in the experiments which assume more moderate migration. That is, during the 1970s the primary school population in the cities will expand only about half as rapidly as during the preceeding 20 year period; and the pressure for primary school facilities will therefore ease substantially from the levels of the recent past. The rate of increase is likely to rise somewhat during the 1980s, although it should remain below 3.5 per cent per annum, and will then probably decline substantially again during the last decade of the century. With different assumptions the trend is of course somewhat different, and there are significant differences in the increase in different regions;1/ but in general it is clear that although the urban primary school age population will continue to increase at a moderately rapid rate for the rest of the century and there will have to be a continuing, and quite rapid, expansion of educational facilities for this group, the needs will be less pressing than during the 1950 to 1970 period.

If rural-urban migration continues to be substantial there will be only modest increases in the primary school age population in the rural areas. In the third experiment, for example, there is a continuing increase in the rural intermediate area (at an average rate of about 1.5 per cent per annum) from 1970 to the end of the century; but the primary school population in the rural developed area remains

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1/ In the third experiment, for example, this age group increases most rapidly in the urban less developed area: at 3.9 per cent per annum during the 1970s, 3.6 per cent during the 1980s, and at 2.2 per cent during the 1990s. In the urban developed area by contrast the rate of increase is only 2.3 per cent per annum during the 1970s, rises to 3.3 per cent during the 1980s and falls back to 2.2 per cent during the 1990s. The differences result from the different age structures and the migration patterns assumed.

/approximately constant;

approximately constant; and in the rural less developed area this age group increases about 15 per cent during the 1970s and then declines in size. Most if not all resources devoted to rural elementary school education could therefore be used to raise standards rather than to simply provide equivalent facilities for a growing school age population.

In terms of distribution from the national point of view, the bulk of the increase will occur in the urban areas and it is there that most of the additional facilities will be required. Even if there is not much migration (as assumed in the first experiment) 60 per cent of the total increase in the elementary school population to the end of the century will occur in the cities, and if large scale migration continues (as in the third experiment) nearly 90 per cent of the increase will be in the urban areas. In regional terms the most significant aspect to note is that about half of the total increase in the primary school age population will continue to occur in the less developed region, so that maintaining, and especially improving, basic educational standards will require the assignment of a very large proportion of available resources to this region.

The decline in the proportion of children and adolescents will be offset by increases in the relative importance of all of the adult age groups. Perhaps the principal aspect to note here is that the young adult group (those 20-39 years of age) does not increase its relative importance more than the other groups in Brazil; on the contrary, the number of young adults will increase somewhat less rapidly than either of the older adult age groups. This contrasts with the situation in countries such as Venezuela or El Salvador, where the young adult group will increase particularly rapidly, with the consequences which were noted in the analyses of those countries. The young adult group will increase more rapidly than the general population in Brazil, and this will have similar implications, but the impact will be less than in the other countries and the discussion need not be repeated here.1/

1/ For a discussion of these aspects see the Venezuelan analysis, Chapter II, pages 55-57.

/Migration, as

Migration, as well as differential changes in fertility rates, can result in quite different trends for the active adult age groups in different areas of the country, and this can have major implications. The proportion of active adults is largely the counterpart of the relative importance of the dependent population, and is an important factor in the determination of per capita income levels in an area. As already noted, these proportions were quite different in different areas in 1970, and the divergences could well increase. For example, in 1970 the active adult age groups accounted for only 39.2 per cent of the population in the rural less developed area but for 49.4 per cent in the urban developed area. With the assumptions of the third experiment (large scale migration and substantial declines in urban fertility rates) the divergence increases greatly with the opposing trends in the two areas: the proportion of active adults declines to 34.8 per cent in the rural less developed area while rising to 58.4 per cent in the urban developed area. The trends in other areas and in the different experiments are shown in table 14.

Labour force trends and structures

As in most of the region, the labour force in Brazil will continue to increase rapidly at least to the end of the century. The simulation experiments indicate that at the end of the century the labour force will be a minimum of two and one-third times its 1970 size, and may well be more than two and a half times that size; such figures correspond to average rates of increase over the 30 year period as a whole ranging from 2.9 to 3.3 per cent per annum. This expansion of the labour force in Brazil is somewhat less rapid than that to be expected in either Venezuela or El Salvador, however, and the possible variation in trend indicated by the simulation experiments is somewhat larger than in those countries.

The increase in the labour force in Brazil during the coming decades is likely to be a good deal larger than the increase in the population as a whole. This is similar to the situation already described in the other countries analysed, although the reasons are more of a mixture in Brazil. There are two major reasons why this occurs. First, the age structure in most of the region is changing,

/with the

with the active age groups increasing more rapidly than the rest of the population; this will be the predominant factor in Venezuela and El Salvador, where especially the young adult group will be increasing very rapidly in the years ahead. Second, activity coefficients may rise; as was shown, this is a major factor in Argentina. In Brazil both reasons are present, but as will be seen in more detail below, the second may be of greater importance.

As is again common to most of the region, the labour force in Brazil is now increasing more rapidly than in earlier years: during the 1950s the increase was at the rate of 2.7 per cent per annum, but had risen to 3.1 per cent per annum by the latter half of the 1960s. The future trend will depend to an important extent on the evolution of labour participation rates. If these do not change the rate of increase in the labour force will remain approximately constant to the end of the century (as in the first experiment). If labour participation rates rise more or less steadily then the rate of increase will rise to a peak around 1980 (of 3.5 per cent per annum in the second experiment or 3.3 per cent in the third experiment, for example) and then decline slowly, to about its present level at the end of the century.

This rise and fall in the rate of expansion of the labour force is much more moderate in Brazil than in a country such as Venezuela, where the rate of increase was slower in the early 1950s (2.5 per cent) and can be expected to rise to a much higher peak during the 1970s (around 3.8 per cent). Essentially this is a reflection of the greater stability in the age structure in Brazil which, in its turn, follows largely from the fact that fertility rates never reached such high levels.

At the national level then the labour force will expand rapidly to the end of the century in Brazil, and the expansion is likely to be a relatively steady one; there is not the same process of rapidly rising rates of expansion which culminate in a period of extremely rapid growth after which the pressures subside, also fairly rapidly. In Brazil the pressure for additional employment will remain, to the end of the century, at levels similar to that experienced in the recent past.

/The growth

The growth of the labour force, and the associated problem of adequate employment opportunities, will in the future need to be dealt with primarily in the urban areas. Even if there should be relatively little rural-urban migration (as assumed in the first experiment) well over two-thirds of the total increase in the labour force to the end of the century would occur in the urban areas; and if large scale migration is assumed (as in the third experiment) these areas will have to absorb practially all of the increase. In an intermediate type development, with only moderate migration (significantly less than in the recent past) and with considerable orientation toward the rural areas - the assumptions of the fifth experiment - the urban areas would still account for close to 80 per cent of the total expansion of the labour force.

In regional terms, each of the three major regions can be expected to absorb an important proportion of the expansion. The intermediate region, the smallest of the three, still accounts for from one-fifth to one-quarter of the increase in the different experiments. There is more variation in the relative importance of the two larger regions, depending upon the amount of migration assumed: with large scale migration the developed region will absorb the largest proportion of the increase in the labour force (44 per cent in the third experiment, for example), but if migration should be slower the less developed region would account for the largest proportion. So here too it is useful to stress the continuing importance of the less developed region. Even with large scale regional migration, as assumed in the third experiment, close to one-third of the total increase in the labour force will occur in the region; and if migration is less substantial the proportion will be higher. Thus if adequate employment opportunities are to be available a major proportion of these will have to be created within the less developed region in the years ahead.

/Viewed in

Viewed in terms of rates of increase in the individual areas of the country, it is primarily the cities, in all regions of the country, which will experience a rapid expansion of the labour force. Migration will clearly be a major factor and migration flows will need to be watched closely; but here again Brazil is in an "average" position in the region. Rates of natural increase in the cities remain fairly high, so that even in the absence of migration the urban labour force will expand at a rate of close to 3 per cent per annum in the immediate future (which contrasts with the situation in Argentina). The rural population is still a large proportion of the total so that rural-urban migration can still be a major factor in the growth of the urban labour force (considerably more so than in Venezuela); but at the same time the majority of the labour force is now urban so that the impact of migration also has limits (more so than in El Salvador). Natural increase and migration can therefore both be expected to contribute importantly to the expansion of the urban labour force for some time to come.

The actual increase varies considerably with the different assumptions used. With the large scale migration and substantial shift in urban participation rates assumed in the third experiment the urban labour force is 3 2/3 times its 1970 size at the end of the century, an average rate of increase for the period as a whole of 4.4 per cent per annum. With the much slower migration and much smaller shift in urban participation rates of the intermediate type fifth experiment the urban labour force somewhat more than triples over the period, implying an average rate of increase of 3.8 per cent per annum.1/ In both experiments the increase is somewhat larger in the cities of the intermediate area, but quite similar in the two

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1/ The results of the other experiments are shown in table 14. At the extremes, with the massive shift to the cities of the second experiment the urban labour force multiplies four-fold to the end of the century, while if rural-urban migration should nearly stop, as assumed in the fourth experiment, the end of century size would be about 2 1/2 times that of 1970.

largest urban areas, those of the developed and of the less developed regions.1/ The pattern however is rather different in these two latter regions. In the third experiment, for example, the increase is much faster in the urban less developed areas in the early years of the projection, but from the 1980s on the reverse is true. This reflects the pattern of migration assumed and is an interesting aspect of the trend in the less developed region.2/

For the urban areas as a whole, if large scale rural-urban migration continues (as assumed in the third experiment) the rate of expansion of the labour force during the 1970s will be similar to that of the recent past, and will then decline gradually to the end of the century. But there could be important differences between the developed and the other regions in this respect. During the 1950 to 1970 period

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1/ Too much significance should not be attached to the higher rates of growth projected for the intermediate region. This results from the migration flows postulated, and while these are considered reasonable there is considerable uncertainty involved. Over the 1950 to 1970 period the population increase was most rapid in the intermediate region, but this was primarily due to trends during the first decade of that period; during the 1960s the increase was more rapid in the developed region. Much will depend upon the pattern of development, and it is possible to envision a substantial migration from the extreme south toward the Sao Paulo area, in which case the increase in the intermediate region would be a good deal less than shown in the projections.

2/ Essentially it is assumed that a steady and substantial migration out of the region occurs. In the early years of the projection this is in effect a large net outflow from the rural area, and the urban labour force increases very rapidly. As the rural area declines in relative importance however (it remains approximately constant in absolute size in the third experiment) the continuing migration out of the region increasingly affects the urban labour force and its rate of increase declines steadily.

/the urban

the urban labour force in the more developed regions increased at the very rapid rate of around 5 1/2 per cent per annum, while in the less developed region the increase was significantly lower, less than 4.5 per cent per annum.1/

In the developed region this rapid rate of increase of the recent past has almost certainly already fallen to a more moderate level. Thus in the third experiment, which assumes continuing large scale migration and also a substantial shift in urban labour participation rates, the labour force in the urban developed area increases at the somewhat lower rate of 4.6 per cent per annum during the 1970s and the rate then declines steadily to 3.9 per cent at the end of the century. As was noted in the discussion of trends for the population as a whole, the principal factor here is that the massive rural-urban shift has already been completed in the developed region and the potential for further increases in the urban labour force from this source is no longer very large.

The situation is different in the other regions, where the rural labour force was still much larger than the urban in 1970 and where the potential for large additions to the urban labour force from rural-urban migration within the region therefore still exists. Thus in the third experiment the labour force in the urban intermediate area increases at a rate of 6 per cent per annum during the 1970s and, although it declines steadily throughout the 30 year period, the rate of increase is still at the high level of 4.5 per cent per annum at the end of the century. In the urban less developed area the increase is nearly as fast during the early 1970s but then declines more rapidly,

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1/ Again these estimates must be regarded as only approximate. As noted before, a detailed analysis of the 1950 census was not made and figures for the state of Sao Paulo are used as an indication of the trend in the developed region and in the Northeast as an indication of the less developed region. As labour participation rates by area for 1950 are not available, for the same reason, it has been assumed that they were the same as those estimated for 1970. With these assumptions, the estimated rate of increase for the 1950-1970 period were 5.3 per cent, 5.7 per cent, and 4.2 per cent per annum in the developed, intermediate, and less developed urban areas respectively.

/to a

to a rate of 3.1 per cent per annum at the end of the century; the greater decline in the rate here is the result of the assumed continuing heavy migration out of the less developed region as a whole.

It is worth noting the results of the second experiment here as this experiment was specifically designed to show the results of a possible massive population shift in Brazil (the rural population as a whole declines about 10 per cent over the 30 year period). Combined with the assumption that labour participation rates in the urban areas move to the Western European levels at the end of the century, this suggests an upper limit to the expansion of the urban labour force in the decades ahead. In this experiment the urban labour force as a whole multiplies nearly four-fold to the end of the century, an average rate of increase of 4.7 per cent per annum over the 30 year period. During the 1970s the increase is least rapid in the urban developed area; at 5.3 per cent per annum it is similar to the rate of increase in the recent past. The rate of increase in the urban intermediate and less developed regions however is over 7 per cent per annum during the early 1970s, considerably higher in both cases than in the immediate past. In all of the urban areas the rate of increase then declines steadily to the end of the century, but the decline is particularly marked in the urban less developed area, due again to the continuing heavy migration out of the region.

If rural-urban migration should slow in the years ahead then of course the expansion of the urban labour force would be less rapid. In the intermediate type fifth experiment for example (much less migration and a smaller shift in urban labour participation rates) the average rate of increase to the end of the century for the urban areas as a whole is 3.7 per cent per annum; less, as noted, but still substantial. In this experiment the rate of expansion in the urban developed area is well below that of the recent past from the beginning of the projection, but in the other two urban areas the rate in the 1970s is closer to that of the preceeding period. In all of the urban areas the rate then again declines to the end of the century, but more slowly in this experiment.

/In summary,

In summary, the simulation experiments clearly indicate that the urban labour force in Brazil will continue to increase rapidly at least to the end of the century, although the amount of rural-urban migration and possible changes in urban labour participation rates will be important determinants of just how fast the expansion is. Leaving aside the more extreme assumptions, the range for the urban areas as a whole over the 30 year period is still from 3.7 per cent to 4.4 per cent per annum (in the fifth and third experiments respectively). Of perhaps greater importance is the fact that there is considerable variation from one urban area to another, and the problems faced in providing sufficient employment opportunities to absorb the projected increase are likely to be quite different in the different regions.

The problems are likely to be most readily resolved in the urban developed area. Employment problems have never been as severe in this area as the economy has expanded greatly during the post-war period and this expansion has been concentrated to a major extent in the cities of the developed region. The large scale migration into the area probably reflected more the attraction of the opportunities offered by this expansion than a flight from severe distress, at least from the nearby rural areas. So while difficulties were always present, and there were periods of serious dislocation, in general the employment situation has probably been more satisfactory in the urban developed area of Brazil than in many of the important urban areas of Latin America. And this despite the fact that the labour force in the urban developed area was increasing very rapidly during the 1950 to 1970 period. As noted, the labour force in this area can be expected to increase less rapidly during the coming decades; the rate of increase has probably already dropped significantly from the peak level of the 1960s, and should continue to fall to the end of the century. If moderately rapid economic growth continues in the developed region the employment problem should thus be easier to handle in this urban area.

/The provision

The provision of adequate employment opportunities is likely to be a progressively more serious problem in the cities of the intermediate and less developed regions. In both regions the bulk of the labour force was still rural in 1970 so that the potential future impact of rural-urban migration is large, and this is reflected in the higher growth rates in these areas when large scale migration is assumed. In both areas the labour force could well expand more rapidly in the 1970s than it did in the preceeding decade.

The situation is mitigated in the intermediate region by the general economic environment in which this expansion will occur. Income levels are moderately high, and there has been substantial development in both the rural and urban areas during the post-war period. As a result there has not been a large scale flight from the land and the urban employment situation has been sufficiently good to attract substantial migration from outside the region. A further mitigating factor is the proximity of Sao Paulo, the heart of the developed region, to which migration would be relatively easy should the employment situation become more difficult in the intermediate region.1/ While the continuing very rapid expansion of the labour force in the urban intermediate area is likely to be more difficult to absorb than in the developed area, and could well become a source of serious concern, it is for these reasons likely to be manageable if a rapid economic growth can be maintained in the region.

The situation in the cities of the less developed region is much more serious. Income levels are much lower and the employment situation has already been a source of major concern for some time. The expansion of the labour force in the urban less developed area appears to have been significantly faster during the 1960s than during the 1950s, and the possibility of continuing rural-urban migration on

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1/ This has not been assumed in any of the experiments; but as the labour force in the urban developed area in 1970 was about 3 1/2 times as large as in the urban intermediate area, a migration sufficient to ease the pressure in the intermediate area would not be overly difficult to absorb in the developed area.

/a large

a large scale holds the prospect of an even faster expansion during the 1970s. Large scale migration out of the region as a whole would eventually reduce the pace, but it seems likely that until at least the mid-1980s the labour force in the area will expand at a very rapid rate. It is clearly in this region that the employment situation will remain most critical in Brazil, and substantial resources will be required simply to prevent deterioration of an already critical situation; the resolution of that situation would require resources on an even larger scale.

If rural-urban migration continues on the scale of the recent past, rural employment should not be a major problem in Brazil in the decades ahead, but here too the situation will vary substantially from one region to another. Within the developed region, the rural labour force has already been reduced to a minor proportion of the total and this relative decline will continue. During the past decade the rural labour force in the state of Sao Paulo declined substantially in absolute size, and even if this draining of labour from the rural areas stops (as is assumed in the simulation experiments) the labour force is not likely to increase much in size. It is easier to envision the possibility of labour shortages in this area than serious employment problems; the situation is somewhat similar to that already analysed in the rural South of Argentina, although urbanization has not gone as far as in the Argentine South, nor are rural productivity levels as high.

In both of the other two rural areas the labour force has continued to expand moderately rapidly, and is still the bulk of the total in each region. But again the situation is more favourable in the intermediate region, the more rapid increase in the rural labour force being more an indication of the expansion of agricultural production in the region. It is in the less developed region that the most serious problems of rural employment are concentrated, but even here the prospects for the future are somewhat better. The rural labour force appears to have increased at not much more than 1 per cent per annum during the 1960s as a result of the increasing movement to

/the cities.

the cities. Continuing large scale migration could well hold the rural labour force more or less constant in the decades to come, and the opening up of interior areas of the country will open better opportunities, still within the rural areas, and make possible the easing of the pressure in the densely settled coastal zones. Poverty, and the pressure for adequate employment opportunities, will remain a serious problem in the rural less developed area, but there appear to be good prospects for improvement during the period of the projections. These problems will remain to be faced primarily in the less developed region in Brazil, but the focus is likely to increasingly shift from the rural to the urban area.

As noted several times in this analysis, changes in labour participation rates can be an important factor in the expansion of the labour force in Brazil, and it is useful to explore this situation somewhat further. The principal factor here is that, as in most of the region, relatively few women were members of the labour force in 1970 so that there is very considerable scope for increasing the female participation rates, and to the extent this occurs the labour force will of course increase more rapidly. The possible impact this can have can be readily illustrated from the results of the second experiment, where it is assumed that labour participation rates in the urban areas shift to the Western European level at the end of the century. In that experiment the female labour force increases from 6.2 million in 1970 to 25 million at the end of the century, and half of the total increase is the result of the higher participation rates assumed; if female participation rates had remained at their 1970 level the increase would only have been to 15.6 million.

A further factor is that male labour participation rates are not as high as in some countries, and this adds to the possibility of expansion. In the rural areas, although male participation rates are quite high throughout the age range, they are closer to the levels in Argentina, and significantly lower than in Venezuela or El Salvador. In the cities male participation rates tend to be lower than in any of the other countries analysed. The proportion of

/teenagers who

teenagers who work is quite low, in contrast to the situation in other countries, and throughout the active adult age groups the proportion is somewhat lower than elsewhere. Finally, there is a substantial decline in male participation rates in the older adult groups, similar to that already described in the analysis of Argentina; the principal difference is that it begins at the somewhat earlier age of 40 to 45 in Brazil. The total result is that whereas the male labour force declines in most countries with the assumption that labour participation rates shift to the Western European level, this is not the case in Brazil. In the second experiment the male labour force at the end of the century with participation rates at the Western European level is 54 million; if participation rates had remained at their 1970 level the figure would have been slightly less than 53 million.

Thus the assumption that labour participation rates shift to the Western European level results in a larger increase in the labour force in Brazil than in most countries. There is the same (or even larger) increase in the female labour force, and this is not offset by any decline in the male labour force.1/ In the second experiment, for example, more than one-fifth of the entire increase in the labour force over the 30 year period of the projection is the result of the shift in labour participation rates, and the labour force at the end of the century is 15 per cent larger than it would have been had labour participation rates remained at their 1970 level. With the somewhat smaller shift assumed in the third experiment this factor accounts for 17 per cent of the total increase and the labour force

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1/ The decline in most countries results from the substantial reduction in the proportion of teenagers and older males who are members of the labour force. In the urban areas of Brazil the proportion of teenagers working is already less than in France in 1968 and so does not decline, and there is only a moderate decline in the proportion of those 65 and over who are active members of the labour force. As the coefficients rise somewhat throughout the rest of the age range the net result of a shift to Western European participation rates is an increase in the male labour force.

/is nearly

is nearly 12 per cent larger at the end of the century than if labour participation rates had remained unchanged.

As it is primarily female urban participation rates which change in these two experiments these are worth considering somewhat further.1/ They are relatively low in all of the urban areas, but are much the lowest in the cities of the less developed region, somewhat higher in the intermediate region, and higher still in the developed region.2/ If it is assumed that female participation rates shift to the Western European level, as in the second experiment, the impact is very large in all of the urban areas. For the urban areas as a whole about half of the total increase in the female labour force to the end of the century is due to the shift in participation rates; by region this factor accounts for from 42 per cent of the increase in the urban developed area to 58 per cent in the urban less developed area. With the smaller shift assumed in the third experiment the impact is of course somewhat less, but still large: the shift in participation rates accounts for from 37 per cent of the increase in the female labour force in the urban developed area to 52 per cent of the increase in the urban less developed area.

1/ As has been noted several times, there is more doubt about rural labour participation rates and assumed shifts have to be interpreted more carefully. The fourth experiment (rural oriented development) assumes that rural participation rates move toward urban levels, and in that experiment this results in a large increase in the number of women in the labour force and so is a major factor in the expansion of the rural labour force.

2/ These differences are suggested by the overall female participation rates, by area, shown in table 14, but those figures exaggerate the disparity due to the fact that the active age groups - to which the labour participation rates are applied - are a smaller proportion of the population in the less developed area, and this alone would give a somewhat smaller aggregate figure. But most of the difference indicated by these figures does reflect differences in female labour participation rates of the individual age groups.

/This situation

This situation imparts a flexibility to the potential expansion of the labour force in Brazil similar to that already discussed in the analysis of Argentina. But whereas in Argentina this flexibility could be an important advantage during periods of rapid growth, because the labour force will be increasing fairly slowly, in Brazil the situation is different. The labour force will be expanding rapidly in any case, and is not likely to be a limiting factor even during periods of rapid growth (except possibly at times in the developed region). In these different circumstances the flexibility may rather be viewed as a factor which makes it more difficult to improve the employment situation: as more employment is provided this induces, or permits, more workers, especially women, to enter the labour force and so the situation does not change, or changes less than was expected.

Another aspect which can be readily illustrated at this point is the inadequacy of projecting labour force trends on the basis of expected changes in the population as a whole. At the national level it has already been noted that the two trends will often diverge due to shifts in the age structure. For many countries the labour force probably increased less rapidly than the total population during much of the post-World War II period, reflecting the fact that the number of children often increased a good deal faster than the rest of the population during the period of transition to higher rates of population growth.1/ As this initial bulge moved through the age structure these relations were reversed, and from around 1960 the labour force has probably been increasing more rapidly than the total population in many countries; and this will continue to be the case for some time to come. In the case of Brazil, in the third

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1/ As already noted in other parts of this study, the shift to higher rates of population growth was due primarily to falling mortality rates, and as a large proportion of total deaths had earlier occurred among infants and small children, it was primarily these groups which benefitted with the improvements in health conditions. As a result the proportion of children in the total population often increased substantially.

experiment for example, with 1970 as a base of 100, the total population increases to 212 at the end of the century, but the labour force increases much more, to 257. In addition to the changing age structure, the assumed shift in labour participation rates is an important factor in producing the disparity.

When individual areas within a country are considered there is the further complicating factor of migration to be considered, as this is likely to affect disproportionately the active age groups, and hence the labour force. Comparisons for all of the different areas and in each of the different experiments can be made from the figures shown in table 14, but the situation can be illustrated by mention of two of the more disparate comparisons. In the third experiment, the labour force in the less developed rural area increases somewhat less than the population as a whole; more accurately with 1970 = 100, it declines to 96 at the end of the century while the population declines only to 98. In the developed urban area by contrast the labour force increases much more than the population: again with 1970 = 100, the figures are 350 and 279 respectively. It is clear that population trends alone are a poor guide to changes in the labour force in conditions of this sort.

The structure of the labour force in Brazil can be expected to change substantially in several different ways in the years to come. The most important are the geographical shifts discussed above: the urban labour force will be an increasing proportion of the total, and the same will be true of the labour force in the more developed regions. In 1970 some 55.8 per cent of the labour force was urban, and by the end of the century the proportion rises to close to 70 per cent in the intermediate type fifth experiment, and to nearly 80 per cent in the third experiment with its assumption of continuing large scale rural-urban migration. Just over half of the labour force was in the intermediate and developed regions, combined, in 1970, and this proportion rises to 57 per cent at the end of the century in the fifth experiment and to 61 per cent in the third experiment. The relative shift to the cities can thus be expected to

/be much

be much more substantial than the regional shift, and it is worth noting again that a large proportion of the labour force will remain in the less developed region at least to the end of the century; if adequate employment opportunities are to be provided for the mass of the labour force much will have to be done in this region.

A second substantial shift which is likely to occur in the structure of the labour force is that women are likely to become a much larger proportion of the total. This will be a common feature in labour force trends in most of the region and has already been discussed in the other country analyses. The reasons for the shift in Brazil are the same as elsewhere: migration to the cities increases the proportion of women in the labour force (more women work in the cities than in the rural areas), and female labour participation rates are likely to rise, as even in the cities these are still very low. The increase in relative importance is substantial - from 20.6 per cent of the labour force in 1970 to 29.4 per cent at the end of the century in the third experiment for example - but in this respect as in numerous others the situation in Brazil appears to be an "average" one in the region.

Finally, there will be some change in the age structure in the labour force, and if migration continues on a large scale and there is a substantial shift in labour participation rates toward Western European levels the change will be fairly substantial. The proportion of teenagers will decline (from 19.8 per cent of the total in 1970 to 13.7 per cent at the end of the century in the third experiment for example) and the proportion of the two large active adult age groups will rise. The increase is somewhat larger in the more mature age group (those 40 to 64 years of age) and this group may become somewhat more important in Brazil than in countries such as Venezuela or El Salvador; but the age structure of the labour force will remain younger than that which characterized Argentina even in 1970.

/This aggregate

This aggregate age structure is again an average, and the age structures in different areas of the country vary greatly. In general the proportion of teenagers and elderly workers (those 65 and over) is much higher in the rural than in the urban areas, reflecting the fact that participation rates are much higher for these age groups in the rural areas. How these area structures change will depend upon the extent of migration and upon how labour participation rates change, and the large potential impact can be illustrated from the results of the third experiment. With the large scale migration assumed in that experiment there is a substantial rise in the proportion of teenagers and elderly workers in the rural labour force, due to the fact that it is the active adult age groups which, over the 30 year period, are most affected; in the rural less developed area, from which migration is heaviest, the proportion of teenagers rises from 23.2 per cent in 1970 to 27.1 per cent at the end of the century and the proportion of elderly workers from 3.8 per cent to 6.9 per cent. The opposite sort of shift occurs in the urban areas, and it is reinforced by the fact that labour participation rates in the cities are assumed to shift toward the Western European level, thereby reducing the numbers of teenagers and older workers in the labour force. In the urban intermediate area, for example, the proportion of teenagers drops sharply from 18.1 per cent of the labour force in 1970 to 9.5 per cent at the end of the century, and there is also a decline in the proportion of elderly workers. There is a good deal of variation from one urban (or rural) area to another due to varying population age structures and the type of migration flows postulated in the simulation experiments; figures for the other areas and results of the other experiments are shown in table 14.

There is also a great difference in the age structures of the male and of the female labour forces, which can be illustrated with estimates of this sort for the urban developed area. The female labour force is much younger: teenage workers accounted for fully one-quarter of the total in 1970, and more mature workers

/(40 and

(40 and over) were correspondingly a much smaller proportion. In the third experiment the assumed shift in labour participation rates toward the Western European level is the primary factor in the movement to quite similar age structures for the male and the female labour forces in the area at the end of the century; there is a decline in the proportion of teenagers and an offsetting rise in the proportion of the more mature active adult group in each age structure, but the shift is much greater for female workers.

Although not shown in table 14 the differences in the other urban areas are of a broadly similar type. In the rural areas labour participation rates for teenage males are much higher and so the age structure for the male and for the female labour force are more similar. As has been noted before however, labour participation rate estimates in the rural areas, particularly for women, are probably less meaningful and so such comparisons are of less interest than in the case of the urban labour force.

Chapter VI

COMPARATIVE ANALYSIS AND CONCLUSIONS

The preceeding chapters have analyzed the 1970 situation and likely trends to the end of the century in four countries of the region, and there remains only to look at these individual studies as a group with the view of drawing possible conclusions for Latin America as a whole. In several important aspects this can be done, but one of the principal general conclusions must be that, at least with respect to population parameters and trends, there is an impressive range of variation within the region. Any statement about conditions in "Latin America" is apt to refer to some kind of average, around which there is considerable dispersion, rather than describing a situation which is the common norm throughout the region.

A. The Situation around 1970

To begin with, the two major underlying population parameters - fertility rates and death rates - have evolved in quite different ways in the countries analyzed, so that in 1970 rates of population growth and age structures, as well as the parameters themselves, varied considerably. At the national level fertility rates in Argentina have been declining for some time and are now at moderately low levels; in the other three countries they remain very high, although in Brazil and Venezuela there has been a modest decline in recent years. Death rates have been greatly reduced in all countries, but with the partial exception of Argentina, there is still important scope for further reductions. It is well to note at once that the setting apart of Argentina already noted will tend to continue throughout this analysis; the general population structure has evolved much further in Argentina than in any of the other countries studied and when different aspects are considered it will often be found that the values or trends characterizing that country are markedly different from those prevailing elsewhere.

/But these

But these values at the national level are already averages of widely differing conditions in major areas within the individual countries, and in this respect Argentina is no exception. The table below shows the total fertility rate in 1970 in each of the areas distinguished in the analysis; relative infant mortality rates are also shown to give some idea of the variation in death rates.1/

Table 15

ESTIMATES OF TOTAL FERTILITY RATES AND RELATIVE INFANT MORTALITY RATES IN THE 1965-1970 PERIOD IN THE AREAS ANALYZED

Area	Total fertility rates	Infant mortality rates (Brazil = 100)
Venezuela rural	7.54	90
Brazil less develcped rural	7.53	144
El Salvador rural	7.33	123
Brazil intermediate rural	6.48	68
Argentina North rural	5.93	85
Brazil developed rural	5.64	68
El Salvador urban	5.52	123
Venezuela urban	5.44	60
Brazil less developed urban	5.43	103
Argentina South rural	3.93	55
Argentina North urban	3.81	85
Brazil intermediate urban	3.78	57
Brazil developed urban	3.45	57
Argentina South urban	2.27	55

1/ Up to about the age of 50 the variation of the age specific death rates among the different areas is fairly similar to that shown for infant mortality rates. From about the age of 50 on the range narrows greatly: at more advanced ages death rates tend to be more similar throughout the areas analyzed.

/With the

With the exception of the rural South in Argentina, fertility rates are higher in all rural areas than in any urban zone, but there are major variations within each grouping. At the top of the listing are three rural areas where the total fertility rate remains at the very high level of more than 7 (the figure can be approximately interpreted as the number of children the average woman would have during her lifetime with prevailing age specific fertility rates). The decline is then moderately rapid to a clustering of one rural and three urban areas with total fertility rates ranging around 5 1/2. Then a sharp drop and another rural area plus three urban areas with rates of 3 1/2 to 4. And finally, well below all of the others, the relatively low total fertility rate in the urban South of Argentina.

Except for this last area, fertility rates are everywhere at least moderately high, but the range is very great. The cluster of areas with figures of from 3 1/2 to 4, for example, have total fertility rates only about half those prevailing in the three areas at the top of the list; and there are major population groups in both clusters. It is always useful to bear in mind that when observing that the total fertility rate in Latin America in 1970 was about 5.38, this is an average figure covering areas with widely varying figures like those shown.

To some extent death rates follow an order of ranking similar to that for fertility rates - in particular those areas with low infant mortality rates tend to be the same as those with relatively low fertility rates - but there are striking exceptions. In general infant mortality rates appear to vary at least as much by region as on an urban-rural basis; thus the areas with the highest infant mortality rates are the urban as well as the rural areas in El Salvador and the less developed region of Brazil. Here too there is a very great range: infant mortality rates in the rural less developed area of Brazil and in El Salvador appear to be well over double those in the areas with the lowest figures. Too much cannot be made of these comparisons however as in general the data on which these estimates are based are less complete than that available for making the fertility rate estimates.

/These differing

These differing population parameters, with the major further factor of internal migration flows, have lead to differing age structures in different areas, and to differing geographic, and in particular rural-urban, population structures. These aspects have already been analyzed in comparative terms, and in the context of the recent past, in the introductory chapter and there is no need to repeat that discussion. With respect to age structures it need only be recalled that, except in Argentina, populations are everywhere still very young, especially in the rural areas. With respect to rural-urban structures it is useful to summarize here the degree to urbanization in the regions which have been distinguished in the analysis. The situation in 1970 is shown in table 16.

Table 16

THE DEGREE OF URBANIZATION IN 1970 a/

Region	Percentage of Population Urban
Argentina, South region	87.9
Brazil, developed region	80.4
Venezuela	77.0
Argentina, North region	55.7
Brazil, intermediate region	44.2
Brazil, less developed region	43.7
El Salvador	39.4

a/ The definitions of urban here are those of the respective censuses, generally cities with a population of 1,000 or more; in the case of Brazil however, the definition appears to be based more on the type of administrative unit. The percentage shown for the developed region of Brazil is in fact the figure for the state of Sao Paulo, which is more appropriate here given the way the developed region is defined in the study.

/Again there

Again there is a wide range, and several of the major regions have reached very high degrees of urbanization. From these figures follow important implications about migration flows. In each of the first four regions the rural-urban flow in recent years has been of sufficient size to result in an important decline in the absolute size of the rural population. In the following two regions of Brazil rural-urban migration has also been substantial, even though the rural populations have continued to increase moderately rapidly. El Salvador is the only country, or region, analyzed where rural-urban migration in recent years has been relatively unimportant, at least in relation to natural rates of population increase in the rural area.

Given the importance of internal migration, the structure of the migration flows becomes another variable of considerable importance, and here there is much less variation among the countries analyzed. The common characteristics are that it is primarily the very young who migrate, and women migrate more than men. It is a commonplace that migrants tend to be young, but they are perhaps surprisingly so in Latin America, particularly women. It is in the rural-urban migration flows that women dominate, but even over the greater distances involved in regional migration in Argentina and Brazil they appear to migrate in numbers approximately equal to those for men. As the structure of migration tends to be fairly similar in the different countries the more complete discussion in the Venezuelan analysis can be referred to for details.

This then is the general demographic background from which the simulation experiments begin: very considerable diversity, within as well as among the countries analyzed, with Argentina a case apart in many respects; fertility rates and hence population growth for the most part ranging from moderately high to very high; major migration flows nearly everywhere, but with widely varying degrees of urbanization already achieved in the different regions.

/B. Projected

B. Projected Population Trends

Trends at the national level

The first question is: how fast is the population likely to increase from 1970 to the end of the century, and how much do the projections change with changing assumptions about the underlying population parameters? Populations increase most rapidly with the assumptions of little change from the 1970 situation in the first experiment, and least rapidly with the assumptions of great change in the second experiment, so a comparison of these two experiments will show the probable limits involved. The results of the two experiments are shown in table 17.

Table 17

PROJECTED POPULATION INCREASES TO THE END OF THE CENTURY - PROBABLE LIMITS

Country	Population in 2000 (1970 = 100)		Average increase per annum 1970 to 2000 (percentage)		Increase per annum at the end of the century (percentage)	
	Exp. II	Exp. I	Exp. II	Exp. I	Exp. II	Exp. I
Argentina	130	142	0.9	1.2	0.5	1.1
Brazil	203	237	2.4	2.9	2.0	2.9
El Salvador	217	280	2.6	3.5	2.0	3.6
Venezuela	204	248	2.4	3.1	1.6	2.8

The extent to which Argentina is a case apart is at once clear. The population will increase only moderately to the end of the century and the range of uncertainty is quite small; the difference between the maximum and minimum end of the century projection is only 12 per cent of the 1970 population.

/In each

In each of the other three countries the population more than doubles over the 30 year period even in the minimum projection, and to the extent the substantial changes assumed in that second experiment do not occur the increase will be even larger. This means an average rate of population increase of at least 2.4 per cent per annum from 1970 to the end of the century, and probably significantly higher in most countries.

It is important to stress that this large increase occurs despite assumptions which lead to large declines in fertility rates. First, large scale migration to the cities, and in Brazil to the more developed regions, is assumed; and as fertility rates are substantially lower in these areas the effect is an important decline in the total national fertility rate. Second, it is directly assumed that fertility rates in the urban areas drop sharply, at least in the more developed regions to the level of zero population growth in an eventually stable economy. The net result is that in 30 years the total fertility rate declines from about 5.4 to about 3.1 in Brazil, from 6.6 to 3.1 in El Salvador, and from 6.0 to only 2.5 in Venezuela.

That populations nevertheless increase rapidly over the period is a reflection of the very young age structure in most of Latin America. The very high fertility rates which have prevailed in many areas would have produced even higher rates of population increase with a stable age structure but, mostly due to the way in which the shift to higher rates of increase occurred, the age structure in most countries is still in a process of fairly rapid evolution. It was primarily the number of children which first increased very rapidly, due to falling infant mortality rates in the 1940s and 1950s, and this bulge is only now beginning to work its way through the adult age structure. As a consequence, the numbers in the most fertile age groups will be increasing rapidly in the coming decades in most countries - usually a good deal faster than the population as a whole - and this will be a major factor in increasing the number of births, and tending to offset declines in age specific fertility rates.

/Thus even

Thus even rapidly falling fertility rates, as in the second experiment, may require a prolonged period before the impact is fully felt. The rates of population increase at the end of the century in the second experiment are important to note in this respect. They have by that time declined to 2 per cent per annum or less, and as the numbers in the fertile age groups are no longer increasing so rapidly (reflecting the decline in fertility rates which began several decades earlier), the decline could be expected to proceed a good deal further in the early decades of the next century. This is an indication of the very long term nature of population changes; even sharp changes in the parameters may well require several decades to produce the expected results.

If there is no important decline in fertility rates the youthful age structure may actually result in rising rates of population increase in some countries in the years ahead. Thus, even though the first experiment does assume some decline in fertility rates, the figures above show that rates of population increase at the end of the century are not necessarily lower than the average for the period as a whole. In Brazil there is a very small rise during the 1975-1985 period, but the rate of increase is essentially constant to the end of the century; in Venezuela there is a more significant rise during the 1975-1985 period, after which the rate declines slowly to the end of the century; and in El Salvador the rate continues to rise, from 3.2 per cent per annum in 1970 to 3.6 per cent at the end of the century.

Argentina apart then it is clear that the population will increase very substantially in Latin America, and even if fertility rates should begin an immediate and rapid decline - and this has not yet occurred in most of the region - the rate of increase will remain high at least to the end of the century. Two very general economic issues of interest here are the implications of such an increase for per capita resource availabilities and the potential size of the market. To say much about either issue would of course

/require a

require a thorough study of its own, but the figures shown in table 18 are of interest as a general, although imprecise, sort of indicator.

Table 18

PROJECTIONS FOR THE YEAR 2000

Country	Total population (millions)	Inhabitants per square kilometer
Argentina	31 to 34	11 to 12
Brazil	194 to 225	23 to 26
El Salvador	7.6 to 9.7	354 to 455
Venezuela	22 to 26	24 to 29

In terms of the resource base - insofar as this is indicated by the simplistic measure of population density - Latin America will continue to be among the more favoured regions of the world. For the region as a whole the population density at the end of the century will probably be around 30, somewhat higher than the figures shown for Brazil and Venezuela; for the South American continent the overall density will be lower, and this will be offset by higher densities in Central America and the Caribbean. By comparison with outside areas, the density for the world as a whole was already about 30 in the mid-1970s, although densities in the areas regarded as resource rich were of course much lower.1/

1/ As examples, population densities in the mid-1970s were around 11 in the U.S.S.R., 22 in the United States, 2 in Canada and Oceania, 13 in Africa, and 16 in Latin America itself. As examples of densely populated areas, the figure in Western Europe was around 155, it was over 180 in India, over 290 in Japan, and around 475 in Bangladesh.

/Thus even

Thus even with the rapid population increase which will occur the region as a whole will not be particularly densely populated at the end of the century. But the resource base will have become much less generous than it has been customary to assume. From the early post-World War II period to the end of the century the population of the region will have multiplied about four-fold, and this of course means that the per capita resource base will have been cut by three-quarters in half a century. In the mid-1970s the world as a whole is no longer considered to be especially resource rich in relation to its population, and at the end of the century that is about the density level which will characterize Latin America.

With respect to markets, it is clear that for the region as a whole the number of potential consumers will be more than sufficiently large to support even those modern industries with very large economies of scale. The more relevant question here is the extent to which the population can be integrated into the production process so as to provide effective money demand for such products. But also, at least with present institutional arrangements, markets need to be considered more on a national than regional basis and this situation, in conjunction with population densities in the different countries has been described in the individual country analyses. All that need be stressed here is that this is another situation in which the diversity is striking.

In Argentina the total population is moderately large and already more generally integrated and with higher incomes than in most countries, so that this should provide an effective market large enough to support a reasonably diversified modern economy. At the same time the population density will remain low, implying an unusually favourable per capita resource base; in particular there are rich agricultural resources, a key asset in a world expected to be characterized by problems of food availability. Argentina may well find itself in a uniquely favourable situation in the region in these most general economic terms.

/Brazil stands

Brazil stands out in a different way. The resource base, as expressed by population density, will be somewhat better than the average for the region as a whole (although worse than the South American average); but the potential market will be very large. The Brazilian population at the end of the century will be of the same order of magnitude as those of the economic superpowers of the post-World War II period, the E.E.C., the United States, or the U.S.S.R. The major issue in Brazil in this respect will be the extent to which that population can be integrated into the modern economy so as to provide an effective market with real purchasing power. Although populations will not be nearly so large as in Brazil, this sort of situation is likely to characterize other major countries in the region. Mexico will have a very large population and the limiting factor in market terms will be the extent to which that population can be integrated; densities will be well over double those in Brazil. And both Colombia and Peru will have populations large enough to support diversified economies, if, again, they can be integrated into the economy so as to provide effective monetary markets.

Venezuela is more similar to the Argentine situation, but rather less favourable in both respects. Population density will be more than double that of Argentina at the end of the century, yet the total market will be significantly smaller. Income levels are likely to be high however so that the population can be expected to be relatively fully integrated and the effective market large in relation to the population.

Finally, El Salvador is in a much less favourable situation. Population density will be very high - to the point that simple pressure on resources, especially land, may be a major problem - and at the same time the total population is not large enough to provide the basic market for a diversified, internally oriented economy. Although to less extreme degrees, a number of the smaller countries of the region are apt to find themselves in this sort of situation in the decades ahead.

/Trends in

Trends in the different areas

In addition to the total population increase, it is of major importance to determine where that increase is likely to occur and the implications this will have for the different areas. In much of Latin America a substantial proportion of the population is still rural and, combined with the fact that fertility rates are generally much higher in the rural areas, this will often mean that most of the population increase originates in these rural areas. But migration to the cities is occurring everywhere, often on a large scale, so that in general it is the urban areas which will absorb the bulk of the population increase in the decades ahead. To a lesser extent the same sort of considerations will apply as between more and less developed regions within the larger countries.

Trends, and the possible range of variation, can be seen by comparing the results of the third and fourth simulation experiments. The third assumes continuing modern type development, oriented towards the cities and, in Argentina and Brazil, the more developed regions; there is large scale migration and major declines in urban fertility rates, although less than with the extreme assumptions of the second experiment. The fourth simulation by contrast assumes a shift to a less modern type development, oriented toward the rural areas and the less developed regions; there is very little migration and it is primarily the population parameters in the rural areas which are assumed to change. These two experiments thus show the extremes to which the population increase might remain in the rural areas (and the less developed regions) or might shift to the cities instead. A series of comparative figures are shown in table 19.

/Table 19

Table 19

RELATIVE IMPORTANCE OF DIFFERENT AREAS IN THE PROJECTED POPULATION INCREASE, 1970-2000

Country and area	Distribution of population in the country			Percentage of population increase in area		Average annual rate of increase	
	1970	2000 Experiment III	2000 Experiment IV	Experiment III	Experiment IV	Experiment III	Experiment IV
Argentina							
North rural	12.9	7.9	14.8	-6.6	20.3	-0.7	1.6
North urban	14.9	18.2	21.3	25.7	37.0	1.5	2.2
South rural	9.7	5.7	9.1	-4.7	9.4	-0.7	1.1
South urban	62.5	68.2	54.8	85.7	33.4	1.3	0.6
Brazil							
Less developed rural	30.1	13.9	27.9	-0.6	25.9	-0.1	2.3
Less developed urban	23.4	30.8	23.2	37.5	23.1	3.5	2.6
Intermediate rural	9.9	7.9	10.8	6.1	11.7	1.8	2.9
Intermediate urban	7.8	12.7	8.1	17.0	8.4	4.2	2.7
Developed rural	4.1	2.3	4.0	0.7	3.9	0.6	2.5
Developed urban	27.4	32.4	25.9	39.4	27.0	3.5	2.7
El Salvador							
Rural	60.6	33.1	57.1	15.4	54.7	1.1	2.9
Urban	39.4	66.9	42.9	84.6	45.3	5.0	3.4
Venezuela							
Rural	25.3	14.6	24.6	6.5	24.0	0.9	2.7
Urban	74.7	85.4	75.4	93.5	76.0	3.3	2.8

/With the

With the assumptions of the fourth experiment, except in Argentina there is not much change in the distribution of the population, and rates of increase are fairly similar from one area to another within each country.1/ But even in the fourth experiment El Salvador is the only country where somewhat more than half of the population increase takes place in the rural areas; in the other countries even if migration is held to a minimum it is primarily the cities which will have to accommodate the increase. In regional terms however the situation is different: practically half of the total increase would occur in the less developed region in Brazil, and well over half in the North of Argentina.

With the assumptions of the third experiment on the other hand the situation is very different. There are substantial shifts in the distribution of the population in all countries, toward the cities and, in Brazil, toward the more developed regions. Practically all of the population increase is accounted for by the expansion of the urban areas, and most of it occurs in the more developed regions of Brazil and Argentina. And of course rates of population increase are very much higher in the cities than in the rural areas; except in Argentina the urban rates of increase are everywhere high, ranging from 3.3 per cent to 5 per cent per annum for the 30 year period as a whole. Because of the gradually declining impact of migration as the shift to the cities proceeds, as well as the substantial fall in urban fertility rates, these rates of increase are even higher at the beginning of the period and then decline to lower levels at the end of the century.

These potential shifts in population structures and the varying possible rates of increase in the different areas are of major importance and have been analyzed in some detail in the individual

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1/ The low fertility rates in the urban South of Argentina mean that population growth in the area depends to an unusual extent on migration. Thus with the limited migration assumed in the fourth experiment the population of the area does not increase much and its proportion of the total declines from 62.5 per cent in 1970 to 54.8 per cent at the end of the century.

country studies. Several different type situations are apparent - depending upon the 1970 population distribution and upon variations in fertility rates - and these are worth summarizing for their general implications.

Venezuela is the best illustration of likely trends in a country which was already quite highly urbanized in 1970. In that country the bulk of the population increase occurs in the cities under all assumptions; even with the limited migration assumed in the fourth experiment over three-quarters of the increase is in the cities, and if substantial migration continues essentially the entire increase will be urban (during the 1960s the rural population actually declined).

There are several important implications of this situation. The direct one is simply that facilities required for the growing population will have to be provided largely, or even entirely, in the urban areas; because of greater densities and the usual provision of more services in the cities, this will mean that infrastructure costs are likely to be relatively high.

A second implication is that, since the rural population has already been reduced to a minor part of the total, the impact on the cities of continuing migration will be relatively small, and the increase in the urban population will depend primarily on fertility rates in the cities themselves. Thus in Venezuela, with the assumption of continuing rapid migration in the third simulation, newly arriving migrants account for only about 18 per cent of the total increase in the urban population at the beginning of the period and the figure declines to about 14 per cent at the end of the century (despite the fact that urban fertility rates fall sharply over the 30 year period). Related to the total, the number of migrants arriving in a year would be only about 2/3 of one per cent of the urban population in the early 1970s and the proportion would decline to less than 1/3 of one per cent at the end of the century. Migration in these conditions will continue to be a major factor in determining the size, and composition, of the rural population, but its significance for the cities will become increasing marginal.

/A further

A further implication which follows is that the nature of the urban population will gradually change: migrants will become a steadily smaller proportion of the total. Even with the assumptions of continuing substantial migration in the third simulation, less than 10 per cent of the urban population in Venezuela at the end of the century will have lived in the cities for less than 30 years; over 80 per cent of that population will have been born in the cities. Recent arrivals from the rural areas were a much larger part of the urban population during the 1950s and 1960s, and the shift can be expected to have an important impact on expectations, and in general on social, economic and political orientations in the urban areas.

Finally, and perhaps of greatest importance, the fact that the massive shift to the cities has already occurred, and that the impact of migration is declining, will mean that rates of urban population growth can also be expected to decline. In Venezuela the urban population increased at rates of well over 6 per cent per annum during the 1940s and 1950s, with newly arriving migrants representing more than half of that increase. Around 1960 the impact of migration began to decline markedly (two-thirds of the population was already urban by that date), and the rate of urban population increase began to slow correspondingly. In the second half of the 1960s the urban population increased at the already substantially slower rate of 4.7 per cent per annum, and the rate will continue to decline steadily.1/ The period of most rapid urban population increase is therefore already over, and in Venezuela future rates of increase will be much lower than the peak

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1/ How fast it declines will also, of course, depend on the trend in urban fertility rates. If these do not decline much the rate of increase will fall to around 3 per cent per annum at the end of the century. If there is a substantial decline in urban fertility rates the rate of increase will fall to around 2 1/2 per cent at the end of the century, even assuming continuing substantial migration.

/rates of

rates of the recent past. Pressures for urban employment, housing, social services, etc., should as a result be substantially less, at least in relative terms, and so be easier to accomodate.

At the same time, the problem of rural poverty will be easier to deal with. The rural population is now much smaller than the urban population and so funds required to improve conditions for the former are more likely to be a manageable proportion of the total available. Those who cannot obtain remunerative employment in the rural areas can migrate to the cities where, as noted, they now have a relatively small impact, and this in itself should substantially ease poverty conditions in the countryside. Indeed, the fact that the population is already relatively highly urbanized is likely to mean that conditions have not deteriorated in the rural areas; in Venezuela the rural population has remained approximately constant in size since about 1940, so there has been no build-up of pressure on the land. And so long as the natural increase is drained away by migration all efforts can go to increasing levels of per capita welfare in the rural area; nothing is required to accomodate greater numbers. All of these considerations mean that the problem of rural poverty is not likely to be as severe as in some regions, and should be easier to deal with.

This is all true of course only if the bulk of the population which is nor urban has been more or less effectively integrated into the urban money economy; a simple shift from conditions of rural poverty to unintegrated urban poverty would not really mean changes of the sort implied here. But the mere fact that urbanization has gone this far is evidence that this has probably been the case. Otherwise it is unlikely that migration would have continued for so long on such a large scale.

This then is something of a case of those who have shall also receive. Once the mass transition from a basically rural to a basically urban society is successfully made, the problems - which are apt to be very severe in the transition period - become easier and at the same time resources available to deal with them are apt

/to become

to become more generous, at least in relative terms. Much of the post-World War II period was one of transition of this sort for Venezuela, and it seems likely that pressures associated with rapidly increasing numbers will moderate considerably in the years ahead.

In addition to Venezuela, of the countries (or regions) analysed the South of Argentina and the developed region of Brazil are also characterized by high degrees of urbanization, although there are special characteristics in each case and both are complicated by the existance of migration flows from other regions within the country. Migration may therefore continue to be somewhat more important, even though the rural populations within each region are smaller in relative terms than in Venezuela. Nevertheless, much of the above discussion can also be applied to these two major regions.1/

A somewhat different sort of problem which may persist in these highly urbanized regions is that related to the absolute size, as distinct from the rate of expansion, of some metropolitan areas. Given the type of economic growth which has characterized the region in the post-War period, there has often been a considerable concentration in one or a few major cities, and some of these have reached a size where diseconomies of scale are now thought to present serious problems. In these circumstances it is possible that if a city continues to expand fairly rapidly the difficulties of coping with the expansion may increase - despite the fact that the rate of population growth may be declining. The metropolitan areas of Buenos Aires and of Sao Paulo, for example, may well have reached a size where considerations of this sort apply.

The relative difficulty of dealing with problems of regional disparity can also be viewed in the terms used above to discuss rural poverty, and the contrast between the situation in Argentina and in Brazil can be noted here. In Argentina over 72 per cent of

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1/ For more detailed discussions see the country analyses of Argentina and Brazil.

the 1970 population was in the high income South (62.5 per cent in the urban South alone). The comparison between the South and the North is thus fairly similar to that between the urban and rural areas of Venezuela and many of the same comments are applicable. A regional development programme in Argentina appears manageable in these conditions and could probably be undertaken while at the same time continuing a modern oriented type of expansion in the South itself. That is, the diversion of resources required would probably not be so great that it would require all, or the bulk, of what was available.

In Brazil however, the situation is much less favourable. In 1970 less than 28 per cent of the population was in the developed region (less than one-quarter in the urban developed area), and well over half still lived in the less developed region. In these conditions the resources required for a full scale regional development programme could well preempt everything available, leaving little for continuing modern type of expansion in the developed region itself. That is, a different style of development would probably be required to bring about near- or even intermediate-term regional change on a major scale.

A second useful "type" to analyse is a situation where around half the population was urban at the beginning of the projection period. Brazil as a whole and the North of Argentina are fairly close to this situation - in each case about 56 per cent of the population was urban in 1970 - but it can be better illustrated with the Brazilian data, the situation in the North of Argentina again being complicated by regional migration flows.

The bulk, if not all, of the population increase will still occur in the urban areas, but if there is continuing large scale migration the impact on the cities will be considerably greater than in the Venezuela type situation. In the third experiment, which assumes that rural-urban migration continues on about the same scale as in the recent past, the urban areas absorb practically all (94 per cent) of the population increase; and newly arriving

/migrants account

migrants account for well over 40 per cent of the total urban population growth in the early 1970s and for nearly 30 per cent even at the end of the century.1/ In the early 1970s migrants arriving during the course of a year would represent about 2 per cent of the entire urban population, a figure which would decline to about 0.8 per cent at the end of the century.

These figures are much higher than those cited for Venezuela and indicate that rural-urban migration may for some time continue to be a major factor in the growth of the cities in Brazil. The impact will be fairly large and for some time to come recent migrants will continue to be an important component of the urban population.

Nevertheless, this impact has already begun to decline, and in Brazil too the peak period of urban population growth is almost certainly over. Rural-urban migration has been substantial in Brazil in recent decades and has been an even larger factor in the urban population growth than the simulation projections indicate will be the case in the future. The rate of urban population growth reached a peak during the 1950s, when the urban population increased at the rate of 5.5 per cent per annum; during the 1960s the rate of increase had already declined to 4.8 per cent per annum; and the third simulation projects a rate of 4.4 per cent during the early 1970s and then a continuing decline to 3.2 per cent per annum at the end of the century.

The pressures on the urban areas can therefore also be expected to decline in the Brazil type case in the years ahead, although less rapidly, and from less extreme peaks, than in Venezuela. This reflects the fact that the mass shift from a basically rural to a basically urban population was compressed into a shorter time period in Venezuela, producing rates of urban population increase of well

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1/ The fact that the relative importance of newly arriving migrants does not decline faster is due to the assumption that urban fertility rates decline substantially over the period. But this assumption is used in the third experiment in all countries so the figures are directly comparable to others cited in this connexion.

/over 6

over 6 per cent per annum from 1940 to 1960, and then a sharper drop once the transition was well on its way to completion. In Brasil the shift has been more gradual and so such high rates of urban population increase never occurred, and the decline has also been less sharp.1/

This more gradual transition in Brazil is at least in part the result of the great regional differences in the country, and these require a major qualification to the above discussion. As a general example, it is useful to indicate likely trends, and their implications, for a country with somewhat more than half its population now urban. But in the specific case of Brazil this is of more limited relevance. As the degree of urbanization is very different in the major regions of the country, so trends in the individual regions will be different, and it is these which are of primary importance. As is often the case for Latin America as a whole, the "average" here is only a sum of disparate parts.2/

Finally, a third "type" is a country whose population is still largely rural, and this can be illustrated with the data for El Salvador. As shown earlier, over 60 per cent of the population was still rural in 1970 so that the transition to an urban society, with its implications for rapid expansion of the cities, is a possibility which remains in the future. Further, this relatively low degree of urbanization has not changed much in recent decades; as early as 1930 about the same percentage of the population was urban (38.3 per cent) and in the intervening decades there has been no major rural-urban migration flow and rates of population increase

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1/ During the period of most rapid urban expansion in Brazil (1950 to 1970) the urban population rose from 36 per cent to nearly 56 per cent of the total population. During the equivalent 20 year period in Venezuela (1941 to 1961) the urban population increased much more, from 39 per cent to 67 per cent of the total.

2/ The analysis in the chapter on Brazil is largely in terms of the individual regions for this reason and reference can be made to that chapter for details.

/in the

in the rural and urban areas have been much more similar than in most of the region. Rapid urbanization, should it begin, would therefore also represent a sharp break with past trends.

The first important point to note is that a relatively low degree of urbanization means greater uncertainty about the distribution of the future population increase as between the rural and the urban areas. If past trends continue the bulk of the population increase will be in the rural area - which is not true of any other country analysed - but to the extent migration increases it will shift to the urban area. With a continuation of past trends rates of population increase will be fairly similar, and high, in both areas; but if there is substantial migration the rate of increase will drop sharply in the rural area and rise sharply in the cities. Thus migration flows become a more central variable in this sort of situation and must be watched even more closely for policy purposes.

The implications of different levels of migration are discussed in more detail in the analysis of El Salvador; here the principal object is to compare the impact of large scale migration, should it occur, with the other "type" situations discussed above. With large scale migration, here as in the other type situations the great bulk of the population increase would be in the urban area, and it is there that facilities would have to be provided. But the impact of such migration on the urban area would be greater here.

Using the projections of the third experiment again, newly arriving migrants account for over half of the total urban population increase in the early 1970s and still acount for about 30 per cent of that increase at the end of the century. Migrants arriving during the course of a year total more than 3 per cent of the existing urban population in the early 1970s and although it declines steadily the proportion is still 1.2 per cent at the end of the century. These figures are far higher than those for the corresponding simulation for Venezuela and substantially higher than those for Brazil, particularly during the first half of the

/projection period,

projection period, and indicate the major potential impact of large scale migration in this sort of situation. The composition of the urban population would here shift, but in a way opposite to that to be expected in Venezuela. Here recent migrants would be a rising proportion of the total for some time to come, and would remain a major element in the cities until well past the end of the century.

As large scale migration would represent a break with past trends in El Salvador the pressure on the cities would sharply increase. The rate of urban population increase has been fairly rapid in the recent past (around 3 1/2 per cent per annum) but with large scale migration the rate would rise to an average of 5 per cent per annum for the period 1970-2000 as a whole. At the beginning of the large scale migration it would be around 6 per cent per annum and then decline, as the shift to the cities progressed, to about 4 per cent per annum at the end of the century.1/

A shift of this magnitude, with the urban population rising from less than 40 per cent to about two-thirds of the total over a thirty year period, would not be particularly unusual in the region. It would be similar to the speed of urbanization in Brazil in recent years, for example, and would be less rapid than the transition which occurred in Venezuela during the post-War

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1/ These projected rates of increase are with the assumptions of the third simulation, and the rates could be even higher. Although large, the migration assumed in that experiment is less than has often occurred elsewhere, and the rural population continues to increase at an average rate of 1.1 per cent per annum to the end of the century. The third experiment also assumes a sharp drop in urban fertility rates, which of course reduces the rate of increase. In an experiment designed to show the extremes (the rural population is held approximately constant and there is only a small decline in fertility rates) the average rate of urban population increase to the end of the century is 5.6 per cent per annum.

/period.1/ But

period.1/ But the resulting pressures for employment, infrastructure requirements, and social services in the urban areas would be severe and at best difficult to cope with.

The general characteristics of this transition period, in terms of population trends, are among the most important results obtained from the simulation experiments. With the high fertility rates which prevail in most of the region the transition will of necessity involve a period of very rapid urban population growth with the pressures that this will involve. This may well be a period which assumes crisis characteristics, and is likely to be crucial to success or failure in establishing a reasonably integrated modern economy. The highly urbanized countries, or regions, have passed through this transition, and pressures can be expected to ease, perhaps greatly, others are still at one phase or another within the period of transition; while for still others it remains in the future.

A final aspect of a still largely rural population to note is that the problem of rural poverty is an extremely difficult one to resolve. As most of the population may well be involved, the resources required are likely to bulk very large in the total available to the economy, and in these circumstances it is likely to be impossible to seek a basic solution to the problem of rural poverty while at the same time pursuing a growth programme centerred on a modern type urban economy. The choice may in effect be limited to less satisfactory alternatives. If a near-term solution is to be sought to the problem of rural poverty this may well necessitate a different style of development, oriented toward less modern type

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1/ In Brazil the urban population rose from 36 per cent of the total in 1950 to 56 per cent in 1970, and rates of increase in the urban and rural populations were similar to those projected in the third experiment for El Salvador. In Venezuela the shift projected over 30 years for El Salvador occurred in only 20 (the urban population increased from less than 40 per cent of the population in 1941 to over two-thirds in 1961); rates of population growth were higher in the cities and there was essentially no expansion of the rural population.

/production and

production and toward the rural areas. This could be regarded either as a long-term alternative, or as an intermediate-term solution, in the latter case with the expectation that it would result in a fairly rapid decline in rural fertility rates so that, with less rapid population growth, the shift to a more modern urban economy could then be undertaken more gradually and so with less severe pressures. Or, alternatively, the transition to an urban, modern type, economy could be undertaken at once, with essentially all resources concentrated on making the transition successful and the problem of rural poverty left either to be resolved by the transfer of population itself, or to be dealt with later. As noted, neither alternative is likely to be completely satisfactory.1/

The simulation projections provide data on another issue related to urbanization which is worth noting: the extent to which the process reduces fertility rates and hence the rate of population increase at the national level. Since fertility rates are in general lower in the cities, if migrants adopt urban practices this will reduce the number of births, and so urbanization is sometimes regarded as the most effective and practical way of reducing the rate of population growth. Past trends in the countries included in this study do not offer much support to this hypothesis. In Venezuela there has been a mass shift to the cities in recent decades, but this has not been accompanied by any substantial decline in fertility rates at the national level. In

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1/ This discussion implicitly involves one of the factors which are likely to be important in determining how difficult the transition to an urban society is likely to be: the population density at the time the transition begins. If the rural areas are only sparcely populated - as was the case in Venezuela, for example - then the problem of rural poverty is likely to be less severe and can more safely be ignored to concentrate on the pressures in the burgeoning cities; and can be more easily dealt with later. If densities are already rather high in the rural areas - as in El Salvador - then the problem is likely to be more serious and the whole process of transition more difficult to handle.

/Brazil there

Brazil there has been a somewhat smaller, but still very substantial, shift toward the areas with lower fertility rates (the cities and the more developed regions) but again this has not been accompanied by any important decline in the total national fertility rate. Other factors have no doubt been present, but these trends do not encourage the belief that urbanization alone is likely to slow the rapid rates of population increase.

The potential numerical impact can be shown in two differing cases - Venezuela and El Salvador - with data from the simulation experiments.1/ Venezuela represents a country already quite highly urbanized and so it is not surprising that the impact of further migration is limited, even though fertility rates are estimated to be nearly 40 per cent higher in the rural than in the urban area. Both the rate of increase and the total population at the end of the century are closely similar in the two experiments.2/

El Salvador is still primarily rural at the start of the projections however, and the difference between the degree of

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1/ For these two countries an additional simulation experiment was run to determine the impact of mass migration in conditions where otherwise, particularly with respect to fertility rates, there was little change from the 1970 situation. In this experiment, with the exception of migration rates, all variables are the same as in the first experiment. Any difference in results is therefore exclusively due to migration, this being very limited in the first experiment and very large, in relation to the rural population, in this additional experiment.

2/ With 1970 = 100 the population is 248 at the end of the century with limited migration and 245 with large scale migration. The rates of population increase are 2.79 per cent per annum and 2.74 per cent per annum, respectively. This simply confirms numerically the intuitively obvious conclusion that in a population which is already large urban further urbanization alone will not have a significant impact on total fertility rates.

urbanization in the two experiments is very great,1/ so it might be expected that the differential impact on population growth would be large. There is in fact an important difference: in the first experiment the total population at the end of the century, with 1970 = 100, is 280 and the population is then increasing at the very rapid rate of 3.6 per cent per annum, whereas in the special experiment the figures are only 263 and 3.3 per cent per annum respectively. The impact of urbanization is as noted important, but even with a massive population shift of the sort projected here, and with the assumption that migrants immediately adopt urban practices, the impact is clearly limited. Urbanization alone cannot be expected to reduce the rate of population increase to moderate levels in most of the region; that will only occur when fertility rates within the different areas decline from their generally high present levels.

C. Projected Trends in Age Structures

Currently prevailing age structures have already been discussed in comparative terms, and the principal implications noted, in chapter I of this study so that here it is necessary to deal only with likely trends to the end of the century. Apart from the existing age structure, it is the trend in fertility rates which largely determines that structure and so a comparison of simulation experiments with differing assumptions about fertility rates will show the limits within which changes can be expected to occur. This means comparing the results of the first experiment (little change from the 1970 situation) with those of the second (large scale migration toward areas with lower fertility rates and sharp declines in fertility rates in the urban areas). The results are shown in table 20.

1/ In the first experiment the proportion of the population which is urban rises only from 39.4 per cent in 1970 to 43.6 per cent at the end of the century. In the special experiment it rises to 76.9 per cent at the end of the century. That is, there is a differential shift of fully one-third of the total population.

/Table 20

Table 20

PROJECTED AGE STRUCTURES IN THE DIFFEPENT COUNTRIES

(Percentage distribution)

Age group	1970				2000 in experiment I				2000 in experiment II			
	Argentina	Brazil	Venezuela	El Salvador	Argentina	Brazil	Venezuela	El Salvador	Argentina	Brazil	Venezuela	El Salvador
0-4	10.1	16.3	16.9	18.4	9.7	15.3	14.8	18.1	7.4	11.7	9.7	11.7
5-14	19.1	26.4	29.4	28.6	18.0	25.0	25.5	27.9	15.5	22.0	21.5	23.5
15-19	9.0	10.8	10.7	10.2	8.4	10.2	10.7	10.6	7.9	9.9	10.6	10.8
20-39	28.5	27.1	25.1	25.6	28.4	28.3	28.9	26.9	30.2	31.5	33.5	32.7
40-64	26.2	16.3	15.0	14.0	25.4	17.1	16.0	13.4	27.9	20.0	19.6	17.2
65 and over	7.2	3.1	2.9	3.2	10.2	4.2	4.1	3.2	11.1	4.9	5.0	4.1

/In the

In the first experiment there are only moderate changes to the end of the century. In Argentina there is an important increase in the relative importance of the over 65 group; in Venezuela, and to a lesser extent in Brazil, there is a decline in the relative importance of children and an offsetting increase in the relative importance of the adult age groups; and in El Salvador there is a small increase in the importance of teenagers and young adults.1/ With the continuing exception of Argentina, populations will remain very young if there is not much of a decline in fertility rates.

In the second experiment there is a much greater shift in all countries, with the relative importance of children declining substantially and that of the adult age groups increasing. But, Argentina apart, populations will remain quite young even if there should be a sharp and sustained decline in fertility rates. At the end of the century less than one-quarter of the population in the other countries will be 40 or more years of age, whereas in Argentina one-third of the population was already in that category in 1970, and in an eventually stable, zero growth, population the proportion would be about 45 per cent.

Since the bulk of the age range at the end of the century represents those already born in 1970, and whose numbers are therefore essentially unaffected by the assumptions of the projections, the differences between age structures in the first and in the second experiments are due very largely to differences in the numbers of children and adolescents at the end of the century. These differences are very large and worth noting. With the rapidly falling birth rates assumed in the second experiment the number of infants (the 0-4 age group) at the end of the century in Venezuela and El Salvador is not much more than half the number projected in

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1/ The changes are different in the several countries mostly because of differing past trends in the population parameters, the results of which are now working their way through the age structure. There are also some differences due to the extent of the decline in fertility rates assumed in the first experiment in the different countries.

/the first

the first experiment, and in Brazil it is less than two-thirds. The number of children (those 5-14) at the end of the century in the second experiment is only about two-thirds the number projected in the first experiment in Venezuela and El Salvador, and about three-quarters in Brazil.1/ With the adult population more or less predertermined, it is these sharp possible variations in the number of children which account for the different age structures in the two experiments.

There are already great differences in the age structures in different areas within each country, and large scale migration can further alter these differences. As it is mostly the young who migrate this will tend, over the period of the projection, to reduce the relative importance of young adults in the areas from which migrants come (primarily the rural areas) and to increase the relative importance of the same group in the receiving areas. Different trends in fertility rates can of course cause the age structures to diverge further. The possible extent of such differences can be shown by the age structures at the end of the century projected with the assumptions of great change in the second experiment. Figures for selected areas in each country are shown in table 21. Too much emphasis cannot be placed on these figures because of the way in which migration is calculated in the model, but they do illustrate the striking extent of the divergencies which might arise.

1/ The differences are less in Brazil largely because of regional differences in that country and the consequently somewhat different pattern of assumptions used in the experiments.

/Table 21

Table 21

AGE STRUCTURES IN 2000 AS PROJECTED IN THE SECOND EXPERIMENT

Age group	Venezuela		El Salvador		Argentina			Brazil	
	Rural	Urban	Rural	Urban	North rural	South rural	South urban	Less developed rural	Developed urban
0-4	14.1	9.1	17.5	9.6	10.7	7.3	6.8	17.6	8.9
5-14	26.7	20.8	28.6	21.6	21.5	16.2	14.0	32.8	17.0
15-19	10.0	10.7	9.8	11.1	8.2	6.8	7.7	13.2	8.6
20-39	27.4	34.4	24.7	35.7	21.8	22.8	31.7	21.2	35.8
40-64	16.7	20.0	15.2	18.0	24.7	27.3	28.7	10.8	24.3
65 and over	5.1	5.0	4.2	4.0	13.0	19.6	11.1	4.4	5.4

In general the proportion of children will be much higher in the rural areas and the proportion of active adults, especially young adults, much lower. A special situation to note is the high proportion of older people in the rural South of Argentina. A fairly mature population structure has evolved in that region, and continuing large scale migration will drain away much of the younger population, and older people, who tend to remain, will become an increasingly large proportion of the total. All of the figures shown illustrate the changes that could occur with the assumptions of extreme change of the second experiment; in the other simulations the divergencies between areas are less striking, but they are always substantial.

There are several important implications of these potential changes in age structure. The first is that the relative size of the dependent population (those less than 15 and over 65) will generally decline somewhat, how much depending on trends in

/fertility rates.

fertility rates. In Argentina the dependent population in 1970 was of the same relative importance as it would be in an eventually stable, zero growth, population (somewhat more than 36 per cent of the total), and this proportion will not change greatly. But in all of the other countries the proportion was much larger (nearly 46 per cent in Brazil and around half in Venezuela and El Salvador), and can be expected to decline, perhaps quite substantially. There are again marked differences from one area to another, with dependency ratios substantially higher in the rural areas and in the poorer regions. The likely range at the end of the century can be illustrated with the results of the first experiment (little change from the 1970 situation) and the third (substantial change, but less extreme than that assumed in the second experiment), selected figures from which are shown in table 22.

Table 22

RELATIVE IMPORTANCE OF THE DEPENDENT POPULATION

(Percentage of total population)

Country and area	1970	2000	
		Exp. I	Exp. III
Argentina: total	36.4	37.9	35.4
North rural	49.0	47.6	45.7
South urban	31.7	34.4	33.1
Brazil: total	45.8	44.5	40.3
Less developed rural	50.2	51.8	52.9
Developed urban	39.4	35.8	32.8
El Salvador: total	50.2	49.2	46.0
Rural	51.8	51.8	50.8
Urban	47.5	45.7	43.5
Venezuela: total	49.2	44.4	41.2
Rural	54.1	48.5	47.5
Urban	47.1	43.4	40.2

/In addition

In addition to the total it is important to note the composition of this dependent population. In Argentina, in 1970 the over-65 group was already somewhat more than 7 per cent of the entire population, and about one-fifth of the dependent population itself; and if fertility rates decline further these figures could rise to close to 11 per cent and to 30 per cent respectively at the end of the century. The elderly population is thus beginning to assume considerable importance in Argentina.1/ In the other countries however, the over-65 group was only about 3 per cent of the population in 1970 (6 per cent to 7 per cent of the dependent population), and although its relative importance will rise it does not exceed 5 per cent of the population at the end of the century (less than 14 per cent of the dependent population) in any simulation. It will only be in the next century that the elderly group will become a major part of the dependent population in these countries, and in most of the rest of Latin America as well.

The principal consequence of the generally large dependent population is simply that there are more dependents in relation to the active population. Each member of the labour force will have a greater average number of dependents to support, and so with any given labour productivity level per capita incomes for the population as a whole are lower. This is a major factor in the relatively high per capita income levels in Argentina, and as dependency ratios in the other countries decline this will tend to raise per capita incomes in those countries. This is the immediate way in which a decline in fertility rates can have an impact: there are fewer children to support per member of the active population and so per capita incomes rise.

There are also policy implications relating to the measures which will have to be taken to provide for the dependent population.

1/ As a point of reference, in an eventually stable, zero growth, population the over-65 group would be about 15 per cent of the total, and well over 40 per cent of the dependent population.

/In Argentina

In Argentina a major consideration will be the provision of social services and health facilities for the elderly, but in the other countries it will very largely be provision for children which is required. The major aspect here which falls in the social area relates to educational facilities, and the most important issue is therefore how fast the primary school age population is likely to increase.

The 5 to 14 year age group can be used as an estimate of the primary school age ppopulation, and the figures presented earlier show that the relative importance of this group will decline in all countries - moderately even in the first experiment and much more if there is an important decline in fertility rates. This means that this age group will increase less rapidly than the population as a whole in the years ahead. At the national level the period of most rapid increase in the primary school age population has already passed in all of the countries analyzed so that, in the aggregate, the often severe pressures for school facilities experienced in the recent past can be expected to ease in the years ahead. But the extent of the easing varies greatly, and it is often the pressure in particular areas rather than the aggregate which is most important, so care must be used in interpreting such a sweeping, although still very important, generalization. In addition to the clear differences from one area to another there is often considerable uncertainty here, so that for purposes of educational planning trends will have to be closely followed if effective provisions are to be made.

At one extreme, the rate of increase in the primary school age population in Argentina had already slowed to about 1 per cent per annum during the 1960s, and will slow somewhat further during the 1970s. If fertility rates continue to decline this age group will then remain approximately constant from 1980 to the end of the century, so that no further expansion of primary school facilities would be required on this score. This would be a situation similar to that experienced in a number of the advanced industrial countries in recent years. But as the primary school age population is

/quickly affected

quickly affected by trends in fertility rates this introduces uncertainty, although less in Argentina than elsewhere, and if there is no further important decline in fertility rates the school age population will increase somewhat faster again after 1980.1/

The primary school age population will continue to increase much more rapidly in the other countries, and a further important characteristic to note is that the rate may fluctuate substantially. This can be illustrated by past and projected trends in Venezuela, figures for which are shown in table 23.

Table 23

VENEZUELA: AVERAGE ANNUAL INCREASE IN THE PRIMARY SCHOOL AGE POPULATION

(Percentage)

Period	Actual rates of increase	
1950-1955	4.1	
1955-1960	5.7	
1960-1965	4.7	
1965-1970	3.8	
	Projected rates of increase	
	Exp.I	Exp.III
1970-1980	1.9	1.8
1980-1990	3.4	2.8
1990-2000	2.5	1.7

1/ In the first experiment (little change from the 1970 situation) the 5-14 year age group increases at the rate of 1.3 per cent per annum during the 1980s and then, somewhat more slowly again, at 1 per cent per annum during the last decade of the century.

/As shown,

As shown, the peak was reached during the second half of the 1950s, when this age group increased at the extremely rapid rate of 5.7 per cent per annum. The rate has declined since, and will drop sharply to less than 2 per cent per annum during the 1970s. From that relatively low level it will rise substantially during the 1980s, and again decline during the last decade of the century, the magnitude of the fluctuation depending on the trend of fertility rates.1/

The fluctuations in the rate of increase in Venezuela have been, and will continue to be, very substantial, and pose important problems for the planning of required educational facilities; and although less striking than in Venezuela the same factors are evident in the other countries. As the probable increase in the primary school population is of considerable importance, it is treated in some detail in the individual country analyses and reference can be made to those sections for further discussion.

In addition to the variable nature of the increase at the national level, there are great differences in the extent to which the increase, and the need for primary school facilities, is likely to be concentrated in particular areas; and so the rate of increase is also likely to vary greatly from one area to another. At one extreme, the rural primary school population in Argentina declined substantially during the 1960s, and if migration continues on a similar scale the decline will continue. There was also a significant decline in the rural developed area in Brazil and only a small increase in the rural areas in Venezuela, so that continuing migration will here too involve little or no increase. In such circumstances no expansion of school places is required, except perhaps to improve attendance ratios, and available funds can be used entirely to raise standards.

1/ These fluctuations result from the nature of the underlying population parameters and from the way in which the transition to higher rates of population increase occurred. Reference can be made to the Venezuelan analysis for a more explicit discussion of the causes of the fluctuations.

/At the

At the other extreme, the cities must often clearly absorb the great bulk of the increase, and rates of increase in some circumstances can be very high. To cite the most striking instances, the urban primary school age population in Venezuela was increasing at a peak rate of close to 10 per cent per annum during the late 1950s, when the rapid increase in this age group in the country as a whole coincided with the mass movement to the cities. The rate then declined fairly rapidly from that peak, and, as the bulk of the population shift to the cities has already occurred, the increase in the urban primary school population in Venezuela will in the future remain below 4 per cent per annum. Within that limit there will be important fluctuations from one period to another, and much will depend on the trend in fertility rates.

Rates of increase in the urban areas of Brazil were also very high during the 1960s (for the decade as a whole they ranged from 5.5 per cent to 6.8 per cent per annum in the different regions of the country) and will remain quite high to the end of the century. But the peak rates of urban increase in Brazil, as in Venezuela, have passed, and the pressures for primary school facilities in the cities, which have often been very great, can be expected to ease substantially in the years ahead. In the countries here considered the only urban area which could well experience an important increase in the pressures for primary schooling is that of El Salvador. In El Salvador the population is still basically rural, and large scale migration to the cities could lead to increasingly rapid rates of increase in the urban primary school age population.

It is clear that there is a good deal of variation among the different areas, and again, as this is of considerable importance, the possibilities have been more fully discussed in the individual country analyses. Here it is precisely that great variation which most needs to be emphasized. Both the existing situation and the trend are likely to be quite different from one area to another, and there is considerable room for uncertainty because of possible changes in fertility rates and/or migration flows. Adequate

educational planning will require a careful analysis of the conditions in the different areas of the country, and trends will need to be followed closely - they are unlikely to be steady and can change relatively quickly for this age group.

The other age group which is likely to change substantially in relative importance in most countries, and with implications that require noting, is the young adult group (those 20-39 years of age). Argentina is again an exception, but in the other countries the young adult age group will increase in relative importance even if there is no substantial decline in fertility rates, and if there are larger declines the increase can be very substantial.1/ The number of young adults will therefore be increasing more rapidly than the population as a whole in most countries, and perhaps much more rapidly. This reflects the fact that the initial bulge, which began with the transition to higher rates of population growth, and which as noted above often resulted in very high rates of increase in the child population during the late 1950s and 1960s, is now beginning to enter the young adult age group; as a result this age group will expand rapidly in most countries until at least the last years of this century.2/

1/ In Argentina the decline in the relative importance of children tends to be offset primarily by an increase in the relative importance of the elderly. If there is an important decline in fertility rates the relative importance of young adults will of course increase, but no more than that of the older adult group. The situation is also somewhat different in Brazil. As in Venezuela and El Salvador, the relative importance of young adults will rise, perhaps substantially; but in Brazil the 40-64 year age group will increase approximately as much as young adults.

2/ The projected rates of increase in this age group to the end of the century in the different countries are as follows:

	1970-1980	1980-1990	1990-2000	
			Exp.I	Exp.III
Argentina	1.5	1.2	0.8	0.6
Brazil	3.4	3.0	2.8	2.4
El Salvador	3.6	3.8	3.5	3.1
Venezuela	4.2	3.8	2.8	2.3

The rates are of course the same in all experiments until 1990. Only after that date do differing assumptions about fertility rates begin to affect this age group.

/There is

There is again likely to be considerable variation from one area to another within a country, particularly if there are important migration flows. As this group is heavily affected, large scale migration can well result in an absolute fall in the number of young adults in some rural areas, with offsetting large increases in the urban areas to which the migrants move. Those experiments which assume large scale migration project rates of increase of 5 per cent to 6 per cent per annum during the first half of the 30 year period in several of the urban areas.

There are two major implications of this rapid increase in the young adult population during the years to come. The first is that this is the age group with the highest age specific fertility rates, so that a rapid increase in numbers will tend to mean a rapid increase in the number of births, and hence a relatively high rate of growth for the population as a whole. So this aspect of the age structure is a basic factor in ensuring a rapid rate of population increase in most countries at least to the end of the century - regardless of assumptions about fertility rates.

The impact is clear from the simulation experiments. In the first experiment only a slow decline in fertility rates is assumed, and this is largely, or entirely, negated by the rapid increase in the numbers of those in the fertile age groups: in Venezuela the rate of population increase rises marginally during the 1975-1985 period and then declines slowly to the end of the century; in Brazil the rate remains practically constant throughout the period of the projections; and in El Salvador the rate of population increase rises steadily to the end of the century in this experiment. At the other extreme, even with the rather unrealistically large declines in fertility rates assumed in the second experiment, the projected rates of population increase generally remain very high until the last decade of the century.

The second major implication is that young adults tend to account for about half of the total labour force, so that the rapid expansion of this age group is a basic factor in the expected expansion of the

labour force itself. As labour force trends are a central concern of the study, this aspect is included in the more complete analysis in the following section.

D. The Labour Force

Projected trends

The labour force in most of Latin America will increase rapidly at least to the end of the century, and the simulation experiments show clearly the certainty of this central conclusion; despite widely differing underlying assumptions the projections do not differ greatly from one experiment to another. A general impression of likely trends, and possible variations in those trends, can be given by comparing the projections of the first and of the second experiments, and the figures for these are shown in table 24.1/

Here, as in most other aspects relating to population, Argentina is clearly a case apart. The labour force in Argentina is likely to increase at rates ranging around 1 1/4 per cent per annum during the next several decades, and at the end of the century the total labour force will be perhaps 50 per cent larger than it was in 1970. This rate of increase is higher than that characteristic of most of the high income industrial countries, but it is closer to that type of situation than to the situation which will prevail in most of the rest of Latin America.

1/ The first experiment assumes little change from the 1970 situation, while the second experiment assumes great change. In addition to the different assumptions about population parameters which have been noted before, the first experiment assumes little change in labour participation rates, while the second assumes that in the urban areas these shift to the rates which prevailed in France in 1968.

/Table 24

Table 24

LABOUR FORCE TRENDS TO THE END OF THE CENTURY

	Argentina	Brazil	El Salvador	Venezuela
Actual increase 1965-1970 (per cent per annum)	1.4	3.1	3.2	3.4
Projected increases in experiment I (per cent per annum)				
1970-1980	1.2	3.0	3.6	3.6
1980-1990	1.1	3.0	3.6	3.3
1990-2000	1.2	3.1	3.8	3.3
Projected increases in experiment II (per cent per annum)				
1970-1980	1.6	3.4	3.6	3.9
1980-1990	1.4	3.3	3.5	3.4
1990-2000	1.2	3.0	3.2	3.1
Size of the labour force in 2000 (1970 = 100)				
Experiment I	141	244	291	274
Experiment II	153	262	277	278

/In the

In the other countries analyzed the rates of increase in the labour force will be 3 per cent per annum or higher in the decades ahead, and at the end of the century the total labour force is likely to be 2 1/2 to 2 3/4 times its 1970 size. These rates of increase, and the total increase to which they give rise during the 30 year period of the projection, are very high, and will pose a central challenge to the modern type industrial development process which characterizes the economies of the region. Historically, during the period of industrialization in the now highly industrialized countries the labour force was increasing much more slowly, and even so the employment problem was for long periods often critical. In much of Western Europe, for example, reasonably full integration has only been achieved during the post-World War II period, with the unusually favourable record of growth and structural change which has characterized those years; and during that period the labour force was expanding at a rate of around 1 per cent per annum in most countries. It is clear that with the much higher rates of increase which will prevail in most of Latin America the problem of adequate employment opportunities will remain a central issue at least until well into the next century.1/

1/ It is worth emphasizing the importance of these much higher rates of increase, and this can be done with a simple numerical exercise. The problem, insofar as it relates to employment, is to absorb the labour force into the modern, high productivity and high income areas of the economy. This has generally been associated with a shift in the structure of the labour force away from the low income agricultural sector and toward industrial and high income service activities. Very large shifts of this sort have occurred in many of the high income industrial countries during the post-World War II period, reflecting the strong and continuous industrial expansion. The change which has occurred in three countries considered to have achieved a great deal during this period are noted below. With respect to Western Europe, common reference has been made to the Italian and to the West German "economic miracles"; and Japan is commonly cited as the outstanding success story of this type. From 1955 to 1970, which was a period of very concentrated change in these countries (in Italy the gross product increased at close to 6 per cent per annum, in West Germany at slightly (cont.)

/It has

It has already been pointed out in the first chapter of this study that these very high rates of increase in most countries are a relatively recent phenomenon. The labour force has probably been expanding with increasing rapidity throughout the post-World War II period, a process may reach a climax during the 1970s, after which

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1/ (cont.) more than 6 per cent per annum, and in Japan at close to 11 per cent per annum), labour force structures shifted as follows:

	Percentage distribution of the labour force		
	Agriculture	Industry	Services
Italy: 1955	42.2	32.1	25.7
1970	17.2	44.4	38.4
Germany: 1955	22.8	43.9	33.3
1970	8.7	47.0	44.3
Japan: 1955	43.8	27.3	28.9
1970	19.8	34.1	46.1

The shift out of agriculture and into the higher income industrial and services sectors is striking in each country. But this must be viewed in relation to the rates of increase in the labour force which occurred during the 1955-1970 period: in Italy there was a slight decline in the size of the labour force over the period, in West Germany it increased at the rate of 0.7 per cent per annum, and in Japan at 1.5 per cent per annum.

These rates are much lower than those which will prevail in Latin America. If it is hypothetically assumed that the same process of expansion, and the same absorption of labour into the industrial and services sectors should occur, but that the total labour force would be expanding at a rate of 3 per cent per annum, with any residual increase remaining in the agricultural sector, the results would be very different. In the hypothesized cases of both Italy and West Germany the proportion of the labour force in agriculture would actually increase (to 46.9 per cent in Italy and to 35 per cent in West Germany), while the proportion in industry and services would decline - although of course there would be the same absolute increase as actually occurred in these sectors. In the Japan type expansion the much higher growth rate would still produce a moderate decline in the proportion of the labour force in agriculture (to 35.8 per cent), while the proportion in the industrial sector would remain constant, and there would be an offsetting increase in the proportion engaged in services. (Concl.)

/rates of

rates of increase may decline somewhat in many countries. As the above figures show, this is not a certainty; somewhat different trends occur in the different countries, and with the use of different assumptions. But these fluctuations in the rate of increase over the 30 year period of the projections are of secondary importance. The central conclusion must be that, at least to the end of the century, the labour force will continue to increase very rapidly in most countries.

Before examining in more detail the different aspects and implications of these trends it is important to clarify the two major factors underlying the aggregate increase, and the relative importance of each. The first factor is simply the increase in the population in the active age groups in the different countries. As has been discussed in some detail earlier, the total population in most countries will increase rapidly over the period of the projections, and the relative importance of the active age groups as a whole is likely to rise substantially; that is, the population in these groups is likely to increase a good deal faster than the population as a whole in most countries. The young adult age group will increase particularly rapidly, especially during the 1970s and 1980s, and as noted this age group alone tends to account for around half of the total labour force. The second most important group in the labour

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1/ (Concl.) That is, with the rates of increase in the labour force to be expected in most of Latin America in the decades ahead, an "economic miracle" of the Italian or West German variety would not improve the structure of the labour force; the proportion underemployed (for which the agricultural sector is here used as a proxy) would actually rise. Even a "miracle" of the Japanese variety would lead only to a moderate improvement: if the labour force is increasing at 3 per cent per annum (and it will increase even faster in some countries), the proportion underemployed would decline from 43.8 per cent to 35.8 per cent over a 15 year period, and there would be no increase in the proportion in the industrial sector.

As noted earlier, modern type industrial expansion does not readily absorb large quantities of labour. If the labour force is increasing rapidly, the absorption of the bulk of the labour force into the high productivity sectors is apt to require extremely high growth rates. In the past such shifts have been achieved in circumstances where the labour force was increasing at much more moderate rates.

/force is

force is that of more mature adults (those 40-64 years of age), and this group too can be expected to increase more rapidly than the population as a whole. This rapid increase in the population in the active age groups will alone insure a very large expansion of the labour force, regardless of any reasonable assumptions which might be made about labour participation rates.

Labour participation rates

This is the second major underlying factor - possible changes in labour participation rates - and although it is clearly the less important of the two, can also have a substantial impact in some circumstances. The situation here is a good deal more complicated, and "reasonable" assumptions to be used in the projections are more difficult to define; and it is of considerable interest to analyze the situation here in more detail.

Perhaps the first point to note is that labour participation rates at the national level must be used with caution as they combine the rural and urban population, and participation rates in the two areas are likely to be quite different. Male participation rates are generally significantly higher at all ages (but particularly for adolescents and for older men) in the rural areas; while female participation rates, by contrast, tend to be much lower in the rural areas. These differences probably reflect at least in part conventions of registration in the rural areas - nearly all men regard themselves as members of the labour force while women do not - and so rural participation rates, and projected changes in those rates, are probably less significnat from the present point of view. For this reason, as well as the fact that greater importance is usually attached to the problem of urban employment, due to the general social and political context in which it occurs, the following discussion concentrates on labour participation rates in the urban areas.

It is female labour participation rates which present the greatest scope for possible change and so can most affect the increase in the labour force. Female labour participation rates in Latin America

/are quite

are quite low, even in the cities, and so if more women should enter the labour force, for whatever reason, the impact could possibly be quite large. Even within Latin America however there is a good deal of variation from one country and region to another, and it is best to present the estimated age specific participation rates in the different urban areas before proceeding; the rates prevailing in France in 1968 are shown for comparison.1/

Table 25

ESTIMATED FEMALE LABOUR PARTICIPATION RATES

Age group	Argentina 1960		Brazil 1970		El Salvador 1960 urban	Venezuela 1960 urban	France 1968
	Urban North	Urban South	Less developed urban	Developed urban			
15-19	.350	.369	.222	.388	.311	.222	.313
20-24	.419	.459	.281	.437	.407	.327	.623
25-29	.338	.332	.232	.327	.381	.305	.507
30-44	.278	.254	.212	.281	.329	.279	.424
45-49	.223	.212	.205	.238	.285	.236	.455
50-54	.184	.163	.195	.189	.267	.203	.453
55-59	.148	.121	.181	.143	.229	.170	.423
60-64	.114	.087	.159	.095	.204	.140	.324
65-69	.087	.065	.124	.063	.169	.110	.150
70 +	.052	.037	.066	.029	.114	.064	.020

1/ The French rates are for the country as a whole rather than for the urban area. These rates were used in the simulation experiments as a possible "target" toward which rates might move. The French rates were chosen as they occur in a diversified, industrialized urban economy, where the social structure is perhaps closer to that of Latin America than in the case of some of the other high income economies of Western Europe. These rates therefore provide an indication of the direction in which labour participation rates might move as the industrialization process advanced in the region. As will be noted in the text however, there is a great deal of uncertainty in this area.

/Participation rates

Participation rates for adolescents and for elderly women are often somewhat higher in the Latin American urban areas than in France; but for all of the rest of the age range they are much lower, so there is great scope for an increase in the number of working women in all of the countries analyzed. How much of an increase might actually occur depends of course on the reasons for the present low participation rates and the extent to which anticipated changes might alter that situation; and this is very difficult to specify. One important reason for the relatively low proportion of working women in Latin America may simply be a lack of employment opportunities; to the extent that more and/or better opportunities become available, that alone might suffice to increase the numbers in the labour force. A comparison of labour participation rates in the different areas does not give much support to this hypothesis however. In Argentina, for example, female participation rates are somewhat higher in the urban South up to the age of 25; but for women over 25 they are higher in the urban North - and it is unlikely that there are greater opportunities in the North than in the South. Further, for the female population as a whole the highest rates occur in El Salvador, where income levels are lower and opportunities probably less attractive than in most of the other urban areas analyzed. The opposite economic motive might even be argued to explain such comparisons; that is, women tend to work primarily from necessity. But this hypothesis in its turn is contradicted by the fact that, up to the age of 50, the lowest rates occur in the urban less developed area of Brazil, where income levels are lower than in most other urban areas and so the pressure to work presumably greater.

Both of these factors, plus many others, probably have a part in the determination of female participation rates. The fairly clear conclusion that follows from an examination of participation rates in different countries is that these are to a major extent a reflection of the entire, and quite specific, socio-cultural

/environment. As

environment. As such they may vary widely from one urban area to another, and it is unlikely that any simplified set of economic or other factors can satisfactorily explain these differences or predict future trends.1/

1/ This can be even more graphically illustrated by noting female participation rates in countries outside Latin America, where extreme variations can be found. A number of these, admittedly picked to show divergencies, follow (the figure are taken from the ILO Labour Statistics Yearbook).

FEMALE LABOUR PARTICIPATION RATES

Age group	Egypt 1966	Mozam-bique 1970	Ghana 1970	Nether-lands 1971	Denmark 1970	Norway 1970	Finland 1970
15-19	.073	.323	.392	.493	.478	.298	.336
20-24	.078	.327	.614	.556	.675	.484	.626
25-29		.314	.650	.252	.587	.348	.677
30-44	.053	.309	.739	.230	.561	.279	.676
45-49		.348	.779	.231	.554	.349	.642
50-54	.051	.355	.790	.214	.505	.351	.589
55-59		.351	.755	.183	.410	.320	.494
60-65	.017	.339	.711	.126	.261	.245	.292
65		.244	.475	.028	.053	.056	.036

The first three countries are all low income countries in Africa, yet female participation rates run the entire range from extremely low in Egypt through moderate in Mozambique to very high in Ghana. The Netherlands and Denmark are both high income industrialized countries of Northern Europe, yet rates are much higher in the latter (except for adolescents). And although the last two are both Scandinavian countries, female participation rates are much higher in Finland. Differences in statistical methods are no doubt part of the problem, but much more is involved. As states in the text, it seems clear that female labour participation rates are the result of a large number of factors, many of which are specific to the particular country or area concerned. Even within a given area the situation can change substantially in fairly short periods of time; this is clear from the substantial increases in female participation rates which have occurred in a number of the high income industrial countries in recent years.

/Viewed in

Viewed in these terms the general structure of female participation rates in Latin America is worth noting. In all of the countries analyzed participation rates are highest for very young women (the peak is for the 20-24 year age group), and then decline quite rapidly after the age of 30; although there are again important differences in both levels and structure from one area to another. This general structure suggests that the great bulk of women view work outside the home not as a career, but rather as a transitory phase, prior to marriage, or the formation of a family, or perhaps until the male head of the family is more firmly established. It may also be linked to the type of activities open to women; these may be mostly casual, unskilled positions offering little incentive to the formation of a longer term, career oriented outlook.

These are clearly broad socio-cultural aspects of a society, and changes are difficult to project and will not necessarily be closely linked to economic, or any other limited set of variables. About all that can definitely be said is that if the role of women in society, and their attitude to work outside the home should change, there could be a very large increase in the number of women in the labour force. The solution to this difficulty, insofar as the simulation experiments are concerned, has been, as already noted, to select the 1968 French participation rates as a possible "target". To the extent the general environment changes, participation rates might move part or all of the way to those levels, and this is the sort of assumption used in the experiments. It must be kept in mind however that such assumptions are to a considerable extent arbitrary.

The situation with respect to male labour participation rates is more straightforward, but here too the situation is worth noting; again for the reasons cited earlier only the urban rates are considered, and the estimates for these are shown in table 26.

/Table 26

Table 26

ESTIMATED MALE LABOUR PARTICIPATION RATES

Age group	Argentina 1960		Brazil 1970		El Salvador 1960	Venezuela 1960	France 1968
	Urban North	Urban South	Less developed urban	Developed urban	urban	urban	
10-14	.052	.061	.081	.075	.108	.080	.025
15-19	.630	.659	.485	.487	.602	.530	.528
20-24	.876	.884	.841	.842	.878	.899	.826
25-29	.857	.964	.926	.920	.941	.963	.951
30-44	.970	.974	.937	.941	.962	.972	.972
45-49	.946	.938	.894	.896	.963	.964	.949
50-54	.879	.841	.834	.807	.954	.940	.914
55-59	.738	.643	.799	.694	.935	.906	.825
60-64	.587	.469	.583	.525	.907	.790	.657
65-69	.490	.357	.548	.372	.868	.700	.300
70 +	.332	.224	.266	.155	.682	.490	.100

/By comparison

By comparison with the French standard, male participation rates in Latin America tend to be relatively high for the very young (teenagers and those in their early 20s) and for the elderly (those 65 and over), probably reflecting somewhat lower attendance ratios in secondary schooling and higher educational institutions, and less complete social security coverage for the elderly. From the age of 25 to the age of 50 participation rates tend to be quite similar to those in France; nearly all males are active members of the labour force during these most active adult years.

The divergence among countries occurs primarily in the 50-65 year age groups. In El Salvador and Venezuela male participation rates remain relatively high through this age range - well above the French rates. In Argentina and Brazil by contrast participation rates decline rapidly through this age range, particularly in the more developed regions in the two countries, and are well below the French rates. This aspect is of some interest, particularly in the case of Argentina, and is discussed further in the individual country analyses.

Overall, while there is some variation in male labour participation rates among the different countries, this is much less than in the case of female participation rates; and the general level is also more similar to that in France. If male participation rates should move toward the French "target" rates, as assumed in several of the simulation experiments, this would result in a significant decline in the male labour force in El Salvador and in Venezuela, but would involve little overall change in Argentina and Brazil.

When considering possible changes in labour participation rates, and the impact this might have on the size of the labour force, it is best to consider all of these elements in combination; the total result may well be quite different from that obtained from the consideration of any single aspect in isolation. The major factor here is that the changes may produce opposing trends in the male and in the female labour force: participation rates for women could rise

/substantially, and

substantially, and lead to a large increase in the number of women in the labour force, but male participation rates are more likely to decline and so partially offset such an increase.

The potential overall importance of changes in participation rates can be seen from the projections of the second experiment, where it is assumed that by the end of the century urban participation rates move to the "target" 1968 French level. The total impact of such a shift in the different urban areas is shown by the figures in table 27.

Table 27

THE RELATIVE IMPACT OF CHANGES IN LABOUR PARTICIPATION RATES ASSUMED IN THE SECOND SIMULATION EXPERIMENT

	Percentage change in the size of the labour force in 2000 due to changes in labour participation rates			Percentage of the increase in the labour force 1970-2000 due to changes in labour participation rates		
	Total	Male	Female	Total	Male	Female
Argentina						
urban North	10.8	-4.0	57.1	23.7	-11.9	67.5
urban South	14.4	-1.2	64.1	29.1	-3.5	65.6
Brazil						
urban less developed	21.9	0.5	87.8	25.4	0.8	58.2
urban developed	15.4	3.5	48.9	17.8	4.7	41.7
El Salvador: urban	2.7	-8.1	30.7	3.3	-11.2	27.9
Venezuela: urban	8.7	-8.5	66.7	11.6	-14.5	50.0

/As the

As the figures show, such changes would be of some importance everywhere, but there is substantial variation from one urban area to another. The least impact would be in El Salvador. Urban female participation rates are already relatively high in that country so that a shift to the French level would result in only a 30 per cent increase in the size of the female labour force - substantial, but much less than in the other countries. And as the underlying active population will be increasing very rapidly, the assumed change in participation rates accounts for a more moderate 28 per cent of the total projected increase in the female labour force. Male participation rates are also quite high in El Salvador so that a shift to the French level would result in an important decline in the male labour force, although this would still not be very large in relation to the total projected increase to the end of the century. Finally, since the assumed change in labour participation rates produces opposing effects on the male and the female labour forces, these largely offset each other and the size of labour force as a whole is little affected. The impact on the female labour force would be much greater in Venezuela, but otherwise the situation is similar to that in El Salvador and the overall effect would be quite moderate.

In Argentina and Brazil the relative impact would be considerably greater. A shift in participation rates to the French level would result in a large increase in the female labour force, and as male participation rates are lower there would be less of an offsetting decline in the male labour force (this would actually increase in Brazil). As a result the total labour force would increase substantially, and the shift in labour participation rates would account for an important part of the projected increase in both countries.

All of the above is with the assumption that labour participation rates shift fully to the French levels by the end of the century. To the extent they move in that direction, but to a lesser degree, as assumed in other simulation experiments, the impact is of course less but of the same sort discussed here.

/The substantial

The substantial variations from one country to another mean that this is another aspect which will need to be closely followed to determine trends in any particular area. It is clear that concern will be primarily with female participation rates, where there is great scope for changes in all countries, with consequent large potential increases in the female labour force, and where the factors which might bring about such change are likely to be quite specific to the area concerned. Possible changes in male labour participation rates would have a much smaller impact on the male labour force, and are more uniform and probably easier to predict.

While possible changes in labour participation rates are of considerable importance, it should again be stressed that they are not the major factor in the rapid projected increase in the labour force. Even in the second experiment, where the impact of changing participation rates is greatest, this accounts for only from 3 per cent to 29 per cent of the total projected increases; in the other experiments the relative importance is less. The predominant factor is the increase in the underlying population in the active age groups, and this alone will insure a rapid increase in the labour force to the end of the century in most of the region.

Trends in individual areas

Turning away from the aggregate increase and its underlying causes, the next aspect to be considered is where that increase is likely to be concentrated, and the probable rates of increase which this implies in the different areas of the countries analyzed. Since the increase in the population in the active age groups is the major determinant of the increase in the labour force, the earlier discussion of general population shifts and rates of total population growth in the different areas provides the basic background (see above, pp. 205-208), and the discussion here should be read in that context.

In rural-urban terms, it is clear that it is primarily the cities which will have to cope with the problem of adequate employment

/opportunities in

opportunities in the decades ahead. Even if there should be very little rural-urban migration the bulk of the increase will occur in the urban areas. In the first experiment, where little migration is assumed, around 85 per cent of the total increase in the labour force to the end of the century nevertheless occurs in the urban areas in Argentina and Venezuela, over two-thirds in the urban areas in Brazil, and only in El Salvador is the proportion slightly less than one-half. If substantial migration is assumed nearly all of the increase will take place in the urban areas. Thus, in the third experiment (substantial migration but less massive than in the second experiment) less than one-sixth of the increase in the labour force is in the rural area even in El Salvador, and in the other countries the proportion is negligible.

In general then, pressures for additional employment opportunities are, to say the least, not likely to rise rapidly in the rural areas - but prevailing conditions vary greatly. If large scale migration continues it is possible that labour shortages could develope in some rural areas. The principal such possibility is the rural South in Argentina, but it might also occur in Venezuela or the rural developed area in Brazil; and in any case employment opportunities are not likely to be a serious problem in these areas.1/ In rural areas such as in El Salvador or the rural less developed area in Brazil, however, the problem of employment is likely to remain of much greater importance. At least until 1970 the rural labour force was still increasing very rapidly in El Salvador, and moderately rapidly in the less developed region of Brazil, and if these rates of increase continue then of course pressures for employment will rise. Further, even if large scale migration should sharply slow the increase in the decades ahead the pressures in such areas have

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1/ This does not mean that the problem of low rural incomes, or even rural poverty, will necessarily disappear in such areas. More or less adequate employment opportunities should certainly improve these conditions, but their resolution is likely to depend on other factors outside the scope of this study.

already been built up to the point where they are likely to remain severe for prolonged periods of time. But it is still true that, from the national point of view, the employment problem will not necessarily be concentrated in such areas. In El Salvador slightly over half of the increase in the labour force will occur in the rural areas if there is no significant migration, but to the extent that migration to the cities increases the problem will shift to the urban area even here. And in Brazil less than one-fifth of the increase in the labour force will occur in the rural less developed area, even if there is little migration; to the extent migration occurs the proportion will be still smaller.

Putting aside the strict rural-urban division and thinking instead in terms of low income areas, there are two such areas in the countries analyzed which are likely to be of major concern in this respect. The first, as already noted, is the rural area in El Salvador. If migration trends continue in the pattern of the recent past half of the increase in the labour force will be in the rural area, and even if migration increases a significant part of the increase is likely to occur there for some years to come. The second is the less developed region in Brazil. If there is little migration (as in the first experiment), well over 40 per cent of the total increase in the labour force in Brazil will occur in this region; and even with large scale migration (as in the third experiment) well over 30 per cent of the increase will occur there. Most of the increase will be in the cities of the region, but the employment problem will nevertheless have to be dealt with to a major extent within the less developed region of the country.

But it is in the urban areas that the bulk of the increase will occur, and as unemployment here tends to be more open, and to exert greater social and political pressures, it is of particular interest to determine how rapidly the labour force is likely to expand in the urban areas. Much will depend on the extent of migration, and on how much labour participation rates change, and the range of possibilities can be determined by examining the results of the first

/experiment (little

experiment (little change from the 1970 situation) and the third experiment (substantial change, but less extreme than the changes assumed in the second experiment). The relevant figures from these two experiments are shown in table 28.

Table 28

PROJECTED INCREASES IN THE LABOUR FORCE IN SELECTED URBAN AREAS, 1970 TO 2000

	Argentina		Brazil		El Salvador urban	Venezuela urban
	Urban North	Urban South	Urban less developed	Urban developed		
Size of the labour force in 2000 (1970 = 100)						
Exp. I	187	134	265	285	325	299
Exp. III	182	163	349	350	479	323
Actual rate of increase, 1965-1970 (per cent per annum)	3.0	1.9	4.9	5.8	3.4	4.9
Rates of increase projected in experiment I						
1970-1980	2.2	1.1	3.3	3.8	4.0	4.0
1980-1990	2.1	0.9	3.3	3.4	4.0	3.6
1990-2000	2.0	1.0	3.3	3.4	4.0	3.6
Rates of increase projected in experiment III						
1970-1980	2.3	1.8	5.5	4.6	6.3	4.5
1980-1990	2.2	1.9	4.0	4.2	5.2	3.9
1990-2000	1.6	1.8	3.3	4.0	4.6	3.6

/As the

As the figures show, with the partial exception of Argentina, the labour force in the urban areas will expand greatly during the 30 year period of the projections. With the assumptions of the first experiment the labour force in the urban South in Argentina will increase by only about one-third, an average rate of increase of 1 per cent per annum. With the assumptions of the third experiment the increase will be about twice as large; and in the urban North it will be significantly larger with either set of assumptions. Possible changes in labour participation rates are of considerable importance in the urban areas of Argentina, particularly in the South. In the urban South fertility rates have already declined to quite low levels and the rate of natural increase in the active age groups will be fairly low; and as close to two-thirds of the labour force was already concentrated in the area in 1970, migration can no longer have such a major impact. Thus if there is no change in labour participation rates the increase in the labour force in the urban South, with or without migration, will be fairly moderate,1/ and the possibility of an important increase in the labour force as a result of rising participation rates imparts an element of flexibility to the labour force in that area; this is of considerable importance in Argentina and is analyzed further in the chapter covering that country. The major point to note here is that the increase in the urban labour force in Argentina will be fairly moderate whatever the assumptions made; again the situation is clearly differentiated from that in most of the rest of the region.

In all of the other urban areas considered the increase in the labour force will be much larger. Even if there is no large scale migration the labour force at the end of the century will be about

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1/ In the third experiment, with its assumption of large scale migration, the labour force would increase only about 45 per cent to the end of the century if labour participation rates remained constant. The difference between this figure and the 63 per cent increase shown in the table reflects the impact of the assumed changes in participation rates.

/2 2/3 times

2 2/3 times its 1970 size in the urban less developed area in Brazil, and the range is then upward to 3 1/4 times the 1970 size in the urban area in El Salvador. If there is substantial rural-urban migration, which has been the case in most regions in the past and is likely to be the case in the future, the increases will be still larger. In the projections of the third experiment the urban labour forces increase to around 3 1/2 times their 1970 size by the end of the century, except in El Salvador where the corresponding figure is 4.8 times. As can be seen from the table, although there is some variation, such figures imply that to the end of the century urban labour forces can be expected to increase at rates ranging around 4 per cent per annum.

Such rates are extremely high, and virtually assure that the problem of urban employment will remain a central concern in most of the region at least until the end of the century.1/ Nevertheless, it is very important to note that, in one sense, the period of maximum pressure has already passed in many of the urban areas of Latin America. As the above table shows, in most of the urban areas the rate of increase in the latter 1960s was higher than that projected for the decades ahead. Thus, insofar as the rate of increase in the labour force is an adequate measure of the pressure for employment that pressure can be expected to ease in many urban areas.

1/ The difficulty of absorbing an increase of this magnitude in a modern, urban oriented pattern of industrial development can be illustrated by refering again to favourable post-World War II experiences (see the note on page 235). During the 1955 to 1970 period, during which the gross product increased at an average rate of close to 11 per cent per annum, employment in the industrial sector in Japan increased at the rate of 3 per cent per annum, while employment in the industrial and services sectors combined increased at the rate of 3.9 per cent per annum. In Italy and West Germany, where the gross product increased at around 6 per cent per annum during the period, employment in the industrial and services sectors combined increased at rates of 2.4 per cent and 1.8 per cent per annum respectively. Such past experience indicates that modern type industrial expansion, even when very rapid, tends to be achieved with only moderate increases in employment in the high productivity sectors.

/The reason

The reason for this slower rate of increase is again linked to the extent to which the shift to the cities has already occurred, and has been analyzed earlier in relation to the population as a whole. A more precise appreciation of the labour force situation would require estimates which take into account past changes in urban labour participation rates, and these have not been made. With that margin of uncertainty, it is nevertheless clear that the period of most rapid expansion of the urban labour force in Venezuela occurred during the 1950s: although still very high the rate of increase has already fallen from that peak level and can be expected to decline further in the decades ahead. The same general pattern is characteristic of Argentina and Brazil, although the fluctuations have been more moderate, and, in Brazil, the period of most rapid increase was also more recent.1/

The only urban area considered where the period of most rapid increase in the labour force clearly lies ahead is that in El Salvador. Rural-urban migration in that country has been limited, and has not been a major factor in the increase in the urban labour force in recent years. Even apart from migration the urban labour force will tend to increase somewhat faster in the years ahead due to the underlying increase in the active age groups: and if substantial migration to the cities should begin the increase, as shown by the figures in the table, could be very rapid indeed.

But although the rate of increase in the labour force is very important, it is not the only determinant of the pressure for employment opportunities. A further basic factor is the prevailing situation: that is, how much pressure has already been built up. If the past very rapid increase in the urban labour force has led to a situation where a large pool of un- or under-employed has already

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1/ There are also important regional differences in these countries which are discussed in the respective country chapters. The period of most rapid increase has passed in most urban areas; the possible exception is the urban less developed area of Brazil where the already rapid increase could speed up temporarily if migration should increase.

been created, a slowing of the rate of increase may mean only that the pool of under-employed will increase less rapidly; it will not necessarily shrink, and so the pressures for employment will not necessarily lessen. The number of unemployed will decline only if new employment opportunities are created faster than the labour force is increasing, and as noted the labour force will continue to increase very rapidly in most urban areas and this will be difficult to achieve.

The magnitude of existing pressures could well be the central consideration in such circumstances, and this is one of the critical aspects of the transition from a basically rural to a basically urban population structure. The transition has tended to be a rapid one in many countries, involving mass migration which for a 20 to 30 year period has produced a very rapid increase in the urban labour force. If the urban economic structure has been sufficiently dynamic and flexible to cope with this influx (although severe problems are unlikely to have been avoided even in the best of circumstances), the passing of the transition period will bring lower rates of increase and the urban employment problem may become more manageable. If, on the other hand, the transitional influx tended to overwhelm the urban economy, the passing of the transition period and a slower rate of increase in the labour force may not, in itself, produce any fundamental change. It is likely that such conditions vary widely from one extreme to the other in the different urban areas of the region.

Another aspect of the passing of the transitional phase is the effect this will have on the composition of the urban labour force. The very high rates of increase in the recent past in many urban areas are a reflection of the large influx of rural workers. Rural migrants have probably often accounted for one-third to one-half of the increase in the urban labour force, and workers with a still limited experience of urban life have been an important proportion of the urban total. As the period of transition passes migrants will be of declining importance and the situation will change. New

/entrants in

entrants in the urban labour force will increasingly be dominated by those born, or at least having grown up, in the cities, and those with limited experience of urban life will cease to be a substantial part of the total labour force. Expectations, and responses, may well change in these altered circumstances, and the pressures for adequate employment opportunities may take somewhat different forms.

A final aspect of the growth of the labour force worth noting is that this often differs significantly from the growth in the population as a whole. This results to a large extent from changing age structures. As was pointed out earlier the transition to higher rates of population growth, which occurred in many countries in the 1940s, initially tended to cause a sharp increase in the number of children, and this bulge then began working its way gradually through the different age groups, with corresponding changes in the age structure. To the extent that birth rates have begun to decline this too produces changes in the age structure. In the individual areas within a country migration can cause further shifts as migration affects particularly the very young; and, finally, changes in labour participation rates can cause labour force trends to diverge from those of the population as a whole, particularly in the urban areas. The possible extent of such divergence can be quite substantial, as shown by the following illustrative results from the projections of the first and the third simulation experiments. (See table 29.)

In Argentina, for the country as a whole the labour force increases marginally less than the total population in the first experiment (little change from the 1970 situation), but in all of the other countries the labour force increases more even in this experiment: in the third experiment, with substantial assumed changes, the labour force increases more rapidly in all countries, and the divergence is much greater. In area terms there are also substantial divergencies, and considerable variation from one area to another; in particular, the labour force in some rural areas may increase less than the population while the relationship is the reverse in the cities.

/Table 29

Table 29

PROJECTED SIZE OF THE POPULATION AND OF THE LABOUR FORCE IN 2000 IN SELECTED COUNTRIES AND AREAS

(1970 = 100)

	Experiment I		Experiment III	
	Population	Labour force	Population	Labour force
Argentina: total	142	141	134	150
South rural	124	113	82	82
South urban	134	134	145	163
Brazil: total	237	244	212	257
less developed rural	196	191	98	96
developed urban	263	285	279	350
El Salvador: total	280	291	255	286
urban	311	325	433	479
Venezuela: total	248	274	229	282
urban	273	299	262	323

One implication of these divergencies is simply that population trends are often a poor indicator for estimating changes in the labour force. In most countries of the region the labour force probably increased significantly less rapidly than the population as a whole from around 1940 to the mid-1950s, whereas since around 1960 the relationship has been reversed. This sort of situation is important as it is one factor in the emerging employment problem. Comparative trends in the individual areas are more complex and there is even more need to keep such possible divergences in mind.

/A further

A further implication is that such divergencies reflect shifts in activity rates (total labour participation rates),1/ and thus affect trends in per capita income levels - quite apart from the movement of productivity levels. There was a good deal of variation in activity rates in 1970, and as is clear from the above discussion they may change substantially in the decades ahead. Illustrative figures for 1970 and at the end of the century with the projections of the third simulation experiment are shown in table 30.

Table 30

ACTIVITY RATES IN SELECTED COUNTRIES AND AREAS

	1970	2000 (projections of the third experiment)
Argentina: total	37.9	42.6
urban North	35.4	41.1
urban South	39.1	43.8
Brazil: total	31.7	38.4
urban less developed	28.1	35.1
urban developed	35.0	43.8
El Salvador: total	31.6	35.5
Venezuela: total	30.6	37.6

Argentina again stands apart, with the activity rate at a substantially higher level in 1970. The total figures for the other countries are quite similar, but within Brazil (as to a lesser extent within Argentina) there is a substantial difference along

1/ Activity rates, defined as the ratio of the total labour force to the total population, are of course nothing more than a measure of the concept being discussed.

regional lines, with the activity rate in the more developed region considerably higher. These higher activity rates in Argentina (and in the more developed regions) mean that per capita incomes in those areas will be higher even apart from possible differences in productivity per member of the labour force; in effect a given volume of production per worker is shared with a smaller number of inactive persons.

With the assumptions of the third experiment activity rates everywhere will rise substantially, and in general the disparities will be reduced. Part of the rise is the result of the very rapid increase in the labour force which will occur in most of the region, and this poses the central problem of adequate employment opportunities. But a further major factor is the less rapid growth of the non-active population, and this can be an important factor in raising per capita incomes: it is, in effect, the relatively immediate economic benefit that results from a decline in birth rates.

Changes of this sort can be of considerable importance. From around 1940 to the mid-1950s total activity rates probably fell significantly in many countries of the region, and this tended to hold down the increase in per capita incomes; that is, given the increase in productivity per member of the labour force which occurred, there was a smaller increase in per capita incomes because the number of inactive persons per member of the labour force was rising. This trend probably began to be reversed around the mid-1950s in much of the region, and is sharply opposite with the projections of the third simulation. With the rise in activity rates shown, even if there was no increase in productivity per member of the labour force there would be an increase in per capita incomes of well over 20 per cent by the end of the century in Brazil and Venezuela, for example.

Changes in the structure of the labour force

In addition to the changes in size, there are likely to be major changes in the structure of the labour force in most of the

/region. The

region. The most important of these is the continuing shift toward a predominantly urban labour force. The nature and significance of this shift has already been analyzed above and it is only necessary here to emphasize the extent to which the labour force in the region is likely to be urban by the end of the century. In 1970 the great bulk of the labour force was already urban in the more highly developed regions of Argentina and Brazil and in Venezuela; but the majority of the total was still rural in the other regions of Brazil and in El Salvador. Even with the assumption of little change in the first experiment there is a continuing rise in the relative importance of the urban labour force everywhere, and if substantial migration continues the shift will of course be much greater. With the assumptions of the third experiment over two-thirds of the labour force will be urban at the end of the century even in El Salvador, and the proportion rises to well over 90 per cent in the more developed regions of Argentina and Brazil. The figures for the different countries and regions are shown in table 31.

Table 31

PERCENTAGE DISTRIBUTION OF THE LABOUR FORCE BETWEEN THE RURAL AND THE URBAN AREAS

	1970		2000 (projections of exp. I)		2000 (projections of exp. III)	
	Rural	Urban	Rural	Urban	Rural	Urban
Argentina: total	20.0	80.0	19.1	80.9	11.4	88.6
North region	43.1	56.9	38.3	61.7	27.0	73.0
South region	12.3	87.7	10.6	89.4	6.6	93.4
Brazil: total	44.3	55.7	36.6	63.4	20.5	79.5
less developed region	58.4	41.6	50.4	49.6	27.8	72.2
developed region	14.9	85.1	11.5	88.5	5.9	94.1
El Salvador: total	58.9	41.1	54.1	45.9	31.2	68.8
Venezuela: total	24.5	75.5	17.8	82.2	13.4	86.5

/A second

A second major change which is likely to occur is with respect to the structure of the labour force by sex. In 1970 males heavily dominated the labour force everywhere, but women can be expected to be of increasing relative importance in the decades ahead. To some extent this aspect of the changing structure of the labour force is linked to the rural-urban shift: since males are a larger proportion of the labour force in the rural areas (generally around 90 per cent of the total) than in the cities, the movement to the cities will itself tend to increase the relative importance of women in the labour force as a whole. But most of the prospective change here will occur to the extent that labour participation rates shift toward Western European levels. As was discussed earlier, such a shift could result in a very large increase in the number of working women, whereas the number of active males would be more likely to decline, and the structure of the labour force would change accordingly. The extent of the change which might occur is indicated in the projections of the third experiment, and these figures are shown in table 32. Males will continue to comprise around 70 per cent of the total labour force in the different countries - and around two-thirds in the urban areas - but the projected shift is nevertheless quite substantial.

/Table 32

Table 32

PERCENTAGE COMPOSITION OF THE LABOUR FORCE, BY SEX

	1970		2000 (projections of exp. III)	
	Male	Female	Male	Female
Argentina: total	78.0	22.0	69.6	30.4
North urban	73.2	26.8	67.6	32.4
South urban	75.6	24.4	67.5	32.5
Brazil: total	79.5	20.5	70.6	29.4
less developed urban	74.9	25.1	64.5	35.5
developed urban	71.6	28.4	67.8	32.2
El Salvador: total	83.0	17.0	72.9	27.1
urban	70.6	29.4	65.4	34.6
Venezuela: total	80.6	19.4	70.0	30.0
urban	77.0	23.0	66.9	33.1

Finally, there are also likely to be important changes in the age structure of the labour force. In 1970 the labour force in Latin America was a very young one: young adults accounted for about half of the total, and teenagers a further 15-20 per cent. The proportion of older to younger workers therefore tended to be rather low, and this can have important implications. On the one hand, a young labour force has obvious advantages in that young workers are more flexible and more easily trained, and in a rapidly changing economic structure this can be of considerable importance. On the other hand the older but still fully active members of the labour force are likely to be more stable and more experienced, and as the economy becomes more complex - in particular as the industrial sector expands - these aspects are likely to be of increasing importance. In the high income industrial countries the balance

/between the

between the two large adult age groups is much more even (in France in 1968, for example, young adults were about 46 per cent of the labour force and the older active adult group 42 per cent) and this is likely to be a factor of some importance.

Within the region labour force age structures already varied considerably in 1970, and as noted are likely to change further in the years ahead. Within each country labour force age structures also vary a great deal, both by area and by sex, and the national aggregates, and changes in those aggregates, may not be very meaningful without taking this into account. The figures for 1970 for these different groupings are shown in table 33, along with the end of the century results from the projections of the third experiment to give an idea of the sort of changes likely to occur.

At the national level young adults are of similar relative importance in all countries; the differences tend to be concentrated more in the relative importance of teenagers and the older active adult group. Again Argentina stands apart, here because the labour force is less young than in the other countries, with the proportion of more experienced older adult workers substantially larger. In area terms the proportion of teenagers is higher in the rural labour force, and in general in the less highly developed regions, but particular patterns of migration flows can have an important and varying impact on age structures. Finally, the female labour force is much younger than the male labour force, and a somewhat different age classification would make this contrast still greater; within the young adult labour force women tend to be much more heavily concentrated in the first half of the age range (those 20-29) than men.

/Table 33

Table 33

PERCENTAGE COMPOSITION OF THE LABOUR FORCE, BY AGE GROUP

	1970				2000 (projections of experiment III)			
	10-19	20-39	40-64	65 +	10-19	20-39	40-64	65 +
Total labour force								
Argentina	13.7	47.7	34.7	3.9	9.3	48.0	38.9	3.8
Brazil	19.8	50.5	27.1	2.6	13.7	53.3	30.6	2.4
El Salvador	23.1	47.8	24.9	4.3	17.5	53.9	25.8	2.8
Venezuela	17.5	50.4	28.6	3.4	12.5	55.7	29.3	2.5
Rural labour force								
Argentina, North	18.3	38.3	36.4	7.0	16.0	39.7	33.6	10.6
Argentina, South	12.9	35.2	44.0	7.9	11.6	38.1	36.2	14.1
Brazil, less developed	23.2	45.8	27.2	3.8	27.1	42.2	23.8	6.9
Brazil, developed	24.0	46.9	26.2	2.9	21.1	45.9	28.2	4.8
El Salvador	27.2	44.7	23.8	4.3	25.9	44.4	24.4	5.3
Venezuela	22.9	41.3	30.1	5.7	20.0	45.9	27.5	6.6
Urban labour force								
Argentina, North	16.7	51.9	28.5	2.9	10.5	50.7	36.4	2.4
Argentina, South	12.4	50.0	34.5	3.1	8.0	48.8	40.2	2.8
Brazil, less developed	17.5	51.8	28.3	2.4	13.3	55.3	29.7	1.7
Brazil, developed	15.3	55.6	27.7	1.4	9.2	55.9	33.5	1.5
El Salvador	17.1	52.2	26.5	4.2	13.8	58.2	26.4	1.6
Venezuela	15.8	53.4	28.2	2.6	11.3	57.3	29.6	1.8
Male urban labour force								
Argentina, South	10.6	49.0	37.0	3.4	7.6	48.4	41.1	2.9
Brazil, developed	11.4	56.7	30.3	1.6	8.5	56.6	33.4	1.5
El Salvador	15.8	51.5	28.0	4.7	13.2	57.7	27.3	1.8
Venezuela	14.5	52.9	29.8	2.9	10.3	56.9	30.7	2.1
Female urban labour force								
Argentina, South	18.0	53.1	26.7	2.2	9.3	49.7	38.3	2.7
Brazil, developed	25.2	53.1	20.8	0.9	10.4	54.4	33.7	1.5
El Salvador	20.4	54.0	22.7	2.9	14.8	59.1	24.8	1.3
Venezuela	20.1	55.3	22.7	1.8	13.2	58.1	27.4	1.3

/As the

As the age structure of the population as a whole gradually changes and, of greater importance in the decades immediately ahead, to the extent that labour participation rates shift toward Western European levels, labour force age structures will themselves change. While in general the labour force can be expected to be somewhat more mature, and experienced, at the end of the century, there are substantial differences in the extent and manner in which this is likely to occur, and although the figures are shown in the table, several of the more important aspects can be specifically noted.

With the projections of the third experiment the changes in the rural areas are quite small, but too much importance should not be attached to these figures.1/ Perhaps the most significant rural change is the consistent rise in the relative importance of the over-65 group in the labour force, caused by the draining away of the more active age groups through migration.

The changes in all of the other groupings are much more substantial. The greatest shift occurs in the structure of the urban female labour force, where the movement of labour participation rates to closer to the Western European levels is the primary factor in producing a sharp decline in the relative importance of teenagers and an offsetting increase in the importance of active adults, usually concentrated in the more mature adult group. At the end of the century the age structure of the female labour force is much more similar to that of the male labour force. The male labour force itself changes in a similar way, but the change is much smaller. And of course the shift in the total urban labour force, being the sum of the male and female age structures, is also of the same sort.

1/ As has been noted before labour participation rates in the rural areas are probably less meaningful than those in the urban areas, and little or no change in these rates has been assumed in the third experiment. The changes shown in the table therefore reflect changes in the structure of the population as a whole, which in its turn can be greatly influenced by migration; and here too caution must be used because of the way in which migration is treated in the model.

/But as

But as the aggregation process continues a divergence between the different countries becomes increasingly clear, and at the total national level is quite marked. In all of the countries analyzed the labour force becomes somewhat more mature, but the sense in which this is true varies from one country to another. In Argentina the age structure of the labour force shifts clearly closer to that which characterized the high income industrial countries: the relative importance of teenagers declines, and this is offset by an increase in the relative importance of the more mature but still fully active adult age group - which was already of considerably greater relative importance than in the other countries considered.

In the other countries there is also a decline in the relative importance of teenagers, but the offsetting gain is in the young adult age group to a much greater extent. In Brazil the relative increase is somewhat greater in the more experienced adult group, and so the shift is more similar to that in Argentina, but in El Salvador and in Venezuela the relative increase is heavily concentrated in the young adult group.

As a consequence, at the end of the century Argentina is further removed from the other countries in this respect than was the case in 1970; the proportion of the labour force accounted for by teenagers and young adults is much lower in Argentina while the proportion of older, more experienced, workers is much higher than in the other countries. The basic explanation is again the earlier beginning of the population transition. It will be only in the next century that a similar evolution can lead to a corresponding maturing of the labour force in the other countries.