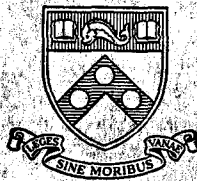# METHODS FOR ANALYZING COMPONENTS OF CHANGE IN SIZE AND STRUCTURE OF THE LABOR FORCE WITH APPLICATION TO PUERTO RICO, 1950-60

by

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PREFACE

This is the eighth in a series of technical and analytical reports issued by the Population Studies Center of the University of Pennsylvania. A list of preceding reports in the series will be found on the back cover.

This report was prepared in connection with a comparative study of growth and changing structure of the labor force in countries throughout the world, being conducted at the Population Studies Center under the direction of Dr. John D. Durand and Dr. Ann R. Miller. The study is being carried out with the help of a grant from the National Science Foundation.

The authors are grateful to Dr. Ann R. Miller for her invaluable participation in the development of the analytical methods described and illustrated in this report. The careful work of Miss Elvita P. McKenney in typing the manuscript and of Mrs. Miranda R. Reinis in proofreading is also gratefully acknowledged.

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A. INTRODUCTION

The increase or decrease of a country's labor force during a given period of time can be factored into the following components:

A. Loss by death of labor force members.

B. Net gain or loss by immigration and emigration of labor force members.

C. Gain by entry into the labor force of individuals from the economically inactive population.

D. Loss by retirement from the labor force into economically inactive status (including involuntary withdrawal on account of disability or for other reasons, as well as voluntary retirement).

Likewise the change in number of workers attached to a given occupation or industry group of the labor force can be factored into the same four components, plus the fifth component:

E. Net gain or loss by occupational or industrial mobility, i. e. transfers of labor force members from one occupation or industry to another.[1]

It is useful to subdivide components C and D as follows:

C_1 and D_1. Labor force entries and retirements which would correspond to the maintenance of unchanging age-specific rates of entry and retirement (in the labor force as a whole and in

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[1]This scheme of components was developed by A. J. Jaffe and R. O. Carleton in their study, Occupational Mobility in the United States, 1930-1960 (New York, Kings Crown Press, 1954). The subdivision of components C and D and the measure of natural increase of the labor force, defined below, are modifications of the Jaffe-Carleton scheme developed by the authors of the present report. The method of estimation described here also differs in some important respects from the method used by Jaffe and Carleton.

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given occupation or industry categories).

C_2 and D_2. Entries and retirements due to changes during the
period in the age-specific entry and retirement rates.

The sum of components A, C_1, and D_1 can be considered as a measure
of "natural increase" in the labor force as a whole or a given occupation
or industry. This is the increase which would result from natural increase
of the population and associated changes in its age structure without
migration and without occupational or industrial mobility. Components B,
C_2, D_2 and E are media through which the natural increase is modified
under the influence of supply and demand factors.

Such an analysis of components is helpful in gaining insight into the
processes of growth and structural change of the labor force and studying
demographic, economic, and other factors which affect these processes. It
provides a better basis for labor force projections and forecasts than can
be obtained merely by studying net changes in time-series data on the size
of the labor force and its occupation or industry categories.

Given suitable data from two censuses (or census-type surveys of popu-
lation and labor force), one can estimate these components of change during
the interval, in the labor force of each sex separately as well as the two
sexes combined. Corresponding estimates can also be made for urban and
rural sectors and for regions, provinces, etc., within a country. The
method of estimation is explained and illustrated in section B-1 of this
report with regard to components of change in the labor force as a whole,
and in section B-2 with regard to components of change in occupation and
industry categories.

The data required for making such estimates are adequate classifi-
cations by sex and age, at each census, of the population, the labor force,

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and the occupation or industry groups to be considered. An urban-rural classification of the population and labor force by sex and age groups is valuable for improving reliability in estimates of the components of change in occupation or industry groups, as will be shown in section B-2. A life table representing conditions of mortality during the interval is also needed for a comprehensive analysis where migration (component B) is important. Otherwise "census survival rates" may be substituted for the life-table functions and combined estimates of the mortality and migration components (A and B) of change in the labor force of the country as a whole will be obtained.

It is also possible, with the data of a single census, to estimate the natural increase (but not other components of change) in the labor force and in occupation or industry groups. A method for doing so is explained and illustrated in section B-3. The data required are adequate sex-age classifications of the population, labor force, and occupation or industry categories at the date of the one census, and an appropriate life table. Again, an urban-rural classification of population and total labor force by sex and age is helpful for estimating the natural increase of occupation or industry categories. Because these requirements are less demanding than those of analysis of components of intercensal changes, and because the calculations are simpler, the method of estimating natural increase from the data of a single census has wider applicability.

B. METHODOLOGY

B-1. Components of change in size of the labor force during an intercensal interval

Principles of the method

The method considered here for estimating components of change in size of the labor force between the dates of two censuses is illustrated with the example of Puerto Rico in the 1950-60 intercensal interval. In this example, the components are estimated separately with reference to the male and female labor force in the urban and rural sectors. Details of the calculations are shown in table 1 with reference to urban males while table 2 shows the results obtained by applying the same method to the data for each sex in the rural as well as the urban sector, and the components of change in the labor force of Puerto Rico as a whole, by addition.[2]

The method is one of cohort analysis, whereby the increase or decrease in a cohort of the labor force advancing from one age level to another is factored into components and results for various cohorts are summed up to obtain estimates of the components of change in the whole labor force (of each sex, urban and rural). Such an analysis using census data classified by age in five-year groups is most straightforward where the interval between censuses is also five years, so that the changes in the cohort can be measured directly by comparing the number of each age group at one census with the corresponding number of the group five years older at the next census. Where the intercensal interval is longer than five years, it is convenient to follow the procedure illustrated in the present example, of

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[2]Slightly different totals would be obtained by carrying out the computations directly with the data for the population and labor force of the whole island, instead of adding together the results of the separate calculations for the rural and urban sectors.

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using interpolations to reduce the time-reference of the analysis to a central quinquennium within the intercensal interval. For the interval between the 1950 and 1960 censuses of Puerto Rico, we shall denote the beginning and ending dates of the central quinquennium as 1952.5 and 1957.5. (The exact dates are 1 October 1952 and 1 October 1957, since the censuses were taken as of 1 April). Estimates of the population and labor force at these dates, by sex and age, rural and urban, are made by linear interpolation of the 1950 and 1960 data and the interpolated figures for age groups are arranged in cohort sequence to make the starting points of the analysis as shown in columns 1, 2, 5, and 6 of table 1.[3]

Such interpolations are most helpful in resolving the problem encountered where the number of years between censuses is not an even multiple of five. Where the interval is ten years, as in Puerto Rico and many other countries, there is the alternative of considering cohorts in a given age group at one census and ten years older at the next census, but then the age intervals overlap (10-14 to 20-24, 15-19 to 25-29, etc.) and the result is a somewhat confused picture of the processes of change in the labor force which go with advancing age.

Of course, the trends of population and labor force during an intercensal period are not ordinarily linear and so the estimates for beginning and ending dates of the central quinquennium, obtained by linear interpolation, will not be exact. This consideration, however, is irrelevant to

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[3]The labor force data given in the 1950 and 1960 census reports refer to persons 14 years of age and over, but the present analysis is limited to ages 15 and over (i. e., the labor force is assumed to be zero in ages below 15 years) in order to avoid the complications involved in an age classification in intervals other than five years. The labor force in the age-group 15-19 years in 1950 had to be estimated by interpolation of the data given in the census report for ages 14-15, 16-17, and 18-19. No such adjustment was required for 1960, as separate data were given for age 14.

the purpose, which is not to estimate actual changes during the central quinquennium but rather to obtain measures having a five-year time-reference which will be representative of the experience during the inter-censal interval.

With reference to each cohort, the decrement of the labor force during the central quinquennium due to mortality is estimated by applying an appropriate mortality rate derived from a life table; and the increment or decrement due to the difference between labor force entries and retire-ments is estimated by means of a net entry or retirement rate derived from the census data (as explained farther on). Since no independent measures of migration rates are available, the migration component has to be estimated as a residual.

It is important in such an analysis to take account of interactions among the components of change. For example, in the cohort of males advancing from ages 65-69 to 70-74 during the quinquennium, the amount of loss from the labor force due to mortality depends not only on the mor-tality rate but also on the retirement rate and on the rate of gain or loss by migration, if any. If the mortality component were estimated by applying a mortality quotient to the initial number of the cohort in the labor force (as has commonly been done in calculations of this sort), the estimate would be exaggerated. Likewise if the retirement component were estimated by applying a retirement rate to the initial number without re-gard for mortality, this estimate, too, would be exaggerated. The sum of estimates of mortality and retirement components, in a cohort little affected by migration, would exceed the net change. The method adopted here for dealing with such interactions is an "average" method: the com-ponents are estimated by applying appropriate rates to average numbers of

the cohorts during the central quinquennium rather than to initial numbers. This is the equivalent of dividing interactions equally among the components, and the sum of the estimates of components so obtained is equal to the net change.[4]

Mortality and migration (components A and B)

To estimate changes in cohorts of the labor force due to mortality and migration during the central quinquennium, one begins by estimating these components of change in cohorts of the population (as shown in columns 13, 14 and 15 of table 1) and multiplies the results by average activity rates of the cohorts during the quinquennium (as shown in columns 12, 16, and 17).

The mortality component of change in population cohorts is calculated by means of a five-year cohort mortality rate derived from a life table. (In this example, the life-table functions used were averages of the functions of Puerto Rican life tables of 1949-51 and 1959-61).[5] The usual way of making such calculations is to use the mortality rate, $_5Q_x$ (or the survival rate, $1 - _5Q_x$) defined as the ratio of deaths (or survivors) in a five-year cohort of the life-table stationary population as the cohort ages five years, to the number of the cohort at the <u>beginning</u> of the five years. But in keeping with the principle of the "average" method, we use instead a mortality rate, $_5M_x$, defined as the ratio of deaths to the <u>average</u>

[4]On the problem of dealing with interactions, see United Nations, Population Division, <u>Methods of Analyzing Census Data on Economic Activities of the Population</u> (by J. D. Durand and A. R. Miller), Population Studies, No. 43, New York, 1968, pp. 43-46.

[5]Jose L. Vazquez, Nidia R. Morales, and Jose L. Janer, <u>Tablas de Vida Abreviadas para Puerto Rico 1894-1959-61</u>. San Juan, Universidad de Puerto Rico, Escuela de Medicina, 1963.

number of the cohort during the period. This is derived from the life-table stationary population function, $_5L_x$, as follows:[6]

$$_5M_x = \frac{_5L_x - {_5L_{x+5}}}{1/2 \; (_5L_x + {_5L_{x+5}})}$$

The mortality rate, $_5M_x$ (column 13 of table 1), is applied to the average population of each cohort (column 4) to estimate the loss of population by mortality (column 14). This estimate is subtracted from the change in the cohort's population during the quinquennium (column 3) to derive the estimate of net gain or loss of population by migration (column 15). Corresponding components of change in the labor force of each cohort are then estimated (columns 16 and 17) by applying the average activity rate of the cohort during the quinquennium (column 12).

In the example of the urban male population of Puerto Rico, the migration component represents the result of net emigration to the United States counter-balancing net in-migration from the rural parts of Puerto Rico. (It also includes some non-migratory shifting from the rural to the urban category, as rural territory is annexed to cities and as growing rural communities graduate to urban status). It should be emphasized that this

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[6]Where the L_x function is not given (as in the compilations of life-table functions shown in the United Nations *Demographic Yearbook*), $_5M_x$ may be estimated from $_5q_x$ or from l_x without incurring important errors. Given $_5q_x$, $_5M_x$ is obtained within narrow error margins by the relationship:

$$_5M_x = \frac{_5Q_x}{1 - 1/2 \; (_5Q_x)}$$

where $_5Q_x$ is calculated approximately as $1/2 \; (_5q_x + {_5q_{x+5}})$. Given l_x at intervals of five years, one can derive $_5q_x$ as the ratio, $\dfrac{l_x - l_{x+5}}{l_x}$.

estimate of the migration component also incorporates errors due to faults in the census enumerations and inaccurate reporting of ages in the censuses, as well as inaccuracy in the life-table functions. Where the size of the estimates is not large, they may represent mainly the effects of such errors rather than those of migration.

As regards the mortality component, the method outlined above goes on the assumption that the sex-age specific mortality rates in the life table relating to the whole population apply to persons in and outside the labor force, in the rural and urban sectors. Of course, this is not strictly valid in any case and the estimates are biassed to some extent by failure to take account of mortality differentials. While the bias is unlikely to be of great importance for cohorts in the young and medium age ranges, it may become quite substantial in the highest age groups. Differences between mortality rates of persons remaining in the labor force and those having retired voluntarily or withdrawn on account of disability, in the higher age groups, may be especially important. In fact, without detailed data of a kind that is not generally available, there seems to be no wholly satisfactory way of dividing losses from the labor force at ages above 65 between those due to death "in harness" and those due to retirement prior to death.

Likewise as regards the migration component, the method presumes that activity rates in the whole population of each sex-age group are applicable equally to migrants and non-migrants. This, too, is valid only for approximate estimates. Accuracy may be improved if data are available on migrants and non-migrants in and outside the labor force, cross-classified by sex and age.

An alternative to the use of the life table is the "census survival

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ratio" method for estimating the mortality component. This is most suitable for use in countries where the importance of international migration is relatively small. The mortality rate of each cohort is then estimated as follows:

$$5^M{}_x = \frac{P_x^0 - P_{x+5}^1}{1/2(P_x^0 + P_{x+5}^1)}$$

where P_x^0 denotes the population of a cohort (in the country as a whole) of age x at the beginning of the central quinquennium and P_{x+5}^1 denotes the population of the same cohort, age x + 5, at the end of the quinquennium.[7] The mortality component as estimated in this way incorporates effects of international migration and of errors in the census enumerations and age declarations as well as actual losses by mortality. Where international migration is relatively unimportant, the differences between the estimates of components obtained by the "census survival ratio" method and by the life table method can be considered as approximate measures of the effects of errors in the census enumerations and age reports and in the life-table functions. The "census survival ratio" method is not suitable for use in the case of Puerto Rico, where external migration is very important.

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[7]Conventionally, the "census survival ratio" is defined as $\dfrac{P_{x+5}^1}{P_x^0}$.

The corresponding measure expressed as a mortality rate is $\dfrac{P_x^0 - P_{x+5}^1}{P_x^0}$.

The mortality rate, $5^M{}_x$, defined above is substituted here, in keeping with the principle of the "average" method.

<u>Labor force entries and retirements (components C and D)</u>

The change in activity rate of each cohort as it ages five years during the central quinquennium (column 11 of table 1) is used as an estimate of the net rate of entry into or retirement from the labor force. This is applied to the average population of the cohort (column 4) to derive the estimated number of net entries (column 18) or net retirements (column 19).

It is important to note that these are net and not gross measures of labor force entry or retirement, for each cohort. They can be regarded as satisfactory approximations to gross measures on condition that the number of retirements at ages of net entry into the labor force and the number of entries at ages of net retirement are negligible. This condition may be satisfied well enough in the case of males in most countries, and possibly also of females in some countries; but in many countries, the entry and retirement ages of females are not so distinct. Then separate estimates of components C and D for females, obtained by this method, would not be very meaningful; but the net balance of labor force entries and retirements (difference between components C and D) would still have meaning.

For estimating the number of net entries or retirements which would have taken place in each cohort during the quinquennium in the absence of any change over time in entry or retirement rates (components C_1 and D_1), a schedule of these rates representing conditions at the beginning of the quinquennium is required. This is obtained by calculating differences between successive age groups in activity rates at the beginning of the

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quinquennium (column 9 of table 1).[8] The net entry and retirement rates

so obtained (columns 20 and 22) are applied to the average population

of each cohort (column 4) to get the corresponding hypothetical numbers

of net entries and retirements (columns 21 and 23). Differences between

these hypothetical numbers and the estimated numbers of actual net entries

and retirements (columns 18 and 19) are estimates of components C_2 and D_2,

i.e., effects of changes during the quinquennium in the entry and retire-

ment rates (or in other words, of changes in the levels of age-specific

activity rates). These appear in column 24 of table 1.

As estimates of net entry and retirement rates at the beginning of

the quinquennium, the figures obtained by differencing activity rates of

successive age groups are subject to a bias, the nature of which can be

perceived in the following example of Puerto Rican urban male activity

rates for ages 65-69 and 70-74:

	1950	1952.5	1957.5	1960
Activity rates:				
65-69	53.20	47.85	40.59	38.01
70-74	37.24	32.26	26.00	23.90
Net retirement rates	15.96	15.59	14.59	14.11

In the 1952.5 column, the net retirement rate of 15.6 percent is predi-

cated on the supposition that the activity rate of the cohort at ages

70-74 in 1952.5 would have been 47.8 percent when they were at ages 65-69,

but actually it would have been higher, since the activity rates were

decreasing in the course of time. So the retirement rates may be under-

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[8]It might seem more logical to take the rates at the beginning of the
intercensal period (1950 in this example) as the basis, but if this were
done, the estimates of components C_2 and D_2 obtained as residuals (as
indicated below) would represent effects of changes in the activity rates
during a period longer than the central quinquennium.

estimated by about one-fourth in this case. Such a bias toward underesti-
mation of retirement rates and a corresponding bias toward overstatement of
labor force entry rates at younger ages exist wherever the trend of activity
rates is downward. The biasses are opposite in the case of upward trends
of activity rates, such as are found in the 1950 and 1960 census data for
Puerto Rican females in age groups between 20 and 65, and in the statis-
tics of females in many other countries.

Natural increase

The natural increase of the labor force is represented by the alge-
braic sum of losses by mortality and gains and losses by labor force en-
tries and retirements under conditions of constant age-specific entry and
retirement rates (sum of components A, C_1 and D_1, as shown in column 25 of
table 1). In the example of Puerto Rico, urban males, the natural increase
of the labor force during the central quinquennium is found to be 22,466,
which is made up of the following components:

Net entries in younger cohorts.............. +36,634

Mortality................................... -7,497

Net retirements in older cohorts............ -6,671

Natural increase....... +22,466

The actual increase of the Puerto Rican urban male labor force was
less than the natural increase as a result of emigration to the United
States and elsewhere being greater than both net in-migration from rural
areas of Puerto Rico and labor force increase due to changing age-speci-
fic activity rates (i.e. to increasing rates of labor force entry for
males 25-44 more than compensating for decreasing rates of entry of males
under age 25 and increasing retirement rates in the oldest age groups).

The estimates are as follows:

Natural increase.................................. +22,466

Net migration (including error factors and non-
   migratory shifts from the rural to the urban
   category).................................... -10,664

Effect of changing activity rates.............. +1,842

Net change.............. +13,644

Annual rates of components of change

The numerical estimates of labor force changes and their components during the central quinquennium are converted to annual rates simply by dividing the numbers by five and relating them to the average number of the labor force during the quinquennium. For example, in the urban male labor force of Puerto Rico, the estimated natural increase of 22,466 during the central quinquennium corresponds to an annual average of 4,493, which is equivalent to a rate of 2.3 percent of the average number (191,902) of the labor force during the quinquennium.

Table 2 shows numbers and annual rates of the components of change in the male, female, and total labor force in urban and rural sectors and the whole island of Puerto Rico, for the central quinquennium of the 1950-60 intercensal interval. This provides a comprehensive picture of the processes of growth and rural-urban redistribution of the labor force, in a form which is useful for studying the demographic, economic, and other factors involved.

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B-2. Components of change in occupation and industry groups during an intercensal interval

Assumptions and reliability of estimates

Since the kinds of data needed for precise measurement of components of change in industry and occupation groups of the labor force are not generally available, one must ordinarily be content with more or less rough approximations based on assumptions of equal sex-age specific rates of mortality, net migration, and net labor force entries or retirements among different industry or occupation groups in the labor force as a whole or in rural and urban sectors. While it may be possible to gain some improvement in accuracy of estimates obtained on this basis by making adjustments in view of various kinds of available information, no such adjustments have been attempted in the present example of estimates for Puerto Rico.[9]

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[9]Some kinds of data which may be useful for such adjustments are:

For mortality differentials: death registration statistics classified by occupation (seldom given with classifications by industry). Serious problems are involved in coordinating occupational data in death registration statistics with those of censuses so as to derive accurate occupational mortality rates.

For net migration differentials: (a) current statistics of emigrants classified by occupation and industry before emigration, and of immigrants by types of economic activities in the countries of origin or intended activities in the country of immigration; (b) census data on occupations and industries of persons born outside the country or (preferably) of those living outside the country at a specified date prior to the census. Likewise, census data according to place of birth or place of previous residence within the country may be pertinent to estimates of the migration component for urban-rural and other subdivisions. None of these kinds of data nor any combination of them is likely to furnish satisfactory measures of net migration in occupation or industry groups, but it may be possible to use them advantageously as indicators for adjusting estimates.

For differentials in net labor force entry and retirement rates: data on occupation and industry of persons entering the labor force and of those having retired during specified periods of time, such as have been obtained in some demographic sampling surveys.

For the mortality component, errors resulting from failure to take account of occupational and industrial differentials in mortality rates are unlikely to be very important in most circumstances. Greater risks of distortion are involved in applying equal age-sex specific rates of the net migration and net labor force entry and retirement components to different occupation and industry groups. While differences in these rates between the agricultural and nonagricultural sectors may be taken into account in a more or less satisfactory way by the methods outlined below for using estimates of these components of change in the rural and the urban labor force, such methods do not take account of differences in the rates of net migration, entry and retirement among occupations or industries within the nonagricultural sector. For occupational or industrial mobility (component E), without data to furnish a basis for direct estimates, one must be satisfied with estimates derived as residuals by subtracting the other components from net changes in occupation or industry groups. As residuals, the estimates will of course be affected by all errors in estimates of the other components, and these effects may be cumulative. Therefore estimates of the occupational or industrial mobility component should be used most cautiously and it may be advisable in some circumstances to combine them with those estimates for other components which are subject to largest errors.

(Footnote 9, p. 15 cont.) For rates of net gain or loss by occupational or industrial mobility: data on persons shifting between industry or occupation groups during specified time periods, such as have been obtained in some demographic sampling surveys or from social security records, etc.

Estimation of components for agricultural and nonagricultural sectors on the basis of estimates for rural and urban labor force

Distinct rural-urban differences are commonly found in the age-patterns of labor force entry and retirement for each sex, and these may reflect, more or less faithfully, differences between the agricultural and nonagricultural sectors. In the case of males, the median age of entry into the labor force is usually lower and the median age of retirement higher in the rural than in the urban population, as shown by the examples in table 3, derived from recent census statistics of six countries.[10] Where the rural labor force corresponds fairly closely to the agricultural sector and the urban to the nonagricultural sector, one can put considerable confidence in estimates of net labor force entry and retirement components made by applying rural and urban sex-age specific rates respectively to the agricultural and the nonagricultural labor force (defined either in terms of occupation or industry). Actually there are wide variations among countries in the numerical relations between rural and agricultural and between urban and nonagricultural labor force, especially in the case of females, as shown by the examples in table 4.[11] Depending on these relationships, one may choose among four procedures for estimating net entries and retirements (and net migration) in the

[10]The median ages were estimated from age-specific net entry and retirement rates derived from cross-sectional data of a single census for each country, by taking differences between activity rates of successive age groups. The estimates obtained by this method are not the same as those given by analysis of changes during intercensal intervals.

[11]Data showing the industry or occupation classifications of the urban and rural labor force separately would be more pertinent to the problem of estimation considered here, but such data are not widely available.

agricultural and nonagricultural sectors:

(1) to estimate these components for the agricultural sector by applying the sex-age specific rates of the rural labor force, and derive the components for the nonagricultural sector as residuals (by subtracting the estimates for the agricultural sector from those for the total labor force, urban plus rural);

(2) to go the other way around and estimate the components for the nonagricultural sector on the basis of the urban rates, and derive those for the agricultural sector as residuals;

(3) to estimate the components for both the agricultural and nonagricultural sectors independently by applying the rural and urban rates, respectively, and adjust the results (pro-rata or otherwise) to agree with the estimates for the total;

(4) to disregard the rural and urban estimates and obtain the components for the agricultural and nonagricultural sectors by applying to both equally the rates estimated for the total labor force.

Procedure 1 is suggested in circumstances like those of females in Turkey, where the number in the agricultural sector is close to the number in the rural labor force but there is a larger proportionate difference between the nonagricultural and the urban labor force. Conversely, Procedure 2 is suggested in cases like those of females in El Salvador and Panama, where the correspondence between the nonagricultural and urban labor force is much closer than between the agricultural and the rural. Procedure 3 may be a logical choice in circumstances like those of males in El Salvador and Panama, where the rural-agricultural and the urban-nonagricultural relationships are about equally close. The basis for a

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choice is less readily apparent in such circumstances as those of Puerto
Rico, both males and females, where neither relationship is close. How-
ever, a case can be made for preferring Procedure 2 to either Procedure 1
or 3 where, as in Puerto Rico, the rural labor force is a composite of agri-
cultural and nonagricultural workers while the urban labor force is almost
purely nonagricultural. The rates of the components for the urban labor
force must then approximate very closely those of at least the urban part
of the nonagricultural labor force, and may possibly also be fairly repre-
sentative of the rates for rural nonagricultural workers. Anyway Proce-
dure 1 should be rejected in circumstances such as those of females in
Puerto Rico, where the number in agriculture is only a small fraction of
the number in the rural labor force.

For Puerto Rico, estimates of the net entry and retirement components
obtained by the different procedures are compared, for males in table 5
and for females in table 6. In the case of males, the results do not differ
widely, thanks to the fact that the rural and urban age-specific activity
rates of males in Puerto Rico are not very far apart. Procedure 2 gives
the smallest totals for net entries and largest net retirements for the
agricultural sector. The largest net entries and smallest net retirements
for agriculture are obtained with Procedure 4. Procedure 2 has been
adopted in carrying through the component analysis for males in the agri-
cultural and nonagricultural sectors of the Puerto Rican labor force, and
the estimates of the net entry and retirement components deserve some con-
fidence in the circumstances of this case. In the case of females, however,
although Procedure 2 is logically preferable to Procedure 1 for the reasons
stated above, the estimate of net retirements obtained for the agricultural
sector (as a residual) by Procedure 2 is erratic -- net retirements during

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the five-year period being approximately double the average number of the female labor force in agriculture. Procedure 4 has therefore been adopted for carrying out the component analysis in the case of females, but the results are much less reliable than those obtained for males.

It should be noted that either Procedure 1 or 2 may yield estimates of net entries and retirements which do not agree exactly with the totals for these components obtained by adding the estimates for the rural and the urban labor force. In table 5, for example, while the sums of the estimates for the agricultural and nonagricultural sectors according to Procedure 2 (columns 5 and 9) agree with the totals of the rural and urban estimates (column 1) for each cohort and the total of all cohorts, there are slight discrepancies in the sum for cohorts of net increment (component C) and those of net decrement (component D). These result from the fact that for cohorts between ages 20-24 and 35-44, Procedure 2 gives estimates of net entries in the nonagricultural sector slightly exceeding the estimated totals of net entry for the labor force as a whole in the same cohorts. Consequently, the residuals obtained for the agricultural sector are small numbers of net retirements, although net entries are estimated for both the rural and the urban labor force of these cohorts. Procedure 3 would have the advantage of eliminating such discrepancies, but the price might be some distortion of the estimates.

When net migration (component B) of the agricultural and nonagricultural labor force is calculated by Procedure 1, 2, or 3 the results are estimates of combined net effects of emigration (or immigration) and rural-urban migration on the labor force in the agricultural and nonagricultural sectors. Thus the estimates of inter-industry shifts (component E) obtained as residuals represent only those shifts between agriculture and

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nonagricultural industries which take place without rural-urban migration. Such are the definitions of the estimates for Puerto Rican males, for which Procedure 2 was adopted. On the other hand, the estimates of the migration component obtained by Procedure 4, which was adopted in the case of Puerto Rican females, refer only to international migration; in other words, Procedure 4 has the effect of excluding rural-urban migration from the estimates of component B in the agricultural and nonagricultural sectors, so that the estimates of component E obtained as residuals include shifts between agriculture and nonagricultural employment associated with such migration. This difference of definition between the estimates for males and females in Puerto Rico has little relevance to the totals of the estimates for the two sexes, because the number of females employed in agriculture is relatively small.

For estimating the net migration, labor force entry, and retirement components for different industry or occupation groups within the nonagricultural sector, no better basis is commonly available than to assume equal sex-age specific rates of these components for all nonagricultural industries or occupations. Such is the procedure adopted for the component analysis of changes in industrial structure of the nonagricultural labor force in Puerto Rico. As a result, the differences found in these components between different groups of nonagricultural industries reflect only the varying age structure of the labor force in these different groups. Actually, the rates of these components may vary considerably among nonagricultural industries and occupations, and therefore the reliability of the estimates is relatively low. This caution applies above all to the estimates of inter-industry shifts (component E) obtained as residuals in the calculations for industry divisions within the nonagricultural sector.

Example of calculations

Table 7 gives an example of the calculation of components of change in industry groups with reference to the male labor force of Puerto Rico in the central quinquennium of the 1950-60 intercensal interval. In this example, the components are calculated for the agricultural and nonagricultural sectors and for manufacturing industries (ISIC Division 2-3) within the nonagricultural sector.

First, for the total of the nonagricultural sector, components A, B, C, D, C_1, D_1, C_2, and D_2 are estimated as shown in columns 29-35 of table 7. This is done by applying the ratio of the nonagricultural sector per 100 of the urban labor force of each cohort (column 28) to the estimated components of change in the urban labor force (columns 13-19). Such a calculation is equivalent to the assumption of Procedure 2 as stated above, that the rates of these components are the same in the nonagricultural as in the urban labor force. The components for the agricultural sector (columns 38-44) are then derived by subtracting those for the nonagricultural sector from the totals of corresponding components for the labor force as a whole (columns 20-26). Components A, B, C, D, C_1, D_1, C_2, and D_2 for manufacturing industries (columns 48-54) are estimated by applying the ratio of workers in manufacturing per 100 of the nonagricultural sector (column 47) to the estimates of these components for the nonagricultural sector as a whole, cohort by cohort. This is in accord with the assumption of equal rates of these components for all industries within the nonagricultural group. Estimates of inter-industry shifts (component E) are then calculated as residuals, by subtracting the other components from the net changes of labor force in the various industry groups during the central quinquennium of the intercensal period, as shown in columns

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36, 45, and 55. Finally, natural increase for the agricultural and non-agricultural sectors and manufacturing industries is calculated by adding components A, C_1 and D_1.

The results obtained by carrying out the calculations with reference to all nonagricultural divisions of the International Standard Industrial Classification, and with reference to females as well as males, are summed up in table 8. Calculations for female components of change differed only in that components of the total nonagricultural sector were estimated by calculating the ratio of the nonagricultural sector to the total labor force of each cohort and applying this ratio to the estimated components of change in the total labor force.

B-3. Projections of natural increase of labor force and of occupation and industry groups from the data of one census

A method of short-range projections is used to derive estimates of natural increase in the labor force as a whole and in occupation or industry groups from the data of a single census, with the help of a contemporary life table. Such projections yield measures of the natural increase which is inherent in the age structure of the population, the schedule of age-specific activity rates and age structure of occupation or industry groups at the census date, and the mortality conditions represented by the life table.

An example of a projection of natural increase in the labor force in urban and rural sectors is given in table 9, based on the 1960 census statistics of male population and labor force in Puerto Rico and the Puerto Rican life table of 1959/61. First, the population of each cohort as of 1960 is projected to 1965 by applying a five-year survival rate obtained from the life table (column 9). Summing the results for cohorts 15 years of age and over in 1965, as shown in columns 10 and 11, and comparing with

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the total of those 15 years and over in 1960, one obtains a measure of five-year natural increase of the population in working ages (columns 16 and 17). Next, the projected population of each cohort in 1965 is multiplied by an activity rate (columns 7 and 8) assumed to be the same as the rate for the same age group in 1960 (columns 5 and 6). From the resulting 1965 projections of labor force (columns 12 and 13), one subtracts the 1960 labor force figures for the same cohorts (columns 3 and 4) to derive the natural increase (columns 14 and 15). This is positive for the younger cohorts and negative for older cohorts, representing the combined effects of mortality (component A) and labor force entries and retirements at constant age-specific rates (components C_1 and D_1). Summing these natural increase estimates for the different cohorts, one obtains totals for the cohorts of positive natural increase of labor force and for those of negative natural increase, as well as the net positive total for the labor force as a whole, shown at the foot of columns 14 and 15. These five-year natural increase estimates can be expressed in terms of annual percent rates, by dividing the numbers by five and relating them to the averages of the 1960 and projected 1965 labor force numbers.

It should be noted that the same assumptions discussed in the preceding section, with regard to equality of mortality rates in the urban and rural and the economically active and inactive sectors of the population belonging to each cohort, also underlie this method of estimating natural increase by projection. In addition to errors on that account, the results are affected by the bias mentioned in the preceding section, in estimates of age-specific net rates of entry into and retirement from the labor force derived from the cross-sectional data of a census.

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Table 10 gives an example of the method of distributing such projected natural increases of the male labor force among industry groups. (The same method can be used for occupation groups). The assumptions and procedures used here are analogous to those used in estimating components of change in industry and occupation groups during an intercensal interval. The natural increase rate is assumed to be the same in the nonagricultural sector as in the urban labor force, and the same in each industry group within the nonagricultural sector. The natural increase of the nonagricultural labor force, calculated on this assumption, is subtracted from that of the labor force as a whole to derive the natural increase in the agricultural sector.

Table 11 shows five-year projections of natural increase in the labor force of Puerto Rico, made by the methods illustrated in tables 9 and 10, by sex, urban-rural sectors, and industry groups, for the periods 1960-65 and 1950-55. The natural increase rate of nonagricultural females is assumed to be the same as for the total female labor force, rather than for the urban females, for the reasons explained on pages 19 and 20.

B-4. Comparisons of rates of natural increase obtained by projections and by component analysis

Comparisons between the rates of natural increase obtained by projections and by component analysis are provided in table 12. For this purpose, the rates obtained by projections for 1950-55 and 1960-65 have been interpolated on an assumed linear trend to get corresponding rates for 1950-60. In the present example, the rates obtained by the two methods are in close agreement on the whole but they differ appreciably in some industry groups, especially in the case of females. Such differences are accounted for partly by the weighting of the data for the two census years and partly by the treatment of interactions.

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In the component analysis, the 1950 and 1960 census data and the 1949/51 and 1959/61 mortality rates are given equal weight by the process of linear interpolation and averaging of figures for the central quinquennium. On the ohter hand, when the rates obtained by projections for 1950-55 and 1960-65 are interpolated linearly for 1950-60, greater weight is given to the 1950-55 projections, which represent the conditions of 1950. On this account, the method of projections tends to give higher rates for 1950-60 than those obtained by component analysis where the projected rates for 1950-55 are higher than those for 1960-65, and lower rates for 1950-60 where the 1950-55 projected rates are lower than those of 1960-65. In fact, such a relationship is found in table 12 in the natural increase rates for male and female population of working age and for total female labor force. The relationship does not hold in the rates for total male labor force and in those for some industry groups of each sex, as a result of interactions being treated differently by the two methods.

In the projection method, interactions between natural increase and other components of change do not come into play since the other factors are held constant. In the component analysis, such interactions are distributed among the interacting components (as explained on page 6). This difference is probably responsible for much of the discrepancy between the results of the two methods for certain industry groups, since rates of natural increase for industry groups are heavily influenced by the interaction of age structure with the components of change. Interaction effects may be particularly important, in the case of Puerto Rico, in both the male and female labor force in the industry divisions of electricity, transport, etc., which have rapidly changing age structures as compared with the totals of nonagricultural industries.

In circumstances such as those of Puerto Rico, rates of natural increase in industry groups of the female labor force must be interpreted with caution. While the application of rates of the various components of change in the total female labor force to the totals for females in the nonagricultural sector may not involve great risk of errors, the risk is more serious when it comes to particular groups of nonagricultural industries. Rates for the urban female labor force may be more representative of the components of change in such industries as electricity, transport, and construction.

C. INTERPRETATION OF RESULTS FOR PUERTO RICO

Natural and recorded increase of population and labor force

Rates of natural increase in the population of working ages and in
the labor force were high and rising in Puerto Rico during the 1950's as
shown by the following summary of the estimates:[12]

	Annual amount of natural increase			Annual percent rate of natural increase		
	Both sexes	Males	Females	Both sexes	Males	Females
Population 15 years and over:						
Component analysis, 1950-60............	44,322	22,293	22,029	3.4	3.5	3.3
Projection, 1950-55	40,021	20,277	19,744	3.0	3.0	2.9
Projection, 1960-65	52,621	26,073	26,548	3.6	3.6	3.5
Labor force:						
Component analysis, 1950-60............	17,126	12,980	4,146	2.9	2.9	3.0
Projection, 1950-55	18,274	14,191	4,083	2.8	2.9	2.8
Projection, 1960-65	21,206	15,992	5,214	3.3	3.3	3.3

Source: Component analysis: table 13.
         Projections: table 11.

These estimates indicate the growing pressure from expanding labor
supply to which Puerto Rico's economy would have been subjected if the
natural increase had not been offset by emigration and by some decline in
age-specific activity rates, especially of men over the age of 55.
Actually, these offsetting factors held the growth of working-age popu-
lation between 1950 and 1960 down to an average annual rate of 0.7 per-
cent and kept the size of the labor force at a standstill. Estimates of

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[12]Here and in what follows, the results of the component analysis for
the central quinquennium of the intercensal period are considered as repre-
senting the experience of the 1950-60 decade.

effects of the offsetting factors, derived from the component analysis, are summarized in table 13.

The natural increase of the population of working ages is determined by past fertility and mortality rates and flows of migration as they have formed the present age structure of the population, as well as by current mortality rates. Natural increase of the labor force depends, in addition, upon the current age-specific net entry and retirement rates. Changes in fertility affect the natural increase of working-age population and labor force only after an interval corresponding to the lower limit of working ages (15 years in the present case). The Puerto Rican experience presents an example of this delay in the impact of changing fertility. Puerto Rico's birth rate dropped from 39.0 per 1,000 population in 1950 to 32.3 in 1960 while the death rate dropped from 9.9 to 6.7, so that the rate of natural increase in the total population was reduced from 29.1 per 1,000 in 1950 to 25.6 in 1960.[13] The decline of the birth rate would begin to affect the natural increase of the working-age population and labor force in the latter half of the 1960's; but in the 1950's, while natural increase of the total population was slackening, that of the working-age population and labor force accelerated. The acceleration was due mainly to the decrease of mortality, with some additional impetus from a slight earlier rise in the birth rate, from 39.1 in 1935-39 to 40.8 in 1945-49. The importance of the decrease in mortality during the 1950's is indicated by the following measures of expectation

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[13]United Nations, Demographic Yearbook, 1955, tables 19 and 25, and 1964, tables 16 and 20.

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of life at birth (in years):[14]

	Males	Females
1949-51	59.4	62.4
1954-56	66.0	70.0
1959-61	67.1	71.9

The rate of natural increase of the labor force is not the same as that of the working-age population because of inequalities in natural increase of different age groups within the working-age population. In Puerto Rico, the fact that the natural increase rate of the labor force is somewhat less than that of the working-age population implies that the population in the age groups of peak activity rates gains proportionately less by natural increase than the younger and older groups gain. In other words, the processes of natural increase affect the age structure of the population in a way which would tend to lower the ratio of labor force to population of working ages.

The labor force grows by increments in young cohorts, at ages of entry into economic activities, more or less offset by decrements in older cohorts due to retirements and deaths. It is useful to disaggregate the rates of natural and actual increase of the labor force into these two offsetting parts. In the component analysis for 1950-60, the natural increase of the labor force was found to be composed of net increments (in cohorts showing positive balances of net labor force entries and losses by mortality) at the annual rate of 4.3 percent and net decrements (in the cohorts showing negative balances of net retirements and deaths) at the rate of 1.4 percent. The corresponding components of the natural increase projections for 1950-55 and 1960-65, and of the recorded increase during 1950-60, will be seen in the following comparison:

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[14]United Nations, Demographic Yearbook, 1967, table 29.

	Annual amounts of change			Annual percent rates		
	Both sexes	Males	Females	Both sexes	Males	Females
	Net increments of labor force					
Natural increase:						
1950-55 projection	27,070	20,090	6,980	+4.23	+4.08	+4.74
1960-65 projection	31,234	22,852	8,382	+4.84	+4.67	+5.35
1950-60 component analysis	25,573	18,624	6,949	+4.34	+4.23	+4.89
Actual increase, 1950-60 component analysis	17,686	12,521	5,165	+2.98	+2.76	+3.68
	Net decrements of labor force					
Natural increase:						
1950-55 projection	8,795	5,898	2,897	-1.38	-1.20	-1.97
1960-65 projection	10,028	6,860	3,168	-1.55	-1.40	-2.02
1950-60 component analysis	8,447	5,644	2,803	-1.42	-1.24	-1.99
Actual increase, 1950-60 component analysis	17,817	13,307	4,510	-3.00	-2.94	-3.22

Source: Projections: table 11.
         Components: data not presented in text.

The acceleration of natural increase of the labor force between the 1950-55 and 1960-65 projections was the result of a greater acceleration in the natural inflow of the younger cohorts, partly offset by an increase in the natural outflow (net decrements) in the older cohorts. The shifting age structure of the population, with increases in the proportions of both young and elderly age groups at the expense of the central group of adult ages (due partly to emigration), was a primary factor in these trends. The offsets to natural increase (emigration and decreasing activity rates) reduced the net increments and increased the net decrements of the labor force by approximately equal amounts.

Emigration

Emigration was the main safety-valve through which the pressure of
natural increase in Puerto Rico's labor supply was released. Rates of
net emigration of working-age population and labor force during the 1950's
were estimated in the component analysis by adding the estimated migration
components of change in the urban and rural sectors (with due regard for
sign), since the difference between the net loss by migration in rural areas
and the net gain in urban areas should represent net emigration from the
island. Thus it was found that net emigration drained off 2.7 percent of
the population 15 years and older and 2.5 percent of the labor force annually
during the 1950's, as shown in table 13.[15]

Cohort net emigration rates by sex and age, estimated in the same way,
are shown in table 14. The rates are highest at ages between 15 and 30 and
drop to insignificant values beyond the age of 50, where return migration
offset whatever outward movement took place. It should be recalled that
the estimates of net migration are affected by misreporting of ages and
other errors in the censuses; on this account, no significance should be
imputed to the slight variations of the estimated rates for the older co-
horts nor to the appearance of small positive values (estimates of net

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[15]Recorded annual net emigration from the island averaged 1.9 per 100
total population between April 1950 and April 1960. The inclusion of per-
sons less than 15 years of age, who migrated at a lower rate than did the
adult population, depresses the official migration rate below that derived
by the component analysis. The latter figure also includes interaction
effects between migration and mortality, which would have reduced popula-
tion growth by biasing the age structure towards the oldest age groups
with the highest mortality. When these two considerations are taken into
account, the estimate of net emigration derived from intercensal component
analysis seems quite reasonable. Cf. Stanley L. Friedlander, Labor Migration
and Economic Growth: A Case Study of Puerto Rico (Cambridge, The M.I.T.
Press, 1965), p. 170.

immigration) in some cases.[16] The net emigration rates of males are greater

than those of females, especially in ages between 15 and 25 years. These

observations indicate that emigration was especially effective in easing

the pressure on the Puerto Rican labor market from growing numbers of

young men coming of age and seeking employment. (Of course, it should not

be taken for granted that emigration was necessarily a boon to Puerto Rico

in every way. So far as it was selective in terms of education, skills,

health, etc., emigration may have had a negative effect on the development

of productive capacity and adaptability of the labor force; and it is also

possible that by moderating the pressure of labor force growth it took

away some of the stimulus for technological improvement and expansion of

the economy).

After 1960, the rate of emigration decreased sharply, perhaps in part

as a result of the slackening rate of natural increase of the labor force

due to the earlier decline of the birth rate. Annual average net immigra-

tion of Puerto Ricans into the United States dropped from about 45,000

during the decade of the 1950's to slightly less than 10,000 during 1960-65.[17]

Changes in activity rates

Changes in the age-specific activity rates of the two sexes also

helped to relieve some of the pressure of natural increase. These changes

[16]Likewise, little significance can be attached to the differences
between estimated net emigration rates of labor force and population
within the same sex-age group, which appear in table 14. These merely
reflect differences between the rural-urban distribution of the labor
force and that of the population in each sex-age group, since it was
assumed in making the estimates that net migration rates of the labor
force were the same as those of the population of corresponding sex and
age, separately for rural and urban areas.

[17]Donald S. Akers, "Immigration data and national population esti-
mates for the United States", Demography, Vol. 4 (1967), p. 264.

are shown in table 15 in terms of gross years of active life for each sex in three broad age groups.[18] The principal change was a sharp decrease in the activity rates of males over the age of 55 -- in other words, a reduction in the average age of retirement. There was also some rise in the average age of entry into the labor force, reflected by moderate decreases of activity rates of males and females under the age of 25. A partly offsetting change was some increase in activity rates of both sexes in the age-range of 25 to 54 years.

The net effect of the changes in specific activity rates, as measured by the component analysis, was to reduce the annual growth of Puerto Rico's labor force during the 1950's by approximately 0.4 percentage points. (See table 13). In the case of males, the effect of this factor was more than enough to wipe out what remained of the natural increase of the labor force after the drain of emigration, but not so in the case of females. Thus the female labor force increased slightly during the 1950's, balancing a slight decrease in the male labor force.

Labor force entries and retirements

The offset to natural increase of the labor force by changing age-specific activity rates took both the form of reduction in the rate of inflow of entrants and increase in the rate of outflow of retiring workers. Measures of these effects are obtained from the results of the component analysis (table 2) by subtracting from the "observed" net entries and retirements (components C and D), the corresponding components in natural increase of the labor force (components C_1 and D_1). The estimates for

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[18]Gross years of active life are defined as the average number of economically active years between specified age limits for a hypothetical cohort having given specific activity rates at each age and not affected by mortality. This index serves as a measure of the levels of age-specific activity rates which is independent of the age structure of the population.

the 1950-60 decade are as follows:

	Annual amounts of change			Annual percent rates		
	Both sexes	Males	Females	Both sexes	Males	Females
Net entries:						
1. In observed increase (component C)	+25,271	+18,963	+6,308	+4.3	+4.2	+4.5
2. In natural increase (component C_1)	+26,570	+19,562	+7,008	+4.5	+4.3	+5.0
3. Difference, 1-2 (component C_2)	-1,299	-599	-700	-0.2	-0.1	-0.5
Net retirements:						
4. In observed increase (component D)	-6,050	-4,218	-1,832	-1.0	-.9	-1.3
5. In natural increase (component D_1)	-5,124	-2,914	-2,209	-.9	-.6	-1.6
6. Difference, 4-5 (component D_2)	-926	-1,304	+377	-.2	-.3	+.3
Net effect of changes in specific activity rates, 3+6 (components C_2, D_2)	-2,226	-1,903	-323	-.4	-.4	-.2

Source: table 2.

The most influential factor retarding the growth of the labor force, apart from emigration, was the increase in the retirement rates of males, reflected in the decreasing activity rates of men in the upper age brackets. The effects of this and of decreasing labor force entry rates of both males and females were partly counter-balanced by a decrease in the retirement rate of females -- that is, a tendency of women to remain longer in the labor force, reflected by the increased gross years of active life of females between the ages of 25 and 55.

Changes in urban and rural population and labor force

Urbanization in Puerto Rico during the 1950's was marked by a decrease in the rural labor force and an increase in the urban, so that the urban share of the total labor force expanded from 43.6 percent in 1950 to 50.8

percent in 1960. The results of the component analysis summarized in table 16 provide some insight into processes and factors involved in this shift of manpower distribution.

By natural increase alone, the rural sector would have enlarged its proportionate share in the working-age population and the labor force, since the rural rates of natural increase were considerably higher than the urban. In fact, natural increase of the rural population 15 years of age and over during the 1950's is estimated at the very high rate of 4.2 percent per annum, but this was completely drained away by migration to urban areas and emigration abroad. In the rural labor force, natural increase at the annual rate of 3.4 percent was more than balanced by net losses through migration at the rate of 3.7 percent per annum,[19] and there was a further loss of 1.0 percent per annum resulting from decreases in rural age-specific activity rates of both sexes. Thus, on balance, the rural labor force decreased during the 1950's at an annual rate of 1.4 percent.

In the urban sector, while the rate of natural increase was lower, the net loss by migration was smaller than in the rural sector, as emigration to the United States and other countries was partly offset by net in-migration from rural areas to the cities. Moreover, the effect of changing age-specific activity rates in the urban population was a positive contribution to growth of the labor force, partly offsetting the loss by migration. On balance, the natural increase of the urban labor force, estimated at an annual rate of 2.3 percent, was reduced to an actual

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[19]It should be recalled that the estimates of the "migration" components include non-migratory transfers of population by annexation of rural territory to urban areas and reclassification of rural areas to urban status.

increase at the annual rate of 1.5 percent during the 1950's.

The contrast between the trends of age-specific activity rates in the rural and the urban population of Puerto Rico is noteworthy. As shown in table 15, gross years of active life of rural males decreased sharply between 1950 and 1960, mainly as a result of a precipitous decline in activity rates of men over the age of 55, although there were appreciable decreases also in the rates for rural males and females under age 25. In the urban population, decreases in activity rates of males over 55 and of both sexes under 25 years of age were much smaller than in the rural population, and there were appreciable increases in the rates of both urban males and urban females at ages between 25 and 55. As a result, the urban-rural difference in gross years of active life of males was reduced from 6 years in 1950 (48.2 for rural, 42.2 for urban) to 1 1/2 years in 1960 (43.5 for rural, 42.1 for urban). The changes in urban areas (especially the increase in male activity rates at ages between 25 and 55) may possibly be interpreted as effects of improvements in both health and employment opportunity in the cities. While the unemployment rate was high and even rising during the 1950's in Puerto Rico, wage levels were rising and underemployment may have diminished.[20] An important share of the credit for such improvement of employment opportunity may be due to emigration as well as to the expansion of Puerto Rico's urban industries. On the other hand, the large decreases in rural activity rates might be regarded partly

[20]Real weekly earnings rose by 28.5 percent for males and 40.3 percent for females employed in all industries between 1952 and 1956. It is more difficult to evaluate the trend of underemployment. Over this same period, the proportion of employed persons working less than 30 hours per week did not seem to decline, although the number of subsistence farmers (who may be classified as underemployed) declined somewhat. See A. J. Jaffe, People, Jobs and Economic Development (The Free Press of Glencoe, Illinois, 1959), pp 92-95, 131.

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as symptoms of betterment in economic circumstances of the rural population (also due partly to the high rate of out-migration), encouraging earlier retirement for men, longer schooling and later entry into the labor force for young people, and withdrawal of women from economic activities. The increasing employment of rural residents in nonagricultural occupations may have been an additional factor.

Although the component analysis provides no separate measures of effects of emigration and rural-urban migration upon population and labor force growth in urban and rural areas, lower and upper limits for estimates of effects of these two kinds of migration can be drawn. Estimates at one extreme are obtained by assuming that all net emigration from the island was drawn from the urban population and all net outflow from rural areas went to urban areas within Puerto Rico; and at the other extreme, that all net outflow from rural areas was emigration and net rural-urban migration was zero. (The possibility of a net balance of internal migration in favor of rural areas is excluded from consideration). An intermediate assumption is that the percent rates of net emigration were the same in the urban and the rural population. By applying these assumptions, the following estimates of annual net migration rates per 100 working-age population of each sex during 1950-60 are obtained:[21]

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[21] For the intermediate estimates, the annual rates of net emigration for the working-age population of Puerto Rico as a whole (from table 2) are assumed to be the same in the rural and the urban population; and the rates of net rural-urban migration are obtained as differences between the net emigration rates and the rates of net gain or loss by all migration in the urban and rural sectors (from table 2). The ranges have been calculated according to the two extreme assumptions stated above.

		Net gain (+) or loss (-)				
	All migra-tion	Emigration			Rural-urban migration	
		Inter-mediate estimate	Range		Inter-mediate estimate	Range
Urban:						
Both sexes	-.9	-2.4	-.9 to -5.4		+1.5	0 to +4.5
Males	-1.0	-2.7	-1.0 to -6.2		+1.7	0 to +5.2
Females	-.8	-2.2	-.8 to -4.6		+1.4	0 to +3.8
Rural:						
Both sexes	-3.7	-2.4	0 to -3.7		-1.3	0 to -3.7
Males	-3.9	-2.7	0 to -3.9		-1.2	0 to -3.9
Females	-3.5	-2.2	0 to -3.5		-1.3	0 to -3.5

Source: table 2.

These estimates suggest that emigration was probably the larger of the two streams of migration and that the net rates of both emigration and rural-urban internal migration were probably lower in the female than in the male population. It is noteworthy in the latter connection that the age-specific net migration rates of females were lower than those of males in all but two cohorts of the urban population. (See table 17).

Changes in structure of the labor force

Urbanization may be economically advantageous if there is a corresponding shift of the labor force out of low-wage, low-productivity industries into more efficient, higher-paid and modern industries. An important aspect of the change in industrial structure which goes with economic growth is the increase in proportionate share of the nonagricultural sector in the labor force -- i.e. disagriculturalization; and of course this is related to urbanization. In Puerto Rico during the 1950's disagriculturalization proceeded at a very rapid rate, as shown by the measures of structural change of the labor force in table 18. In fact, disagriculturalization far outpaced urbanization, as the increase in the percent share of

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nonagricultural industries was nearly double the increase in the urban share of the labor force.

The measure of disagriculturalization alone is not a very satisfactory index of industrialization or modernization because the nonagricultural sector includes some traditional industries where efficiency and earnings are low, and these may be havens for underemployed and disadvantaged workers. The unemployed also are included in the nonagricultural total. A better index, although it is still a crude one, is given by the change in share of "growth industries", defined as the sum of males employed in manufacturing and both sexes employed in construction, electricity, transport, and related industries. (Females employed in manufacturing are not included in "growth industries" because many of them are engaged in needlework and other handicrafts which have relatively low productivity). It can be seen in table 18 that the "growth industries" expanded at a high rate between 1950 and 1960, increasing their share of the labor force by almost one-half, mainly as a result of expansion in manufacturing and construction. The increase in share of the "growth industries" was more than enough by itself to match the increase in the urban share of the total labor force.

The remainder of the nonagricultural sector also increased its percentage of the labor force total, although the gain here was proportionately less than in the "growth industries". The greatest gain within this remainder was in the division of service industries, although increases were also recorded in commerce, etc. and in the unemployed. There was a noteworthy decrease in the low-productivity category of females employed in manufacturing. Referring to the detailed classification of industries within the service division, one finds that personal services also

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decreased, particularly on the female side; this is another group of relatively low productivity on the whole. Most of the expansion in the service industries was accounted for by growth of educational services and public administration. The general impression conveyed by the data is one of appreciable up-grading of the industry distribution of the labor force.

By natural increase alone, Puerto Rico's labor force would have made no progress in disagriculturalization during the 1950's, since the natural increase rates were nearly the same in the agricultural and nonagricultural sectors. Disagriculturalization was brought about mainly by migration, as the balance of emigration and rural-urban internal migration reduced the labor force proportionately much more in the agricultural than in the non-agricultural sector. Other factors which added to the rate of disagriculturalization were the decreasing age-specific activity rates in the rural population and shifting of rural residents from agriculture to other employments (by commuting to cities and towns or taking nonagricultural jobs in rural communities). Such disagriculturalization of the rural labor force was reflected by a considerable decrease during the 1950's in the ratio of the agricultural to the rural labor force:

	Agricultural labor force per 100 rural labor force		
	Both sexes	Males	Females
1950	64.2	75.8	6.9
1960	45.8	53.9	4.8
Change	-18.4	-21.9	-2.1

Through these processes, the natural increase of the agricultural labor force, estimated at 2.9 percent per annum for the 1950's, was converted to a decrease at the annual rate of 4.7 percent. Estimates of the

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components of change which produced this result are shown in table 19 (extracted from table 8). According to these estimates, migration was by far the most important factor. The estimated annual net loss from the agricultural labor force by migration to the cities or abroad exceeds the sum of all other negative components (retirements, deaths, and non-migratory shifts of workers from agriculture to the nonagricultural sector), and exceeds the natural increase of the agricultural labor force by more than 50 percent. It should be recalled, however, that the components of change in the male agricultural labor force were estimated as residuals, and the net inter-industry shift was derived as a residual of these residuals, which merits relatively little reliance. Thus it is easily possible that the estimates misrepresent the relative importance of inter-industry shifts within the rural labor force as a factor in Puerto Rico's disagriculturalization. It should also be recalled that in the case of females, a result of the procedures adopted was to exclude effects of rural-urban migration from the estimate of the migration component of change in the agricultural and nonagricultural sectors, and to include such effects in the component of inter-industry shifts.

Of course, whatever part of the net loss by migration from the agricultural labor force represented rural-urban migration within the island was also an inter-industry shift. The component analysis provides no measure of this, but if it is assumed (in line with the "intermediate" assumption considered above for separating rural-urban migration from emigration) that the net rate of loss by emigration was the same in the agricultural and nonagricultural sectors, the following estimates are obtained:

	Total labor force	Agricultural sector	Nonagricultural sector
Annual amounts of change			
1. Net migration	-15,032	-8,619	-6,413
2. Emigration	-15,032	-4,310	-10,722
3. Rural-urban migration	-	-4,310	+4,310
4. Non-migratory net inter-industry shifts	-	-2,223	+2,223
5. Total net inter-industry shifts (3+4)	-	-6,533	+6,533
Annual percent rates			
1. Net migration	-2.5	-2.5	-1.5
2. Emigration	-2.5	-2.5	-2.5
3. Rural-urban migration	-	-2.5	+1.0
4. Non-migratory net inter-industry shifts	-	-1.3	+.5
5. Total net inter-industry shifts (3+4)	-	-3.8	+1.5

Source: table 8.

In the nonagricultural sector, where emigration was partly offset by the inflow of migrants and non-migratory shifts from agriculture, there was an increase of labor force during the 1950's, but the annual rate of increase (1.9 percent) was considerably less than the natural increase (2.9 percent).[22] The rate of increase in the "growth industries" was much higher (3.5 percent) -- in fact, half again higher than their natural increase. These industries expanded, possibly by drawing more than their proportionate share of

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[22]Changing activity rates had little effect (-.2 percent) on the number of females employed in nonagriculture. This may seem surprising in view of the importance of this component for the urban and rural female labor force (+.7 percent and -1.8 percent respectively). However, when it is recalled that components of change for nonagricultural females are the net effect of these components on the nonagricultural-urban and nonagricultural-rural female labor force, the relative unimportance of their total net effect is understandable.

new entrants into the labor force and of migrants and non-migratory inter-industry shifters flowing out of the agricultural labor reserve, and also possibly by attracting inter-industry shifters from some of the less expansive industries in the nonagricultural sector, including women from the declining needlework industry. The detailed tabulation of results of the component analysis for industry divisions (table 8) suggests that the "growth industries" gained labor force in all of these ways, but for the reasons stated earlier, these estimates have relatively low reliability for industry divisions within the nonagricultural sector. It is safer to combine components C_2, D_2, B, and E for such groups, as is done in table 19.

It is always necessary in interpreting results of the component analysis for industry or occupation groups to make cautious allowance for possible errors, and the need for caution increases as one turns from aggregates for broad sectors to estimates for more particular categories. Where the nonagricultural sector is fairly closely identified with the urban labor force (as in the case of males in Puerto Rico) and the industry or occupation group under consideration constitutes a major fraction of the nonagricultural total, there may be relatively little risk in considering the estimates as fairly representative of reality. The risk is greater in estimates for small industries such as mining in Puerto Rico, and for those which differ greatly in rate of growth from the nonagricultural total, such as females in manufacturing. Even when the urban-nonagricultural labor force identification is relatively good, there may be individual nonagricultural industries which are not closely identified with the urban sector. Where this is a possibility, as it is for mining in Puerto Rico, one should realize that the estimated component rates of change may not be realistic for the specific industry. For males in agriculture and for the unemployed,

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the estimates of components are residuals and are therefore affected by errors in the estimates for the other industry divisions. Special reasons for caution in interpreting the estimates for females in various industries have been mentioned (pages 19 and 20).

Differing estimated rates of natural increase, migration, and net entry and retirement among industries within the nonagricultural sector are due wholly to differences in age structure of the labor force of these industries. For example, an industry having a relatively high proportion of workers above the age of 50 will on that account have relatively high rates of loss by retirement and death and relatively low rates of entry and of gain or loss by migration.

In Puerto Rico, the manufacturing and service industries have a relatively youthful age structure and on this account their rates of natural increase are high. These are precisely the industry divisions which contain both relatively modern and traditional subsectors, responding in different ways to economic change. The non-manufacturing "growth industries" -- construction, electricity, transport, etc. -- have lower rates of natural increase but their expansion has been fed by rural-urban migration and/or inter-industry shifts.

A distinctly unfavorable aspect of Puerto Rico's disagriculturalization is the increase in number of the unemployed, both male and female. With unemployment rates of 6.5 percent in the male and 7.1 percent in the female labor force in 1960, the economy cannot be considered as wholly healthy in spite of the indications of rising income per head and up-grading of industrial structure. The unemployed group has a very high natural increase (estimated annual rate of 6.9 percent for 1950-60), again on account of its youthful age structure. Thanks to emigration and shifting of workers from

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unemployment into various nonagricultural employments, this natural increase was reduced to an actural increase of the unemployed at an average annual rate of 2.6 percent during the 1950's, which is still disquieting. Without emigration, it is apparent that the rate of unemployment would rise on a more alarming trend unless employment opportunities for young people within Puerto Rico were expanded at a greatly accelerated rate.

D. TABLES

Table 1. Estimation of components of change in size of the labor force: Puerto Rico, urban males, central quinquennium of the intercensal interval 1950-60.

Age of cohorts		Population				Labor force			
1952.5	1957.5	1952.5 (1)	1957.5 (2)	Change (3)	Average (4)	1952.5 (5)	1957.5 (6)	Change (7)=(6)-(5)	Average (8)
10-14	15-19	51,027	47,561	-3,466	49,294		11,439	11,439	5,720
15-19	20-24	42,996	37,187	-5,809	40,092	12,364	26,290	13,926	19,327
20-24	25-29	38,129	32,219	-5,910	35,174	27,087	25,915	-1,172	26,501
25-29	30-34	34,257	30,070	-4,187	32,164	25,545	25,879	334	25,712
30-34	35-39	29,843	30,061	218	29,952	24,212	26,771	2,559	25,492
35-39	40-44	29,055	24,266	-4,789	26,661	25,224	21,782	-3,442	23,503
40-44	45-49	21,629	22,541	912	22,085	19,145	20,160	1,015	19,653
45-49	50-54	18,598	17,616	-982	18,107	16,352	15,048	-1,304	15,700
50-54	55-59	15,959	14,021	-1,938	14,990	13,329	11,236	-2,093	12,283
55-59	60-64	11,486	11,991	505	11,739	8,891	7,746	-1,145	8,319
60-64	65-69	10,646	9,279	-1,367	9,963	6,885	3,766	-3,119	5,326
65-69	70-74	7,292	6,392	-900	6,842	3,489	1,662	-1,827	2,576
70+ (70-74) (75+)	75+	10,491 (4,816) (5,675)	7,094	-3,397	8,793	2,555 (1,554) (1,001)	1,024	-1,531	1,790
Total		321,408	290,298	-31,110	305,856	185,078	198,718	13,640	191,902

Table 1 (continued)

Age of cohorts		Activity rates				Mortality rate	Components of population change	
1952.5	1957.5	1952.5 (9)= (5)÷(1)	1957.5 (10)= (6)÷(2)	Change (11)= (10)-(9)	Average (12)=(9)+ (10)÷(2)	(13)	Mortality (14)= (13)x(4)	Migration[a] (15)= (3)-(14)
10-14	15-19		24.05	24.05	12.03	.0060	-296	-3,170
15-19	20-24	28.76	70.70	41.94	49.73	.0116	-465	-5,344
20-24	25-29	71.04	80.43	9.39	75.74	.0170	-598	-5,312
25-29	30-34	74.57	86.06	11.49	80.32	.0200	-643	-3,544
30-34	35-39	81.13	89.06	7.93	85.09	.0230	-689	907
35-39	40-44	86.82	89.76	2.94	88.29	.0278	-741	-4,048
40-44	45-49	88.52	89.44	.92	88.98	.0348	-769	1,681
45-49	50-54	87.92	85.42	-2.50	86.67	.0466	-844	-138
50-54	55-59	83.52	80.14	-3.38	81.83	.0644	-965	-973
55-59	60-64	77.41	64.60	-12.81	71.00	.0905	-1,062	1,567
60-64	65-69	64.67	40.59	-24.08	52.63	.1332	-1,327	-40
65-69	70-74	47.85	26.00	-21.85	36.92	.2004	-1,371	471
70+ (70-74) (75+)	75+	24.35 (32.27) (17.64)	14.44	-9.91	19.39	.5028	-4,421	1,024
Total		57.58	68.45	10.83	62.74		-14,191	-16,919

[a] Including effects of error factors and of non-migratory shifts between the rural and urban sectors. Calculations were carried out to three decimal places.

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Table 1 (continued)

Age of cohorts		Components of labor force change				C$_1$. Net entry at constant rate	
1952.5	1957.5	A. Mortality	B. Migration[a]	C. Net entry	D. Net retirement	Rate	Number
		(16)=(14)x(12)	(17)=(15)x(12)	(18)=(11)x(4)	(19)=(11)x(4)	(20)	(21)=(20)x(4)
10-14	15-19	-36	-381	11,856		28.76	14,175
15-19	20-24	-231	-2,657	16,815		42.28	16,952
20-24	25-29	-453	-4,023	3,304		3.53	1,241
25-29	30-34	-516	-2,846	3,697		6.56	2,111
30-34	35-39	-586	772	2,374		5.68	1.702
35-39	40-44	-654	-3,574	786		1.70	453
40-44	45-49	-684	1,496	204			
45-49	50-54	-732	-120		-453		
50-54	55-59	-790	-796		-507		
55-59	60-64	-754	1,113		-1,504		
60-64	65-69	-698	-21		-2,400		
65-69	70-74	-506	174		-1,495		
70+	75+	-857	199		-872		
Total		-7,497	-10,664	39,036	-7,231		36,634

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Table 1 (continued)

Age of cohorts		Components of labor force change			
1952.5	1957.5	D_1. Net retirement at constant rate		C_2 and D_2. Effect of changing entry and retirement rates	Natural increase
		Rate (22)	Number (23)= (22)x(4)	(24)=(18)-(21) or (19)-(23)	(25)=(16)+ (21)or(23)
10-14	15-19			-2,319	14,139
15-19	20-24			-137	16,721
20-24	25-29			2,063	788
25-29	30-34			1,586	1,595
30-34	35-39			672	1,116
35-39	40-44			333	-201
40-44	45-49	-.59	-131	335	-815
45-49	50-54	-4.40	-797	344	-1,529
50-54	55-59	-6.11	-916	409	-1,706
55-59	60-64	-12.74	-1,495	-9	-2,249
60-64	65-69	-16.82	-1,676	-724	-2,374
65-69	70-74	-15.58	-1,066	-429	-1,572
70+	75+	-6.72	-590	-282	-1,447
Total			-6,671	1,842	22,466

Table 2. Estimated components of change in the labor force by sex: Puerto Rico urban and rural, central quinquennium of the intercensal interval, 1950-60.

Area and components	Quinquennial changes			Annual percent rates of change		
	Both sexes (1)	Male (2)	Female (3)	Both sexes (4)	Male (5)	Female (6)
Total						
1) Net change	-657	-3,927	3,270	-.02	-.17	.47
2) A. Mortality	-21,603	-18,338	-3,265	-.73	-.81	-.47
3) B. Migration[a]	-75,158	-59,313	-15,845	-2.53	-2.62	-2.26
4) C. Net entries in cohorts of net entry	126,355	94,814	31,541	4.26	4.19	4.50
5) D. Net retirements in cohorts of net retirement	-30,251	-21,090	-9,161	-1.02	-.93	-1.31
Entries and retirements at constant age-specific rates:						
6) C_1. Net entries	132,852	97,812	35,040	4.48	4.32	5.00
7) D_1. Net retirements	-25,619	-14,572	-11,047	-.86	-.64	-1.58
8) Effects of changing entry and retirement rates (C_2 and D_2)	-11,129	-9,516	-1,613	-.38	-.42	-.23
9) Natural increase ($A + C_1 + D_1$)	85,630	64,902	20,728	2.89	2.87	2.96

[a]Including effects of error factors and of non-migratory shifts between the rural and urban sectors.

Table 2 (continued)

Area and components	Quinquennial changes			Annual percent rates of change		
	Both sexes (1)	Male (2)	Female (3)	Both sexes (4)	Male (5)	Female (6)
Urban						
1) Net change	20,951	13,644	7,307	1.50	1.42	1.66
2) A. Mortality	-9,597	-7,497	-2,100	-.69	-.78	-.48
3) B. Migration[a]	-16,649	-10,664	-5,985	-1.19	-1.11	-1.36
4) C. Net entries in cohorts of net entry	58,287	39,036	19,251	4.16	4.07	4.37
5) D. Net retirements in cohorts of net retirement	-11,090	-7,231	-3,859	-.79	-.75	-.88
Entries and retirements at constant age-specific rates:						
6) C_1. Net entries	55,454	36,634	18,820	3.96	3.82	4.28
7) D_1. Net retirements	-13,077	-6,671	-6,406	-.93	-.70	-1.46
8) Effects of changing entry and retirement rates (C_2 and D_2)	4,820	1,842	2,978	.34	.19	.68
9) Natural increase ($A + C_1 + D_1$)	32,780	22,466	10,314	2.34	2.34	2.34

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Table 2 (continued)

Area and components	Quinquennial changes			Annual percent rates of change		
	Both sexes (1)	Male (2)	Female (3)	Both sexes (4)	Male (5)	Female (6)
Rural						
1) Net change	-21,608	-17,571	-4,037	-1.38	-1.35	-1.55
2) A. Mortality	-12,006	-10,841	-1,165	-.77	-.83	-.45
3) B. Migration[a]	-58,509	-48,649	-9,860	-3.74	-3.73	-3.78
4) C. Net entries in cohorts of net entry	68,068	55,778	12,290	4.35	4.28	4.71
5) D. Net retirements in cohorts of net retirement	-19,161	-13,859	-5,302	-1.22	-1.06	-2.03
Entries and retirements at constant age-specific rates:						
6) C_1. Net entries	77,398	61,178	16,220	4.94	4.69	6.21
7) D_1. Net retirements	-12,542	-7,901	-4,641	-.80	-.61	-1.78
8) Effects of changing entry and retirement rates (C_2 and D_2)	-15,949	-11,358	-4,591	-1.02	-.87	-1.76
9) Natural increase ($A + C_1 + D_1$)	52,850	42,436	10,414	3.38	3.25	3.99

Sources for males:

Row 1 - Table 1, Column 7
" 2 - " 1, " 16
" 3 - " 1, " 17
" 4 - " 1, " 18
" 5 - " 1, " 19

Row 6 - Table 1, Column 21
" 7 - " 1, " 23
" 8 - " 1, " 24
" 9 - " 1, " 25

Table 3. Median ages of labor force entry and retirement of males, rural and urban, estimated from cross-sectional data of censuses of six countries.

	Median age of entry (years)		Median age of retirement (years)	
	Rural	Urban	Rural	Urban
Puerto Rico 1960	18.9	19.9	68.6	66.2
El Salvador 1961	13.4	16.3	75+	75+
Panama 1960	14.8	18.5	75+	67.9
Iran 1966	12.5	17.5	71.3	70.2
Turkey 1966	11.6	16.5	75+	75+
Japan 1960	17.4	17.2	75+	72.1

See text (p. 17) for derivation.

Table 4. Agricultural sector per 100 rural labor force (A) and nonagricultural sector per 100 urban labor force (B), by sex and age groups: censuses around 1960 in six countries.[a]

Sex and age	Puerto Rico 1960		El Salvador 1961		Panama 1960		Iran 1966		Turkey 1960		Japan 1960	
	A	B	A	B	A	B	A	B	A	B	A	B
Males												
Total 15+	53.86	154.62	107.62	86.13	91.82	112.06	72.20	143.80	87.71	128.29	73.82	114.03
15-19	66.43	172.24	107.72	81.13	93.40	119.20	68.16	164.35	91.46	128.15	59.38	116.37
20-24	45.22	171.42	105.99	89.16	91.15	114.09	64.50	138.15	74.48	131.02	54.26	119.56
25-29	40.33	157.75	104.93	91.35	90.43	113.74	68.11	145.63	84.54	133.76	60.39	118.10
30-34	44.91	152.92	105.28	91.01	89.90	112.42	71.42	145.69	83.93	135.06	63.77	119.10
35-39	)49.70	152.78	106.22	89.51	89.49	112.11	72.55	144.55	85.62	131.63	65.36	119.32
40-44	)		107.07	87.63	89.27	111.92	74.12	143.06	89.28	126.19	69.57	117.22
45-49	)58.75	150.50	109.06	84.96	91.52	109.74	75.43	137.34	90.02	124.19	72.14	115.79
50-54	)		110.13	83.12	92.81	109.02	77.17	137.66	92.65	121.70	80.30	111.88
55-59	66.34	142.62	111.92	80.36	95.07	107.38	78.48	139.64	94.33	117.43	100.38	99.76
60-64	69.95	137.96	112.69	75.62	96.93	105.25	81.23	134.11	97.14	110.74	111.61	91.31
65-69	)		114.64	74.34	97.98	103.93	)				121.19	81.38
70-74	)75.06	135.04	115.35	72.76	98.85	102.86	)83.78	131.42	99.87	100.51	130.72	68.17
75+	)		119.57	69.34	100.21	99.38	)				131.26	61.86

[a]The agricultural sector is defined (except in El Salvador) as persons employed in Division 0 of the International Standard Industries Classification (including forestry and fishing as well as agriculture); the remainder of the labor force (including the unemployed and the category of ill-defined and not reported industries) is included in the nonagricultural sector. In El Salvador, unemployed persons reported in ISIC Division 0 are included in the agricultural rather than the nonagricultural sector.

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Table 4 (continued)

Sex and age	Puerto Rico 1960		El Salvador 1961		Panama 1960		Iran 1966		Turkey 1960		Japan 1960	
	A	B	A	B	A	B	A	B	A	B	A	B
Females												
Total 15+	4.80	148.11	33.47	124.30	28.00	118.24	30.56	239.49	98.69	133.96	100.97	99.28
15-19	7.52	165.30	42.70	129.52	29.80	129.80	28.76	292.90	97.60	153.85	55.23	119.50
20-24	2.88	155.12	32.89	123.55	23.48	119.85	27.78	232.55	98.03	146.05	72.67	114.06
25-29	2.22	148.06	31.38	122.26	24.67	116.84	30.13	248.33	98.50	143.53	99.22	100.57
30-34	3.04	144.61	31.24	121.67	24.08	114.99	31.46	258.20	98.59	132.89	109.49	91.85
35-39	)4.46	147.14	32.05	121.57	28.12	113.35	32.39	240.31	98.68	124.33	105.55	95.12
40-44	)		32.83	123.22	30.54	112.78	32.56	231.54	99.16	119.92	107.97	93.15
45-49	)6.44	138.97	26.59	124.64	28.49	114.21	33.55	214.82	99.13	117.85	110.98	90.13
50-54	)		26.45	123.53	31.07	116.05	33.48	189.04	99.44	117.80	116.85	84.01
55-59	13.56	133.05	25.39	125.48	37.11	116.27	34.10	196.14	99.46	114.67	124.19	74.54
60-64	15.77	138.45	23.37	128.65	43.04	119.07	33.13	180.51	99.59	120.20	127.55	67.64
65-69	)		21.99	129.56	35.57	119.83	)				130.50	59.84
70-74	)16.13	138.52	31.19	129.26	40.62	123.55	)29.99	183.16	99.71	119.84	123.70	62.69
75+	)		31.90	125.93	48.05	126.49	)				130.80	48.87

Table 5. Estimated net labor force entries and retirements (components C and D) of males in urban and rural, agricultural and nonagricultural sectors: Puerto Rico, central quinquennium of the intercensal interval, 1950-60.

Age of cohorts		Net entries (+) and retirements (-)			Agricultural sector			
1952.5	1957.5	Total	Urban	Rural	Procedure 1	Procedure 2	Procedure 3	Procedure 4
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
10-14	15-19	40,703	11,856	28,847	20,053	20,863	20,460	19,478
15-19	20-24	40,106	16,815	23,291	14,693	12,872	14,055	15,855
20-24	25-29	4,531	3,304	1,227	749	-449	592	1,563
25-29	30-34	5,204	3,697	1,507	895	-230	736	1,659
30-39	35-44	3,679	3,160	519	320	-957	238	1,243
40-49	45-54	-1,637	-249	-1,388	-933	-1,281	-1,185	-625
50-54	55-59	-1,631	-507	-1,124	-818	-933	-880	-689
55-59	60-64	-4,133	-1,504	-2,629	-2,016	-2,126	-2,071	-1,868
60+	65+	-13,098	-4,767	-8,331	-6,852	-6,887	-6,870	-6,792
Total		73,724	31,805	41,919	26,091	20,872	25,075	29,824
Sum of net entry cohorts (component C)		94,223	38,832	55,391	36,710	33,735	36,081	39,798
Sum of net retirement cohorts (component D)		-20,499	-7,027	-13,472	-10,619	-12,863	-11,006	-9,974

Table 5 (continued)

Age of cohorts		Nonagricultural sector				Agricultural sector per 100 rural labor force[a]	Nonag. sector per 100 urban labor force[a]	Nonag. sector per 100 total labor force[a]
1952.5	1957.5	Procedure 1 (8)	Procedure 2 (9)	Procedure 3 (10)	Procedure 4 (11)	(12)	(13)	(14)
10-14	15-19	20,650	19,840	20,243	21,225	69.5	167.3	52.1
15-19	20-24	24,513	27,234	26,051	24,251	63.1	162.0	60.5
20-24	25-29	3,782	4,980	3,939	2,968	61.0	150.7	65.5
25-29	30-34	4,309	5,434	4,468	3,545	59.4	147.0	68.1
30-39	35-44	3,359	4,636	3,441	2,436	61.6	146.7	66.2
40-49	45-54	-704	-356	-452	-1,012	67.2	143.1	61.8
50-54	55-59	-813	-698	-751	-942	72.8	137.8	57.8
55-59	60-64	-2,117	-2,007	-2,062	-2,265	76.7	133.4	54.8
60+	65+	-6,246	-6,211	-6,228	-6,306	82.2	130.3	48.1
Total		46,733	52,852	48,649	43,900	65.6	146.8	62.2
Sum of net entry cohorts (component C)		57,513	62,124	58,142	54,425			
Sum of net retirement cohorts (component D)		-9,880	-9,272	-9,493	-10,525			

[a]Average ratios for the central quinquennium.

Source: Column 2 - Table 1, Column 18 & 19
      "   5 -   "   7,   "   40 & 41
      "   9 -   "   7,   "   31 & 32
      "   13 -   "   7,   "   28

Table 6. Estimated net labor force entries and retirements of females (components C and D) in urban and rural, agricultural and nonagricultural sectors: Puerto Rico, central quinquennium of the intercensal interval, 1950-60.

Age of cohorts		Net entries (+) and retirements (-)			Agricultural sector		
1952.5	1957.5	Total	Urban	Rural	Procedure 1	Procedure 2	Procedure 4
10-14	15-19	16,314	8,400	7,914	557	1,520	519
15-19	20-24	14,049	9,673	4,376	210	-2,450	286
20-24	25-29	-896	254	-1,150	-40	-1,299	-12
25-29	30-34	416	690	-274	-10	-641	5
30-39	35-44	-1,562	-109	-1,453	-77	-1,395	-30
40-49	45-54	-2,728	-1,384	-1,344	-114	-731	-75
50-54	55-59	-918	-601	-317	-44	-84	-40
55-59	60-64	-732	-505	-227	-40	-27	-42
60+	65+	-1,563	-1,026	-537	-110	-104	-112
Total		22,380	15,392	6,988	332	-5,211	499
Sum of net entry cohorts (component C)		30,779	19,017	12,290	767	1,520	810
Sum of net retirement cohorts (component D)		-8,399	-3,625	-5,302	-435	-6,731	-311

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Table 6 (continued)

Age of cohorts		Nonagricultural sector			Nonagricultural labor force per 100 total labor force
1952.5	1957.5	Procedure 1	Procedure 2	Procedure 4	
10-14	15-19	15,757	14,794	15,795	96.8
15-19	20-24	13,839	16,499	13,763	98.0
20-24	25-29	-856	403	-884	98.7
25-29	30-34	426	1,057	411	98.7
30-39	35-44	-1,485	-167	-1,532	98.1
40-49	45-54	-2,614	-1,997	-2,653	97.2
50-54	55-59	-874	-834	-878	95.7
55-59	60-64	-692	-705	-690	94.3
60+	65+	-1,453	-1,459	-1,451	92.8
Total		22,048	27,591	21,881	97.8
Sum of net entry cohorts (component C)		30,022	32,753	29,969	
Sum of net retirement cohorts (component D)		-7,974	-5,162	-8,088	

Table 7. Calculation of components of change in industry groups: Puerto Rico males, central quinquennium of the intercensal interval, 1950-60.

Age of cohorts[a]		Number in agricultural sector[b]				Number in nonagricultural sector[c]			
1952.5	1957.5	1952.5 (1)	1957.5 (2)	Change (3)	Average (4)	1952.5 (5)	1957.5 (6)	Change (7)	Average (8)
10-14	15-19		17,568	17,568	8,784		19,143	19,143	9,572
15-19	20-24	21,330	19,598	-1,732	20,464	19,617	42,987	23,370	31,302
20-24	25-29	28,265	13,813	-14,452	21,039	40,194	39,691	-503	39,942
25-29	30-34	21,063	14,323	-6,740	17,693	36,729	38,861	2,132	37,795
30-39	35-44	42,331	31,013	-11,318	36,672	71,192	72,561	1,369	71,876
40-49	45-54	34,101	28,425	-5,676	31,263	49,452	51,753	2,301	50,602
50-54	55-59	14,361	10,395	-3,966	12,378	18,132	15,707	-2,425	16,920
55-59	60-64	10,337	7,969	-2,368	9,153	11,727	10,474	-1,253	11,100
60+	65+	19,259	7,947	-11,312	13,603	16,662	8,593	-8,069	12,628
Total		191,047	151,051	-39,996	171,049	263,705	299,770	36,065	281,737

[a]Interpolations were necessary for five-year age groups in the range of 34-59 years in 1952.5 to avoid overlapping cohorts.

[b]Employed males in agriculture, forestry and fishing (ISIC division 0).

[c]Employed males in nonagricultural industries (ISIC divisions 1-9) and total unemployed males.

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Table 7 (continued)

Age of cohorts		Number in manufacturing[d]				Components of change in urban labor force[e]						
1952.5	1957.5	1952.5	1957.5	Change	Average	A	B	C	D	C_1	D_1	C_2 and D_2
		(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
10-14	15-19		3,633	3,633	1,816	-36	-381	11,856		14,175		-2,319
15-19	20-24	3,563	9,644	6,081	6,604	-231	-2,657	16,815		16,952		-137
20-24	25-29	9,909	8,656	-253	8,782	-453	-4,023	3,304		1,241		2,063
25-29	30-34	7,447	8,192	745	7,820	-516	-2,846	3,697		2,111		1,586
30-39	35-44	13,663	13,995	332	13,829	-1,240	-2,802	3,160		2,155		1,005
40-49	45-54	9,217	9,400	183	9,308	-1,416	1,376		-249		-928	679
50-54	55-59	3,303	2,748	-555	3,026	-790	-796		-507		-916	409
55-59	60-64	2,083	1,915	-168	1,999	-754	1,113		-1,504		-1,495	-9
60+	65+	2,771	1,345	-1,426	2,058	-2,061	352		-4,767		-3,332	-1,435
Total		50,956	59,528	8,572	55,242	-7,497	-10,664	38,832	-7,027	36,634	-6,671	1,842

[d]Employed males in manufacturing (ISIC division 2-3).

[e]From table 1.

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Table 7 (continued)

Age of cohorts		Components of change in total labor force[f]							Average urban labor force[g]	Nonagricultural per 100 urban labor force
1952.5	1957.5	A	B	C	D	C_1	D_1	C_2 and D_2		
		(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)=(8)÷(27)
10-14	15-19	-123	-3,869	40,703		48,372		-7,669	5,720	167.34
15-19	20-24	-637	-17,830	40,106		40,972		-866	19,327	161.96
20-24	25-29	-1,042	-18,444	4,531		1,876		2,655	26,501	150.72
25-29	30-34	-1,113	-8,698	5,204		3,201		2,003	25,712	146.99
30-39	35-44	-2,751	-10,876	3,679		3,391		288	48,995	146.70
40-49	45-54	-3,282	1,544		-1,637		-1,598	-39	35,353	143.13
50-54	55-59	-1,882	-2,878		-1,631		-1,745	114	12,283	137.75
55-59	60-64	-1,835	2,346		-4,133		-3,307	-826	8,319	133.43
60+	65+	-5,673	-608		-13,098		-7,922	-5,176	9,692	130.29
Total		-18,338	-59,313	94,223	-20,499	97,812	-14,572	-9,516	191,902	146.81

[f]Sums of components of change in rural labor force and those in the urban labor force, calculated by the method illustrated in table 1.

[g]From table 1.

Table 7 (continued)

Age of cohorts		Components of change in nonagricultural sector						
		A	B	C	D	C_1	D_1	C_2 and D_2
1952.5	1957.5	$(29)=$ $(13)\times(28)$	$(30)=$ $(14)\times(28)$	$(31)=$ $(15)\times(28)$	$(32)=$ $(16)\times(28)$	$(33)=$ $(17)\times(28)$	$(34)=$ $(18)\times(28)$	$(35)=$ $(19)\times(28)$
10-14	15-19	-60	-638	19,840		23,721		-3,881
15-19	20-24	-374	-4,303	27,234		27,455		-221
20-24	25-29	-683	-6,063	4,980		1,870		3,109
25-29	30-34	-758	-4,183	5,434		3,103		2,331
30-39	35-44	-1,819	-4,111	4,636		3,161		1,474
40-49	45-54	-2,027	1,970		-356		-1,328	972
50-54	55-59	-1,088	-1,096		-698		-1,262	563
55-59	60-64	-1,006	1,485		-2,007		-1,995	-12
60+	65+	-2,685	459		-6,211		-4,341	-1,870
Total		-10,500	-16,480	62,124	-9,272	59,310	-8,926	2,465

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Table 7 (continued)

Age of cohorts		Components of change in nonagricultural sector (continued)		Components of change in agricultural sector				
		E	Natural increase	A	B	C	D	C_1
1952.5	1957.5	$(36)=(7)$ $-(29)-(30)$ $-(31)-(32)$	$(37)=(29)$ $+(33)+(34)$	$(38)=$ $(20)-(29)$	$(39)=$ $(21)-(30)$	$(40)=$ $(22)-(31)$	$(41)=$ $(23)-(32)$	$(42)=$ $(24)-(33)$
10-14	15-19	h_1	23,661	-63	-3,231	20,863		24,651
15-19	20-24	813	27,081	-263	-13,527	12,872		13,517
20-24	25-29	1,263	1,187	-359	-12,381		-449	6
25-29	30-34	1,639	2,345	-355	-4,515		-230	98
30-39	35-44	2,663	1,342	-932	-6,765		-957	230
40-49	45-54	2,714	-3,355	-1,255	-426		-1,281	
50-54	55-59	457	-2,350	-794	-1,782		-933	
55-59	60-64	275	-3,001	-829	861		-2,126	
60+	65+	368	-7,026	-2,988	-1,067		-6,887	
Total		10,193	39,884	-7,838	-42,833	33,735	-12,863	38,502

[h]Non-zero numbers for the 10-14 year old cohort are due to errors in rounding.

Table 7 (continued)

Age of cohorts		Components of change in agricultural sector (continued)				Manufacturing per 100 non-agricultural labor force	Components of change in manufacturing	
		D_1	C_2 and D_2	E	Natural increase		A	B
1952.5	1957.5	(43)=(25)-(34)	(44)=(26)-(35) =(40)-(42) or =(41)-(43)	(45)=(7) -(38)-(39) -(40)-(41)	(46)=(38) +(42)+(43)	(47)= (12)÷(8)	(48)= (29)x(47)	(49)= (30)x(47)
10-14	15-19		-3,788	h_{-1}	24,588	18.97	-11	-121
15-19	20-24		-644	-814	13,254	21.10	-79	-908
20-24	25-29		-454	-1,263	-353	21.99	-150	-1,333
25-29	30-34		-328	-1,640	-257	20.69	-157	-865
30-39	35-44		-1,186	-2,664	-702	19.24	-350	-791
40-49	45-54	-270	-1,011	-2,714	-1,525	18.39	-373	362
50-54	55-59	-483	-449	-457	-1,277	17.88	-195	-196
55-59	60-64	-1,312	-814	-274	-2,141	18.01	-181	267
60+	65+	-3,581	-3,306	-370	-6,569	16.30	-438	75
Total		-5,646	-11,980	-10,197	25,018	19.61	-1,934	-3,510

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Table 7 (continued)

Age of cohorts		Components of change in manufacturing (continued)						
		C	D	C_1	D_1	C_2 and D_2	E	Natural increase
1952.5	1957.5	(50)= (31)x(47)	(51)= (32)x(47)	(52)= (33)x(47)	(53)= (34)x(47)	(54)=(35)x(47) =(50)-(52) or =(51)-(53)	(55)=(11) -(48)-(49) -(50)-(51)	(56)=(37) x(47)=(48) +(52)+(53)
10-14	15-19	3,764		4,500		-736	h_1	4,489
15-19	20-24	5,746		5,792		-47	1,322	5,713
20-24	25-29	1,095		411		684	135	261
25-29	30-34	1,124		642		482	643	485
30-39	35-44	892		608		284	581	258
40-49	45-54		-65		-244	179	259	-617
50-54	55-59		-125		-226	101	-39	-421
55-59	60-64		-361		-359	-2	107	-540
60+	65+		-1,012		-707	-305	-51	-1,145
Total		12,621	-1,563	11,953	-1,536	640	2,958	8,483

Source:

Column 13 - Table 1, Column 16   Column 17 - Table 1, Column 21
"   14 -   "   "   17   "   18 -   "   "   23
"   15 -   "   "   18   "   19 -   "   "   24
"   16 -   "   "   19   "   27 -   "   "   8

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Table 8. Estimated components of change in industry groups of the labor force by sex: Puerto Rico, central quinquennium of the intercensal interval, 1950-60.

Components of change	Both sexes: Quinquennial changes					
	Total labor force (1)	Agricultural sector (div. 0) (2)	Nonagricultural sector total (3)	Mining, etc. (div. 1) (4)	Manufacturing (div. 2-3) (5)	Construction (div. 4) (6)
1) Net change	-658	-40,784	40,126	-38	1,505	9,969
2) A. Mortality	-21,603	-7,946	-13,657	-50	-2,784	-1,388
3) B. Migration	-75,158	-43,095	-32,063	-79	-9,118	-1,995
4) C. Net entries in cohorts of net entry	125,002[a]	34,545	92,093	220	22,852	7,092
5) D. Net retirements in cohorts of net retirement	-28,898[a]	-13,174	-17,360	-35	-3,497	-1,154
Entries and retirements at constant age-specific rates:						
6) C_1. Net entries	132,852	39,471	93,381	193	23,371	6,747
7) D_1. Net retirements	-25,619	-5,996	-19,623	-36	-4,364	-1,213
8) Effects of changing entry and retirement rates (C_2 and D_2)	-11,129	-12,099	970	30	344	405
9) E. Inter-industry shifts (component E)		-11,114	11,113	-94	-5,948	7,414
10) Natural increase ($A + C_1 + D_1$)	85,630	25,529	60,101	107	16,223	4,146

[a]Components C and D for the total labor force are not equal to the sums of agricultural and non-agricultural sectors. See page 20 for explanation of this result when estimation procedure 2 is used, as it was for Puerto Rican males.

Table 8 (continued)

Components of change	Both sexes: Quinquennial changes					
	Electricity, etc. (div. 5) (7)	Commerce, etc. (div. 6) (8)	Transport, etc. (div. 7) (9)	Services (div. 8) (10)	Not specified (div. 9) (11)	Unemployed (12)
1) Net change	2,329	6,347	1,804	13,722	51	4,437
2) A. Mortality	-321	-2,784	-904	-4,121	-296	-1,009
3) B. Migration	-502	-4,059	-1,650	-10,989	-597	-3,074
4) C. Net entries in cohorts of net entry	1,345	13,032	3,975	27,299	2,829	13,449
5) D. Net retirements in cohorts of net retirement	-265	-3,438	-639	-6,659	-540	-1,133
Entries and retirements at constant age-specific rates:						
6) C_1. Net entries	1,195	12,811	3,470	28,291	3,137	14,166
7) D_1. Net retirements	-286	-3,454	-730	-7,830	-517	-1,193
8) Effects of changing entry and retirement rates (C_2 and D_2)	172	235	598	178	-333	-659
9) E. Inter-industry shifts (component E)	2,072	3,596	1,022	8,192	-1,345	-3,796
10) Natural increase ($A + C_1 + D_1$)	588	6,573	1,836	16,340	2,324	11,964

Table 8 (continued)

Components of change	Males: Quinquennial changes					
	Total labor force (1)	Agricultural sector (div. 0) (2)	Nonagricultural sector total (3)	Mining, etc. (div. 1) (4)	Manufacturing (div. 2-3) (5)	Construction (div. 4) (6)
1) Net change	-3,931	-39,996	36,065	-31	8,572	9,615
2) A. Mortality	-18,338	-7,838	-10,500	-50	-1,934	-1,352
3) B. Migration	-59,313	-42,833	-16,480	-79	-3,510	-1,857
4) C. Net entries in cohorts of net entry	94,223	33,735	62,124	216	12,621	6,944
5) D. Net retirements in cohorts of net retirement	-20,499	-12,863	-9,272	-35	-1,563	-1,069
Entries and retirements at constant age-specific rates:						
6) C_1. Net entries	97,812	38,502	59,310	188	11,953	6,580
7) D_1. Net retirements	-14,572	-5,646	-8,926	-36	-1,536	-1,112
8) Effects of changing entry and retirement rates (C_2 and D_2)	-9,516	-11,980	2,464	31	640	406
9) E. Inter-industry shifts (component E)		-10,197	10,193	-83	2,958	6,949
10) Natural increase ($A + C_1 + D_1$)	64,902	25,018	39,884	102	8,483	4,116

Table 8 (continued)

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Components of change	Males: Quinquennial changes					
	Electricity, etc. (div. 5) (7)	Commerce, etc. (div. 6) (8)	Transport, etc. (div. 7) (9)	Services (div. 8) (10)	Not specified (div. 9) (11)	Unemployed (12)
1) Net change	2,148	3,241	1,345	9,115	-419	2,479
2) A. Mortality	-311	-2,508	-868	-2,436	-185	-856
3) B. Migration	-433	-2,689	-1,443	-4,081	-289	-2,099
4) C. Net entries in cohorts of net entry	1,267	10,675	3,764	14,324	1,814	10,499
5) D. Net retirements in cohorts of net retirement	-243	-2,721	-550	-2,052	-249	-790
Entries and retirements at constant age-specific rates:						
6) C_1. Net entries	1,118	10,161	3,252	13,502	1,903	10,653
7) D_1. Net retirements	-253	-2,491	-601	-1,989	-200	-708
8) Effects of changing entry and retirement rates (C_2 and D_2)	157	284	564	758	-140	-236
9) E. Inter-industry shifts (component E)	1,868	484	442	3,360	-1,510	-4,275
10) Natural increase ($A + C_1 + D_1$)	554	5,162	1,783	9,077	1,518	9,089

Source: (for males)
         Column 1 – Table 7, Column 20, 26
           "   2 –   "   "   3, 38, 46
           "   3 –   "   "   7, 29, 37
           "   5 –   "   "   11, 48, 56

Table 8 (continued)

Components of change	Females: Quinquennial changes					
	Total labor force (1)	Agricultural sector (div. 0) (2)	Nonagricultural sector total (3)	Mining, etc. (div. 1) (4)	Manufacturing (div. 2-3) (5)	Construction (div. 4) (6)
1) Net change	3,273	-788	4,061	-7	-7,067	354
2) A. Mortality	-3,265	-108	-3,157		-850	-36
3) B. Migration	-15,845	-262	-15,583		-5,608	-138
4) C. Net entries in cohorts of net entry	30,779	810	29,969	4	10,231	148
5) D. Net retirements in cohorts of net retirement	-8,399	-311	-8,088		-1,934	-85
Entries and retirements at constant age-specific rates:						
6) C_1. Net entries	35,040	969	34,071	5	11,418	167
7) D_1. Net retirements	-11,047	-350	-10,697		-2,828	-101
8) Effects of changing entry and retirement rates (C_2 and D_2)	-1,613	-119	-1,494	-1	-296	-1
9) E. Inter-industry shifts (component E)		-917	920	-11	-8,906	465
10) Natural increase ($A + C_1 + D_1$)	20,728	511	20,217	5	7,740	30

Table 8 (continued)

Components of change	Females: Quinquennial changes					
	Electri-city, etc. (div. 5) (7)	Commerce, etc. (div. 6) (8)	Transport, etc. (div. 7) (9)	Services. (div. 8) (10)	Not speci-fied (div. 9) (11)	Unem-ployed (12)
1) Net change	181	3,106	459	4,607	470	1,958
2) A. Mortality	-10	-276	-36	-1,685	-111	-153
3) B. Migration	-69	-1,370	-207	-6,908	-308	-975
4) C. Net entries in cohorts of net entry	78	2,357	211	12,975	1,015	2,950
5) D. Net retirements in co-horts of net retirement	-22	-717	-89	-4,607	-291	-343
Entries and retirements at constant age-specific rates:						
6) C_1. Net entries	77	2,650	218	14,789	1,234	3,513
7) D_1. Net retirements	-33	-963	-129	-5,841	-317	-485
8) Effects of changing entry and retirement rates (C_2 and D_2)	15	-49	34	-580	-193	-423
9) E. Inter-industry shifts (component E)	204	3,112	580	4,832	165	479
10) Natural increase ($A + C_1 + D_1$)	34	1,411	53	7,263	806	2,875

Table 8 (continued)

Components of change	Both sexes: Annual rates of change					
	Total labor force (1)	Agricultural sector (div. 0) (2)	Nonagricultural sector total (3)	Mining, etc. (div. 1) (4)	Manufacturing (div. 2-3) (5)	Construction (div. 4) (6)
1) Net change	-.02	-4.68	1.92	-.53	.30	5.40
2) A. Mortality	-.73	-.91	-.65	-.70	-.56	-.75
3) B. Migration	-2.53	-4.95	-1.53	-1.10	-1.83	-1.08
4) C. Net entries in cohorts of net entry	4.22	3.97	4.40	3.06	4.59	3.84
5) D. Net retirements in cohorts of net retirement	-.97	-1.51	-.83	-.49	-.70	-.62
Entries and retirements at constant age-specific rates:						
6) C_1. Net entries	4.48	4.53	4.46	2.69	4.69	3.65
7) D_1. Net retirements	-.86	-.69	-.94	-.50	-.88	-.66
8) Effects of changing entry and retirement rates (C_2 and D_2)	-.38	-1.39	.05	.42	.07	.22
9) E. Inter-industry shifts (component E)		-1.28	.53	-1.31	-1.19	4.01
10) Natural increase ($A + C_1 + D_1$)	2.89	2.93	2.87	1.49	3.26	2.24

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Table 8 (continued)

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Components of change	Both sexes: Annual rates of change					
	Electricity, etc. (div. 5) (7)	Commerce, etc. (div. 6) (8)	Transport, etc. (div. 7) (9)	Services (div. 8) (10)	Not specified (div. 9) (11)	Unemployed (12)
1) Net change	5.20	1.84	1.33	2.05	.14	2.55
2) A. Mortality	-.72	-.81	-.66	-.62	-.80	-.58
3) B. Migration	-1.12	-1.18	-1.22	-1.64	-1.62	-1.78
4) C. Net entries in cohorts of net entry	3.01	3.78	2.93	4.08	7.68	7.75
5) D. Net retirements in cohorts of net retirement	-.59	-1.00	-.47	-.99	-1.47	-.65
Entries and retirements at constant age-specific rates:						
6) C_1. Net entries	2.68	3.72	2.56	4.23	8.52	8.16
7) D_1. Net retirements	-.64	-1.00	-.54	-1.17	-1.40	-.69
8) Effects of changing entry and retirement rates (C_2 and D_2)	.38	.07	.44	.03	-.90	-.38
9) E. Inter-industry shifts (component E)	4.63	1.04	.75	1.22	-3.66	-2.20
10) Natural increase ($A + C_1 + D_1$)	1.31	1.91	1.35	2.44	6.31	6.90

Table 8 (continued)

Components of change	Males: Annual rates of change					
	Total labor force (1)	Agricultural sector (div. 0) (2)	Nonagricultural sector total (3)	Mining, etc. (div. 1) (4)	Manufacturing (div. 2-3) (5)	Construction (div. 4) (6)
1) Net change	-.17	-4.68	2.56	-.44	3.10	5.29
2) A. Mortality	-.81	-.92	-.75	-.70	-.70	-.74
3) B. Migration	-2.62	-5.01	-1.17	-1.11	-1.27	-1.02
4) C. Net entries in cohorts of net entry	4.16	3.94	4.41	3.04	4.57	3.82
5) D. Net retirements in cohorts of net retirement	-.91	-1.50	-.66	-.49	-.57	-.59
Entries and retirements at constant age-specific rates:						
6) C_1. Net entries	4.32	4.50	4.21	2.65	4.33	3.62
7) D_1. Net retirements	-.64	-.66	-.63	-.51	-.56	-.61
8) Effects of changing entry and retirement rates (C_2 and D_2)	-.42	-1.40	.17	.44	.23	.22
9) E. Inter-industry shifts (component E)		-1.19	.72	-1.17	1.07	3.83
10) Natural increase ($A + C_1 + D_1$)	2.87	2.93	2.83	1.44	3.07	2.27

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Table 8 (continued)

Components of change	Males: Annual rates of change					
	Electricity, etc. (div. 5) (7)	Commerce, etc. (div. 6) (8)	Transport, etc. (div. 7) (9)	Services (div. 8) (10)	Not specified (div. 9) (11)	Unemployed (12)
1) Net change	5.12	1.14	1.06	2.71	-1.95	1.87
2) A. Mortality	-.74	-.88	-.68	-.72	-.86	-.65
3) B. Migration	-1.03	-.95	-1.13	-1.21	-1.35	-1.58
4) C. Net entries in cohorts of net entry	3.02	3.76	2.96	4.26	8.46	7.92
5) D. Net retirements in cohorts of net retirement	-.58	-.96	-.43	-.61	-1.16	-.60
Entries and retirements at constant age-specific rates:						
6) C_1. Net entries	2.66	3.57	2.55	4.02	8.88	8.03
7) D_1. Net retirements	-.60	-.88	-.47	-.59	-.93	-.53
8) Effects of changing entry and retirement rates (C_2 and D_2)	.37	.10	.44	.23	-.65	-.18
9) E. Inter-industry shifts (component E)	4.45	.17	.35	1.00	-7.04	-3.22
10) Natural increase ($A + C_1 + D_1$)	1.32	1.82	1.40	2.70	7.08	6.85

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Table 8 (continued)

Components of change	Females: Annual rates of change					
	Total labor force (1)	Agricultural sector (div. 0) (2)	Nonagricultural sector total (3)	Mining, etc. (div. 1) (4)	Manufacturing (div. 2-3) (5)	Construction (div. 4) (6)
1) Net change	.47	-5.09	.59	-7.78	-3.19	11.38
2) A. Mortality	-.47	-.70	-.46		-.38	-1.16
3) B. Migration	-2.26	-1.69	-2.27		-2.53	-4.44
4) C. Net entries in cohorts of net entry	4.39	5.23	4.37	4.44	4.61	4.76
5) D. Net retirements in cohorts of net retirement	-1.20	-2.01	-1.18		-.87	-2.73
Entries and retirements at constant age-specific rates:						
6) C_1. Net entries	5.00	6.26	4.97	5.56	5.15	5.37
7) D_1. Net retirements	-1.58	-2.26	-1.56		-1.27	-3.25
8) Effects of changing entry and retirement rates (C_2 and D_2)	-.23	-.77	-.22	-1.11	-.13	-.03
9) E. Inter-industry shifts (component E)		-5.93	.13	-12.22	-4.02	14.95
10) Natural increase ($A + C_1 + D_1$)	2.96	3.30	2.95	5.56	3.49	.96

Table 8 (continued)

Components of change	Females: Annual rates of change					
	Electri-city, etc. (div. 5) (7)	Commerce, etc. (div. 6) (8)	Transport, etc. (div. 7) (9)	Services (div. 8) (10)	Not speci-fied (div. 9) (11)	Unem-ployed (12)
1) Net change	6.73	5.14	5.44	1.38	3.06	4.79
2) A. Mortality	-.37	-.46	-.43	-.51	-.72	-.37
3) B. Migration	-2.56	-2.27	-2.45	-2.07	-2.01	-2.39
4) C. Net entries in cohorts of net entry	2.90	3.90	2.50	3.90	6.62	7.22
5) D. Net retirements in co-horts of net retirement	-.82	-1.19	-1.06	-1.38	-1.90	-.84
Entries and retirements at constant age-specific rates:						
6) C_1. Net entries	2.86	4.39	2.58	4.44	8.05	8.60
7) D_1. Net retirements	-1.23	-1.59	-1.53	-1.75	-2.07	-1.19
8) Effects of changing entry and retirement rates (C_2 and D_2)	.56	-.08	.40	-.17	-1.26	-1.04
9) E. Inter-industry shifts (component E)	7.58	5.15	6.88	1.45	1.08	1.17
10) Natural increase ($A + C_1 + D_1$)	1.26	2.34	.63	2.18	5.26	7.04

Table 9. Projection of natural increase of working-age population and labor force: Puerto Rico males, urban and rural, 1960-1965.

Age		Population, 1960		Labor force, 1960		Activity rates, 1960		Activity rates, 1965		Survival rates, 1960-65[a]
1960	1965	Urban (1)	Rural (2)	Urban (3)	Rural (4)	Urban (5)= (3)÷(1)	Rural (6)= (4)÷(2)	Urban (7)=(5), age x+5	Rural (8)=(6), age x+5	(9)
10-14	15-19	62,628	101,668					22.02	31.48	99.52
15-19	20-24	49,844	75,008	10,976	23,616	22.02	31.48	70.52	80.80	99.23
20-24	25-29	36,716	41,780	25,892	33,756	70.52	80.80	83.65	86.77	98.92
25-29	30-34	31,200	29,112	26,100	25,260	83.65	86.77	88.50	89.48	98.70
30-34	35-39	30,184	28,676	26,712	25,660	88.50	89.48	90.12	89.71	98.41
35-39	40-44	30,564	30,816	27,544	27,644	90.12	89.71	90.29	89.22	97.92
40-44	45-49	25,584	28,580	23,100	25,500	90.29	89.22	90.01	88.67	97.28
45-49	50-54	24,512	30,508	22,064	27,052	90.01	88.67	86.25	86.63	96.10
50-54	55-59	18,444	22,432	15,908	19,432	86.25	86.63	81.16	82.14	94.42
55-59	60-64	15,288	19,128	12,408	15,712	91.16	82.14	64.56	64.97	92.20
60-64	65-69	12,664	15,896	8,176	10,328	94.56	64.97	38.01	41.59	88.81
65-69	70-74	10,272	13,456	3,904	5,596	38.01	41.59	23.90	26.60	83.67
70+	75+	14,984	19,356	2,752	3,756	18.37	19.40	13.28	13.67	63.08
Total 15+		300,256	354,748	205,536	243,312	56.64	53.31	56.64	53.31	

[a]Computed from L_x values of the Puerto Rico 1959/61 life table. The survival rate is calculated as the ratio, $L_{x+5} \div L_x$.

Table 9 (continued)

Age		Projected population, 1965		Projected labor force, 1965		Natural increase of labor force, 1960-65		Natural increase of population 15+, 1960-65	
1960	1965	Urban (10)= (1)x(9)	Rural (11)= (2)x(9)	Urban (12)= (10)x(7)	Rural (13)= (11)x(8)	Urban (14)= (12)-(3)	Rural (15)= (13)-(4)	Urban (16)= (10)-(1)	Rural (17)= (11)-(2)
10-14	15-19	62,327	101,180	13,725	31,857	13,725	31,857	62,327	101,180
15-19	20-24	49,460	74,430	34,879	60,136	23,903	36,520	-384	-578
20-24	25-29	36,319	41,329	30,382	35,860	4,490	2,104	-397	-451
25-29	30-34	30,794	28,734	27,252	25,712	1,152	452	-406	-378
30-34	35-39	29,704	28,220	26,769	25,315	57	-345	-480	-456
35-39	40-44	29,928	30,175	27,022	26,923	-522	-721	-636	-641
40-44	45-49	24,888	27,803	22,402	24,653	-698	-847	-696	-777
45-49	50-54	23,556	29,318	20,317	25,397	-1,747	-1,655	-956	-1,190
50-54	55-59	17,415	21,180	14,134	17,397	-1,774	-2,035	-1,029	-1,252
55-59	60-64	14,096	17,636	9,101	11,458	-3,307	-4,254	-1,192	-1,492
60-64	65-69	11,247	14,117	4,275	5,871	-3,901	-4,457	-1,417	-1,779
65-69	70-74	8,595	11,259	2,054	2,994	-1,850	-2,602	-1,677	-2,197
70+	75+	9,452	12,210	1,255	1,669	-1,497	-2,087	-5,532	-7,146
Total 15+		347,781	437,591	233,567	295,242	28,031	51,930	47,525	82,843
Sum of cohorts of net increment						43,327	70,933	62,327	101,180
Sum of cohorts of net decrement						-15,296	-19,003	-14,802	-18,337

Table 10. Distribution of projected natural increase of labor force by industry groups: Puerto Rico males, 1960-65.

Age		1960 labor force								
1960	1965	Total	Agricultural sector (div. 0)	Nonagricultural sector	Mining, etc. (div. 1)	Manufacturing (div. 2-3)	Construction (div. 4)	Electricity, etc. (div. 5)	Commerce, etc. (div. 6)	Transport, etc. (div. 7)
		(1)	(2)	(3)= (1)-(2)	(4)	(5)	(6)	(7)	(8)	(9)
10-14	15-19									
15-19	20-24	34,592	15,687	18,905	23	3,668	2,469	291	3,233	687
20-24	25-29	59,648	15,264	44,384	160	10,012	5,900	1,084	6,464	2,448
25-29	30-34	51,360	10,188	41,172	144	9,260	4,976	1,204	6,668	3,400
30-34	35-39	52,372	11,524	40,848	204	8,912	5,508	1,492	7,180	3,880
35-44	40-49	103,788	26,412	77,376	392	15,036	11,804	3,088	14,392	8,280
45-54	50-59	84,456	27,308	57,148	344	10,340	10,084	2,132	12,096	5,524
55-59	60-64	28,120	10,424	17,696	72	3,080	2,900	620	4,132	1,516
60-64	65-69	18,504	7,224	11,280	16	2,100	1,600	468	2,984	672
65+	70+	16,008	7,020	8,988	28	1,404	708	164	2,940	404
Total 15+		448,848	131,051	317,797	1,383	63,812	45,949	10,543	60,089	26,811

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Table 10 (continued)

Age		1960 labor force				Natural increase of labor force 1960-65			
1960	1965	Services (div. 8)	Not classified (div. 9)	Unemployed	Nonag. sector per 100 urban	Total	Urban	Rural	Agricultural sector
		(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)= (14)-(18)
10-14	15-19				172.24[a]	45,582	13,725	31,857	21,942
15-19	20-24	4,293	869	3,372	172.24	60,423	23,903	36,520	19,253
20-24	25-29	10,124	640	7,552	171.42	6,594	4,490	2,104	-1,103
25-29	30-34	10,300	404	4,816	157.75	1,604	1,152	452	-213
30-34	35-39	10,576	440	2,656	152.92	-288	57	-345	-375
35-44	40-49	19,384	564	4,436	152.78	-2,788	-1,220	-1,568	-924
45-54	50-59	12,944	500	3,184	150.50	-7,211	-3,521	-3,690	-1,912
55-59	60-64	4,052	152	1,172	142.62	-7,561	-3,307	-4,254	-2,845
60-64	65-69	2,496	112	832	137.96	-8,358	-3,901	-4,457	-2,976
65+	70+	2,172	184	984	135.04	-8,036	-3,347	-4,689	-3,516
Total 15+		76,341	3,865	29,004	154.62	79,961	28,031	51,930	27,331
Sum of cohorts of net increment						114,203	43,327	70,933	41,195
Sum of cohorts of net decrement						-34,242	-15,296	-19,003	-13,864

[a]The ratio for 10-14 is assumed to be the same as for 15-19.

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Table 10 (continued)

Age		Natural increase of labor force 1960-65					
1960	1965	Nonagricultural sector (18)= (16)x(13)	Mining, etc. (div. 1) (19)= (4)x(28)	Manufacturing (div. 2-3) (20)= (5)x(28)	Construction (div. 4) (21)	Electricity, etc. (div. 5) (22)	Commerce, etc. (div. 6) (23)
10-14	15-19	23,640	29	4,587	3,087	364	4,043
15-19	20-24	41,170	50	7,988	5,377	634	7,041
20-24	25-29	7,697	28	1,736	1,023	188	1,121
25-29	30-34	1,817	6	409	220	53	294
30-34	35-39	87		19	12	3	15
35-44	40-49	-1,864	-9	-362	-284	-74	-347
45-54	50-59	-5,299	-32	-959	-935	-198	-1,122
55-59	60-64	-4,716	-19	-821	-773	-165	-1,101
60-64	65-69	-5,382	-8	-1,002	-763	-223	-1,424
65+	70+	-4,520	-14	-706	-356	-82	-1,478
Total 15+		52,630	31	10,889	6,608	500	7,042
Sum of cohorts of net increment		74,411	113	14,739	9,719	1,242	12,514
Sum of cohorts of net decrement		-21,781	-82	-3,850	-3,111	-742	-5,472

Table 10 (continued)

Age		Natural increase of labor force 1960-65				Natural increase of nonag. sector per 100 nonag. sector of 1960
1960	1965	Transport, etc. (div. 7) (24)	Services (div. 8) (25)	Not classified (div. 9) (26)	Unemployed (27)	(28)=(18)÷(3)
10-14	15-19	859	5,368	1,087	4,217	125.05[b]
15-19	20-24	1,496	9,347	1,892	7,343	217.77
20-24	25-29	425	1,756	111	1,310	17.34
25-29	30-34	150	455	18	213	4.41
30-34	35-39	8	23	1	6	.21
35-44	40-49	-200	-467	-14	-107	-2.41
45-54	50-59	-512	-1,200	-46	-295	-9.27
55-59	60-64	-404	-1,080	-41	-312	-26.65
60-64	65-69	-321	-1,191	-53	-397	-47.71
65+	70+	-203	-1,092	-93	-495	-50.29
Total 15+		1,298	11,919	2,862	11,483	16.56
Sum of cohorts of net increment		2,938	16,949	3,109	13,089	
Sum of cohorts of net decrement		-1,640	-5,030	-247	-1,606	

[b]The number in the nonagricultural sector, 10-14 years old, is assumed to be the same as the number of 15-19 year-olds in this sector. This is equivalent to distributing the natural increase for ages 10-14 in the nonagricultural sector according to the distribution for ages 15-19.

Table 11. Projections of natural increase of working-age population and labor force in urban and rural areas and of labor force by industry groups, by sex: Puerto Rico, 1950-55 and 1960-65.

Urban-rural residence and industry	Both sexes			Males		
	Total	Cohorts of net increment	Cohorts of net decrement	Total	Cohorts of net increment	Cohorts of net decrement
	(1)	(2)	(3)	(4)	(5)	(6)
	A. Five-year natural increase 1960-65					
Population 15+	263,107	322,961	-59,854	130,368	163,507	-33,139
Urban	96,179	125,233	-29,054	47,525	62,327	-14,802
Rural	166,928	197,728	-30,800	82,843	101,180	-18,337
Labor force	106,029	156,170	-50,141	79,961	114,260	-34,299
Urban	41,856	67,152	-25,296	28,031	43,327	-15,296
Rural	64,173	89,018	-24,845	51,930	70,933	-19,003
Agricultural sector (div. 0)	28,294[a]	42,500	-14,206	27,331[a]	41,195	-13,864
Nonagricultural sector	77,735[a]	115,016	-37,281	52,630[a]	74,411	-21,781
Mining, etc. (div. 1)	31	113	-82	31	113	-82
Manufacturing (div. 2-3)	17,355	24,652	-7,297	10,889	14,739	-3,850
Construction (div. 4)	6,807	10,006	-3,199	6,608	9,719	-3,111
Electricity, etc. (div. 5)	467	1,280	-813	500	1,242	-742
Commerce, etc. (div. 6)	9,237	16,407	-7,170	7,042	12,514	-5,472
Transport, etc. (div. 7)	1,240	3,110	-1,870	1,298	2,938	-1,640
Services (div. 8)	21,230	34,842	-13,612	11,919	16,949	-5,030
Not classified (div. 9)	4,615	5,329	-714	2,862	3,109	-247
Unemployed	16,758	19,280	-2,522	11,483	13,089	-1,606

[a]Natural increases of the total and male labor force (urban plus rural) are not equal to the sums of agricultural and nonagricultural sectors, for reasons corresponding to those stated on page 20 with regard to the use of Procedure 2 in the component analysis.

Table 11 (continued)

Urban-rural residence and industry	Females			Both sexes		
	Total	Cohorts of net increment	Cohorts of net decrement	Total	Cohorts of net increment	Cohorts of net decrement
	(7)	(8)	(9)	(1)	(2)	(3)
	A. Five-year natural increase 1960-65			B. Five-year natural increase 1950-55		
Population 15+	132,739	159,454	-26,715	200,108	268,650	-68,542
Urban	48,654	62,906	-14,252	64,421	94,757	-30,336
Rural	84,085	96,548	-12,463	135,687	173,893	-38,206
Labor force	26,068	41,910	-15,842	91,373	135,350	-43,977
Urban	13,825	23,825	-10,000	30,922	50,472	-19,550
Rural	12,243	18,085	-5,842	60,451	84,878	-24,427
Agricultural sector (div. 0)	963	1,305	-342	35,070[a]	50,574	-15,504
Nonagricultural sector	25,105	40,605	-15,500	56,303[a]	85,013	-28,710
Mining, etc. (div. 1)				115	192	-77
Manufacturing (div. 2-3)	6,466	9,913	-3,447	16,771	23,928	-7,157
Construction (div. 4)	199	287	-88	1,283	3,042	-1,759
Electricity, etc. (div. 5)	-33	38	-71	145	546	-401
Commerce, etc. (div. 6)	2,195	3,893	-1,698	5,778	10,881	-5,103
Transport, etc. (div. 7)	-58	172	-230	1,271	2,530	-1,259
Services (div. 8)	9,311	17,893	-8,582	15,368	25,755	-10,387
Not classified (div. 9)	1,753	2,220	-467	2,344	3,133	-789
Unemployed	5,275	6,191	-916	13,232	15,003	-1,771

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Table 11 (continued)

Urban-rural residence and industry	Males			Females		
	Total (4)	Cohorts of net increment (5)	Cohorts of net decrement (6)	Total (7)	Cohorts of net increment (8)	Cohorts of net decrement (9)
B. Five-year natural increase 1950-55						
Population 15+	101,387	137,684	-36,297	98,721	130,966	-32,245
Urban	32,226	46,816	-14,590	32,195	47,941	-15,746
Rural	69,161	90,868	-21,707	66,526	83,025	-16,499
Labor force	70,957	100,448	-29,491	20,416	34,902	-14,486
Urban	21,980	33,421	-11,441	8,942	17,051	-8,109
Rural	48,977	67,027	-18,050	11,474	17,851	-6,377
Agricultural sector (div. 0)	34,481[a]	49,427	-14,946	589	1,147	-558
Nonagricultural sector	36,476[a]	51,289	-14,813	19,827	33,724	-13,897
Mining, etc. (div. 1)	109	184	-75	6	8	-2
Manufacturing (div. 2-3)	6,551	9,161	-2,610	10,220	14,767	-4,547
Construction (div. 4)	1,289	3,018	-1,729	-6	24	-30
Electricity, etc. (div. 5)	134	506	-372	11	40	-29
Commerce, etc. (div. 6)	5,526	9,642	-4,116	252	1,239	-987
Transport, etc. (div. 7)	1,257	2,385	-1,128	14	145	-131
Services (div. 8)	7,764	10,981	-3,217	7,604	14,774	-7,170
Not classified (div. 9)	1,861	2,282	-421	483	851	-368
Unemployed	11,986	13,129	-1,143	1,246	1,874	-628

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Table 11 (continued)

Urban-rural residence and industry	Females			Both sexes		
	Total	Cohorts of net increment	Cohorts of net decrement	Total	Cohorts of net increment	Cohorts of net decrement
	(7)	(8)	(9)	(1)	(2)	(3)
	C. Annual percent rate of natural increase 1960-65			D. Annual percent rate of natural increase 1950-55		
Population 15+	3.51	4.21	-.71	2.95	3.96	-1.01
Urban	2.64	3.41	-.77	2.18	3.21	-1.03
Rural	4.33	4.97	-.64	3.54	4.54	-1.00
Labor force	3.33	5.35	-2.02	2.86	4.23	-1.38
Urban	2.70	4.66	-1.96	2.25	3.68	-1.42
Rural	4.51	6.66	-2.15	3.31	4.65	-1.34
Agricultural sector (div. 0)	6.90	9.35	-2.45	3.02	4.35	-1.33
Nonagricultural sector	3.27	5.28	-2.02	2.78	4.18	-1.41
Mining, etc. (div. 1)				1.50	2.51	-1.01
Manufacturing (div. 2-3)	3.19	4.89	-1.70	3.15	4.49	-1.34
Construction (div. 4)	3.70	5.34	-1.64	.93	2.20	-1.27
Electricity, etc. (div. 5)	-.94	1.08	-2.02	.43	1.64	-1.20
Commerce, etc. (div. 6)	2.70	4.78	-2.08	1.76	3.32	-1.56
Transport, etc. (div. 7)	-.55	1.62	-2.17	.98	1.95	-.97
Services (div. 8)	2.45	4.72	-2.26	2.40	4.03	-1.63
Not classified (div. 9)	7.94	10.06	-2.12	5.53	7.40	-1.86
Unemployed	8.27	9.71	-1.44	7.17	8.13	-.96

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Table 11 (continued)

Urban-rural residence and industry	Males			Females		
	Total	Cohorts of net increment	Cohorts of net decrement	Total	Cohorts of net increment	Cohorts of net decrement
	(4)	(5)	(6)	(7)	(8)	(9)
	D.	Annual percent rate of natural increase 1950-55				
Population 15+	3.00	4.07	-1.07	2.91	3.86	-.95
Urban	2.33	3.39	-1.06	2.06	3.06	-1.01
Rural	3.46	4.54	-1.09	3.64	4.54	-.90
Labor force	2.88	4.08	-1.20	2.77	4.74	-1.97
Urban	2.32	3.53	-1.21	2.10	4.00	-1.90
Rural	3.23	4.42	-1.19	3.70	5.76	-2.06
Agricultural sector (div. 0)	3.02	4.33	-1.31	2.82	5.49	-2.67
Nonagricultural sector	2.76	3.89	-1.12	2.77	4.72	-1.94
Mining, etc. (div. 1)	1.45	2.45	-1.00	4.44	5.93	-1.48
Manufacturing (div. 2-3)	2.62	3.67	-1.05	3.62	5.22	-1.61
Construction (div. 4)	.94	2.21	-1.26	-.45	1.81	-2.26
Electricity, etc. (div. 5)	.42	1.60	-1.18	.61	2.22	-1.61
Commerce, etc. (div. 6)	1.96	3.42	-1.46	.55	2.72	-2.17
Transport, etc. (div. 7)	1.02	1.93	-.91	.23	2.35	-2.12
Services (div. 8)	2.50	3.54	-1.04	2.31	4.49	-2.18
Not classified (div. 9)	6.60	8.10	-1.49	3.41	6.00	-2.59
Unemployed	7.98	8.74	-.76	3.64	5.47	-1.83

Source: (for males)
         Population 15+:   Urban - Table 9, column 16
                          Rural -   "   9,   "   17
         Labor force: Urban -   "   9,   "   14
                          Rural -   "   9,   "   15
                          Agricultural and
                          nonagricultural
                          industries - Table 10, columns (17)-(27)

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Table 12. Comparison of annual percent rates of natural increase of working-age
population and labor force in Puerto Rico according to 1950-55 and
1960-65 projections and according to analysis of components of change
during the central quinquennium of the intercensal interval, 1950-60.

Sex, urban-rural residence and industry	Projections			Component analysis 1950-60[b]	Differ-ence
	1950-55 (1)	1960-65 (2)	1950-60[a] (3)	(4)	(3)-(4)
Males					
Population 15+	3.00	3.62	3.16	3.48	-.32
Urban	2.33	2.93	2.48	2.63	-.15
Rural	3.46	4.18	3.64	4.15	-.51
Labor force	2.88	3.27	2.98	2.87	.11
Urban	2.32	2.55	2.38	2.34	.04
Rural	3.23	3.86	3.39	3.25	.14
Agricultural sector (div. 0)	3.02	3.78	3.15	2.92	.23
Nonagricultural sector	2.76	3.06	2.85	2.83	.02
Mining, etc. (div. 1)	1.45	.44	1.22	1.44	-.22
Manufacturing (div. 2-3)	2.62	3.14	2.79	3.07	-.28
Construction (div. 4)	.94	2.68	1.60	2.27	-.67
Electricity, etc. (div. 5)	.42	.93	.61	1.31	-.70
Commerce (div. 6)	1.96	2.21	2.03	1.82	.21
Transport, etc. (div. 7)	1.02	.95	1.00	1.40	-.40
Services (div. 8)	2.50	2.90	2.62	2.70	-.08
Not specified (div. 9)	6.60	10.81	7.61	7.07	-.54
Unemployed	7.98	6.61	7.60	6.85	.75

[a]Estimated by interpolation of 1950-55 and 1960-65 projections.

[b]Rates calculated for the central quinquennium, taken to represent averages for
the intercensal decade.

Source: Column 1 - Table 11, Part D, Column 4
       "   2 -   "   11,   "   C,   "   4
       "   4 -   "   8,   "   B (natural increase)

Table 12 (continued)

Sex, urban-rural residence and industry	Projections			Component analysis 1950-60[b]	Differ-ence
	1950-55 (1)	1960-65 (2)	1950-60[a] (3)	(4)	(3)-(4)
Females					
Population 15+	2.91	3.51	3.07	3.34	-.27
Urban	2.06	2.64	2.22	2.33	-.11
Rural	3.64	4.33	3.82	4.29	-.47
Labor force	2.77	3.33	2.92	2.96	-.04
Urban	2.10	2.70	2.27	2.34	-.07
Rural	3.70	4.51	3.88	3.99	-.11
Agricultural sector (div. 0)	2.83	6.91	3.57	3.30	.27
Nonagricultural sector	2.77	3.27	2.90	2.95	-.05
Mining, etc. (div. 1)	4.44		3.48	5.56	-2.08
Manufacturing (div. (2-3)	3.62	3.19	3.53	3.49	.04
Construction (div. 4)	-.45	3.72	1.93	.96	.97
Electricity, etc. (div. 5)	.61	-.94	0.00	1.12	-1.12
Commerce (div. 6)	.55	2.70	1.35	2.33	-.98
Transport, etc. (div. 7)	.23	-.55	-.55	.59	-1.14
Services (div. 8)	2.31	2.45	2.35	2.18	-.17
Not specified (div. 9)	3.41	7.94	4.96	5.25	-.29
Unemployed	3.64	8.27	5.41	7.04	-1.63

Source: Column 1 - Table 11, Part D, Column 7
      "   2 -   "   11, "   C,   "   7
      "   4 -   "   8, "   B (natural increase)

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Table 13. Components of change in the population 15 years of age and over and in the labor force, by sex: Puerto Rico, 1950-60.

Components	Annual amounts of change			Annual percent rates		
	Both sexes	Males	Females	Both sexes	Males	Females
Population 15 years & over:						
Natural increase	44,322	22,293	22,029	3.4	3.5	3.3
Net emigration	-35,269	-19,372	-15,897	-2.7	-3.0	-2.4
Net change	9,053	2,921	6,132	.7	.5	.9
Labor force:						
Natural increase	17,126	12,980	4,146	2.9	2.9	3.0
Net emigration	-15,032	-11,863	-3,169	-2.5	-2.6	-2.3
Effect of changing age-specific activity rates	-2,226	-1,903	-323	-.4	-.4	-.2
Net change	-131	-785	654	0	-.2	.5

Source: Labor force: Table 2.

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Table 14. Annual percent rates of net emigration (-) or immigration (+),
by sex and age: Puerto Rico, 1950-60.

Age of cohort	Population			Labor force		
	Both sexes	Male	Female	Both sexes	Male	Female
10-14 to 15-19	-2.9	-3.5	-2.4	-3.5	-4.2	-1.9
15-19 to 20-24	-5.0	-6.2	-3.8	-5.8	-6.9	-3.4
20-24 to 25-29	-5.4	-5.9	-5.1	-5.7	-6.1	-4.8
25-29 to 30-34	-3.0	-3.1	-3.0	-3.0	-3.1	-2.7
30-39 to 35-44	-1.6	-2.0	-1.3	-1.8	-2.0	-1.1
40-49 to 45-49	+.1	+.4	-0.3	+0.3	+0.4	-0.0
50-59 to 55-64	-.1	-.1	-0.2	-0.0	-0.0	-0.3
60+ to 65+	-.1	0.0	-0.1	-0.5	-0.1	-0.5
Total, 10+ to 15+	-2.4	-2.7	-2.2	-2.5	-2.6	-2.3

Source: Male labor force: Table 7, column 21.

Table 15. Gross years of active life by sex and age: Puerto Rico, 1950-60.

	Males				Females			
	15+	15-24	25-54	55+	15+	15-24	25-54	55+
Total								
1950	45.81	5.89	25.84	14.08	11.17	2.44	6.94	1.79
1960	42.88	5.18	26.47	11.22	11.44	2.13	7.44	1.87
Change	-2.93	-.71	+.63	-2.86	+.27	-.31	+.50	+.08
Urban								
1950	42.24	5.14	24.66	12.44	14.22	2.89	9.06	2.26
1960	42.09	4.63	26.44	11.02	15.20	2.77	9.99	2.45
Change	-.15	-.51	+1.78	-1.42	+.98	-.12	+.93	+.19
Rural								
1950	48.24	6.38	26.75	15.12	8.37	2.04	5.00	1.32
1960	43.51	5.61	26.52	11.38	7.54	1.53	4.80	1.21
Change	-4.73	-.77	-.23	-3.74	-.83	-.51	-.20	-.11

Source: Males: Table 9, columns 5-6.

Table 16. Components of change in the population 15 years of age and over and in the labor force by sex, urban and rural: Puerto Rico, 1950-60.

Components	Urban			Rural		
	Both sexes	Males	Females	Both sexes	Males	Females

Annual amounts of change

Components	Both sexes	Males	Females	Both sexes	Males	Females
Population 15+						
Natural increase	14,829	7,367	7,462	29,493	14,926	14,567
Net migration	-6,073	-3,384	-2,689	-29,197	-15,988	-13,209
Net change	8,756	3,983	4,773	296	-1,062	1,358
Labor force						
Natural increase	6,556	4,493	2,063	10,570	8,487	2,083
Net migration	-3,330	-2,133	-1,197	-11,702	-9,730	-1,972
Effect of changing activity rates	964	368	596	-3,190	-2,272	-918
Net change	4,191	2,729	1,462	-4,321	-3,514	-807

Annual percent rates

Components	Both sexes	Males	Females	Both sexes	Males	Females
Population 15+						
Natural increase	2.5	2.6	2.3	4.2	4.2	4.3
Net migration	-1.0	-1.2	-.8	-4.2	-4.5	-3.9
Net change	1.5	1.4	1.5	0	-.3	.4
Labor force						
Natural increase	2.3	2.3	2.3	3.4	3.2	4.0
Net migration	-1.2	-1.1	-1.4	-3.7	-3.7	-3.8
Effect of changing activity rates	.3	.2	.7	-1.0	-.9	-1.8
Net change	1.5	1.4	1.7	-1.4	-1.4	-1.6

Source: Table 2.

Table 17. Annual percent rates of net migration of population of working ages, by sex and age: Puerto Rico, urban and rural, 1950-60.

Age of cohorts	Males		Females	
	Urban	Rural	Urban	Rural
10-14 to 15-19	-1.3	-4.8	+.7	-4.6
15-19 to 20-24	-2.7	-8.7	-1.5	-5.8
20-24 to 25-29	-3.0	-8.3	-3.9	-6.2
25-29 to 30-34	-2.2	-3.9	-2.1	-3.9
30-39 to 35-44	-1.1	-2.7	-.9	-1.7
40-49 to 45-54	+.8	-.1	+.4	-1.0
50-59 to 55-64	+.4	-.4	+.7	-1.1
60+ to 65+	+1.1	-.8	+.9	-1.2
Total	-1.0	-3.9	-.8	-3.5

Source: Urban males: Table 1, column 15.

Table 18. Shares of urban and rural areas and of industry divisions in the labor force, by sex: Puerto Rico, 1950-60.

Areas and industry divisions	Percent of total labor force of both sexes								
	Both sexes			Males			Females		
	1950	1960	Change	1950	1960	Change	1950	1960	Change
Total labor force	100.0	100.0		76.9	75.8	-1.1	23.1	24.2	+1.1
Urban	43.6	50.8	+7.2	30.0	34.7	+4.7	13.6	16.1	+2.5
Rural	56.4	49.2	-7.2	46.9	41.1	-5.8	9.5	8.1	-1.4
Agricultural sector	36.2	22.5	-13.7	35.5	22.1	-13.4	.7	.4	-.3
Nonagricultural sector, total	63.8	77.5	+13.7	41.4	53.7	+12.3	22.4	23.8	+1.4
"Growth industries"	17.8	25.5	+7.7	17.5	24.9	+7.4	.3	.6	+.3
Manufacturing (males)	7.9	10.8	+2.9	7.9	10.8	+2.9			
Construction	4.5	7.9	+3.4	4.5	7.8	+3.3	a	.2	+.2
Electricity, etc.	1.1	1.9	+.8	1.1	1.8	+.7	.1	.1	0
Transport, etc.	4.3	4.9	+.6	4.1	4.5	+.4	.2	.4	+.2
Remainder of nonagricultural sector	46.0	52.0	+6.0	23.9	28.8	+4.9	22.1	23.2	+1.1
Mining	.2	.2	0	.2	.2	0	a	a	a
Manufacturing (females)	8.7	6.3	-2.4				8.7	6.3	-2.4
Commerce, etc.	10.5	12.7	+2.2	9.0	10.1	+1.1	1.5	2.6	+1.1
Services	20.2	24.9	+4.7	9.8	12.9	+3.1	10.4	12.0	+1.6
Not specified	1.2	1.2	0	.8	.6	-.2	.4	.6	+.2
Unemployed	5.1	6.6	+1.5	4.1	4.9	+.8	1.0	1.7	+.7

[a]Less than .05 percent.

Source: 1960 males - Table 10, columns (1)-(12).

Table 19. Components of change in industry sectors of the labor force, both sexes: Puerto Rico, 1950-60.

Components	Total labor force	Agricul- tural sector	Total nonag. sector	Growth indus- tries	Remainder of nonag. sector	Females in manu- facturing
			Annual amounts of change			
Natural increase	+17,126	+5,106	+12,020	+3,011	+9,009	+1,548
Net entries (C_1)	+26,570	+7,894	+18,678	+4,673	+14,005	+2,284
Net retirements (D_1)	-5,124	-1,199	-3,925	-753	-3,172	-566
Mortality (A)	-4,321	-1,589	-2,731	-909	-1,822	-170
Net migration (B)	-15,032	-8,619	-6,413 ⎫			
Effects of changing acti- vity rates (C_2 and D_2)	-2,226	-2,420	+194 ⎬ +1,525		-5,521	-2,962
Net inter-industry shifts (E)		-2,223	+2,223 ⎭			
Net change	-131	-8,157	+8,025	+4,535	+3,490	-1,413
			Annual percent rates of change			
Natural increase	+2.9	+2.9	+2.9	+2.3	+3.1	+3.5
Net entries (C_1)	+4.5	+4.5	+4.5	+3.6	+4.8	+5.2
Net retirements (D_1)	-.9	-.7	-.9	-.6	-1.1	-1.3
Mortality (A)	-.7	-.9	-.7	-.7	-.6	-.4
Net migration (B)	-2.5	-5.0	-1.5 ⎫			
Effects of changing acti- vity rates (C_2 and D_2)	-.4	-1.4	0 ⎬ +1.3		-2.0	-6.6
Net inter-industry shifts (E)		-1.3	+.5 ⎭			
Net change	0	-4.7	+1.9	+3.5	+1.2	-3.2

Source: Table 8.

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