

# UNITED STATES CENSUS OF POPULATION

## 1960

### *Migration Between State Economic Areas*

U.S. DEPARTMENT OF COMMERCE  
BUREAU OF THE CENSUS



WYSE	148	652		
MONT	56	321		
PITTSBURGH	9	94		
PANTVILLE	38	582	14	
ROCHESTER	29	571	26	759
SERVIS	68	348	32	118
				21
PSIC	253	743	38	327
TR	7	465	2	875
	54	872	42	732
	12	359	9	783
	28	980	19	689
	21	641	12	543
	5	003	2	333
	94	169	67	079
	112	248	98	564
	82	392	45	098
	41	004	16	321
	3	649		98
	136	932	38	40
	22	385	15	1
	46	940	18	
	18	608	2	
	74	320	54	
	65	082	33	
	1	642	20	
	9	842		
	321			
	644			
	100			
	72			
	3			
	9			

## VOLUME II. SUBJECT REPORTS

### Series PC(2) Final Reports

- 1A Nativity and Parentage
- 1B Persons of Spanish Surname
- 1C Nonwhite Population by Race
- 1D Puerto Ricans in the United States
- 1E Mother Tongue of the Foreign Born
  
- 2A State of Birth
- 2B Mobility for States and State Economic Areas
- 2C Mobility for Metropolitan Areas
- 2D Lifetime and Recent Migration
- 2E Migration Between State Economic Areas
  
- 3A Women by Number of Children Ever Born
- \*3B Childspacing
- \*3C Women by Children Under 5 Years Old
  
- 4A Families
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- 4C Sources and Structure of Family Income
- 4D Age at First Marriage
- 4E Marital Status
  
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- 6C Labor Reserve
  
- 7A Occupational Characteristics
- 7B Occupation by Earnings and Education
- 7C Occupation by Industry
- 7D Characteristics of Teachers
- 7E Characteristics of Professional Workers
- 7F Industrial Characteristics
  
- 8A Inmates of Institutions
- 8B Income of the Elderly Population
- 8C Veterans

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\* Report in preparation.

BUREAU OF THE CENSUS  
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# U.S. CENSUS OF POPULATION: 1960

Final Report PC(2)-2E

## SUBJECT REPORTS

# Migration Between State Economic Areas

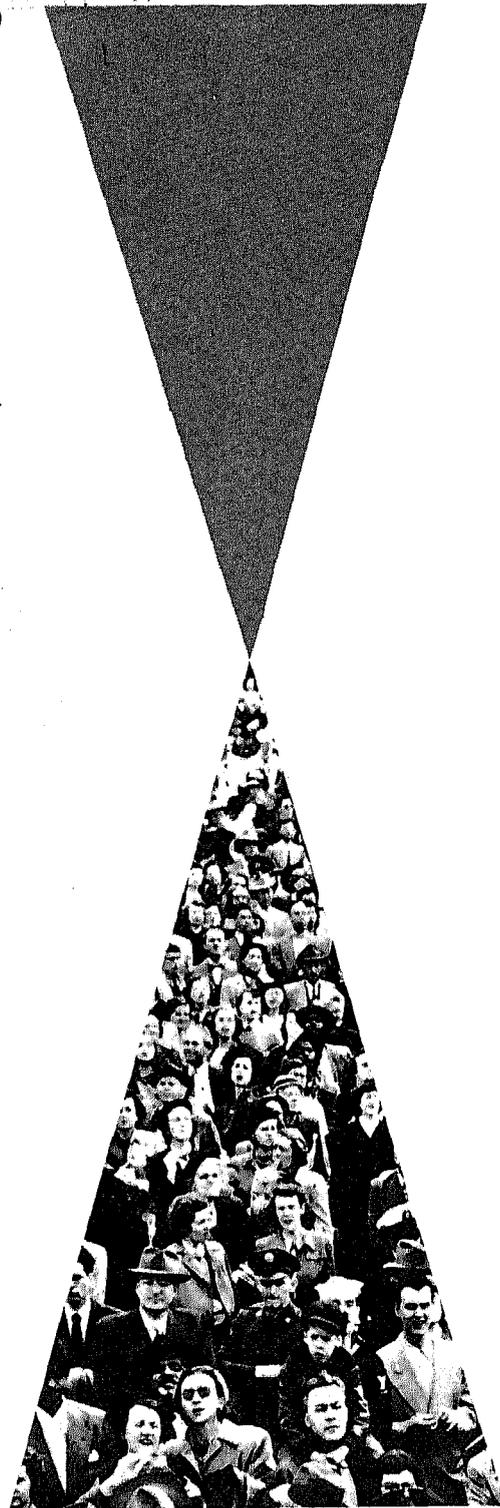
*Residence in 1960 by Residence in 1955  
for State Economic Areas and  
Economic Subregions*

*Prepared under the supervision of  
HERMAN P. MILLER, Chief  
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## PREFACE

This report presents statistics from the 1960 Census of Population on the streams of migrants between State economic areas and between economic subregions in the period 1955 to 1960. Legal provision for this census, which was conducted as of April 1, 1960, was made in the Act of Congress of August 31, 1954 (amended August 1957), which codified Title 13 United States Code.

The major portion of the information compiled from the 1960 Census of Population appears in Volume I, Characteristics of the Population, which contains data for the United States, States and counties and their urban and rural parts, cities, minor civil divisions, etc. The present report is part of Volume II, Subject Reports, and is designated as PC(2)-2E. A list of the Volume II Subject Reports appears on the inside of the front cover. A summary description of all the final reports of the 1960 Population Census appears on page IV.

## ACKNOWLEDGMENTS

Henry D. Sheldon and Charles P. Brinkman of the Demographic Statistics Branch planned this report and developed its content, under the general direction of Paul C. Glick, Assistant Chief (Demographic and Social Statistics Programs), Population Division. Henry S. Shryock, Assistant Chief (Program Development), and David L. Kaplan, Assistant Chief (Methods Development), made important contributions in the planning and development of the entire series of Subject Reports. For the present report, John C. Beresford provided liaison with the operations staff, Elizabeth A. Larmon assisted in the preparation of the introductory text, and Louise L. Douglas performed the technical editorial work. The procedures for compiling the data were devised by Catherine M. Neafsey, Margaret P. Brooks, and Anthony B. Woodell of the Systems Division. The sampling materials were prepared by Robert H. Hanson and Warren J. Mitofsky of the Statistical Methods Division.

The census program was designed in consultation with a number of advisory committees and many individuals in order to maximize the usefulness of the data. Among the groups organized for this purpose were the Technical Advisory Committee for the 1960 Population Census, the Council of Population and Housing Census Users, and the Federal Agency Population and Housing Census Council (sponsored by the U.S. Bureau of the Budget). The persons who served with these groups represented a wide range of interest in the census program; their affiliations included universities, private industry, research organizations, labor groups, Federal agencies, State and local governments, and professional associations.

Tabulation of the data for this report was made possible in part by funds provided by the Economic Research Service, U.S. Department of Agriculture, and by cooperative work with Oklahoma State University. Gladys K. Bowles and Calvin L. Beale of the Department of Agriculture, and James D. Tarver and Patrick M. Skees, formerly of Oklahoma State University, made substantial contributions to the planning and preparation of the report.

June 1967.

# FINAL REPORTS OF THE 1960 CENSUS OF POPULATION

The final reports of the 1960 Population Census are arranged in three volumes and a joint Population-Housing series of census tract reports. The 1960 Population Census publication program also includes preliminary, advance, and supplementary reports, certain evaluation, procedural, and administrative reports, and graphic summaries. After publication, copies of all reports are available for examination or purchase at any U.S. Department of Commerce Field Office.

Certain types of unpublished statistics are available for the cost of preparing a copy of the data. Also, under certain conditions, special tabulations of the 1960 Census data can be prepared on a reimbursable basis. In addition, there are available for purchase magnetic tapes and punchcards containing 1960 Census information on the characteristics on a one-in-a-thousand and a one-in-ten-thousand sample of the population of the United States. Confidentiality of the information, as required by law, has been maintained by the omission of certain identification items. Further information about any of these materials can be obtained by writing to the Chief, Population Division, Bureau of the Census, Washington, D.C., 20233.

Volume I. Characteristics of the Population. This volume consists of separate reports for the United States, each of the 50 States, the District of Columbia, Puerto Rico, Guam, Virgin Islands, American Samoa, and Canal Zone. For each of these 57 areas, the data were first issued in four separate paper-bound "chapters," designated as PC(1)-A, B, C, and D. (For Guam, Virgin Islands, American Samoa, and Canal Zone, the material normally contained in chapters B, C, and D are included in chapter B.) For library and general reference use, the paper-bound reports have been assembled and reissued in buckram-bound books identified as Parts A and 1 to 57 of Volume I.

Series PC(1)-1A to 57A: Chapter A. Number of Inhabitants. These reports contain final population counts for States and counties and their urban and rural parts, and for standard metropolitan statistical areas, urbanized areas, all incorporated places, unincorporated places of 1,000 inhabitants or more, and minor civil divisions.

Series PC(1)-1B to 57B: Chapter B. General Population Characteristics. These reports present statistics on sex, age, marital status, color or race, and relationship to head of household for States and counties and their urban and rural parts, and for standard metropolitan statistical areas, urbanized areas, places of 1,000 inhabitants or more, and minor civil divisions.

Series PC(1)-1C to 57C: Chapter C. General Social and Economic Characteristics. These reports cover the subjects of nativity and parentage, State of birth, country of origin of the foreign stock, mother tongue, place of residence in 1955, year moved into present house, school enrollment by level and type, years of school completed, families and their composition, fertility, veteran status, employment status, weeks worked in 1959, year last worked, occupation group, industry group, class of worker, place of work, means of transportation to work, and income of persons and families. Each subject is shown for some or all of the following areas: States and counties and their urban, rural-nonfarm, and rural-farm parts, standard metropolitan statistical areas, urbanized areas, and urban places.

Series PC(1)-1D to 57D: Chapter D. Detailed Characteristics. These reports present most of the subjects covered in chapter C, above, cross-classified by age, color, and other characteristics. There is also included additional information on families, as well as data on single years of age, detailed occupation, and detailed industry. Each subject is shown for some or all of the following areas: States and their urban, rural-nonfarm, and rural-farm parts; and large counties, cities, and standard metropolitan statistical areas.

Volume I, Part A: Number of Inhabitants. This is a compendium of the 57 chapter A reports, i.e., PC(1)-1A to 57A.

Volume I, Parts 1 to 57: Characteristics of the Population. The 57 parts relate respectively to the United States, each of the 50 States, District of Columbia, Puerto Rico, Guam, Virgin Islands, American Samoa, and Canal Zone. Each part contains the data previously published in the four chapters A, B, C, and D, and is in the form of a separate, buckram-bound book. Parts 54, 55, 56, and 57--for Guam, Virgin Islands, American Samoa, and Canal Zone, respectively--are bound in a single book.

Volume II (Series PC(2) reports). Subject Reports. Each report in this volume concentrates on a particular subject. Detailed information and cross-relationships are generally provided on a national and regional level; in a few reports data for States or standard metropolitan statistical areas are also shown. Among the characteristics covered are ethnic origin and race, fertility, families, migration, education, employment, unemployment, occupation, industry, and income. There is also a report on the geographic distribution and characteristics of inmates of institutions. A list of reports is given on the inside of the front cover.

Volume III (Series PC(3) reports). Selected Area Reports. Four of the reports in this volume present selected characteristics of the population for State economic areas, for standard metropolitan statistical areas, and according to the size and type of place where the individual resided. A fifth report provides data on the social and economic characteristics of Americans overseas.

Series PHC(1). Census Tract Reports. These reports present information on both population and housing subjects. There is one report for each of 180 tracted areas in the United States and Puerto Rico. The population subjects include age, race, marital status, country of origin of the foreign stock, relationship to head of household, school enrollment, years of school completed, place of residence in 1955, employment status, occupation group, industry group, place of work, means of transportation to work, and income of families, as well as certain characteristics of the nonwhite population in selected tracts. The housing subjects include tenure, color of head of household, vacancy status, condition and plumbing facilities, number of rooms, number of bathrooms, number of housing units in structure, year structure built, basement, heating equipment, number of persons in unit, persons per room, year household head moved into unit, automobiles available, value of property, and gross and contract rent, as well as certain characteristics of housing units with nonwhite household head for selected tracts. In addition, for selected tracts these reports contain data on certain population and housing subjects for persons of Puerto Rican birth or parentage and for white persons with Spanish surname. (This series is the same as the tract reports listed in the publication program for the 1960 Census of Housing.)

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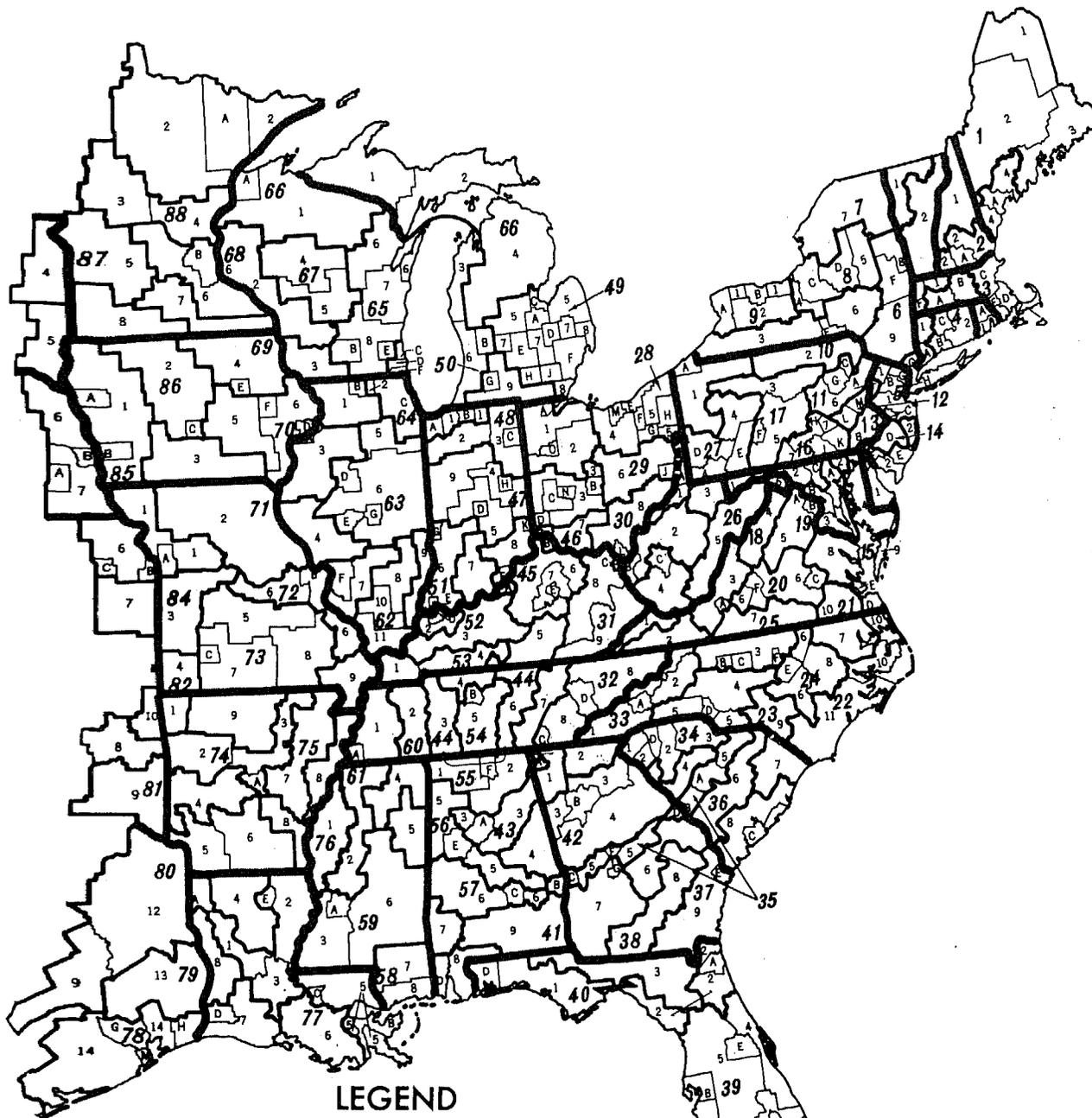
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ECONOMIC SUBREGIONS AND STATE ECONOMIC AREAS: 1960—Continued



LEGEND

- ECONOMIC SUBREGION BOUNDARY
- - - STATE BOUNDARY WHERE NOT PART OF ECONOMIC SUBREGION BOUNDARY
- STATE ECONOMIC AREA BOUNDARY. ALL ECONOMIC SUBREGION BOUNDARIES AND STATE BOUNDARIES ARE ALSO STATE ECONOMIC AREA BOUNDARIES
- 57 ECONOMIC SUBREGIONS— LARGE NUMBERS
- A—N STATE ECONOMIC AREAS—SMALL NUMBERS AND LETTERS

# Migration Between State Economic Areas

## GENERAL

This report presents statistics on the movement of persons 5 years old and over between State economic areas and economic subregions in the period 1955 to 1960. The data are from the Eighteenth Decennial Census of Population, taken as of April 1, 1960. The focus is on the streams of migrants between these areas. Tables 1 and 2 present the mobility status of the population of the State economic areas and economic subregions, respectively. Table 3 presents the residence in 1955 and 1960 of migrants between State economic areas. Similarly, in table 4, migrants between economic subregions are shown by residence in 1960 cross-classified by residence in 1955. Table 5 shows the resultant net gain or loss through migration for each economic subregion. All the statistics are based on a 25-percent sample of the population.

### RELATED MATERIALS

1960 Census reports.--The Volume I State reports contain statistics on mobility status and year moved into present house for States, by urban-rural residence, standard metropolitan statistical areas (SMSA's), urbanized areas, urban places of 10,000 or more, and counties, and statistics on mobility status and region of origin by age, sex, and color, for States and for cities of 250,000 or more. The Volume I United States Summary report gives totals for the Nation and its regions and geographic divisions and shows region of residence in 1955 by region of residence in 1960 and the net gain or loss for each region through inter-regional migration.

Statistics on place of residence in 1955 are presented in Census Tracts, Series PHC(1). Movers living in each census tract are classified by 1955 residence as follows: (1) Central city of this SMSA, (2) other part of this SMSA, and (3) outside this SMSA. The last category is further subdivided into "North and West" and "South." Additional statistics on mobility for State economic areas are presented in report PC(2)-2B, Mobility for States and State Economic Areas. Other 1960 Census reports on mobility are PC(2)-2A, State of Birth; PC(2)-2C, Mobility for Metropolitan Areas; and PC(2)-2D, Lifetime and Recent Migration. Additional statistics on the mobility of the population are included in a few other PC(2) and PC(3) reports.

The report PC(3)-1A, State Economic Areas, presents information on selected characteristics of persons for State economic areas with some characteristics shown separately for the urban, rural-nonfarm, and

rural-farm population of the areas. These statistics were not tabulated for economic subregions, but corresponding information for the economic subregions can be obtained through the consolidation of the statistics for the State economic areas comprising the economic subregion using the list in appendix A.

1950 Census reports.--Mobility data for 1950 are based on the 1-year interval rather than the 5-year interval. The 1950 reports for States, Volume II, Characteristics of the Population, included statistics on residence in 1949 for the State, for standard metropolitan areas, urbanized areas, urban places with 10,000 inhabitants or more in 1950, and for counties. Data on mobility status were also presented for census tracts in Volume III of the 1950 reports. Volume IV of the 1950 Census included four special reports on mobility, namely: Part 4A, State of Birth; Part 4B, Population Mobility--States and State Economic Areas; Part 4C, Population Mobility--Farm and Nonfarm Movers; and Part 4D, Population Mobility--Characteristics of Migrants. Some reports on other subjects in Volume IV, Special Reports, contained additional data on mobility cross-classified with the central subject of the report.

1940 Census reports.--The 1940 Census, in which for the first time data were obtained on the mobility of the population during a fixed period of time, used a 5-year interval (1935 to 1940) and hence from this standpoint is comparable to the 1960 Census. Although the population schedule called for a report on all changes of usual residence, in the main tabulations, persons moving from one house to another within the same county, or quasi-county,<sup>1</sup> were not distinguished from those in the same house at both dates. All these persons, as well as children under 5 years old, were described as "nonmigrants" in the 1940 reports. Data were presented for the United States, regions, geographic divisions, States, urban and rural residence, and for individual cities of 100,000 inhabitants or more. Statistics were published in four special reports entitled Color and Sex of Migrants, Age of Migrants, Economic Characteristics of Migrants, and Social Characteristics of Migrants. Additional statistics on migration were contained in some of the special reports on other subjects.

<sup>1</sup> A quasi-county was defined as a city of 100,000 or more or the balance of its county.

Current Population Survey.--Sample data on mobility during the preceding year have been collected annually since 1948 in the Current Population Survey and have been published mostly in Current Population Reports, Series P-20. Earlier surveys at irregular intervals covered other periods back to 1940.

Estimates of net migration.--Estimates of net migration including net immigration from abroad by States and counties have been computed for the decade 1950 to 1960. The State estimates are published in Current Population Reports, Series P-25, No. 247, and 304 and the county estimates in Series P-23, No. 7. The methods of computing net migration and net civilian migration by the so-called "residual method" are explained in these reports. Similar estimates of net

migration can also be computed by age, sex, and color; and such estimates have been published by a number of agencies.<sup>2</sup>

#### AVAILABILITY OF UNPUBLISHED DATA

The statistics appearing in this report represent the full detail printed out by the computer system. Additional statistics could be extracted to show 1960 residence detail not appearing in published tables. Requests for unpublished data may be made in writing to the Chief, Population Division, Bureau of the Census, Washington, D.C. 20233; a specific description of the figures desired should be included in the request. Inquiries concerning unpublished data should be transmitted to the Bureau as soon as possible because the tape files are not retained indefinitely.

### DEFINITIONS AND EXPLANATIONS

The definition of residence in 1955 is consistent with the instructions given to the enumerator. As in all surveys, there were some failures to execute the instructions exactly. Through the forms distributed to households, the respondents were given explanations of some of the questions more uniformly than would have been given in direct interviews. Nevertheless, it was not feasible to give the full instructions to the respondents, and some erroneous replies have undoubtedly gone undetected.

More complete discussions of the definitions of population items are given in 1960 Census of Population, Volume I, Characteristics of the Population, Part 1, United States Summary, and each of the State parts, and in 1960 Census of Housing, Volume I, States and Small Areas.

#### RESIDENCE IN 1955

This report deals essentially with the streams, i.e., the number of persons living in a given State economic area (SEA) in 1955 but in another in 1960. Specifically, the statistics give the number of immigrants into each SEA by SEA of residence in 1955, and the number of out-migrants from each SEA to the SEA of 1960 residence. Similar statistics are presented for economic subregions. In addition, the net gain or loss experienced by each economic subregion is also given. The net gain or loss through migration between State economic areas may be found in table 31 of the report PC(2)-2B.

The data on residence in 1955 were derived from the answers to the questions on the Household Questionnaire shown in the next column.

Residence on April 1, 1955, is the usual place of residence five years prior to enumeration. Residence in 1955 was used on conjunction with residence in 1960 to determine the mobility status of the population. The category "same house as in 1960" includes all persons 5 years old and over who were reported as living in the same house on the date of enumeration in 1960 and five years prior to enumeration. Included in the group are persons who had never moved during the five years, as well as those who had moved but by 1960 had returned to their 1955 residence. The category

**P13. Did he live in this house on April 1, 1955?**  
(Answer 1, 2, or 3)

1. Born April 1955 or later.....

OR

2. Yes, this house.....

OR

3. No, different house.....

↙

**Where did he live on April 1, 1955?**

a. City or town.....

b. If city or town—Did he live inside  
the city limits?..... { Yes...   
No...

c. County.....

**AND**  
State, foreign  
country, U.S.  
possession, etc.....

"different house in the United States" includes persons who, on April 1, 1955, lived in the United States in a different house from the one they occupied on April 1, 1960. These persons were subdivided into three groups according to their 1955 residence; viz., "different house, same county," "different county, same State," and "different State." The last category was further subdivided into contiguous and noncontiguous States. States have been classified as contiguous if their boundaries touch at any point. For some distributions the different county category was subdivided into region, division, and State of 1955 residence. The category "abroad" includes those with residence in a foreign country or an outlying area of the United States

<sup>2</sup> See, for example, Economic Research Service, U.S. Department of Agriculture (in cooperation with Research Foundation, Oklahoma State University, and Area Redevelopment Administration, U.S. Department of Commerce), Net Migration of the Population, 1950 to 1960, by Age, Sex, and Color--States, Counties, Economic Areas, and Metropolitan Areas, by Gladys K. Bowles and James D. Tarver, Population-Migration Report, Vol. I, 1965.

in 1955. (In the coding of this item, persons who lived in Alaska or Hawaii in 1955 but in other States in 1960 were classified as living in a different State in 1955.<sup>3</sup>)

Persons 5 years old and over who had indicated they had moved into their present residence after April 1, 1955, but for whom, or for members of their families, sufficiently complete and consistent information concerning residence on April 1, 1955 was not collected, are included in the group "moved, place of residence in 1955 not reported." (Missing information was supplied if data were available for other members of the family.) Also included in the category "moved, place of residence in 1955 not reported" are persons who gave no indication as to their movement since April 1, 1955, but who, on the basis of the final edited entry for year moved (for which all nonresponses were replaced by assigned entries), were classified as having moved into their present house since April 1, 1955.

<sup>3</sup> The following is a list of the contiguous States for each State:

Alabama.....	Fla., Ga., Miss., Tenn.
Alaska.....	None
Arizona.....	Calif., Colo., Nev., N. Mex., Utah
Arkansas.....	La., Miss., Mo., Okla., Tenn., Texas
California.....	Ariz., Nev., Oreg.
Colorado.....	Ariz., Kans., Nebr., N. Mex., Okla., Utah, Wyo.
Connecticut.....	Mass., N.Y., R.I.
Delaware.....	Md., N.J., Pa.
Dist. of Col....	Md., Va.
Florida.....	Ala., Ga.
Georgia.....	Ala., Fla., N.C., S.C., Tenn.
Hawaii.....	None
Idaho.....	Mont., Nev., Oreg., Utah, Wash., Wyo.
Illinois.....	Ind., Iowa, Ky., Mo., Wis.
Indiana.....	Ill., Ky., Mich., Ohio
Iowa.....	Ill., Minn., Mo., Nebr., S. Dak., Wis.
Kansas.....	Colo., Mo., Nebr., Okla.
Kentucky.....	Ill., Ind., Mo., Ohio, Tenn., Va., W. Va.
Louisiana.....	Ark., Miss., Texas
Maine.....	N.H.
Maryland.....	Del., D.C., Pa., Va., W. Va.
Massachusetts...	Conn., N.H., N.Y., R.I., Vt.
Michigan.....	Ind., Ohio, Wis.
Minnesota.....	Iowa, N. Dak., S. Dak., Wis.
Mississippi.....	Ala., Ark., La., Tenn.
Missouri.....	Ark., Ill., Iowa, Kans., Ky., Nebr., Okla., Tenn.
Montana.....	Idaho, N. Dak., S. Dak., Wyo.
Nebraska.....	Colo., Iowa, Kans., Mo., S. Dak., Wyo.
Nevada.....	Ariz., Calif., Idaho, Oreg., Utah
New Hampshire...	Maine, Mass., Vt.
New Jersey.....	Del., N.Y., Pa.
New Mexico.....	Ariz., Colo., Okla., Texas, Utah
New York.....	Conn., Mass., N.J., Pa., Vt.
North Carolina...	Ga., S.C., Tenn., Va.
North Dakota....	Minn., Mont., S. Dak.
Ohio.....	Ind., Ky., Mich., Pa., W. Va.
Oklahoma.....	Ark., Colo., Kans., Mo., N. Mex., Texas
Oregon.....	Calif., Idaho, Nev., Wash.
Pennsylvania....	Del., Md., N.J., N.Y., Ohio, W. Va.
Rhode Island....	Conn., Mass.
South Carolina..	Ga., N.C.
South Dakota....	Iowa, Minn., Mont., Nebr., N. Dak., Wyo.
Tennessee.....	Ala., Ark., Ga., Ky., Miss., Mo., N.C., Va.
Texas.....	Ark., La., N. Mex., Okla.
Utah.....	Ariz., Colo., Idaho, Nev., N. Mex., Wyo.
Vermont.....	Mass., N.H., N.Y.
Virginia.....	D.C., Ky., Md., N.C., Tenn., W. Va.
Washington.....	Idaho, Oreg.
West Virginia...	Ky., Md., Ohio, Pa., Va.
Wisconsin.....	Ill., Iowa, Mich., Minn.
Wyoming.....	Colo., Idaho, Mont., Nebr., S. Dak., Utah

In-migrants and out-migrants.--The terms "in-migrants" and "out-migrants" have been used with reference to migrants into or out of particular areas. In-migrants to an area are migrants who moved into that area from elsewhere in the United States between 1955 and 1960 and were still living there in 1960. Out-migrants from an area are migrants who were living in the area in 1955 and moved out to some other area in the United States where they were in 1960. In-migrants and out-migrants for any area exclude migrants within that area. In-migrants and out-migrants, for example, for a particular economic subregion do not include migrants between its SEA's. Thus, the sum of the in-migrants to all SEA's in any economic subregion of two or more SEA's will be greater than the number of in-migrants to that economic subregion.

Net migration.--The term "net migration" like the terms "in-migration" and "out-migration" is used with reference to migration to or from a particular area. Net migration refers to the net gain or loss to an area through the balance of in-migration and out-migration. In the tables, net in-migration is distinguishable by a plus (+) sign and net out-migration by a minus (-) sign preceding the figure. The algebraic sum of net migration for all States and the District of Columbia is equal to zero, since a loss in one State must be compensated for by a gain in other States.

#### Uses and Limitations of the Data

The census statistics on mobility provide information on the number of movers and migrants, and on in-movement and out-movement for a given area. The census statistics, however, do not take into account all the different moves that were made in the 5-year period. For example, some persons in the same house at the two dates had moved during the 5-year period, but by the time of enumeration had returned to their 1955 residence. Other persons made two or more moves. Some movers during the 5-year period had died and others had gone abroad. Regardless of the number of moves made, a person is counted only once as a mover in the census data. Persons who moved were not asked the number of miles they had moved. The census data, however, provide some indication of the relative distance involved in the moves. On the average, a person who moves within a county moves a shorter distance than one who moves to another county in the same SEA. He in turn moves a shorter distance than a mover to another SEA or economic subregion.

A 5-year period, as chosen for use in the 1960 Census, should give a more representative picture of recent mobility than does the 1-year period that has been used in other censuses and surveys. Nonetheless, the last five years of the 1950-60 decade may have had a somewhat different mobility history from the first five years. Hence, figures on net movements computed from the statistics of this report may indicate a different net direction or suggest a different annual rate as compared with estimates for the same areas made by the "residual" method for the entire decade, even when allowance is made for variations in coverage. The data presented in this report will permit analysis of the net exchange between economic subregions and SEA's.

### Quality of the Data

Information on the quality of data on mobility status for 1960 is available from findings from the Content Evaluation Study (CES) of the 1960 Census, a postcensal study in which an intensive reinterview approach was used for a sample of census respondents. In the CES, measures of response error were developed with respect to selected items of information by comparing and reconciling the responses obtained in the reinterview with the corresponding census entries.

Analysis of the CES data on mobility status indicates that, in general, the tendency is for the census to overestimate the more stable elements in the society and to underestimate the more mobile. The census showed fewer people living in a different State or abroad five years earlier than actually were living in a different State or abroad, and conversely, more people living in the same State, same county, and same house five years earlier than the resurvey revealed to be the case. One measure of the extent of the discrepancy is the distribution of interstate migrants in the resurvey by their classification in the census enumeration. Of those who were classified as interstate migrants in the CES and for whom mobility status was reported in the census, 85.6 percent were classified the same in the census, and the remainder were classified as having lived in the same State five years earlier (13.5 percent) or abroad (0.9 percent).

The total number of interstate migrants enumerated by the census is 92.0 percent of the number estimated in the resurvey. Hence, the census also enumerated some persons as interstate migrants who, on the basis of the resurvey, actually were not interstate migrants. The two sets of comparisons taken together indicate that, in net terms, the census count is an underestimate of interstate migrants.

The results of the 1960 Content Evaluation Study are not entirely comparable with those of the 1950 Post-Enumeration Survey. In considering comparative results, it should be noted that reported differences in quality may, in part, arise from improvement in procedures in the 1960 evaluation study, changes in accuracy between the 1960 and the 1950 Censuses, or both. For a more comprehensive report of the results of the evaluation studies, the reader is referred to Evaluation and Research Program of the U.S. Censuses of Population and Housing: 1960, Series ER 60, No. 4, Accuracy of Data on Population Characteristics as Measured by Reinterviews, and to Bureau of the Census Technical Paper No. 4, The Post Enumeration Survey: 1950.

### Comparability

Similar questions on mobility were asked in the 1950 and 1940 Censuses. However, the questions in the 1950 Census, as well as in annual supplements to the Current Population Survey, applied to residence one year earlier rather than five years earlier. In the 1950 reports, migrants reporting the State but not the county of residence in 1949 appear in the known categories of migration status and State of origin, whereas in this report such persons were all assigned to the category "moved, place of residence in 1955 not reported." This partial nonresponse group comprised 411,590 migrants in 1950; the corresponding figure for 1960 is not known.

Although the questions in the 1940 Census covered a 5-year period, comparability with that census is reduced somewhat because of different definitions and categories of tabulation. In 1940, the population was classified in terms of four categories: Migrants, nonmigrants, immigrants, and migration status not reported. The first group, "migrants," included those persons who in 1935 lived in a county (or quasi-county) different from the one in which they were living in 1940. The second group, "nonmigrants," comprised those persons living in the same house in 1935 as in 1940 as well as persons living in a different house in the same county or quasi-county. The group classified as "immigrant" in 1940 is comparable to the group classified in 1960 as "abroad." The 1940 classification, "migration status not reported," included persons for whom information supplied was not sufficient for the assignment of a more specific category.

### USUAL PLACE OF RESIDENCE

In accordance with Census practice dating back to 1790, each person enumerated in the 1960 Census was counted as an inhabitant of his usual place of residence or usual place of abode, that is, the place where he lives and sleeps most of the time. This place is not necessarily the same as his legal residence, voting residence, or domicile, although, in the vast majority of cases, the use of these different bases of classification would produce identical results.

The questions on place of residence in 1955 were supposed to refer to usual residence also. The respondent was not, however, furnished all the rules that the enumerator was instructed to use in determining the respondent's usual residence in 1960. Hence, in some cases, another type of residence may have been reported.

### STANDARD METROPOLITAN STATISTICAL AREAS

Except in New England, an SMSA is a county or group of contiguous counties which contains at least one city of 50,000 inhabitants or more, or "twin cities" with a combined population of at least 50,000. In addition to the county, or counties, containing such a city or cities, contiguous counties are included in an SMSA if, according to certain criteria, they are essentially metropolitan in character and are socially and economically integrated with the central city. In New England, SMSA's consist of towns and cities, rather than counties.

### STATE ECONOMIC AREAS

State economic areas are relatively homogeneous subdivisions of States. They consist of single counties or groups of counties which have similar economic and social characteristics. The boundaries of these areas have been drawn in such a way that each State is subdivided into relatively few parts, with each part having certain significant characteristics which distinguish it from adjoining areas. The SEA's, as delineated, are shown on the map of the United States on pages VI and VII. The counties comprising each SEA are listed in the appendix.

The State economic areas were originally delineated for the 1950 Census. The 1960 set of State economic areas represents a limited revision of the 1950 areas. This revision takes into account changes in the definitions of standard metropolitan statistical areas, but no attempt was made to reexamine the original principles or to apply them to more recent data relating to homogeneity. In addition, State economic areas were delineated for Alaska and Hawaii for the first time. As a result of the revision, the number of areas was increased from 501 to 509. (In the publications of the 1950 Census of Population, combinations of areas reduced the number of areas to 453.)

The combination of counties into State economic areas has been made for the entire country, and in this process the larger standard metropolitan statistical areas (those in 1960 with a central city of 50,000 or more and a total population of 100,000 or more) have been recognized as metropolitan State economic areas. When a standard metropolitan statistical area is located in two or more States or economic subregions, each State part and each part in an economic subregion becomes a separate metropolitan State economic area. In New England this correspondence of standard metropolitan State economic areas and standard metropolitan statistical areas does not exist because State economic areas are composed of whole

counties, whereas standard metropolitan statistical areas are built up from towns. Here, a county with more than half its population in one or more standard metropolitan statistical areas is classified as a metropolitan State economic area if the county or a combination of counties containing the standard metropolitan statistical area or areas has 100,000 inhabitants or more.

State economic areas are identified by the name of the State in which they are located followed by a letter (A, B, C, etc.) or a number (1, 2, 3, etc.). Metropolitan SEA's are identified by the letter suffix and the nonmetropolitan SEA's by the number suffix.

#### ECONOMIC SUBREGIONS

These areas represent combinations of State economic areas. The 509 State economic areas are consolidated into a set of 121 areas which cut across State lines but which, as intended, preserve to a great extent the homogeneous character of the State economic areas. No changes were made in the boundaries of the 119 economic subregions of 1950 in conterminous United States. Two new subregions were established for the 1960 Census, one in Alaska and one in Hawaii. The SEA's comprising the economic subregions are shown in appendix A.

## COLLECTION AND PROCESSING OF DATA

### COLLECTION OF DATA

Several enumeration forms were used to collect the information for the 1960 Census of Population. A few days before the census date, the Post Office Department delivered an Advance Census Report (ACR) to households on postal delivery routes. This form contained questions which were to be answered for every person and every housing unit. Household members were requested to fill the ACR and have it ready for the enumerator. The census enumerator recorded this information on a form specially designed for electronic data processing by FOSDIC (Film Optical Sensing Device for Input to Computer). The information was either transcribed from the ACR to the complete-count FOSDIC schedule or entered on this schedule during direct interview.

In the densely populated areas, the enumerator left a Household Questionnaire to be completed by each household (or person) in the sample and mailed to the local census office. The population and housing information was transcribed from the Household Questionnaire to a sample FOSDIC schedule. When the Household Questionnaire was not returned or was returned without having been completed, the enumerator collected the missing information by personal visit or by telephone and entered it directly on the sample FOSDIC schedule. In the remaining areas, when the enumerator picked up the ACR, he obtained all the information by direct interview and recorded it directly on the sample FOSDIC schedule.

Soon after the enumerator started work, his schedules were examined in a formal field review. This

operation was designed to assure at an early stage of the work that the enumerator was performing his duties properly and had corrected any errors he had made.

More detailed descriptions of the 1960 Census procedures in the collection and processing of the data are given in reports entitled United States Censuses of Population and Housing, 1960: Principal Data Collection Forms and Procedures, 1961; and 1960 Censuses of Population and Housing: Procedural History, 1966, U.S. Government Printing Office, Washington, D.C. 20402.

### MANUAL EDITING AND CODING

After the FOSDIC forms had been checked for completeness in the field, they were sent to a central processing office for manual editing and coding and for microfilming. Except where some special problems arose, there was no manual coding of the FOSDIC forms for complete-count data. On the sample forms, the manual operation was limited to those items where coding required the reading of written entries and therefore could not be done effectively by machine. The coding clerks converted the written entries to codes by marking the appropriate circles on the FOSDIC schedules and at the same time were able to correct obviously wrong entries and sometimes supply missing information.

### ELECTRONIC PROCESSING

After the enumerators and coders recorded the information by marking the appropriate circles, the schedules were microfilmed. The information on the

microfilm was then read by FOSDIC, which converted the markings to signals on magnetic tape. The tape, in turn, was processed in an electronic computer, which was used extensively to edit and tabulate the data and to produce the publication tables.

#### EDITING

For a majority of items, nonresponses and inconsistencies were eliminated by using the computer to assign entries and correct inconsistencies. In general, few assignments or corrections were required, although the amount varied by subject and by enumerator.

The assignment of an acceptable entry by machine was based on related information reported for the person or on information reported for a similar person in the immediate neighborhood. For example, in the assignment of age in the complete-count tabulations, the computer stored reported ages of persons by sex, color or race, household relationship, and marital status; each stored age was retained in the computer only until a succeeding person having the same characteristics and having age reported was processed through the computer; this stored age was assigned to the next person whose age was unknown and who otherwise had the same characteristics. This procedure insured that the distribution of ages assigned by the computer for persons of a given set of characteristics would correspond closely to the reported age distribution of such persons as obtained in the current census.

The extent of the allocations for nonresponse or for inconsistency is shown for the United States and for States, places of 10,000 inhabitants or more, and other areas in appendix tables in chapters B, C, and D of 1960 Census of Population, Volume I, Characteristics of the Population.

Specific tolerances were established for the number of computer allocations acceptable for a given area. If the number was beyond tolerance, the data were rejected and the original schedules were re-examined to determine the source of the error. Correction and reprocessing were undertaken as necessary and feasible.

### SAMPLE DESIGN AND SAMPLING VARIABILITY

#### SAMPLE DESIGN

For persons in housing units at the time of the 1960 Census, the sampling unit was the housing unit and all its occupants; for persons in group quarters, it was the person. To provide a sampling frame for the 25-percent sample, the enumerators were instructed (on the first visit to an address) to assign a key letter (A, B, C, or D) to each housing unit sequentially in the order in which he first visited the units, whether or not he completed an interview. The enumerators were given a random key letter to start their assignments, and the order of canvassing was indicated in advance. The instructions allowed some latitude in the order of visiting addresses. Each housing unit to which the key letter "A" was assigned was designated as a sample unit, and all persons

#### ACCURACY OF THE DATA

Human and mechanical errors occur in any mass statistical operation such as a decennial census. Such errors include failure to obtain required information from respondents, obtaining inconsistent information, recording information in the wrong place or incorrectly, or otherwise producing inconsistencies between entries on interrelated items on the field documents. Sampling biases occur because some of the enumerators fail to follow the sampling instructions. Clerical coding and editing errors occur, as well as errors in the electronic processing operation.

Careful efforts are made in every census to keep the errors in each step at an acceptably low level. Review of the enumerator's work, verification of manual coding and editing, checking of tabulated figures, and ratio estimation of sample data to control totals from the complete count reduce the effects of the errors in the census data.

In printed tables produced by the computer, very small differences may sometimes occur between tables because of the nature of computer transfers of data. No attempt has been made to reconcile these minor discrepancies.

Some innovations in the 1960 Censuses reduced errors in processing and others produced a more consistent quality of editing. The elimination of the card-punching operation removed one important source of error. The extensive use of electronic equipment insured a more uniform and more flexible edit than could have been accomplished manually or by less intricate mechanical equipment. It is believed that the use of electronic equipment in the 1960 Censuses has improved the quality of the editing compared with that of earlier censuses but, at the same time, it has introduced an element of difference in the statistics.

A group of reports designated Series ER 60, Evaluation and Research Program of the U.S. Censuses of Population and Housing: 1960, deals with the methods, results, and interpretation of a group of evaluation and research studies of the 1960 Censuses of Population and Housing. A report entitled The Post-Enumeration Survey: 1950, Technical Paper No. 4, presents evaluative material on the 1950 Census.

enumerated in the unit were included in the sample. In group quarters, the sample consisted of every fourth person in the order listed.

Although the subsampling procedure did not automatically insure an exact 25-percent sample of persons, the sample design was unbiased. Generally, for large areas, the deviation from the estimated sample size was found to be quite small. Biases may have arisen, however, when the enumerator failed to follow his listing and sampling instructions exactly during the designation of the 25-percent sample.

#### RATIO ESTIMATION

The statistics based on the 25-percent sample of the 1960 Census returns are estimates that have been developed through the use of a ratio estimation

procedure. This procedure was carried out for each of the following 44 groups of persons in each of the sample weighting areas:<sup>4</sup>

Group	Sex, color, and age	Relationship and tenure
Male white:		
1	Under 5	
2	5 to 13	
3	14 to 24	Head of owner household
4	14 to 24	Head of renter household
5	14 to 24	Not head of household
6-8	25 to 44	Same groups as age group 14 to 24
9-11	45 and over	Same groups as age group 14 to 24
Male nonwhite:		
12-22	Same groups as male white	
Female white:		
23-33	Same groups as male white	
Female nonwhite:		
34-44	Same groups as male white	

For each of the 44 groups, the ratio of the complete count to the sample count of the population in the group was determined. Each specific sample person in the group was assigned an integral weight so that the sum of the weights would equal the complete count for the group. For example, if the ratio for a group was 4.2, one-fifth of the persons (selected at random) within the group were assigned a weight of 5, and the remaining four-fifths a weight of 4. The use of such a combination of integral weights rather than a single fractional weight was adopted to avoid the complications involved in rounding in the final tables. In order to control a potential bias in the estimates, where there were fewer than 50 persons in the complete count in a group, or where the resulting weight was over 16, groups were combined in a specific order until both of these conditions were satisfied.

These ratio estimates reduce the component of sampling error arising from the variation in the size of household and achieve some of the gains of stratification in the selection of the sample, with the strata being the groups for which separate ratio estimates are computed. The net effect is a reduction in the sampling error of most statistics below what would be obtained by weighting the results of the 25-percent sample by a uniform factor of four. The reduction in sampling error will be trivial for some items and substantial for others. A by-product of this estimation procedure, in general, is that estimates for this

<sup>4</sup> Estimates of characteristics from the sample for a given area are produced using the formula:

$$x' = \sum_{i=1}^{44} \frac{x_i}{y_i} Y_i$$

where  $x'$  is the estimate of the characteristic for the area obtained through the use of the ratio estimation procedure,  $x_i$  is the count of sample persons with the characteristic for the area in one (i) of the 44 groups,  $y_i$  is the count of all sample persons for the area in the same one of the 44 groups, and  $Y_i$  is the count of persons in the complete count for the area in the same one of the 44 groups.

sample are generally consistent with the complete count with respect to the total population and for the subdivisions used as groups in the estimation procedure.

### SAMPLING VARIABILITY

The figures from the 25-percent sample tabulations are subject to sampling variability, which can be estimated roughly from the standard errors shown in tables A and B.

These tables do not reflect all the effect of response variance, or bias arising in the collection, processing, and estimation steps. Estimates of the magnitude of some of these factors in the total error are being evaluated and are being published in reports in Series ER 60, Evaluation and Research Program of the U.S. Censuses of Population and Housing: 1960. The chances are about two out of three that the difference due to sampling variability between an estimate and the figure that would have been obtained from a complete count of the population is less than the standard error. The chances are about 19 out of 20 that the difference is less than twice the standard error and about 99 out of 100 that it is less than 2½ times the standard error. The amount by which the estimated standard error must be multiplied to obtain other odds deemed more appropriate can be found in most statistical textbooks.

Table A.--ROUGH APPROXIMATION TO STANDARD ERROR OF ESTIMATED NUMBER

(Range of 2 chances out of 3)

Estimated number	Standard error	Estimated number	Standard error
50.....	25	5,000.....	180
100.....	35	10,000.....	260
250.....	50	15,000.....	305
500.....	65	25,000.....	400
1,000.....	80	50,000.....	560
2,500.....	130		

Table B.--ROUGH APPROXIMATION TO STANDARD ERROR OF ESTIMATED PERCENTAGE

(Range of 2 chances out of 3)

Estimated percentage	Base of percentage					
	500	1,000	2,500	10,000	25,000	100,000
2 or 98.....	2.1	1.4	0.8	0.5	0.2	0.2
5 or 95.....	3.2	2.2	1.4	0.6	0.3	0.2
10 or 90.....	4.5	3.2	1.9	1.0	0.5	0.3
25 or 75.....	6.1	4.3	2.4	1.1	0.6	0.3
50.....	7.0	5.0	2.6	1.3	0.8	0.5

Table A shows rough standard errors of estimated numbers up to 50,000. The relative sampling errors of larger estimated numbers are somewhat smaller than for 50,000. For estimated numbers above 50,000, however, the nonsampling errors, e.g., response errors and processing errors, may have an increasingly important effect on the total error. Table B contains rough standard errors of data in the form of percentages, and

although percentages are not published in this text, table B may be useful. Linear interpolation in tables A and B will provide approximate results that are satisfactory for most purposes.

The standard errors estimated from tables A and B are not directly applicable to differences between two sample estimates. For a difference between two estimates, the standard error is approximately the square root of the sum of the squares of the standard error of each estimate considered separately. The estimated differences shown in table 5 are based on the sample estimates in table 4. The approximate standard error of the differences in table 5 can be determined from the above formula using the standard error of the corresponding estimates from table 4 (see illustration).

Illustration.--Table 4 shows that there were an estimated 6,398 persons whose residence in 1960 was in economic subregion 7, but whose residence in 1955 was

in economic subregion 1. Table 4 shows that for an estimated 6,398 persons, the approximate standard error is 202. Table 4 also shows that there were an estimated 4,543 persons whose residence in 1960 was in economic subregion 1, but whose residence in 1955 was in economic subregion 7. Table A shows that for an estimated 4,543 persons, the approximate standard error is 171. Table 5 shows that there were an estimated 1,855 persons in net migration between economic subregions 1 and 7. Therefore, the approximate standard error for this estimated 1,855 persons in net migration is  $\sqrt{(202)^2 + (171)^2}$ , or 265. This means that the chances are approximately two out of three that the results of a complete count would not differ by as much as 265 from a sample estimate. It also follows that there is only about one chance in 100 that the results of a complete count would differ by as much as 663, that is, by about  $2\frac{1}{2}$  times the standard error.