

FEDERAL RESERVE BANK OF RICHMOND

MONTHLY REVIEW

*Fifth District Population
Zero Population Growth*



SEPTEMBER 1971

FIFTH DISTRICT POPULATION

GROWTH AND DISTRIBUTION, 1950-1970

INTRODUCTION

Changes in the economic and social structure of the United States have had and are continuing to have profound effects upon the nature and location of employment opportunities and the distribution of population. Increasingly, Americans are coming to realize that a highly uneven distribution of population can have serious implications. Migration may result in serious problems of over-population in some areas and under-population in others. There is a growing concern that population shifts of the past two decades have had extremely detrimental effects on many rural areas while at the same time greatly aggravating urban problems. Thus, there has recently been a renewed interest in the geographic distribution of the population. Policymakers at both the national and state level are interested in achieving more widespread geographic distribution of economic growth.

The two major sources of population change for any area are natural increase (or decrease) and net migration. Natural increase (or decrease) refers to the difference between births and deaths. Net migration is the difference between the number of persons migrating into an area and the number migrating from the area. Although differentials in the rate of natural increase exist, net migration is generally the more important determinant of differences in population changes from area to area. For example, every decrease in population occurring in the counties of the Fifth Federal Reserve District between 1960 and 1970 can be attributed to net out-migration.

Migration is influenced by many factors, but those who have studied population movement in the United States generally agree that the availability of jobs is the primary determinant of the amount and the direction of migration. Although population growth is not necessarily the same thing as labor force growth, research indicates that population migration normally includes a sufficient number of individuals actively seeking work so that it is representative of

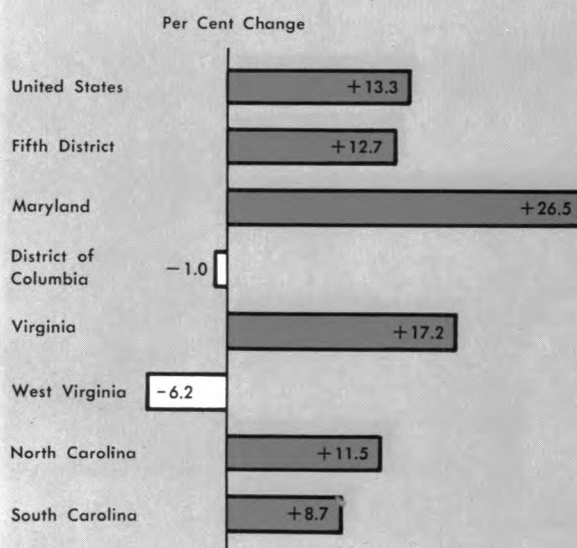
labor force migration.¹ Thus, a study of net migration rates enables one to pinpoint areas where the growth in employment opportunities has exceeded labor force growth and vice versa.

POPULATION CHANGE

In the past decade, the population of the Fifth District increased 12.7 percent, somewhat less than the national increase of 13.3 percent. There was, however, a wide variation in population growth rates among District states (Chart 1). Although

¹ For a more extensive discussion of the relationship between employment opportunities and population migration, see Glen H. Miller, Jr., "Population Growth in the States of the Tenth Federal Reserve District 1950 to 1964," *Monthly Review*, Federal Reserve Bank of Kansas City (Kansas City, May-June 1966), pp. 3-11 and Margaret S. Gordon, "Immigration and Its Effect on Labor Force Characteristics," *Monthly Labor Review*, Bureau of Labor Statistics, Vol. 82, No. 5 (Washington, May 1959), pp. 492-501.

Chart 1
RATE OF POPULATION CHANGE, 1960-1970
UNITED STATES AND FIFTH DISTRICT



Source: Table 1.

the rate of growth in Maryland and Virginia was less than it had been in the previous two decades, the rate of population gains exceeded the national rate in both of these states. North Carolina had its slowest rate of growth since 1870 and South Carolina had its slowest growth since 1930. West Virginia and the District of Columbia both lost population between 1960 and 1970, but the rate of loss was not as high as in the previous decade.

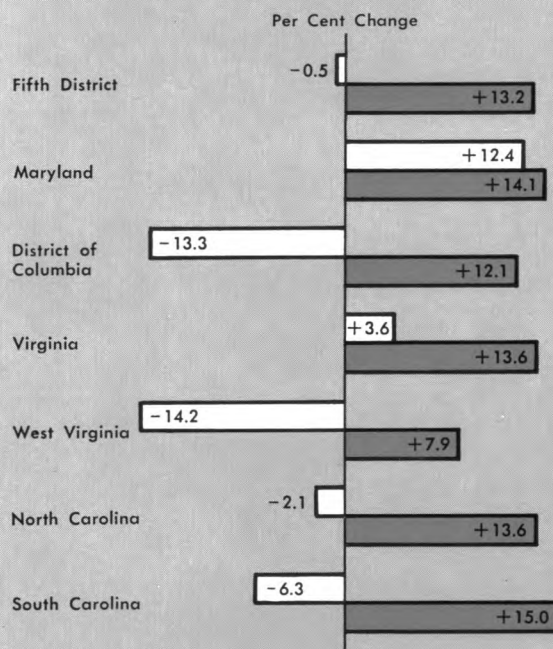
Had there been no movement of people into or out of District states, all of the states would have grown in the 1960's, even though there were some differences in the rate of natural increase (Chart 2). The rate of natural increase for the District as a whole was approximately 13.2 percent, ranging from a low of 7.9 percent for West Virginia to a high of 15.0 percent for South Carolina.

Using net migration as an index of response to economic opportunities, one can see that economic opportunities varied widely from state to state in the District. Net out-migration from the District as a whole during the 1960's was approximately one-tenth of what it was during the previous ten years—83,032 compared with 820,069 in the 1950's (Table I). Apparently economic opportunities were strong enough to attract people in only two states—Maryland and Virginia. Migration to these states was undoubtedly affected by the growth of employment opportunities in the Washington, D. C. metropolitan area and the concomitant exodus of people from the District of Columbia to Maryland and Virginia suburbs. All other District states lost population through net migration losses that ranged from a rate of 2.1 percent for North Carolina to 14.2 percent for West Virginia. The rate of migration loss from these states declined considerably from the 1950-1960 rate (Table I).

There was a heavy out-migration of the nonwhite population from the Fifth District during the 1960's, following the pattern set in the previous two decades. Only Maryland and the District of Columbia experienced net migration gains of nonwhites. All other District states had net migration losses, with North and South Carolina experiencing migration losses of more than 175,000 nonwhites each. Out-movement was largest in nonmetropolitan areas, although many metropolitan counties in the District showed net out-migration of nonwhites. The net migration gains of Virginia and Maryland were almost entirely in Standard Metropolitan Statistical Area counties.

Between 1960 and 1970, the rate of population growth was higher in the metropolitan (SMSA) counties although the rate of growth for these

Chart 2
NATURAL INCREASE AND MIGRATION,
1960-1970
FIFTH DISTRICT



Source: Table I.

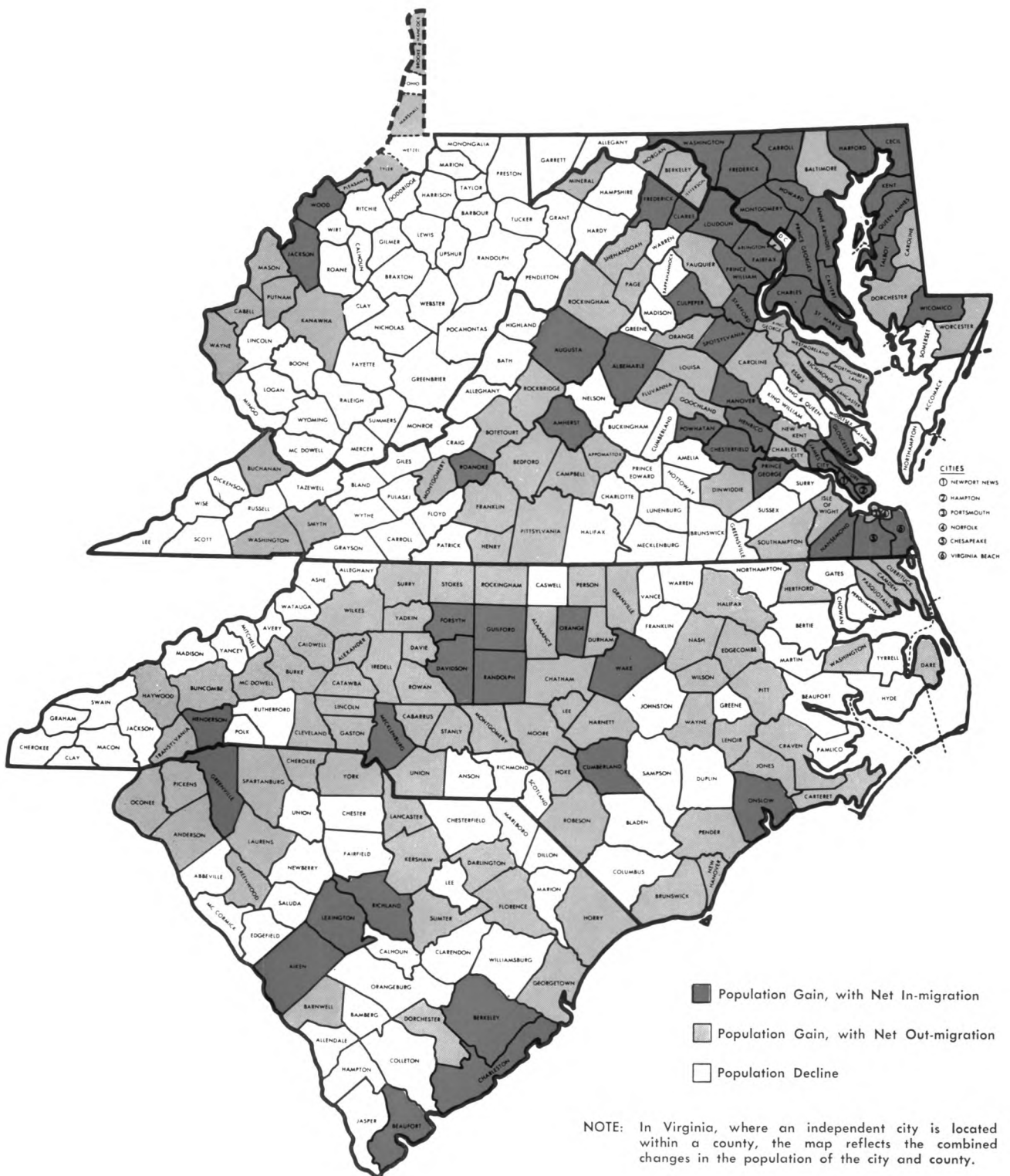
counties was less than it was in the 1950's. The rate of population growth in non-SMSA counties with urban populations of over 50,000 more than doubled between the two decades. Counties with urban population of 10,000 to 25,000 also increased their rate of growth. Rural counties experienced a loss in population in the past decade (Table II). All states in the District experienced a net out-migration from non-SMSA counties between 1960 and 1970.

DISTRIBUTION OF POPULATION CHANGE

To illustrate recent differences in population change in the District, the maps divide the counties of the District into three categories: (1) counties that have grown in population from net in-migration of people, as well as from an excess of births over deaths, (2) counties that increased in population but had some net out-migration to other areas, and (3) counties that declined in total population. The growth rates of counties experiencing net migration gains vary substantially, but given the close association of economic and population growth, most of

FIFTH DISTRICT POPULATION CHANGE

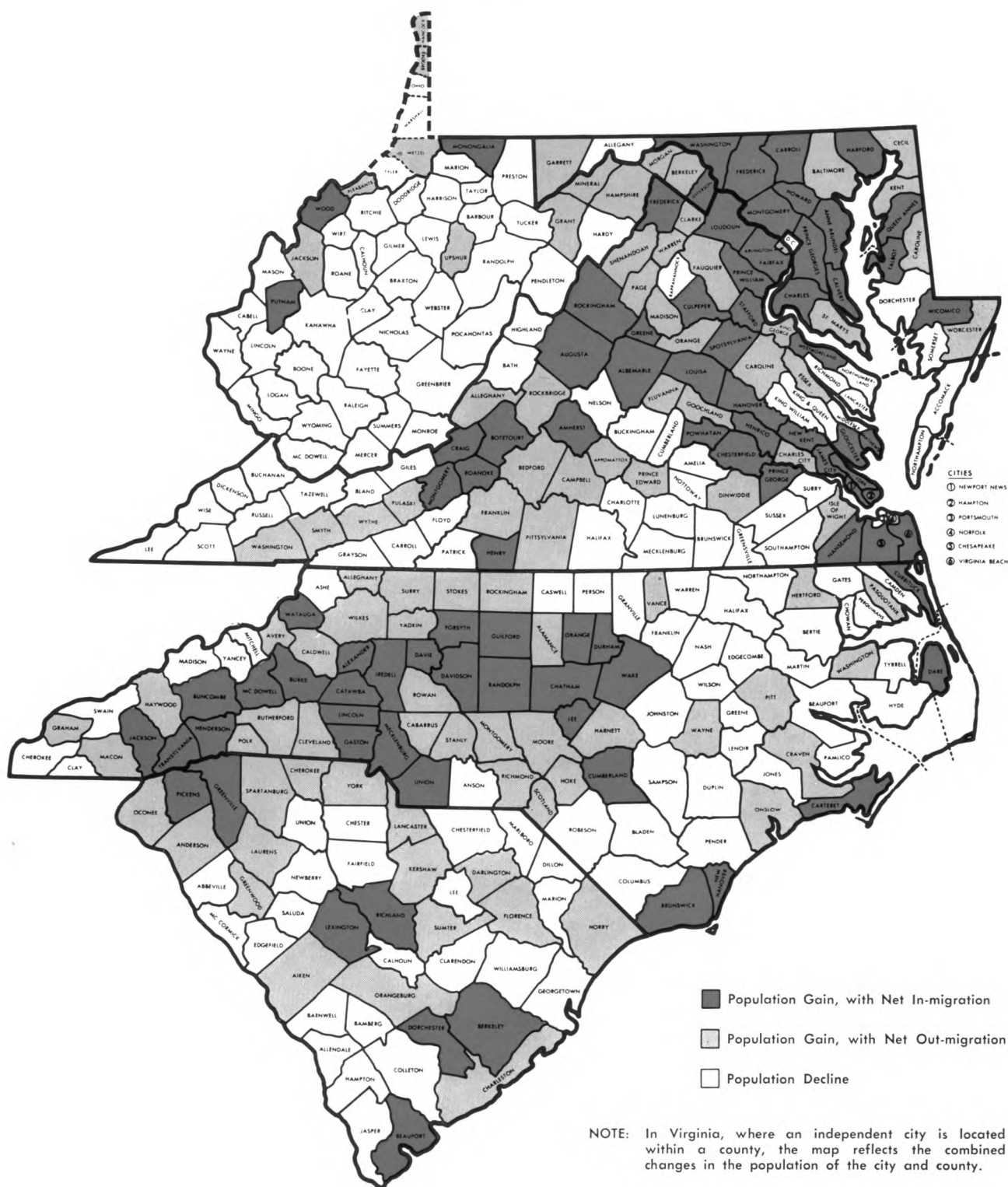
1950-1960



Source: U. S. Bureau of the Census, Current Population Reports: Population Estimates and Projections, Series P-25, No. 461, June 28, 1971 and Components of Population Change 1950 to 1960, for Counties, Standard Metropolitan Statistical Areas, State Economic Areas, and Economic Subregions, Series P-23, No. 7, November 1962.

FIFTH DISTRICT POPULATION CHANGE

1960-1970



Source: U. S. Bureau of the Census, Current Population Reports: Population Estimates and Projections, Series P-25, No. 461, June 28, 1971 and Components of Population Change 1950 to 1960, for Counties, Standard Metropolitan Statistical Areas, State Economic Areas, and Economic Subregions, Series P-23, No. 7, November 1962.

Table I

**POPULATION AND NET MIGRATION TRENDS IN THE UNITED STATES AND FIFTH DISTRICT
1950, 1960, AND 1970**

	Census Population			Percent Change		Net Migration		Net Migration Rate	
	1950	1960	1970	1950-60	1960-70	1950-60	1960-70	1950-60	1960-70
United States	151,325,798	179,323,175	203,184,772	18.5	13.3	N.A. ¹	N.A.	N.A.	N.A.
Fifth District	14,648,367	16,630,764	18,744,215	13.5	12.7	-820,069	- 83,032	- 5.6	- 0.5
Maryland	2,343,001	3,100,689	3,922,399	32.3	26.5	319,978	384,672	13.7	12.4
D. C.	802,178	763,956	756,510	- 4.8	- 1.0	-158,285	- 99,975	-19.7	-13.3
Virginia	3,318,680	3,966,949	4,648,494	19.5	17.2	14,722	140,958	0.4	3.6
West Virginia	2,005,552	1,860,421	1,744,237	- 7.2	- 6.2	-446,711	-264,874	-22.3	-14.2
North Carolina	4,061,929	4,556,155	5,082,059	12.2	11.5	-327,987	- 94,399	- 8.1	- 2.1
South Carolina	2,117,027	2,382,594	2,590,516	12.5	8.7	-221,786	-149,414	-10.5	- 6.3

¹ Not applicable

Source: U. S. Bureau of the Census, *Current Population Reports: Population Estimates and Projections*, Series P-25, No. 461, June 28, 1971 and *Components of Population Change 1950 to 1960, for Counties, Standard Metropolitan Statistical Areas, State Economic Areas, and Economic Subregions*, Series P-23, No. 7, November 1962.

these areas can be said to have generated more employment opportunities in recent years than could be filled by the local labor force. All of the SMSA areas in the District are evident in this respect, especially the Maryland and Virginia counties surrounding the District of Columbia. There are a number of essentially rural counties in the Fifth District where net in-migration has occurred. Some of these had substantial losses of population in the 1950's. In the 1960's, of 320 counties in District states, 82 had net migration gains and 98 had population gains despite net out-migration. Between 1950 and 1960, only 69 counties in the District states were able to create enough jobs to have a net in-migration and 104 had population gains despite net out-migration.

At the other end of the spectrum are counties that declined in population. There were 140 of them or more than 40 percent in the 1960's. This was slightly less than in the 1950's when 146 counties

decreased in population. Population losses were especially evident in the Appalachian areas of West Virginia and Virginia.

Economic activity as reflected by net migration was more widely dispersed during the 1960-1970 period than in the previous ten years. This fact is particularly evident in North Carolina. During the 1950's there was a high concentration of growth in North Carolina. Only ten counties had net in-migration and seven of these were in the Raleigh, Durham, and Greensboro-Winston-Salem-High Point SMSA's. In the 1960's, 30 counties had net in-migration and they were scattered over much of the state. Thus there likely was less incentive to migrate among counties and from the state than in the previous decade. Virginia likewise achieved a more widely distributed population growth during the 1960's. Net in-migration was experienced by 30 counties compared to 25 during the 1950's. Very little change in geographic distribution of population changes was evident in other District states.

Table II

**POPULATION CHANGE IN
FIFTH DISTRICT COUNTIES**

Counties Classified by Size of 1950 and 1960 Urban Population	Population Change	
	1950-1960 (percent)	1960-1970 (percent)
Metropolitan (SMSA)	25.6	20.5
Over 50,000	8.7	18.0
25,000 to 50,000	11.8	8.9
10,000 to 25,000	5.7	9.9
2,500 to 10,000	5.1	1.9
Under 2,500 (rural)	0.3	- 0.5

SUMMARY

Substantial changes in the growth and distribution of the Fifth District population have occurred since 1950. While the District had a net out-migration of people in the 1960's, the rate of out-migration declined significantly. The growth of economic activity, as reflected by net migration rates, apparently was more widely distributed during the 1960's than in the 1950's, especially in North Carolina and Virginia.

Thomas E. Snider

ZERO POPULATION GROWTH

A movement to limit population growth in the United States has developed in recent years. Many people feel that if population growth is not limited, neither enough resources nor enough space will be available to accommodate the population.

Most people recall the dire consequences of population expansion predicted in the early nineteenth century by the English philosopher Thomas Malthus. Malthus argued that population would increase in a geometric progression (i.e., would double or triple each generation) whereas the food supply would increase only in an arithmetic progression (i.e., by the same amount each generation). Hence, the population might increase as 2, 4, 8, 16, 32, . . . , while, in contrast, food might increase as 2, 4, 6, 8, 10, . . . per generation. Malthus' prediction that famine, war, and pestilence would come upon the world unless population growth could be curtailed in other ways (such as late marriage) fortunately did not come true in the United States, although some would argue that these conditions have been approached in a number of the less affluent nations of the world.

Clearly, the reason that population growth has not unduly burdened the resources of the world is that man's inventiveness has enabled him to find ever more efficient methods of producing the food, clothing, and shelter necessary for his survival. But the adequacy of food, clothing, and shelter is only part of the problem posed by overpopulation. Another problem is space. The more dramatic population forecasts conclude that if world population were to continue its present growth, only one square foot of land per person would be available in six or seven centuries. Such predictions are just as dire as those made by Malthus in the early 1800's. Obviously, if space even approached this degree of scarcity, living standards would be markedly changed from their present levels.

A chief reason for the upsurge in world popula-

tion growth during the past half century has been the worldwide improvement in health care. The prevention and control of disease substantially lowered infant mortality rates and increased longevity throughout the world. World health organizations have employed modern medical and sanitation techniques to prevent killing epidemics. Even cholera, still the plague of many underdeveloped countries, can now be cured if medical treatment is prompt. Vaccination and other preventative measures are usually relatively cheap to employ and require relatively few resources from the rest of the world. Since the population growth in many underdeveloped areas had been limited for centuries by high infant mortality rates, better medical care has led to population increases of often astounding proportions in these areas.

Recently, many Americans concerned with population growth have advocated population control policies for this country. A fundamental reason that they propose control, even though the United States still has a very small population problem compared to other countries, is that they think increasing population leads to increasing pollution of the land, air, and water. In the sense that more goods and services must be produced to support an ever increasing population, some linkage between population and pollution may exist. Moreover, the number of motor vehicles that contribute substantially to the pollution problem varies directly with population expansion. As an alternative to controlling population for pollution control, however, there is the argument that when man turns his ingenuity to a problem, even a problem of such magnitude as environmental pollution, a solution is likely to be found. Much of the pollution in the United States probably could be lessened if it was thought to be important enough to be worth the cost of the solution.

Another argument raised by population-control advocates is that every child born in the United

States will use 30 times more of the basic life support systems of the earth than the average child born in India, hence, the average American makes a much larger than average levy on the limited resource base. The basic life support systems include all necessary natural resources that are not replaceable or restorable, e.g., fossil fuels and ores. Man's ingenuity, some argue, will be sorely taxed in any effort to offset the increased use of such life support systems.

Increased concern with population pressures has generated heightened interest in several organizations that advocate national policies designed to limit population growth in the United States. The groups thus far have limited their suggestions for population control to voluntary restraint. Most plans include incentives to reduce the birth rate—for example, changes in the tax laws to encourage small rather than large families.

Zero Population Growth One of the more radical proposals made is that the United States should strive for the rather elusive goal of zero population growth. It would be extraordinarily difficult for the United States to move immediately to a stationary population. The total fertility rate, i.e., the total number of children that the average woman bears during her lifetime, would have to be 2.1 currently if each generation were to replace itself exactly. Thus, 1,000 women would have to bear 2,100 children to replace themselves with 1,000 women of childbearing age in the next generation. The extra 100 children are needed to allow for mortality and the fact that slightly less than 50% of all newborns are female.

The number of women at or nearing childbearing age in the United States at present is quite large because of the postwar baby boom and the high fertility rate of the early fifties. This large generation could not replace itself without increasing the population. More specifically, zero population growth over the next few years would require the fertility rate to fall to 1.4 children per woman. But, unless the population is to decline, the total fertility rate would subsequently have to rise appreciably when the children of parents born in the depression of the thirties reach childbearing age. In fact, the total fertility rate would have to reach 2.6. Fluctuations of this sort in the total fertility rate would have to continue, gradually diminishing in magnitude, for almost four centuries if the United

States were to have zero population growth. Such changes are highly unlikely.

If the fertility rate were to drop to the replacement level of 2.1, population growth would be said to have stabilized, excluding the effect of immigration. Zero population growth, however, would not be achieved with this fertility rate until the year 2037. At that time, the U.S. population would total 275.5 million persons in comparison with the current figure of approximately 203 million. In other words, the U.S. population, even stabilized, would become 35.7% larger before becoming stationary. Therefore, even a shift in social behavior and attitudes large enough to reduce the total fertility rate to the 2.1 replacement level would still mean a population increase of 75 million persons. It does not seem likely that the total fertility rate will fall to 2.1 in the near future, although it has dropped rather substantially in the past few years. Historically, the fertility rate has never been as low as the replacement level in the U.S.

Fertility Patterns The total fertility rate averaged 3.0 during the 1920's. During the depression years of the 1930's, it dropped substantially to around 2.3 children per woman. The rate increased somewhat to 2.6 in the forties and shot up to 3.7 in the fifties. During the first half of the sixties, the rate remained around 3.5, but it fell to 2.6 in the second half of the decade. The only periods in recent history when the fertility rate was as low as it was in the late sixties were the depression era and the World War II years. Looking at annual data, the recent change in fertility patterns seems even more marked. The total fertility rate was 2.9 in 1965, but it dropped rather steadily to 2.4 by 1969.

This recent decline in fertility was not expected by the Bureau of the Census. In 1958, the Census Bureau estimated the U.S. population in 1980 to range from 231 to 272 million depending upon which of four alternative fertility rates actually materialized. Nearly all of the alternative fertility rates used in these projections now seem too high. Recently revised projections for 1980 range from 225 to 237 million persons. This 1970 revision in the Census projections obviously reflects attitudes quite different from those underlying the estimates made in 1958.

In an appendix to its 1970 projections, the Census Bureau published a set of "Series X" projections

ANNUAL PROJECTIONS OF THE POPULATION OF THE UNITED STATES
BY AGE AND SEX
(FOR SELECTED YEARS 1970-2037)

Intermediate Fertility Level Assumptions — Female
(Thousands of People)

Age Groups	1970	1975	1980	1985	1990	2020	2037
16 - 19	7,429	8,188	8,288	7,092	7,873	12,094	
20 - 24	8,516	9,514	10,360	10,329	9,013	14,200	
25 - 34	12,743	15,668	18,360	20,195	21,007	27,162	
35 - 44	11,738	11,499	12,938	15,827	18,486	24,994	
45 - 54	12,106	12,278	11,566	11,350	12,762	19,246	
55 - 64	9,765	10,609	11,369	11,536	10,890	19,516	
65 and over	11,406	12,574	13,858	15,133	16,454	23,410	
Total	104,603	111,059	118,710	127,248	135,825	195,499	
Median Age	28.9	29.1	29.5	30.0	30.6	31.1	

Intermediate Fertility Level Assumptions — Male

16 - 19	7,647	8,423	8,603	7,350	8,172	12,571	
20 - 24	8,675	9,691	10,550	10,604	9,244	14,641	
25 - 34	12,608	15,652	18,419	20,278	21,184	27,672	
35 - 44	11,304	11,108	12,585	15,567	18,277	25,123	
45 - 54	11,285	11,392	10,786	10,628	12,055	18,732	
55 - 64	8,753	9,303	9,811	9,923	9,428	17,677	
65 and over	8,393	8,930	9,634	10,341	11,113	16,793	
Total	100,754	106,499	113,702	121,999	130,494	190,460	
Median Age	26.4	26.8	27.3	27.7	28.2	28.9	

Replacement Level Fertility Assumptions — Female

16 - 19	6,601	6,192	6,497	5,937	5,287	6,017	6,061
20 - 24	8,483	9,298	10,113	9,273	8,433	8,841	9,149
25 - 34	12,692	15,212	17,732	18,860	19,981	18,282	18,139
35 - 44	11,707	12,107	12,507	14,996	17,485	18,187	17,436
45 - 54	12,090	11,701	11,310	11,716	12,120	15,927	17,869
55 - 64	9,754	10,490	11,225	10,825	10,524	17,911	15,961
65 and over	11,400	12,576	13,752	14,967	16,182	21,707	25,616
Total	104,236	108,417	112,597	116,871	121,144	137,461	140,496
Median Age	29.0	29.8	30.5	31.7	32.9	37.8	38.8

Replacement Level Fertility Assumptions — Male

16 - 19	6,105	6,447	6,829	6,203	5,499	6,262	6,309
20 - 24	8,658	9,507	10,361	9,540	8,718	9,162	9,484
25 - 34	12,568	15,283	17,998	19,204	20,410	18,820	18,679
35 - 44	11,281	11,766	12,250	14,910	17,569	18,554	17,796
45 - 54	11,273	10,938	10,609	11,095	11,581	15,867	17,801
55 - 64	8,745	9,230	9,713	9,449	9,185	16,572	14,900
65 and over	8,389	8,979	10,568	10,761	10,953	15,862	18,518
Total	100,428	104,188	107,948	112,165	116,381	132,986	135,062
Median Age	26.5	27.4	28.2	29.4	30.6	35.2	35.8

Source: U.S. Department of Commerce, Bureau of the Census.

LABOR FORCE PARTICIPATION RATES—FEMALE

Age Groups	1970	1975	1980	1985
	(PERCENT)			
16-19	44	41	41	41
20-24	58	57	58	58
25-34	45	44	46	47
35-44	51	51	52	53
45-54	54	54	55	55
55-64	43	44	45	45
65 and over	9	9	9	9

LABOR FORCE PARTICIPATION RATES—MALE

16-19	57	57	57	56
20-24	85	83	83	83
25-34	95	96	96	96
35-44	96	96	96	96
45-54	93	94	94	94
55-64	82	81	81	80
65 and over	26	23	22	21

Source: U.S. Department of Labor, Bureau of Labor Statistics.

shown in the table below. These projections are based upon a total fertility rate of 2.1 children per woman and assume no net immigration. Under these assumptions, the population in 2020 reaches 250.3 million.

The Census also prepared estimates based on "intermediate fertility assumptions." These "intermediate" rates, almost 2.8 children per woman, imply an *increase* of 183 million in the U.S. population by the year 2020. In contrast, the total population in 1960 was only 180 million. This "intermediate" rate, incidentally, is based upon the assumption that U.S. fertility will settle at some level commensurate with rates observed during the 50 years preceding the large postwar rise in fertility. It is the rate some demographers consider most likely to materialize.

Implications of Stable Population Growth

The Population The table also shows the age distribution of the population in 2020 and the median age for the "intermediate" fertility rate assumption and the stabilized population fertility assumptions.

Perhaps the most striking feature of the stabilized population in 2020 is that it is, on average, older. Stephen Enke, a noted economist, has argued that the relatively fewer "unproductive" children in the population would be a factor leading to a higher per capita income with a stabilized population than with the present character of the population. Others have argued that an older population may be less receptive to change and less innovative than a

younger population. If true, this phenomenon could deter technological growth. Duke University economist and demographer, Joseph J. Spengler, states the problem as follows: "At issue here is not so much the correlation, if such there be, of efficiency and creativeness with being under 50 or 60, as the fact that man's planning time-horizon tends to shrink as he ages." Still others point out that the age distribution of the U.S. population in 2037, when the stabilized population would become a stationary population, would be similar to the current age distribution in Sweden, and England and Wales. According to their reasoning, this similarity should dampen fears about the effects of an older population.

Any inference about the changed age distribution under conditions of stabilized population growth, however, are likely to be little more than mere speculation. The lowest total fertility rate experienced in the United States in recent years was 2.3 during the Great Depression. Although the rate in 1969 had fallen again to 2.4 and may be even lower at the present time because of the recent changes in abortion laws, it is not likely to be as low as 2.1. Even if it should move to 2.1, it is not likely to remain that low for 50 or 60 years. Moreover, if there is *any* net immigration, the total fertility rate would have to fall lower than 2.1 if the replacement level projections are to materialize.

The Labor Force Of course, if a stable population were achieved or even approached, it would have significant implications for the character of the U.S. labor force. The labor force cannot be predicted with anything approaching the degree of accuracy possible in overall population projections. The major difficulty lies in predicting the percentage of each age and sex group in the population that will participate in the labor force. These percentages, called participation rates, are affected by a host of social and economic factors. Labor force participation rates were projected to 1985 by age group and sex in the 1971 *Manpower Report of the President*. They are also reproduced in a table.

The participation rates for males are expected to show little change from 1970 to 1985 except in the 20-24 age group and for those over 55, but the female population is expected to show considerably more participation. Both young adult males and older adult males are expected to participate less in the labor force. Participation rates for young adult males (20-24) are expected to continue their decline

because of the trend toward college education and toward longer stays in colleges and universities. Older males (over 55) are expected to participate less because of an expected tendency to take earlier retirements.

Projections of female participation rates, however, imply a continuation of the movement from home to office. Probably the most interesting projection involves females between 35 and 64. Participation rates for these women are expected to rise significantly during the 1970-1985 period. The Department of Labor is assuming that as women finish their childbearing obligations, more and more of them will take jobs. The projection of increased female participation is consistent with developments in the latter half of the 1960's when the female labor force increased much more rapidly than the female population of working age.

Based upon the projected labor force participation rates for 1985 and the Census' stabilized population projections, the hypothetical labor force by age and sex was prepared for the year 2037. The 1985 participation rate projections are not at all likely to reflect actual participation rates in 2037, but they

can serve as a point of departure for purposes of analysis. This hypothetical labor force for 2037 assuming a stationary population is shown in another table.

Other things equal, a fall in the total fertility rate should lead to an increase in female participation in the labor force. With fewer children, more women could enter the labor force. Higher participation rates could be expected even in the prime childbearing age group (20-35) since a decline in the average fertility rate to under 2.1 would undoubtedly be accompanied by a larger percentage of families opting for no children. Also, if the present trend toward more female participation continues, the female labor force will be even more severely understated in the table. In any case, it seems highly likely that the labor force projections substantially underestimate the number of females that would be in the labor force in 2037 if the population were to stabilize. Indeed, given recent trends the percentage of females in the labor force will likely be considerably higher than projected for 2037 if population growth does not stabilize. Also, if the present trend toward more advanced training continues, both males and

LABOR FORCE PROJECTIONS AT REPLACEMENT LEVEL FERTILITY RATE ASSUMPTIONS—FEMALE

(Thousands of People)

Age Groups	1970	Percent Of Total	1975	1980	1985	1990	2020	2037	Percent Of Total
16 - 19	2,886	9	2,552	2,695	2,440	2,353	2,985	2,514	6
20 - 24	4,879	15	5,290	5,825	5,351	4,874	5,111	5,297	12
25 - 34	5,682	18	6,754	8,104	8,770	9,451	8,647	8,725	19
35 - 44	5,953	18	6,175	6,554	7,993	9,477	9,857	9,607	21
45 - 54	6,524	20	6,307	6,199	6,467	6,739	8,856	9,971	22
55 - 64	4,151	13	4,644	5,075	4,871	4,758	8,098	7,253	16
65 and over	2,192	7	1,109	1,195	1,272	1,358	1,821	2,116	5
Total	32,267	100	32,831	35,646	37,163	39,010	45,376	45,483	100

LABOR FORCE PROJECTIONS AT REPLACEMENT LEVEL FERTILITY RATE ASSUMPTIONS—MALE

16 - 19	3,507	7	3,659	3,875	3,103	3,085	4,203	4,235	5
20 - 24	7,369	14	7,929	8,600	7,870	7,149	7,513	7,777	10
25 - 34	11,942	22	14,672	17,278	18,436	19,594	18,067	17,932	23
35 - 44	10,719	20	11,307	11,772	14,829	16,884	17,830	17,102	22
45 - 54	10,478	20	10,282	9,972	10,429	10,886	14,915	16,733	21
55 - 64	7,130	13	7,900	7,823	7,549	7,278	13,132	11,807	15
65 and over	2,164	4	2,442	2,324	2,268	2,239	3,199	3,735	5
Total	53,308	100	58,191	61,645	63,984	67,115	78,859	79,320	100

females in the 20-25 age group will have lower participation rates.

Participation rates for the 65 and over age group are more difficult to analyze. If improved medical care is able to retard the aging process in the future, people will be able to function more effectively at higher age levels. Even so, the direction of change of the mature adult participation rates depends upon social attitudes with respect to work-leisure choices, technological advancements, early retirements, etc.

Under the stable population growth assumption, labor force projections indicate that the 2037 labor force would be older than the present labor force. Specifically, the median age of the labor force would be substantially higher, a change implied by the nature of stabilized population growth. Also, as mentioned before, the labor force will have a higher proportion of females in 2037.

Other attributes of the labor force in 2037 are worth exploring. For example, the general quality of the labor force is likely to be higher. For one thing, stabilized population growth should make it

easier for the supply of medical facilities to keep pace with the demands of the population. Sociologists also note that lower fertility rates imply that there is a smaller chance that unwanted children would be born; children should grow up healthier, happier, and more secure. Workers will be older, more skilled, and more stable in their jobs. Also, stabilized population growth might mean that educational facilities could soon be adequate to provide advanced training for everyone. According to the hypothetical labor force estimates, 45% of the people would be working to support the population in 2037. In 1970, only 42% were working. Because of increased female participation, the 45% figure is probably too low, perhaps much too low. If so, unless something unforeseen occurs, like diminishing returns to capital and land which are not offset by technological growth, the population should be more productive and have higher standards of living in 2037 under replacement level fertility rates than under higher fertility assumptions.

William E. Cullison