STAFF STUDY No. 1

Population and Labour Force Projections to 1970

by Frank T. Denton, Yoshiko Kasahara *and* Sylvia Ostry

prepared for the Economic Council of Canada

POPULATION AND LABOUR FORCE PROJECTIONS TO 1970

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Staff Study No. 1

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PART I

POPULATION PROJECTIONS TO 1970

by

Yoshiko Kasahara

POPULATION PROJECTIONS TO 1970

At the present stage of development in demographic research, population projection is essentially an attempt to extrapolate the past trends in the basic components of population change — fertility, mortality, and migration — under certain assumptions as to their probable levels at a future date. Such assumptions, of course, have to take into account relevant determinants of population change. It should be noted, however, that the available data on the process of interplay between demographic factors and their socio-economic correlates provide little more than clues to what is expected in the future; the causal nexus involved is neither precisely identifiable nor quantifiable. Furthermore, an unforeseen course of events may alter the dynamics of population change significantly even within a short period of time. Particularly volatile are fertility and migration trends which are highly sensitive to short-term social and economic changes. Population projections, therefore, should be taken not as predictions, but as approximations to the probable size and composition of a population anticipated under given assumptions. For this reason, they should be subject to revision whenever new trends emerge to belie the assumptions adopted earlier.

I - GENERAL ASSUMPTIONS AND METHOD

The projections presented here assume that there will be no catastrophic events which will seriously affect the levels of fertility and mortality and the volume of migration over the entire period of projection. It is further assumed that during this period more or less full employment conditions will prevail.

The method used is a "component method" involving separate projections of the basic components of population change, i.e., fertility, mortality, immigration and emigration. Starting with the estimates of Canada's population by age and sex as of June 1, 1963, calculation of the expected survivors of this population subject to the assumed mortality conditions was carried out for each of the years over the period 1963-70. Additions to this population due to births after June 1, 1963, were estimated separately on the basis of assumed age-specific fertility and mortality rates applicable to each birth cohort over the period involved. Losses due to emigration from this base population and the birth cohorts to be associated with it were then accounted for. Gains to be attributed to surviving immigrants and their children born since their entry into Canada were also calculated separately. The projected population by age and sex for any given year is thus the sum of the survivors of the segments of the population expected to be residing in Canada on June 1 of that year after an allowance was made for the accumulated emigration over the period preceding that date.

Mortality

Allowances for the effects of mortality were made by the use of projected survival ratios. In order to facilitate the calculation of the required age-sex groups expected for each year over the period of projection, the survival ratios by single years of age were derived for each sex. Except for birth cohorts, the survival ratio at age x represents the probability that persons at age x as of last birthday will survive another year. The survival ratio for the birth cohort in a given year is adjusted to represent the probability that infants born at any time during the year will survive until the beginning of the following year.

In deriving survival ratios by age and sex for each of the years between 1963 and 1970, the past trends in life-table mortality rates q_x[1/] by sex were first examined and projected for the selected ages essential for evaluating the probable levels of mortality in 1965 and 1970. In this process, the following factors were taken into account:

1) the past trend in mortality decline and its variations by age and sex;

2) major causes of death and their age-sex differentials;

3) probable advances in medical research and public health measures in controlling mortality, with special reference to major causes of death in each age-sex group;

4) the past trends and current levels of mortality in countries whose mortality experience has been similar to that of Canada; and the projected levels of mortality for the comparable period wherever such data are available;

5) the levels of mortality attained in some areas of Canada and in other countries which have reduced their mortality below the total Canadian level — in other words, improvements in mortality possible within the limits of the currently available means of mortality control;

6) possible effects of technological developments upon mortality (e.g., potential rise of mortality due to traffic accidents and occupational hazards and its implications for age-sex differentials in the rate of mortality decline).

Table 10 shows the values of q_x given in the 1960-62 life table for Canada and the projected values of q_x for 1966 and 1971 for selected age groups by sex.

From these projected values of q_x the required survival ratios by single years of age were first derived for 1966 and 1971. In estimating these survival ratios for the two years, it was assumed that their rates of improvement over the given period of projection would form a reasonably smooth curve, although some discontinuity could not be eliminated. The survival ratios for the intervening years were interpolated by assuming a constant annual rate of change for each age by sex over each five-year interval.

1/ This is the probability that persons at the exact age of x will die before reaching age x + 1.

The resulting matrix of projected survival ratios by single years of age and sex was then applied to the component segments of the population to estimate their expected survivors for each year from 1964 to 1970. The expected survivors of the 1963 population for each of the following years were first calculated by assuming no migration over the entire period. Survivorship of the migration components was then accounted for separately by cumulating the survivors of annual entries and outflows over the period preceding June 1 of a given year.

In the absence of any reliable data on the possible mortality differentials between migrant and nonmigrant population, mortality is assumed to be the same for both. Adjustment was made, however, for estimating the effect of mortality upon immigrants during the first year of their entry into Canada. The adjustment is based on the assumption that the dates of their entry are more or less evenly distributed over the twelve months and that the expected mean of the period of their exposure to the risk of death would be approximately six months. Similar adjustment was made in calculating the expected number of deaths among projected emigrants each year after their departure. Estimates of deaths among emigrants after their departure were required in order to account for the net effect of emigration on the Canadian population.

Fertility

Unlike mortality rates, which have shown a more or less steady decline over the last forty years, fertility rates in Canada have fluctuated considerably from time to time. Readily available measures of fertility, however, are inadequate for assessing even the past trends in fertility. In order to gain insight into the underlying social and economic forces, much more data are required.

Crude birth rates indicate merely the contribution made by births to annual population growth. Although somewhat more refined, age-specific fertility rates -- the only long-term historical series other than crude rates -- provide little more than pointers to some of the demographic factors in changing fertility. A more or less consistent decline in the fertility rates among women over 30 years of age in the last ten years implies that the majority of present-day women tend to complete their childbearing period within ten or fifteen years after their marriage. This trend is also demonstrated by the decline in the proportion of large families with five or more children. Among the younger women, on the other hand, the fertility rates showed an impressive rise over the ten years prior to 1958. This reflects the post-war trend towards younger marriages and earlier childbearing than in the preceding decades. Since 1958, however, the fertility rates among these younger women have also begun to show a downward trend.

Within the limits of the data available at present, it is difficult to assess how much of the observed decline is a "true" reduction of fertility and how much is a function of a recent decline in marriage rates due probably to a relatively smaller proportion of potential brides under 30 years of age. As for social and economic determinants of fertility, even less is known. Under the circumstances, the probable course of fertility change in the future has to remain largely a matter of conjecture and judgment based on circumstantial evidence alone.

Because of uncertainties in assessing fertility trends, long-term projections should take into account more than one set of assumptions on the future levels of fertility. The projections presented here, however, are designed to cover only seven years up to 1970. Hence only one set of assumptions was adopted.

At the time when the present projections were prepared, statistics for 1963 were not available. In the light of the recent trends, however, it is reasonable to assume that by 1963 the fertility rate at every age of women 15-49 would have declined below the level reached in 1962. It is also assumed that the rate of decline would have been minimal among women under 25 years of age, while it would have been progressively greater for the older women.

In arriving at the fertility rates for 1963-64, the following steps were taken. First, the fertility rates by single years of age for all women 15-49 were estimated for each year of the period 1951-62. On the basis of these estimates, the rates for 1963-64 were derived on the assumption that the rate of decline among women of a given age would be more or less consistent with the observed trend in the recent years. The major reasons for carrying out the projection of fertility by single years of age were (1) to reflect the effect of a rather sharply changing age structure expected among women passing through the reproductive period in the coming few years, and (2) to facilitate the calculation of the projected 0-4 age group for each year between 1963 and 1970 as well as the age group 5-9 in the last two years of the projection period, which would contain survivors of the birth cohorts after 1963.

The projected age-specific fertility rates for the period 1963-64 were held constant over the entire period of projection. In the light of the fertility experience in the last few years, this may be a rather conservative assumption as to the possible fertility decline in the future. In adopting this assumption, however, a probable rise in the marriage rates over the coming few years and an expected increase in the proportion of women under 25 years of age in the total forthcoming marriages were taken into

account. It was also noted that the currently available time series of age-specific fertility rates for Canada excludes Newfoundland. Since this province has shown a considerably higher crude birth rate than the other provinces, the fertility projection based on these statistics will tend to understate, at least slightly, the actual level of fertility for the country.

The projected values of fertility rates by single years of age of women are given in Table 11. As in the case of mortality, these rates are assumed to apply to both migrant and nonmigrant population. Adjustment was made, however, to allow for the spread of the dates of movement of migrant population over twelve months and the consequent reduction of the period of exposure to the "risk" of childbearing in the first year of migration.

The sex ratio at birth is known to be remarkably stable. Hence the average sex ratio since 1926 was used to estimate the sex breakdown of each birth cohort.

Immigration and Emigration

Immigration and emigration are the most unpredictable factors in population projection in Canada. The volume of immigration has fluctuated sharply in the past and may quite possibly undergo drastic changes in the future. Changes in the flow of immigration depend in part on government policy. They also depend on social and economic conditions, not only in Canada but also in the potential supply areas of immigrants.

Projection of emigration is even more hazardous, since no statistics on total annual emigration exist. The only information available at present on this factor comes from the United States and United Kingdom statistics on immigrants from Canada, and residual estimates derived from Canadian census data and statistics on births, deaths, and immigration. Estimates of emigration based on these statistics are subject to various types of error.

In practice, therefore, the projection of migration components becomes primarily a matter of judgment. The assumptions made for the present projections are as follows:

	Annual Gross Immigration	Annual Gross Emigration	Annual Net Immigration
1964	115,000	75,000	40,000
1965-70	125,000	75,000	50,000

These assumptions imply levels of immigration, both gross and net, that are lower than those prevailing throughout much of the 1950's but higher than those of more recent years. Several considerations were taken into account in arriving at these figures. First, it was assumed that there would be no major change in the underlying principles of Canadian immigration policy. Secondly, it was recognized that the high levels of immigration of the early and mid-1950's reflected, in large measure, the special circumstances of the period. With the economies of Europe now fully recovered from the effects of World War II and growing at a rapid pace in conditions of general labour shortage, the potential supply of immigrants from this source has diminished. Furthermore, there is little reason to expect events as exceptional as the Hungarian revolution and the Suez crisis which together resulted in the phenomenal influx of some 282,000 persons in the single year 1957. On the other hand, the income or standard-of-living gap between North America and the rest of the world still exists and will continue to be an inducement to immigrants in the years ahead. Moreover, it is assumed that relatively high levels of employment will be achieved and maintained in Canada throughout the projection period, thus further enhancing the attractiveness of this country to persons abroad. Weighing all of these factors, it is believed that the above migration assumptions are reasonable. Even if they were to be rather wide of the mark, though, the effect on the rate of total population growth would be quite small. For example, if net immigration should be 25,000 higher or lower than we have assumed for the period 1965-70, this would alter the annual average rate of growth by no more than one or two tenths of a percentage point.

The sex breakdown of immigrant population for the 1963-64 period was estimated on the basis of the average sex ratio over the last decade, which indicates some excess of females over males. For the period 1966-70, however, the numbers of male and female immigrants are assumed to be equal. The proportion of each sex for the intervening years was derived by interpolation. One of the bases for the above assumptions is a relative increase in the immigration of family units, which is likely to reduce the sex differential in immigration. It was also noted that the post-war immigration prior to 1957 showed a pronounced male dominance and that the more recent reversal in the sex ratio represents largely the delayed immigration of wives, brides and other female dependants of men who had immigrated earlier.

Estimated immigration for each sex was broken down first into five-year age groups according to the average age distribution of the immigrants of the given sex over the last decade. Single years of age distributions were then derived by the use

of Sprague's multipliers. The age-sex distribution of emigrants was based on the United States statistics on Canadian-born immigrants. Some adjustment was necessary, because the youngest age groups are apparently overweighted by inclusion of children born in Canada to persons born elsewhere. Graduation of emigrant population of each sex by single years of age was also calculated by applying Sprague's multipliers. It should be noted that statistics on the age distribution of both immigrants and emigrants represent the ages of migrant population at the time of their movement. Some adjustment was made, therefore, for the aging factor involved in order to make the age distribution of these segments of the population more or less consistent with that of the base population, for which the reference date is June 1.

II - STATISTICAL TABLES

The population projections are presented in the following tables. These projections, which have been used in all the studies by the Economic Council, including the labour force projections, were prepared before the Dominion Bureau of Statistics intercensal estimates by age and sex for June 1, 1964, became available. The differences between the DBS estimates and the projected figures for 1964 have proved to be negligible with the possible exception of the age groups under 5 and the female population over 70 years of age, where some minor overstatements are indicated.

Table 1

Total Population, Actual and Projected, by Age, for Canada, as of June 1, 1950-70
(in thousands)

Age	Actual[1]						Projected						
	1950	1955	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
0- 4	1,630.4	1,939.9	2,221.8	2,256.4	2,285.4	2,288.9	2,299.3	2,315.0	2,335.6	2,372.8	2,422.1	2,487.3	2,561.0
5- 9	1,311.1	1,731.1	2,031.9	2,079.5	2,103.8	2,145.6	2,185.8	2,222.5	2,260.6	2,290.9	2,306.7	2,319.5	2,334.4
10-14	1,121.1	1,367.9	1,776.3	1,856.0	1,916.3	1,965.0	2,006.8	2,045.2	2,082.8	2,116.9	2,160.2	2,201.2	2,238.3
15-19	1,074.7	1,138.3	1,374.9	1,432.6	1,511.5	1,600.2	1,692.7	1,779.4	1,854.7	1,918.2	1,969.7	2,012.1	2,050.8
20-24	1,106.1	1,121.9	1,177.8	1,183.6	1,211.7	1,255.3	1,316.1	1,386.5	1,464.2	1,548.7	1,640.4	1,733.8	1,820.8
25-29	1,109.9	1,192.8	1,216.6	1,209.3	1,192.6	1,178.2	1,176.6	1,188.1	1,215.8	1,256.4	1,309.3	1,372.7	1,444.1
30-34	1,029.6	1,182.8	1,273.7	1,271.8	1,260.3	1,244.8	1,233.4	1,222.4	1,212.6	1,204.8	1,199.1	1,199.9	1,212.5
35-39	962.7	1,095.8	1,246.3	1,270.9	1,282.1	1,282.9	1,279.9	1,273.8	1,266.4	1,257.7	1,248.4	1,238.4	1,228.4
40-44	839.3	998.2	1,102.7	1,119.0	1,144.2	1,174.4	1,207.3	1,235.9	1,256.1	1,268.3	1,272.7	1,270.7	1,265.1
45-49	728.5	852.1	992.3	1,015.3	1,032.8	1,045.9	1,059.5	1,076.1	1,098.2	1,124.7	1,156.4	1,189.3	1,217.7
50-54	653.2	720.9	837.1	863.2	889.1	914.8	940.7	964.7	986.1	1,004.8	1,019.7	1,033.3	1,049.9
55-59	570.9	619.6	690.7	705.8	727.3	749.8	774.2	799.2	824.4	849.6	875.3	900.5	923.8
60-64	500.2	522.0	570.1	583.7	595.7	608.0	622.1	636.2	656.5	676.8	698.5	721.7	745.4
65-69	416.3	457.9	480.1	487.1	491.4	497.3	504.9	513.4	522.7	533.2	545.0	557.9	572.5
70 and over	634.0	756.8	877.7	904.1	925.8	944.9	973.1	987.6	1,002.2	1,016.8	1,031.2	1,047.9	1,064.5
All ages	13,688.0	15,698.0	17,870.0	18,238.3	18,570.0	18,896.0	19,272.4	19,646.0	20,038.9	20,440.6	20,854.7	21,286.2	21,729.2

[1] The figures for 1961 are from the census; those for the other years are DBS intercensal estimates.

Table 2

Male Population, Actual and Projected, by Age, for Canada, as of June 1, 1950-70
(in thousands)

Age	Actual[1]						Projected						
	1950	1955	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
0- 4	832.0	990.5	1,136.4	1,154.1	1,169.3	1,170.7	1,175.9	1,183.9	1,194.6	1,213.7	1,239.2	1,272.9	1,310.7
5- 9	668.5	883.8	1,037.3	1,063.8	1,075.8	1,097.5	1,117.8	1,136.0	1,155.2	1,170.4	1,178.7	1,185.9	1,192.9
10-14	568.9	697.5	907.6	948.2	979.4	1,004.6	1,026.1	1,045.9	1,065.0	1,082.5	1,104.1	1,124.9	1,143.4
15-19	542.4	575.4	699.3	729.0	770.8	816.6	864.4	908.9	947.7	980.5	1,007.0	1,028.9	1,048.9
20-24	549.5	563.0	587.7	587.1	601.2	625.3	660.2	700.1	742.9	788.4	836.5	884.8	929.5
25-29	547.9	599.8	619.8	613.9	603.2	592.4	587.4	589.9	602.6	623.8	653.5	689.8	730.4
30-34	510.8	584.9	643.0	644.4	639.9	633.2	627.9	622.1	616.1	610.1	603.9	600.4	603.7
35-39	486.2	547.9	618.7	631.1	637.7	640.6	642.1	641.9	640.3	637.5	634.0	629.5	624.4
40-44	430.1	509.1	553.2	560.0	570.5	583.4	598.0	611.3	621.7	629.2	633.9	636.0	636.1
45-49	376.4	441.6	506.4	515.5	522.0	526.9	531.7	538.0	547.0	558.2	571.9	586.5	599.8
50-54	336.7	374.4	431.2	442.9	454.5	465.8	477.3	487.6	496.6	504.1	509.7	514.6	520.9
55-59	295.4	316.1	354.1	362.1	372.4	382.8	394.0	405.4	416.7	427.8	439.2	450.2	460.1
60-64	262.0	265.1	285.7	292.6	298.3	304.6	311.7	317.8	328.7	338.3	348.2	358.6	369.1
65-69	219.9	235.6	238.0	239.7	240.7	242.8	245.7	249.2	253.3	258.2	264.0	270.3	277.4
70 and over	315.5	373.9	424.2	434.4	441.4	447.2	450.4	453.6	456.8	460.0	463.4	467.5	472.0
All ages	6,942.2	7,958.6	9,042.6	9,218.9	9,377.1	9,534.4	9,710.6	9,891.6	10,085.2	10,282.7	10,487.2	10,700.8	10,919.3

(1) The figures for 1961 are from the census; those for the other years are DBS intercensal estimates.

Table 3

Female Population, Actual and Projected, by Age, for Canada, as of June 1, 1950-70
(in thousands)

Age	Actual (1)						Projected						
	1950	1955	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
0- 4	798.4	949.4	1,085.4	1,102.3	1,116.1	1,118.2	1,123.4	1,131.1	1,141.0	1,159.1	1,182.9	1,214.4	1,250.3
5- 9	642.6	847.3	994.6	1,015.7	1,028.0	1,048.1	1,068.0	1,086.5	1,105.4	1,120.5	1,128.0	1,133.6	1,141.5
10-14	552.2	670.4	868.7	907.8	936.9	960.4	980.7	999.3	1,017.8	1,034.4	1,056.1	1,076.3	1,094.9
15-19	532.3	562.9	675.6	703.5	740.7	783.6	828.3	870.5	907.0	937.7	962.7	983.2	1,001.9
20-24	556.6	558.9	590.1	596.5	610.5	630.0	655.9	686.4	721.3	760.3	803.9	849.0	891.3
25-29	562.0	593.0	596.8	595.4	589.4	585.8	589.2	598.2	613.2	632.6	655.8	682.9	713.7
30-34	518.8	597.9	630.7	627.4	620.4	611.6	605.5	600.3	596.5	594.7	595.2	599.5	608.8
35-39	476.5	547.9	627.6	639.8	644.4	642.3	637.8	631.9	626.1	620.2	614.4	608.9	604.0
40-44	409.2	489.1	549.5	559.0	573.7	591.0	609.3	624.6	634.4	639.1	638.8	634.7	629.0
45-49	352.1	410.5	485.9	499.8	510.8	519.0	527.8	538.1	551.2	566.5	584.5	602.8	617.9
50-54	316.5	346.5	405.9	420.3	434.6	449.0	463.4	477.1	489.5	500.7	510.0	518.7	529.0
55-59	275.5	303.5	336.6	343.7	354.9	367.0	380.2	393.8	407.7	421.8	436.1	450.3	463.7
60-64	238.2	256.9	284.4	291.1	297.4	303.4	310.4	318.4	327.8	338.5	350.3	363.1	376.3
65-69	196.4	222.3	242.1	247.4	250.7	254.5	259.2	264.2	269.4	275.0	281.0	287.6	295.1
70 and over	318.5	382.9	453.5	469.7	484.4	497.7	522.7	534.0	545.4	556.8	567.8	580.4	592.5
All ages	6,745.8	7,739.4	8,827.4	9,019.4	9,192.9	9,361.6	9,561.8	9,754.4	9,953.7	10,157.9	10,367.5	10,585.4	10,809.9

(1) The figures for 1961 are from the census; those for the other years are DBS intercensal estimates.

Table 4

Percentage Distribution of Total Population, Actual and Projected, by Age, for Canada, as of June 1, 1950-70

Age	Actual[1]						Projected						
	1950	1955	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
0- 4	11.9	12.4	12.4	12.4	12.3	12.1	11.9	11.8	11.7	11.6	11.6	11.7	11.8
5- 9	9.6	11.0	11.4	11.4	11.3	11.4	11.3	11.3	11.3	11.2	11.1	10.9	10.7
10-14	8.2	8.7	9.9	10.2	10.3	10.4	10.4	10.4	10.4	10.4	10.4	10.3	10.3
15-19	7.9	7.3	7.7	7.9	8.1	8.5	8.8	9.1	9.3	9.4	9.4	9.5	9.4
20-24	8.1	7.1	6.6	6.5	6.5	6.6	6.8	7.1	7.3	7.6	7.9	8.1	8.4
25-29	8.1	7.6	6.8	6.6	6.4	6.2	6.1	6.0	6.1	6.1	6.3	6.4	6.6
30-34	7.5	7.5	7.1	7.0	6.8	6.6	6.4	6.2	6.1	5.9	5.7	5.6	5.6
35-39	7.0	7.0	7.0	7.0	6.9	6.8	6.6	6.5	6.3	6.2	6.0	5.8	5.7
40-44	6.1	6.4	6.2	6.1	6.2	6.2	6.3	6.3	6.3	6.2	6.1	6.0	5.8
45-49	5.3	5.4	5.6	5.6	5.6	5.5	5.5	5.5	5.5	5.5	5.5	5.6	5.6
50-54	4.8	4.6	4.7	4.7	4.8	4.8	4.9	4.9	4.9	4.9	4.9	4.9	4.8
55-59	4.2	3.9	3.9	3.9	3.9	4.0	4.0	4.1	4.1	4.2	4.2	4.2	4.3
60-64	3.7	3.3	3.2	3.2	3.2	3.2	3.2	3.2	3.3	3.3	3.3	3.4	3.4
65-69	3.0	2.9	2.7	2.7	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
70 and over	4.6	4.8	4.9	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.9	4.9	4.9
All ages	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(1) The distribution for 1961 is based on census data; the distributions for the other years are based on DBS intercensal estimates.

Table 5

Percentage Distribution of Male Population, Actual and Projected, by Age, for Canada, as of June 1, 1950-70

Age	Actual (1)						Projected						
	1950	1955	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
0- 4	12.0	12.4	12.6	12.5	12.5	12.3	12.1	12.0	11.8	11.8	11.8	11.9	12.0
5- 9	9.6	11.1	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.4	11.2	11.1	10.9
10-14	8.2	8.8	10.0	10.3	10.4	10.5	10.6	10.6	10.6	10.5	10.5	10.5	10.5
15-19	7.8	7.2	7.7	7.9	8.2	8.6	8.9	9.2	9.4	9.5	9.6	9.6	9.6
20-24	7.9	7.1	6.5	6.4	6.4	6.6	6.8	7.1	7.4	7.7	8.0	8.3	8.5
25-29	7.9	7.5	6.9	6.7	6.4	6.2	6.0	6.0	6.0	6.1	6.2	6.4	6.7
30-34	7.4	7.3	7.1	7.0	6.8	6.6	6.5	6.3	6.1	5.9	5.8	5.6	5.5
35-39	7.0	6.9	6.8	6.8	6.8	6.7	6.6	6.5	6.3	6.2	6.0	5.9	5.7
40-44	6.2	6.4	6.1	6.1	6.1	6.1	6.2	6.2	6.2	6.1	6.0	5.9	5.8
45-49	5.4	5.5	5.6	5.6	5.6	5.5	5.5	5.4	5.4	5.4	5.5	5.5	5.5
50-54	4.8	4.7	4.8	4.8	4.8	4.9	4.9	4.9	4.9	4.9	4.9	4.8	4.8
55-59	4.3	4.0	3.9	3.9	4.0	4.0	4.1	4.1	4.1	4.2	4.2	4.2	4.2
60-64	3.8	3.3	3.2	3.2	3.2	3.2	3.2	3.2	3.3	3.3	3.3	3.4	3.4
65-69	3.2	3.0	2.6	2.6	2.6	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
70 and over	4.5	4.7	4.7	4.7	4.7	4.7	4.6	4.6	4.5	4.5	4.4	4.4	4.3
All ages	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(1) The distribution for 1961 is based on census data; the distributions for the other years are based on DBS intercensal estimates.

Table 6

Percentage Distribution of Female Population, Actual and Projected, by Age, for Canada, as of June 1, 1950-70

Age	Actual[1]						Projected						
	1950	1955	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
0- 4	11.8	12.3	12.3	12.2	12.1	11.9	11.7	11.6	11.5	11.4	11.4	11.5	11.6
5- 9	9.5	10.9	11.3	11.3	11.2	11.2	11.2	11.1	11.1	11.0	10.9	10.7	10.6
10-14	8.2	8.7	9.8	10.1	10.2	10.3	10.3	10.2	10.2	10.2	10.2	10.2	10.1
15-19	7.9	7.3	7.7	7.8	8.1	8.4	8.7	8.9	9.1	9.2	9.3	9.3	9.3
20-24	8.3	7.2	6.7	6.6	6.6	6.7	6.9	7.0	7.2	7.5	7.8	8.0	8.2
25-29	8.3	7.7	6.8	6.6	6.4	6.3	6.2	6.1	6.2	6.2	6.3	6.5	6.6
30-34	7.7	7.7	7.1	7.0	6.7	6.5	6.3	6.2	6.0	5.9	5.7	5.7	5.6
35-39	7.1	7.1	7.1	7.1	7.0	6.9	6.7	6.5	6.3	6.1	5.9	5.8	5.6
40-44	6.1	6.3	6.2	6.2	6.2	6.3	6.4	6.4	6.4	6.3	6.2	6.0	5.8
45-49	5.2	5.3	5.5	5.5	5.6	5.5	5.5	5.5	5.5	5.6	5.6	5.7	5.7
50-54	4.7	4.5	4.6	4.7	4.7	4.8	4.8	4.9	4.9	4.9	4.9	4.9	4.9
55-59	4.1	3.9	3.8	3.8	3.9	3.9	4.0	4.0	4.1	4.2	4.2	4.3	4.3
60-64	3.5	3.3	3.2	3.2	3.2	3.2	3.2	3.3	3.3	3.3	3.4	3.4	3.5
65-69	2.9	2.9	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
70 and over	4.7	4.9	5.1	5.2	5.3	5.3	5.5	5.5	5.5	5.5	5.5	5.5	5.5
All ages	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(1) The distribution for 1961 is based on census data; the distributions for the other years are based on DBS intercensal estimates.

Table 7

Percentage Change of Total Population, Actual and Projected, by Age, for Canada, as of June 1, 1950-70

Age	Actual (1) 1950-55	Actual (1) 1955-60	Projected 1960-65	Projected 1965-70	Actual (1) 1960-61	Actual (1) 1961-62	Actual (1) 1962-63	Projected 1963-64	Projected 1964-65	Projected 1965-66	Projected 1966-67	Projected 1967-68	Projected 1968-69	Projected 1969-70
0- 4	19.0	14.5	4.2	10.6	1.6	1.3	0.2	0.5	0.7	0.9	1.6	2.1	2.7	3.0
5- 9	32.0	17.4	9.4	5.0	2.3	1.2	2.0	1.9	1.7	1.7	1.3	0.7	0.6	0.6
10-14	22.0	29.9	15.1	9.4	4.5	3.2	2.5	2.1	1.9	1.8	1.6	2.0	1.9	1.7
15-19	5.9	20.8	29.4	15.3	4.2	5.5	5.9	5.8	5.1	4.2	3.4	2.7	2.2	1.9
20-24	1.4	5.0	17.7	31.3	0.5	2.4	3.6	4.8	5.3	5.6	5.8	5.9	5.7	5.0
25-29	7.5	2.0	- 2.3	21.5	- 0.6	- 1.4	- 1.2	- 0.1	1.0	2.3	3.3	4.2	4.8	5.2
30-34	14.9	7.7	- 4.0	- 0.8	- 0.1	- 0.9	- 1.2	- 0.9	- 0.9	- 0.8	- 0.6	- 0.5	0.1	1.1
35-39	13.8	13.7	2.2	- 3.6	2.0	0.9	0.1	- 0.2	- 0.5	- 0.6	- 0.7	- 0.7	- 0.8	- 0.8
40-44	18.9	10.5	12.1	2.4	1.5	2.3	2.6	2.8	2.4	1.6	1.0	0.3	- 0.2	- 0.4
45-49	17.0	16.5	8.4	13.2	2.3	1.7	1.3	1.3	1.6	2.1	2.4	2.8	2.8	2.4
50-54	10.4	16.1	15.2	8.8	3.1	3.0	2.9	2.8	2.6	2.2	1.9	1.5	1.3	1.6
55-59	8.5	11.5	15.7	15.6	2.2	3.0	3.1	3.3	3.2	3.2	3.1	3.0	2.9	2.6
60-64	4.4	9.2	11.6	17.2	2.4	2.1	2.1	2.3	2.3	3.2	3.1	3.2	3.3	3.3
65-69	10.0	4.8	6.9	11.5	1.5	0.9	1.2	1.5	1.7	1.8	2.0	2.2	2.4	2.6
70 and over	19.4	16.0	12.5	7.8	3.0	2.4	2.1	3.0	1.5	1.5	1.5	1.4	1.6	1.6
All ages	14.7	13.8	9.9	10.6	2.1	1.8	1.8	2.0	1.9	2.0	2.0	2.0	2.1	2.1

(1) Based on census data or DBS intercensal estimates.

Table 8

Percentage Change of Male Population, Actual and Projected, by Age, for Canada, as of June 1, 1950-70

Age	Actual (1)		Projected		Actual (1)			Projected						
	1950-55	1955-60	1960-65	1965-70	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66	1966-67	1967-68	1968-69	1969-70
0- 4	19.1	14.7	4.2	10.7	1.6	1.3	0.1	0.4	0.7	0.9	1.6	2.1	2.7	3.0
5- 9	32.2	17.4	9.5	5.0	2.6	1.1	2.0	1.8	1.6	1.7	1.3	0.7	0.6	0.6
10-14	22.6	30.1	15.2	9.3	4.5	3.3	2.6	2.1	1.9	1.8	1.6	2.0	1.9	1.6
15-19	6.1	21.5	30.0	15.4	4.2	5.7	5.9	5.9	5.1	4.3	3.5	2.7	2.2	1.9
20-24	2.5	4.4	19.1	32.8	- 0.1	2.4	4.0	5.6	6.0	6.1	6.1	6.1	5.8	5.1
25-29	9.5	3.3	- 4.8	23.8	- 1.0	- 1.8	- 1.8	- 0.8	0.4	2.2	3.5	4.8	5.6	5.9
30-34	14.5	9.9	- 3.3	- 3.0	0.2	- 0.7	- 1.0	- 0.8	- 0.9	- 1.0	- 1.0	- 1.0	- 0.6	0.5
35-39	12.7	12.9	3.7	- 2.7	2.0	1.0	0.5	0.2	0.0	- 0.2	- 0.4	- 0.5	- 0.7	- 0.8
40-44	18.4	8.7	10.5	4.1	1.2	1.9	2.3	2.5	2.2	1.7	1.2	0.7	0.3	0.0
45-49	17.3	14.7	6.2	11.5	1.8	1.3	0.9	0.9	1.2	1.7	2.0	2.5	2.6	2.3
50-54	11.2	15.2	13.1	6.8	2.7	2.6	2.5	2.5	2.2	1.8	1.5	1.1	1.0	1.2
55-59	7.0	12.0	14.5	13.5	2.3	2.8	2.8	2.9	2.9	2.8	2.7	2.7	2.5	2.2
60-64	1.2	7.8	11.2	16.1	2.4	1.9	2.1	2.3	2.0	3.4	2.9	3.0	3.0	2.9
65-69	7.1	1.0	4.7	11.3	0.7	0.4	0.9	1.2	1.4	1.6	1.9	2.2	2.4	2.6
70 and over	18.5	13.5	6.9	4.1	2.4	1.6	1.3	0.7	0.7	0.7	0.7	0.7	0.9	1.0
All ages	14.6	13.6	9.4	10.4	1.9	1.7	1.7	1.8	1.9	2.0	2.0	2.0	2.0	2.0

(1) Based on census data or DBS intercensal estimates.

Table 9

Percentage Change of Female Population, Actual and Projected, by Age, for Canada, as of June 1, 1950-70

Age	Actual[1]		Projected		Actual[1]			Projected						
	1950-55	1955-60	1960-65	1965-70	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66	1966-67	1967-68	1968-69	1969-70
0- 4	18.9	14.3	4.2	10.5	1.6	1.3	0.2	0.5	0.7	0.9	1.6	2.1	2.7	3.0
5- 9	31.9	17.4	9.2	5.1	2.1	1.2	2.0	1.9	1.7	1.7	1.4	0.7	0.5	0.7
10-14	21.4	29.6	15.0	9.6	4.5	3.2	2.5	2.1	1.9	1.9	1.6	2.1	1.9	1.7
15-19	5.7	20.0	28.8	15.1	4.1	5.3	5.8	5.7	5.1	4.2	3.4	2.7	2.1	1.9
20-24	0.4	5.6	16.3	29.9	1.1	2.3	3.2	4.1	4.7	5.1	5.4	5.7	5.6	5.0
25-29	5.5	0.6	0.2	19.3	- 0.2	- 1.0	- 0.6	0.6	1.5	2.5	3.2	3.7	4.1	4.5
30-34	15.2	5.5	- 4.8	1.4	- 0.5	- 1.1	- 1.4	- 1.0	- 0.9	- 0.6	- 0.3	0.1	0.7	1.6
35-39	15.0	14.5	0.7	- 4.4	1.9	0.7	- 0.3	- 0.7	- 0.9	- 0.9	- 0.9	- 0.9	- 0.9	- 0.8
40-44	19.5	12.3	13.7	0.7	1.7	2.6	3.0	3.1	2.5	1.6	0.7	0.0	- 0.6	- 0.9
45-49	16.6	18.4	10.7	14.8	2.9	2.2	1.6	1.7	2.0	2.4	2.8	3.2	3.1	2.5
50-54	9.5	17.1	17.5	10.9	3.5	3.4	3.3	3.2	3.0	2.6	2.3	1.9	1.7	2.0
55-59	10.2	10.9	17.0	17.8	2.1	3.3	3.4	3.6	3.6	3.5	3.5	3.4	3.3	3.0
60-64	7.9	10.7	12.0	18.2	2.4	2.2	2.0	2.3	2.6	3.0	3.3	3.5	3.7	3.6
65-69	13.2	8.9	9.1	11.7	2.2	1.3	1.5	1.8	1.9	2.0	2.1	2.2	2.3	2.6
70 and over	20.2	18.4	17.8	11.0	3.6	3.1	2.7	5.0	2.2	2.1	2.1	2.0	2.2	2.1
All ages	14.7	14.1	10.5	10.8	2.2	1.9	1.8	2.1	2.0	2.0	2.1	2.1	2.1	2.1

[1] Based on census data or DBS intercensal estimates.

Table 10

Life-Table Mortality Rates for the Selected Ages by Sex, Actual and Projected, 1961-71

	Males			Females		
	$1,000q_x$			$1,000q_x$		
x	1961	1966	1971	1961	1966	1971
0	30.58	27.98	25.60	23.87	21.84	19.98
1	1.85	1.72	1.60	1.64	1.53	1.42
2	1.14	1.11	1.07	.96	.93	.90
3	.99	.93	.90	.71	.69	.67
4	.83	.81	.79	.61	.59	.58
5	.73	.71	.69	.53	.52	.50
7	.60	.58	.56	.39	.38	.36
10	.50	.48	.45	.29	.28	.27
12	.54	.51	.48	.29	.28	.27
15	.89	.82	.75	.40	.38	.35
17	1.17	1.09	1.01	.48	.45	.42
20	1.53	1.44	1.35	.55	.52	.50
25	1.57	1.48	1.39	.64	.62	.60
30	1.50	1.44	1.38	.79	.78	.77
35	1.93	1.88	1.83	1.15	1.14	1.12
40	2.82	2.75	2.68	1.74	1.71	1.69
45	4.65	4.53	4.42	2.77	2.72	2.68
50	7.72	7.53	7.34	4.36	4.23	4.10
55	12.65	12.40	12.15	6.75	6.48	6.22
60	19.95	19.59	19.20	10.64	10.19	9.76
65	29.72	29.42	29.13	17.18	16.53	15.90
70	44.67	44.45	44.24	27.74	27.05	26.37
75	67.06	66.72	66.46	46.64	45.80	44.98
80	100.91	100.41	100.10	79.41	78.38	77.36
85	152.31	152.16	152.07	131.18	129.87	128.57
90	227.12	227.00	226.89	207.08	206.04	205.01

Table 11

Assumed Annual Fertility Rates by Single Years of Age of Women, 15-49 Years Old, 1963-70

Age	Rate
15	6.5
16	18.1
17	46.1
18	90.0
19	137.2
20	191.1
21	224.1
22	248.1
23	256.1
24	247.9
25	245.5
26	230.4
27	215.1
28	206.5
29	193.1
30	180.5
31	159.1
32	142.1
33	127.0
34	112.0
35	96.9
36	89.1
37	77.0
38	68.1
39	56.9
40	47.9
41	35.0
42	25.1
43	17.4
44	10.1
45	5.5
46	2.7
47	1.5
48	0.7
49	0.4

PART II

LABOUR FORCE PROJECTIONS TO 1970

by

Frank T. Denton
Sylvia Ostry

LABOUR FORCE PROJECTIONS TO 1970

The labour force projections presented here were obtained in the conventional manner by combining projections of the population in each age-sex group with projections of participation rates (ratios of labour force to population). The various assumptions and procedures are described below.

I - GENERAL ASSUMPTIONS AND METHOD

Basic Population Projections

The basic population projections were prepared by Yoshiko Kasahara, and are described in the previous part of this study.

For the labour force projections, the following four groups were excluded from the basic population: (1) members of the Armed Forces; (2) Indians living on reserves; (3) inmates of institutions; and (4) residents of the Yukon and Northwest Territories. (This was done in order to achieve comparability with historical series from the DBS Labour Force Survey.) For each of these groups, separate projections were made by age and sex, and subtracted from the totals to obtain what may be termed the "labour force population". Also, a minor adjustment was made to convert the population projections, which relate to June 1, to an annual average basis. These adjustments are described in detail below.

Participation Rates

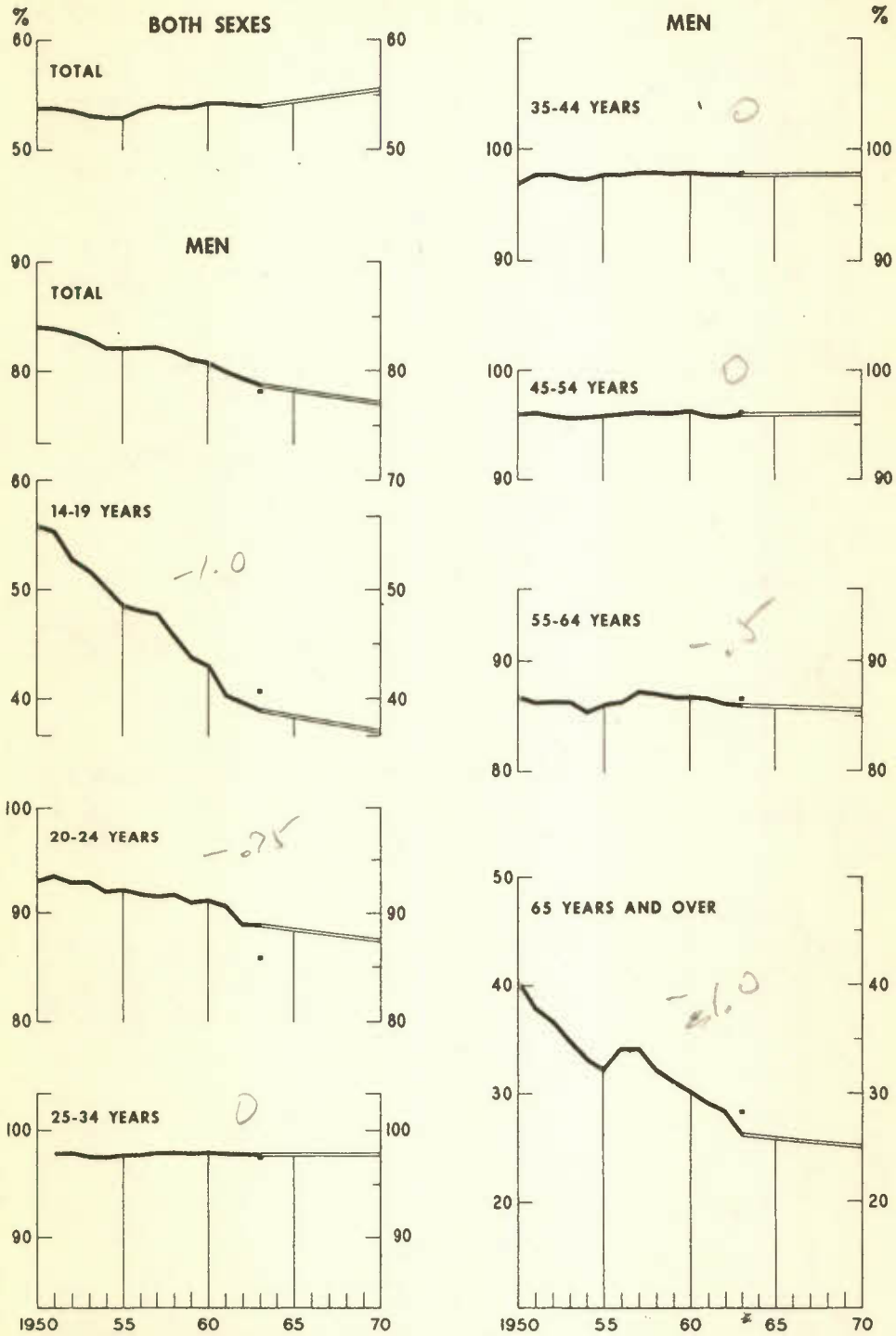
The post-war annual average participation rates were plotted and projected graphically from 1963 to 1970. Particular attention was given to those groups in which there have been marked changes in participation; namely, younger and older men and married women. Specific factors were taken into account in the projection for each group but, in addition, the general assumption was made that the economy would be operating at a relatively high employment level throughout the period. No attempt was made to predict short-term fluctuations since the labour force projections were intended primarily for use in making projections of potential output.[1/] Participation rates for years between 1963 and 1970 were calculated by straight-line interpolation, the only exception being the age-shift effects which are discussed below and which were calculated separately for each year. Past and projected rates are shown in Table 1 and Chart 1, together with comparable United States rates for 1963.

1/ See B. J. Drabble, Potential Output, 1946 to 1970, Staff Study No. 2, Economic Council of Canada, Ottawa: Queen's Printer.

CHART I

CIVILIAN PARTICIPATION RATES

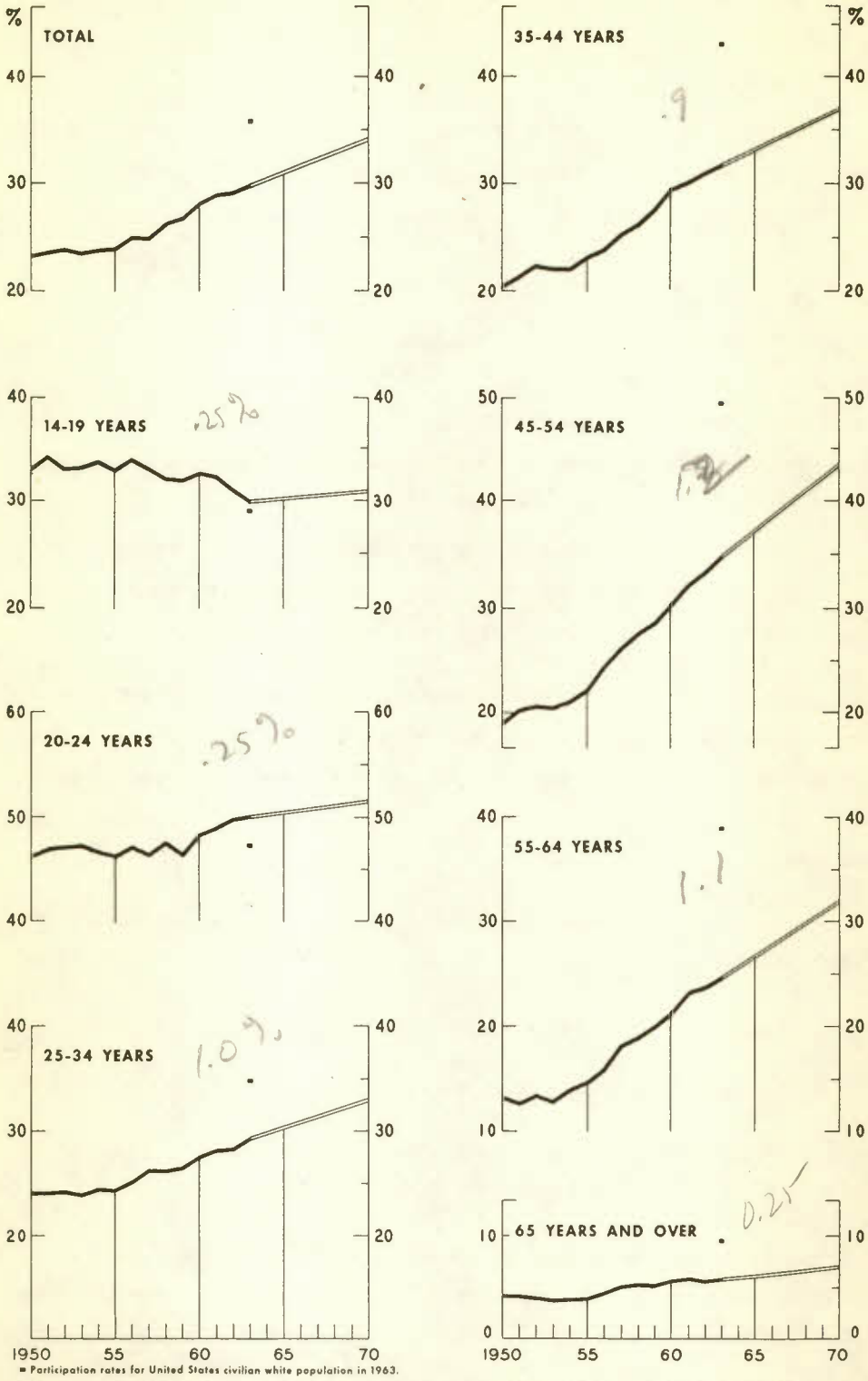
LABOUR FORCE AS PERCENTAGE
OF LABOUR FORCE POPULATION



■ Participation rates for United States civilian white population in 1963.

CHART I (continued)

WOMEN



Source: Canadian participation rates based on data from DBS Labour Force Survey and estimates or projections by Economic Council of Canada. United States rates from U.S. Manpower Report of the President, 1964.

Men 14-19 — The participation rate for male "teen-agers" has been falling more or less consistently since the Second World War as a result of the rapid rise in school-leaving age. Some further decline in participation is anticipated for this group but the pace is expected to be much slower. From 1956 to 1963, the rate fell by about 9 percentage points; for the period 1963-70 the projected drop is only about 2 percentage points.

The Canadian rate is already lower than the United States rate for this group, and some levelling off would seem to be inevitable before long under almost any circumstances. In addition, while the relationship between the level of unemployment and "teen-age" participation rates is difficult to establish with precision, there is a presumption that at high levels of employment some young men who might otherwise have remained in school would be drawn into the labour market. Another factor is the change in the internal age composition of the group. A relative shift towards the older end is taking place, and since the participation rates are, of course, much higher at the older end, this alone will tend to keep the group average from falling much in the next few years. As described below, the participation rates for 14-19-year olds, and for other selected groups, were split into two parts: one representing the effect of age shifts and the other, referred to as the "standardised" rate, reflecting changes in propensity to participate. The two components were projected separately and then combined.

Men 20-24 -- The rate for this group declined throughout the 1950's and early 1960's, and some further moderate decline is predicted. The same approach was followed here as in the case of the previous group, with separate projections of the age-shift effect and the standardised rate. However, the age effect turned out to be negligible in this case.

Men 25-34 — No change is projected since historically the rate for this group, as for the following two, has been very stable.

Men 35-44 -- No change is projected.

Men 45-54 -- No change is projected.

Men 55-64 -- A very slight decline (half a percentage point) is projected for this group in the light of the observed trend.

Men 65 and over — The tendency towards earlier retirement has brought the rate for older men down sharply in the last two decades and will probably result in some further decrease. However, a levelling off seems likely, particularly in view of the

assumed high level of employment. (Again, though, the precise relationship between participation and employment level is not easy to establish.) The rate is now substantially lower in Canada than in the United States. The effect of changes in age composition, which was measured separately, will also be to reduce the rate of decline. Weighing all of these factors, a drop of just over 1 percentage point is projected.

Women 14-19 -- Separate projections of the age effect and standardised rates were made for this group. The standardised rate is expected to drop slightly but it is expected that this will be more than offset by the age shift. A rise of about 1 percentage point in the actual rate is projected.

Women 20-24 -- A slight increase is projected, the result of an increase in the standardised rate reinforced by an age-shift effect operating in the same direction.

Women 25-34 -- The rates for this group, as for the ones that follow, reflect the rapid influx of married women into the labour force. Although the Canadian rate has risen substantially since the mid-1950's, it still remains lower than the United States rate and a continuation of the upward trend is expected. In large measure, women in this and the subsequent age categories have been drawn into the rapidly expanding service sector of the economy and it is assumed that there will be considerable further expansion of employment in this sector.

Women 35-44 -- The rate for this group started to rise in the early 1950's. The United States rate seems to have levelled off since 1956, whereas the Canadian rate has continued to move up rapidly. However, there still remains a large gap between the Canadian and United States rates, and while the increase in the Canadian rate may be less from 1963 to 1970 than it was in the previous seven years, it is still expected to be quite substantial.

Women 45-54 -- The growth of labour force participation in this group has been phenomenal and further rapid growth is expected. In 1963, the Canadian rate stood at just under 35 per cent, a level attained in the United States about 1949. Seven years later, the United States rate had risen some 10 percentage points. If the United States experience were to be duplicated here - and many of the same influences are present - the Canadian rate would be slightly under 45 per cent in 1970. An independent, and more conservative projection puts it at 42 per cent. The final figure, 43.5 per cent, represents what seems to be a reasonable estimate in the light of both the United States experience and recent movements of the Canadian rate.

Women 55-64 -- Similar procedures were followed here. The United States rate again reached the 1963 Canadian level around 1949. Seven years later it had advanced by a little less than 10 percentage points. Applying this increase to the 1963 Canadian rate of 24.7 per cent yields a 1970 figure of 34.5. An alternative, and again more conservative projection, places it at 31.0. The final estimate is 32.0.

Women 65 and over -- A small increase in participation is forecast for this group on the basis of the upward trend of the last ten years.

Adjustments to Historical Estimates

Projections of participation rates having been obtained, these were then applied to the labour force population projections in each age-sex group to obtain the labour force projections. The population, and consequently the labour force, projections take account of revisions of the DBS annual population estimates based on 1961 census data, whereas at the time that the labour force projections were prepared the published DBS labour force estimates had not yet been revised. The revisions will affect the published series from mid-1956 on. In order to avoid any lack of comparability between the projected and historical series, some preliminary estimates of the revisions were made by calculating a revised estimate of the 1963 labour force population in each age-sex group (using the same procedures as were used for the projections) and assuming that the difference between the original and revised figures had accumulated since 1956 by equal annual increments. Revised labour force estimates were then calculated by applying the original participation rates in each age-sex group to the revised labour force population figures.

Adjustments to Population Projections

Armed Forces -- It was assumed that the Armed Forces would be maintained at a level of about 120,000. The government's plans to reduce this number were not announced until after the original calculations had been completed. Since the anticipated reduction is very small in relation to the total labour force, and to the expected growth of the labour force, it was considered safe for most purposes to ignore it and no adjustments were made to the basic labour force projections. However, for purposes of calculating potential output some allowance was made for the reduction.[1/]

The allocation of the Armed Forces total by age and sex was based on the most recent distribution available at the time.

1/ See B. J. Drabble, Potential Output, 1946 to 1970, Staff Study No. 2, Economic Council of Canada, Ottawa: Queen's Printer.

Indians on Reserves -- The number of Indians on reserves was projected from 1961 after an examination of 1951, 1956, and 1961 census data. It was assumed that the annual arithmetic rate of change would be half of the 1956-61 rate until 1966 and a quarter of that rate thereafter. This assumption was made for every age-sex group.

Inmates of Institutions -- After an examination of 1951, 1956 and 1961 census data, inmates of institutions were projected on the assumption that there would be no change from 1961 levels in any age group under 70. For men and women 70 years of age and over the arithmetic rate of increase from 1961 to 1966 was assumed to be the same as from 1956 to 1961. After 1966, the rate was assumed to be half of the 1956-61 annual rate.

Yukon and Northwest Territories -- The assumption made for residents of the Yukon and Northwest Territories was that the annual arithmetic rate of change would be the same from 1963 to 1970 as it was from 1956 to 1963. This assumption was made for every age-sex group.

Adjustment to Annual Average Basis -- An estimate of the June 1, 1963 labour force population was made for each age-sex group by interpolating between the published May and June figures. The difference between this estimate and the published 1963 annual average was then calculated. This difference was added to the June 1 labour force population projection for each year.

Estimates of the Effects of Age Shifts on Participation Rates for Selected Groups

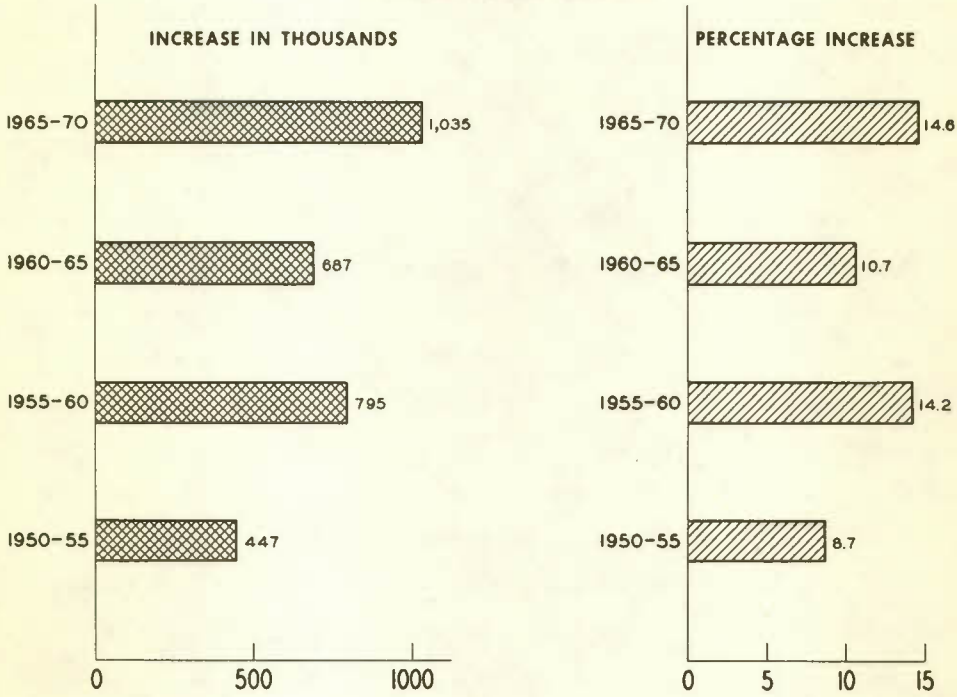
For the 14-19 and 20-24 male and female age groups, estimates of single-age participation rates were made for the year 1962 by graphic interpolation between published rates. Estimates were also made of the labour force population at each age in every year from 1951 on. The 1962 participation rates were then reweighted on the basis of the population distributions for each of the other years. The difference between the actual 1962 group rate and the group rate obtained by reweighting the 1962 single-age rates according to the population distribution for, say, 1951 represents an estimate of the pure effect of age shifts between the two years. In this manner, the age effect was estimated for each year from 1951 to 1963 and subtracted from the original rate to obtain the "standardised" rate. The age effect was estimated in a similar fashion for each year of the period of projection.

The procedures were the same for the male 65-and-over group, except that here the calculations were carried out using only two age divisions -- 65-69 and 70 and over.

II - BRIEF SUMMARY OF RESULTS

On the basis of the foregoing calculations, the labour force is expected to grow by a little over a million people between 1965 and 1970, or something in excess of 200 thousand per year. This would represent an increase of just under 15 per cent in the second half of the decade -- a substantially higher rate than in the first half and slightly above the 1955-60 rate. A comparison of labour force growth in the 1950's and 1960's is afforded by Chart 2.

CHART 2
LABOUR FORCE GROWTH



Source: DBS Labour Force Survey and estimates or projections by Economic Council of Canada.

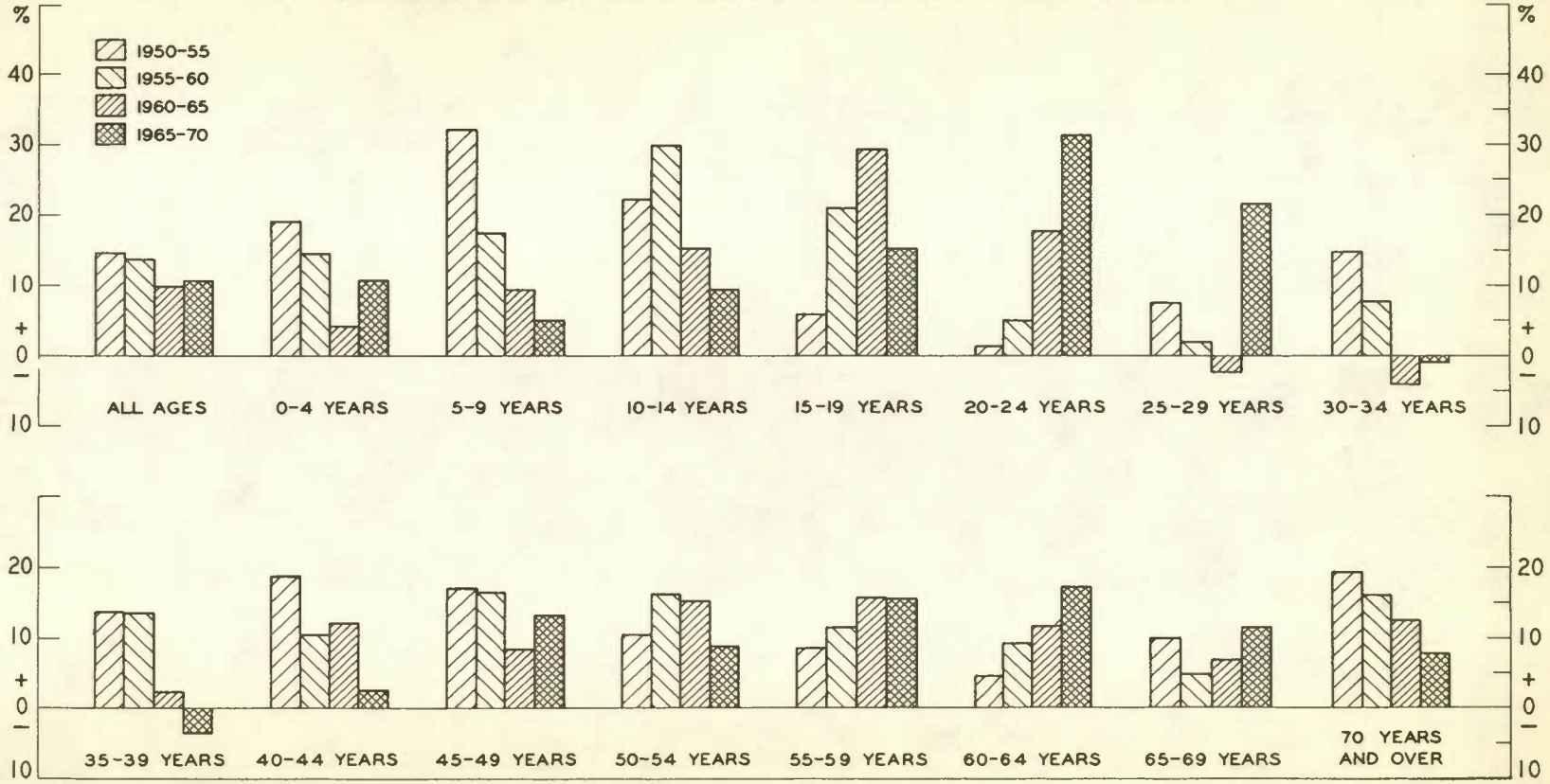
The changes in particular components of the labour force are of interest. The impact of the "baby boom" has been modified and delayed during the last few years by the tendency for young people to stay in school longer. However, this could only act as a temporary brake. The number of people 20-24 in the labour force is expected to increase by 33 per cent from 1965 to 1970, and 57 per cent over the decade as a whole. Whereas the male labour force in this age group increased by 25 thousand in the 1950's, for the 1960's an increase of 270 thousand is projected, or more than ten times as much. The population changes which underlie these changes in the labour force are displayed in Chart 3 based on the material presented by Yoshiko Kasahara in Part I of this study.

Another important aspect of labour force growth is the rapid increase in the number of working women referred to in section I. In 1950, the female labour force numbered a little over a million; in 1970, it is expected to number about 2½ million, or almost a third of the total Canadian labour force. It is anticipated that by the end of the decade roughly three out of every ten married women will be in the labour force.

Immigration played a major rôle in the growth of the labour force in the 1950's, especially in the early years. With the domestic supply of young people severely limited by the low pre-war birth rates, there was a heavy dependence on foreign sources of manpower. It is calculated that net immigration accounted for roughly two thirds of the total labour force increase in the period 1950-55 and almost half over the decade as a whole. But in the 1960's the situation is quite different, as can be seen in Chart 4. It is estimated that over 90 per cent of the 1960-65 increase in the labour force and perhaps 85 per cent of the 1965-70 increase will come from within the population now living in Canada. Even if net immigration were to be considerably higher than the 50,000 per annum assumed here, domestic population would still be the dominant source of labour force growth throughout this decade.

CHART 3

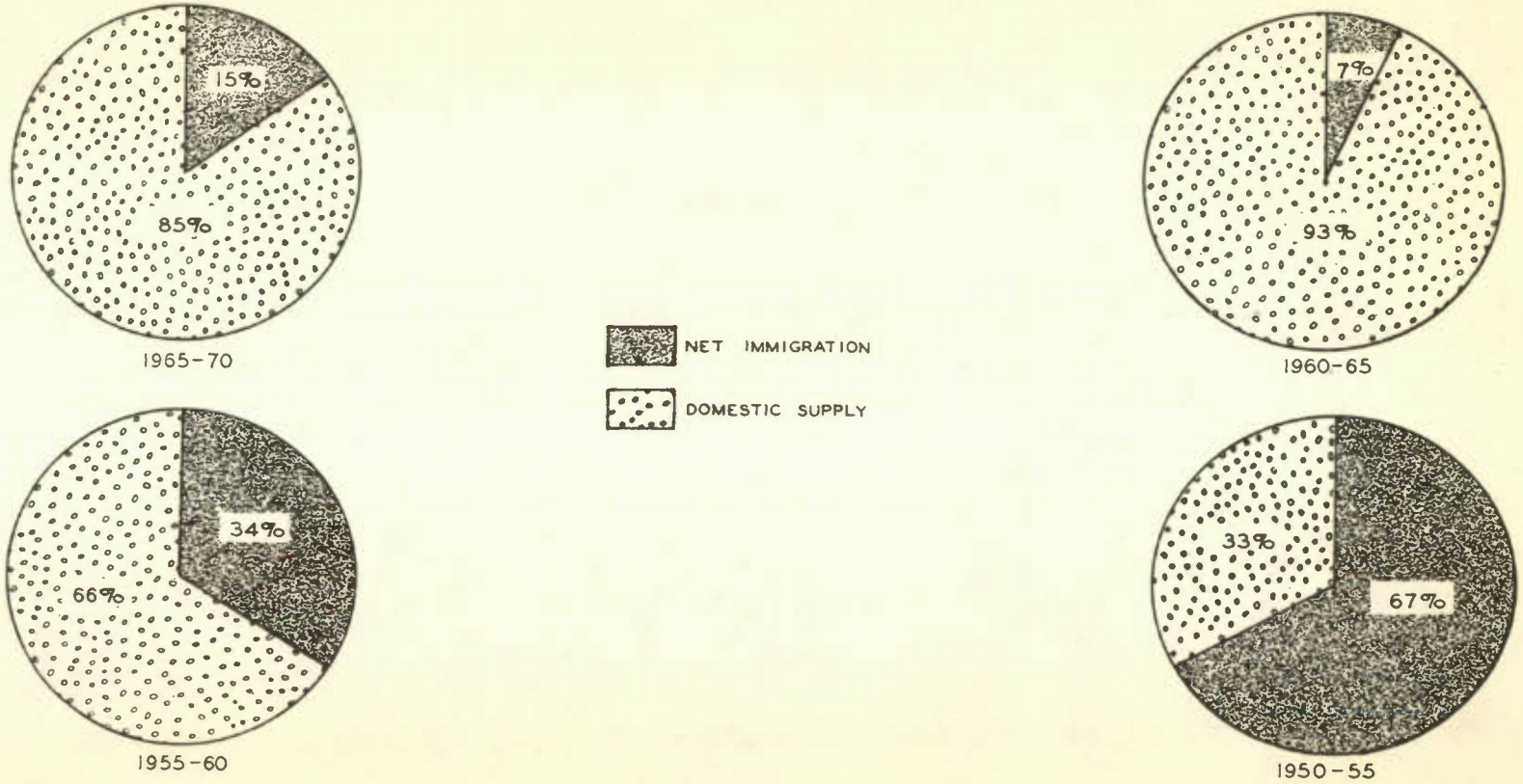
PERCENTAGE CHANGES IN POPULATION BY AGE GROUP



Source: DBS intercensal estimates and projections by Economic Council of Canada

CHART 4

THE COMPONENTS OF LABOUR FORCE GROWTH



Source: Economic Council of Canada

III - STATISTICAL TABLES

Table 1

Average Annual Participation Rates

(Labour force as percentage of labour force population)

	United States (Civilian White Population) 1963	Canada (Civilian Population) 1956	1963	1970	Change 1956-63	Change 1963-70
Men						
14-19	40.7	48.1	39.0	37.1	-9.1	-1.9
20-24	85.8	91.7	88.9	87.4	-2.8	-1.5
25-34	97.4	97.6	97.6	97.6	0.0	0.0
35-44	97.8	97.6	97.8	97.8	0.2	0.0
45-54	96.2	96.0	96.0	96.0	0.0	0.0
55-64	86.6	86.4	86.0	85.5	-0.4	-0.5
65 and over	28.4	34.1	26.3	25.1	-7.8	-1.2
All ages, 14 and over	78.1	82.2	78.4	77.2	-3.8	-1.2
Women						
14-19	29.0	33.9	29.9	30.9	-4.0	1.0
20-24	47.3	47.1	50.0	51.4	2.9	1.4
25-34	34.8	25.1	29.2	33.0	4.1	3.8
35-44	43.1	23.8	31.7	37.0	7.9	5.3
45-54	49.5	24.4	34.7	43.5	10.3	8.8
55-64	38.9	15.9	24.7	32.0	8.8	7.3
65 and over	9.4	4.5	5.8	7.0	1.3	1.2
All ages, 14 and over	35.9	24.9	29.6	34.1	4.7	4.5

Source: Canadian participation rates based on data from DBS Labour Force Survey and estimates or projections by Economic Council of Canada. United States rates from U.S. Manpower Report of the President, 1964.

Table 2

Civilian Labour Force, Estimated and Projected, by Sex and Age, Annual Averages
(in thousands)

	Estimated[1]						Projected						
	1950	1955	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Both Sexes													
14-19	559	548	636	643	654	671	703	738	769	794	812	824	834
20-24	735	729	787	801	808	833	877	928	984	1,044	1,109	1,173	1,234
25-34	1,248	1,382	1,493	1,491	1,481	1,479	1,474	1,479	1,495	1,523	1,559	1,610	1,671
35-44	1,059	1,237	1,446	1,477	1,507	1,538	1,568	1,592	1,612	1,626	1,634	1,637	1,637
45-54	793	932	1,146	1,185	1,221	1,263	1,300	1,336	1,376	1,417	1,460	1,504	1,548
55-64	538	569	670	699	720	745	771	799	832	863	895	931	965
65 and over	230	213	227	226	223	215	217	220	222	225	229	233	238
All ages, 14 and over	5,163	5,610	6,405	6,522	6,614	6,744	6,910	7,092	7,290	7,492	7,698	7,912	8,127
Men													
14-19	352	327	365	361	371	385	402	419	434	446	454	459	462
20-24	480	475	505	510	506	521	551	585	621	659	700	740	779
25-34	990	1,096	1,163	1,154	1,144	1,134	1,124	1,121	1,127	1,142	1,165	1,198	1,240
35-44	879	999	1,104	1,120	1,134	1,151	1,167	1,179	1,188	1,193	1,194	1,191	1,186
45-54	669	766	879	894	910	931	947	962	979	997	1,016	1,035	1,054
55-64	472	489	541	554	567	581	596	611	630	646	663	682	699
65 and over	209	190	191	187	185	174	173	174	173	174	175	177	179
All ages, 14 and over	4,050	4,341	4,748	4,780	4,817	4,877	4,960	5,051	5,152	5,257	5,367	5,482	5,599
Women													
14-19	207	222	271	282	283	286	301	319	335	348	358	365	372
20-24	255	254	282	291	302	312	326	343	363	385	409	433	455
25-34	258	285	330	337	337	345	350	358	368	381	394	412	431
35-44	180	238	342	357	373	387	401	413	424	433	440	446	451
45-54	125	166	267	291	311	332	353	374	397	420	444	469	494
55-64	67	81	129	145	153	164	175	188	202	217	232	249	266
65 and over	21	23	36	39	38	41	44	46	49	51	54	56	59
All ages, 14 and over	1,112	1,269	1,657	1,742	1,797	1,867	1,950	2,041	2,138	2,235	2,331	2,430	2,528

(1) DBS Labour Force Survey estimates. The 1960-63 estimates have been adjusted to achieve consistency with population data from the 1961 census and revised DBS intercensal population estimates.

Table 3

Changes in the Civilian Labour Force, Estimated and Projected, by Sex and Age

	Increase or Decrease in Thousands						Percentage Increase or Decrease					
	Estimated[1]		Projected				Estimated[1]		Projected			
	1950–55	1955–60	1960–65	1965–70	1950–60	1960–70	1950–55	1955–60	1960–65	1965–70	1950–60	1960–70
Both Sexes												
14 – 19	–11	88	102	96	77	198	–2.0	16.1	16.0	13.0	13.8	31.1
20 – 24	– 6	58	141	306	52	447	–0.8	8.0	17.9	33.0	7.1	56.8
25 – 34	134	111	–14	192	245	178	10.7	8.0	–0.9	13.0	19.6	11.9
35 – 44	178	209	146	45	387	191	16.8	16.9	10.1	2.8	36.5	13.2
45 – 54	139	214	190	212	353	402	17.5	23.0	16.6	15.9	44.5	35.1
55 – 64	31	101	129	166	132	295	5.8	17.8	19.3	20.8	24.5	44.0
65 and over	–17	14	– 7	18	– 3	11	–7.4	6.6	–3.1	8.2	–1.3	4.8
All ages, 14 and over	447	795	687	1,035	1,242	1,722	8.7	14.2	10.7	14.6	24.1	26.9
Men												
14 – 19	–25	38	54	43	13	97	–7.1	11.6	14.8	10.3	3.7	26.6
20 – 24	– 5	30	80	194	25	274	–1.0	6.3	15.8	33.2	5.2	54.3
25 – 34	106	67	–42	119	173	77	10.7	6.1	–3.6	10.6	17.5	6.6
35 – 44	120	105	75	7	225	82	13.7	10.5	6.8	0.6	25.6	7.4
45 – 54	97	113	83	92	210	175	14.5	14.8	9.4	9.6	31.4	19.9
55 – 64	17	52	70	88	69	158	3.6	10.6	12.9	14.4	14.6	29.2
65 and over	–19	1	–17	5	–18	–12	–9.1	0.5	–8.9	2.9	–8.6	–6.3
All ages, 14 and over	291	407	303	548	698	851	7.2	9.4	6.4	10.8	17.2	17.9
Women												
14 – 19	15	49	48	53	64	101	7.2	22.1	17.7	16.6	30.9	37.3
20 – 24	– 1	28	61	112	27	173	–0.4	11.0	21.6	32.7	10.6	61.3
25 – 34	27	45	28	73	72	101	10.5	15.8	8.5	20.4	27.9	30.6
35 – 44	58	104	71	38	162	109	32.2	43.7	20.8	9.2	90.0	31.9
45 – 54	41	101	107	120	142	227	32.8	60.8	40.1	32.1	113.6	85.0
55 – 64	14	48	59	78	62	137	20.9	59.3	45.7	41.5	92.5	106.2
65 and over	2	13	10	13	15	23	9.5	56.5	27.8	28.3	71.4	63.9
All ages, 14 and over	157	388	384	487	545	871	14.1	30.6	23.2	23.9	49.0	52.6

(1) Based on DBS Labour Force Survey estimates. The 1960 estimates have been adjusted to achieve consistency with population data from the 1961 census and revised DBS intercensal population estimates.

Table 4

Percentage Distribution of the Civilian Labour Force, Estimated and Projected, by Sex and Age, Annual Averages

	Estimated[1]						Projected						
	1950	1955	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Men													
14-19	6.8	5.8	5.7	5.5	5.6	5.7	5.8	5.9	6.0	6.0	5.9	5.8	5.7
20-24	9.3	8.5	7.9	7.8	7.6	7.7	8.0	8.2	8.5	8.8	9.1	9.4	9.6
25-34	19.2	19.5	18.2	17.7	17.3	16.8	16.3	15.8	15.5	15.3	15.1	15.1	15.2
35-44	17.0	17.8	17.2	17.2	17.1	17.1	16.9	16.6	16.3	15.9	15.5	15.1	14.6
45-54	13.0	13.7	13.7	13.7	13.8	13.8	13.7	13.6	13.4	13.3	13.2	13.1	13.0
55-64	9.1	8.7	8.4	8.5	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
65 and over	4.1	3.4	3.0	2.9	2.8	2.6	2.5	2.5	2.4	2.3	2.3	2.2	2.2
All ages, 14 and over	78.5	77.4	74.1	73.3	72.8	72.3	71.8	71.2	70.7	70.2	69.7	69.3	68.9
Women													
14-19	4.0	4.0	4.2	4.3	4.3	4.3	4.4	4.5	4.6	4.6	4.7	4.6	4.6
20-24	4.9	4.5	4.4	4.4	4.6	4.6	4.7	4.8	5.0	5.1	5.3	5.5	5.6
25-34	5.0	5.1	5.2	5.2	5.1	5.1	5.1	5.1	5.0	5.1	5.1	5.2	5.3
35-44	3.5	4.2	5.3	5.5	5.6	5.8	5.8	5.8	5.8	5.8	5.7	5.6	5.5
45-54	2.4	3.0	4.2	4.5	4.7	4.9	5.1	5.3	5.4	5.6	5.8	5.9	6.1
55-64	1.3	1.4	2.0	2.2	2.3	2.4	2.5	2.7	2.8	2.9	3.0	3.2	3.3
65 and over	0.4	0.4	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7
All ages, 14 and over	21.5	22.6	25.9	26.7	27.2	27.7	28.2	28.8	29.3	29.8	30.3	30.7	31.1
Total, Both Sexes	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(1) Based on DBS Labour Force Survey estimates. The 1960-63 estimates have been adjusted to achieve consistency with population data from the 1961 census and revised DBS intercensal population estimates.

Table 5

Civilian Labour Force Population 14 Years of Age and Over, Estimated and Projected, by Sex and Age, Annual Averages
(in thousands)

	Estimated[1]						Projected						
	1950	1955	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Both Sexes													
14-19	1,258	1,347	1,681	1,762	1,848	1,944	2,047	2,142	2,224	2,296	2,356	2,405	2,450
20-24	1,065	1,064	1,141	1,159	1,177	1,210	1,271	1,341	1,419	1,504	1,596	1,689	1,776
25-34	2,095	2,299	2,396	2,381	2,363	2,344	2,331	2,332	2,349	2,382	2,430	2,494	2,578
35-44	1,776	2,049	2,294	2,331	2,363	2,398	2,428	2,450	2,463	2,467	2,461	2,449	2,433
45-54	1,358	1,547	1,789	1,837	1,885	1,928	1,967	2,007	2,050	2,096	2,142	2,189	2,234
55-64	1,050	1,119	1,233	1,266	1,301	1,338	1,376	1,414	1,460	1,505	1,552	1,601	1,648
65 and over	1,015	1,172	1,295	1,321	1,347	1,373	1,406	1,426	1,447	1,470	1,495	1,524	1,553
All ages, 14 and over	9,615	10,597	11,829	12,057	12,284	12,535	12,826	13,112	13,412	13,720	14,032	14,351	14,672
Men													
14-19	630	673	849	891	936	986	1,039	1,088	1,130	1,167	1,198	1,223	1,246
20-24	516	515	554	562	569	586	621	661	704	750	798	846	891
25-34	1,022	1,123	1,188	1,182	1,172	1,162	1,152	1,149	1,155	1,170	1,194	1,227	1,271
35-44	896	1,024	1,130	1,146	1,160	1,177	1,193	1,206	1,215	1,220	1,221	1,218	1,213
45-54	697	799	912	933	952	970	986	1,002	1,020	1,039	1,058	1,078	1,098
55-64	544	568	623	640	658	676	694	711	734	754	775	797	817
65 and over	517	588	633	643	651	660	665	670	677	684	693	703	714
All ages, 14 and over	4,822	5,290	5,889	5,997	6,098	6,217	6,350	6,487	6,635	6,784	6,937	7,092	7,250
Women													
14-19	628	674	832	871	912	958	1,008	1,054	1,094	1,129	1,158	1,182	1,204
20-24	549	549	587	597	608	624	650	680	715	754	798	843	885
25-34	1,073	1,176	1,208	1,199	1,191	1,182	1,179	1,183	1,194	1,212	1,236	1,267	1,307
35-44	879	1,025	1,164	1,185	1,203	1,221	1,235	1,244	1,248	1,247	1,240	1,231	1,220
45-54	660	747	877	904	933	958	981	1,005	1,030	1,057	1,084	1,111	1,136
55-64	506	551	610	626	643	662	682	703	726	751	777	804	831
65 and over	498	585	662	678	696	713	741	756	770	786	802	821	839
All ages, 14 and over	4,793	5,306	5,940	6,060	6,186	6,318	6,476	6,625	6,777	6,936	7,095	7,259	7,422

(1) DBS Labour Force Survey estimates. The 1960-63 estimates have been adjusted to achieve consistency with population data from the 1961 census and revised DBS intercensal population estimates.

Table 6

Civilian Labour Force Participation Rates, Estimated and Projected, by Sex and Age, Annual Averages

(Labour force as percentage of labour force population)

	Estimated[1]						Projected						
	1950	1955	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Men													
14-19	55.9	48.6	43.0	40.5	39.6	39.0	38.7	38.5	38.4	38.2	37.9	37.5	37.1
20-24	93.0	92.2	91.2	90.7	89.0	88.9	88.7	88.5	88.2	87.9	87.7	87.5	87.4
25-34	96.9	97.6	97.9	97.6	97.6	97.6	97.6	97.6	97.6	97.6	97.6	97.6	97.6
35-44	98.1	97.6	97.7	97.7	97.8	97.8	97.8	97.8	97.8	97.8	97.8	97.8	97.8
45-54	96.0	95.9	96.4	95.8	95.6	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0
55-64	86.8	86.1	86.8	86.6	86.1	86.0	85.9	85.9	85.8	85.7	85.6	85.6	85.5
65 and over	40.4	32.3	30.2	29.1	28.4	26.3	26.0	25.9	25.6	25.5	25.3	25.2	25.1
All ages, 14 and over	84.0	82.1	80.6	79.7	79.0	78.4	78.1	77.9	77.6	77.5	77.4	77.3	77.2
Women													
14-19	33.0	32.9	32.6	32.4	31.0	29.9	29.9	30.3	30.6	30.8	30.9	30.9	30.9
20-24	46.4	46.3	48.1	48.8	49.7	50.0	50.2	50.5	50.7	51.1	51.2	51.4	51.4
25-34	24.0	24.2	27.3	28.1	28.3	29.2	29.7	30.3	30.8	31.4	31.9	32.5	33.0
35-44	20.5	23.2	29.4	30.1	31.0	31.7	32.5	33.2	34.0	34.7	35.5	36.2	37.0
45-54	18.9	22.2	30.4	32.2	33.3	34.7	36.0	37.2	38.5	39.7	41.0	42.2	43.5
55-64	13.2	14.7	21.2	23.2	23.8	24.7	25.7	26.8	27.8	28.9	29.9	31.0	32.0
65 and over	4.2	3.9	5.5	5.8	5.5	5.8	6.0	6.1	6.3	6.5	6.7	6.8	7.0
All ages, 14 and over	23.2	23.9	27.9	28.7	29.0	29.6	30.1	30.8	31.5	32.2	32.9	33.5	34.1
Both Sexes, All ages 14 and over	53.7	52.9	54.1	54.1	53.8	53.8	53.9	54.1	54.4	54.6	54.9	55.1	55.4

(1) DBS Labour Force Survey estimates. The 1960-63 estimates have been adjusted to achieve consistency with population data from the 1961 census and revised DBS intercensal population estimates. In the case of participation rates, these adjustments affect only the total men, total women, and total both sexes figures.

Table 7

Effects of Age Shifts on Civilian Labour Force Participation Rates for Selected Groups, Estimated and Projected, Annual Averages

(Labour force as percentage of labour force population)

	Men 14 - 19			Men 20 - 24			Men 65 and over			Women 14 - 19			Women 20 - 24		
	Standardised Rate	Age Effect	Observed Rate	Standardised Rate	Age Effect	Observed Rate	Standardised Rate	Age Effect	Observed Rate	Standardised Rate	Age Effect	Observed Rate	Standardised Rate	Age Effect	Observed Rate
1951	53.4	1.9	55.3	93.2	0.2	93.4	35.9	2.0	37.9	32.1	2.1	34.2	47.6	-0.7	46.9
1952	51.0	1.8	52.8	92.7	0.2	92.9	35.0	1.7	36.7	31.2	1.9	33.1	47.8	-0.7	47.1
1953	50.1	1.6	51.7	92.6	0.3	92.9	33.3	1.5	34.8	31.4	1.8	33.2	47.9	-0.7	47.2
1954	48.8	1.4	50.2	91.7	0.3	92.0	31.9	1.3	33.2	32.0	1.6	33.6	47.2	-0.6	46.6
1955	47.5	1.1	48.6	91.9	0.3	92.2	31.2	1.1	32.3	31.6	1.3	32.9	46.9	-0.6	46.3
1956	47.3	0.8	48.1	91.4	0.3	91.7	33.2	0.9	34.1	32.9	1.0	33.9	47.7	-0.6	47.1
1957	47.3	0.5	47.8	91.3	0.2	91.5	33.5	0.7	34.2	32.4	0.7	33.1	47.0	-0.5	46.5
1958	45.3	0.3	45.6	91.4	0.2	91.6	31.7	0.5	32.2	31.5	0.6	32.1	47.9	-0.5	47.4
1959	43.5	0.2	43.7	90.8	0.2	91.0	30.8	0.3	31.1	31.5	0.5	32.0	46.9	-0.4	46.5
1960	42.9	0.1	43.0	91.0	0.2	91.2	30.0	0.2	30.2	32.3	0.3	32.6	48.4	-0.3	48.1
1961	40.5	0.0	40.5	90.6	0.1	90.7	29.0	0.1	29.1	32.4	0.0	32.4	49.0	-0.2	48.8
1962	39.6	0.0	39.6	89.0	0.0	89.0	28.4	0.0	28.4	31.0	0.0	31.0	49.7	0.0	49.7
1963	39.0	0.0	39.0	89.0	-0.1	88.9	26.3	0.0	26.3	30.0	-0.1	29.9	50.0	0.0	50.0
1964	38.5	0.2	38.7	88.8	-0.1	88.7	26.0	0.0	26.0	29.9	0.0	29.9	50.1	0.1	50.2
1965	38.0	0.5	38.5	88.6	-0.1	88.5	25.8	0.1	25.9	29.9	0.4	30.3	50.3	0.2	50.5
1966	37.5	0.9	38.4	88.4	-0.2	88.2	25.5	0.1	25.6	29.8	0.8	30.6	50.4	0.3	50.7
1967	37.0	1.2	38.2	88.1	-0.2	87.9	25.3	0.2	25.5	29.7	1.1	30.8	50.6	0.5	51.1
1968	36.5	1.4	37.9	87.9	-0.2	87.7	25.0	0.3	25.3	29.6	1.3	30.9	50.7	0.5	51.2
1969	36.0	1.5	37.5	87.7	-0.2	87.5	24.8	0.4	25.2	29.6	1.3	30.9	50.9	0.5	51.4
1970	35.5	1.6	37.1	87.5	-0.1	87.4	24.5	0.6	25.1	29.5	1.4	30.9	51.0	0.4	51.4

TECHNICAL STUDIES

The following is a list of technical studies which have been prepared as background papers for the First Annual Review of the Economic Council of Canada. They are being published separately and are available from the Queen's Printer, Ottawa. Although they are being published under the auspices of the Economic Council, the views expressed in them are those of the authors themselves.

Staff Studies

1. Population and Labour Force Projections to 1970, by Frank T. Denton, Yoshiko Kasahara and Sylvia Ostry.
2. Potential Output, 1946 to 1970, by B. J. Drabble.
3. An Analysis of Post-War Unemployment, by Frank T. Denton and Sylvia Ostry.
4. Housing Demand to 1970, by Wolfgang M. Illing.
5. Business Investment to 1970, by Derek A. White.
6. Special Survey of Longer Range Investment Outlook and Planning in Business, by B. A. Keys.
7. Canada and World Trade, by M. G. Clark.
8. Export Projections to 1970, by J. R. Downs.
9. Federal Tax Revenues at Potential Output, 1960 and 1970, by D. J. Daly.
10. National Saving at Potential Output to 1970, by Frank Wildgen.
11. Changes in Agriculture to 1970, by John Dawson.

Special Studies

1. Immigration and Emigration of Professional and Skilled Manpower During the Post-War Period, by Louis Parai.
2. A Survey of Labour Market Conditions, Windsor, Ontario, 1964: A Case Study, by G. R. Horne, W. J. Gillen and R. A. Helling.

Population and Labour Force Projections to 1970,

by Frank T. Denton, Yoshiko Kasahara *and* Sylvia Ostry

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