MIGRATION AND SETTLEMENT:
4. GERMAN DEMOCRATIC REPUBLIC

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FOREWORD

Interest in human settlement systems and policies has been a central part of urban-related work at the International Institute for Applied Systems Analysis (IIASA) from the outset. From 1975 through 1978 this interest was manifested in the work of the Migration and Settlement Task, which was formally concluded in November 1978. Since then, attention has turned to dissemination of the Task's results and to the conclusion of its comparative study, which under the leadership of Dr. Frans Willekens is focusing on a comparative quantitative assessment of recent migration patterns and spatial population dynamics in all of IIASA's 17 National Member Organization countries.

The comparative analysis of national patterns of interregional migration and spatial population growth is being carried out by an international network of scholars who are using methodology and computer programs developed at IIASA.

Professor Gerhard Mohs, of the Institute of Geography and Geoecology, Academy of Sciences of the German Democratic Republic, analyzes in this report the dynamics of multiregional population change in the GDR. A system of five long-term economic planning regions constitutes the framework for the analysis. The author shows that the nation's population distribution is closely related to its pattern of industrial development and national policy.

Reports summarizing previous work on migration and settlement at IIASA are listed at the end of this report.

Andrei Rogers
Chairman
Human Settlements
and Services Area

CONTENTS

1 INTRODUCTION

With 108,000 km^2 and about 17 million inhabitants, the German Democratic Republic is a relatively small country. It is a highly industrialized country with an advanced agriculture and a high rate of urbanization. The present territorial structure and development is based on both the development under socialistic conditions during the postwar period and the historical conditions of the prewar capitalistic development.

From the nineteenth century onward, a sharp contrast has arisen in the development of the southern and the northern parts of the country. The south has been moving toward a high level of industrialization while the north has been lagging behind; this has affected population density and contributed to strong discrepancies in the development of settlements, infrastructure, and services in general.

One of the main goals of the planned territorial development under the postwar socialistic conditions has been to eliminate the antagonistic regional contrasts and, step by step, to overcome the regional differences in working and living conditions. The population distribution policy in the GDR and the development of migration and settlement in general have been determined to a high degree by these aims. The development of migration and settlement in the GDR is closely connected with the development of the territorial structure of the national economy. Therefore, this study should not only be demographic in nature but also should emphasize the economic and geographic background of migration and settlement.

For the purposes of this study, we will look at the 15 administrative districts (*Bezirke*) of the GDR; Berlin, the capital, is one of these districts.

The southern part of the country is characterized by the highly industrialized districts of Halle, Leipzig, Dresden, and Karl-Marx-Stadt (Figure 1). These areas qualify as "agglomeration areas" because of their high population density, their cities, their infrastructure, and their production forces. In this sense, Berlin and its surroundings (especially some parts of the district of Frankfurt) are also considered an agglomeration. The districts of the northern part of the GDR are still more agricultural in structure, particularly Schwerin and Neubrandenburg. In the northernmost district of Rostock, an important industrialization process was introduced in the fifties. One of the most changed districts is the Cottbus district which, based on its richness in brown coal, has become the prime place of energy production in the last two decades. The districts of Magdeburg and Potsdam have developed industrial centers and a very advanced agriculture as well. Therefore, the economic basis of their territorial structure is mixed. The districts of Gera, Erfurt, and Suhl are also mixed economically.

Table 1 shows the percentage of the labor force employed in industry and agriculture during the last half century. The prewar disparities have declined remarkably in the present districts of both the northern and the southern parts of the GDR. This change in the economic base has effected an evident development of the material and cultural living conditions, particularly in the regions of the northern part of the GDR that formerly were lagging behind.

In connection with the changing economic base of the districts, the regional population distribution was modified, particularly during the 1950s and 1960s. As shown in Figure 2, in the early sixties large flows of internal migration were directed to centers and regions of industrialization. During the last two decades, the general level of individual migration has been decreasing (Table 2) and the pattern of interregional migration has shifted toward local migration over shorter distances (Table 3). The reason for this phenomenon is very complex. Lüdemann and Heinzmann (1978) note three main causes:

1. During the 1950s and 1960s, a large number of industrial plants were established in former agrarian regions, causing an intensification and rationalization of industry.
2. Since the end of the 1960s, the transition to industrylike production methods in agriculture has achieved a high level. With such changes as the increasing cooperation among cooperative farms, the establishment of large production units for animal husbandry, and large service and repair centers, there has been a notable decrease in the number of persons employed in agriculture, which in turn has caused a trend toward concentration in the rural settlement network.

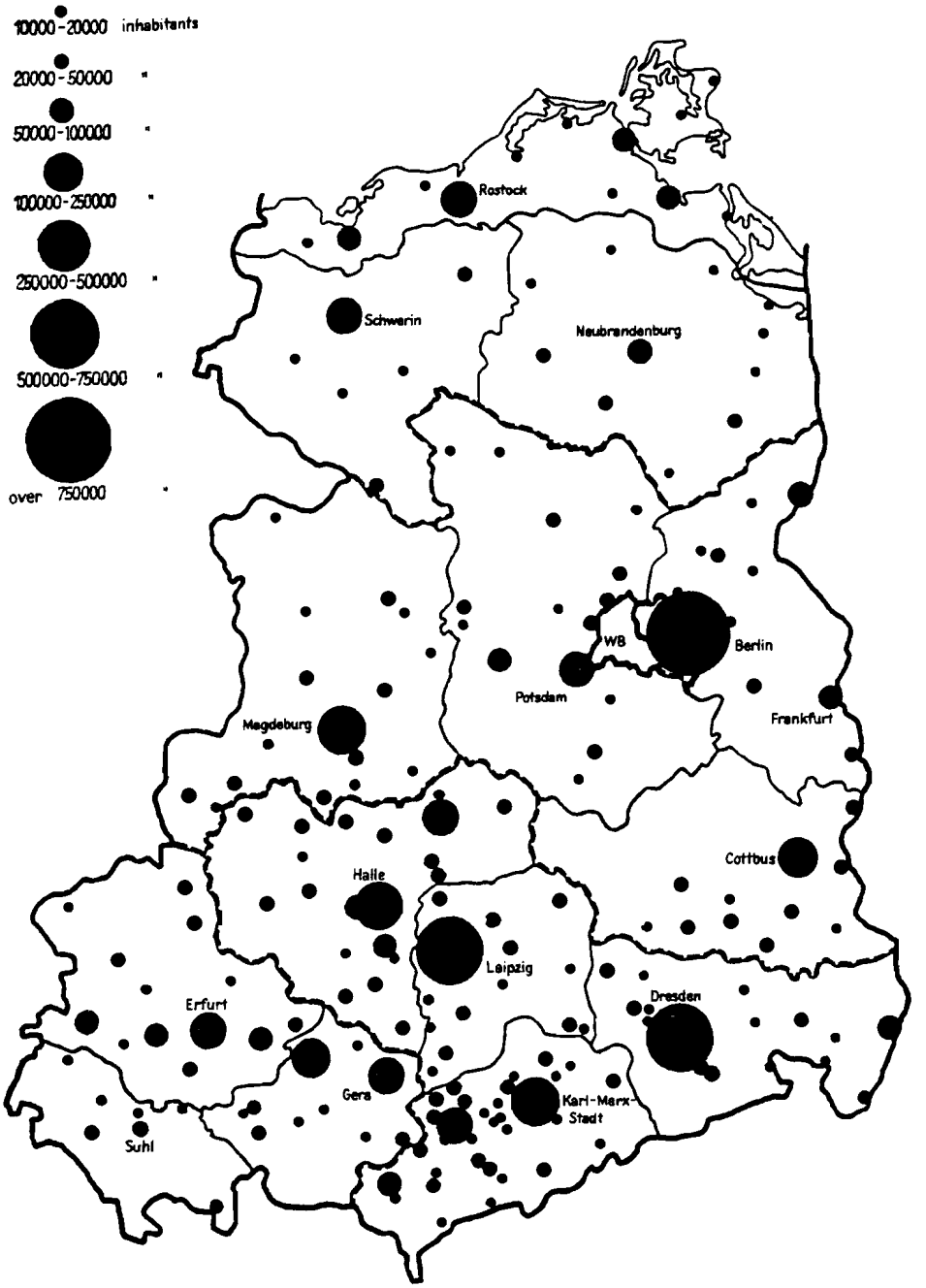

FIGURE 1 Groups of districts (regions), districts, and cities of the GDR.

TABLE 1 Percentage of labor force employed in industry and agriculture.

	1925		1939		1956		1966		1975	
District	Ind.	Agric.	Ind.	Agric.	Ind.	Agric.	Ind.	Agric.	Ind.	Agric.
Rostock	34.3	65.7	45.4	54.6	48.4	51.6	57.4	42.6	69.3	30.7
Schwerin	29.5	70.5	32.5	67.5	34.1	65.9	42.5	57.5	59.7	40.3
Neubrandenburg	29.7	70.3	33.4	66.3	24.7	75.3	31.4	68.6	51.2	48.8
Halle	61.5	38.5	69.4	30.6	73.8	26.2	78.7	21.3	83.7	16.1
Leipzig	76.6	23.4	80.4	19.6	78.8	21.2	80.9	19.1	85.1	14.9
Karl-Marx-Stadt	86.3	13.7	86.4	14.0	85.7	14.3	88.3	11.7	91.2	8.8
GDR	65.5	34.5	69.9	30.1	68.6	31.4	74.3	25.7	71.2	18.8

SOURCE: Lüdemann and Heinzmann (1978).

3. The overcoming of regional disparities in the material and living conditions of the people negatively affects internal migration and, to a certain degree, causes a stabilization of the settlement system (see Lüdemann and Heinzmann 1978).

In this way the internal migration and settlement patterns in the GDR have been highly dependent on the evolutionary process of the development of the regional structure, although the migration of people is determined both by objective factors and by the subjective behavior of the people.

2 CURRENT PATTERNS OF SPATIAL POPULATION DEVELOPMENT

In order to analyze the current patterns of the spatial population development in the GDR according to the observed population characteristics in 1975 (see Table A1), it is necessary to take into consideration several characteristics of the country.

First, it is important that one understand the tendencies of population development in the GDR during the last decades. The actual age structure of the population and its causes must be considered. Two wars and a temporary relatively high out-migration rate in the first years after World War II have severely affected the age structure of the GDR population. The population pyramid (Figure 3) shows an abnormally high percentage of old-age pensioners and a relatively small portion of the population in working

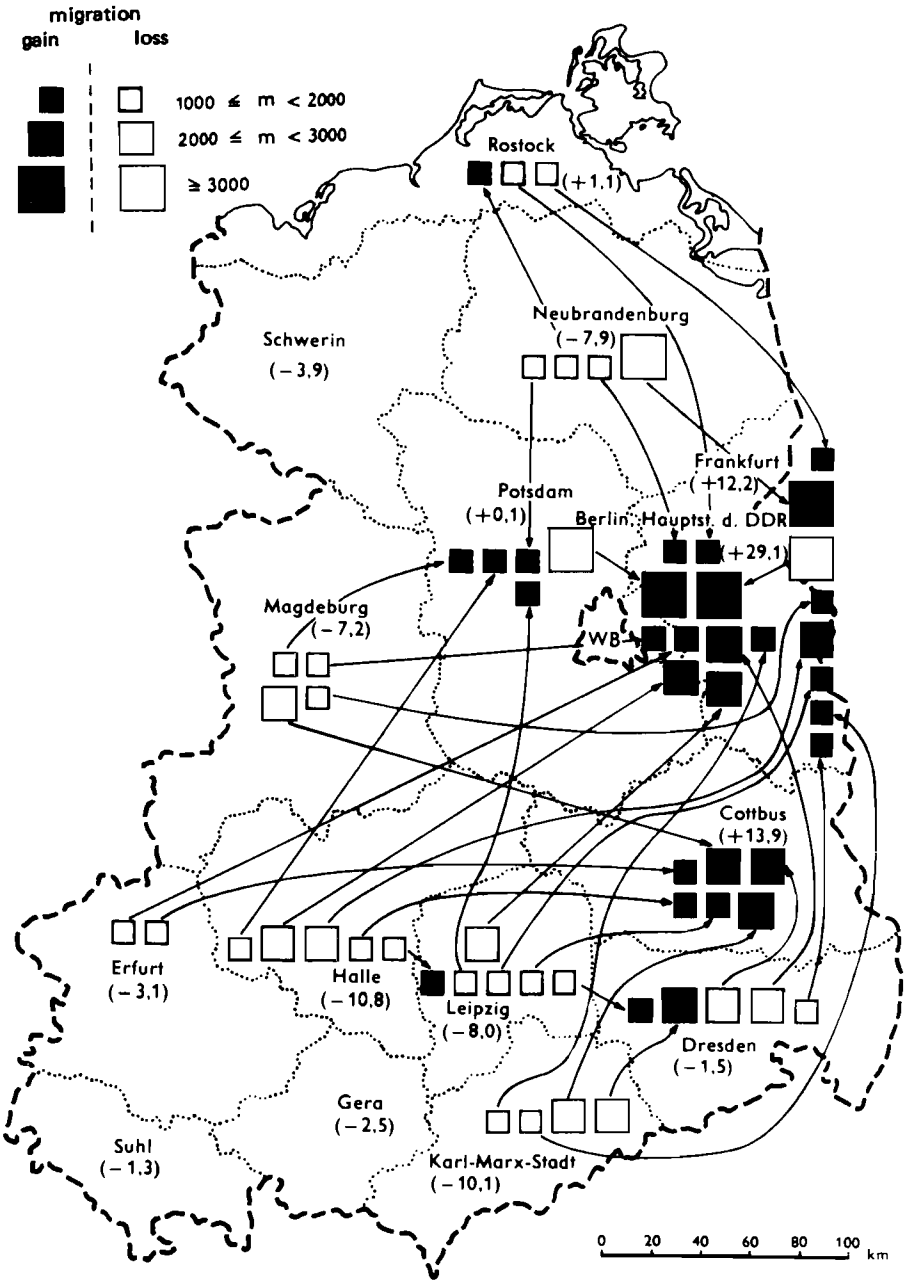

FIGURE 2 Migration gain and migration loss between the districts of the GDR (1963–1965). The figures in parentheses show the absolute migration gain and migration loss of the district in thousands. Source: Weber (1976).

TABLE 2 Internal migration across county boundaries (per thousand people).

1955	43.0	1970	15.9
1960	36.1	1975	16.5
1965	29.3		

SOURCE: *Statistisches Jahrbuch der DDR* (1976), p. 398.

TABLE 3 The interregional migration between districts, counties, and communities within counties.

Year	Districts	Counties	Communities	Total
1963	41.0	30.0	29.0	100.0
1964	40.4	30.1	29.5	100.0
1965	40.6	30.6	28.8	100.0
1966	38.1	30.4	31.5	100.0
1967	36.0	30.7	33.3	100.0
1968	34.0	30.3	35.7	100.0
1969	34.9	32.6	32.5	100.0
1970	34.6	32.9	32.5	100.0
1971	34.7	33.6	31.8	100.0
1972	34.4	34.6	31.0	100.0
1973	33.7	34.4	32.0	100.0

NOTE: The calculations were done with the data of the Directorate of Statistics of the GDR.

age groups. Connected with the high level of industrialization, the present population structure has led to a permanent shortage of manpower in more or less all the regions of the GDR.

Second, the data used for this study are taken from 1975. This year marked the midpoint between the census of 1971 and the census of 1980–1981. The data were provided by the Directorate of Statistics of the GDR, the central statistical bureau of the government.

In 1952, the government of the GDR decided to create a new administrative territorial scheme. From the historical 5 Länder, 15 districts were delineated, including Berlin as the capital of the GDR. The hierarchical system consists of the districts, counties (*Kreise*), and communities (*Gemeinden*). In 1975 there were 219 counties and 7,634 communities. According to the structure of the state and its hierarchically administrative territorial system, the original data on births, deaths, and migrations are

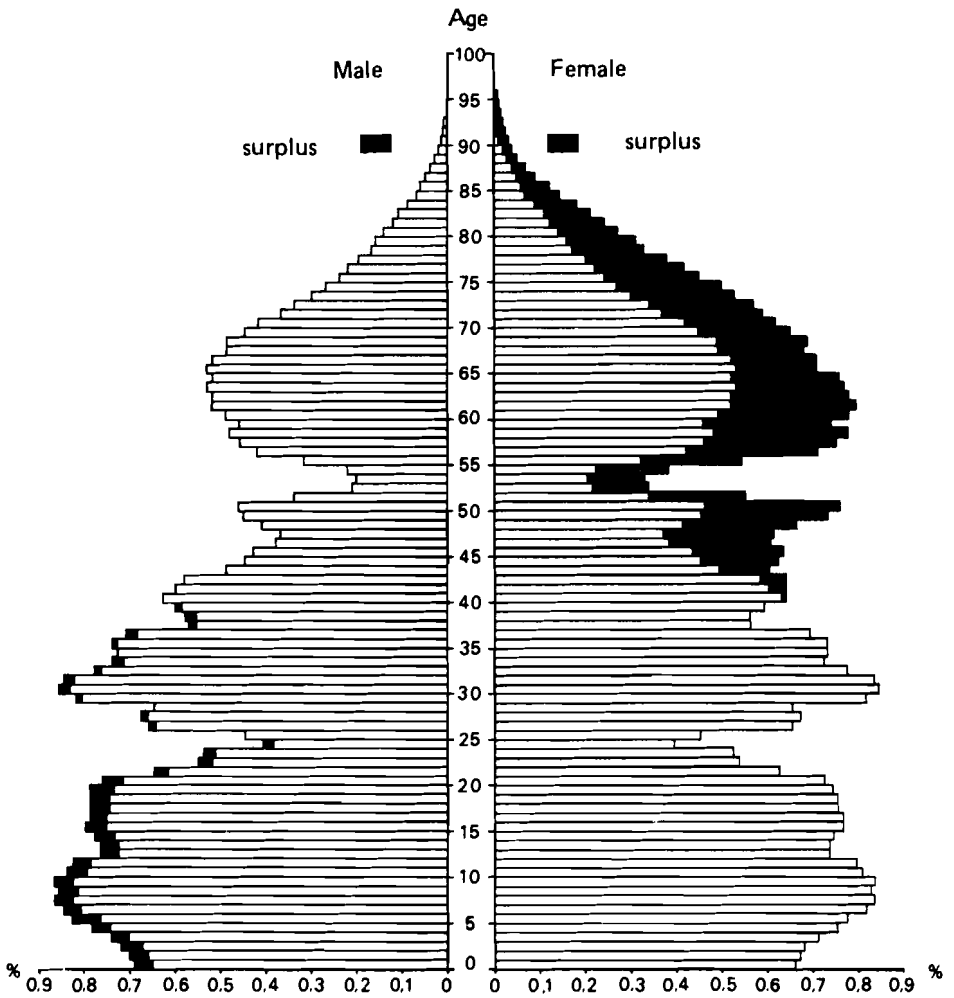

FIGURE 3 Age structure of the population of the GDR (1971). Source: Weber (1976, p. 76).

collected in the communities and aggregated yearly within the counties and districts (by the Regional Statistical Office in each of them) and in the country as a whole. In this way there is a continuing adjustment of statistical data. The main figures are published annually in the *Statistisches Jahrbuch der DDR* [Statistical Yearbook of the GDR], which contains the data in general for the country and in some cases also for the districts. The required age-specific data for each district are mainly taken from the original aggregations by the Directorate of Statistics, because these are specified in the Statistical Yearbook.

2.1 Regional Disaggregation

In a socialist planned economy, the administratively defined regions, from a geographical point of view, are both economically and socially based: they are regional units within which the members of the society both live and work. On every level, based on regional management and planning, the development of economic and social processes is determined according to the society's goals. But an administrative territorial structure is a relatively stable one, whereas economic and social processes are dynamic. Therefore, investigations of regional dynamics and development are of great importance with respect to the changing character of a country and its regions. Because of this, the dynamics of migration and settlement is one of the most important aspects in the analysis of tendencies and laws that determine regional development as a whole. For this analysis, one must look at the optimal basic regional patterns and the scope of the study. Whereas regional planning at the county level depends on the basic patterns of communities, central territorial planning requires information on the basic patterns in districts or counties.

For long-term planning, the State Planning Commission uses a pattern of five regions which includes:

1. *Berlin*, capital of the GDR
2. The *North region*, including the districts of Rostock, Schwerin, and Neubrandenburg
3. The *Middle region*, including the districts of Magdeburg, Potsdam, Frankfurt, and Cottbus
4. The *South region*, including the districts of Halle, Leipzig, Dresden, and Karl-Marx-Stadt
5. The *Southwest region*, including the districts of Erfurt, Gera, and Suhl

This study, as originally planned, was to compute the given data according to the 15 districts of the GDR. The data are shown in Appendix C. Because of limitations on computer memory space, the number of regions was reduced to 10: (1) Berlin, capital of the GDR, (2) the Rostock district, (3) the Schwerin and Neubrandenburg districts, (4) the Magdeburg and Potsdam districts, (5) the Frankfurt district, (6) the Cottbus district, (7) the Halle and Leipzig districts, (8) the Dresden district, (9) the Karl-Marx-Stadt district, and (10) the Erfurt, Gera, and Suhl districts.

The 10 regions were then aggregated into the 5 planning regions. Computer analysis was done for the 10- and the 5-region system. Only the results for the latter system are discussed in this study. The results

of computer analysis on the 10 regional units are used to assess more exactly and intensively the developing trends within the 5 long-term planning regions.

In 1975, the basic year of our study, the total population of the GDR was about 16,820,000. Compared with the preceding year, there was a decline of the total population by roughly 70,000. After being relatively stationary with a growth rate of nearly zero during the 1960s, the population of the GDR has decreased since the early 1970s. The main reason has been the decline in the fertility rate, brought about partly by the changing age structure of the population. Currently, the population decline is being reversed. In 1977, the population growth rate was positive owing to a growing fertility rate. This is a result of several new government benefits and facilities, particularly for mothers with more than one child, which are part of some new aspects of the current population policy of the GDR (see Section 4).

In the next section we will describe some regional differences in the observed patterns of the components of multiregional demographic growth. The comparison of the districts and regions in Table 4 and Figure 4 shows significant regional differences not only in the total number of people and the density of population in the districts and the five regions (groups of districts), but also in the population growth rates because of differing fertility, mortality, and migration rates.

2.2 Components of Multiregional Demographic Development

FERTILITY

The reproduction of the population of the country as a whole and its regions is determined to a high degree by the ratio of births to deaths, when migration is left out of consideration. Therefore, the prediction of population growth in many countries, including the GDR, is based mainly on the estimation of the development of the fertility index, or the fertility rate, as the case may be.

During the past two decades, the number of births has greatly decreased, whereas the number of deaths has increased (Table 5). This development depends heavily on the age structure. As shown in Figure 5 the birth rates differ considerably among the various age groups. They reflect a behavior of the population that is influenced by economic conditions, social conditions, and ethical norms. For instance, there is a close connection between the decline of the birth rate and the legalization of abortion in 1972 and a broad marketing of contraceptives. This has given the women of the GDR the possibility to decide themselves whether to have children

TABLE 4 The population of districts in the GDR from 1955 to 1975.

	Area		Population					
			1955		1965		1975	
	(km^2)	%	10^3 People	%	10^3 People	%	10^3 People	%
Berlin	403	0.4	1,139.9	6.4	1,077.2	6.3	1,098.2	6.5
Cottbus	8,262	7.6	799.0	4.5	838.9	4.9	873.3	5.2
Frankfurt	7,186	4.1	666.3	3.7	660.1	3.9	688.9	4.1
Magdeburg	11,525	10.7	1,445.5	8.1	1,323.0	7.8	1,289.6	7.6
Potsdam	12,572	11.6	1,208.9	6.8	1,127.0	6.6	1,120.6	6.7
Total (Middle)	39,545	36.5	4,119.7	23.1	3,949.0	23.2	3,972.4	23.6
Rostock	7,074	6.5	845.6	4.7	842.4	5.0	868.7	5.2
Neubrandenburg	10,792	10.6	686.7	3.8	633.0	3.7	626.4	3.7
Schwerin	8,672	8.0	651.3	3.7	594.5	3.5	590.3	3.5
Total (North)	26,538	25.1	2,183.6	12.2	2,069.9	12.2	2,085.4	12.4
Halle	8,771	8.1	2,055.3	11.5	1,931.2	11.3	1,876.5	11.1
Leipzig	4,966	4.6	1,582.2	8.9	1,510.6	8.9	1,445.8	8.6
Karl-Marx-Stadt	6,009	5.6	2,218.0	12.4	2,082.1	12.2	1,976.9	11.8
Dresden	6,738	6.2	1,941.3	10.9	1,887.2	11.1	1,835.6	10.9
Total (South)	26,484	24.5	7,796.8	43.7	7,410.5	43.5	7,134.8	42.4
Erfurt	7,349	6.8	1,302.9	7.3	1,249.0	7.3	1,245.5	7.4
Gera	4,004	3.7	740.7	4.2	734.9	4.3	737.9	4.4
Suhl	3,856	3.1	548.6	3.1	549.1	3.2	549.4	3.3
Total (Southwest)	15,209	13.6	2,592.2	14.6	2,533.0	14.8	2,529.8	15.1
GDR	108,179	100.	17,832.2	100.	17,039.6	100.	16,820.6	100.

SOURCE: *Statistisches Jahrbuch der DDR* (1976), pp. 73–102.

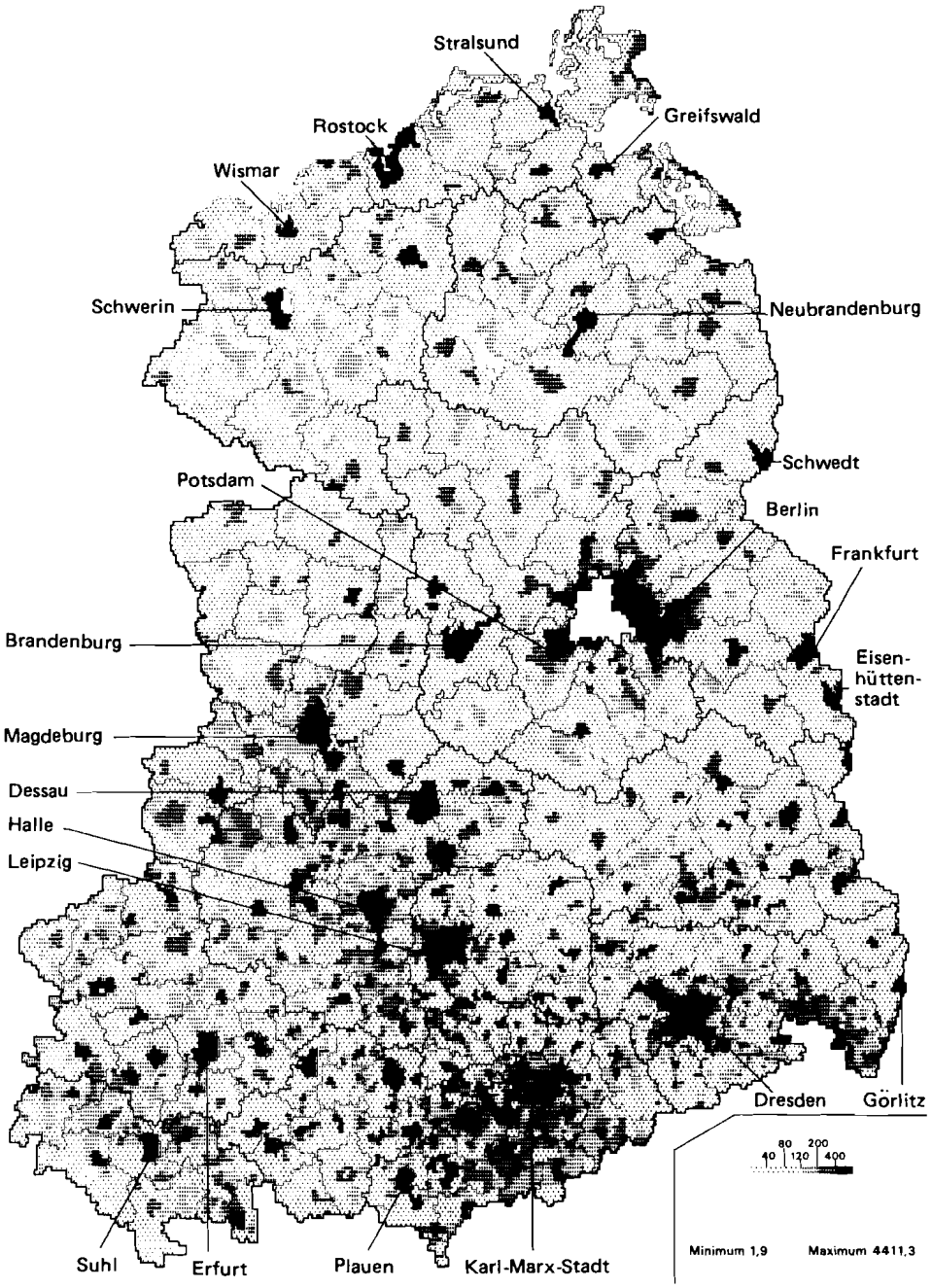

FIGURE 4 Density of population in the GDR (1971). Source: Informationen der Forschungsleitstelle für Territorialplanung (Berlin) 3 (1978), p.31.

TABLE 5 Number of births and deaths in the GDR.

Year	Births	Deaths
1950	303,866	219,582
1955	293,280	214,066
1960	292,985	233,759
1965	281,058	230,254
1970	236,929	240,821
1975	181,788	240,389
1976	195,483	233,733
1977	233,157	225,239

SOURCE: *Statistisches Jahrbuch der DDR* (1978), p. 349.

or not and is today an important means of family planning.

Since 1976, the birth rate, and with that the total number of births, has greatly increased. This marks a new behavior, particularly with respect to younger women (age 20–25) that has been stimulated above all by new measures in the field of social policy. The regional differences in fertility are shown by the observed population characteristics and fertility rates of the five regions in 1975 in Tables A1 and A2. From these, two observations may be made.

First, the mean age of childbearing lies between the age of 24.5 in the North and Middle regions and 29.6 in Berlin; in the Southwest region it is 29.3 and in the South region 29.3. Similarly, the crude rate has the highest level in the North region (0.013). The other 4 regions have crude rates ranging from 0.010 to 0.011. This is evidence of the prevailing differences between the more agrarian region in the north and the more industrialized regions, particularly in the south.

Secondly, considering the districts within the regions, the crude rate is distinctly higher in the Cottbus and Frankfurt districts (0.012) than in the Potsdam and Magdeburg districts (0.010) of the Middle region. The reason for this is the increased in-migration of young people in the 1960s and 1970s, due to the above-average economic development in these districts. This has also influenced the age structure considerably.

MORTALITY

Even more than fertility, mortality is determined by the age structure of the population. Age-specific mortality and the expectation of life have also changed in the GDR in the previous decades. Above all, the expectation of

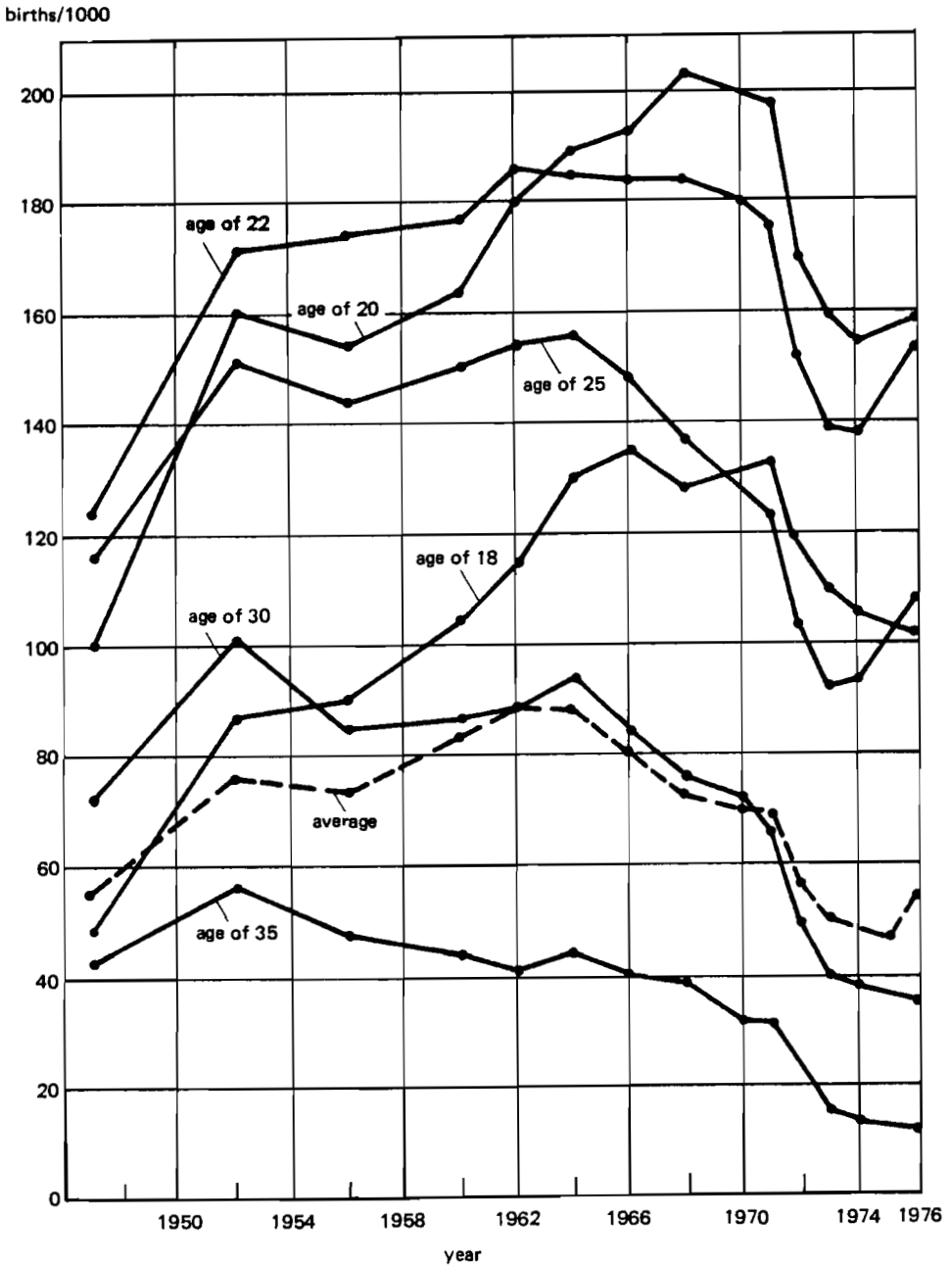

FIGURE 5 Age-specific birth rates per 1,000 females between the ages of 20 and 35. Source: Stempell (1977, p. 554).

life of the 0–1-year age group has increased from 68–74 years during the period 1953–1975 for the female population, and from 65–69 years for the male. The average expectation of life of the GDR was 71.74 years of age in 1975. This increase in the expectation of life is connected with a considerable decline in infant mortality and with an improvement of the living conditions in general.

The regional differences in the mortality levels are relatively insignificant if one looks at the mean death age in the five regions (Table A3). The range is only from 69.67 to 69.98 years. The crude rates are more diverse. The highest rates are found in the regions of Berlin and the South (0.015), and the lowest one in the North region. Obviously, this is again connected with the different economic and social structures.

MIGRATION

In a description of internal migration in the GDR, two main aspects have to be considered: the age patterns of the migrants and the regional patterns of migration. The information in Tables A1 and A4 allows us to consider both aspects.

We agree with Willekens (1978) that migration is a phenomenon that links regions together to form an interdependent system. However, this statement is true only under certain conditions. As shown by the historical review, migration in the GDR has strongly declined in the last two decades, although during this time economic development and urbanization increased considerably in all districts and counties (Table 6).

Nevertheless, in many cases the migration flows reflect different developments of the regions with regard to time and space. Between 1953 and 1972, the balance of migration shows that characteristic trends of migration flows have been maintained through the decades (Figure 6). The Schwerin and Neubrandenburg districts within the North region had a continuous migration loss, and the highly industrialized districts of Karl-Marx-Stadt and Halle in the South region as well as the district of Magdeburg in the Middle region have also had a migration loss. The migration balance has been positive in the Potsdam, Frankfurt, and Cottbus districts in the Middle region and also in Rostock, the only district in the north with a positive balance. The highest migration gain was observed in Berlin. The increase of population of Berlin will be continued in the future by means of planned in-migration.

With regard to the observed rates of the five long-term planning regions, the pattern of migration is reduced to a simple scheme: in 1975 only the Berlin region and the Middle region have a migration gain; the

TABLE 6 Degree of urbanization: percentage of inhabitants living in communities with more than 2,000 people.

	Degree of Urbanization			Change		
Region	1965	1970	1975	1965–70	1970–75	1965–75
North	61.0	63.1	66.3	+2.1	+3.2	+5.3
Southwest	65.7	66.6	67.5	+0.9	+0.9	+1.8
South	78.4	78.4	79.5	±0	+1.1	+1.1
Middle	67.5	68.4	71.2	+0.9	+2.8	+3.7
GDR (without Berlin)	73.0	73.8	75.3	+0.8	+1.5	+2.3

SOURCE: *Statistisches Jahrbuch der DDR* (1976), p. 8.

other regions have a negative balance. In fact, the real migration flows are very different, because the motives for the out-migration or in-migration of people from or to cities and towns are very different. As shown in Figure 7, there were considerable flows of in-migration to Dresden in 1971; on the other hand, in the same year Leipzig had a relatively strong out-migration. Both towns are nearly the same size (Dresden has about 510,000 inhabitants and Leipzig about 580,000). The reasons for these differences are not within the realm of this paper since they include special economic and social problems, investments in industry, development of infrastructure, housing problems, and, to a certain degree, problems of environmental protection.

A new geographical interpretation of the internal migration in the GDR by Neumann (1978) shows that at present there are in the GDR about 60 dominant centers (cities) that attract the main flows of migration. These centers are linked with their surrounding areas, from which these in-migrants generally come. Of course, cities like Berlin, Dresden, or Rostock have in-migrants from the whole of the GDR. Altogether, these investigations allow one to see the fundamental regional patterns of migration in the GDR (Figure 8). Table 7 also shows that the larger urban areas are the concentration points of migration.

The age structure of the migrants in the GDR is comparable to other countries (Drewe 1978, Bies and Tekse 1978, Philipov 1978). Figures 9 and 10 show the migration schedules of the GDR. The migration schedules are for age groups of 5 years. They were estimated from available data, which referred to unequal age groupings, by applying the techniques of model migration schedules (Appendix B).

The analysis of the observed out-migration rates shows differences

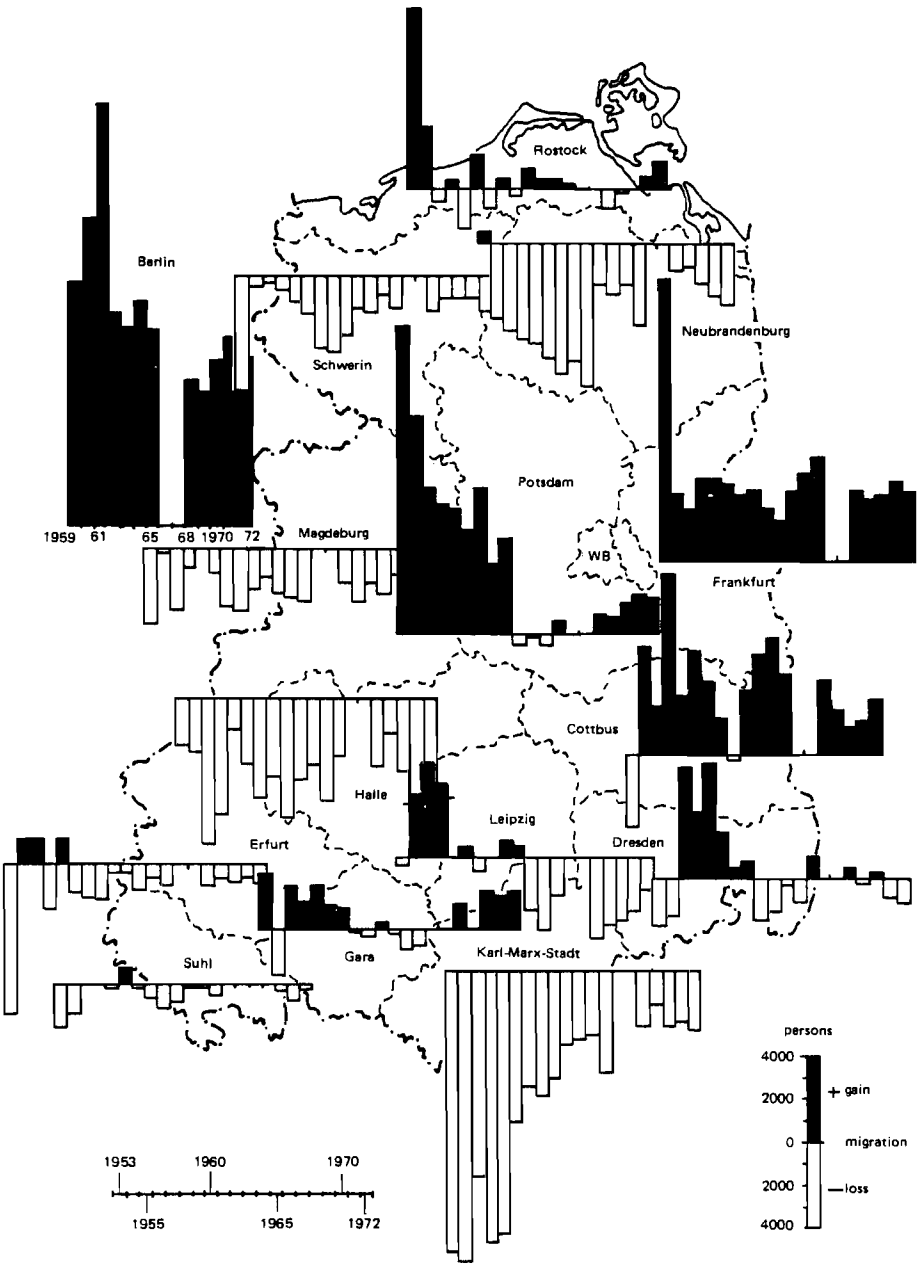

FIGURE 6 Development of migration between the districts of the GDR (all persons) during the period 1953–1972. From 1953 to 1958, migration to Berlin is not included. Source: Bose (1975, Appendix).

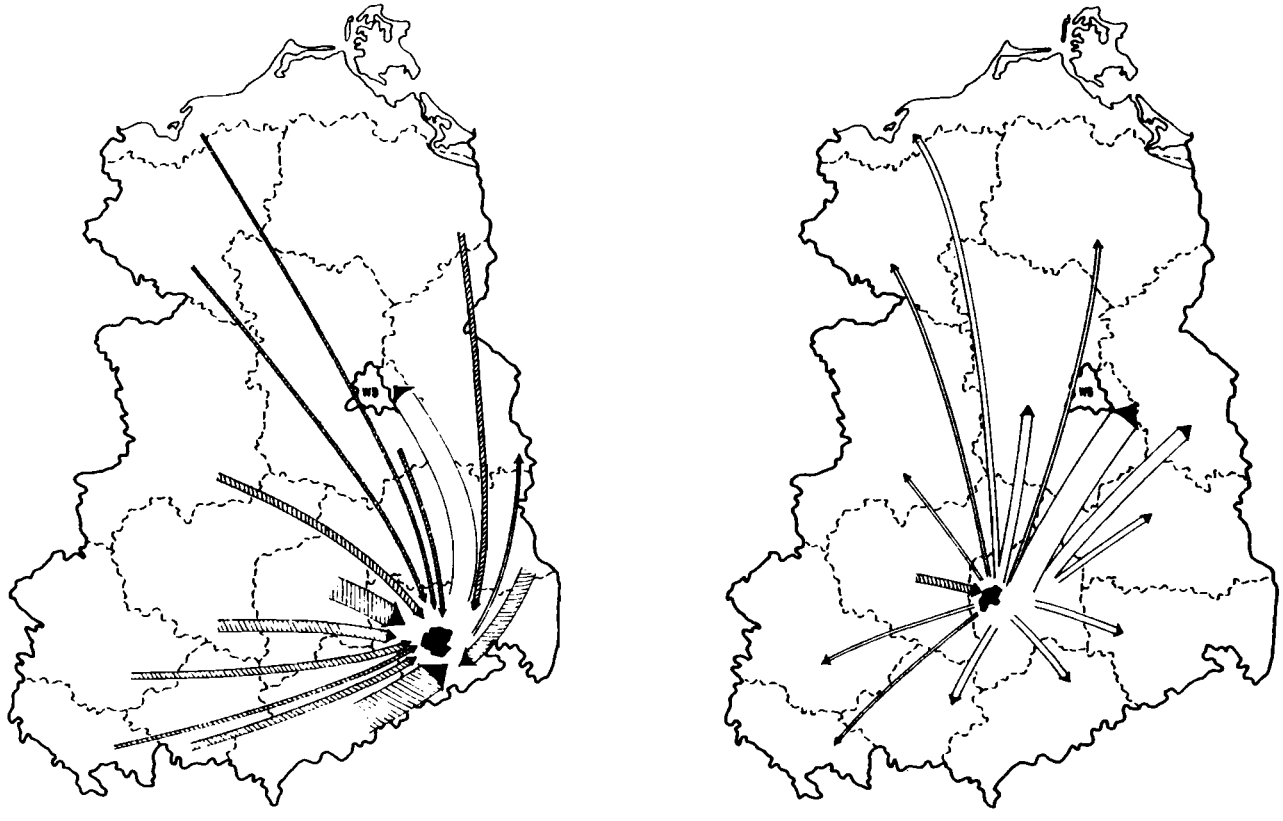

FIGURE 7 Migration flows between Dresden and the districts of the GDR (left) and between Leipzig and the districts of the GDR (total population, 1971). The width of the arrows denotes the number of people migrating; 1 mm = 50 people. Source: Bose (1975, Appendix).

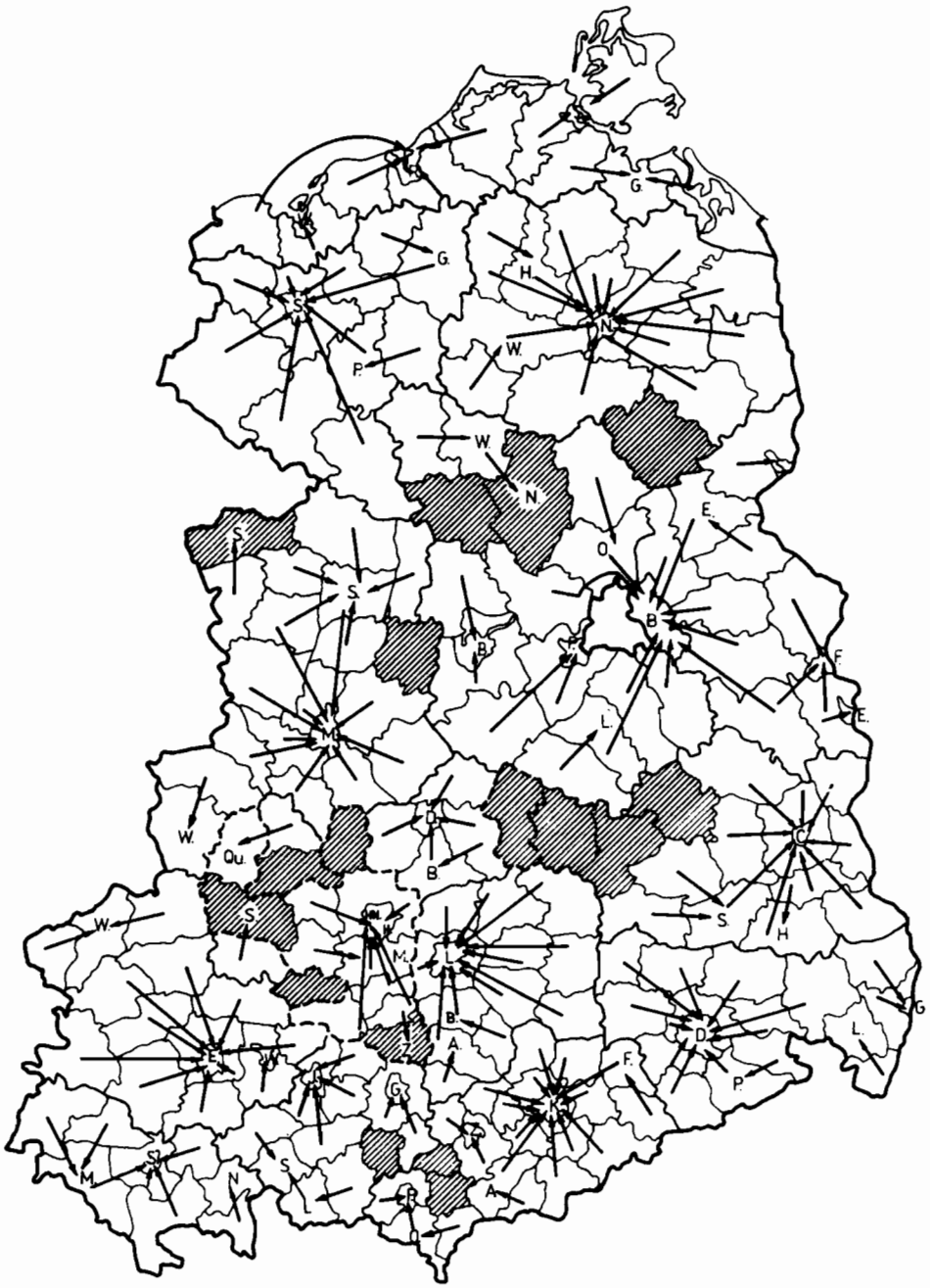

FIGURE 8a Dominant centers and areas of internal migration. The abbreviations may be identified with the help of Figure 8b on the next page. Source: Neumann (1978, p. 17).

FIGURE 8b Districts, counties, and cities of the GDR.

TABLE 7 Net in-migration rates per thousand of population according to size of community.

Size of Community (Inhabitants)	1968	1970	1972	1974
less than 2,000	−5.1	−8.1	− 9.8	−10.6
2,000 to 5,000	−1.7	−2.2	− 4.6	− 5.9
5,000 to 10,000	+5.3	+1.2	− 2.3	− 2.9
10,000 to 20,000	−0.6	+1.7	+ 1.7	+ 0.6
20,000 to 50,000	+3.3	+5.8	+ 4.8	+ 3.1
50,000 to 100,000	+2.0	+7.8	+17.2	+17.7
more than 100,000	+2.4	+3.7	+ 5.7	+ 7.8

NOTE: The calculations were done with the data of the Directorate of Statistics of the GDR.

between the five regions with regard to the crude rates (Table A4). These differences reflect the relatively strong out-migration rates from the North region, and also the above-average out-migration rates of the Middle region and Berlin (Table 8). However, as already shown, the Middle region and Berlin have a surplus of in-migrants and therefore a positive balance. The mean age of the migrants in the five regions is similar except for a slightly above-average age for out-migrants from Berlin and a slightly below-average age for out-migrants from the South region.

A comparison of the age-specific migration rates among the regions indicates that the age profile is similar in all cases (Table A4). The active migration age group is the 20–29-year-old group. The migration in this age group is connected to a high degree with the choice of occupations or jobs at places that offer good long-term prospects. Often these migrants are married and have children. Therefore, the migration rate of the 0–5-year age group is relatively high. The 15–20-year age group also has a rather high migration rate because vocational training is often offered at places other than the place of residence.

2.3 Age Group Structures and Regional Composition

The formation of the age group structure used in this study differs from that which is used in the official statistics of the GDR. In the *Statistical Yearbook of the GDR*, the age groups are 0–1, 1–3, 3–6, 6–10, 10–15, 15–18, 18–21, and 21–25, followed by the 5-year age groups, 25–30, 30–35, and so on. This formation is important for the national economy. Today in the GDR a high proportion of preschool-age children are going

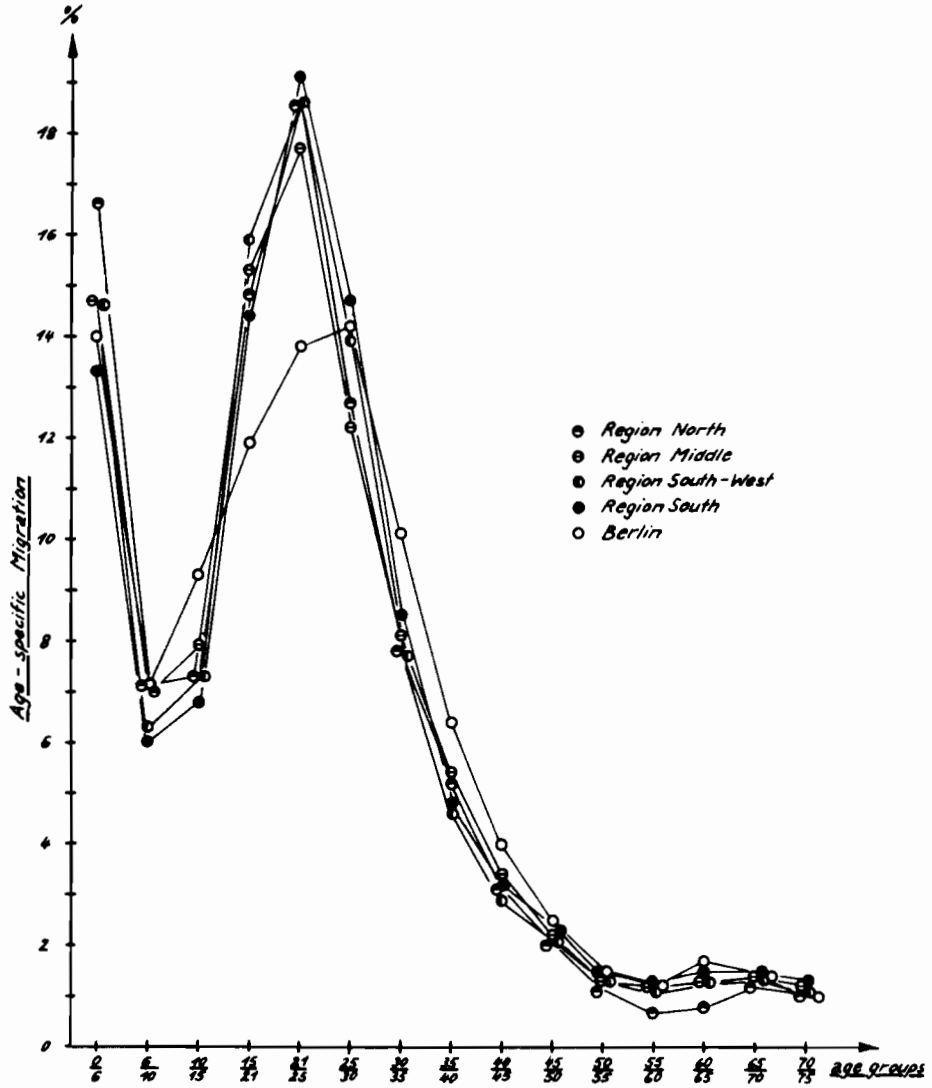

FIGURE 9 Age-specific out-migration rates of the regions of the GDR (average of 1970 and 1975).

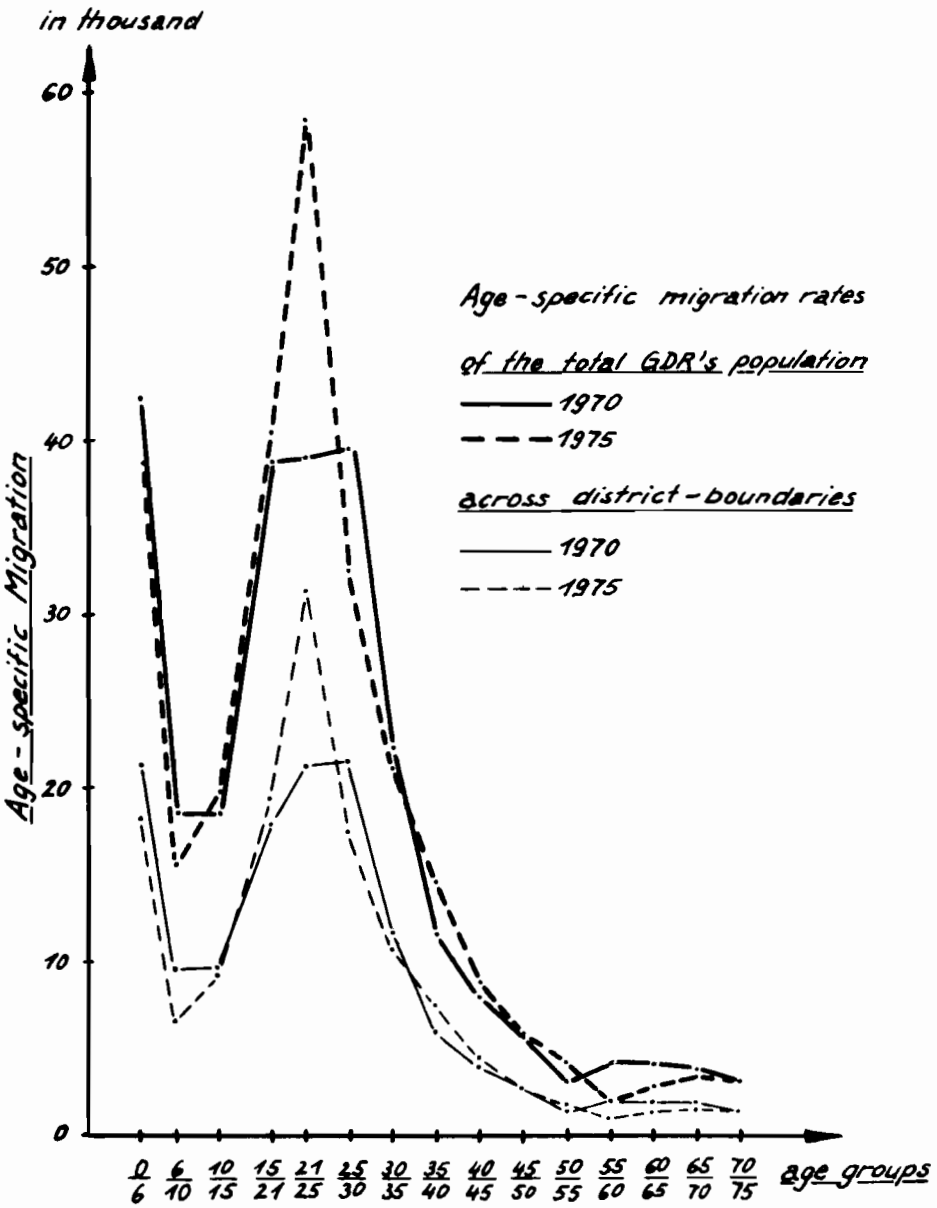

FIGURE 10 Age-specific out-migration rates of the population of the GDR (1970 and 1975).

TABLE 8 Crude rates of out-migration and mean age of migrants for the five regions (1975).

Region	Crude Rate of Out-migration	Mean Age of Migrants
North	0.0076	25.59
Berlin	0.0067	26.15
Southwest	0.0053	25.29
South	0.0049	24.87
Middle	0.0070	25.53

to crèches (between the ages of 0 and 3) or kindergartens (between the ages of 3 and 6). Obligatory education in a general polytechnical school is for the 6–15-year age group. Between 16 and 18 years of age, a child is eligible for vocational training, and within the 18–21-year age group, about 25 percent of all children attend colleges and universities.

The formation of the age group structure for an economic analysis is distinctly classified as follows:

Pre–labor force age – 0–15 years
Labor force age – 15–60 years (female)
15–65 years (male)
Post–labor force age – more than 60 or 65 years

The development of the proportions of these age groups for the whole country (Table 9) is particularly significant for the national economy. The figures show a definite decline in the percentage of the labor force between 1950 and 1975. Simultaneously, the proportion of the post–labor force ages has increased. In 1977, one can see that there is a change in this tendency, which will influence the development of the age structure from now until the mid-1980s. During this time, the proportion of the labor force will increase. However, in the following years, another decline is expected.

With respect to the analogous figures for the districts, the comparison between the age groups shows significant differences (Table 10). It is evident that the labor force population in the districts of Dresden, Karl-Marx-Stadt, and Leipzig is below average and that the size of the post–labor force age group is particularly high and the size of the pre–labor force age group particularly low. There are difficult problems in solving the shortage of manpower in these highly industrialized districts with many employ-

TABLE 9 The age structure of the residential population of the GDR (percent).

	Pre–Labor Force Age	Labor Force Age	Post–Labor Force Age
1939	21.4	67.5	11.1
1950	20.1	64.1	16.0
1960	21.0	61.3	17.6
1970	22.6	57.9	19.5
1975	20.6	59.7	19.6
1977	19.7	61.4	18.9

SOURCE: *Statistisches Jahrbuch der DDR* (1978), p. 342.

ment possibilities. The solutions to these problems affect both the economic conditions and the population distribution. In the GDR, a planned production policy must be accompanied by a planned, temporary inmigration of people, particularly younger people, from the northern districts to the south. At present, strong migration flows are going to Berlin (Figure 11).

3 MULTIREGIONAL POPULATION ANALYSIS

In this section, the computer results of the multiregional population analysis will be interpreted in accordance with the methods published by Willekens and Rogers (1976), Rogers (1978), and Willekens (1978). The approach for examining the multiregional population development is on this occasion a theoretical model of a closed population with a given regional distribution and constant age-specific rates of fertility, mortality, and migration. Corresponding to the computer program, the analysis includes the multiregional life table, a multiregional population projection, as well as the fertility and migration analysis.

3.1 The Multiregional Life Table

By using a life table, it is possible to describe a stationary population in which the number of births is equal to the number of deaths within a hypothetical cohort. This basic concept has been extended to the multiregional case by including the migration between a number of regions. The computer program used is based on hypothetical birth cohorts of 100,000 in each region. It gives an insight into their life history by ana-

TABLE 10 The age structure of the residential population in the GDR in 1975 according to districts (percent).

	Pre–Labor Force Age	Labor Force Age	Post–Labor Force Age
North			
Rostock	23.5	61.1	15.5
Schwerin	22.6	59.8	17.6
Neubrandenburg	23.1	60.3	16.6
Berlin	20.6	59.9	19.5
Southwest			
Gera	20.5	60.0	19.6
Erfurt	21.3	60.3	18.5
Suhl	20.4	60.7	19.0
South			
Halle	20.4	60.5	19.1
Leipzig	19.4	59.1	21.5
Dresden	19.7	58.0	22.3
Karl-Marx-Stadt	17.8	59.0	23.1
Middle			
Frankfurt	22.5	60.3	17.2
Potsdam	21.3	59.9	18.8
Magdeburg	20.9	59.8	19.3
Cottbus	22.3	60.1	17.7
GDR	20.6	59.7	19.6

SOURCE: *Statistisches Jahrbuch der DDR* (1976), p. 393.

lyzing the age-specific probabilities of dying and (out)-migration of the five regions.

Tables A5 to A10 give the most important characteristics of the five regions' life tables for the GDR. They allow one to construct the life history of a hypothetical cohort with respect to each region. By applying this method of calculating the age-specific probabilities of dying and migrating (Table A5), we have found that of the 100,000 babies born in Berlin, 98,249 will be alive at age 5 (Table A6), 92,360 will have remained in Berlin, 3,578 will have moved to the Middle region, 819 to the North region, and so on. Five years later, at the age of 10, there will be 98,060

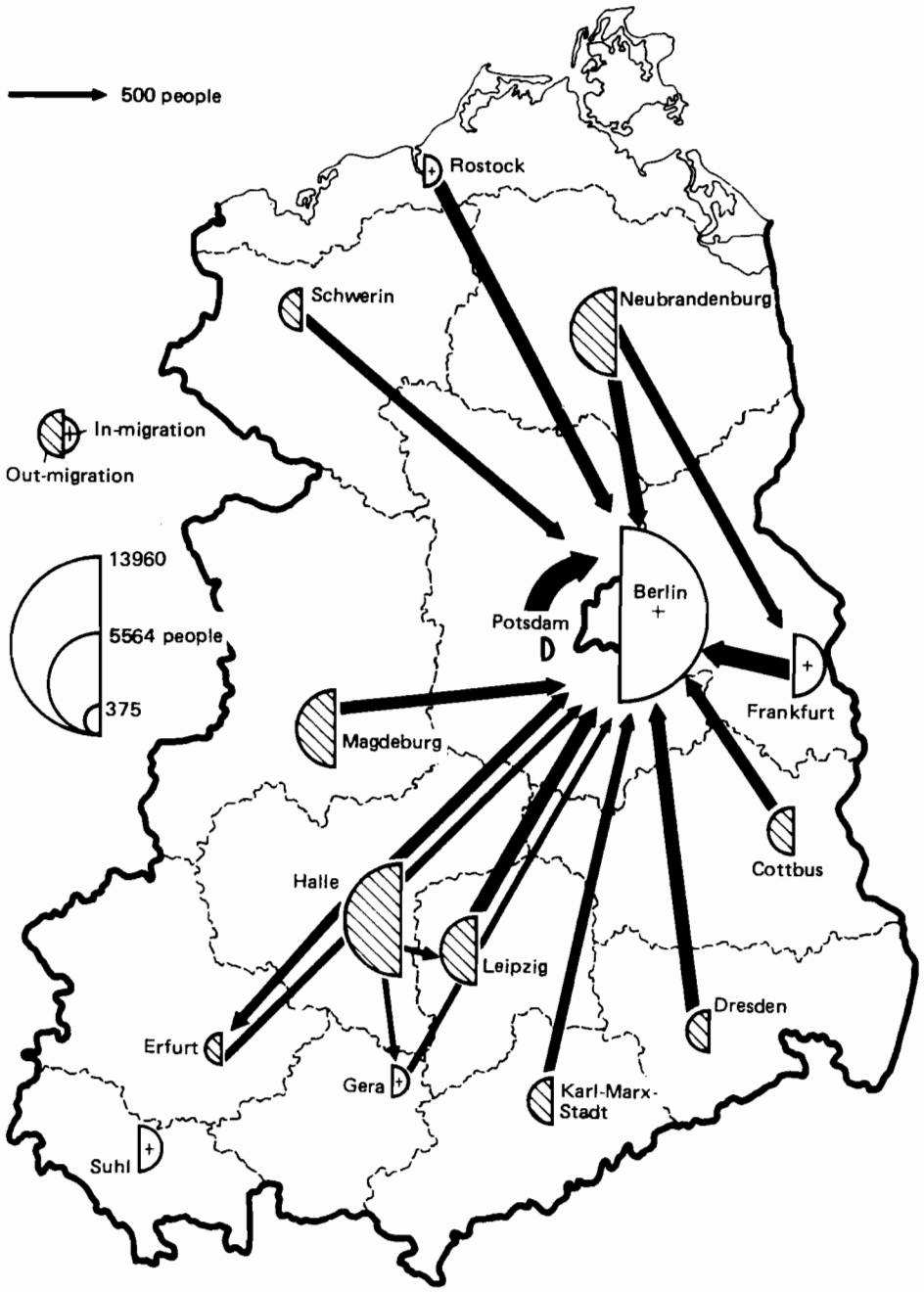

FIGURE 11 Main migration flows in the GDR in 1977. Only migrations of more than 500 people are shown. Source: Stempell (1978, Appendix).

of the initial 100,000 still living. Of these, 88,840 will have remained in Berlin, 5,544 will live in the Middle region, and so forth.

Because it is impossible to interpret here the life history as a whole, only the age group of 20–25 will be explained as an example since it contains the most active ages. From the initial birth cohort of 100,000, there are still 81,599 persons living in Berlin at exact age 20. During the following period of 5 years, 388 persons die and the number of migrants to the North region is 1,119, to the Southwest region 741, to the South region 1,973, and to the Middle region 3,389. However, in the same time period some of the migrants to the Middle region will die, according to the probability of dying in this region, and others – exactly 161 persons – will move back to Berlin. This is similar to the other regions. Out of the initial cohort, 74,258 are still living in Berlin at exact age 25.*

Table A6 summarizes the life histories. It gives the *expected number of survivors at exact age x in each region* by place of birth and place of residence. Taking the example of age 20 once more, we find distinct differences between the five regions with respect to the expected number of survivors in each region (Table 11). The North region has the lowest level of out-migration. However, this picture is reversed at the age of 25. The North has then the highest number of people living outside of the region of birth. This is consistent with the pattern found in the out-migration rates. Note the high level of migration to the South. This observation is not limited to the age of 20 years. Other age groups in the South also have an expected high number of migrants from other regions, as shown in Table A6. This reflects a planned trend of internal migration in the GDR.

Table A7 gives a further interpretation of the life history. The *number of years lived in each region by a unit birth cohort* shows the expectancy of an individual to be living in the next 5 years in the region of birth or in another region of residence. For example, a 20-year-old person who was born in the South region is expected to live, on the average, 4.87 years of the following 5 years. Of these years, the person is expected to stay in the South for 4.10 years and to live in the Middle region for 0.32 years, in Berlin for 0.12 years, and so on.

Tables A8 and A9 show the *expectations of life by place of birth* and by *place of residence*, respectively. They give the total number of years that a person is expected to live by region of birth and by residence at an exact age x. The expectations of life at age 0 are also shown in Table 12.

*The data from which most of these figures were calculated are not included in this report.

TABLE 11 Expected number of survivors at exact age 20 by region of birth and region of residence, per birth cohorts of 100,000, for the five regions.

Region of Residence	Region of Birth				
	North	Berlin	Southwest	South	Middle
North		2,455	1,581	2,126	3,879
Berlin	2,673		1,522	2,045	5,593
Southwest	2,022	1,561		3,254	2,306
South	4,222	3,673	5,924		6,756
Middle	6,227	8,250	3,030	5,305	
Total	15,144	15,903	12,057	12,730	18,534

TABLE 12 Expectation of life at birth, by region of birth and region of residence.

Region of Residence	Region of Birth				
	North	Berlin	Southwest	South	Middle
North	51.67	2.67	1.91	2.30	3.54
Berlin	3.65	52.85	2.15	2.54	5.49
Southwest	2.56	1.81	56.49	3.60	2.37
South	5.63	4.67	7.17	7.61	6.83
Middle	7.79	9.12	3.97	5.96	53.16
Total	71.30	71.13	71.69	72.01	71.39

Between the regions there are no significant disparities with regard to the expectations of life at birth. This is undoubtedly an expression of the relatively equal living conditions in all parts of the country within the socialist society. But at exact age 20, a person born in the South region can expect to live another 53.64 years. Of these years, the person will remain 40.24 years in the region of birth and 13.40 years in other regions. A person in the North region can expect to live 53.18 years, only 36.24 in the North region and nearly 17 in other regions.

With respect to the expectations of life by place of residence (Table A9), the figures differ compared with the expectations by place of birth.

An individual who reached an age of 20 as a resident in the South region can expect to live another 53.70 years and to remain 45.74 of those years in that region. The corresponding figures for the North region are 53.13 and 41.02 years. The expectations of life by place of residence are slightly higher than the corresponding expectations of life by place of birth because of certain structure effects of the population of residence compared with the birth cohort. Table A10 shows, in an aggregated manner, the *proportions of survivorship and out-migration* according to the 5-year age groups.

3.2 A Multiregional Population Projection

Assuming that the multiregional population structure of the GDR will be developing with constant coefficients, a projection of multiregional population development has been computed for 50 years based on 1975 data. We will interpret the results only for the period from 1975 to 2000.

The projection of an age- and region-specific population by means of an equation system is described by Willekens and Rogers (1976). Table A11 gives the results using GDR data. They contain, in addition to the regional and total population in each age group and the age composition, the mean age (M.AG) of the population, the regional shares (SHA) of the total population, and the growth ratio (LAM) of the previous period.

The main result is that the structural effects, which are typical for the population composition in 1975, influence the development during the whole period to the year 2000. This means that the total population of the GDR is expected to decline from 16.82 million in 1975 to 16.03 million in 2000. The reliability of this assertion depends to a certain degree on the influence of structural changes caused by the currently large rise of the fertility rate. Without the influence of a rise in the fertility rate, the regional shares of the total population will be changing as shown in Table 13.

The main "winner" of this change is Berlin; the main "loser," the South region. The total population will be increasing in Berlin from 1.098 million inhabitants to 1.349 million, whereas the population of the South region will be declining from 7.135 million to 6.316 million.

For the planned economy, it is more important to note the change of proportions between the labor force age groups and the pre– and post–labor force age groups. Despite the continued decline of the total population, the number of people in the labor force will be increasing by more than 1 million in the 1980s. In the South region, the sharp decline in population will be compensated for by a slight increase in the total labor force. But in the last decade, particularly after 1995, a large drop will occur. This

TABLE 13 Regional shares of total population (1975–2000; percentage).

	1975	1980	1985	1990	1995	2000
North	12.4	12.5	12.7	12.8	12.8	12.8
Berlin	6.5	6.9	7.2	7.6	8.1	8.4
Southwest	15.0	15.1	15.2	15.4	15.5	15.6
South	42.4	41.8	41.1	40.4	39.8	39.4
Middle	23.6	23.7	23.8	23.8	23.8	23.7

decline will require a new manpower policy in the highly industrialized South region and a changing population distribution policy.

In general, the mean age of the population will be increasing in the next 25 years. But the regional disparities tend toward a more uniform level, as shown in Table 14. Only in Berlin will the mean age in 2000 be nearly unchanged from that in 1975. This is explained by the expected high rates of in-migration during the whole period.

The tendency toward a more uniform level of the mean age touches on the problem of development toward a stable population. Willekens and Rogers (1976) remark that, if one projects the population with a constant growth rate for a long enough period of time, the ultimate (stable) growth ratio and the ultimate (stable) distribution are independent of the current growth rate and population distribution. Strohbach, a GDR demographer, says (1977) that in the long run the population development within a socialist or communist society will tend toward a stable population with an almost-zero growth rate.

3.3 Fertility and Migration Analysis

In this section, a multiregional analysis of fertility and migration is related to the observed population distribution (Section 2.2) as well as to the distribution of the life table (stationary) population (Section 3.1).

FERTILITY ANALYSIS

The observed fertility rates given in Table A2 show the specific rates of the age groups according to the five regions. The sum of the age-specific rate, multiplied by the age interval of 5 years, gives the *gross reproduction rate* (GRR). The word *GROSS* in Table A2 means the GRR. Table 15 compares the most important regional fertility rates of the observed population

TABLE 14 The mean age of the population of the five regions in 1975 and 2000.

	1975	2000
North	34.56	38.24
Berlin	37.12	37.21
Southwest	36.69	38.37
South	38.36	39.85
Middle	36.15	39.35
GDR	37.03	39.07

TABLE 15 Crude birth rate, gross reproduction rate, and mean age of childbearing in the five regions (1975).

	Crude Birth Rate	Gross Reproduction Rate	Mean Age of Childbearing
North	0.0125	0.794	24.50
Berlin	0.0107	0.776	29.62
Southwest	0.0110	0.842	29.33
South	0.0102	0.816	29.28
Middle	0.0109	0.739	24.48
GDR	0.0108	0.810	27.57

in 1975. As can be seen, the GRR is very low for the GDR as a whole and for each region. Only the Southwest and the South regions are above average. Because the given rates refer to the fertility level in 1975, the rates for 1977 or 1978 will differ in accordance with the impact of a rising fertility rate during these years.

It is important, therefore, to calculate the *net* reproduction rate (NRR), which refers to the age composition of the life table population. The NRR is derived by multiplying the observed fertility rates (Table A2) by the number of years a unit birth cohort has lived in each region (Table A7). Because not all persons survive to childbearing age, the NRR is lower than the GRR. Table 16 gives the results. Compared with Table 15, the ranking of the regions changes. First place is taken by the North region, followed by the Southwest. Both regions are above the average of the whole country.

TABLE 16 Spatial fertility expectancies: net reproduction rates and net reproduction allocations.

Region of Residence	Region of Birth				
	North	Berlin	Southwest	South	Middle
North	0.593(0.747)[a]	0.025(0.034)	0.017(0.022)	0.021(0.028)	0.035(0.046)
Berlin	0.041(0.051)	0.552(0.757)	0.024(0.030)	0.028(0.037)	0.061(0.081)
Southwest	0.030(0.038)	0.021(0.030)	0.630(0.801)	0.043(0.056)	0.028(0.037)
South	0.064(0.081)	0.053(0.072)	0.083(0.105)	0.622(0.812)	0.078(0.103)
Middle	0.066(0.083)	0.078(0.107)	0.033(0.042)	0.052(0.067)	0.554(0.733)
Total	0.794(1.000)	0.729(1.000)	0.787(1.000)	0.766(1.000)	0.756(1.000)

NOTE: The net reproduction rate of the GDR is 0.766 (the dominant eigenvalue of the matrix).
[a]The net reproduction allocation is the ratio of the net reproduction rate of a region to the total net reproduction rate.

MIGRATION ANALYSIS

Analogous to the gross reproduction rate (GRR) is the gross migraproduction rate (GMR). It is the sum of the age-specific out-migration rates (Table A4), multiplied by 5, and represents the number of times an average person would leave a region during his life, if there is no mortality effect (i.e., if all mortality occurs at the highest age). The gross migraproduction rates are given in Table 17.

The figures for GMR confirm the assertion of Section 2.2. They reflect the migration flows and are in accordance with the relative mobility of the population. In this connection the mobility of the Southwest and the South regions is clearly below the GDR average.

The net migraproduction rate (NMR), like the net reproduction rate, is derived from the life table population. These rates are obtained by multiplying the observed age-specific *total* out-migration rates (first columns of Table A4) by the number of years lived in each region by a unit birth cohort. The results are given in Table 18.

The net migraproduction rates show the expected number of migrations out of each of the five regions that an individual makes during his lifetime. The column sum of a region denotes the total expected number of migrations to be made by a person born in that region (Willekens and Rogers 1977).

The lowest number of moves is expected for a person born in the South region or the Southwest region. The reason for this is the different economic conditions in the regions. Whereas the South region is highly industrialized, the economic structure of the Southwest region is in a

TABLE 17 Gross migraproduction rates for the five regions (1975).

Region of Destination	Region of Out-migration				
	North	Berlin	Southwest	South	Middle
North		0.070	0.048	0.058	0.010
Berlin	0.098		0.051	0.060	0.169
Southwest	0.063	0.040		0.096	0.058
South	0.140	0.111	0.191		0.183
Middle	0.228	0.277	0.096	0.160	
Total	0.529	0.498	0.386	0.374	0.510

NOTE: The gross migraproduction rate of the GDR is 0.437.

TABLE 18 Spatial migration expectancies: net migraproduction rates and net migraproduction allocations.

Region of Out-migration	Region of Birth				
	North	Berlin	Southwest	South	Middle
North	0.396(0.813)[a]	0.015(0.032)	0.010(0.027)	0.013(0.034)	0.020(0.043)
Berlin	0.019(0.038)	0.379(0.812)	0.011(0.028)	0.013(0.034)	0.029(0.061)
Southwest	0.010(0.021)	0.007(0.015)	0.309(0.819)	0.014(0.039)	0.010(0.020)
South	0.021(0.044)	0.017(0.037)	0.027(0.072)	0.304(0.809)	0.026(0.056)
Middle	0.041(0.084)	0.048(0.104)	0.020(0.054)	0.031(0.084)	0.388(0.820)
Total	0.487(1.000)	0.466(1.000)	0.377(1.000)	0.375(1.000)	0.473(1.000)

NOTE: The net migraproduction rate of the GDR is 0.456 (the dominant eigenvalue of the matrix).
[a]The net migraproduction allocation is the ratio of the net migraproduction rate of a region to the the total net reproduction rate.

certain equilibrium. On the other hand, the more agrarian North region has a high rate of out-migration. In addition to a relatively high rate of in-migration, the Middle region has a relatively high rate of out-migration, mainly to Berlin.

4 POPULATION DISTRIBUTION POLICY

In the GDR, the population policy, including the population distribution policy, is based on the socialist system. As formulated at the VIII and the IX Congress of the Socialist Unity Party of Germany and several times by

the government of the GDR, the aim of both the economic and the social policy is the further development of the advanced socialist society. This means that the material and cultural living conditions of the people must be constantly improved, and that a constant development of material production is required.

During the whole postwar era, the general aims of the socialist social system have determined the population policy, but different tendencies have influenced the regional population development. Partly they have been a result of conditions and measures of specific actions and policies concerned directly with the population distribution. One can call them direct policies. On the other hand, various instruments have been used indirectly and actions have been taken indirectly that are playing an important role relating to the regional population distribution. These shall be reviewed as indirect policies.

4.1 Direct Policies

RESETTLEMENT

After World War II, the main task of the population policy was to safeguard the lives of the people. Millions of them had lost their homes and had left the war-devastated areas and destroyed cities. Millions of people were repatriated from Eastern Europe, especially Czechoslovakia. The transfer of people was directed both spontaneously and administratively to the agrarian regions and particularly to the northern parts of the country, where the low density of population made it possible to resettle a lot of people. In 1946 and the years following, the politically determined democratic land reform was an important instrument to ensure the existence of life for many people.

At the end of the 1940s and the beginning of the 1950s, the reconstruction of the destroyed factories within the cities and industrial centers required manpower and provided new possibilities for the inhabitants. Therefore, there has been a strong backflow from the agrarian to the urban regions. But because of the high amount of destruction, particularly of the cities, a strict limitation of in-migrants was invoked and free access to the cities was ended through administrative measures such as the introduction of residence permits.

HEALTH CARE

Immediately after the war, one of the most important tasks was to reconstruct the health service system. In 1947, an integrated social insurance

system was set up and controlled by the Confederation of Free German Trade Unions, and the medical care was subsidized by the state. People have been provided with everything necessary for the maintenance and recovery of their health completely free of charge. Already by the 1950s there were important results in the development of the health service system. This led to a distinct decrease in the mortality rate. The infant mortality rate declined particularly sharply. Today, the GDR belongs to the group of countries with an extremely low infant mortality rate. With regard to the medical welfare work and the state of health of the people, there are no significant regional differences within the GDR today.

RECRUITMENT OF WORKERS FOR INDUSTRIAL CENTERS AND REGIONS

Beginning in the 1950s and continuing in the 1960s, an important goal of the economic and social policy was to reduce the disparities in the development level of the regions in the GDR. Two main results have been achieved:

a) In the regions that were formerly lagging behind, the social infrastructure was greatly improved, particularly the education system and the health service system. Today, this social level has been assimilated to a high degree by all the regions.
b) The former agrarian regions have been developed by extended industrialization.

In this regard, a direct impact on the population distribution policy can be observed. With the creation of many new jobs and with the construction of residential buildings in new industrial centers, particularly in the North and in the Middle regions, strong migration flows were initiated. Skilled workers from the highly industrialized regions and from regions with certain manpower reserves were encouraged to go to new industrial centers. In connection with this, the recruiting of skilled workers and management personnel was undertaken and their transfer was organized, particularly to the North region but also to new industrial centers in the Middle region. Over time, a planning system for the coordination of demand and supply in employment was established. Special offices were organized and planning instruments developed to meet the needs, especially on the district, county, and local level.

Since the 1960s, particularly because of the decline of the labor force a significant shortage of manpower has arisen, especially in the more industrialized regions and in the industrial centers. This development has been partly compensated for by increasing the number of women workers. Today, nearly 50 percent of the workers in the GDR are women, 86 per-

cent of the women of labor force age were employed in 1976.

At present and in the future, the planning bodies of the government and of the districts will be faced more and more with the problem of meeting the shortage of manpower, particularly in the South region and in Berlin. Whereas Berlin is already attractive and needs only indirect population distribution policy measures, the agglomeration areas in the South region need more active measures to meet their need for manpower. Therefore, a temporary increase of migration flows to the South region is planned, including the migration of young people from the North region.

FAMILY PLANNING

The emancipation of women is one of the main concerns of the socialist society. The rights of women in the GDR are not only laid down in the constitution but also in a number of laws, such as the Labor Code, the Family Code, the Law on the Rights of Women, and the Law on the Protection of Mother and Child; the last two were passed after the GDR was founded. Birth control with the wider use of contraceptives and the legal provision for abortions is a direct consequence of this emancipation policy. However, the high level of employment of women is an important fact of the national economy of the GDR. In the 1960s and the beginning of the 1970s, the large decrease in fertility rates has led to a further decline in the number of people within the labor force age group.

Against this background, the present population policy in the GDR is characterized by a comprehensive program of measures in the field of social policy. This program includes laws for the benefit of young married people, for the benefit of mothers with more than two children, for increased maternity allowance paid by the state for every child born, and for a children's allowance paid by the state to households with four or more children; special facilities have been set up for working women with children, for large families, and so on. The result of this social policy has been a sharp increase in the birth rate during the last part of the 1970s.

4.2 Indirect Policies

In many cases it is difficult to distinguish between direct and indirect influences on regional population development. On the whole, the range of indirect measures and actions is wide within the population distribution policy. Here we can consider only some of the most important measures.

REGIONAL DISTRIBUTION OF PRODUCTIVE FORCES

During the past three decades, the territorial structure of the national economy has been changed significantly. The main objective was and is to guarantee a continuous improvement of the working and living conditions for all people within all parts of the country.

In the first period after World War II, the policy of investment planning and coordination was directed to the reconstruction of the historically industrial centers and areas. The greater change was caused by the democratic land reform in the agrarian regions. The connection with direct measures relating to the population distribution is shown above.

The second period, from the beginning of the 1950s through the 1960s, was characterized by extensive industrialization in formerly more agrarian regions. Primarily, the location of new industrial centers was connected with the needs to develop basic industry, above all the energy industry, metallurgy, and heavy industry.

Since the 1950s, the base of the electrical power program has been almost exclusively brown coal mining. Because of the richness of its deposits of brown coal, the district of Cottbus has been developed as the main center of electrical power and gas production. A lot of opencase pits, power stations, and enterprises for gas production have been located in this district. New towns have been built up and other settlements have greatly increased the number of their inhabitants.

In an analogous manner, the development of shipbuilding and the enlargement of the commercial ports in the coastal region have greatly changed the territorial and population structure of the Rostock district in the north since the 1950s.

Other decisions on the location of metallurgical and heavy industry have influenced the development on a more local level. But always they have led to a fairly substantial enlargement of cities or to the building of new towns, and have strengthened the relations of these urban areas to their surrounding areas. An increase in commuting has been a significant result in each case.

The third period of the policy of investment planning began at the end of the 1960s. Generally, the intensification and rationalization of the whole national economy have been coming into the foreground. Only a few larger industrial enterprises have been built up in the last years. The changing of the production structure is occurring primarily within the given enterprises and at the given sites by means of rationalization and automation.

As a result, the macrostructure of the regional distribution of produc-

tive forces tends to be more stable. Simultaneously, the dynamic of economic and social development is growing on the local and regional level, and the current development of agriculture, which is becoming more and more mechanized, is stimulating this process.

As shown in the previous sections, in the last decade migration patterns sprang up spontaneously on a regional level, and a limited number of cities became the dominant centers of in-migration from their surrounding areas (see Figure 7). These linked centers are the backbone of the regional distribution of productive forces.

Along with significant trends toward a more intensive economic development, both the concentration of production and the concentration of settlements have been increased in the last decade. This is connected with a general decline in internal migration and with the tendency of migrations to be over shorter distances. At the same time, the number of commuters between places of residence and places of work has been increased.

HOUSING

During World War II, a tremendous number of houses, public service buildings, infrastructure equipment, plants, and factories were destroyed in many places, particularly in the large cities. At this time, the society was faced with the task of organizing a required minimum of rebuilding. To satisfy one of the most urgent needs of humanity, the reconstruction of houses and dwellings was of greatest importance. But the limitation of materials and investment resources required the concentration of housing construction on the most essential centers of the society's life and production during the first years.

In the following years, increasing investment resources have allowed the widening of housing construction relating to the quantity of dwellings as well as to the number of localities. During the two decades from 1950 to 1970, roughly 1.25 million new dwellings were built. But at the end of the 1960s there was still a shortage of housing, and the location of housing construction has been yet another essential instrument of planning the population distribution.

To ultimately solve the housing problem as a social problem by 1990, a long-term program was initiated at the beginning of the 1970s. During this time, it is planned that roughly 3 million dwellings will be made available by means of new construction, above all of apartments or by reconstruction and modernization of existing dwellings. During the period 1971–1975, more than 500,000 dwellings were built or reconstructed. From 1976 to 1980, the building or reconstruction of 750,000 dwellings is planned.

About 90 percent of the newly built dwellings have been erected by local authorities – they are national property – as well as by workers' building cooperatives.

Since the 1960s, an increasing number of dwellings have been built in an industrialized manner, in which prefabricated parts predominate. This leads to the consequence that the buildings are on large sites. Currently, the general orientation is directed to large units of houses (apartments) connected with public service buildings such as schools, health centers, trade and cultural centers, and so on. Such complexes are being built primarily as suburbs or "New Towns" within or near cities. Therefore, they improve the attractiveness of these centers with regard to migration.

Berlin, the capital of the GDR since the country was founded, has been the most important center of housing construction. It is not only the largest city of the country but also the most essential center of industry and services. It is the seat of the government and the center of leadership and planning of the society's development. Therefore, continuous growth is planned for the future. Besides, a maximum of housing construction, higher wages, and the attractiveness of the capital in general bring migrants in large numbers.

OTHER INDIRECT INFLUENCES

In addition to the above two main indirect policies, several other indirect measures and actions influence the population distribution, e.g., the development of infrastructure, the policy of diminution of the differences between city and country, the increase in attractiveness of selected settlements or whole regions, and so on. Because of the relative homogeneity of the working and living conditions within and among all districts, such indirect policy aspects will stimulate migration even further. Some hidden influences affect the population distribution currently and will be expected to do so even more in the future. In particular, environmental problems (e.g., air and water pollution) within the highly industrialized regions are increasingly affecting the behavior of the population.

5 CONCLUSION

The multiregional population model applied in this study allowed, by means of a spatial population analysis, an assessment of the observed population data as well as a report on the consequences of the current behavior of the population projected into the future by an analysis of life table statistics.

Compared with the usual methods of accounting for population development according to administrative units, the multiregional population

model gives better insight into the impacts of migration on the population distribution. But the current change in the fertility rates leads to the necessity of using additional methods or instruments to assess the dynamic of the changing behavior of the population. The use of simulation methods can probably meet the need.

The specific nature of the population structure and the population distribution of the GDR is in evidence from the migration analysis. As shown, the decreasing number of migrants and the trend toward migration over shorter distances are connected with the concentration of migration into a limited number of in-migration centers with relatively small and closed out-migration areas. This leads to two special areas for further research:

Firstly, to try the given multiregional population model on a subregional level. This may lead to difficulties in computing with a very large amount of data.

Secondly, to use the multiregional migration analysis to solve problems of urban change.

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APPENDIXES

Appendix A

DEMOGRAPHIC DATA FOR THE GDR (5 REGIONS)

TABLE A1 Observed population characteristics (1975).

A. Region: North

Age	Population	Births	Deaths	Migration from North to				
				North	Berlin	Southwest	South	Middle
0	130,449.	0.	519.	0.	337.	247.	532.	865.
5	164,503.	0.	76.	0.	188.	139.	298.	488.
10	204,645.	1.	51.	0.	130.	126.	225.	499.
15	189,898.	5,100.	167.	0.	270.	191.	417.	598.
20	188,590.	13,550.	196.	0.	876.	615.	1,364.	1,933.
25	116,643.	4,452.	119.	0.	421.	211.	491.	742.
30	124,046.	1,896.	172.	0.	228.	128.	304.	450.
35	168,270.	887.	313.	0.	150.	91.	201.	369.
40	140,364.	196.	423.	0.	75.	50.	111.	213.
45	117,915.	3.	501.	0.	51.	31.	71.	142.
50	96,209.	0.	676.	0.	31.	18.	42.	92.
55	66,299.	0.	651.	0.	11.	6.	23.	53.
60	95,490.	0.	1,765.	0.	34.	20.	35.	65.
65	100,051.	0.	3,033.	0.	35.	23.	38.	95.
70	84,113.	0.	4,544.	0.	22.	12.	29.	54.
75	97,898.	0.	12,783.	0.	38.	21.	47.	115.
Total	2,085,383.	26,085.	25,989.	0.	2,897.	1,929.	4,228	6,773.

B. Region: Berlin

Age	Population	Births	Deaths	Migration from Berlin to				
				North	Berlin	Southwest	South	Middle
0	62,653.	0.	221.	108.	0.	56.	135.	481.
5	79,009.	0.	30.	83.	0.	42.	103.	367.
10	92,259.	0.	30.	99.	0.	82.	164.	359.
15	73,156.	2.	53.	105.	0.	67.	181.	315.
20	72,651.	1,428.	69.	216.	0.	137.	368.	643.
25	66,688.	5,451.	62.	132.	0.	62.	191.	406.
30	90,215.	2,840.	112.	87.	0.	54.	187.	443.
35	100,196.	1,426.	164.	60.	0.	33.	115.	324.
40	76,735.	505.	212.	36.	0.	21.	65.	193.
45	62,934.	89.	287.	19.	0.	5.	32.	134.
50	48,528.	0.	357.	11.	0.	12.	27.	84.
55	38,995.	0.	453.	4.	0.	3.	19.	42.
60	56,860.	0.	1,171.	18.	0.	3.	14.	75.
65	64,747.	0.	2,194.	14.	0.	4.	14.	61.
70	52,249.	0.	3,005.	9.	0.	6.	14.	42.
75	60,299.	0.	8,338.	20.	0.	5.	18.	79.
Total	1,098,174.	11,741.	16,758.	1,021.	0.	592.	1,647.	4,048.

TABLE A1 *Continued.*

C. Region: Southwest

Age	Population	Births	Deaths	Migration from Southwest to				
				North	Berlin	Southwest	South	Middle
0	147,410.	0.	583.	162.	155.	0.	675.	334.
5	185,894.	4.	72.	128.	123.	0.	530.	263.
10	212,098.	0.	75.	97.	67.	0.	388.	180.
15	203,787.	4.	157.	227.	233.	0.	874.	461.
20	202,382.	4,777.	187.	446.	459.	0.	1,718.	906.
25	153,362.	13,731.	113.	220.	331.	0.	875.	435.
30	158,742.	5,490.	221.	135.	146.	0.	503.	252.
35	197,410.	2,445.	330.	87.	88.	0.	303.	155.
40	153,749.	1,057.	421.	43.	51.	0.	195.	99.
45	149,926.	200.	514.	28.	49.	0.	146.	67.
50	139,022.	0.	844.	23.	21.	0.	85.	42.
55	95,091.	0.	889.	10.	8.	0.	36.	22.
60	137,037.	0.	2,407.	20.	19.	0.	72.	36.
65	141,890.	0.	4,360.	15.	10.	0.	82.	39.
70	118,205.	0.	6,325.	12.	8.	0.	60.	28.
75	133,800.	0.	17,446.	17.	22.	0.	113.	56.
Total	2,529,805.	27,704.	34,944.	1,670.	1,790.	0.	6,655.	3,375.

D. Region: South

Age	Population	Births	Deaths	Migration from South to				
				North	Berlin	Southwest	South	Middle
0	384,605.	0.	1,296.	583.	512.	902.	0.	1,590.
5	485,010.	0.	183.	452.	396.	701.	0.	1,236.
10	554,272.	0.	196.	327.	299.	553.	0.	887.
15	535,508.	10.	390.	839.	863.	1,385.	0.	2,345.
20	531,815.	11,636.	560.	1,158.	1,132.	1,960.	0.	3,181.
25	407,753.	36,483.	357.	727.	1,008.	1,187.	0.	1,875.
30	466,059.	14,898.	555.	458.	531.	707.	0.	1,184.
35	537,937.	6,811.	839.	268.	328.	448.	0.	785.
40	436,268.	2,658.	1,178.	183.	151.	298.	0.	498.
45	429,621.	481.	1,772.	126.	107.	187.	0.	314.
50	396,536.	0.	2,551.	75.	59.	129.	0.	228.
55	282,475.	0.	2,610.	35.	51.	65.	0.	124.
60	406,848.	0.	7,021.	69.	48.	101.	0.	162.
65	445,774.	0.	12,854.	55.	38.	104.	0.	190.
70	383,328.	0.	19,309.	50.	48.	93.	0.	188.
75	451,037.	0.	56,259.	68.	84.	183.	0.	282.
Total	7,134,846.	72,977.	107,930.	5,473.	5,655.	9,003.	0.	15,069.

TABLE A1 *Continued.*

E. Region: Middle

Age	Population	Births	Deaths	Migration from Middle to				
				North	Berlin	Southwest	South	Middle
0	232,948.	0.	864.	620.	856.	302.	1,036.	0.
5	293,763.	0.	138.	468.	647.	229.	779.	0.
10	361,577.	3.	147.	407.	532.	215.	692.	0.
15	327,065.	7,715.	280.	1,209.	2,000.	806.	2,247.	0.
20	324,810.	22,286.	341.	812.	1,357.	547.	1,561.	0.
25	219,846.	7,927.	214.	657.	1,185.	368.	1,173.	0.
30	256,253.	3,451.	361.	437.	757.	220.	791.	0.
35	324,814.	1,549.	598.	314.	568.	153.	571.	0.
40	260,360.	301.	761.	181.	315.	100.	332.	0.
45	229,616.	10.	954.	103.	225.	57.	209.	0.
50	195,077.	0.	1,333.	69.	167.	40.	127.	0.
55	138,687.	0.	1,381.	30.	75.	18.	75.	0.
60	199,906.	0.	3,688.	33.	108.	35.	105.	0.
65	215,871.	0.	6,465.	50.	133.	28.	134.	0.
70	180,240.	0.	9,734.	48.	101.	32.	103.	0.
75	211,208.	0.	27,527.	73.	166.	60.	136.	0.
Total	3,972,041.	43,242.	54,786.	5,511.	9,192.	3,210.	10,071.	0.

TABLE A2 Observed fertility rates (1975).

age	north	berlin	s.west	south	middle
0	0.000000	0.000000	0.000000	0.000000	0.000000
5	0.000000	0.000000	0.000000	0.000000	0.000000
10	0.000005	0.000000	0.000000	0.000000	0.000008
15	0.026857	0.000027	0.000020	0.000019	0.023589
20	0.071849	0.019656	0.023604	0.021880	0.068612
25	0.038168	0.081739	0.089533	0.089473	0.036057
30	0.015285	0.031480	0.034584	0.031966	0.013467
35	0.005271	0.014232	0.012385	0.012661	0.004769
40	0.001396	0.006581	0.006875	0.006093	0.001156
45	0.000025	0.001414	0.001334	0.001120	0.000044
50	0.000000	0.000000	0.000000	0.000000	0.000000
55	0.000000	0.000000	0.000000	0.000000	0.000000
60	0.000000	0.000000	0.000000	0.000000	0.000000
65	0.000000	0.000000	0.000000	0.000000	0.000000
70	0.000000	0.000000	0.000000	0.000000	0.000000
75	0.000000	0.000000	0.000000	0.000000	0.000000
gross	0.794279	0.775648	0.841677	0.816056	0.738510
crude	0.012508	0.010691	0.010951	0.010228	0.010887
m.age	24.4954	29.6155	29.3318	29.2807	24.4815

TABLE A3 Observed death rates (1975).

age	north	berlin	s.west	south	middle
0	0.003979	0.003527	0.003955	0.003370	0.003709
5	0.000462	0.000380	0.000387	0.000377	0.000470
10	0.000249	0.000325	0.000354	0.000354	0.000407
15	0.000879	0.000724	0.000770	0.000728	0.000856
20	0.001039	0.000950	0.000924	0.001053	0.001050
25	0.001020	0.000930	0.000737	0.000876	0.000973
30	0.001387	0.001241	0.001392	0.001191	0.001409
35	0.001860	0.001637	0.001672	0.001560	0.001841
40	0.003014	0.002763	0.002738	0.002700	0.002923
45	0.004249	0.004560	0.003428	0.004125	0.004155
50	0.007026	0.007357	0.006071	0.006433	0.006833
55	0.009819	0.011617	0.009349	0.009240	0.009958
60	0.018484	0.020594	0.017565	0.017257	0.018449
65	0.030315	0.033886	0.030728	0.028835	0.029948
70	0.054023	0.057513	0.053509	0.050372	0.054006
75	0.130575	0.138278	0.130389	0.124733	0.130331
gross	1.341894	1.431409	1.319837	1.266013	1.336586
crude	0.012462	0.015260	0.013813	0.015127	0.013793
m.age	69.6746	69.9519	69.9769	69.8918	69.7359

TABLE A4 Observed out-migration rates (1975).

	migration from	north to			
age	total	north	berlin	s.west	south	middle
0	0.015186	0.000000	0.002583	0.001893	0.004078	0.006631
5	0.006766	0.000000	0.001143	0.000845	0.001812	0.002967
10	0.004789	0.000000	0.000635	0.000616	0.001099	0.002438
15	0.007773	0.000000	0.001422	0.001006	0.002196	0.003149
20	0.025388	0.000000	0.004645	0.003261	0.007233	0.010250
25	0.015989	0.000000	0.003609	0.001809	0.004209	0.006361
30	0.008948	0.000000	0.001838	0.001032	0.002451	0.003628
35	0.004820	0.000000	0.000891	0.000541	0.001195	0.002193
40	0.003199	0.000000	0.000534	0.000356	0.000791	0.001517
45	0.002502	0.000000	0.000433	0.000263	0.000602	0.001204
50	0.001902	0.000000	0.000322	0.000187	0.000437	0.000956
55	0.001403	0.000000	0.000166	0.000090	0.000347	0.000799
60	0.001613	0.000000	0.000356	0.000209	0.000367	0.000681
65	0.001909	0.000000	0.000350	0.000230	0.000380	0.000950
70	0.001391	0.000000	0.000262	0.000143	0.000345	0.000642
75	0.002257	0.000000	0.000388	0.000215	0.000480	0.001175
gross	0.529171	0.000000	0.097888	0.063479	0.140100	0.227704
crude	0.007589	0.000000	0.001389	0.000925	0.002027	0.003248
m.age	25.5857	0.0000	26.0198	24.5382	24.7935	26.1784

TABLE A4 *Continued.*

	migration from berlin to					
age	total	north	berlin	s.west	south	middle
0	0.012450	0.001724	0.000000	0.000894	0.002155	0.007677
5	0.007531	0.001051	0.000000	0.000532	0.001304	0.004645
10	0.007631	0.001073	0.000000	0.000889	0.001778	0.003891
15	0.009131	0.001435	0.000000	0.000916	0.002474	0.004306
20	0.018775	0.002973	0.000000	0.001886	0.005065	0.008851
25	0.011861	0.001979	0.000000	0.000930	0.002864	0.006088
30	0.008546	0.000964	0.000000	0.000599	0.002073	0.004910
35	0.005310	0.000599	0.000000	0.000329	0.001148	0.003234
40	0.004105	0.000469	0.000000	0.000274	0.000847	0.002515
45	0.003019	0.000302	0.000000	0.000079	0.000508	0.002129
50	0.002761	0.000227	0.000000	0.000247	0.000556	0.001731
55	0.001744	0.000103	0.000000	0.000077	0.000487	0.001077
60	0.001935	0.000317	0.000000	0.000053	0.000246	0.001319
65	0.001436	0.000216	0.000000	0.000062	0.000216	0.000942
70	0.001359	0.000172	0.000000	0.000115	0.000268	0.000804
75	0.002023	0.000332	0.000000	0.000083	0.000299	0.001310
gross	0.498081	0.069677	0.000000	0.039815	0.111441	0.277148
crude	0.006655	0.000930	0.000000	0.000539	0.001500	0.003686
m.age	26.1459	25.1516	0.0000	23.6328	25.7421	26.9192

	migration from s.west to					
age	total	north	berlin	s.west	south	middle
0	0.008995	0.001099	0.001051	0.000000	0.004579	0.002266
5	0.005616	0.000689	0.000662	0.000000	0.002851	0.001415
10	0.003451	0.000457	0.000316	0.000000	0.001829	0.000849
15	0.008808	0.001114	0.001143	0.000000	0.004289	0.002262
20	0.017437	0.002204	0.002268	0.000000	0.008489	0.004477
25	0.012135	0.001435	0.002158	0.000000	0.005705	0.002836
30	0.006526	0.000850	0.000920	0.000000	0.003169	0.001587
35	0.003207	0.000441	0.000446	0.000000	0.001535	0.000785
40	0.002524	0.000280	0.000332	0.000000	0.001268	0.000644
45	0.001934	0.000187	0.000327	0.000000	0.000974	0.000447
50	0.001230	0.000165	0.000151	0.000000	0.000611	0.000302
55	0.000799	0.000105	0.000084	0.000000	0.000379	0.000231
60	0.001073	0.000146	0.000139	0.000000	0.000525	0.000263
65	0.001029	0.000106	0.000070	0.000000	0.000578	0.000275
70	0.000914	0.000102	0.000068	0.000000	0.000508	0.000237
75	0.001555	0.000127	0.000164	0.000000	0.000845	0.000419
gross	0.386164	0.047527	0.051496	0.000000	0.190669	0.096472
crude	0.005332	0.000660	0.000708	0.000000	0.002631	0.001334
m.age	25.2894	24.7516	25.4391	0.0000	25.3664	25.3221

TABLE A4 *Continued.*

	migration from			south to		
age	total	north	berlin	s.west	south	middle
0	0.009326	0.001516	0.001331	0.002345	0.000000	0.004134
5	0.005742	0.000932	0.000816	0.001445	0.000000	0.002548
10	0.003727	0.000590	0.000539	0.000998	0.000000	0.001600
15	0.010144	0.001567	0.001612	0.002586	0.000000	0.004379
20	0.013973	0.002177	0.002129	0.003685	0.000000	0.005981
25	0.011764	0.001783	0.002472	0.002911	0.000000	0.004598
30	0.006179	0.000983	0.001139	0.001517	0.000000	0.002540
35	0.003400	0.000498	0.000610	0.000833	0.000000	0.001459
40	0.002590	0.000419	0.000346	0.000683	0.000000	0.001142
45	0.001708	0.000293	0.000249	0.000435	0.000000	0.000731
50	0.001238	0.000189	0.000149	0.000325	0.000000	0.000575
55	0.000974	0.000124	0.000181	0.000230	0.000000	0.000439
60	0.000934	0.000170	0.000118	0.000248	0.000000	0.000398
65	0.000868	0.000123	0.000085	0.000233	0.000000	0.000426
70	0.000989	0.000130	0.000125	0.000243	0.000000	0.000490
75	0.001368	0.000151	0.000186	0.000406	0.000000	0.000625
gross	0.374629	0.058229	0.060438	0.095623	0.000000	0.160339
crude	0.004934	0.000767	0.000793	0.001262	0.000000	0.002112
m.age	24.8730	24.3090	24.9460	25.0075	0.0000	24.9701

	migration from		middle to			
age	total	north	berlin	s.west	south	middle
0	0.012080	0.002662	0.003675	0.001296	0.004447	0.000000
5	0.007227	0.001593	0.002202	0.000780	0.002652	0.000000
10	0.005105	0.001126	0.001471	0.000595	0.001914	0.000000
15	0.019146	0.003697	0.006115	0.002464	0.006870	0.000000
20	0.013168	0.002500	0.004178	0.001684	0.004806	0.000000
25	0.015388	0.002988	0.005390	0.001674	0.005336	0.000000
30	0.008605	0.001705	0.002954	0.000859	0.003087	0.000000
35	0.004944	0.000967	0.001749	0.000471	0.001758	0.000000
40	0.003564	0.000695	0.001210	0.000384	0.001275	0.000000
45	0.002587	0.000449	0.000980	0.000248	0.000910	0.000000
50	0.002066	0.000354	0.000856	0.000205	0.000651	0.000000
55	0.001428	0.000216	0.000541	0.000130	0.000541	0.000000
60	0.001406	0.000165	0.000540	0.000175	0.000525	0.000000
65	0.001598	0.000232	0.000616	0.000130	0.000621	0.000000
70	0.001576	0.000266	0.000560	0.000178	0.000571	0.000000
75	0.002060	0.000346	0.000786	0.000284	0.000644	0.000000
gross	0.509735	0.099798	0.169117	0.057780	0.183039	0.000000
crude	0.007045	0.001387	0.002314	0.000808	0.002535	0.000000
m.age	25.5258	24.1173	26.7807	25.1007	25.2685	0.0000

TABLE A5 Probabilities of dying and migrating.

region north

age	death	migration from north to				
		north	berlin	s.west	south	middle
0	0.019633	0.908898	0.012213	0.008986	0.019360	0.030910
5	0.002304	0.964601	0.005607	0.004155	0.008905	0.014429
10	0.001253	0.975176	0.003128	0.003050	0.005458	0.011935
15	0.004379	0.957870	0.007071	0.004982	0.010807	0.014892
20	0.005176	0.876731	0.021496	0.015215	0.033830	0.047552
25	0.005067	0.918836	0.017334	0.008710	0.020201	0.029852
30	0.006901	0.949760	0.008916	0.005026	0.011946	0.017451
35	0.009249	0.967192	0.004367	0.002656	0.005871	0.010666
40	0.014948	0.969434	0.002613	0.001746	0.003877	0.007382
45	0.021018	0.966818	0.002104	0.001283	0.002937	0.005841
50	0.034519	0.956338	0.001548	0.000904	0.002106	0.004585
55	0.047921	0.945425	0.000787	0.000432	0.001652	0.003784
60	0.088337	0.904329	0.001609	0.000955	0.001675	0.003095
65	0.140899	0.850898	0.001494	0.000988	0.001644	0.004078
70	0.237969	0.756648	0.001005	0.000553	0.001346	0.002479
75	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000

region berlin
****

age	death	migration from berlin to				
		north	berlin	s.west	south	middle
0	0.017508	0.008187	0.923595	0.004373	0.010558	0.035777
5	0.001903	0.005167	0.961367	0.002645	0.006484	0.022434
10	0.001628	0.005266	0.961088	0.004374	0.008751	0.018894
15	0.003626	0.007099	0.952294	0.004581	0.012180	0.020220
20	0.004757	0.013708	0.906749	0.009082	0.024177	0.041528
25	0.004639	0.009483	0.938592	0.004622	0.013987	0.028677
30	0.006200	0.004717	0.952456	0.002964	0.010164	0.023500
35	0.008159	0.002941	0.965945	0.001633	0.005655	0.015667
40	0.013725	0.002297	0.966285	0.001348	0.004157	0.012189
45	0.022529	0.001470	0.962836	0.000395	0.002485	0.010284
50	0.036097	0.001090	0.950678	0.001191	0.002678	0.008265
55	0.056407	0.000486	0.935364	0.000366	0.002306	0.005071
60	0.097882	0.001430	0.893370	0.000242	0.001124	0.005952
65	0.156140	0.000922	0.837726	0.000265	0.000932	0.004015
70	0.251367	0.000662	0.743410	0.000443	0.001040	0.003078
75	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000

TABLE A5 *Continued.*

region s.west
****

age	death	migration from north	berlin	s.west to s.west	south	middle
0	0.019538	0.005249	0.005096	0.937472	0.021694	0.010952
5	0.001936	0.003399	0.003271	0.970501	0.013905	0.006987
10	0.001766	0.002266	0.001565	0.981191	0.009002	0.004210
15	0.003846	0.005522	0.005711	0.953449	0.020636	0.010837
20	0.004633	0.010291	0.010867	0.912789	0.039688	0.021733
25	0.003705	0.006931	0.010535	0.937950	0.027117	0.013762
30	0.006928	0.004145	0.004519	0.961267	0.015362	0.007780
35	0.008324	0.002163	0.002197	0.975928	0.007519	0.003870
40	0.013600	0.001373	0.001626	0.974048	0.006194	0.003160
45	0.017015	0.000913	0.001592	0.973549	0.004744	0.002188
50	0.029911	0.000798	0.000728	0.964153	0.002950	0.001460
55	0.045681	0.000500	0.000399	0.950516	0.001802	0.001101
60	0.084136	0.000666	0.000630	0.910964	0.002403	0.001201
65	0.142668	0.000455	0.000303	0.852896	0.002494	0.001184
70	0.235967	0.000394	0.000262	0.760478	0.001981	0.000918
75	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000

region south

age	death	migration from south to north	migration from south to berlin	migration from south to s.west	migration from south to south	migration from south to middle
0	0.016754	0.007192	0.006451	0.011120	0.938911	0.019573
5	0.001889	0.004579	0.004035	0.007052	0.970028	0.012418
10	0.001767	0.002918	0.002655	0.004914	0.979880	0.007867
15	0.003645	0.007715	0.008026	0.012459	0.947641	0.020514
20	0.005242	0.010176	0.010270	0.017230	0.928576	0.028507
25	0.004373	0.008553	0.012046	0.013827	0.939380	0.021820
30	0.005950	0.004783	0.005587	0.007350	0.964023	0.012307
35	0.007777	0.002446	0.003001	0.004078	0.975567	0.007132
40	0.013416	0.002052	0.001701	0.003335	0.973929	0.005567
45	0.020411	0.001427	0.001216	0.002120	0.971271	0.003555
50	0.031661	0.000911	0.000719	0.001570	0.962373	0.002766
55	0.045166	0.000589	0.000855	0.001095	0.950210	0.002085
60	0.082729	0.000774	0.000538	0.001136	0.913006	0.001818
65	0.134497	0.000533	0.000368	0.001007	0.861754	0.001841
70	0.223724	0.000509	0.000486	0.000947	0.772423	0.001910
75	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000

TABLE A5 *Continued.*

region middle

age	death	migration from middle to north	berlin	s.west	south	middle
0	0.018361	0.012385	0.017163	0.006256	0.021024	0.924811
5	0.002340	0.007741	0.010650	0.003844	0.012910	0.962515
10	0.002025	0.005519	0.007139	0.002953	0.009404	0.972960
15	0.004250	0.017494	0.028651	0.011776	0.032252	0.905577
20	0.005228	0.011625	0.019525	0.008160	0.022985	0.932477
25	0.004843	0.014033	0.025418	0.008091	0.025288	0.922328
30	0.007004	0.008188	0.014156	0.004204	0.014941	0.951506
35	0.009152	0.004701	0.008477	0.002319	0.008584	0.966767
40	0.014503	0.003383	0.005864	0.001883	0.006217	0.968151
45	0.020563	0.002176	0.004735	0.001212	0.004423	0.966891
50	0.033593	0.001696	0.004087	0.000991	0.003133	0.956499
55	0.048584	0.001025	0.002546	0.000618	0.002568	0.944661
60	0.088181	0.000752	0.002438	0.000799	0.002396	0.905434
65	0.139331	0.000996	0.002625	0.000559	0.002681	0.853808
70	0.237906	0.001028	0.002146	0.000688	0.002226	0.756006
75	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000

TABLE A6 Expected number of survivors at exact age x in each region.

age	initial region of cohort	north				
***	**********					
	total	north	berlin	s.west	south	middle
0	100000.	100000.	0.	0.	0.	0.
5	98037.	90890.	1221.	899.	1936.	3091.
10	97812.	87715.	1727.	1279.	2748.	4344.
15	97684.	85581.	1975.	1556.	3239.	5333.
20	97261.	82117.	2673.	2022.	4222.	6227.
25	96760.	72167.	4376.	3243.	6987.	9987.
30	96283.	66573.	5731.	3868.	8423.	11688.
35	95629.	63408.	6282.	4181.	9207.	12552.
40	94770.	61436.	6488.	4325.	9529.	12991.
45	93387.	59643.	6529.	4385.	9653.	13177.
50	91444.	57720.	6493.	4385.	9647.	13200.
55	88337.	55242.	6326.	4316.	9477.	12977.
60	84078.	52251.	6004.	4147.	9152.	12524.
65	76664.	47280.	5486.	3849.	8490.	11559.
70	65844.	40253.	4701.	3346.	7440.	10104.
75	50226.	30476.	3561.	2583.	5835.	7770.

TABLE A6 *Continued.*

age	initial region of cohort	berlin			
***	**********				
	total	north	berlin	s.west	south	middle
0	100000.	0.	100000.	0.	0.	0.
5	98249.	819.	92360.	437.	1056.	3578.
10	98060.	1301.	88840.	693.	1683.	5544.
15	97899.	1774.	85432.	1097.	2492.	7104.
20	97538.	2455.	81599.	1561.	3673.	8250.
25	97067.	3420.	74258.	2334.	5718.	11337.
30	96617.	4071.	70139.	2733.	6829.	12845.
35	96004.	4346.	67073.	2960.	7579.	14046.
40	95205.	4492.	64956.	3073.	7941.	14742.
45	93884.	4574.	62883.	3143.	8132.	15152.
50	91840.	4562.	60642.	3126.	8150.	15359.
55	88626.	4465.	57729.	3118.	8073.	15240.
60	83908.	4272.	54048.	3005.	7856.	14727.
65	76039.	3959.	48334.	2776.	7283.	13687.
70	64652.	3432.	40536.	2399.	6372.	11913.
75	48820.	2640.	30168.	1859.	5000.	9154.

age	initial region of cohort			s.west		
***	**********					
	total	north	berlin	s.west	south	middle
0	100000.	0.	0.	100000.	0.	0.
5	98046.	525.	510.	93747.	2169.	1095.
10	97856.	846.	820.	91005.	3430.	1755.
15	97683.	1055.	955.	89321.	4209.	2143.
20	97307.	1581.	1522.	85251.	5924.	3030.
25	96850.	2380.	2460.	77980.	9044.	4986.
30	96474.	2898.	3408.	73339.	10819.	6010.
35	95818.	3173.	3749.	70628.	11715.	6553.
40	95019.	3292.	3881.	69005.	12056.	6785.
45	93718.	3343.	3931.	67278.	12240.	6926.
50	92022.	3332.	3947.	65539.	12258.	6947.
55	89183.	3266.	3842.	63224.	12029.	6822.
60	85047.	3135.	3649.	60115.	11576.	6571.
65	77818.	2894.	3325.	54785.	10739.	6074.
70	66784.	2502.	2826.	46744.	9415.	5296.
75	51082.	1924.	2132.	35563.	7383.	4080.

TABLE A6 *Continued.*

age	initial region of cohort				south	
***	**********					
	total	north	berlin	s.west	south	middle
0	100000.	0.	0.	0.	100000.	0.
5	98325.	719.	645.	1112.	93891.	1957.
10	98138.	1146.	1027.	1754.	91128.	3082.
15	97964.	1410.	1258.	2185.	89355.	3756.
20	97603.	2126.	2045.	3254.	84873.	5305.
25	97095.	2851.	2911.	4527.	79184.	7623.
30	96667.	3463.	3977.	5441.	74797.	8989.
35	96073.	3762.	4388.	5847.	72406.	9670.
40	95302.	3886.	4567.	6041.	70811.	9997.
45	94004.	3965.	4612.	6152.	69098.	10176.
50	92093.	3967.	4591.	6155.	67210.	10169.
55	89136.	3882.	4465.	6059.	64752.	9977.
60	85012.	3724.	4263.	5840.	61582.	9604.
65	77833.	3433.	3875.	5402.	56272.	8852.
70	67172.	2966.	3296.	4673.	48539.	7697.
75	51844.	2281.	2495.	3608.	37527.	5934.

age	initial region of cohort	middle			
***	**********				
	total	north	berlin	s.west	south	middle
0	100000.	0.	0.	0.	0.	100000.
5	98164.	1238.	1716.	626.	2102.	92481.
10	97936.	1931.	2652.	987.	3264.	89101.
15	97741.	2401.	3202.	1265.	4079.	86795.
20	97331.	3879.	5593.	2306.	6756.	78797.
25	96826.	4486.	6787.	2974.	8442.	74136.
30	96365.	5319.	8466.	3576.	10072.	68932.
35	95708.	5720.	9159.	3854.	10944.	66032.
40	94859.	5904.	9473.	3989.	11358.	64135.
45	93504.	5991.	9571.	4067.	11547.	62328.
50	91576.	5962.	9543.	4071.	11552.	60447.
55	88507.	5829.	9340.	4020.	11357.	57962.
60	84189.	5583.	8900.	3875.	10978.	54852.
65	76753.	5114.	8102.	3594.	10184.	49760.
70	65952.	4416.	6930.	3110.	8934.	42562.
75	50301.	3395.	5253.	2409.	7015.	32229.

TABLE A7 Number of years lived in each region by a unit birth cohort.

age initial region of cohort north
*** **********

	total	north	berlin	s.west	south	middle
0	4.95092	4.77225	0.03053	0.02247	0.04840	0.07727
5	4.89623	4.46511	0.07372	0.05443	0.11709	0.18588
10	4.88740	4.33239	0.09255	0.07086	0.14966	0.24194
15	4.87363	4.19244	0.11621	0.08945	0.18652	0.28902
20	4.85052	3.85708	0.17624	0.13162	0.28022	0.40536
25	4.82606	3.46851	0.25267	0.17777	0.38523	0.54188
30	4.79779	3.24953	0.30031	0.20121	0.44074	0.60599
35	4.75997	3.12111	0.31924	0.21265	0.46841	0.63856
40	4.70394	3.02698	0.32542	0.21777	0.47957	0.65419
45	4.62079	2.93407	0.32555	0.21926	0.48250	0.65941
50	4.49454	2.82403	0.32048	0.21752	0.47809	0.65442
55	4.31038	2.68731	0.30825	0.21157	0.46572	0.63754
60	4.01854	2.48826	0.28723	0.19990	0.44105	0.60209
65	3.56270	2.18832	0.25466	0.17989	0.39825	0.54159
70	2.90174	1.76823	0.20655	0.14823	0.33187	0.44687
75	3.85365	2.29731	0.26448	0.20246	0.47657	0.61282

age	initial region of cohort berlin					
***	**********					
	total	north	berlin	s.west	south	middle
0	4.95623	0.02047	4.80899	0.01093	0.02640	0.08944
5	4.90774	0.05299	4.52998	0.02827	0.06846	0.22803
10	4.89897	0.07686	4.35680	0.04477	0.10436	0.31619
15	4.88590	0.10571	4.17577	0.06647	0.15411	0.38384
20	4.86512	0.14688	3.89642	0.09739	0.23476	0.48967
25	4.84210	0.18728	3.60993	0.12668	0.31367	0.60454
30	4.81553	0.21043	3.43030	0.14232	0.36019	0.67228
35	4.78022	0.22096	3.30073	0.15082	0.38800	0.71972
40	4.72721	0.22666	3.19597	0.15540	0.40183	0.74735
45	4.64310	0.22842	3.08812	0.15673	0.40706	0.76277
50	4.51165	0.22569	2.95928	0.15612	0.40558	0.76499
55	4.31335	0.21842	2.79443	0.15310	0.39823	0.74918
60	3.99868	0.20577	2.55955	0.14453	0.37849	0.71034
65	3.51727	0.18479	2.22174	0.12937	0.34137	0.64000
70	2.83679	0.15182	1.76759	0.10644	0.28428	0.52667
75	3.63144	0.20662	2.15550	0.14535	0.40700	0.71698

TABLE A7 *Continued.*

age	initial region of cohort			s.west		
***	**********					
	total	north	berlin	s.west	south	middle
0	4.95115	0.01312	0.01274	4.84368	0.05423	0.02738
5	4.89755	0.03427	0.03324	4.61880	0.13998	0.07126
10	4.88847	0.04753	0.04437	4.50815	0.19096	0.09746
15	4.87475	0.06590	0.06192	4.36429	0.25330	0.12934
20	4.85392	0.09901	0.09956	4.08077	0.37418	0.20040
25	4.83309	0.13193	0.14671	3.78299	0.49656	0.27490
30	4.80730	0.15176	0.17891	3.59918	0.56335	0.31409
35	4.77093	0.16163	0.19073	3.49083	0.59428	0.33345
40	4.71843	0.16587	0.19529	3.40709	0.60741	0.34276
45	4.64351	0.16686	0.19694	3.32044	0.61245	0.34681
50	4.53013	0.16494	0.19472	3.21907	0.60718	0.34423
55	4.35575	0.16002	0.18728	3.08347	0.59014	0.33484
60	4.07162	0.15073	0.17436	2.87251	0.55787	0.31614
65	3.61505	0.13492	0.15379	2.53823	0.50384	0.28427
70	2.94664	0.11066	0.12396	2.05767	0.41995	0.23440
75	3.93430	0.14935	0.15814	2.69822	0.60615	0.32245

age	initial region of cohort			south		
***	**********					
	total	north	berlin	s.west	south	middle
0	4.95812	0.01798	0.01613	0.02780	4.84728	0.04893
5	4.91156	0.04663	0.04181	0.07164	4.62549	0.12599
10	4.90255	0.06389	0.05713	0.09847	4.51208	0.17097
15	4.88919	0.08841	0.08257	0.13598	4.35570	0.22653
20	4.86746	0.12444	0.12389	0.19452	4.10142	0.32319
25	4.84405	0.15785	0.17218	0.24919	3.84952	0.41531
30	4.81849	0.18062	0.20912	0.28219	3.68008	0.46649
35	4.78437	0.19120	0.22388	0.29719	3.58042	0.49167
40	4.73265	0.19630	0.22949	0.30482	3.49773	0.50432
45	4.65241	0.19831	0.23009	0.30767	3.40772	0.50862
50	4.53072	0.19623	0.22641	0.30535	3.29907	0.50365
55	4.35371	0.19015	0.21820	0.29746	3.15834	0.48954
60	4.07113	0.17891	0.20344	0.28103	2.94635	0.46141
65	3.62513	0.15995	0.17928	0.25187	2.62029	0.41373
70	2.97541	0.13115	0.14479	0.20704	2.15165	0.34078
75	4.09421	0.17702	0.18522	0.28405	2.98134	0.46658

TABLE A7 *Continued.*

age	initial region of cohort					
***	**********			middle		
	total	north	berlin	s.west	south	middle
0	4.95410	0.03096	0.04291	0.01564	0.05256	4.81203
5	4.90250	0.07924	0.10922	0.04032	0.13416	4.53956
10	4.89194	0.10830	0.14635	0.05631	0.18358	4.39740
15	4.87681	0.15699	0.21985	0.08928	0.27087	4.13981
20	4.85392	0.20913	0.30950	0.13200	0.37996	3.82334
25	4.82977	0.24514	0.38133	0.16376	0.46285	3.57669
30	4.80182	0.27598	0.44062	0.18575	0.52538	3.37410
35	4.76418	0.29060	0.46580	0.19606	0.55753	3.25419
40	4.70907	0.29739	0.47610	0.20139	0.57262	3.16157
45	4.62699	0.29885	0.47786	0.20344	0.57747	3.06937
50	4.50208	0.29478	0.47209	0.20226	0.57271	2.96023
55	4.31740	0.28531	0.45601	0.19736	0.55838	2.82034
60	4.02355	0.26744	0.42505	0.18671	0.52905	2.61529
65	3.56763	0.23825	0.37581	0.16760	0.47794	2.30803
70	2.90632	0.19528	0.30459	0.13797	0.39872	1.86976
75	3.85969	0.26377	0.38982	0.19024	0.57197	2.44388

TABLE A8 Expectations of life by place of birth.

age initial region of cohort north
*** **********

	total	north	berlin	s.west	south	middle
0	71.30880	51.67293	3.65409	2.55706	5.62989	7.79483
5	67.68677	47.83992	3.69613	2.58535	5.69326	7.87211
10	62.83629	43.38468	3.62924	2.53563	5.58661	7.70013
15	57.91573	39.00668	3.53927	2.46643	5.44076	7.46259
20	53.15636	34.86557	3.43516	2.38518	5.27261	7.19784
25	48.41908	31.06014	3.27083	2.26152	5.01036	6.81623
30	43.64654	27.61158	3.02461	2.08809	4.63507	6.28720
35	38.92782	24.40227	2.73125	1.89195	4.20587	5.69648
40	34.25799	21.33010	2.41915	1.68471	3.74973	5.07431
45	29.72812	18.40454	2.10649	1.47646	3.29171	4.44892
50	25.30674	15.58706	1.79524	1.26807	2.83402	3.82235
55	21.10885	12.93838	1.49559	1.06643	2.39248	3.21597
60	17.05165	10.39767	1.20474	0.86883	1.95978	2.62064
65	13.45887	8.15750	0.94658	0.69210	1.57399	2.08870
70	10.25968	6.17449	0.71537	0.53262	1.22780	1.60940
75	7.67269	4.57399	0.52659	0.40310	0.94886	1.22014

TABLE A8 *Continued.*

age	initial region of cohort berlin					
***	**********					
	total	north	berlin	s.west	south	middle
0	71.13130	2.66977	52.85109	1.81468	4.67377	9.12198
5	67.35435	2.69652	48.89824	1.83589	4.73020	9.19350
10	62.47925	2.64767	44.37282	1.81060	4.66949	8.97866
15	57.57834	2.57353	39.99581	1.76786	4.57061	8.67053
20	52.78219	2.47468	35.86265	1.70626	4.42953	8.30908
25	48.02590	2.33536	32.02231	1.61420	4.20914	7.84489
30	43.23811	2.15241	28.43524	1.49061	3.90411	7.25575
35	38.49801	1.94695	25.04358	1.35187	3.55383	6.60178
40	33.80034	1.73121	21.78693	1.20481	3.17614	5.90125
45	29.24069	1.51414	18.68926	1.05623	2.79281	5.18824
50	24.83579	1.29912	15.74269	0.90908	2.41174	4.47316
55	20.64580	1.09158	12.97453	0.76590	2.04157	3.77221
60	16.66606	0.89264	10.37370	0.62651	1.68175	3.09146
65	13.13207	0.71441	8.08115	0.50127	1.35804	2.47720
70	10.00472	0.55441	6.06803	0.38945	1.06923	1.92361
75	7.43845	0.42323	4.41522	0.29772	0.83367	1.46862

age	initial region of cohort			s.west		
***	**********					
	total	north	berlin	s.west	south	middle
0	71.69262	1.90851	2.15267	56.48539	7.17186	3.97418
5	68.07144	1.93316	2.18258	52.67080	7.25946	4.02545
10	63.19901	1.90190	2.15285	48.05326	7.13053	3.96047
15	58.30634	1.85660	2.11124	43.52315	6.94765	3.86770
20	53.52199	1.79605	2.05577	39.20626	6.71418	3.74973
25	48.76288	1.70230	1.96267	35.17786	6.35953	3.56052
30	43.94323	1.57219	1.81825	31.39373	5.86961	3.28945
35	39.22681	1.42456	1.64397	27.85229	5.32184	2.98416
40	34.53560	1.26644	1.45706	24.41264	4.74115	2.65831
45	29.98035	1.10702	1.26891	21.11609	4.15885	2.32948
50	25.48676	0.94610	1.07828	17.89692	3.56993	1.99553
55	21.21856	0.79128	0.89427	14.85719	3.00276	1.67308
60	17.12891	0.64160	0.71755	11.95413	2.45489	1.36073
65	13.48791	0.50750	0.56014	9.37333	1.96605	1.08088
70	10.30328	0.38933	0.42240	7.12130	1.53644	0.83381
75	7.70199	0.29237	0.30958	5.28217	1.18662	0.63124

TABLE A8 *Continued.*

age	initial region of cohort				south	
***	**********					
	total	north	berlin	s.west	south	middle
0	72.01115	2.29905	2.54362	3.59626	57.61449	5.95773
5	68.19555	2.31994	2.57056	3.62927	53.66631	6.00948
10	63.32071	2.27685	2.53285	3.56318	49.05529	5.89254
15	58.42838	2.21566	2.47901	3.46897	44.53629	5.72845
20	53.63515	2.13327	2.40358	3.34247	40.23829	5.51753
25	48.90294	2.01628	2.28858	3.15964	36.22488	5.21356
30	44.10836	1.86190	2.12059	2.91585	32.40300	4.80702
35	39.36573	1.68542	1.91604	2.64017	28.77290	4.35119
40	34.66391	1.49843	1.69662	2.34968	25.24870	3.87047
45	30.10798	1.31030	1.47592	2.05786	21.87647	3.38743
50	25.68103	1.12216	1.25671	1.76648	18.63023	2.90545
55	21.44987	0.93922	1.04439	1.48251	15.54697	2.43677
60	17.36913	0.76111	0.83838	1.20452	12.58600	1.97913
65	13.74061	0.60144	0.65433	0.95455	9.96142	1.56887
70	10.52464	0.45878	0.49129	0.73108	7.64156	1.20194
75	7.89713	0.34144	0.35727	0.54788	5.75056	0.89997

age	initial region of cohort	middle				
***	**********					
	total	north	berlin	s.west	south	middle
0	71.38778	3.53741	5.49291	2.36610	6.82577	53.16559
5	67.67630	3.57203	5.55194	2.39442	6.89990	49.25800
10	62.82782	3.49943	5.45332	2.35882	6.77895	44.73729
15	57.94800	3.39560	5.31446	2.30591	6.60463	40.32740
20	53.18199	3.24863	5.11100	2.22391	6.35420	36.24424
25	48.44619	3.04958	4.81800	2.09918	5.99491	32.48451
30	43.66609	2.80979	4.44535	1.93929	5.54329	28.92837
35	38.94855	2.54072	4.01548	1.75852	5.03238	25.60146
40	34.27483	2.25711	3.56038	1.56758	4.48968	22.40008
45	29.73530	1.97177	3.10280	1.37491	3.94235	19.34347
50	25.30872	1.68694	2.64631	1.18170	3.39475	16.39902
55	21.09947	1.41237	2.20465	0.99415	2.86537	13.62294
60	17.05359	1.14593	1.77610	0.81071	2.34911	10.97174
65	13.46348	0.90850	1.39436	0.64599	1.88740	8.62724
70	10.25898	0.69604	1.05289	0.49766	1.47182	6.54058
75	7.67321	0.52439	0.77497	0.37821	1.13711	4.85853

TABLE A9 Expectations of life by place of residence.

age	region of residence at age x					north
***	**********					
	total	north	berlin	s.west	south	middle
0	71.30879	51.67293	3.65409	2.55706	5.62988	7.79483
5	67.67706	51.41149	3.06173	2.08911	4.63352	6.48120
10	62.82352	48.13290	2.78584	1.87215	4.17208	5.86056
15	57.89547	44.24594	2.63744	1.72508	3.90744	5.37956
20	53.13362	41.02422	2.35174	1.50925	3.43941	4.80900
25	48.37827	41.30771	1.43209	0.82172	1.91568	2.90107
30	43.60442	39.69043	0.72285	0.44697	1.04005	1.70411
35	38.88534	36.64328	0.38454	0.24698	0.56167	1.04887
40	34.22307	32.79650	0.23592	0.15262	0.35132	0.68671
45	29.70343	28.74975	0.15855	0.09847	0.23000	0.46665
50	25.28695	24.64968	0.10520	0.06442	0.15101	0.31664
55	21.10161	20.66042	0.07299	0.04481	0.10435	0.21903
60	17.03744	16.70848	0.06128	0.03831	0.07517	0.15420
65	13.44615	13.21142	0.04043	0.02550	0.05260	0.11620
70	10.24130	10.08818	0.02588	0.01511	0.03623	0.07590
75	7.65865	7.52857	0.02126	0.01249	0.02914	0.06719

age	region of residence at age x berlin					
***	**********					
	total	north	berlin	s.west	south	middle
0	71.13130	2.66977	52.85109	1.81468	4.67377	9.12198
5	67.32605	2.26636	51.76828	1.55981	4.09451	7.63709
10	62.43086	2.00759	48.61267	1.40243	3.72792	6.68025
15	57.50640	1.76430	45.36012	1.16627	3.27526	5.94046
20	52.67688	1.46987	42.40059	0.93753	2.70312	5.16578
25	47.84833	0.87216	41.34391	0.49266	1.57628	3.56331
30	43.01386	0.47263	38.82945	0.28279	0.96304	2.46594
35	38.23038	0.28888	35.61821	0.16042	0.55372	1.60915
40	33.50057	0.18633	31.77566	0.10059	0.34999	1.08800
45	28.91257	0.11609	27.79187	0.05746	0.21855	0.72860
50	24.50780	0.07790	23.76528	0.04729	0.15210	0.46522
55	20.31954	0.05471	19.86702	0.01974	0.09113	0.28693
60	16.37764	0.04820	16.06646	0.01318	0.04782	0.20198
65	12.87714	0.02855	12.68510	0.01022	0.03244	0.12082
70	9.79344	0.02010	9.65773	0.00805	0.02390	0.08368
75	7.23887	0.01801	7.12802	0.00471	0.01734	0.07080

TABLE A9 *Continued.*

age	region of residence at age x					
***	**********			s.west		
	total	north	berlin	s.west	south	middle
0	71.69262	1.90851	2.15267	56.48540	7.17186	3.97418
5	68.07903	1.64169	1.87702	54.97083	6.18105	3.40845
10	63.21087	1.46384	1.69224	51.50185	5.51653	3.03640
15	58.32079	1.35625	1.60781	47.40491	5.12028	2.83155
20	53.54435	1.11491	1.33810	44.52671	4.25088	2.31374
25	48.79602	0.65208	0.83150	43.45370	2.54007	1.31868
30	43.97799	0.35504	0.38458	41.13054	1.39658	0.71125
35	39.27243	0.19195	0.20893	37.67688	0.79481	0.39986
40	34.58363	0.11580	0.13329	33.54132	0.53093	0.26228
45	30.02764	0.07354	0.08438	29.36679	0.33882	0.16410
50	25.50465	0.04945	0.04285	25.09595	0.21092	0.10548
55	21.21361	0.03187	0.02715	20.93572	0.14539	0.07348
60	17.10899	0.02330	0.02056	16.89532	0.11515	0.05466
65	13.45026	0.01399	0.01190	13.30213	0.08336	0.03888
70	10.27157	0.00961	0.00951	10.16512	0.05945	0.02788
75	7.67104	0.00739	0.00911	7.57925	0.05093	0.02436

age	region of residence at age x				south	
***	**********					
	total	north	berlin	s.west	south	middle
0	72.01115	2.29905	2.54362	3.59626	57.61449	5.95773
5	68.21788	1.93802	2.18992	3.08029	55.94118	5.06847
10	63.35617	1.70577	1.96327	2.74468	52.44969	4.49276
15	58.47311	1.57039	1.82485	2.52887	48.39011	4.15890
20	53.70369	1.23784	1.44318	2.00560	45.74434	3.27273
25	49.01258	0.79173	0.96826	1.26943	43.90930	2.07386
30	44.25459	0.43054	0.45823	0.69199	41.50629	1.16755
35	39.52396	0.24393	0.24077	0.40628	37.93929	0.69369
40	34.82455	0.15861	0.13644	0.26397	33.81877	0.44675
45	30.27141	0.09568	0.08455	0.16104	29.65314	0.27699
50	25.85526	0.05805	0.05306	0.10517	25.45461	0.18436
55	21.62247	0.03813	0.03788	0.07088	21.35124	0.12434
60	17.52982	0.02805	0.02286	0.05213	17.33855	0.08823
65	13.88770	0.01731	0.01590	0.03736	13.75209	0.06504
70	10.65926	0.01223	0.01312	0.02850	10.55698	0.04843
75	8.01275	0.00915	0.01079	0.02449	7.93060	0.03772

TABLE A9 *Continued.*

age	region of residence at age x					middle
***	**********					
	total	north	berlin	s.west	south	middle
0	71.38778	3.53741	5.49291	2.36610	6.82577	53.16559
5	67.66775	3.00582	4.82886	2.04274	5.87232	51.91801
10	62.81614	2.66472	4.39587	1.83923	5.26715	48.64917
15	57.93563	2.44138	4.12939	1.69612	4.85991	44.80883
20	53.16489	1.75007	3.02513	1.13119	3.44118	43.81733
25	48.42649	1.28718	2.27716	0.75911	2.46727	41.63577
30	43.64878	0.72573	1.30302	0.40674	1.41390	39.79939
35	38.93938	0.41689	0.79432	0.23906	0.83437	36.65474
40	34.27740	0.25628	0.51840	0.15686	0.53451	32.81136
45	29.74630	0.15406	0.35072	0.09832	0.34283	28.80036
50	25.31968	0.09752	0.23358	0.06625	0.22533	24.69700
55	21.11456	0.06048	0.14836	0.04459	0.15672	20.70440
60	17.06569	0.04297	0.10687	0.03431	0.11169	16.76985
65	13.47487	0.03428	0.07706	0.02380	0.08013	13.25960
70	10.25168	0.02536	0.05280	0.01944	0.05270	10.10137
75	7.67179	0.01982	0.04244	0.01644	0.03886	7.55422

TABLE A10 Survivorship proportions.

region north
****

	total	north	berlin	s.west	south	middle
0	0.98892	0.93535	0.00912	0.00672	0.01444	0.02329
5	0.99821	0.96978	0.00437	0.00362	0.00722	0.01322
10	0.99719	0.96668	0.00514	0.00402	0.00814	0.01321
15	0.99522	0.91818	0.01402	0.00994	0.02203	0.03105
20	0.99489	0.89637	0.01983	0.01222	0.02748	0.03899
25	0.99402	0.93355	0.01323	0.00693	0.01625	0.02406
30	0.99193	0.95822	0.00669	0.00387	0.00897	0.01418
35	0.98792	0.96829	0.00350	0.00220	0.00488	0.00905
40	0.98204	0.96814	0.00236	0.00151	0.00341	0.00662
45	0.97231	0.96167	0.00182	0.00109	0.00252	0.00521
50	0.95889	0.95100	0.00117	0.00067	0.00188	0.00418
55	0.93237	0.92545	0.00118	0.00068	0.00165	0.00341
60	0.88659	0.87896	0.00153	0.00096	0.00164	0.00352
65	0.81425	0.80757	0.00123	0.00076	0.00146	0.00323
70	1.32487	1.29713	0.00461	0.00270	0.00641	0.01402

TABLE A10 *Continued.*

region berlin
****

	total	north	berlin	s.west	south	middle
0	0.99023	0.00680	0.94164	0.00354	0.00858	0.02967
5	0.99824	0.00521	0.96120	0.00349	0.00758	0.02075
10	0.99737	0.00621	0.95690	0.00451	0.01049	0.01926
15	0.99581	0.01016	0.93007	0.00674	0.01799	0.03085
20	0.99531	0.01186	0.92195	0.00697	0.01935	0.03518
25	0.99458	0.00719	0.94517	0.00378	0.01211	0.02632
30	0.99282	0.00384	0.95899	0.00230	0.00794	0.01975
35	0.98907	0.00262	0.96610	0.00149	0.00490	0.01396
40	0.98192	0.00188	0.96459	0.00088	0.00333	0.01125
45	0.97077	0.00128	0.95687	0.00078	0.00257	0.00927
50	0.95395	0.00079	0.94321	0.00078	0.00249	0.00668
55	0.92346	0.00094	0.91507	0.00030	0.00171	0.00544
60	0.87450	0.00117	0.86712	0.00025	0.00102	0.00495
65	0.80028	0.00078	0.79473	0.00034	0.00096	0.00347
70	1.23995	0.00373	1.21580	0.00125	0.00404	0.01512

region s.west
****

	total	north	berlin	s.west	south	middle
0	0.98915	0.00440	0.00422	0.95341	0.01806	0.00906
5	0.99815	0.00284	0.00242	0.97576	0.01152	0.00562
10	0.99719	0.00389	0.00365	0.96748	0.01472	0.00745
15	0.99576	0.00774	0.00817	0.93364	0.02985	0.01635
20	0.99582	0.00879	0.01084	0.92472	0.03375	0.01772
25	0.99471	0.00558	0.00756	0.94916	0.02154	0.01087
30	0.99237	0.00317	0.00337	0.96843	0.01154	0.00586
35	0.98905	0.00177	0.00191	0.97500	0.00686	0.00351
40	0.98469	0.00114	0.00161	0.97380	0.00547	0.00267
45	0.97659	0.00085	0.00116	0.96891	0.00385	0.00182
50	0.96233	0.00065	0.00056	0.95746	0.00238	0.00128
55	0.93554	0.00058	0.00051	0.93124	0.00208	0.00114
60	0.88789	0.00056	0.00046	0.88328	0.00241	0.00118
65	0.81427	0.00041	0.00028	0.81036	0.00219	0.00103
70	1.32905	0.00166	0.00182	1.30962	0.01082	0.00512

TABLE A10 *Continued.*

region south
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	total	north	berlin	s.west	south	middle
0	0.99064	0.00600	0.00529	0.00922	0.95388	0.01624
5	0.99817	0.00376	0.00334	0.00602	0.97486	0.01020
10	0.99729	0.00531	0.00536	0.00863	0.96399	0.01400
15	0.99557	0.00875	0.00902	0.01466	0.93845	0.02469
20	0.99518	0.00950	0.01124	0.01568	0.93367	0.02509
25	0.99483	0.00674	0.00886	0.01074	0.95118	0.01732
30	0.99314	0.00364	0.00431	0.00576	0.96964	0.00979
35	0.98942	0.00225	0.00235	0.00371	0.97475	0.00636
40	0.98311	0.00174	0.00146	0.00273	0.97261	0.00457
45	0.97402	0.00117	0.00097	0.00184	0.96688	0.00316
50	0.96169	0.00075	0.00078	0.00133	0.95641	0.00242
55	0.93648	0.00067	0.00069	0.00110	0.93208	0.00193
60	0.89250	0.00065	0.00045	0.00106	0.88855	0.00180
65	0.82410	0.00051	0.00041	0.00095	0.82040	0.00182
70	1.40054	0.00209	0.00234	0.00519	1.38248	0.00844

region middle
****

	total	north	berlin	s.west	south	middle
0	0.98957	0.01031	0.01417	0.00510	0.01723	0.94276
5	0.99782	0.00667	0.00892	0.00341	0.01122	0.96760
10	0.99686	0.01142	0.01775	0.00730	0.02062	0.93977
15	0.99526	0.01442	0.02407	0.01006	0.02794	0.91877
20	0.99497	0.01288	0.02253	0.00812	0.02404	0.92740
25	0.99409	0.01128	0.02002	0.00621	0.02041	0.93616
30	0.99193	0.00651	0.01142	0.00328	0.01185	0.95888
35	0.98818	0.00405	0.00719	0.00210	0.00741	0.96743
40	0.98248	0.00278	0.00530	0.00155	0.00533	0.96752
45	0.97299	0.00193	0.00440	0.00110	0.00378	0.96178
50	0.95904	0.00136	0.00332	0.00080	0.00285	0.95071
55	0.93211	0.00088	0.00247	0.00070	0.00246	0.92561
60	0.88742	0.00086	0.00249	0.00067	0.00250	0.88090
65	0.81508	0.00098	0.00233	0.00060	0.00240	0.80876
70	1.32717	0.00442	0.00931	0.00351	0.00897	1.30095

TABLE A11 Multiregional population projection (extrapolation).

year 1975

population

age	total	north	berlin	s.west	south	middle
0	958065.	130449.	62653.	147410.	384605.	232948.
5	1208179.	164503.	79009.	185894.	485010.	293763.
10	1424851.	204645.	92259.	212098.	554272.	361577.
15	1329414.	189898.	73156.	203787.	535508.	327065.
20	1320248.	188590.	72651.	202382.	531815.	324810.
25	964292.	116643.	66688.	153362.	407753.	219846.
30	1095315.	124046.	90215.	158742.	466059.	256253.
35	1328627.	168270.	100196.	197410.	537937.	324814.
40	1067476.	140364.	76735.	153749.	436268.	260360.
45	990012.	117915.	62934.	149926.	429621.	229616.
50	875372.	96209.	48528.	139022.	396536.	195077.
55	621547.	66299.	38995.	95091.	282475.	138687.
60	896141.	95490.	56860.	137037.	406848.	199906.
65	968333.	100051.	64747.	141890.	445774.	215871.
70	818135.	84113.	52249.	118205.	383328.	180240.
75	954242.	97898.	60299.	133800.	451037.	211208.
total	16820250.	2085383.	1098174.	2529805.	7134846.	3972041.

percentage distribution

age	total	north	berlin	s.west	south	middle
0	5.6959	6.2554	5.7052	5.8269	5.3905	5.8647
5	7.1829	7.8884	7.1946	7.3482	6.7978	7.3958
10	8.4710	9.8133	8.4011	8.3840	7.7685	9.1031
15	7.9037	9.1061	6.6616	8.0554	7.5055	8.2342
20	7.8492	9.0434	6.6156	7.9999	7.4538	8.1774
25	5.7329	5.5934	6.0726	6.0622	5.7150	5.5348
30	6.5119	5.9484	8.2150	6.2749	6.5322	6.4514
35	7.8990	8.0690	9.1239	7.8034	7.5396	8.1775
40	6.3464	6.7308	6.9875	6.0775	6.1146	6.5548
45	5.8858	5.6544	5.7308	5.9264	6.0214	5.7808
50	5.2043	4.6135	4.4190	5.4954	5.5577	4.9113
55	3.6952	3.1792	3.5509	3.7588	3.9591	3.4916
60	5.3278	4.5790	5.1777	5.4169	5.7023	5.0328
65	5.7569	4.7977	5.8959	5.6087	6.2478	5.4348
70	4.8640	4.0335	4.7578	4.6725	5.3726	4.5377
75	5.6732	4.6945	5.4908	5.2889	6.3216	5.3174
total	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
m.ag	37.0331	34.5597	37.1221	36.6895	38.3569	36.1480
sha	100.0000	12.3981	6.5289	15.0402	42.4182	23.6146

TABLE A11 *Continued.*

year 1980

population

age	total	north	berlin	s.west	south	middle
0	946381.	133580.	64206.	147152.	376461.	224981.
5	948378.	127798.	66145.	146377.	375967.	232091.
10	1205875.	164256.	81350.	186179.	480039.	294052.
15	1420804.	206295.	99499.	213865.	547523.	353623.
20	1323409.	186082.	85071.	203784.	523268.	325204.
25	1313902.	180923.	86209.	200933.	517767.	328070.
30	959013.	115454.	73747.	152370.	398341.	219101.
35	1087190.	123078.	92814.	157943.	458607.	254747.
40	1313805.	166072.	101365.	195671.	529427.	321269.
45	1049287.	137697.	76612.	151596.	427281.	256101.
50	964033.	114549.	62034.	146488.	417297.	223665.
55	840763.	92187.	46920.	133895.	380437.	187326.
60	580592.	61760.	36346.	89018.	264005.	129462.
65	796571.	84509.	50194.	121712.	362547.	177610.
70	792132.	81346.	52305.	115634.	366753.	176094.
75	1109402.	111097.	66704.	157720.	533589.	240292.
total	16651537.	2086684.	1141521.	2520338.	6959307.	3943688.

percentage distribution

age	total	north	berlin	s.west	south	middle
0	5.6834	6.4016	5.6246	5.8386	5.4095	5.7048
5	5.6954	6.1245	5.7945	5.8078	5.4024	5.8851
10	7.2418	7.8716	7.1265	7.3871	6.8978	7.4563
15	8.5326	9.8863	8.7163	8.4856	7.8675	8.9668
20	7.9477	8.9176	7.4524	8.0856	7.5190	8.2462
25	7.8906	8.6703	7.5521	7.9725	7.4399	8.3189
30	5.7593	5.5329	6.4604	6.0456	5.7239	5.5557
35	6.5291	5.8983	8.1307	6.2668	6.5898	6.4596
40	7.8900	7.9587	8.8798	7.7637	7.6075	8.1464
45	6.3014	6.5988	6.7114	6.0149	6.1397	6.4939
50	5.7895	5.4895	5.4343	5.8122	5.9962	5.6715
55	5.0492	4.4179	4.1103	5.3126	5.4666	4.7500
60	3.4867	2.9597	3.1840	3.5320	3.7935	3.2828
65	4.7838	4.0499	4.3971	4.8292	5.2095	4.5036
70	4.7571	3.8983	4.5821	4.5881	5.2700	4.4652
75	6.6625	5.3241	5.8434	6.2579	7.6673	6.0931
total	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
m.ag	37.5557	35.2094	36.8806	37.2227	38.9397	36.7630
sha	100.0000	12.5315	6.8553	15.1358	41.7938	23.6836
lam	0.989970	1.000624	1.039472	0.996258	0.975397	0.992862
r	-0.002016	0.000125	0.007743	-0.000750	-0.004982	-0.001433

TABLE A11 *Continued.*

year 1985

population

age	total	north	berlin	s.west	south	middle
0	1011323.	141448.	72384.	160861.	398486.	238144.
5	936806.	130606.	67479.	146042.	368115.	224565.
10	946570.	127659.	67816.	146575.	372228.	232291.
15	1202456.	165918.	87162.	187443.	473746.	288188.
20	1414389.	201972.	110632.	213976.	536421.	351388.
25	1317051.	178758.	97538.	202155.	510015.	328585.
30	1306671.	177831.	96549.	199895.	507498.	324898.
35	951888.	114274.	76226.	151189.	392223.	217975.
40	1075094.	121762.	93309.	156639.	451054.	252330.
45	1291427.	163012.	100956.	192829.	518612.	316017.
50	1021667.	133640.	75274.	148164.	415226.	249363.
55	925801.	109698.	59795.	141117.	400460.	214731.
60	785425.	85857.	43836.	125316.	355569.	174847.
65	516091.	54658.	32093.	79062.	235256.	115022.
70	651627.	68694.	40591.	99164.	298301.	144876.
75	1073672.	107450.	66677.	154246.	510592.	234707.
total	16427958.	2083237.	1188318.	2504673.	6743803.	3907928.

percentage distribution

age	total	north	berlin	s.west	south	middle
0	6.1561	6.7898	6.0913	6.4224	5.9089	6.0939
5	5.7025	6.2694	5.6785	5.8308	5.4586	5.7464
10	5.7619	6.1279	5.7069	5.8521	5.5196	5.9441
15	7.3196	7.9644	7.3349	7.4837	7.0249	7.3744
20	8.6096	9.6951	9.3099	8.5431	7.9543	8.9917
25	8.0171	8.5808	8.2081	8.0711	7.5627	8.4082
30	7.9539	8.5363	8.1249	7.9809	7.5254	8.3138
35	5.7943	5.4854	6.4146	6.0363	5.8161	5.5778
40	6.5443	5.8448	7.8522	6.2539	6.6884	6.4569
45	7.8612	7.8249	8.4957	7.6988	7.6902	8.0866
50	6.2191	6.4150	6.3345	5.9155	6.1572	6.3810
55	5.6355	5.2657	5.0319	5.6341	5.9382	5.4948
60	4.7810	4.1213	3.6889	5.0033	5.2725	4.4742
65	3.1415	2.6237	2.7007	3.1566	3.4885	2.9433
70	3.9666	3.2975	3.4159	3.9592	4.4233	3.7072
75	6.5356	5.1579	5.6111	6.1583	7.5713	6.0059
total	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
m.ag	37.5529	35.5036	36.5184	37.1991	38.8398	36.9661
sha	100.0000	12.6810	7.2335	15.2464	41.0508	23.7883
lam	0.986573	0.998348	1.040995	0.993785	0.969034	0.990932
r	-0.002704	-0.000331	0.008035	-0.001247	-0.006291	-0.001822

TABLE A11 *Continued.*

year 1990

population

age	total	north	berlin	s.west	south	middle
0	1020728.	136429.	82384.	166922.	403800.	231193.
5	1001089.	138349.	75613.	159464.	389783.	237882.
10	935021.	130308.	69016.	146190.	364515.	224992.
15	943885.	129026.	72203.	147537.	367521.	227598.
20	1197035.	162979.	96134.	187084.	463457.	287381.
25	1407591.	193856.	122267.	212371.	524200.	354897.
30	1309802.	175852.	107179.	201002.	500264.	325506.
35	1296914.	175368.	100349.	198484.	500609.	322104.
40	941291.	112883.	76820.	149686.	385903.	215999.
45	1056786.	119725.	92539.	154425.	441627.	248470.
50	1257438.	158274.	99014.	188396.	504044.	307710.
55	981004.	127898.	72390.	142762.	398625.	239328.
60	864696.	102116.	55723.	132099.	374366.	200391.
65	698230.	75965.	38795.	111276.	316864.	155331.
70	422193.	44430.	25959.	64415.	193566.	93823.
75	883195.	90688.	51896.	132161.	415371.	193079.
total	16216899.	2074146.	1238282.	2494274.	6544515.	3865682.

percentage distribution

age	total	north	berlin	s.west	south	middle
0	6.2942	6.5776	6.6531	6.6922	6.1701	5.9807
5	6.1731	6.6702	6.1063	6.3932	5.9559	6.1537
10	5.7657	6.2825	5.5735	5.8610	5.5698	5.8202
15	5.8204	6.2207	5.8309	5.9150	5.6157	5.8877
20	7.3814	7.8577	7.7635	7.5005	7.0816	7.4342
25	8.6798	9.3463	9.8739	8.5144	8.0098	9.1807
30	8.0768	8.4783	8.6555	8.0585	7.6440	8.4204
35	7.9973	8.4550	8.1039	7.9576	7.6493	8.3324
40	5.8044	5.4424	6.2037	6.0012	5.8966	5.5876
45	6.5166	5.7723	7.4732	6.1912	6.7480	6.4276
50	7.7539	7.6308	7.9961	7.5531	7.7018	7.9600
55	6.0493	6.1663	5.8460	5.7236	6.0910	6.1911
60	5.3321	4.9233	4.5001	5.2961	5.7203	5.1838
65	4.3056	3.6625	3.1330	4.4612	4.8417	4.0182
70	2.6034	2.1421	2.0964	2.5825	2.9577	2.4271
75	5.4461	4.3723	4.1910	5.2986	6.3469	4.9947
total	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
m.ag	37.4897	35.9003	36.0964	37.0946	38.5923	37.1770
sha	100.0000	12.7900	7.6358	15.3807	40.3561	23.8374
lam	0.987152	0.995636	1.042047	0.995846	0.970449	0.989190
r	-0.002586	-0.000875	0.008237	-0.000832	-0.005999	-0.002174

TABLE A11 *Continued.*

year 1995

population

age	total	north	berlin	s.west	south	middle
0	959331.	120508.	85929.	162106.	385380.	205407.
5	1010409.	133708.	84938.	165258.	394855.	231650.
10	999183.	138068.	77091.	159519.	386060.	238445.
15	932371.	131468.	73193.	147061.	359964.	220686.
20	939631.	126841.	78962.	147192.	359804.	226831.
25	1191291.	156979.	105574.	185262.	452277.	291199.
30	1399835.	190574.	131481.	211213.	515058.	351509.
35	1300021.	173494.	110509.	199533.	493681.	322804.
40	1282420.	172853.	101432.	196590.	493065.	318480.
45	925284.	110876.	76314.	147392.	377944.	212759.
50	1028966.	116382.	90465.	150915.	429075.	242129.
55	1207361.	151516.	95097.	181483.	483938.	295327.
60	916044.	118993.	67331.	133662.	372771.	223287.
65	768508.	90308.	49203.	117322.	333684.	177990.
70	571243.	61737.	31448.	90639.	260722.	126697.
75	572279.	58656.	33211.	85846.	269529.	125037.
total	16004176.	2052961.	1292179.	2480994.	6367808.	3810235.

percentage distribution

age	total	north	berlin	s.west	south	middle
0	5.9943	5.8700	6.6500	6.5339	6.0520	5.3909
5	6.3134	6.5130	6.5733	6.6610	6.2008	6.0797
10	6.2433	6.7253	5.9660	6.4296	6.0627	6.2580
15	5.8258	6.4038	5.6643	5.9275	5.6529	5.7919
20	5.8712	6.1785	6.1108	5.9328	5.6504	5.9532
25	7.4436	7.6465	8.1703	7.4672	7.1026	7.6425
30	8.7467	9.2829	10.1752	8.5133	8.0885	9.2254
35	8.1230	8.4509	8.5522	8.0425	7.7528	8.4720
40	8.0130	8.4197	7.8497	7.9238	7.7431	8.3585
45	5.7815	5.4008	5.9058	5.9409	5.9352	5.5839
50	6.4294	5.6690	7.0010	6.0829	6.7382	6.3547
55	7.5440	7.3804	7.3594	7.3149	7.5998	7.7509
60	5.7238	5.7962	5.2106	5.3874	5.8540	5.8602
65	4.8019	4.3989	3.8077	4.7288	5.2402	4.6714
70	3.5693	3.0072	2.4337	3.6534	4.0944	3.3252
75	3.5758	2.8572	2.5701	3.4602	4.2327	3.2816
total	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
m.ag	37.7228	36.6256	36.1637	37.1536	38.5861	37.7705
sha	100.0000	12.8277	8.0740	15.5022	39.7884	23.8078
lam	0.986883	0.989786	1.043525	0.994676	0.972999	0.985656
r	-0.002641	-0.002053	0.008521	-0.001068	-0.005474	-0.002889

TABLE A11 *Continued.*

year 2000

population

age	total	north	berlin	s.west	south	middle
0	853854.	108011.	79748.	144766.	338923.	182407.
5	949647.	118444.	87648.	160270.	376553.	206732.
10	1008488.	133611.	86010.	165198.	391038.	232631.
15	996352.	139339.	81363.	160308.	381354.	233987.
20	928169.	128924.	79678.	146598.	352577.	220391.
25	935123.	122267.	86064.	145695.	351373.	229724.
30	1184738.	154672.	113099.	183996.	443961.	289010.
35	1389372.	187949.	134308.	209705.	508778.	348631.
40	1285492.	171054.	111232.	197600.	486365.	319242.
45	1260568.	169507.	100971.	193631.	483259.	313201.
50	900966.	107701.	74697.	143922.	367274.	207372.
55	987974.	111500.	86687.	145409.	411861.	232516.
60	1127349.	141001.	88353.	169877.	452586.	275533.
65	813904.	105175.	59350.	118736.	332368.	198275.
70	628506.	73361.	39799.	95583.	274620.	145142.
75	774553.	81455.	40475.	120708.	363083.	168832.
total	16025057.	2053972.	1349484.	2502002.	6315973.	3803626.

percentage distribution

age	total	north	berlin	s.west	south	middle
0	5.3282	5.2586	5.9095	5.7860	5.3661	4.7956
5	5.9260	5.7666	6.4950	6.4057	5.9619	5.4351
10	6.2932	6.5050	6.3736	6.6026	6.1913	6.1160
15	6.2175	6.7839	6.0292	6.4072	6.0379	6.1517
20	5.7920	6.2768	5.9044	5.8592	5.5823	5.7942
25	5.8354	5.9527	6.3776	5.8232	5.5632	6.0396
30	7.3930	7.5304	8.3809	7.3539	7.0292	7.5983
35	8.6700	9.1505	9.9526	8.3815	8.0554	9.1658
40	8.0218	8.3280	8.2426	7.8977	7.7005	8.3931
45	7.8662	8.2526	7.4822	7.7390	7.6514	8.2343
50	5.6222	5.2436	5.5352	5.7523	5.8150	5.4519
55	6.1652	5.4285	6.4237	5.8117	6.5209	6.1130
60	7.0349	6.8648	6.5472	6.7896	7.1657	7.2440
65	5.0789	5.1206	4.3980	4.7456	5.2623	5.2128
70	3.9220	3.5717	2.9492	3.8203	4.3480	3.8159
75	4.8334	3.9657	2.9993	4.8245	5.7486	4.4387
total	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
m.ag	39.0711	38.2358	37.2050	38.3742	39.8508	39.3480
sha	100.0000	12.8173	8.4211	15.6131	39.4131	23.7355
lam	1.001305	1.000493	1.044347	1.008468	0.991860	0.998265
r	0.000261	0.000099	0.008678	0.001686	-0.001635	-0.000347

Appendix B

MODEL MIGRATION SCHEDULES

Among the various analytical and practical applications of the model migration schedule concept described in Rogers *et al.* (1977) is the interpolation of the observed age-specific migration rates. For a given set of 5-year age groups, say, the model migration schedule is computed by fitting the following expression, described in Rogers *et al.* (1977), to the observed data:

$$M(x) = a_1 e^{-\alpha_1 x} + a_2 e^{-\alpha_2(x-\mu_2)-e^{-\lambda_2(x-\mu_2)}} + c$$

The expression is then used to obtain the desired migration at some specific age x.

The problem with the GDR data is slightly different. Here one must find the number of migrants $k_{ij}(x)$ for the common 5-year age groups, since the original source uses the age groups <1, 1–3, 3–6, 6–10, 15–18, 18–21, and 21–25. In order to distribute the original number of migrants among the conventional age groups in such a way that the absolute number of migrants in the other correct age groups does not change, it is necessary to employ the following interpolation procedure.

First, the original migrants and the population in the age groups were aggregated into four compact age groups, 0–6, 6–10, 15–21, and 21–25, and their corresponding migration rates were estimated. A model migration schedule was then fitted to these rates, scaled to a GMR = 1, by assuming 5-year age groups. The parameters obtained for each out-migration flow from each region are presented in Table B1. Single-year age groups of migration rates were computed with the parameters and were then aggregated to 5-year age groups. Thus,

$$\hat{M}(0\text{–}5) = \sum_{x=0}^{4} \hat{M}(x + 0.5)$$

$$\hat{M}(5\text{–}10) = \sum_{x=5}^{9} \hat{M}(x + 0.5)$$

and so forth for the other two age groups.

TABLE B1 Model migration schedule parameters for the German Democratic Republic. GMR = 1.0.

	Region									
Parameter	1	2	3	4	5	6	7	8	9	10
a_1	0.029	0.031	0.026	0.024	0.025	0.028	0.025	0.023	0.022	0.022
α_1	0.151	0.128	0.060	0.052	0.051	0.060	0.057	0.063	0.062	0.063
a_2	0.093	0.083	0.092	0.078	0.079	0.077	0.092	0.086	0.083	0.087
μ_2	19.37	19.34	19.31	19.26	19.37	16.99	16.87	16.19	15.84	15.54
α_2	0.160	0.153	0.231	0.199	0.210	0.163	0.171	0.158	0.157	0.155
λ_2	7.644	8.082	12.273	26.877	26.877	0.755	0.487	0.739	0.133	1.282
c	0.003	0.003	0.002	0.002	0.002	0.001	0.001	0.002	0.002	0.002

NOTE: Region 1 refers to Berlin, 2 to Rostock, 3 to Schwerin and Neubrandenburg, 4 to Magdeburg and Potsdam, 5 to Frankfurt, 6 to Cottbus, 7 to Halle and Leipzig, 8 to Dresden, 9 to Karl-Marx-Stadt, and 10 to Erfurt, Gera, and Suhl.

From these estimated 5-year age groups, weights, W, which help to obtain the desired number of migrants, k_{ij}, in each 5-year age group were computed. So,

$$W_0 = \hat{M}(0\text{–}5)/[\hat{M}(0\text{–}5) + \hat{M}(5\text{–}10)]$$

$$W_5 = \hat{M}(5\text{–}10)/[\hat{M}(0\text{–}5) + \hat{M}(5\text{–}10)]$$

$$W_{15} = \hat{M}(15\text{–}20)/[\hat{M}(15\text{–}20) + \hat{M}(20\text{–}25)]$$

$$W_{20} = \hat{M}(20\text{–}25)/[\hat{M}(15\text{–}20) + \hat{M}(20\text{–}25)]$$

and finally

$$\hat{k}_{ij}(0\text{–}5) = W_0 k_{ij}(0\text{–}10)$$

$$\hat{k}_{ij}(5\text{–}10) = W_5 k_{ij}(0\text{–}10)$$

$$\hat{k}_{ij}(15\text{–}20) = W_{15} k_{ij}(15\text{–}25)$$

$$\hat{k}_{ij}(20\text{–}25) = W_{20} k_{ij}(15\text{–}25)$$

where

$$k_{ij}(0\text{–}10) = k_{ij}(0\text{–}3) + k_{ij}(3\text{–}6) + k_{ij}(6\text{–}10)$$

and

$$k_{ij}(15\text{–}25) = k_{ij}(15\text{–}18) + k_{ij}(18\text{–}21) + k_{ij}(21\text{–}25)$$

Appendix C

DEMOGRAPHIC DATA FOR THE GDR (15 REGIONS, 1975)

*Region (District) No.**	*Name*
1	Rostock
2	Schwerin
3	Neubrandenburg
4	Potsdam
5	Frankfurt
6	Cottbus
7	Magdeburg
8	Halle
9	Erfurt
10	Gera
11	Suhl
12	Dresden
13	Leipzig
14	Karl-Marx-Stadt
15	Berlin

*In the computer printouts in Appendix C, *region* refers to a district rather than to a group of districts.

Appendix C *Continued.*

region 1

age	population	births	deaths	migration from region 1 to : 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0	55635.	0.	233.	0.	158.	156.	74.	79.	52.	67.	68.	43.	28.	10.	58.	40.	53.	139.
5	70159.	0.	34.	0.	85.	84.	40.	42.	28.	36.	36.	23.	15.	5.	31.	22.	28.	74.
10	85463.	1.	24.	0.	101.	58.	46.	58.	27.	42.	30.	31.	7.	3.	11.	21.	19.	67.
15	77520.	1804.	59.	0.	91.	85.	56.	50.	35.	49.	49.	27.	15.	11.	35.	34.	44.	91.
20	76986.	5686.	79.	0.	323.	301.	199.	175.	122.	171.	171.	94.	54.	40.	123.	118.	155.	323.
25	50030.	2100.	46.	0.	134.	138.	60.	79.	63.	68.	73.	42.	30.	18.	55.	42.	45.	166.
30	56073.	867.	76.	0.	90.	68.	36.	54.	29.	38.	47.	30.	11.	8.	29.	37.	43.	120.
35	73532.	368.	129.	0.	57.	34.	34.	22.	30.	33.	23.	23.	6.	4.	29.	16.	8.	74.
40	59688.	72.	176.	0.	33.	39.	20.	15.	13.	28.	12.	9.	3.	1.	12.	9.	17.	35.
45	48859.	0.	210.	0.	18.	15.	13.	13.	9.	6.	8.	4.	1.	7.	4.	7.	7.	21.
50	38936.	0.	311.	0.	24.	4.	8.	4.	4.	10.	3.	0.	1.	0.	6.	4.	2.	15.
55	27184.	0.	273.	0.	6.	4.	1.	8.	4.	6.	2.	1.	1.	1.	2.	1.	4.	5.
60	38723.	0.	720.	0.	10.	7.	4.	8.	5.	2.	2.	1.	5.	1.	4.	3.	5.	9.
65	39921.	0.	1216.	0.	7.	17.	8.	8.	4.	2.	6.	2.	3.	0.	5.	4.	5.	6.
70	32738.	0.	1689.	0.	15.	17.	4.	3.	2.	1.	3.	3.	1.	1.	3.	0.	2.	8.
75	37257.	0.	4915.	0.	18.	26.	9.	6.	3.	6.	3.	3.	0.	2.	5.	0.	8.	15.
tot	868674.	10898.	10190.	0.	1170.	1053.	612.	624.	430.	565.	536.	336.	181.	112.	412.	350.	445.	1170.

region 2

age	population	births	deaths	migration from region 2 to : 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0	35955.	0.	142.	226.	0.	93.	90.	37.	32.	72.	37.	31.	23.	11.	36.	20.	42.	81.
5	45341.	0.	20.	131.	0.	54.	52.	22.	19.	42.	22.	18.	13.	7.	21.	11.	24.	46.
10	56802.	0.	14.	93.	0.	41.	39.	15.	16.	24.	20.	17.	7.	6.	9.	22.	14.	19.
15	52902.	1191.	42.	136.	0.	65.	58.	32.	25.	46.	29.	24.	30.	11.	29.	26.	28.	75.
20	52537.	3824.	60.	423.	0.	200.	178.	99.	79.	144.	88.	76.	92.	36.	88.	81.	88.	232.
25	32623.	1302.	37.	226.	0.	58.	65.	31.	34.	66.	45.	22.	16.	8.	39.	24.	28.	103.
30	33767.	487.	49.	126.	0.	40.	48.	26.	23.	30.	19.	23.	7.	4.	17.	19.	14.	40.
35	45785.	239.	88.	79.	0.	40.	30.	9.	11.	28.	14.	9.	5.	6.	11.	24.	7.	24.
40	37822.	63.	106.	42.	0.	28.	18.	6.	3.	14.	12.	9.	5.	4.	6.	5.	4.	17.
45	33417.	3.	148.	25.	0.	14.	17.	5.	4.	11.	5.	4.	4.	1.	10.	6.	3.	15.
50	28650.	0.	181.	19.	0.	12.	6.	1.	6.	4.	1.	3.	2.	1.	4.	2.	2.	6.
55	20147.	0.	199.	7.	0.	5.	4.	0.	2.	4.	2.	0.	0.	1.	4.	0.	1.	2.
60	28402.	0.	515.	11.	0.	4.	10.	1.	3.	7.	4.	3.	2.	2.	4.	2.	0.	14.
65	29815.	0.	881.	8.	0.	4.	13.	4.	3.	8.	4.	3.	1.	2.	3.	0.	1.	15.
70	25270.	0.	1405.	18.	0.	11.	8.	1.	6.	4.	3.	1.	2.	0.	3.	0.	5.	7.
75	31112.	0.	3950.	27.	0.	17.	18.	8.	4.	10.	6.	1.	6.	3.	6.	4.	1.	5.
tot	590347.	7109.	7837.	1597.	0.	686.	654.	297.	270.	514.	311.	244.	215.	103.	290.	246.	262.	701.

region 3

age	population	births	deaths	migration from region 3 to : 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0	38859.	0.	144.	194.	82.	0.	137.	136.	41.	47.	51.	31.	62.	8.	56.	29.	43.	117.
5	49003.	0.	22.	112.	48.	0.	79.	79.	23.	27.	29.	18.	36.	4.	32.	16.	25.	68.
10	62380.	0.	13.	82.	68.	0.	103.	97.	8.	24.	30.	17.	36.	2.	24.	17.	8.	44.
15	59477.	2105.	66.	133.	58.	0.	80.	99.	35.	33.	38.	25.	40.	7.	37.	30.	41.	104.
20	59066.	4040.	57.	411.	179.	0.	248.	307.	109.	102.	118.	79.	122.	23.	114.	91.	126.	321.
25	33990.	1050.	36.	199.	61.	0.	111.	87.	27.	51.	47.	27.	38.	10.	35.	34.	24.	152.
30	34206.	542.	47.	108.	41.	0.	61.	57.	30.	18.	23.	18.	24.	3.	26.	17.	13.	68.
35	48953.	280.	96.	64.	34.	0.	76.	65.	11.	20.	22.	15.	23.	0.	22.	17.	8.	52.
40	42854.	61.	141.	51.	18.	0.	44.	33.	9.	10.	5.	6.	12.	1.	12.	9.	8.	23.
45	35639.	0.	143.	23.	13.	0.	23.	26.	5.	10.	3.	2.	5.	3.	6.	9.	3.	15.
50	28653.	0.	184.	15.	15.	0.	19.	21.	4.	5.	4.	3.	5.	3.	5.	5.	4.	10.
55	18968.	0.	179.	10.	4.	0.	10.	9.	3.	2.	0.	0.	1.	1.	2.	4.	1.	4.
60	28365.	0.	530.	9.	2.	0.	11.	7.	4.	3.	7.	2.	2.	2.	3.	0.	1.	11.
65	30315.	0.	936.	13.	2.	0.	11.	22.	6.	6.	0.	6.	3.	3.	5.	3.	2.	12.
70	26105.	0.	1450.	30.	12.	0.	8.	11.	3.	3.	4.	2.	1.	1.	3.	1.	2.	7.
75	29529.	0.	3918.	30.	25.	0.	16.	27.	4.	4.	3.	3.	2.	1.	5.	2.	4.	18.
tot	626362.	8078.	7962.	1484.	662.	0.	1037.	1083.	322.	365.	384.	254.	412.	72.	387.	284.	313.	1026.

region 4

age	population	births	deaths	migration from region 4 to : 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0	63534.	0.	205.	53.	59.	102.	0.	109.	71.	106.	84.	31.	21.	14.	47.	50.	30.	298.
5	80120.	0.	51.	40.	45.	77.	0.	81.	54.	80.	63.	24.	15.	10.	36.	37.	22.	224.
10	103844.	1.	43.	42.	53.	58.	0.	104.	43.	76.	60.	27.	12.	9.	37.	25.	23.	209.
15	92014.	1999.	87.	140.	113.	159.	0.	227.	140.	232.	155.	93.	63.	59.	112.	101.	92.	628.
20	91379.	6030.	94.	89.	73.	102.	0.	145.	90.	149.	100.	59.	40.	37.	71.	64.	59.	530.
25	58592.	2131.	60.	67.	64.	90.	0.	112.	52.	82.	97.	36.	16.	17.	64.	62.	29.	431.
30	73605.	983.	111.	44.	37.	51.	0.	63.	51.	63.	51.	24.	15.	4.	52.	35.	26.	312.
35	93668.	430.	168.	35.	27.	51.	0.	80.	33.	45.	39.	18.	11.	8.	36.	32.	21.	212.
40	76161.	77.	220.	24.	22.	25.	0.	57.	28.	32.	25.	6.	7.	5.	22.	18.	8.	110.
45	64880.	4.	274.	14.	14.	16.	0.	36.	19.	20.	19.	7.	2.	2.	10.	11.	6.	95.
5	51934.	0.	377.	8.	10.	7.	0.	15.	5.	11.	10.	3.	2.	2.	11.	6.	9.	63.
5	38427.	0.	401.	3.	5.	2.	0.	4.	3.	4.	8.	1.	0.	3.	4.	1.	3.	36.
60	57434.	0.	1085.	7.	4.	2.	0.	10.	4.	11.	11.	4.	1.	6.	4.	2.	6.	42.
6	62739.	0.	1823.	1.	7.	12.	0.	11.	8.	6.	13.	4.	2.	3.	5.	5.	6.	55.
7	51690.	0.	2745.	1.	5.	11.	0.	17.	4.	7.	6.	6.	0.	2.	3.	6.	3.	38.
7	60536.	0.	7882.	10.	7.	10.	0.	31.	12.	26.	10.	7.	7.	0.	3.	3.	5.	61.
t t	1120557.	11655.	15626.	578.	545.	775.	0.	1102.	617.	950.	751.	350.	214.	181.	517.	458.	350.	3544.

Appendix C *Continued.*

region 5

age	population	births	deaths	migration from region 5 to : 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0	41661.	0.	172.	50.	23.	48.	96.	0.	63.	28.	50.	31.	17.	10.	39.	33.	19.	372.
5	52538.	0.	19.	38.	17.	37.	73.	0.	47.	21.	38.	23.	13.	8.	29.	25.	15.	282.
10	66521.	0.	27.	30.	21.	36.	138.	0.	57.	15.	46.	29.	14.	6.	31.	31.	18.	245.
15	58676.	1504.	47.	78.	40.	94.	203.	0.	126.	71.	85.	59.	54.	25.	82.	72.	65.	702.
20	58272.	4159.	48.	55.	28.	66.	142.	0.	89.	49.	59.	41.	37.	17.	57.	50.	45.	492.
25	38441.	1442.	35.	60.	22.	34.	71.	0.	49.	36.	57.	35.	17.	14.	38.	24.	31.	411.
30	44835.	624.	64.	37.	21.	22.	59.	0.	40.	17.	51.	21.	9.	10.	31.	26.	14.	306.
35	58719.	288.	107.	24.	14.	22.	66.	0.	32.	9.	22.	12.	11.	4.	25.	25.	16.	239.
40	47773.	59.	136.	14.	9.	13.	48.	0.	20.	6.	12.	8.	8.	2.	16.	17.	14.	147.
45	39342.	4.	153.	6.	3.	14.	30.	0.	11.	5.	12.	5.	6.	4.	8.	5.	6.	94.
50	30926.	0.	197.	3.	3.	3.	9.	0.	12.	4.	6.	1.	2.	1.	6.	3.	3.	76.
55	21375.	0.	206.	1.	0.	3.	9.	0.	6.	4.	7.	0.	1.	1.	4.	0.	1.	32.
60	31170.	0.	563.	0.	0.	2.	12.	0.	9.	1.	2.	0.	2.	1.	6.	1.	3.	53.
65	34522.	0.	1092.	5.	2.	6.	14.	0.	3.	3.	3.	0.	1.	1.	2.	4.	5.	55.
70	29368.	0.	1565.	2.	2.	6.	15.	0.	6.	1.	2.	2.	1.	1.	3.	1.	3.	40.
75	34744.	0.	4612.	7.	4.	10.	21.	0.	16.	9.	8.	1.	6.	1.	2.	3.	2.	65.
tot	688883.	8080.	9043.	410.	209.	416.	1006.	0.	586.	279.	460.	268.	199.	106.	379.	320.	260.	3611.

region 6

age	population	births	deaths	migration from region 6 to : 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0	53807.	0.	220.	43.	17.	26.	79.	55.	0.	47.	60.	31.	29.	17.	162.	77.	64.	77.
5	67855.	0.	29.	33.	13.	20.	60.	42.	0.	36.	45.	23.	22.	12.	122.	58.	49.	59.
10	79544.	1.	38.	23.	20.	15.	63.	44.	0.	30.	28.	17.	20.	5.	96.	50.	44.	37.
15	72524.	1845.	57.	84.	32.	37.	121.	93.	0.	63.	116.	63.	43.	31.	311.	111.	115.	210.
20	72023.	5248.	88.	67.	25.	30.	97.	75.	0.	50.	92.	51.	35.	25.	249.	88.	91.	168.
25	48680.	1843.	51.	53.	21.	10.	68.	60.	0.	48.	80.	43.	33.	26.	162.	85.	60.	151.
30	57930.	854.	82.	43.	26.	21.	58.	53.	0.	45.	44.	18.	25.	16.	117.	67.	49.	66.
35	72684.	365.	146.	22.	16.	17.	40.	36.	0.	19.	31.	15.	16.	12.	111.	33.	37.	53.
40	56190.	58.	166.	12.	9.	4.	24.	20.	0.	9.	11.	14.	8.	7.	61.	22.	15.	29.
45	49638.	0.	217.	7.	5.	1.	16.	11.	0.	7.	11.	7.	4.	4.	36.	16.	15.	19.
50	43234.	0.	293.	10.	2.	3.	7.	7.	0.	4.	8.	3.	8.	0.	19.	13.	4.	13.
55	29046.	0.	275.	2.	1.	2.	3.	4.	0.	6.	5.	1.	0.	1.	9.	1.	2.	3.
60	41888.	0.	692.	3.	1.	0.	11.	9.	0.	3.	8.	1.	5.	2.	15.	9.	5.	7.
65	44975.	0.	1286.	6.	2.	0.	9.	10.	0.	6.	14.	3.	1.	2.	18.	10.	2.	9.
70	38560.	0.	1950.	0.	5.	3.	6.	8.	0.	3.	6.	2.	3.	2.	16.	6.	9.	4.
75	44408.	0.	5587.	4.	3.	5.	20.	10.	0.	6.	12.	7.	8.	2.	19.	10.	4.	14.
tot	872986.	10214.	11177.	412.	198.	194.	682.	537.	0.	382.	571.	299.	260.	164.	1523.	656.	565.	919.

region 7

age	population	births	deaths	migration from region 7 to : 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0	73946.	0.	267.	81.	78.	39.	132.	58.	66.	0.	176.	40.	38.	25.	50.	58.	36.	109.
5	93250.	0.	39.	61.	59.	29.	99.	43.	50.	0.	133.	30.	29.	18.	38.	43.	27.	82.
10	111668.	1.	39.	33.	48.	28.	85.	41.	37.	0.	104.	35.	30.	11.	27.	44.	28.	41.
15	103852.	2367.	89.	176.	143.	114.	289.	131.	134.	0.	444.	132.	90.	96.	142.	147.	100.	260.
20	103135.	6849.	111.	112.	91.	73.	186.	84.	86.	0.	284.	84.	58.	61.	91.	94.	64.	167.
25	74133.	2511.	68.	132.	69.	35.	127.	43.	77.	0.	201.	58.	41.	32.	61.	71.	51.	192.
30	79883.	990.	104.	61.	42.	32.	93.	51.	48.	0.	116.	37.	27.	14.	45.	40.	25.	73.
35	99743.	466.	177.	32.	36.	18.	78.	31.	26.	0.	66.	25.	14.	7.	22.	38.	17.	64.
40	80236.	107.	239.	19.	16.	14.	39.	21.	13.	0.	50.	11.	14.	10.	14.	10.	17.	29.
45	75756.	2.	310.	14.	5.	4.	24.	13.	10.	0.	29.	6.	5.	5.	3.	12.	10.	17.
50	68983.	0.	466.	10.	7.	3.	13.	9.	12.	0.	14.	8.	6.	4.	5.	6.	4.	15.
55	49839.	0.	499.	3.	4.	4.	10.	8.	3.	0.	17.	5.	4.	1.	2.	8.	3.	4.
60	69414.	0.	1348.	9.	3.	2.	10.	8.	8.	0.	18.	10.	2.	1.	1.	8.	6.	6.
65	73635.	0.	2264.	6.	1.	2.	9.	6.	6.	0.	29.	7.	4.	0.	4.	8.	6.	14.
70	60622.	0.	3474.	9.	4.	0.	17.	5.	5.	0.	21.	9.	2.	2.	6.	8.	4.	19.
75	71520.	0.	9446.	10.	3.	0.	20.	12.	5.	0.	38.	12.	5.	4.	3.	7.	7.	26.
tot	1289615.	13293.	18940.	768.	609.	397.	1231.	564.	586.	0.	1740.	509.	369.	291.	514.	602.	405.	1118.

region 8

age	population	births	deaths	migration from region 8 to : 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0	106205.	0.	378.	88.	53.	50.	117.	83.	116.	215.	0.	140.	134.	55.	80.	268.	101.	145.
5	133932.	0.	54.	70.	42.	39.	93.	65.	91.	169.	0.	111.	105.	44.	64.	211.	80.	114.
10	154954.	0.	57.	47.	41.	28.	77.	53.	47.	132.	0.	102.	74.	34.	45.	151.	55.	89.
15	148359.	4.	114.	116.	66.	59.	143.	98.	147.	271.	0.	201.	146.	65.	110.	323.	122.	188.
20	147335.	3427.	159.	222.	127.	113.	276.	189.	283.	522.	0.	388.	282.	126.	212.	620.	235.	363.
25	110404.	9714.	101.	132.	74.	52.	139.	121.	139.	258.	0.	180.	163.	71.	133.	371.	121.	287.
30	123460.	3612.	141.	64.	41.	38.	116.	62.	72.	166.	0.	93.	97.	46.	63.	251.	77.	147.
35	144588.	1598.	232.	46.	33.	31.	74.	56.	40.	108.	0.	87.	56.	32.	37.	136.	55.	74.
40	117660.	632.	349.	32.	17.	9.	35.	25.	27.	48.	0.	52.	37.	30.	26.	84.	35.	45.
45	114646.	131.	507.	19.	10.	8.	27.	16.	29.	54.	0.	25.	25.	18.	22.	60.	20.	32.
50	103942.	0.	713.	13.	11.	4.	19.	9.	22.	41.	0.	19.	22.	9.	13.	45.	21.	13.
55	72514.	0.	698.	9.	3.	5.	13.	7.	7.	22.	0.	11.	6.	5.	4.	22.	7.	7.
60	101858.	0.	1845.	14.	8.	9.	17.	6.	11.	29.	0.	27.	9.	8.	17.	35.	15.	10.
65	107752.	0.	3431.	9.	6.	10.	18.	14.	10.	38.	0.	22.	12.	7.	19.	39.	11.	9.
70	89047.	0.	4782.	8.	6.	3.	12.	15.	11.	46.	0.	18.	14.	7.	6.	30.	13.	16.
75	99860.	0.	12900.	12.	3.	9.	24.	13.	16.	67.	0.	43.	29.	12.	21.	49.	24.	28.
tot	1876516.	19118.	26451.	901.	541.	467.	1200.	832.	1068.	2186.	0.	1519.	1211.	569.	872.	2695.	992.	1567.

Appendix C *Continued*.

region 9

age	population	births	deaths	migration from region 9 to : 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0	74040.	0.	296.	37.	28.	21.	51.	41.	32.	60.	115.	0.	115.	167.	61.	58.	46.	73.
5	93369.	0.	39.	29.	22.	16.	41.	33.	26.	48.	90.	0.	91.	131.	48.	46.	37.	58.
10	105846.	0.	36.	21.	17.	14.	25.	24.	16.	37.	68.	0.	92.	102.	37.	41.	29.	37.
15	101821.	2.	82.	64.	29.	30.	64.	51.	53.	80.	127.	0.	119.	153.	78.	94.	77.	113.
20	101118.	2457.	99.	127.	57.	60.	126.	101.	104.	157.	251.	0.	233.	302.	154.	186.	151.	221.
25	76470.	6780.	62.	57.	37.	30.	54.	55.	46.	95.	147.	0.	159.	222.	72.	90.	57.	156.
30	77940.	2012.	99.	36.	18.	14.	39.	18.	23.	50.	79.	0.	74.	111.	42.	64.	47.	72.
35	95432.	1175.	165.	30.	14.	14.	24.	15.	19.	27.	59.	0.	62.	85.	23.	21.	23.	48.
40	73997.	572.	201.	8.	5.	1.	9.	7.	4.	23.	44.	0.	29.	33.	18.	17.	20.	24.
45	72395.	114.	231.	0.	10.	4.	8.	4.	7.	11.	23.	0.	17.	34.	10.	16.	14.	26.
50	67194.	0.	428.	5.	3.	0.	6.	0.	7.	6.	14.	0.	9.	24.	1.	10.	2.	7.
55	47211.	0.	439.	2.	1.	0.	3.	2.	2.	3.	6.	0.	11.	15.	1.	1.	4.	3.
60	67121.	0.	1205.	5.	0.	5.	7.	1.	1.	6.	12.	0.	9.	11.	6.	3.	2.	9.
65	68252.	0.	2118.	2.	3.	2.	4.	4.	3.	4.	12.	0.	16.	15.	5.	12.	5.	5.
70	56113.	0.	3054.	6.	3.	0.	6.	4.	2.	2.	10.	0.	12.	10.	7.	6.	3.	4.
75	64135.	0.	8494.	4.	3.	1.	11.	1.	6.	14.	14.	0.	30.	20.	11.	8.	9.	13.
tot	1242454.	13912.	17048.	433.	250.	212.	478.	361.	351.	623.	1071.	0.	1078.	1435.	574.	673.	526.	869.

region 10

age	population	births	deaths	migration from region 10 to : 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0	42129.	0.	177.	21.	8.	14.	26.	17.	16.	18.	67.	103.	0.	59.	43.	75.	92.	41.
5	53128.	0.	22.	17.	6.	11.	20.	14.	13.	14.	52.	81.	0.	47.	34.	59.	72.	32.
10	61111.	0.	21.	17.	7.	7.	15.	9.	10.	8.	32.	70.	0.	35.	26.	51.	33.	21.
15	57995.	1.	42.	27.	18.	15.	31.	27.	28.	36.	81.	118.	0.	67.	46.	108.	112.	74.
20	57595.	1327.	51.	54.	36.	30.	60.	52.	56.	71.	159.	231.	0.	131.	90.	213.	221.	146.
25	43974.	3971.	31.	33.	9.	15.	35.	20.	24.	21.	83.	130.	0.	64.	62.	85.	111.	119.
30	47768.	1533.	70.	24.	8.	10.	18.	10.	13.	22.	39.	67.	0.	44.	28.	53.	67.	45.
35	57723.	750.	85.	10.	6.	3.	11.	11.	7.	9.	16.	64.	0.	27.	16.	43.	45.	26.
40	45973.	280.	118.	13.	6.	3.	5.	9.	6.	7.	12.	23.	0.	17.	8.	22.	25.	18.
45	43908.	46.	144.	3.	2.	1.	2.	5.	1.	7.	16.	14.	0.	16.	5.	21.	15.	9.
50	39811.	0.	223.	6.	5.	3.	5.	1.	4.	2.	5.	20.	0.	5.	4.	10.	18.	6.
55	27216.	0.	249.	3.	2.	1.	0.	1.	1.	1.	2.	5.	0.	0.	2.	5.	9.	1.
60	40247.	0.	661.	3.	3.	1.	2.	2.	4.	2.	5.	7.	0.	3.	8.	15.	10.	5.
65	42565.	0.	1280.	1.	2.	2.	6.	1.	3.	5.	5.	8.	0.	5.	2.	11.	15.	3.
70	35680.	0.	1837.	1.	0.	1.	3.	2.	1.	2.	3.	13.	0.	5.	2.	8.	12.	3.
75	41093.	0.	5188.	4.	2.	1.	2.	1.	3.	6.	8.	28.	0.	13.	7.	19.	27.	7.
tot	737916.	7908.	10199.	237.	120.	118.	241.	182.	190.	231.	585.	982.	0.	538.	383.	798.	884.	556.

region 11

age	population	births	deaths	migration from region 11 to : 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0	31241.	0.	110.	18.	8.	8.	27.	12.	18.	14.	31.	105.	62.	0.	29.	26.	32.	41.
5	39397.	0.	11.	14.	6.	6.	22.	9.	14.	11.	24.	82.	49.	0.	22.	20.	26.	33.
10	45141.	0.	18.	4.	4.	6.	9.	4.	10.	13.	17.	88.	33.	0.	20.	17.	17.	9.
15	43972.	1.	33.	17.	9.	17.	27.	12.	33.	20.	35.	125.	61.	0.	36.	44.	35.	47.
20	43668.	993.	37.	32.	19.	32.	52.	24.	64.	38.	68.	247.	119.	0.	72.	85.	69.	91.
25	32918.	2980.	20.	23.	4.	12.	35.	19.	16.	15.	42.	117.	79.	0.	34.	43.	49.	56.
30	33034.	1145.	52.	13.	10.	2.	19.	10.	13.	17.	24.	61.	46.	0.	17.	21.	22.	29.
35	44255.	520.	80.	4.	2.	4.	8.	3.	12.	9.	22.	49.	11.	0.	12.	9.	14.	14.
40	33779.	205.	102.	1.	3.	3.	4.	7.	10.	8.	10.	37.	17.	0.	5.	6.	8.	9.
45	33623.	40.	139.	0.	3.	5.	5.	3.	11.	3.	8.	22.	9.	0.	5.	6.	7.	14.
50	32017.	0.	193.	1.	0.	0.	3.	2.	4.	2.	8.	20.	3.	0.	3.	5.	5.	8.
55	20664.	0.	201.	1.	0.	0.	3.	2.	3.	1.	0.	12.	3.	0.	5.	1.	0.	4.
60	29669.	0.	541.	2.	1.	0.	2.	3.	4.	2.	0.	15.	9.	0.	7.	3.	1.	5.
65	31073.	0.	962.	1.	2.	0.	3.	0.	2.	4.	4.	17.	7.	0.	7.	1.	3.	2.
70	26412.	0.	1434.	0.	0.	1.	1.	3.	1.	1.	3.	14.	5.	0.	1.	2.	3.	1.
75	28572.	0.	3764.	1.	1.	0.	1.	2.	2.	7.	4.	30.	10.	0.	1.	5.	0.	2.
tot	549435.	5884.	7697.	132.	72.	96.	221.	115.	217.	165.	300.	1033.	523.	0.	276.	294.	291.	365.

region 12

age	population	births	deaths	migration from region 12 to : 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0	101160.	0.	352.	66.	31.	58.	79.	65.	285.	41.	74.	65.	52.	20.	0.	114.	149.	156.
5	127569.	0.	41.	50.	23.	44.	60.	49.	218.	31.	57.	50.	40.	15.	0.	87.	114.	120.
10	145298.	0.	42.	22.	19.	32.	69.	45.	114.	24.	51.	34.	44.	15.	0.	84.	110.	65.
15	134605.	2.	99.	120.	48.	83.	139.	119.	524.	78.	155.	123.	90.	50.	0.	223.	316.	295.
20	133677.	2979.	137.	109.	43.	76.	127.	108.	476.	71.	141.	112.	82.	46.	0.	202.	288.	268.
25	100520.	9886.	85.	86.	33.	47.	73.	74.	341.	64.	98.	87.	63.	34.	0.	149.	210.	261.
30	122132.	4310.	135.	42.	17.	27.	71.	51.	165.	44.	76.	47.	52.	14.	0.	106.	124.	159.
35	139560.	2135.	203.	20.	10.	31.	40.	42.	115.	24.	45.	34.	23.	13.	0.	67.	78.	84.
40	109898.	842.	277.	12.	15.	20.	29.	22.	73.	17.	20.	22.	8.	9.	0.	45.	57.	42.
45	105725.	139.	384.	13.	5.	9.	14.	10.	34.	8.	15.	4.	9.	5.	0.	27.	25.	28.
50	97962.	0.	566.	2.	2.	2.	12.	5.	40.	7.	15.	7.	4.	3.	0.	16.	23.	19.
55	71529.	0.	636.	2.	1.	1.	2.	4.	18.	1.	5.	3.	2.	2.	0.	8.	18.	21.
60	103012.	0.	1658.	6.	1.	4.	6.	6.	23.	1.	6.	5.	2.	4.	0.	9.	27.	11.
65	114830.	0.	2995.	1.	1.	3.	8.	8.	20.	4.	5.	3.	3.	1.	0.	18.	20.	9.
70	102322.	0.	4854.	4.	4.	1.	2.	8.	20.	3.	8.	9.	2.	2.	0.	15.	23.	9.
75	125822.	0.	15210.	7.	1.	4.	21.	11.	28.	10.	14.	12.	4.	3.	0.	22.	43.	24.
tot	1835621.	20293.	27674.	562.	254.	442.	752.	627.	2494.	428.	785.	617.	480.	236.	0.	1192.	1625.	1571.

Appendix C *Continued*.

region 13

age	population	births	deaths	migration from region 13 to : 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0	77702.	0.	287.	50.	36.	45.	70.	68.	116.	53.	232.	63.	113.	37.	153.	0.	170.	100.
5	97988.	0.	39.	40.	29.	36.	55.	53.	92.	41.	184.	50.	89.	29.	121.	0.	135.	79.
10	114467.	0.	50.	32.	29.	24.	39.	47.	50.	33.	128.	38.	73.	24.	85.	0.	111.	60.
15	108031.	2.	74.	60.	34.	40.	92.	59.	115.	74.	269.	90.	106.	48.	159.	0.	222.	130.
20	107286.	2329.	100.	115.	65.	78.	176.	113.	222.	143.	517.	173.	203.	91.	307.	0.	426.	266.
25	81305.	7073.	66.	76.	37.	49.	80.	68.	131.	61.	295.	107.	136.	50.	169.	0.	235.	229.
30	96414.	2866.	135.	79.	34.	26.	59.	57.	83.	30.	212.	50.	86.	41.	107.	0.	124.	126.
35	110985.	1338.	191.	22.	16.	19.	49.	35.	48.	33.	128.	27.	40.	24.	76.	0.	105.	114.
40	89307.	536.	217.	23.	11.	10.	31.	32.	39.	27.	55.	28.	23.	16.	46.	0.	68.	33.
45	85239.	90.	367.	17.	12.	6.	19.	8.	23.	17.	49.	13.	18.	11.	34.	0.	39.	26.
50	78161.	0.	526.	13.	7.	5.	13.	6.	15.	10.	43.	11.	13.	12.	23.	0.	29.	14.
55	57272.	0.	503.	4.	1.	1.	8.	4.	9.	6.	20.	8.	7.	3.	13.	0.	28.	11.
60	83024.	0.	1502.	10.	1.	4.	6.	5.	13.	9.	35.	9.	8.	6.	22.	0.	20.	12.
65	91184.	0.	2621.	5.	1.	5.	11.	6.	8.	10.	29.	11.	14.	3.	20.	0.	31.	11.
70	77516.	0.	3996.	4.	3.	2.	13.	7.	11.	7.	33.	8.	14.	1.	31.	0.	24.	13.
75	89960.	0.	11462.	6.	6.	6.	10.	12.	16.	13.	47.	10.	15.	6.	32.	0.	47.	16.
tot	1445841.	14234.	22136.	556.	322.	356.	731.	580.	991.	567.	2276.	696.	958.	402.	1398.	0.	1814.	1256.

region 14

age	population	births	deaths	migration from region 14 to : 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0	99537.	0.	279.	48.	31.	27.	54.	54.	131.	47.	67.	63.	136.	24.	186.	240.	0.	111.
5	125522.	0.	49.	36.	23.	20.	40.	41.	99.	35.	51.	47.	103.	18.	140.	181.	0.	83.
10	139553.	0.	47.	24.	10.	19.	31.	22.	80.	24.	61.	29.	74.	12.	161.	111.	0.	77.
15	144514.	2.	103.	103.	46.	65.	116.	80.	185.	104.	148.	149.	255.	63.	375.	428.	0.	241.
20	143517.	2901.	164.	100.	45.	64.	114.	79.	182.	101.	144.	145.	249.	62.	368.	419.	0.	236.
25	115524.	9810.	105.	70.	32.	31.	70.	72.	137.	47.	104.	83.	170.	43.	274.	299.	0.	231.
30	124053.	4110.	144.	46.	24.	20.	42.	28.	99.	39.	78.	53.	105.	23.	164.	147.	0.	99.
35	142804.	1740.	213.	13.	16.	11.	21.	20.	65.	15.	34.	19.	69.	24.	104.	94.	0.	56.
40	119403.	648.	335.	13.	9.	12.	15.	15.	48.	15.	16.	8.	53.	12.	72.	65.	0.	31.
45	124011.	121.	514.	12.	8.	7.	9.	10.	28.	8.	14.	12.	36.	11.	47.	35.	0.	21.
50	116471.	0.	746.	6.	6.	4.	7.	7.	8.	7.	11.	10.	9.	10.	36.	34.	0.	13.
55	81160.	0.	783.	6.	1.	1.	6.	2.	10.	5.	12.	7.	7.	4.	23.	19.	0.	12.
60	118954.	0.	2016.	7.	4.	1.	8.	8.	9.	5.	16.	6.	13.	4.	38.	29.	0.	15.
65	132008.	0.	3807.	4.	6.	4.	7.	5.	15.	8.	8.	13.	13.	2.	46.	30.	0.	9.
70	114443.	0.	5677.	7.	4.	4.	6.	9.	11.	7.	7.	6.	11.	1.	34.	32.	0.	10.
75	135395.	0.	16687.	10.	0.	4.	13.	7.	9.	12.	21.	14.	32.	3.	73.	49.	0.	16.
tot	1976869.	19332.	31669.	513.	265.	294.	559.	459.	1116.	479.	792.	664.	1335.	316.	2141.	2212.	0.	1261.

region 15

age	population	births	deaths	migration from region 15 to : 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0	62653.	0.	221.	50.	27.	32.	177.	256.	31.	17.	39.	20.	19.	17.	37.	26.	33.	0.
5	79009.	0.	30.	38.	20.	24.	135.	195.	24.	13.	30.	15.	14.	13.	29.	19.	25.	0.
10	92259.	0.	30.	67.	16.	16.	145.	174.	13.	27.	48.	24.	50.	8.	39.	28.	49.	0.
15	73156.	2.	53.	37.	21.	47.	128.	119.	38.	30.	41.	33.	23.	11.	54.	37.	49.	0.
20	72651.	1428.	69.	77.	43.	96.	261.	242.	79.	61.	83.	68.	46.	23.	110.	75.	100.	0.
25	66688.	5451.	62.	66.	26.	40.	163.	178.	32.	33.	45.	33.	15.	14.	50.	52.	44.	0.
30	90215.	2840.	112.	40.	25.	22.	200.	182.	35.	26.	50.	19.	13.	22.	49.	44.	44.	0.
35	100196.	1426.	164.	28.	13.	19.	137.	158.	13.	16.	29.	14.	10.	9.	31.	26.	29.	0.
40	76735.	505.	212.	14.	6.	16.	96.	75.	17.	5.	20.	7.	9.	5.	12.	16.	17.	0.
45	62934.	89.	287.	12.	4.	3.	60.	58.	6.	10.	8.	1.	3.	1.	8.	9.	7.	0.
50	48528.	0.	357.	6.	2.	3.	47.	29.	1.	7.	4.	3.	4.	5.	10.	7.	6.	0.
55	38995.	0.	453.	3.	0.	1.	19.	17.	2.	4.	3.	2.	1.	0.	6.	4.	6.	0.
60	56860.	0.	1171.	8.	8.	2.	34.	37.	2.	2.	1.	2.	0.	1.	5.	2.	6.	0.
65	64747.	0.	2194.	4.	3.	7.	26.	22.	8.	5.	2.	2.	2.	0.	3.	2.	7.	0.
70	52249.	0.	3005.	4.	3.	2.	19.	21.	1.	1.	4.	4.	2.	0.	2.	4.	4.	0.
75	60299.	0.	8338.	6.	2.	12.	26.	36.	5.	12.	5.	5.	0.	0.	6.	3.	4.	0.
tot	1098174.	11741.	16758.	460.	219.	342.	1673.	1799.	307.	269.	412.	252.	211.	129.	451.	354.	430.	0.

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