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Migration and Settlement: 9. Federal Republic of Germany

Koch, R. and Gatzweiler, H.-P.

IIASA Research Report
November 1980

MIGRATION AND SETTLEMENT:
9. FEDERAL REPUBLIC OF GERMANY

Reinhold Koch
Hans-Peter Gatzweiler
Federal Research Institute for Applied Geography and Regional Planning, Bonn

RR-80-37
November 1980

INTERNATIONAL INSTITUTE FOR APPLIED SYSTEMS ANALYSIS
Laxenburg, Austria

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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.

This study on migration and settlement in the Federal Republic of Germany was prepared by Dr. Reinhold Koch and Dr. Hans-Peter Gatzweiler of the Bundesforschungsanstalt für Landeskunde und Raumordnung (Federal Research Institute for Applied Geography and Regional Planning), Bonn, using the Bundesländer (states) as regional units for the analysis. The report was originally written in German and was translated by Alduild Fürst.

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

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1 INTRODUCTION

With a population density of approximately 250 inhabitants per square kilometer, the Federal Republic of Germany is one of the most densely populated countries in Europe. The population is also relatively mobile: estimates from the National Central Statistical Office suggest that, over the period 1948–1978, eight million people changed their address in the Federal Republic of Germany each year. This represents 14 percent of the total population of the country. Slightly more than half of these people crossed the border of a municipality during their move, and therefore, according to statistical definition, became migrants. In order to investigate the influence of these migratory movements of the past on population development and settlement patterns of the future, several methodological steps are required.

First, a short description of the pattern of settlement in the FRG and an analysis of the influence of migration on population development are given on a general level. Then follows a description of regional population structure and development. Regional population analysis and trend projections are used to estimate the future development of settlement patterns and population. This allows the efficiency of the multiregional population analysis to be evaluated. The expected population development and distribution are then assessed in the light of population policies at both regional and state levels.

1.1 Settlement Pattern

The urbanization process found all over the world is relatively advanced in the FRG, though it is not concentrated in one single dominant economic or administrative metropolitan area. The FRG's regional structure contains a number of large, economically strong centers. These are evenly distributed over the entire

territory and thus offer particular structural advantages when compared with other European countries.

Agglomerations have been formed around these centers, where metropolitan job markets, metropolitan infrastructure and services are available. Metropolitan centers such as Hamburg, Düsseldorf, Frankfurt, and Munich fulfill important tasks in a number of fields, i.e., state government, cultural, and economic activities, as well as playing a major role in the general administration of the neighboring areas. In addition to their respective hinterlands,* these agglomerations are also surrounded by rural areas (Figure 1), to produce eight so-called major regions (Grossregionen). These major regions are more similar to one another than are regional units in other European countries, e.g., France, in terms of population distribution and labor force, and in terms of economic development since 1961 (Table 1).

The major regions and their centers are easily accessible by means of important European transport axes, which link them to the main international and national traffic routes. These axes generally run in a north–south direction, although Aachen, the Ruhr, Hannover, W. Berlin, Saarbrücken, Stuttgart, and Munich lie on the east–west axes of the FRG.

Below the level of major regions, it is the distribution of so-called first-order centers (Oberzentren) that determines the settlement structure and regional quality of life. First-order centers are cities that provide a large and specialized supply of goods and services such as universities, training centers, and highly qualified administrators. The minimum size for a center of this type is about 100,000 inhabitants. The presence of a first-order center can make a considerable difference to the availability of infrastructure and services. Several areas do not have a first-order center. In areas such as Emsland, Lüneburger Heide, some parts of Bavaria, and Allgäu the centers are relatively distant from each other. There are significant differences in the infrastructure and employment situation between these peripheral, thinly populated areas and the nearest agglomerations. For example, in 1975 one medical specialist was responsible for the care of 1,500 inhabitants in rural areas,† while in densely populated areas the ratio was one to 900. In rural areas the average monthly income of an industrial worker was about DM 400 below that of an industrial worker in an agglomeration.

The terms "major region" and "metropolitan center" used here to describe the settlement pattern in the FRG are hardly ever used by policy makers. The territorial units of the FRG are the states (Bundesländer) (Table 2).

The state with the largest area is Bavaria, while the most densely populated of the non-urban states is North Rhine-Westphalia. The differences in area and

*The hinterland is the area immediately outside a city that is linked economically to it.

†Unfortunately, there is no uniform, official definition of rural and urban areas in the FRG. The classification used in this report is that employed for regional monitoring at the Federal Institute for Applied Geography and Regional Planning (Gatzweiler 1978). This classification is based on the functional regions described in Section 2.1.

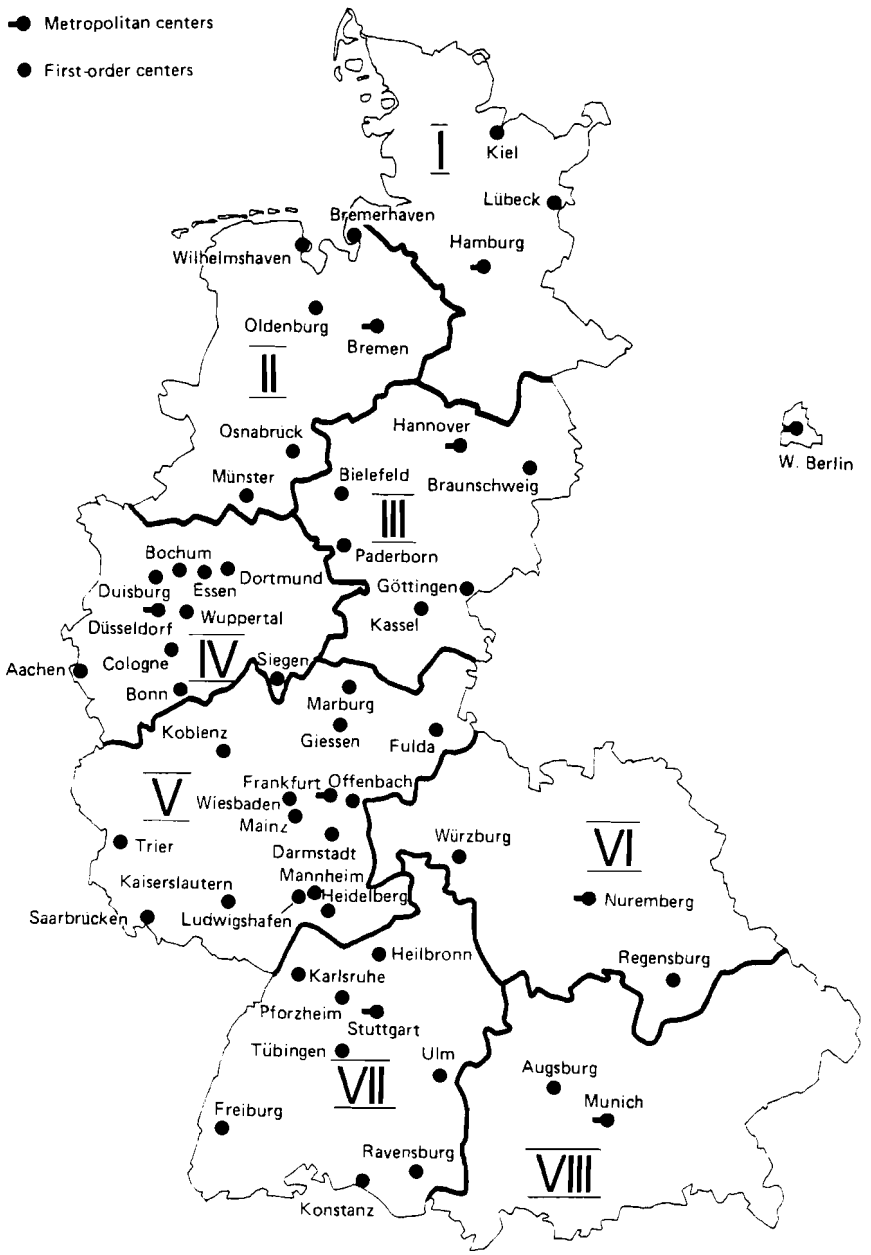

FIGURE 1 The eight major regions of the Federal Republic of Germany. Both metropolitan and first-order centers are shown.

TABLE 1 Surface area and population of the major regions, 1961–1970.[a]

Major region[b]	Surface area (km^2)	Population		
		Absolute ($\times 10^3$)		Change (%)
		1961	1970	1961/1970
I	27,125	5,037.2	5,239.9	+4.0
II	25,905	3,970.0	4,321.7	+8.9
III	29,029	5,911.7	6,266.7	+6.0
IV	22,614	13,355.7	14,101.0	+5.6
V	39,981	9,385.8	10,284.9	+9.5
VI	33,362	4,466.3	4,765.3	+6.7
VII	32,900	6,811.6	7,834.6	+15.0
VIII	37,185	5,049.1	5,714.1	+13.2

[a]Data from Raumordnungsbericht 1974 der Bundesregierung (1975).
[b]The regions identified by the Roman numerals are shown in Figure 1.

TABLE 2 The states of the Federal Republic of Germany.

State	State capital	Area ($\times 10^3$ km^2)	Population[a] ($\times 10^6$)	Population density[a] (per km^2)
Schleswig-Holstein	Kiel	15.7	2.6	165
Hamburg[b]		0.8	1.7	2,302
Lower Saxony	Hannover	47.4	7.3	153
Bremen[b]		0.4	0.7	1,793
North Rhine-Westphalia	Düsseldorf	34.1	17.2	506
Hesse	Wiesbaden	21.1	5.6	264
Rhineland-Palatinate	Mainz	19.8	3.7	186
Baden-Württemberg	Stuttgart	35.8	9.2	258
Bavaria	Munich	70.5	10.8	154
Saarland	Saarbrücken	2.6	1.1	430

[a]1974 data.
[b]Urban states.

population of the states have a historical basis. Many states, such as Bavaria, Bremen, and Hamburg, have a long history. Others, such as Rhineland-Palatinate and Lower Saxony, were established after the end of the Second World War. Baden-Württemberg was established by plebiscite in 1952, and the Saarland did not join the FRG until 1957.

The Federation, the states, and the communities (Gemeinden) all have their own governments and administrations. Each of these administrations has

well-defined tasks and responsibilities, which only in exceptional cases are subject to intervention from a higher level. This system of federal organization integrates the community and local administrations into the structure of government, and has played an important part in the FRG's relatively balanced pattern of settlement, with centers of political and economic activity spread throughout the country.

The collection of statistical data is largely the responsibility of the states. Sectorally disaggregated data can therefore be obtained at the federal and state level without any major difficulty.

1.2 Population Dynamics

According to the population register of 31 December 1977, there were 61.4 million people in the FRG at that time. This represents an increase of 21 percent since 1950, when the population was 50.8 million, though the 1977 figures are still 700,000 below the population peak of 1973. Between 1950 and 1970, the FRG had the fourth highest growth rate (19.4 percent) of all European countries, following Switzerland, the Netherlands, and France.

Apart from the general trends typical of all populations undergoing demographic and social change in the course of the urbanization process (demographic transition, rural depopulation), this population increase was determined largely by the following factors (Bundesinstitut für Bevölkerungsforschung 1974, p. 11):

- World Wars I and II
- The population shifts after both wars
- The migration of large numbers of people between the GDR and the FRG and within the FRG, connected with the integration of refugees
- The immigration of foreign workers

Between 1944 and 1950 the increase in population was due mainly to immigration. Between 1950 and 1961, however, the major factor contributing to the increase was natural population growth (Figure 2). The excess of births over deaths within this period was 3 million and the gain by migration was 2.4 million. This yields an average annual population growth rate of 0.92 percent.

Between the censuses of 1961 and 1970 the rate of population growth slowed down. In that period the average annual growth rate was 0.85 percent. In spite of the decrease in the birth rate that began in 1964, this lower growth rate cannot be explained solely through natural change. The number of children born was 2.9 million, almost as many as from 1950 to 1961. The gain through migration fell to 1.6 million, only 35.7 percent of the total gain; migration was 44.7 percent of the total gain between 1950 and 1961.

The annual changes in population growth were determined mainly by the rapid variations in migration behavior. Between 1958 and 1967, the gain due to natural increase was generally greater than the gain due to migration; from 1968

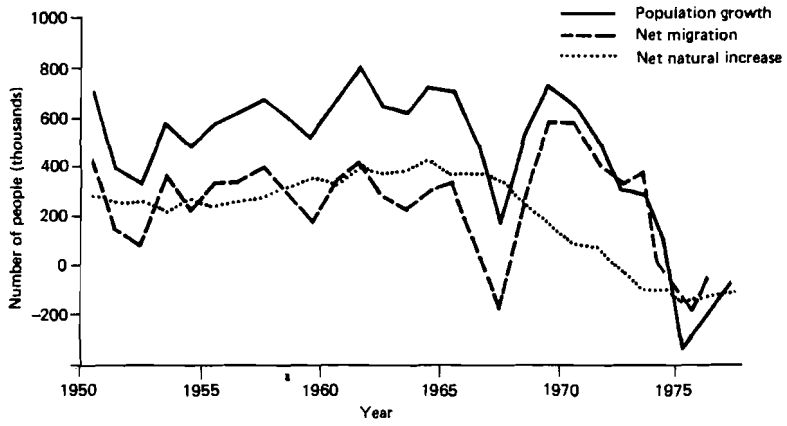

FIGURE 2 Population growth, net migration, and net natural increase between 1950 and 1977. (Taken from data provided by the Federal Statistical Office.)

onwards, the situation was reversed. Since 1953, the curve of the annual excess of births over deaths (natural increase) tended to increase, reached a peak in 1964, and since then has shown a steady decline. In 1972, deaths for the first time exceeded births. In 1977, there were 122,000 more deaths than births in the FRG. After large gains due to migration in the early seventies, the migratory balance became negative in the period 1974–1976; in 1975 the total loss was 200,000 people, 600,000 migrant workers leaving the FRG because of an economic recession. In 1977 the migratory balance was again positive, with a net gain of 32,000 people.

1.2.1 DYNAMICS OF BIRTHS

In 1950, the number of children born in the FRG was 812,835, this figure falling to 796,096 in 1953 (Table 3). It is possible that the large number of children born around 1950 could be explained by the aftermath of the war, many men returning to their families after several years' separation. A process of normalization followed, causing a decline in the number of births after 1950. The birth rate started to increase again in 1954 because of the large number of marriages which took place immediately following the war, the lower mean age at

TABLE 3 Number of births, marriages, and deaths, 1950–1977.[a]

Year	Number of marriages	Number of births		Number of deaths	
		Live	Stillborn	Total	Infant
1950	535,708	812,835	18,118	528,747	45,252
1951	522,946	795,608	17,790	543,897	42,372
1952	483,358	799,060	17,145	545,963	38,624
1953	462,101	796,096	16,456	578,027	37,069
1954	453,168	816,028	16,779	555,459	35,171
1955	461,818	820,123	16,558	581,872	34,284
1956	478,352	855,887	16,129	599,413	33,098
1957	482,590	892,228	15,911	615,016	32,479
1958	494,110	904,465	15,082	597,305	32,589
1959	503,981	951,942	14,951	605,504	32,642
1960	521,445	968,629	15,049	642,962	32,724
1961	529,901	1,012,687	14,704	627,561	32,108
1962	530,640	1,018,552	14,361	644,819	29,807
1963	507,644	1,054,123	13,991	673,069	28,473
1964	506,182	1,065,437	13,590	644,128	26,948
1965	492,128	1,044,328	12,901	677,628	24,947
1966	484,562	1,050,345	12,174	686,321	24,803
1967	483,101	1,019,459	11,422	687,349	23,303
1968	444,150	969,825	10,702	734,048	22,110
1969	446,586	903,456	9,693	744,360	21,162
1970	444,510	810,808	8,351	734,843	19,165
1971	432,030	778,526	7,674	730,670	18,141
1972	415,132	701,214	6,557	731,264	15,907
1973	394,603	635,633	5,686	731,028	14,569
1974	377,265	626,373	5,387	727,511	13,232
1975	386,681	600,512	4,689	749,260	11,875
1976	365,728	602,851	4,444	733,140	10,506
1977	358,347	582,348	3,795	704,922	9,022

[a]Taken from the Statistical Yearbook of the Federal Republic of Germany (1969, p. 44; 1973, p. 54; 1977, p. 68).

marriage, and the high proportion of women reaching the ages of maximum fertility (20–30 years). The number of live births increased to 1.07 million in 1964, and the crude birth rate reached a peak with a value of 18.3 per thousand. After an initial small decrease, the number of births has declined by 5 percent per year since 1966. About 483,000 fewer children were born in 1977 than in 1964, the crude birth rate in 1977 being 9.5 per thousand. Because of this rapid decrease (about 45 percent in 14 years), the FRG now has the lowest crude birth rate of

all the industrialized countries. It is interesting to note that almost 15 percent of the children born in the FRG in 1977 were born to parents of foreign nationality.

Two demographic factors have promoted the decline in the number of births during the 1970s. First, the relatively small group born in the years immediately following the end of the war reached marital age at about this time (Koch 1976b). About 25 percent of the decrease in the number of births since the mid-1960s can therefore be attributed to the age structure. Another 16 percent of the decrease may be explained by couples allowing a longer interval between births. Thus, 60 percent of the decline in the number of births is caused by a real reduction in fertility. This is confirmed by the change in the net reproduction rate between 1961 and 1975; in that period it fell from 1.14 to 0.68 (Table 4).

TABLE 4 Net reproduction rates, 1961–1975.[a]

	Net reproduction rate	
Year	Total population	Native population
1961	1.14	1.14[b]
1966	1.19	1.18[b]
1970	0.95	0.94
1971	0.90	0.89
1972	0.81	0.78
1973	0.73	0.69
1974	0.71	0.67
1975	0.68	0.64

[a] Schwarz (1977) p. 387.
[b] Estimated.

1.2.2 DYNAMICS OF DEATHS

The annual number of deaths in the FRG has increased every year since 1950. This is a result of the age structure of the population. The crude death rate remained relatively constant, lying between 10.5 in 1950 and 12.2 in the years of influenza epidemics, 1968 and 1969. The crude death rate in 1977 was 11.5. Age-specific death rates have always been higher for the male population than for the female population.

There were considerable changes in the probabilities of death between 1950 and 1975. This is especially true of infant mortality. The mortality rate of one- and two-year-old infants was reduced by approximately 60 percent between 1950 and 1975 because more births took place in hospitals and routine medical checkups for infants and babies were made available. The probability of death

for women aged 20–30 years fell by 50 percent during this period, as childbearing became less of a risk to life. Generally speaking, we observe a decline in death probability for females in all age groups; however, the decrease becomes smaller at greater ages. The probability of death of men over 60 has increased owing to the higher incidence of cardiovascular diseases. An increase in male expectation of life occurred only for the newborn, one- and two-year-olds, and men over 80 (Bundesinstitut für Bevölkerungsforschung 1974, p. 25).

1.2.3 INTERNATIONAL MIGRATION

Population transfer between the GDR and the FRG played a major role in the pattern of international migration in the period 1950–1961 (Figure 3). The

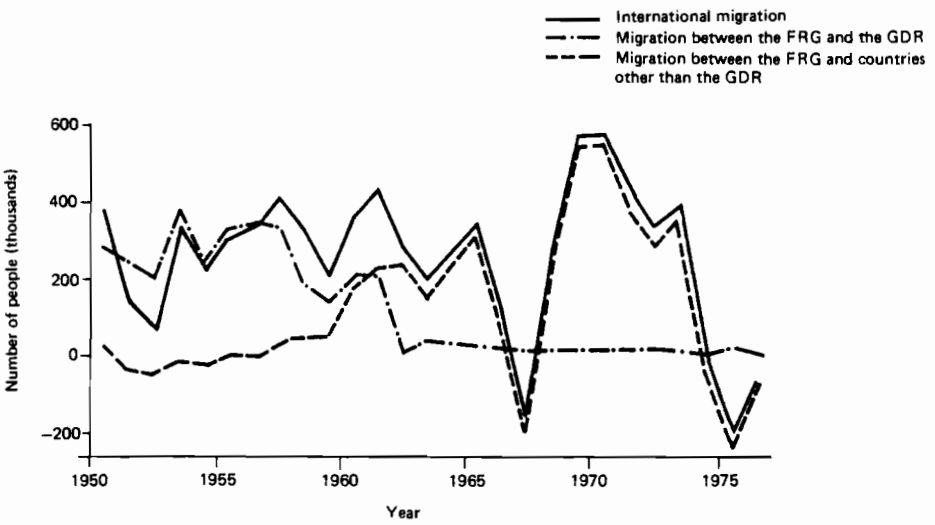

FIGURE 3 Components of net international migration in the FRG.

strong economic growth in the sixties and the lack of migrants from the GDR resulted in an increasing demand for foreign labor. At first, gains through international migration were made from Austria, as well as from fellow Common Market members Italy and the Netherlands. However, the recruitment of the labor force in the second half of the sixties took place under state control and with state support (recruitment contracts). The use of recruitment contracts, in particular those with Yugoslavia and Turkey, caused a marked change in the nationality structure of migrants entering the FRG. Between 1961 and 1974, there was a gain of more than 3 million people through international migration.

With the exception of 1967, when a phase of economic recession caused net emigration, the migratory gains were mostly above 300,000 persons per year. The announcement issued by the federal government toward the end of 1973 that the recruitment of foreign labor should be discontinued resulted in a sharp decrease in the volume of immigrants in 1974.

The severe economic recession that began in 1974 had a decisive effect on the employment of foreign workers and on immigration into the FRG. The number of immigrants fell from 870,000 in 1973 to about 540,000 in 1974; at the same time, the emigration of foreign nationals rose from 530,000 to 580,000. The emigration of foreigners continued during 1975, and reached its peak in the third quarter of 1975. The net migratory balance in 1975 was negative, with the number of emigrants exceeding the number of immigrants by 200,000. Emigration continued throughout 1976, although in a somewhat modified form; the net loss was only 72,000 people (Koch 1977).

There has been an interesting change in the age and sex structure of the immigrant population in recent years. In the early phases of guest-worker migration, the proportion of young, single men in this group was particularly high. Now, because of family reunification, the number of women, children, and adolescents migrating to the FRG has increased markedly. This was possibly the reason for the slightly positive migration balance observed in 1977. The largest group of emigrants is made up of single men. These people prefer to migrate home rather than remain unemployed in the FRG. However, foreign families tend to stay in the FRG despite economic difficulties.

The gain through migration of 32,000 persons in 1977 may be compared with a natural population loss of 122,000 in the same year. Assuming that conditions affecting migration and employment remain the same, i.e., migration restrictions and high unemployment rates, the influence of migration on population dynamics can be expected to be considerably less in the future than it was in the early 1970s.

1.2.4 AGE STRUCTURE OF THE POPULATION

The age structure of the FRG's population is the result of natural change, losses due to the two world wars, and migrations. The most noticeable variations in the age structure of the 1976 population occurred in the groups aged 25–29 and 55–59 years. These discontinuities can be attributed to the decline in the number of births toward the end of the Second World War and the heavy losses of men experienced during the war, respectively (Figure 4).

Because of the loss of males in the two world wars, the sexes are not represented equally in the total population: there were 1,100 females to 1,000 males in 1976.

The number of births increased steadily from the early fifties to the mid-sixties, and this is reflected in the 1976 age structure by the high proportion of

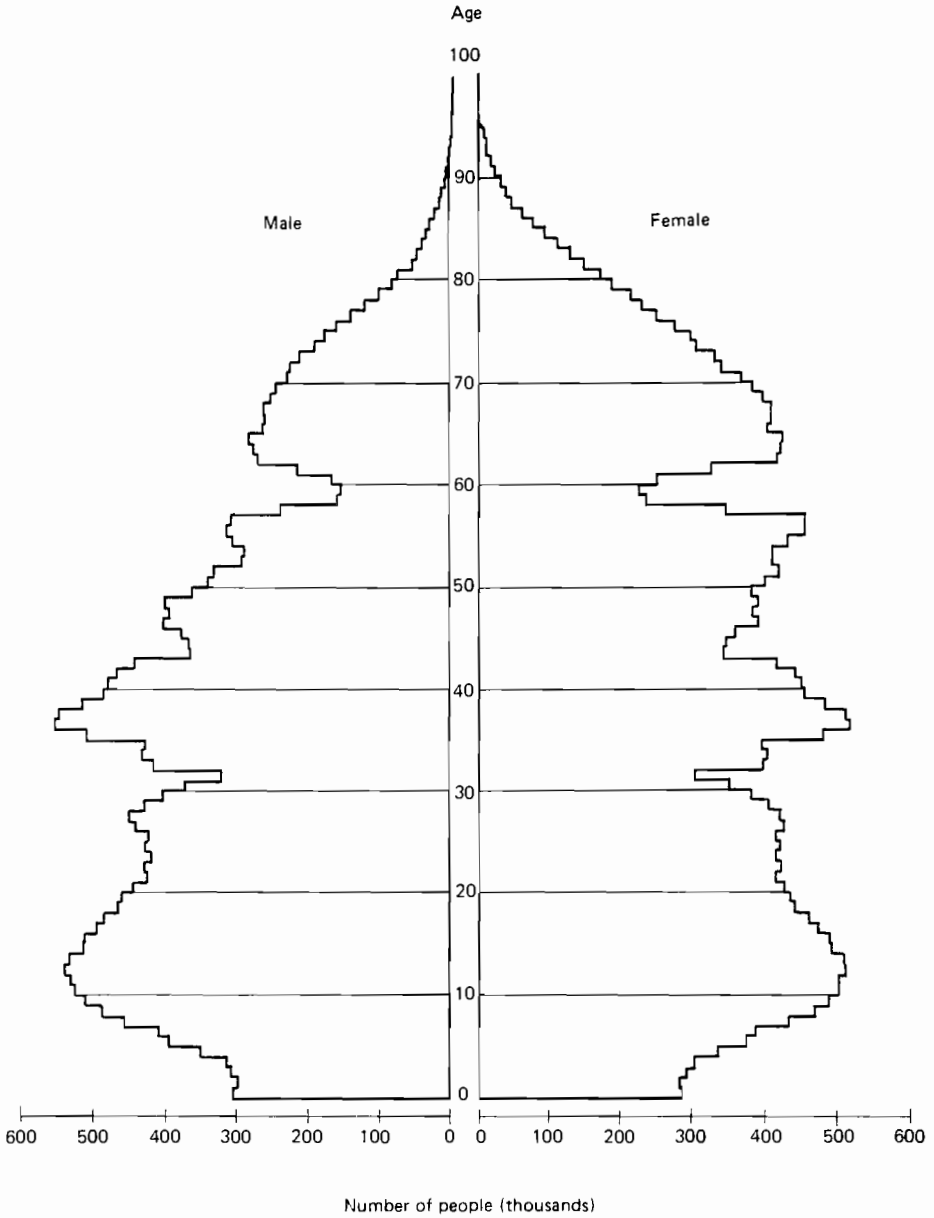

FIGURE 4 The age structure of the population of the FRG on 31 December 1976. (Taken from data provided by the Federal Statistical Office.)

10–15-year-olds. One reason for this rise in the number of births is the relatively large number of people reaching the ages of greatest fertility between 1950 and 1965. Since the mid-sixties, the number of births has been declining, as shown by the low proportion of people in the youngest age groups.

Postwar migrations and the integration of foreign workers have had a considerable influence on the age structure of the population: migrants constitute up to 25 percent of some of the young and middle-aged groups.

2 CURRENT PATTERNS OF SPATIAL POPULATION GROWTH

2.1 Regional Disaggregation

The analysis of population dynamics carried out on the state level in the FRG is unsatisfactory both to the demographer and to the federal and regional planner: important regional trends are suppressed when regions are grouped into states. Nevertheless, we carried out the multiregional population analysis using the states as the basis of the disaggregation, since comprehensive migration data were readily available. To prevent information losses through regional aggregation, the survey of regional demographic trends presented here is based on the functional urban regions (metropolitan and first-order centers with hinterlands) shown in Figure 5, rather than the states. We thus obtain 58 regions, each consisting of a number of administrative units called districts (Kreise), which are defined by functional criteria (Kroner and Kessler 1976).

2.2 Trends of Population Dynamics in the Regions

In 1976, the population density of the regions, as defined above, lay between 72.6 inhabitants/km^2 around Lüneburg and 1,726.7 inhabitants/km^2 around Essen. The average population density in the rural areas was 114.2. The density of population of the non-urban federal states ranged from 153 to 506.

2.2.1 NATURAL INCREASE

In 1976, the crude birth rate in urban areas was 9.3 per thousand, significantly below that in rural areas (10.6 per thousand). As in preceding years, the highest birth rates were observed in the rural areas of the northwest (Emden, 12.5) and eastern Bavaria, as well as southern Baden-Württemberg. The lowest figures were found in the agglomerations of Hamburg and Munich (8.7), despite the fact that the proportion of women of childbearing age was highest in the urban areas. This shows that fertility in rural areas of the FRG is considerably above that observed in urban regions (Figure 6).

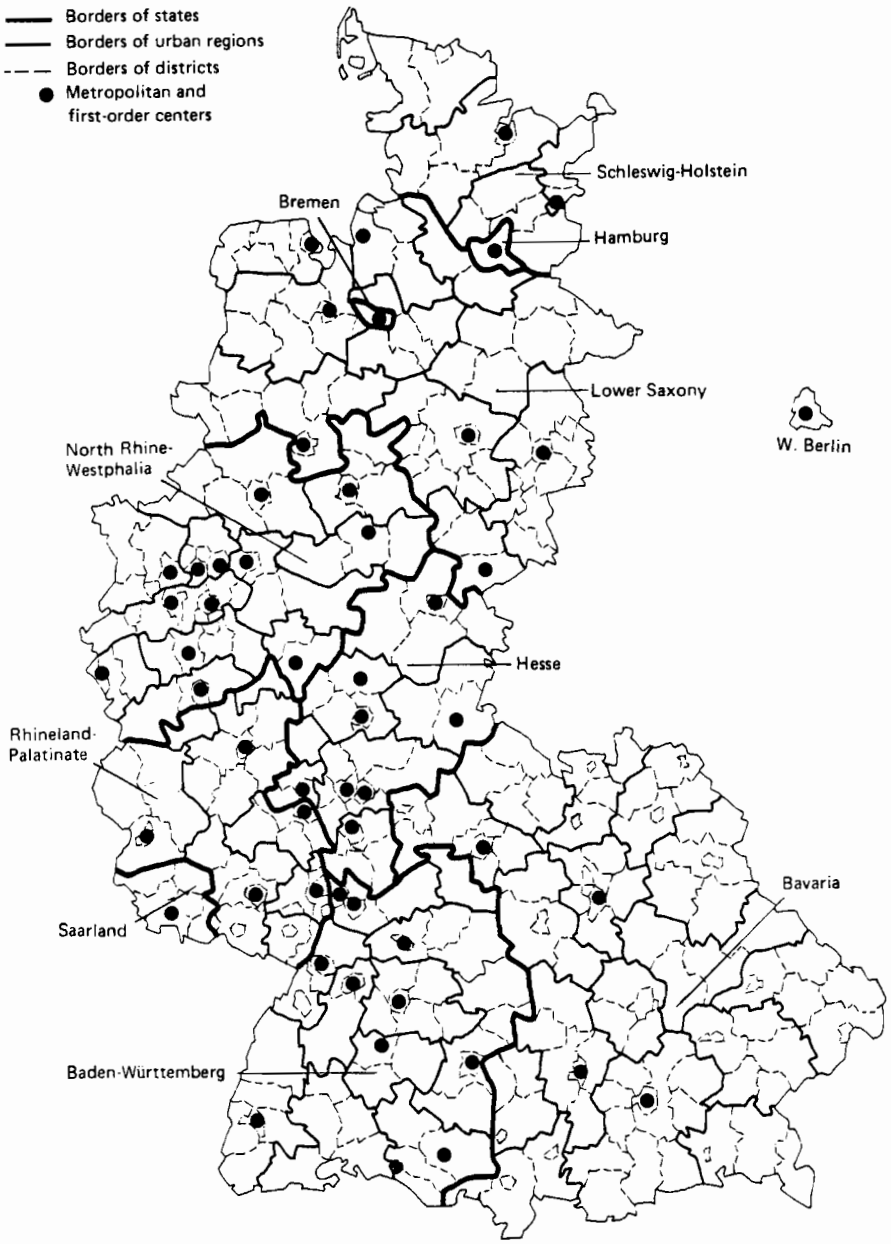

FIGURE 5 The 58 functional urban regions (metropolitan and first-order centers with associated hinterlands) used in the survey of regional demographic trends. Each region consists of a number of administrative units called districts.

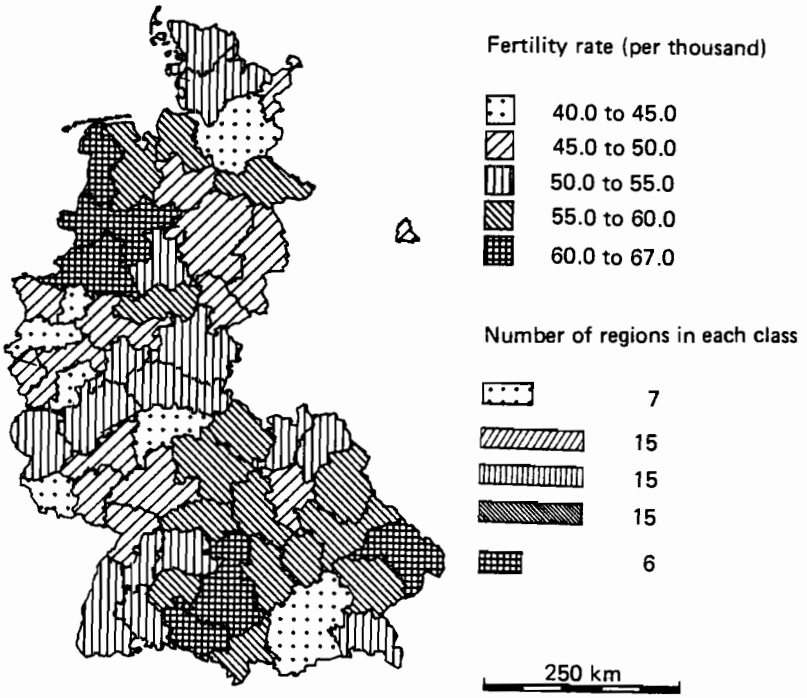

FIGURE 6 The distribution of fertility rates (births per 1,000 women of reproductive age) among the regions of the FRG in 1974.

The general fertility rate ranged from 66.9 in the Emden area to 40.7 in the Munich area in 1974. A net reproduction rate greater than 1.0 was achieved in only a few regions in the same year. These regions, taken together, have a German citizen population of 2.5 million (Schwarz 1977).

The crude death rate is about the same in urban and rural areas, but depends markedly on the specific regional age structure of the population. The 1976 crude death rate was especially high in the rural areas of Schleswig-Holstein and Upper Franconia (14.3), but similarly high rates were also found in urban areas such as Hamburg and Düsseldorf (13.2). All of these regions have a high proportion of people in the over-65 age group.

In 1976, the natural population change was positive (i.e., births exceeded deaths) in only eight regions, the highest natural growth rate being found in the Emden area (2.1 per thousand, see Figure 7). In 1970, 50 regions had a positive balance of natural population change; at that time the natural growth rate in the Emden area was still 8.2 per thousand.

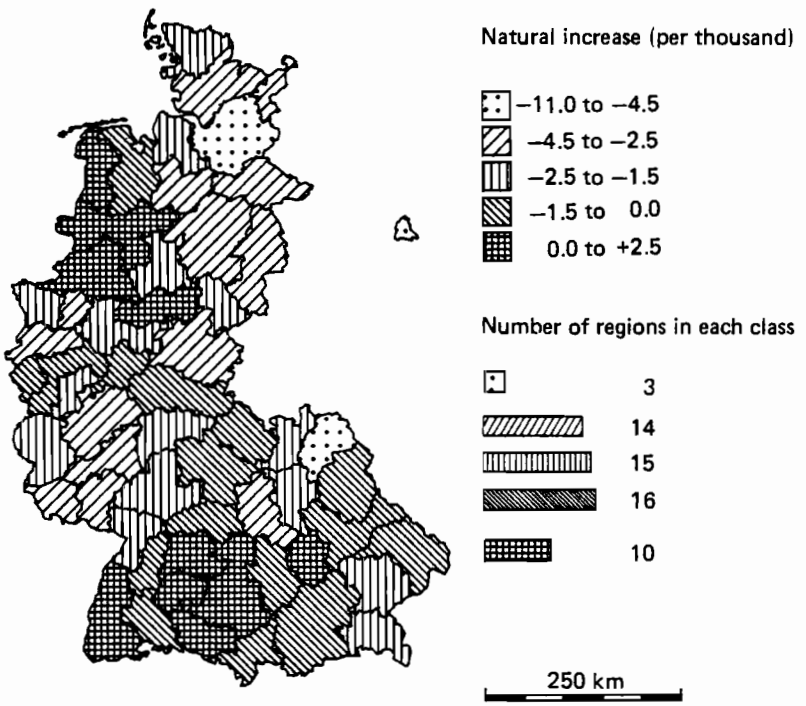

FIGURE 7 The natural increase (net excess of births over deaths per 1,000 people) in the regions of the FRG in 1976.

The radical decline in the number of births led to a natural decrease in the population of almost all regions within a relatively short time. Although the decline was particularly marked in urban areas, the birth rate also decreased in rural areas. If this decrease continues, any shift of people to the urban areas can only speed up the loss of population from the rural areas.

2.2.2 INTERREGIONAL MIGRATION

During recent years, migration has been the main factor influencing the spatial distribution of the population. There were particularly high migration gains in the sixties and the beginning of the seventies in the large urban areas of Hamburg, Düsseldorf, Cologne–Bonn, Rhine–Main, Rhine–Neckar, Stuttgart, and Munich, but almost all sparsely populated rural areas and regions with industrial problems suffered migration losses. These losses were greatest in Emsland, the Ruhr, the Eifel, Saarland, Upper Franconia, and eastern Bavaria. During that time it could be seen that internal migration was less dependent on economic cycles than was international migration, and that internal migration was caused mainly by regional disparities.

The pattern of regional gains and losses through internal migration remained largely unchanged during the economic crisis of 1974/1975. The areas of net out-migration (rural areas and regions with industrial problems) stand in sharp contrast to the attractive metropolitan agglomerations displaying large gains through internal migration. However, the attraction of these regions appears to have decreased slightly since the sixties, only the areas of Bonn and Munich making exceptional gains through migration in 1974/1975. Overall, the gains due to internal migration along the heavily agglomerated Hamburg–Ruhr–Rhine–Main District–Stuttgart–Munich axis were somewhat less in 1974 than in previous years (Koch 1977, p. 879).

The 18–24 and 25–29 age groups tend to migrate toward urban areas. Migration toward university towns plays an important role for the 18–24 age group, and explains the high migration gains of Bonn, Göttingen, Tübingen, and Munich (Figure 8). However, not all regions with universities have sufficient employment for qualified people. This leads to heavy out-migration of the 25–29-year-olds from university regions such as W. Berlin, Giessen, Tübingen, and Freiburg (Figure 9). Migration gains in this age group are found in the large urban areas, and also – and this is a new element in the migration pattern – in parts of the Ruhr and in all areas of northwestern Germany.

Interregional migration of people aged 50 years and over remained relatively independent of economic trends in 1974/1975 (Figure 10). These age groups generally migrate from polluted urban areas, in particular W. Berlin, the Ruhr, and the area of Stuttgart, to the more beautiful areas along the coast, in the Middle Range (Mittelgebirge), and in the Alps (Koch 1976c).

The balance between in-migration and out-migration due to the interregional movement of foreigners is odd in that all those areas with net in-migration also experience heavy emigration of non-FRG citizens. Foreigners living in rural areas presumably expect better job opportunities in the urban areas, in spite of the tight labor market there. All workers, in fact, assume that better working conditions and higher incomes are available in regions with large metropolitan centers, such as Hamburg–Bremen, Düsseldorf–Cologne–Bonn, Frankfurt–

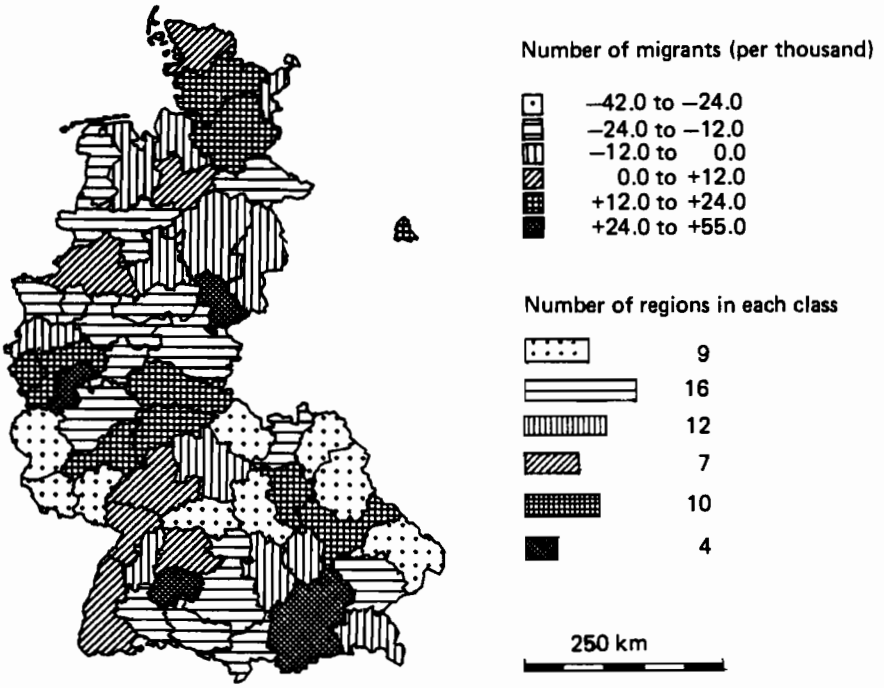

FIGURE 8 Net number of interregional migrants aged 18–24 years entering and leaving each region of the FRG in the period 1974/1975. The data are given per 1,000 people, and are taken from Koch (1977).

Wiesbaden–Mainz, Stuttgart, Nuremberg, and Munich. The attraction of Hamburg and Munich extends for a considerable distance into the neighboring regions.

On the other hand, out-migration from some weakly structured rural regions has decreased. It is very unlikely that this decrease was caused by an improvement in living and working conditions in these areas. More probably, the opportunities for employment of unskilled labor in urban areas deteriorated sufficiently during 1974 and 1975 to deter migration to these destinations. It is possible that unemployment is more easily accepted in the home area, at least by older people. In these areas the unemployment payment may be augmented by casual work, and the familiar environment provides an additional sense of security.

Though the rates of out-migration from traditional areas of out-migration and in-migration into the attractive agglomerations have slowed down, it is much too early to speak of a reverse in migration trends similar to that observed in the United States and Denmark.

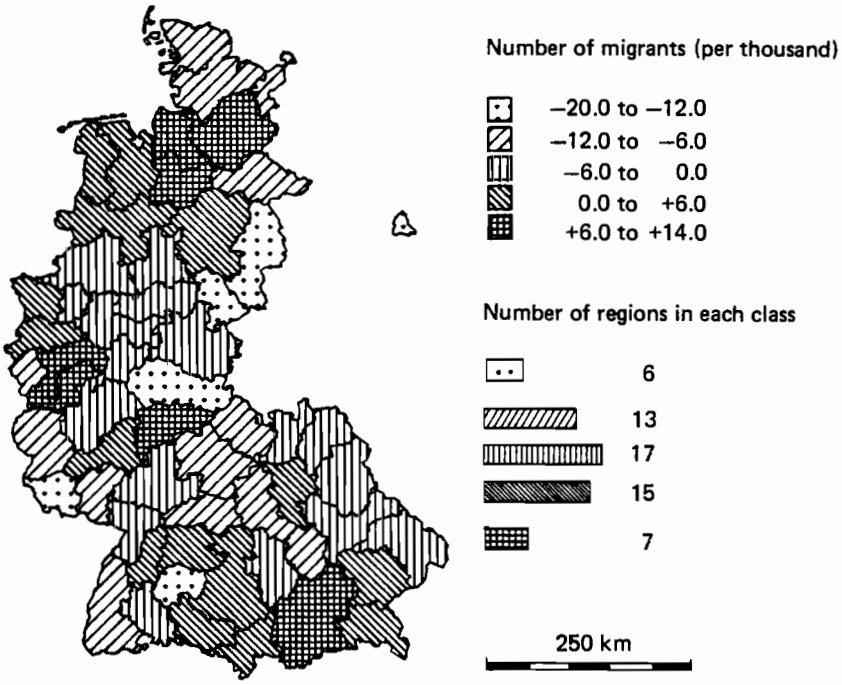

FIGURE 9 Net number of interregional migrants aged 25–29 years entering and leaving each region of the FRG in the period 1974/1975. The data are given per 1,000 people, and are taken from Koch (1977).

2.2.3 INTRAREGIONAL MIGRATION

Any discussion of intraregional migration immediately focuses on the problems of city–hinterland migration in urban areas. Intraregional migration in rural areas has so far been completely neglected in both migration research and political discussion (Koch 1977, p. 884).

The emphasis on city–hinterland migration can be traced back to the general decline of the population in the agglomerations during the early seventies (Table 5). The core cities of the urban areas are losing inhabitants both to the hinterlands and to other areas (e.g., migration into different agglomerations and

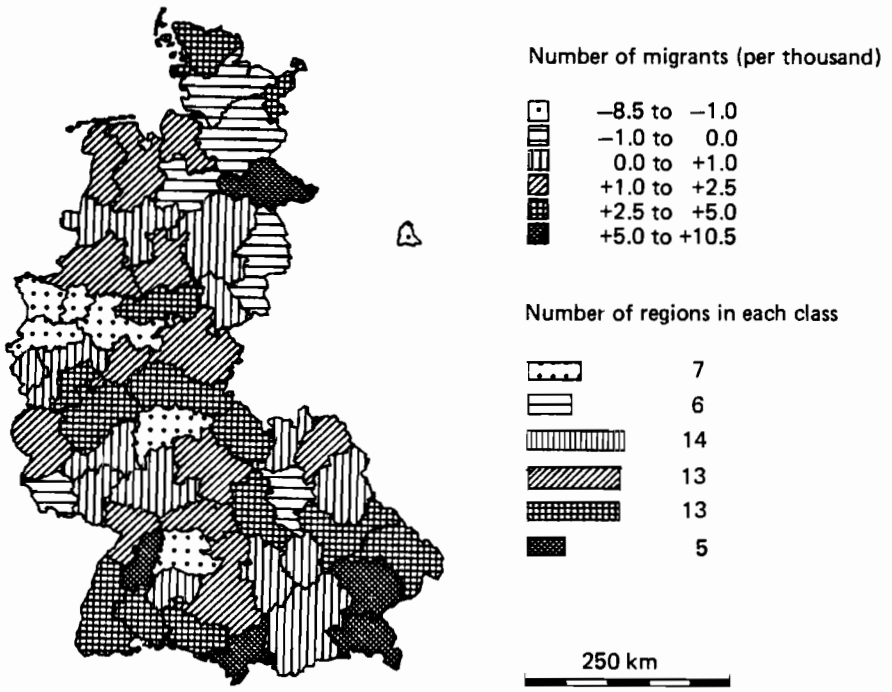

FIGURE 10 Net number of interregional migrants aged 50 years and over entering and leaving each region of the FRG in the period 1974/1975. The data are given per 1,000 people, and are taken from Koch (1977).

retirement migration). This loss can no longer be balanced by migration gains from rural areas. The negative migration balance of German citizens in some urban areas was hidden by the in-migration of foreigners.

The peripheral municipalities in the agglomerations experience a large increase in their population through migration, compared with the central city and core area. Two peripheral migration flows therefore meet in suburban areas: one direct, the other indirect. (Peripheral migration is migration from central cities of other agglomerations.) These migration flows are made up mostly of qualified employees whose origins and destinations lie in the suburbs. The shortage of suitable building area and the rising prices of land encourage the city–hinterland migration to expand still further.

TABLE 5 City–hinterland migration, 1967–1975.[a]

	1967	1968	1969	1970	1971	1972	1973	1974	1975
Net migration (absolute)									
Frankfurt–Offenbach	–11,264	–9,952	–10,817	–11,534	–14,838	–13,760	–12,901	–8,792	–7,923
Hamburg	–12,023	–11,959	–12,656	–12,787	–16,468	–16,187	–15,928	–11,907	–8,634
Munich	–4,385	–3,639	–4,872	–10,398	–13,803	–17,987	–17,060	–9,261	–4,653
Cologne	–4,715	–5,045	–5,263	–6,483	–6,501	–7,134	–8,051	–7,055	–3,332
Emden	+142	–46	–87	–51	+313		+137	+38	–145
Schweinfurt	+59	–35	–234	–223	–177		–315	+174	–192
Net migration per 10^3 people									
Frankfurt–Offenbach	–14.4	–12.8	–13.8	–14.7	–19.1	–17.5	–16.5	–11.4	–10.5
Hamburg	–6.6	–6.6	–7.0	–7.1	–9.2	–9.2	–9.1	–6.9	–5.0
Munich	–3.5	–2.8	–3.7	–7.9	–10.3	–13.4	–12.8	–7.0	–3.5
Cologne	–5.5	–5.9	–6.1	–7.6	–7.7	–8.5	–9.7	–8.5	–3.3
Emden	+3.0	–1.0	–1.8	–1.0	+6.3		+2.6	+0.7	–2.7
Schweinfurt	+1.0	–0.6	–3.9	–3.8	–3.1		–5.5	+3.1	–3.4

[a] Koch (1977).

These migration patterns lead to a form of social segregation in the urban areas. When people in the medium and higher income brackets move out, they are replaced by people on a lower income, if at all. In most cases, the process of city–hinterland migration leads to a concentration of older people in the core town, and an increase in the number of children in the hinterlands.

2.2.4 REGIONAL AGE STRUCTURE

People of working age (15–64) tend to congregate in the urban areas, while younger and older age groups are more frequently found in the peripheral rural areas (Figure 11). For example, in 1974, the ratio of dependent population (0–14

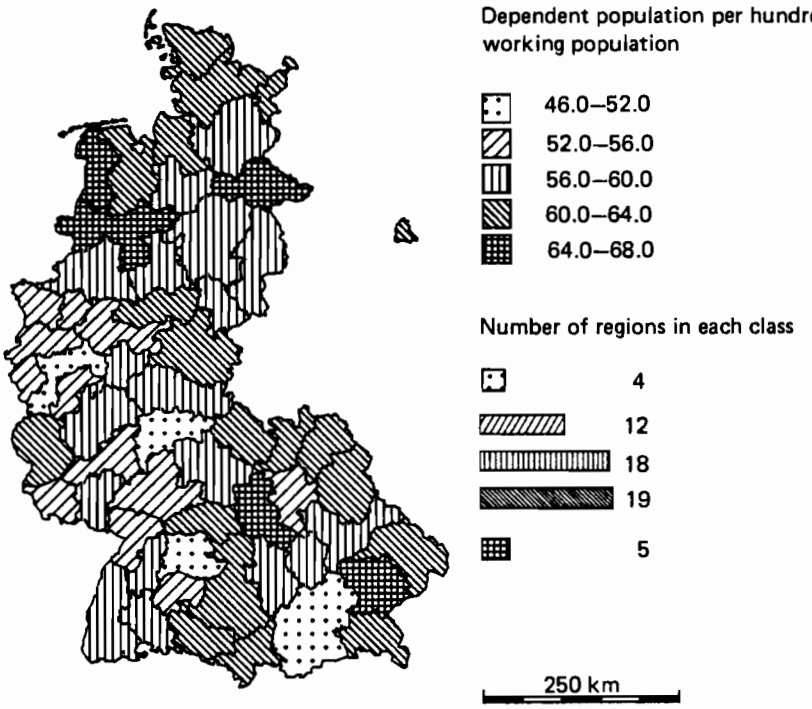

FIGURE 11 Dependency ratios (ratio of dependent population to working population) in each region of the FRG in 1974.

and 65+) to working population (15–64) in Munich was 46:100, while in the rural area of Emden this proportion was approximately 61:100. Regional peculiarities can also be found in those areas where people in specific age groups were

left behind by selective migration after the Second World War (refugees), e.g., the high proportions of those aged 64 years and over in Schleswig-Holstein and in eastern Lower Saxony. The number in the under-15 age group is significantly larger in areas with high birth rates, while in areas that have lost people of labor-force age and gained retired people through migration we find a high proportion of older people (Koch 1976c, p. 34).

The age structure of the population also varies within the regions. This is particularly noticeable within the urban areas. In the centers of these agglomerations there are a large number of single people and old people, while the majority of young couples with children live in the peripheral zones.

2.3 Population Dynamics in the Federal States

The trends in population development and our multiregional population analysis are related to the base year 1974. The regional trends described earlier are reflected in the population dynamics of the individual states, depending on how strongly each type of region is represented. For instance, the states of Hamburg and Bremen are cities just like Munich and Frankfurt, and the population-related problems which face them are therefore very similar. This must be taken into account in a comparison of the urban states with the other eight states, which are composed of zones of varying structure.

States containing regions with high birth rates in 1974 also registered high crude birth rates. In Baden-Württemberg, for instance, the high birth rate may be largely attributed to the considerable proportion of babies born to foreign residents (24 percent).

There is only a slight variation in age-specific fertility rates among the states (Figure 12). A low fertility level and relatively high average age of the mother at birth are typically found in the urban states. As age-specific fertility rates vary only slightly, the age structure of the population plays an important role in the spatial variation of birth totals.

The crude death rate (around 12 per thousand) is similar in all the states except Hamburg and Bremen, so that differences in natural population growth are produced mainly by differing birth rates (Figure 13). There were more deaths than births in all states except Baden-Württemberg, the difference being greatest in Saarland.

The emigration of foreign workers associated with the recession that started in 1974 had more impact in some states than in others. The migration loss in both absolute and relative terms was highest in Baden-Württemberg, because this state, after North Rhine-Westphalia, had the greatest share of foreigners (22 percent). However, North Rhine-Westphalia experienced a net gain through migration in 1974. This may be explained by sectoral differences in the impact of the recession.

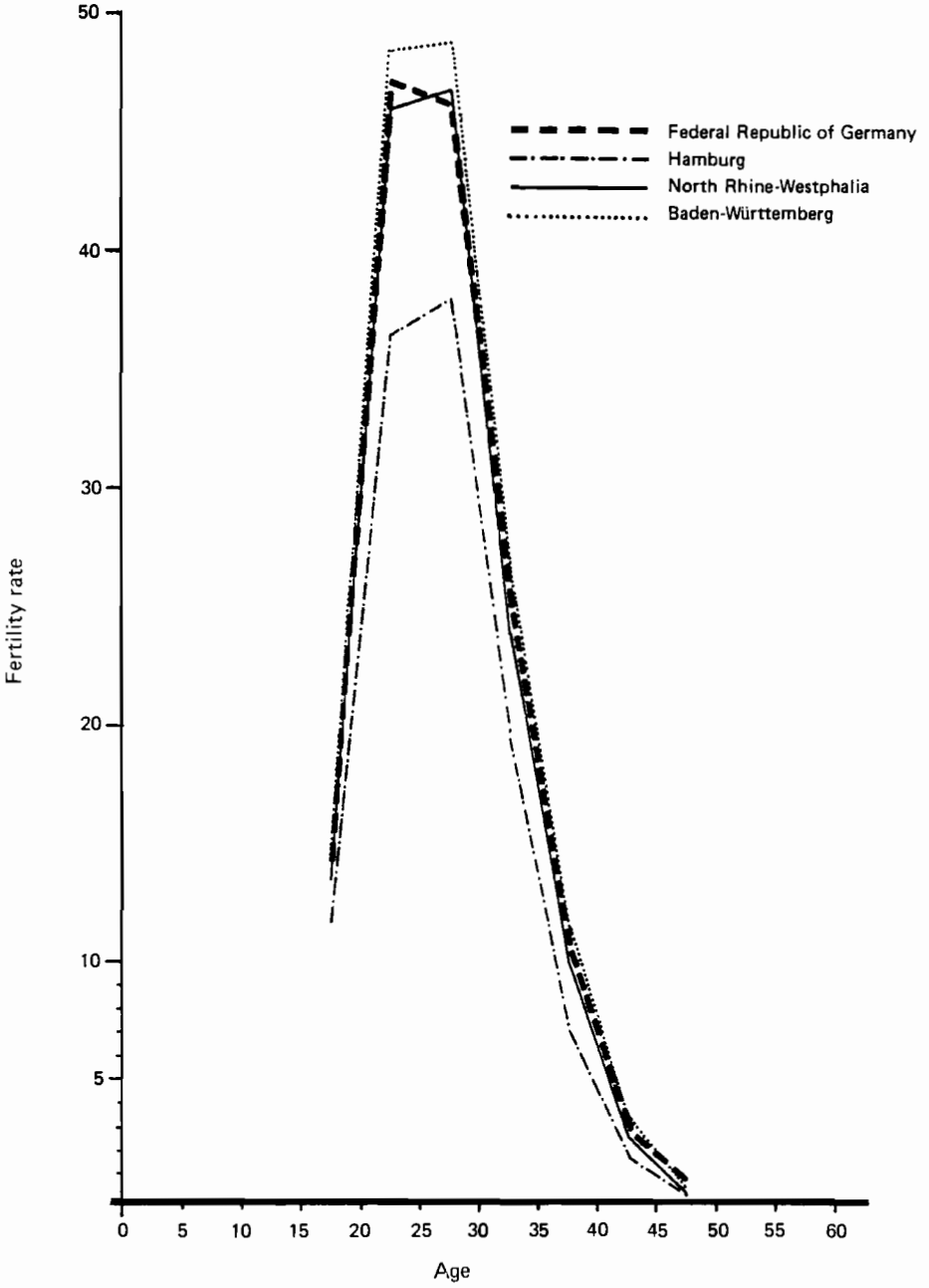

FIGURE 12 Age-specific fertility rates (number of live births per 1,000 women) in the FRG and selected states in 1974.

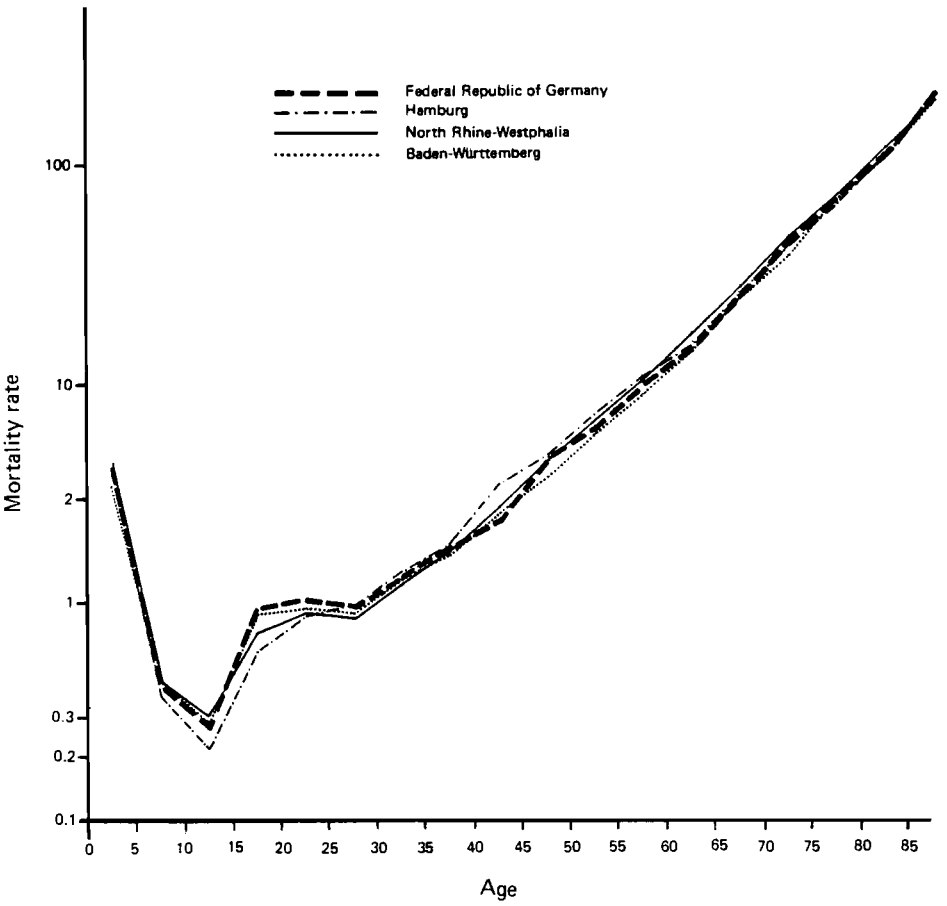

FIGURE 13 Age-specific mortality rates (number of deaths per 1,000 people) in the FRG and selected states in 1974.

One of the most prominent characteristics of internal migration between states after 1961 was a clear flow from Lower Saxony to Hesse, Baden-Württemberg, and Bavaria. Combining the states into three groups – North, Central, and South (Table 6) – the southern states (Baden-Württemberg and Bavaria) gained in population through migration from the northern and central states in 1974. The northern states also showed a positive migration balance, while the central states experienced migration losses. Between 1970 and 1974, North Rhine-Westphalia lost some 81,000 people through migration to other states, Bavaria making the largest migration gains (100,000 people). Thus there is evidence of a remarkable flow of migrants to the south.

TABLE 6 Net interstate migration in 1974 ($\times 10^3$).

	Destination		
Origin	North	Central	South
North		−6	+2
Central	+6		+14
South	−2	−14	
Total	+4	−20	+16

The out-migration rates show the greatest regional variation among people aged between 15 and 30 years (Figure 14). There is hardly any propensity for these people to migrate if they live in the urban states, where a wide range of educational and training opportunities is offered. The tendency to migrate is much greater in states with a large share of structurally weak regions: many of the young people migrate to another state in search of training or better job opportunities. The high out-migration rates observed for Baden-Württemberg, which has a positive balance of migration overall, demonstrate the relatively large fluctuations in migratory behavior.

There is little variation in the age structure of the population among the states (Figure 15), although the more industrialized states have a larger proportion of the population of labor-force age than the predominantly rural states. In Baden-Württemberg and North Rhine-Westphalia, the working population contains a large proportion of foreigners. Urban states (Hamburg and Bremen) are characterized by the fact that a large proportion of the population is over 65 years of age.

3 MULTIREGIONAL POPULATION ANALYSIS

3.1 Preparation of Data

The preparation of the data on population and its natural increase caused no major problems, since previously prepared computer data could be used. The data were mainly collected under the "Law Concerning Statistics on Population Movements and Population Register" of 4 July 1957 (Bundesgesetzblatt 1957, p. 694). In this case the data for marriages, births, deaths, and divorces are derived from the counting cards. These are filled out by an officer when certifying the event. The births are related to the mother's place of residence. The counting cards are collected by the local authorities and are then given to the statistical offices of the states, who in some cases also provide data on magnetic tapes for further analysis. There is a preliminary computation and publication at the

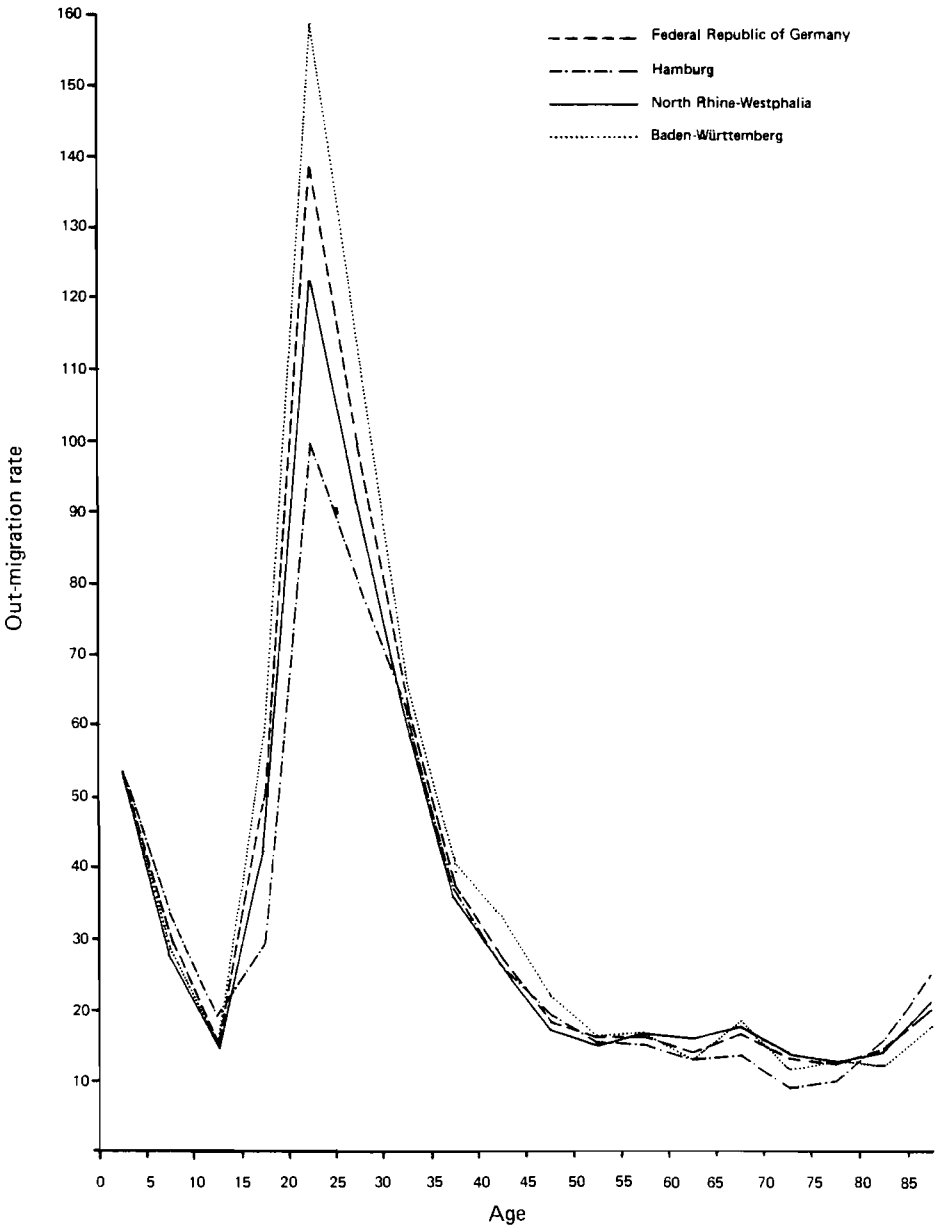

FIGURE 14 Age-specific out-migration rates (number of out-migrants per 1,000 people) in the FRG and selected states in 1974.

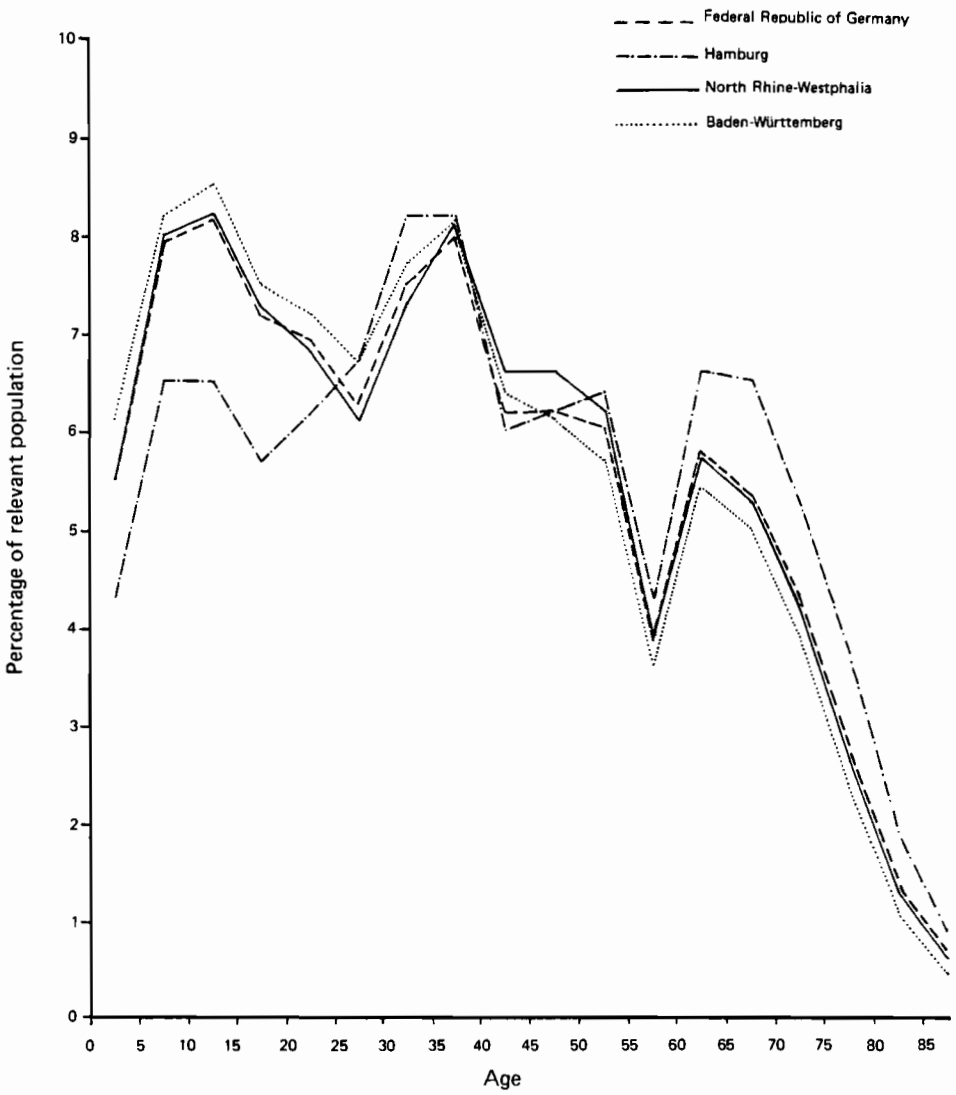

FIGURE 15 Age structure of the population of the FRG and selected states in 1974.

state level, and a subsequent analysis at the federal level by the Federal Statistical Office.

The basic population data were taken from the population register of 31 December 1974, and were divided into 5-year age groups. For each state, the data were disaggregated by age for groups up to and including the 60–64 year group. The 65+ age group in each individual state was then disaggregated into

5-year age groups (65–69, 70–74, 75–79, 80–84, and 85+) in accordance with the age structure of the national population.

The number of live births, categorized by age of mother, was also taken from the population register of 1974. Because of errors in the crude data, the values for Lower Saxony had to be estimated by distributing the known number of total births among mothers in different age groups in the same proportions as found in 1973.

Because the data on deaths were taken from the state statistics, there were some problems involving indirect estimation of missing data:

- Age groups wider than 5 years were disaggregated on the basis of the age distribution of deaths in the whole country.
- The age-specific death rates for Hamburg were used to derive the number of deaths for each age group in Bremen.
- When data were available for 1975, the age-specific death rates for 1974 and 1975 were used to compute the number of deaths in 1974.

Migration statistics are also included in the population register. Since 1950, changes of place of residence have been registered in the FRG. The register contains data on internal and international migrations; moves within communities are not counted. The registration forms for immigration and emigration are used to register international migrations. For migration within the FRG, only the in-migration registration forms were used, because they contain more reliable information concerning the origin and destination of migrants than the out-migration forms.

The collected data are then computed into standard tables by the statistical office of each state. These tables contain information on in- and out-migration at the district level, arranged as follows:

- Total number of migrations
- Migration of foreigners
- Migration of workers
- Migration of people in each of six age groups

At the state level family status is taken into account and the data are disaggregated into 1-year age groups. Data on migration at the district level are available 1–2 years after the reference period. Information with a minor degree of disaggregation is available at higher levels 6 months later.

The tables of migration flows produced by the statistical offices of the states on the district level were used as basic input to investigate interstate migration. The data at the state level were aggregated by sex. Because the age-group breakdown of the Statistical Office did not meet the requirements of the multiregional demographic model, the data for 1-year age groups were aggregated to produce data for specific 5-year age groups.

The input data for the multiregional population analysis obtained in this way were compared with published statistical records. The deviations in the data for births and deaths were only 0.2 percent: these were probably caused by rounding errors. The migration data were identical.

3.2 Multiregional Life Table

Life tables are the oldest models in demographic analysis. They are designed to provide an answer to the question: how would the present mortality regime determine the probability of survival of a hypothetical cohort? Or, expressed differently: how would a hypothetical generation diminish if it were subject to an observed regime of age-specific mortality? Such life tables are obtained on the basis of mortality rates observed over a given period and trace the survival pattern and average expectation of life of an individual.

The multiregional life table also includes the demographic phenomenon of migration. Observed mortality and migration patterns are applied to a cohort of people to answer the question: how would a hypothetical generation in a given region be reduced by mortality and out-migration if it were subject to an observed regime of age-specific mortality and out-migration probabilities? (Rogers 1975, Willekens and Rogers 1978.)

The conventional life table is thus extended by including migration to provide a multiregional life table which contains considerably more detailed information. Multiregional life tables are very useful for comparing the mortality and migration patterns of various populations.

The following life table statistics are of particular interest:

- Life expectancy (expectation of life)
- Survivorship proportions
- Expected number of survivors in any one region at any specific age

These statistics will be examined in detail using the results from the multiregional demographic model adopted by IIASA.

The data required to construct the multiregional life table are the age-specific death and out-migration probabilities. In the FRG, there are only slight regional differences in mortality, e.g., the probabilities for the 20–24 age group range from 0.0009 (Bremen) to 0.0011 (Schleswig-Holstein), a difference of only 0.0002. However, there is a much wider variation in migration probabilities, e.g., in the 20–24 age group, the probability of a person migrating from Bremen to Bavaria (0.0053) is 16 times higher than that of a person migrating from Bavaria to Bremen (0.0003).

These regional variations can be attributed primarily to the differences in size and structure of the states. There are about 725,000 inhabitants in Bremen, and about 10,850,000 in Bavaria. The opportunities for training and prospects

of employment for a young person in Bavaria are much better than those in Bremen, which explains why proportionately more natives of Bremen than Bavaria out-migrate between the ages of 20 and 24 years.

A comprehensive index of the life history of a birth cohort is given by the expectation of life (Table 7). The last column of Table 7 gives the expectation of life of a person born in a specific state.

First, we are interested in the number of years spent in the region of birth, and the number of years spent elsewhere. Someone born in Bremen, for instance, is likely to spend only 19 years of his 72-year lifetime in Bremen, while someone born in Bavaria is likely to spend some two-thirds or 50 years of his lifetime there. A person born in Bremen will most probably spend 23 years in Lower Saxony, but only 4 years in Bavaria. Someone born in Bavaria, on the other hand, is expected to spend 22 years outside Bavaria, 7 of those years in Baden-Württemberg, but only 0.2 years in Bremen.

We are interested not only in the expectation of life at birth, but also in the expectation of life remaining at each age. This is shown for 20-year-olds in Table 8. Members of this age group will generally expect to live a further 54 years. A person born in North Rhine-Westphalia and still alive at exact age 20, will probably spend 32 of the next 54 years in North Rhine-Westphalia, 5 years in Lower Saxony, 4 years in Bavaria, and so on. A person born in Lower Saxony, however, will spend only 24 years in Lower Saxony, 10 years in North Rhine-Westphalia, 4 years in Bavaria, and so on.

Another life table statistic of interest is the survivorship proportion. This denotes the proportion of the life table population in age group x to $x + 4$ in a given region i that will survive and live in region j five years later. There are considerable variations in survivorship proportions among the states. The proportion of people aged 20–24 years living in Hamburg that will survive another 5 years is 0.99520 (Table 9). About 63.1 percent of these will still be in Hamburg 5 years later, while 3.8 percent will be living in North Rhine-Westphalia. The proportion of people aged 20–24 years living in North Rhine-Westphalia that will survive another 5 years is 0.99539 (Table 9). About 86 percent of these will still be living in the same state five years later, while only 0.5 percent are likely to be living in Hamburg.

Life table statistics can be useful in many practical situations. In educational planning, for example, one would like to know how many of a group of newborn babies are likely to enrol for school in a given region 6 years later. The statistic required is the *expected number of persons reaching a specific age x in this region.* For instance, of every 100,000 babies born in Hamburg, only 75,265 will reach the age of 5 in Hamburg (Table 10). In contrast, 92,049 out of every 100,000 born in North Rhine-Westphalia will reach the age of 5 in their region of birth (Table 10). Of every 100,000 born in Hamburg, 1,772 will reach the 5–9 age group in North Rhine-Westphalia, but only 131 of every 100,000 native North Rhine-Westphalians will reach the same age in Hamburg.

TABLE 7 Expectation of life at birth, disaggregated by region of residence and region of birth for both sexes.

Region of birth	Number of years lived in each region											Total (years)
	1	2	3	4	5	6	7	8	9	10	11	
1 Schleswig-Holstein	33.1	6.2	9.0	0.9	8.6	3.0	1.4	3.9	4.2	0.3	1.4	72.0
2 Hamburg	13.1	23.8	12.3	1.0	8.1	3.0	1.3	3.8	4.2	0.2	1.3	72.0
3 Lower Saxony	3.2	2.2	40.1	1.7	10.7	3.3	1.4	3.7	3.8	0.2	1.3	71.7
4 Bremen	3.8	2.1	22.6	19.5	9.6	3.3	1.4	3.9	4.0	0.2	1.3	71.9
5 N. Rhine-Westphalia	1.5	0.8	5.0	0.4	49.4	3.3	2.3	3.9	4.0	0.3	0.9	71.7
6 Hesse	1.3	0.8	4.0	0.4	8.7	38.6	3.6	6.5	6.6	0.5	1.0	72.1
7 Rhineland-Palatinate	1.1	0.6	3.1	0.3	11.4	6.9	32.4	7.8	5.4	1.7	0.9	71.8
8 Baden-Württemburg	1.1	0.6	2.8	0.3	6.1	4.1	2.7	44.4	8.8	0.5	0.9	72.3
9 Bavaria	0.9	0.5	2.3	0.2	5.1	3.2	1.5	7.0	50.0	0.3	0.8	72.0
10 Saarland	1.1	0.5	2.4	0.2	7.8	4.6	7.7	7.3	5.0	33.9	0.8	71.4
11 W. Berlin	2.8	1.4	7.5	0.6	9.7	4.4	1.9	5.8	7.2	0.4	29.9	71.6

TABLE 8 Expectation of life at exact age 20, disaggregated by region of residence and region of birth for both sexes.

Region of birth	Number of years lived in each region											Total (years)
	1	2	3	4	5	6	7	8	9	10	11	
1 Schleswig-Holstein	17.2	5.4	8.5	0.8	8.2	2.8	1.4	3.8	4.1	0.3	1.3	53.8
2 Hamburg	10.7	10.5	10.8	0.9	7.9	3.0	1.3	3.7	4.1	0.2	1.3	53.8
3 Lower Saxony	3.1	2.0	23.6	1.5	10.3	3.1	1.4	3.7	3.8	0.2	1.3	53.8
4 Bremen	3.6	2.0	18.7	6.5	9.3	3.2	1.4	3.8	3.9	0.2	1.3	53.8
5 N. Rhine-Westphalia	1.4	0.8	4.7	0.4	32.4	3.1	2.2	3.7	3.9	0.3	0.9	53.8
6 Hesse	1.3	0.7	3.8	0.3	8.3	22.3	3.3	6.2	6.3	0.5	1.0	54.0
7 Rhineland-Palatinate	1.1	0.6	3.0	0.3	10.8	5.4	16.5	7.5	5.2	1.6	0.9	53.9
8 Baden-Württemberg	1.0	0.6	2.7	0.3	6.0	3.9	2.6	27.4	8.4	0.5	0.9	54.2
9 Bavaria	0.9	0.5	2.3	0.2	5.0	3.1	1.4	6.7	32.8	0.3	0.8	54.1
10 Saarland	1.1	0.5	2.4	0.2	7.7	4.5	7.0	7.1	4.9	17.5	0.8	53.7
11 W. Berlin	2.5	1.3	6.8	0.6	9.2	4.0	1.8	5.5	6.7	0.4	14.9	53.6

It is important to realize that the multiregional life tables are limited by the assumptions implicit in the model used to produce them. Initially, it appears that a great deal of information is computed: present and past data pertaining to migration and death, for population groups disaggregated by age and sex, as well as for regional cohorts. The volume of information is immediately reduced by computing the probabilities of death and migration, assuming that all people living in a certain region have the same probabilities of dying and out-migrating, independent of their previous life history. It is also assumed that within the time interval studied there are no return migrations and that migrants do not die as well as migrate.

3.3 Multiregional Population Projection

Multiregional population projections are a key component of the IIASA comparative migration and settlement study. The results of these projections illustrate the effects of current (in our case those of 1974) fertility, mortality, and mobility rates on regional population dynamics. Note that only internal migration is taken into account and that the system is closed to international migration. To evaluate the long-term effects, multiregional population projections are carried out under the assumptions of constant regional age-specific fertility and mortality conditions, as well as constant age-specific migration rates. Although the assumptions may be unrealistic, the results of such status quo projections are important in that they highlight regional demographic problems that may develop should the present demographic regime continue unchanged.

We shall briefly discuss some interesting points arising from the projection. A comparison between the present (1974) situation and that projected for 1999 (Tables 11 and 12) is of especial interest. According to our study, if the current demographic rates continue unchanged, the population of the FRG will have decreased by 4 million by 1999, i.e., by more than 6.5 percent. The greatest population decline is to be expected for the urban states of Hamburg (−21.6 percent) and Bremen (−15.9 percent), and for W. Berlin (−27.1 percent), as well as for the states of Rhineland-Palatinate (−11.1 percent), and Saarland (−22.3 percent). The remarkable decline in the population of the urban states can be attributed mainly to the current phenomenon of city–hinterland migration, which comes into the category of intraregional migration in the other states and therefore does not appear in the interstate migration data.

The smallest population decline is expected to occur in the southern German states of Baden-Württemberg (−1.3 percent) and Bavaria (−2.2 percent). These developments, in the long run, would bring about a noticeable spatial redistribution of the population. In 1974, some 32.4 percent of the total population lived in the southern states of Baden-Württemberg and Bavaria; in 1999, if conditions remained the same, 34 percent of the population would live in these

TABLE 9 Survivorship proportions.

Age	Total	Region of residence										
		Sch.-Hl.	Hamburg	L. Sax.	Bremen	N.Rh.-W.	Hesse	Rh.-Pal.	Bad.-W.	Bavaria	Saarland	W.Berlin
Initial region: Hamburg												
0	0.98863	0.09467	0.79250	0.05983	0.00243	0.01468	0.00613	0.00186	0.00663	0.00743	0.00026	0.00222
5	0.99845	0.06105	0.87325	0.03819	0.00152	0.00910	0.00386	0.00114	0.00415	0.00463	0.00018	0.00138
10	0.99785	0.05180	0.88558	0.03255	0.00181	0.00908	0.00409	0.00113	0.00443	0.00492	0.00021	0.00225
15	0.99610	0.09926	0.74679	0.06592	0.00551	0.02547	0.01201	0.00334	0.01328	0.01475	0.00076	0.00901
20	0.99520	0.14710	0.63092	0.09353	0.00898	0.03786	0.01797	0.00459	0.01924	0.02168	0.00126	0.01207
25	0.99392	0.12307	0.69139	0.07784	0.00745	0.03390	0.01482	0.00395	0.01536	0.01733	0.00104	0.00777
30	0.99165	0.09727	0.76869	0.05895	0.00420	0.02274	0.00993	0.00298	0.00988	0.01174	0.00048	0.00480
35	0.98676	0.06354	0.84257	0.03812	0.00272	0.01442	0.00635	0.00189	0.00625	0.00751	0.00032	0.00308
40	0.97901	0.04644	0.87446	0.02781	0.00194	0.01024	0.00458	0.00134	0.00446	0.00534	0.00021	0.00219
45	0.96932	0.03587	0.89044	0.02259	0.00124	0.00645	0.00322	0.00091	0.00328	0.00386	0.00013	0.00133
50	0.95417	0.03309	0.88298	0.02221	0.00085	0.00454	0.00266	0.00072	0.00287	0.00326	0.00013	0.00086
55	0.93317	0.02995	0.86912	0.01996	0.00074	0.00405	0.00237	0.00063	0.00255	0.00291	0.00012	0.00077
60	0.89353	0.02595	0.83891	0.01615	0.00060	0.00365	0.00213	0.00059	0.00221	0.00260	0.00013	0.00060
65	0.83172	0.02233	0.78599	0.01263	0.00046	0.00320	0.00186	0.00057	0.00186	0.00225	0.00012	0.00046
70	0.75221	0.01836	0.71508	0.01010	0.00038	0.00261	0.00147	0.00045	0.00145	0.00181	0.00009	0.00041
75	0.63421	0.01897	0.59599	0.01032	0.00042	0.00272	0.00146	0.00049	0.00146	0.00188	0.00009	0.00041
80	0.63551	0.04320	0.54159	0.02712	0.00114	0.00757	0.00354	0.00135	0.00390	0.00487	0.00025	0.00097

Initial region: North Rhine-Westphalia

0	0.98697	0.00295	0.00105	0.01217	0.00064	0.94174	0.00679	0.00680	0.00647	0.00623	0.00046	0.00166
5	0.99810	0.00168	0.00060	0.00695	0.00037	0.97234	0.00387	0.00389	0.00367	0.00353	0.00026	0.00096
10	0.99728	0.00256	0.00101	0.00925	0.00060	0.96253	0.00509	0.00438	0.00500	0.00469	0.00035	0.00184
15	0.99573	0.00798	0.00341	0.02552	0.00194	0.89668	0.01415	0.01043	0.01455	0.01357	0.00100	0.00651
20	0.99539	0.00967	0.00503	0.03325	0.00294	0.86151	0.01961	0.01409	0.02053	0.01909	0.00141	0.00825
25	0.99466	0.00530	0.00382	0.02173	0.00223	0.89835	0.01479	0.01123	0.01609	0.01515	0.00104	0.00493
30	0.99251	0.00346	0.00238	0.01381	0.00129	0.93027	0.00951	0.00816	0.01026	0.01002	0.00061	0.00275
35	0.98859	0.00227	0.00158	0.00916	0.00086	0.94742	0.00628	0.00544	0.00675	0.00662	0.00040	0.00182
40	0.98156	0.00160	0.00112	0.00649	0.00061	0.95244	0.00447	0.00386	0.00477	0.00464	0.00028	0.00128
45	0.97112	0.00135	0.00065	0.00497	0.00038	0.94825	0.00340	0.00378	0.00359	0.00373	0.00020	0.00082
50	0.95581	0.00148	0.00043	0.00492	0.00029	0.93249	0.00334	0.00464	0.00351	0.00387	0.00018	0.00065
55	0.93085	0.00144	0.00040	0.00471	0.00028	0.90853	0.00319	0.00443	0.00337	0.00369	0.00017	0.00063
60	0.88816	0.00122	0.00039	0.00454	0.00024	0.86708	0.00317	0.00422	0.00316	0.00333	0.00018	0.00063
65	0.82206	0.00092	0.00036	0.00404	0.00019	0.80386	0.00288	0.00364	0.00270	0.00270	0.00017	0.00060
70	0.73158	0.00069	0.00028	0.00301	0.00014	0.71812	0.00215	0.00265	0.00199	0.00198	0.00012	0.00047
75	0.61196	0.00060	0.00024	0.00263	0.00012	0.60029	0.00186	0.00227	0.00173	0.00171	0.00010	0.00041
80	0.64882	0.00125	0.00052	0.00605	0.00027	0.62300	0.00391	0.00492	0.00391	0.00390	0.00026	0.00084

TABLE 10 Expected number of survivors at exact age x in each region.

		Region of residence										
Age	Total	Sch.-Hl.	Hamburg	L. Sax.	Bremen	N.Rh.-W.	Hesse	Rh.-Pal.	Bad.-W.	Bavaria	Saarland	W.Berlin
Initial region of cohort: Hamburg												
0	100,000	0	100,000	0	0	0	0	0	0	0	0	0
5	97,944	10,761	75,265	6,915	290	1,772	728	229	797	890	30	267
10	97,748	15,517	64,020	10,265	451	2,841	1,146	379	1,259	1,399	56	414
15	97,626	17,792	58,200	11,997	541	3,464	1,382	465	1,528	1,693	71	492
20	97,258	19,134	51,094	13,656	780	4,754	1,863	636	2,101	2,309	109	823
25	96,763	20,577	33,316	17,213	1,446	8,816	3,430	1,215	4,058	4,383	242	2,067
30	96,276	19,861	24,453	18,323	1,770	11,785	4,466	1,624	5,393	5,863	349	2,388
35	95,620	19,425	19,240	19,062	1,709	13,537	4,985	1,938	6,159	6,730	385	2,449
40	94,726	19,005	16,769	19,205	1,672	14,322	5,177	2,110	6,488	7,148	409	2,422
45	93,387	18,527	15,053	19,119	1,636	14,728	5,251	2,230	6,633	7,432	425	2,351
50	91,132	17,824	13,830	18,843	1,588	14,779	5,243	2,274	6,649	7,448	429	2,225
55	87,941	17,066	12,602	18,371	1,508	14,380	5,170	2,301	6,588	7,446	426	2,082
60	83,388	16,053	11,293	17,553	1,408	13,705	5,032	2,290	6,420	7,320	414	1,899
65	77,022	14,927	9,940	16,337	1,281	12,577	4,730	2,179	6,059	6,934	377	1,681
70	66,640	12,829	8,225	14,107	1,097	10,887	4,177	1,964	5,393	6,222	334	1,404
75	52,457	10,004	6,323	11,057	862	8,551	3,343	1,583	4,378	5,008	264	1,084
80	36,015	6,948	4,269	7,560	595	5,800	2,333	1,090	3,067	3,436	167	750
85	19,231	3,811	2,175	4,054	311	3,085	1,239	579	1,688	1,835	76	379

Initial region of cohort: North Rhine-Westphalia

0	100,000	0	0	0	0	100,000	0	0	0	0	0	0
5	97,645	366	131	1,499	80	92,049	840	833	808	778	58	204
10	97,431	560	200	2,270	122	88,911	1,275	1,248	1,245	1,206	92	302
15	97,277	664	236	2,679	145	87,195	1,509	1,457	1,488	1,444	111	350
20	96,893	985	404	3,707	236	82,597	2,125	1,838	2,149	2,080	162	612
25	96,428	1,917	908	6,275	499	70,628	3,783	2,697	4,047	3,897	305	1,473
30	95,980	2,198	1,315	7,350	693	63,583	4,837	3,121	5,430	5,300	413	1,740
35	95,368	2,398	1,421	7,969	710	59,434	5,325	3,466	6,227	6,181	454	1,783
40	94,511	2,517	1,465	8,286	723	56,841	5,524	3,652	6,599	6,644	483	1,777
45	93,219	2,588	1,479	8,456	729	54,596	5,606	3,775	6,779	6,970	501	1,740
50	91,057	2,578	1,464	8,458	719	52,475	5,591	3,791	6,805	7,014	506	1,654
55	87,928	2,558	1,389	8,362	690	49,671	5,527	3,846	6,769	7,066	503	1,546
60	83,365	2,496	1,298	8,110	652	46,055	5,394	3,837	6,624	6,998	491	1,410
65	76,577	2,395	1,184	7,656	600	41,329	5,093	3,664	6,281	6,677	448	1,250
70	66,145	2,118	1,020	6,736	519	34,821	4,525	3,311	5,614	6,029	400	1,052
75	51,855	1,687	810	5,350	411	26,728	3,633	2,666	4,566	4,871	318	815
80	35,136	1,195	565	3,700	285	17,702	2,540	1,831	3,201	3,350	201	565
85	18,494	670	299	2,005	150	9,125	1,349	966	1,761	1,792	92	286

TABLE 11 Population of the FRG in 1974, disaggregated by age and region.

		Region of residence										
Age	Total	Sch.-Hl.	Hamburg	L. Sax.	Bremen	N.Rh.-W.	Hesse	Rh.-Pal.	Bad.-W.	Bavaria	Saarland	W.Berlin
Number of people												
0	3,493,458	150,080	73,689	440,401	36,612	953,634	304,544	203,732	560,734	622,087	55,407	92,538
5	4,936,305	222,645	112,132	620,656	54,660	1,373,715	422,479	304,307	762,596	859,649	85,507	117,959
10	5,054,872	212,998	113,758	618,954	54,519	1,409,932	433,138	318,372	782,911	897,980	99,368	112,942
15	4,458,872	172,737	99,070	526,355	47,766	1,270,184	383,427	290,300	690,698	791,428	91,887	95,020
20	4,275,050	172,402	105,872	487,288	46,634	1,171,940	390,530	264,842	660,811	756,406	80,706	137,619
25	3,928,871	162,219	116,739	427,742	46,902	1,059,775	380,080	198,401	612,639	719,981	62,787	141,606
30	4,641,743	199,148	142,292	516,783	55,628	1,261,206	430,684	256,762	712,028	817,157	72,157	177,898
35	4,905,239	210,230	141,905	561,600	57,094	1,388,237	442,623	268,434	750,974	844,351	86,524	153,267
40	3,880,997	146,894	103,434	432,789	42,731	1,139,355	347,676	233,425	591,296	666,340	71,077	105,980
45	3,865,118	143,540	107,578	437,986	43,841	1,141,857	354,608	235,546	561,860	661,342	72,585	104,375
50	3,738,355	147,572	111,082	428,397	45,756	1,066,922	348,693	223,448	528,636	657,719	72,459	107,671
55	2,391,856	97,830	74,395	274,663	30,701	678,320	212,382	150,317	328,008	414,172	43,520	87,548
60	3,565,237	150,089	114,314	423,024	46,350	972,036	319,044	212,096	496,175	621,236	62,529	148,344
65	3,318,357	140,302	112,396	389,019	42,894	899,124	301,146	300,384	453,165	565,673	58,549	155,705
70	2,611,503	113,480	90,498	312,208	32,700	694,629	237,565	157,436	349,589	452,208	44,821	126,369
75	1,651,539	80,019	64,379	206,924	22,031	414,677	150,533	95,555	216,092	282,039	24,453	94,837
80	855,577	41,360	33,460	106,965	11,428	215,021	77,806	49,376	111,814	145,972	12,635	49,740
85	430,044	20,798	16,809	53,785	5,743	108,059	39,124	24,828	56,213	73,383	6,354	24,948
Total	62,003,000	2,584,343	1,733,802	7,265,539	723,990	17,218,626	5,576,082	3,687,561	9,226,239	10,849,123	1,103,325	2,034,366

Percentage distribution												
0	5.63	5.81	4.25	6.06	5.06	5.54	5.46	5.52	6.08	5.73	5.02	4.55
5	7.96	8.62	6.47	8.54	7.55	7.98	7.58	8.25	8.27	7.92	7.75	5.80
10	8.15	8.24	6.56	8.52	7.53	8.19	7.77	8.63	8.49	8.28	9.01	5.55
15	7.19	6.68	5.71	7.24	6.60	7.38	6.88	7.87	7.49	7.29	8.33	4.67
20	6.89	6.67	6.11	6.71	6.44	6.81	7.00	7.18	7.16	6.97	7.31	6.76
25	6.34	6.28	6.73	5.89	6.48	6.15	6.82	5.38	6.64	6.64	5.69	6.96
30	7.49	7.71	8.21	7.11	7.68	7.32	7.72	6.96	7.72	7.53	6.54	8.74
35	7.91	8.13	8.18	7.73	7.89	8.06	7.94	7.28	8.14	7.78	7.84	7.53
40	6.26	5.68	5.97	5.96	5.90	6.62	6.24	6.33	6.41	6.14	6.44	5.21
45	6.23	5.55	6.20	6.03	6.06	6.63	6.36	6.39	6.09	6.10	6.58	5.13
50	6.03	5.71	6.41	5.90	6.32	6.20	6.25	6.06	5.73	6.06	6.57	5.29
55	3.86	3.79	4.29	3.78	4.24	3.94	3.81	4.08	3.56	3.82	3.94	4.30
60	5.75	5.81	6.59	5.82	6.40	5.65	5.72	5.75	5.38	5.73	5.67	7.29
65	5.35	5.43	6.48	5.35	5.92	5.22	5.40	5.43	4.91	5.21	5.31	7.65
70	4.21	4.39	5.22	4.30	4.52	4.03	4.26	4.27	3.79	4.17	4.06	6.21
75	2.66	3.10	3.71	2.85	3.04	2.41	2.70	2.59	2.34	2.60	2.22	4.66
80	1.38	1.60	1.93	1.47	1.58	1.25	1.40	1.34	1.21	1.35	1.15	2.44
85	0.69	0.80	0.97	0.74	0.79	0.63	0.70	0.67	0.61	0.68	0.58	1.23
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Mean age	36.7837	36.9038	40.2859	36.5656	38.2444	36.5832	37.1277	36.6118	35.5812	36.5294	36.3813	41.9978
Share	100.0000	4.1681	2.7963	11.7180	1.1677	27.7706	8.9932	5.9474	14.8803	17.4977	1.7795	3.2811

TABLE 12 Multiregional population projection for 1999, disaggregated by age and region.

		Region of residence										
Age	Total	Sch.-Hl.	Hamburg	L. Sax.	Bremen	N.Rh.-W.	Hesse	Rh.-Pal.	Bad.-W.	Bavaria	Saarland	W.Berlin
Number of people												
0	2,852,942	121,947	52,852	383,096	27,866	752,541	251,603	154,770	475,101	531,640	35,096	66,430
5	3,166,350	138,620	57,603	423,869	30,469	840,082	279,873	177,442	521,406	585,796	41,210	69,980
10	3,300,433	144,411	58,783	437,187	31,436	879,735	292,084	189,955	540,121	610,267	45,887	70,567
15	3,196,011	137,202	59,655	414,097	30,952	853,869	285,329	184,205	520,559	592,738	45,995	71,409
20	3,068,780	130,357	66,394	381,159	31,998	813,292	282,577	169,148	497,446	571,275	42,650	82,484
25	3,400,684	146,068	84,331	409,619	38,690	910,147	322,124	179,164	542,940	623,513	44,883	99,204
30	4,836,471	210,661	127,501	576,667	55,754	1,326,405	458,649	255,675	753,370	871,386	64,476	135,928
35	4,922,985	209,617	124,754	579,115	53,518	1,356,627	465,665	265,226	768,644	898,555	68,664	132,600
40	4,308,124	179,055	104,602	500,629	45,387	1,202,433	405,124	240,369	669,826	787,654	62,632	110,413
45	4,074,932	173,015	99,468	474,647	42,495	1,122,467	386,582	230,900	629,445	743,066	59,790	113,057
50	3,656,291	159,348	92,843	423,622	38,276	994,921	350,096	194,925	565,900	682,475	51,641	102,244
55	4,161,753	187,737	107,198	492,180	43,768	1,122,647	388,221	240,113	638,500	758,992	61,134	121,262
60	4,147,179	187,228	103,604	499,236	43,726	1,136,497	381,186	241,194	637,867	745,542	68,910	102,188
65	2,969,100	121,698	68,902	348,264	30,035	826,546	274,084	187,064	460,884	536,131	50,971	64,520
70	2,498,607	101,058	60,253	295,431	25,980	689,031	236,826	159,877	378,599	453,963	43,937	53,652
75	1,840,499	79,351	48,285	219,350	20,740	486,354	178,224	114,957	276,246	342,382	31,835	42,776
80	758,966	35,036	21,480	91,600	9,110	199,191	70,836	48,354	112,600	137,461	11,051	22,247
85	779,176	35,843	21,211	102,309	8,774	200,147	68,559	46,082	120,579	141,851	10,987	22,834
Total	57,939,284	2,498,253	1,359,717	7,052,078	608,975	15,712,933	5,377,643	3,279,418	9,110,032	10,614,688	841,748	1,483,796

Percentage distribution												
0	4.92	4.88	3.89	5.43	4.58	4.79	4.68	4.72	5.22	5.01	4.17	4.48
5	5.46	5.55	4.24	6.01	5.00	5.35	5.20	5.41	5.72	5.52	4.90	4.72
10	5.70	5.78	4.32	6.20	5.16	5.60	5.43	5.79	5.93	5.75	5.45	4.76
15	5.52	5.49	4.39	5.87	5.08	5.43	5.31	5.62	5.71	5.58	5.46	4.81
20	5.30	5.22	4.88	5.40	5.25	5.18	5.25	5.16	5.46	5.38	5.07	5.56
25	5.87	5.85	6.20	5.81	6.35	5.79	5.99	5.46	5.96	5.87	5.33	6.69
30	8.35	8.43	9.38	8.18	9.16	8.44	8.53	7.80	8.27	8.21	7.66	9.16
35	8.50	8.39	9.17	8.21	8.79	8.63	8.66	8.09	8.44	8.47	8.16	8.94
40	7.44	7.17	7.69	7.10	7.45	7.65	7.53	7.33	7.35	7.42	7.44	7.44
45	7.03	6.93	7.32	6.73	6.98	7.14	7.19	7.04	6.91	7.00	7.10	7.62
50	6.31	6.38	6.83	6.01	6.29	6.33	6.51	5.94	6.21	6.43	6.13	6.89
55	7.18	7.51	7.88	6.98	7.19	7.14	7.22	7.32	7.01	7.15	7.26	8.17
60	7.16	7.49	7.62	7.08	7.18	7.23	7.09	7.35	7.00	7.02	8.19	6.89
65	5.12	4.87	5.07	4.94	4.93	5.26	5.10	5.70	5.06	5.05	6.06	4.35
70	4.31	4.05	4.43	4.19	4.27	4.39	4.40	4.88	4.16	4.28	5.22	3.62
75	3.18	3.18	3.55	3.11	3.41	3.10	3.31	3.51	3.03	3.23	3.78	2.88
80	1.31	1.40	1.58	1.30	1.50	1.27	1.32	1.47	1.24	1.30	1.31	1.50
85	1.34	1.43	1.56	1.45	1.44	1.27	1.27	1.41	1.32	1.34	1.31	1.54
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Mean age	40.6379	40.6748	42.6934	39.8674	41.1835	40.7978	40.9827	41.3947	40.0498	40.5069	42.3416	41.0974
Share	100.0000	4.3118	2.3468	12.1715	1.0511	27.1197	9.2815	5.6601	15.7234	18.3204	1.4528	2.5609

states. The states of Schleswig-Holstein, Lower Saxony, and Hesse would also have higher shares of total population than they did in 1974.

In 1974, four of the states still had a positive population growth rate (Schleswig-Holstein, Lower Saxony, Baden-Württemberg, and Bavaria). In 1999, a negative growth rate is expected for all states. The growth rate is expected to fall most quickly in the urban states of Hamburg and Bremen, and also in W. Berlin and the Saarland.

The effects of these developments on the future age structure of the population are also of interest. With the exception of W. Berlin, all the states are expected to have a very high share of elderly people. The mean age of the population in 1999 will be about 4 years greater than it was in 1974. In North Rhine-Westphalia the mean age will rise from 36.6 years in 1974 to 40.8 years in 1999. Only W. Berlin will experience a decrease in the average age of its population, from 42.0 in 1974 to 41.1 in 1999. This would be due mainly to in-migration of young people and heavy out-migration of older people, but also to the fact that many old people will have died between 1974 and 1999. It should be borne in mind that these results show only the long-term impact of current demographic trends – they are projections, not predictions, since the age-specific rates are assumed to remain unchanged.

3.4 Fertility and Migration Analysis

This analysis of fertility and migration in the federal states is based on two main indicators: the net reproduction rate (NRR) and the net migraproduction rate (NMR).

The net reproduction rate measures the average number of children born during a parent's lifetime, assuming that the age-specific rates of fertility and mortality apply. (If a female population is considered, the NRR represents the number of daughters.) Under this assumption, an NRR greater than 1 means a growing population; an NRR equal to 1, a stationary population; and an NRR less than 1, a declining population. The net reproduction rate matrix, which is calculated on the basis of the multiregional life table, adds the impact of migration on the reproductive behavior of a population to the effects of fertility and mortality. This provides information on the reproductive capabilities of the population in different regions.

The column totals of the NRR matrix illustrate the net reproduction rates of people born in various regions (Table 13). In 1974, all states had NRR values below 1. These values reflect the present fertility of the FRG, and mean that in the long run the population may be expected to decrease in all states. The net reproduction rates are still relatively high in predominantly rural states, such as Lower Saxony, Rhineland-Palatinate, and Bavaria. Baden-Württemberg also has a high NRR, largely because it contains a large proportion of foreigners with

TABLE 13 Spatial fertility expectancies.

Region of birth of child[a]	Region of birth of parent										
	1	2	3	4	5	6	7	8	9	10	11
Net reproduction rate matrix											
1 Sch.-Hl.	0.338791	0.143669	0.030120	0.038625	0.013116	0.010901	0.009550	0.008762	0.007346	0.009359	0.026146
2 Hamburg	0.060147	0.194104	0.018468	0.017400	0.005514	0.005353	0.004094	0.004049	0.003476	0.003468	0.010985
3 L. Sax.	0.096037	0.136782	0.449202	0.279966	0.050406	0.039128	0.028496	0.024563	0.019863	0.020821	0.077705
4 Bremen	0.008500	0.009141	0.019603	0.178456	0.003348	0.003090	0.002213	0.002153	0.001801	0.001778	0.005682
5 N.Rh.-W.	0.074421	0.067133	0.097446	0.083819	0.503947	0.072286	0.105813	0.048063	0.038922	0.064587	0.084476
6 Hesse	0.024224	0.024547	0.027360	0.028459	0.026806	0.392277	0.067162	0.034526	0.026522	0.040655	0.037593
7 Rh.-Pal.	0.011708	0.009379	0.010685	0.010859	0.019688	0.034315	0.339084	0.024559	0.011882	0.087756	0.015788
8 Bad.-W.	0.035520	0.033049	0.032590	0.034946	0.033276	0.061825	0.079959	0.486339	0.068240	0.073520	0.054849
9 Bavaria	0.035730	0.035193	0.030779	0.033125	0.031823	0.057751	0.046049	0.082322	0.524466	0.042526	0.064307
10 Saarland	0.002261	0.001652	0.001576	0.001697	0.002049	0.004040	0.017072	0.004349	0.002208	0.320529	0.003161
11 W.Berlin	0.013378	0.011827	0.012674	0.012588	0.008568	0.009410	0.008223	0.008803	0.007370	0.007270	0.299524
Total	0.700717	0.666475	0.730503	0.719940	0.698541	0.690376	0.707716	0.728489	0.712096	0.672267	0.680216
Net reproduction allocations											
1 Sch.-Hl.	0.483492	0.215565	0.041232	0.053650	0.018776	0.015790	0.013494	0.012028	0.010315	0.013921	0.038437
2 Hamburg	0.085836	0.291240	0.025281	0.024168	0.007893	0.007753	0.005785	0.005558	0.004882	0.005158	0.016150
3 L. Sax.	0.137056	0.205231	0.614922	0.388874	0.072159	0.056677	0.040265	0.033718	0.027893	0.030971	0.114235
4 Bremen	0.012131	0.013716	0.026835	0.247876	0.004793	0.004476	0.003127	0.002956	0.002529	0.002645	0.008353
5 N.Rh.-W.	0.106207	0.100728	0.133396	0.116425	0.721428	0.104706	0.149513	0.065977	0.054659	0.096073	0.124190
6 Hesse	0.034570	0.036832	0.037453	0.039530	0.038375	0.568208	0.094899	0.047394	0.037245	0.060474	0.055266
7 Rh.-Pal.	0.016709	0.014072	0.014627	0.015083	0.028184	0.049704	0.479124	0.033712	0.016685	0.130537	0.023210
8 Bad.-W.	0.050691	0.049588	0.044613	0.048540	0.047636	0.089553	0.112982	0.667599	0.095830	0.109361	0.080635
9 Bavaria	0.050990	0.052804	0.042134	0.046011	0.045557	0.083651	0.065068	0.113004	0.736510	0.063258	0.094540
10 Saarland	0.003226	0.002478	0.002157	0.002357	0.002933	0.005852	0.024123	0.005970	0.003101	0.476788	0.004647
11 W.Berlin	0.019092	0.017746	0.017350	0.017485	0.012266	0.013630	0.011620	0.012084	0.010350	0.010813	0.440337
Total	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000

[a]This is assumed to be the same as the region of residence of the parent.

high fertility rates. The elements in the columns of the NRR matrix illustrate the regional distribution of the reproductive capacity of people born in a specific state, i.e., the distribution of birthplace of children born to a birth cohort from a specific state. Table 13 illustrates that, of the average 0.67 children born to a unit birth cohort of Hamburg, only 29 percent will be born in Hamburg, 21.6 percent will be born in Schleswig-Holstein, 20.5 percent in Lower Saxony, and the remaining births will be spread evenly among the remaining states. A birth cohort of Bremen "exports" almost 40 percent of its reproductive force to Lower Saxony, only some 25 percent remaining in Bremen itself. However, almost 74 percent of the offspring of Bavarian parents will also be born in Bavaria, while for North Rhine-Westphalia this figure is 72 percent.

The net migraproduction rate matrix may be calculated in an analogous way to the net reproduction rate matrix. The elements of the NMR matrix illustrate the number of interregional migrations a person born in a given region may be expected to undertake out of another region. It should be noted that, as in the calculation of the NRR, the impact of regional mortality and migration patterns are considered in computing the NMR.

Table 14 shows that persons born in the two urban states, Hamburg and Bremen, are by far the most mobile members of the population as far as interstate migration is concerned. During their lifetime they will undertake an average of two migrations out of a state other than their state of birth. It must be noted, however, that some persons do not migrate at all and others migrate three times or more. The lowest mobility is found in the two largest states, North Rhine-Westphalia and Bavaria. This again demonstrates that people born in the larger states have a better chance of finding satisfactory accommodation and employment in their region of birth than do natives of urban states, thus making out-migration to another state less likely.

Table 14 also contains data on the regional allocation of out-migrations made during a lifetime. As expected, most migrations occur from the region of birth. Thus, some 68 percent of the total migrations made by persons born in Baden-Württemberg will be made from Baden-Württemberg. However, only 33 percent of the migrations undertaken by natives of Bremen actually originate in this state, while 32 percent are made from Lower Saxony. In contrast, only 3 percent of the migrations made by natives of Lower Saxony will be made from Bremen.

The NRR and NMR matrices are of great importance within the framework of demographic analysis because they clarify the complex interdependence of regional fertility, mortality, and migration patterns. On the other hand, because these matrices are so complex it is difficult to obtain a generally plausible interpretation which could be used for planning purposes. The calculation of NRR and NMR matrices also requires a large amount of detailed data, so that their practical use is limited. Finally, we would like to emphasize that we are dealing with results which depend crucially on the assumptions made in the model.

TABLE 14 Spatial migration expectancies.

Region of residence	Region of birth 1	2	3	4	5	6	7	8	9	10	11
Net migraproduction rate matrix											
1 Sch.-Hl.	1.923350	0.666677	0.140134	0.175160	0.062719	0.053057	0.046125	0.042729	0.035958	0.043941	0.125762
2 Hamburg	0.228551	0.990996	0.073732	0.070316	0.024155	0.023424	0.018228	0.018116	0.015704	0.015475	0.045832
3 L. Sax.	0.333400	0.479761	1.842083	0.966121	0.178282	0.140316	0.103810	0.090275	0.073914	0.076687	0.278719
4 Bremen	0.035382	0.038227	0.077962	1.002349	0.014751	0.013659	0.010044	0.009683	0.008201	0.008094	0.024354
5 N.Rh.-W.	0.284257	0.262007	0.364862	0.319465	2.031156	0.283370	0.394193	0.193329	0.159050	0.251986	0.323881
6 Hesse	0.115383	0.117358	0.128813	0.133185	0.127470	1.918595	0.295995	0.161959	0.126639	0.185868	0.175636
7 Rh.-Pal.	0.051574	0.042810	0.048374	0.048959	0.086351	0.144379	1.669753	0.104690	0.052756	0.346380	0.069274
8 Bad.-W.	0.144820	0.136819	0.134846	0.143549	0.138754	0.249847	0.312553	2.140206	0.272105	0.287164	0.222158
9 Bavaria	0.149055	0.148338	0.131527	0.140256	0.136322	0.239980	0.191242	0.331698	2.344372	0.176044	0.266733
10 Saarland	0.007777	0.005842	0.005617	0.005936	0.007239	0.013910	0.055252	0.014711	0.007686	1.254561	0.010900
11 W.Berlin	0.033947	0.030738	0.032427	0.032367	0.022500	0.024805	0.021672	0.022935	0.019924	0.019566	0.821951
Total	3.307495	2.919574	2.980376	3.037662	2.829700	3.105341	3.118867	3.130330	3.116309	2.665766	2.365200
Net migraproduction allocations											
1 Sch.-Hl.	0.581513	0.228347	0.047019	0.057663	0.022165	0.017086	0.014789	0.013650	0.011539	0.016483	0.053172
2 Hamburg	0.069101	0.339432	0.024739	0.023148	0.008536	0.007543	0.005844	0.005787	0.005039	0.005805	0.019378
3 L. Sax.	0.100801	0.164326	0.618071	0.318048	0.063004	0.045185	0.033285	0.028839	0.023719	0.028767	0.117842
4 Bremen	0.010698	0.013093	0.026158	0.329974	0.005213	0.004399	0.003221	0.003093	0.002632	0.003036	0.010297
5 N.Rh.-W.	0.085943	0.089742	0.122421	0.105168	0.717799	0.091252	0.126390	0.061760	0.051038	0.094527	0.136936
6 Hesse	0.034885	0.040197	0.043220	0.043844	0.045047	0.617837	0.094905	0.051739	0.040638	0.069724	0.074258
7 Rh.-Pal.	0.015593	0.014663	0.016231	0.016117	0.030516	0.046494	0.535372	0.033444	0.016929	0.129936	0.029289
8 Bad.-W.	0.043785	0.046863	0.045245	0.047256	0.049035	0.080457	0.100214	0.683700	0.087316	0.107723	0.093928
9 Bavaria	0.045066	0.050808	0.044131	0.046172	0.048176	0.077280	0.061318	0.105963	0.752291	0.066039	0.112774
10 Saarland	0.002351	0.002001	0.001885	0.001954	0.002558	0.004479	0.017715	0.004700	0.002466	0.470619	0.004608
11 W.Berlin	0.010264	0.010528	0.010880	0.010655	0.007952	0.007988	0.006949	0.007327	0.006394	0.007340	0.347519
Total	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000

4 POPULATION DISTRIBUTION POLICY

Regional planners may view the population of a region in one of two different ways. On the one hand, the size and structure of the population can be considered as a starting point, and future planning based on catering for the needs of this population as it evolves. This philosophy is the basis of multiregional population analysis. On the other hand, the population of a region could be regarded as a variable capable of adjusting to changes in the economic and social climate (Koch 1976c, p. 184). This makes it theoretically possible to influence the number, distribution, and structure of the population by adopting the appropriate regional policies. In some cases this can be done through direct state intervention, as shown by the following example.

In the early years of the economic boom around 1970, there were no controls on the number of immigrants entering the country, or the regions in which they could settle. In 1975, immigrants were prevented from entering certain urban areas following massive pressure from the cities concerned. This measure was meant to protect the infrastructure and to encourage the integration of the migrants already living there. A thorough discussion took place, in which regional planning aspects were also considered. The effect of this decision remained open to dispute, since the recruitment of labor in non-EEC countries had been discontinued in 1974 as a result of economic development, and this had already reduced the real pressure from migration. However, the ban on immigration was suspended following the large population losses in core cities. Fears of overburdening the infrastructure were replaced by fears of threatened under-utilization. This example demonstrates the use of a regional population policy to prevent certain population distributions, in order to safeguard other objectives. In this case an attempt to improve the availability of infrastructure involved reducing the size of the population rather than increasing the supply of infrastructure.

Though there are a number of measures that may directly or indirectly influence population dynamics and distribution, we conclude that they are neither motivated by population policy, nor can they be coordinated into one homogeneous system for this purpose.

4.1 Population and Regional Planning

The Federal Regional Planning Program (Bundesraumordnungsprogramm or BROP) gives priority to the objectives relevant to people, such as population planning. Regional planning is thus meant to help improve the quality of life (Bundesraumordnungsprogramm 1975, p. 6). The main objective of regional planning is to create equal living conditions in all districts of the nation, i.e., to reduce regional inequalities. This requires a three-point program, involving:

- Improvement of infrastructure
- Improvement of employment opportunities and economic structure
- Improvement of the quality of the environment

In order to improve the supply of infrastructure for the population, the capacity, efficiency, and accessibility of existing infrastructure must be increased. The economic structure of deprived areas could be improved by the creation of additional jobs for qualified workers, while those jobs already in existence must be protected and improved. The quality of the environment in industrial regions should be optimized by a compromise between the economic and ecological potential of the area (Figure 16). These objectives do not require the implementation of a population policy, nor do they suggest the direction such a policy should take.

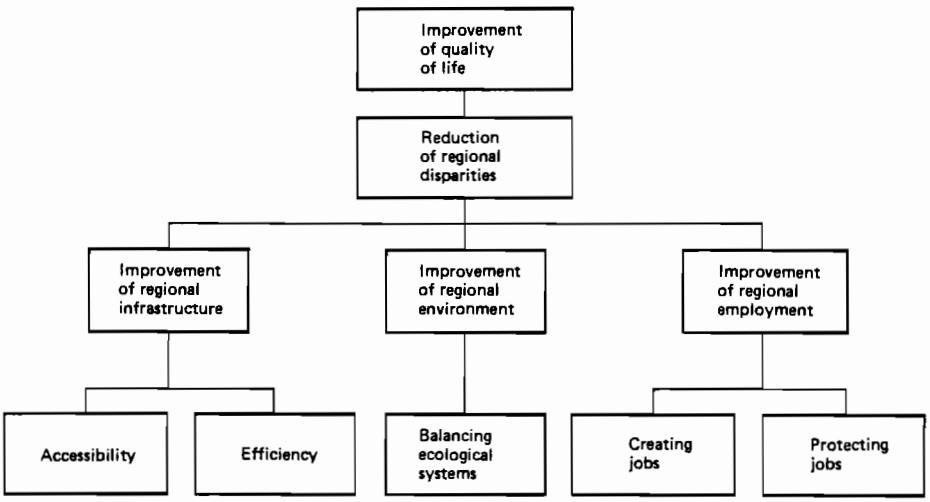

FIGURE 16 Regional planning objectives based on the Federal Regional Planning Program.

The objectives related to population distribution and dynamics in the Federal Regional Planning Program are largely isolated from the regional planning system and its objectives. The federal objectives are each related to a certain type of area or subarea without considering their joint implications (Figure 17). For example, should out-migration from rural areas be prevented inasmuch as "this would lead to a reduction of the development potential in weakly structured areas" or should the increase of population in agglomerations be halted inasmuch as "the quality of living conditions in agglomerations would be affected" (Bundesraumordnungsprogramm 1975, p. 10)? No explanation for these objectives is given or even attempted; there seems to be no reason for them

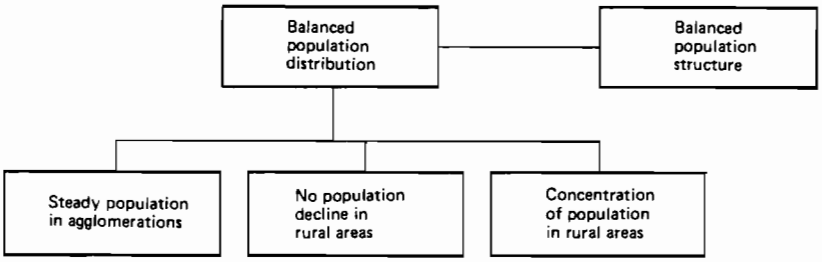

FIGURE 17 Population-related objectives from the Federal Regional Planning Program.

whatever. There is no basis for them in the Constitution, other than, for example, the general objective to equalize living conditions throughout the FRG. How can the Federal Regional Planning Program put forward policy objectives on population distribution without justifying them?

4.2 National Objectives and the Derivation of Objectives Relevant to Population

A set of so-called system objectives can be developed in parallel with the objectives of the Federal Regional Planning Program (Figure 18). These are objectives of national relevance, covering a wide range of subjects and, like the BROP system, are based on the Constitution. Although they are designed to strengthen the "population-relevant system of objectives", the aims of the two programs often conflict. This is because there are objectives perceived as of equal or even greater importance than the sociopolitical principle of "improved quality of life". These are "safeguarding the liberal-democratic constitution" and "safeguarding the system of social market economy" (Art. 20GG and Art. 104aGG). These objectives are generally realized by sociopolitical and economic-political means. From the point of view of the national economy, it is necessary to manage with a minimal investment. Each regional planning objective can be related to the national objectives through the use of a derived objective. On this level there will be no conflict of aims:

- Providing a population with sufficient infrastructure will help minimize the potential for social conflict while maximizing the opportunities given to each individual.
- The system objective of "ensuring growth, full employment, and stability" does not immediately conflict with the objective of "improving the (regional) economic structure". These aims are mutually dependent.
- The objectives "avoiding physical, psychological, and social pressures on population" and "improving the quality of the environment" coincide with the aim of producing a better quality of life. In addition, the

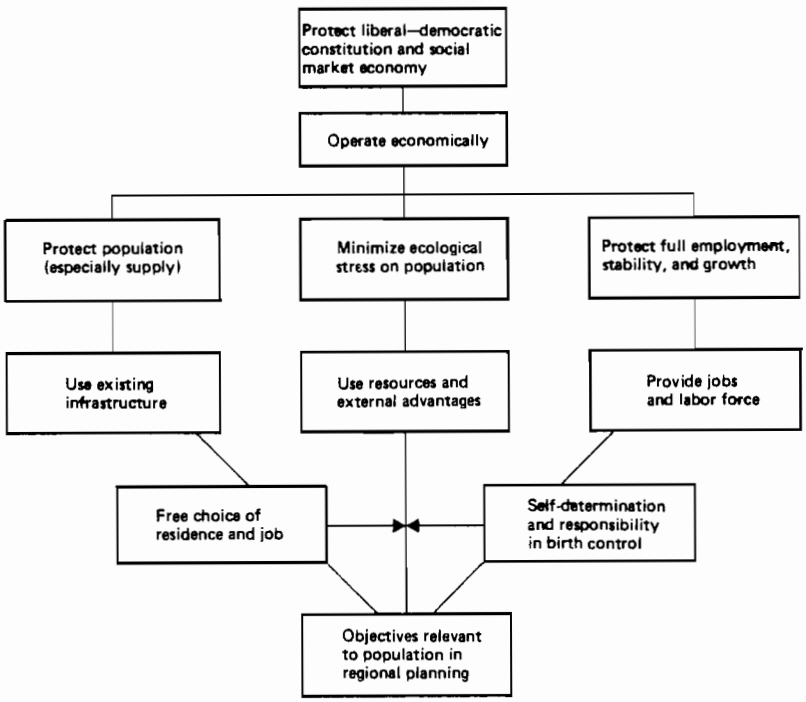

FIGURE 18 National goals on which population-related objectives are based.

national economy benefits from environment-conscious measures such as recycling.

On the next level, however, conflicts between regional planning sub-objectives and system objectives may occur:

- The sub-objectives "improving the efficiency of infrastructure" and "improving the accessibility of existing infrastructure" are complemented for reasons of cost by the system objective of "full utilization of existing infrastructure".
- A similar situation arises with creation of employment and improvement of job quality in weakly structured areas. A potential labor force must be present; all resources must be optimally utilized.
- When considering whether an industrialized area should be developed further, the objective of "improving the quality of the environment" is often considered secondary to the system objective of "ensuring growth, full employment, and stability".

4.3 Consequences for Regional Population Policy

The question finally arises of whether it would not be cost-effective to direct the development of the population by setting up a regional population policy, rather than investing in costly measures to adapt to population change. Such a regional population policy, however, would be severely limited: the provision for free development of the personality (Art. 2GG) protects the freedom of parents to decide the number of their children, and the intervals between them. The right of free mobility ensures that all German citizens may live and work where they choose. This leads to two consequences for regional planning:

1. Pure population policy objectives do not exist. A population, large or small, is not inherently good or bad; the population structure, its dynamics, and distribution can be evaluated only in relation to other objectives.
2. Any objectives and measures that seek to direct population development must therefore be seen against the background of national policy as a whole and within a framework that protects the basic human rights of individual development and free mobility.

Thus the aim of preventing out-migration from rural areas and the measures adopted to implement this aim can be justified only as long as they do not reduce the freedom of movement. This means an increase in the number of options made available and the reduction of certain pressures on mobility (see Raumordnungsbericht 1974 der Bundesregierung 1975, p. 37). Measures that affect freedom of movement must be rejected even if their implementation would help to produce the population structure required to attain a national objective.

5 CONCLUSION

Population analysis in the FRG is used in regional planning as part of a regional monitoring system (Laufende Raumbeobachtung). Population forecasts and projections are required to monitor the possible development of the population in the future, and models for population analysis and projection are therefore necessary. These models also make it possible to evaluate the effects of certain policy measures on the structure of the population.

Population analysis and projection are therefore an integral part of the planning system, which involves the steps enumerated below:

1. Definition of objectives
2. Analysis of present regional living conditions
3. Status quo projection of regional living conditions
4. Definition of regional goals

5. Preselection of instruments
6. Analysis of effectiveness of instruments
7. Selection of instruments, establishment of programs
8. Control of working instruments
9. Evaluation of programs

Regional monitoring involves steps 2, 3, and 9. The main objectives of the regional monitoring system within the framework of a long-term regional planning policy are to update the Federal Regional Planning Program and to write Federal Reports on regional planning. The results of multiregional population analyses provide a small but notable step toward more effective planning and better understanding of population dynamics.

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APPENDIXES

Appendix A

OBSERVED POPULATION, NUMBERS OF BIRTHS, DEATHS, AND MIGRANTS, DISAGGREGATED BY AGE AND REGION (1974)

APPENDIX A

Observed population characteristics.

region sch-hols

age	population	births	deaths	migration from sch-hols to sch-hols	hamburg	l.sax	bremen	n.r-w.p	hesse	rhine-pl	bad-wurt	bavaria	saarland	w.berlin
0	150080.	0.	568.	6175.	1338.	869.	92.	616.	205.	98.	226.	219.	23.	131.
5	222685.	0.	95.	5359.	1162.	758.	79.	536.	179.	85.	197.	190.	20.	113.
10	212998.	0.	66.	3098.	671.	436.	46.	309.	103.	49.	114.	110.	12.	65.
15	172737.	2593.	148.	6185.	1598.	1058.	132.	756.	247.	124.	333.	314.	29.	200.
20	172402.	8357.	205.	17471.	4821.	3535.	486.	2518.	765.	429.	1141.	1102.	91.	729.
25	162219.	7619.	164.	9925.	3514.	1990.	350.	1480.	531.	230.	687.	715.	53.	376.
30	199148.	4604.	266.	7710.	2807.	1585.	226.	1262.	421.	196.	511.	480.	34.	258.
35	210230.	1966.	399.	4250.	1551.	854.	126.	697.	232.	108.	282.	264.	19.	142.
40	146894.	363.	354.	2158.	788.	434.	64.	354.	118.	55.	143.	134.	10.	72.
45	143540.	31.	757.	1490.	539.	296.	43.	243.	82.	38.	99.	93.	7.	49.
50	147572.	0.	1110.	1328.	415.	234.	25.	176.	67.	34.	75.	81.	3.	50.
55	97830.	0.	1060.	882.	271.	155.	17.	117.	44.	24.	50.	54.	2.	34.
60	150089.	0.	2054.	1032.	313.	183.	20.	139.	52.	28.	59.	64.	2.	41.
65	140302.	0.	4142.	1156.	265.	172.	18.	149.	42.	22.	64.	58.	1.	38.
70	113480.	0.	5485.	815.	188.	120.	13.	107.	30.	15.	45.	40.	1.	28.
75	80019.	0.	5677.	594.	138.	88.	9.	80.	22.	11.	33.	28.	1.	20.
80	41360.	0.	4768.	396.	91.	59.	7.	53.	15.	7.	21.	19.	1.	13.
85	20798.	0.	4762.	283.	65.	42.	4.	37.	10.	6.	15.	13.	0.	10.
total	2584343.	25533.	32080.	70267.	20535.	12820.	1757.	9629.	3165.	1559.	4095.	3978.	309.	2369.

region hamburg

age	population	births	deaths	migration from hamburg to sch-hols	hamburg	l.sax	bremen	n.r-w.p	hesse	rhine-pl	bad-wurt	bavaria	saarland	w.berlin
0	73689.	0.	306.	1935.	0.	1191.	46.	270.	115.	33.	124.	140.	4.	42.
5	112132.	0.	44.	1836.	0.	1130.	43.	257.	111.	32.	118.	132.	5.	40.
10	113758.	0.	25.	1118.	0.	687.	27.	156.	67.	19.	72.	81.	3.	24.
15	99070.	1176.	60.	1373.	0.	810.	49.	208.	106.	25.	111.	124.	5.	70.
20	105872.	3869.	96.	4845.	0.	2765.	225.	792.	443.	94.	451.	520.	25.	363.
25	116739.	4436.	119.	3997.	0.	2374.	270.	948.	442.	93.	445.	496.	36.	252.
30	142292.	2842.	207.	4040.	0.	2367.	166.	844.	382.	107.	369.	442.	17.	187.
35	141905.	1009.	270.	2318.	0.	1357.	96.	486.	219.	62.	212.	255.	10.	109.
40	103434.	178.	369.	1242.	0.	727.	51.	260.	118.	33.	113.	136.	6.	58.
45	107578.	13.	530.	894.	0.	525.	36.	184.	84.	24.	81.	98.	3.	41.
50	111082.	0.	845.	820.	0.	543.	21.	106.	63.	16.	68.	77.	3.	20.
55	74395.	0.	840.	544.	0.	361.	13.	71.	42.	11.	45.	51.	2.	14.
60	114314.	0.	1906.	690.	0.	458.	17.	91.	53.	13.	57.	65.	3.	17.
65	112396.	0.	3259.	704.	0.	398.	14.	97.	58.	17.	57.	69.	4.	14.
70	90498.	0.	4159.	444.	0.	247.	9.	62.	35.	11.	35.	43.	2.	9.
75	64379.	0.	4541.	345.	0.	188.	7.	48.	27.	8.	26.	34.	2.	8.
80	33460.	0.	3999.	255.	0.	139.	6.	36.	19.	7.	19.	25.	1.	5.
85	16809.	0.	3716.	201.	0.	110.	5.	29.	15.	5.	15.	19.	1.	4.
total	1733802.	13523.	25291.	27601.	0.	16377.	1101.	4945.	2399.	610.	2418.	2807.	132.	1277.

region l.sax

age	population	births	deaths	migretion from l.sax to sch-hols	hamburg	l.sax	bremen	n.r-w.p	hesse	rhine-pl	bad-wurt	bavaria	saarlandw.	berlin
0	¾40¾01.	0.	2009.	776.	772.	1¾237.	1099.	2570.	735.	256.	615.	56¾.	30.	326.
5	620656.	0.	259.	658.	65¾.	12073.	932.	2179.	623.	218.	522.	¾79.	26.	276.
10	61895¾.	0.	181.	379.	377.	6950.	537.	125¾.	359.	125.	301.	276.	15.	159.
15	526355.	6949.	599.	1153.	1055.	16883.	1¾07.	3¾¾¾.	9¾1.	280.	8¾9.	717.	¾0.	57¾.
20	¾87288.	2¾936.	56¾.	3745.	3072.	¾5728.	¾123.	10082.	2628.	7¾0.	2¾62.	2049.	119.	1950.
25	¾277¾2.	21650.	¾51.	1862.	2316.	2¾6¾1.	2291.	6256.	1797.	611.	1822.	1676.	108.	93¾.
30	516783.	1¾782.	728.	130¾.	1521.	18531.	1552.	¾760.	1¾39.	¾81.	1351.	1285.	59.	711.
35	561600.	7380.	109¾.	779.	910.	11033.	930.	2855.	857.	288.	806.	768.	35.	¾25.
¾0	¾32789.	1922.	1¾06.	¾17.	¾87.	5907.	¾98.	1528.	¾59.	15¾.	¾32.	¾11.	19.	227.
¾5	¾37986.	137.	2073.	270.	31¾.	3861.	319.	977.	300.	99.	279.	266.	12.	1¾7.
50	¾28397.	0.	303¾.	20¾.	189.	363¾.	229.	716.	269.	103.	239.	251.	12.	1¾7.
55	27¾663.	0.	2896.	1¾0.	129.	2¾50.	153.	¾86.	181.	70.	163.	170.	8.	101.
60	¾23028¾.	0.	6¾83.	181.	165.	3128.	195.	622.	231.	90.	209.	218.	11.	130.
65	389019.	0.	11316.	19¾.	171.	352¾.	19¾.	7¾¾.	263.	97.	223.	206.	12.	1¾2.
70	312208.	0.	1¾968.	133.	117.	2¾19.	135.	515.	181.	65.	152.	1¾0.	8.	99.
75	206928¾.	0.	15¾¾1.	89.	79.	1619.	91.	3¾6.	121.	¾3.	101.	93.	6.	67.
80	106965.	0.	12929.	53.	¾7.	978.	56.	209.	73.	25.	60.	56.	3.	¾1.
85	53785.	0.	10954¾.	38.	3¾.	687.	39.	1¾7.	52.	18.	¾3.	39.	3.	29.
total	7265539.	77756.	87385.	12375.	12¾09.	178283.	1¾780.	39690.	11509.	3763.	10629.	966¾.	526.	6¾85.

region bremen

age	population	births	deaths	migration from bremen to sch-hols	hamburg	l.sax	bremen	n.r-w.p	hesse	rhine-pl	bad-wurt	bavaria	saarlandw.	berlin
0	36612.	0.	153.	92.	¾0.	1587.	66.	150.	69.	23.	60.	5¾.	2.	22.
5	5¾660.	0.	22.	83.	36.	1¾15.	59.	133.	61.	20.	5¾.	¾8.	2.	20.
10	5¾519.	0.	12.	¾9.	21.	833.	3¾.	79.	36.	11.	32.	29.	1.	11.
15	¾7766.	780.	29.	185.	69.	1335.	76.	198.	87.	2¾.	87.	76.	5.	50.
20	¾663¾.	2155.	¾2.	791.	2¾5.	3562.	2¾3.	663.	280.	79.	288.	2¾9.	22.	19¾.
25	¾6902.	1951.	¾8.	267.	215.	2715.	18¾.	52¾.	191.	77.	215.	208.	9.	133.
30	55628.	11¾5.	81.	192.	155.	2569.	15¾.	¾61.	150.	¾6.	166.	151.	2.	85.
35	5709¾.	¾76.	109.	109.	88.	1¾55.	87.	261.	85.	26.	95.	85.	2.	¾8.
¾0	¾2731.	90.	153.	56.	¾5.	750.	¾5.	135.	¾3.	1¾.	¾9.	¾¾.	0.	25.
¾5	¾38¾1.	9.	216.	38.	31.	528.	30.	91.	31.	9.	33.	30.	0.	17.
50	¾5756.	0.	3¾9.	26.	15.	¾51.	17.	¾¾.	26.	9.	2¾.	25.	1.	1¾.
55	30701.	0.	350.	17.	10.	302.	12.	30.	17.	6.	16.	17.	1.	9.
60	¾6350.	0.	779.	23.	13.	38¾.	1¾.	39.	22.	8.	21.	22.	1.	12.
65	¾289¾.	0.	12¾9.	15.	15.	3¾1.	9.	¾5.	19.	10.	21.	2¾.	2.	10.
70	32700.	0.	1513.	10.	11.	230.	7.	30.	12.	7.	1¾.	15.	1.	6.
75	22031.	0.	1563.	7.	8.	163.	5.	21.	8.	5.	10.	11.	1.	¾.
80	11¾28.	0.	1372.	5.	6.	130.	¾.	16.	6.	¾.	7.	8.	1.	¾.
85	5783.	0.	1273.	¾.	5.	97.	3.	12.	5.	3.	6.	6.	0.	3.
total	723990.	6606.	9313.	1969.	1028.	18847.	1049.	2932.	1148.	381.	1198.	1102.	53.	667.

APPENDIX A *Continued.*

region n.r-w.p

age	population	births	deaths	migration from n.r-w.p to sch-hols	hamburg	l.sax	bremen	n.r-w.p	hesse	rhine-pl	bad-wurt	bavaria	saarland	w.berlin
0	953634.	0.	4557.	738.	264.	3074.	160.	40056.	1711.	1735.	1605.	1539.	111.	428.
5	1373715.	0.	605.	598.	213.	2495.	130.	32459.	1386.	1406.	1302.	1248.	90.	348.
10	1409932.	0.	450.	343.	122.	1431.	75.	18606.	795.	806.	747.	716.	52.	200.
15	1270184.	17202.	968.	1059.	394.	3699.	240.	39443.	1972.	1682.	1922.	1766.	126.	803.
20	1171940.	54160.	1095.	3387.	1230.	10808.	757.	102450.	5549.	4392.	5449.	4978.	349.	2716.
25	1059775.	49774.	951.	1395.	1088.	6067.	693.	70015.	4070.	2971.	4299.	3906.	290.	1507.
30	1261206.	30393.	1558.	1117.	789.	4551.	430.	55677.	3141.	2729.	3328.	3225.	192.	916.
35	1388237.	13985.	2453.	738.	526.	3024.	288.	36919.	2083.	1811.	2211.	2142.	128.	612.
40	1139355.	3241.	3232.	454.	324.	1861.	177.	22708.	1281.	1114.	1360.	1318.	78.	377.
45	1141857.	224.	5278.	298.	208.	1208.	113.	14817.	835.	726.	884.	857.	51.	241.
50	1066922.	0.	7620.	328.	95.	1096.	65.	11678.	738.	1038.	769.	848.	40.	147.
55	678320.	0.	7491.	222.	62.	731.	43.	7838.	494.	695.	518.	568.	26.	100.
60	972036.	0.	17399.	290.	80.	950.	56.	10215.	644.	904.	676.	739.	34.	129.
65	849124.	0.	27215.	233.	89.	1021.	46.	11015.	725.	931.	674.	677.	41.	149.
70	694629.	0.	34607.	133.	54.	592.	27.	6525.	420.	529.	388.	388.	24.	91.
75	414677.	0.	32645.	76.	31.	337.	15.	3765.	240.	298.	220.	220.	14.	53.
80	215021.	0.	26881.	45.	18.	202.	9.	2279.	144.	177.	131.	131.	8.	33.
85	108059.	0.	22885.	31.	13.	137.	7.	1546.	97.	120.	89.	89.	5.	22.
total	17218626.	168979.	197890.	11485.	5600.	43284.	3331.	488011.	26325.	24064.	26572.	25355.	1659.	8872.

region hesse

age	population	births	deaths	migration from hesse to sch-hols	hamburg	l.sax	bremen	n.r-w.p	hesse	rhine-pl	bad-wurt	bavaria	saarland	w.berlin
0	304544.	0.	1321.	200.	110.	705.	71.	1445.	11555.	979.	1231.	1144.	88.	173.
5	422479.	0.	173.	163.	88.	574.	58.	1176.	9405.	797.	1002.	932.	71.	140.
10	433138.	0.	95.	96.	52.	338.	35.	693.	5548.	470.	591.	548.	42.	83.
15	383427.	5191.	361.	255.	144.	890.	81.	1594.	12700.	1164.	1457.	1273.	107.	300.
20	390530.	17946.	397.	722.	416.	2470.	214.	4156.	32519.	3149.	3905.	3316.	296.	968.
25	380080.	16610.	321.	464.	410.	1735.	244.	4116.	24249.	2349.	3245.	2924.	261.	600.
30	430684.	9843.	540.	353.	320.	1336.	153.	3569.	18590.	1771.	2492.	2410.	164.	452.
35	442623.	4389.	742.	225.	207.	864.	100.	2337.	11974.	1150.	1619.	1561.	107.	293.
40	347676.	1037.	819.	138.	128.	534.	61.	1454.	7386.	713.	1003.	965.	67.	181.
45	354608.	61.	1540.	92.	82.	343.	39.	907.	4791.	453.	638.	618.	42.	116.
50	348693.	0.	2270.	64.	42.	271.	12.	518.	4567.	399.	454.	546.	37.	72.
55	212382.	0.	1970.	38.	25.	159.	8.	301.	2674.	231.	267.	318.	22.	43.
60	319044.	0.	4855.	50.	31.	204.	11.	380.	3426.	293.	343.	407.	29.	56.
65	301146.	0.	8386.	51.	22.	228.	12.	444.	3557.	296.	352.	420.	25.	76.
70	237565.	0.	11061.	34.	14.	147.	8.	288.	2280.	191.	227.	268.	16.	49.
75	150533.	0.	11017.	22.	9.	93.	4.	184.	1435.	121.	142.	168.	11.	32.
80	77806.	0.	9714.	13.	5.	57.	3.	114.	880.	74.	88.	103.	6.	20.
85	39124.	0.	8860.	9.	3.	39.	2.	78.	601.	50.	60.	70.	4.	13.
total	5576082.	55077.	64442.	2989.	2108.	10987.	1116.	23754.	158137.	14650.	19116.	17991.	1395.	3667.

region rhine-pl

age	population	births	deaths	migration from rhine-pl to schl-hols	hamburg	l.sax	bremen	n.r-w.p	hesse	rhine-pl	bad-wurt	bavaria	saarland	w.berlin
0	203732.	0.	933.	87.	29.	249.	20.	1486.	1091.	6339.	902.	414.	354.	73.
5	304307.	0.	137.	76.	26.	219.	18.	1307.	959.	5578.	793.	365.	312.	63.
10	318372.	0.	96.	51.	17.	147.	12.	879.	645.	3743.	533.	245.	209.	43.
15	290300.	4652.	280.	186.	75.	409.	38.	2508.	1946.	9854.	1896.	783.	672.	197.
20	264842.	12662.	280.	502.	215.	936.	92.	5729.	4587.	20927.	4882.	1946.	1654.	577.
25	198401.	9265.	209.	208.	134.	566.	75.	3489.	2848.	10679.	2611.	1064.	749.	307.
30	256762.	5616.	361.	171.	111.	500.	63.	2795.	2128.	7955.	1987.	872.	452.	184.
35	268434.	2832.	518.	97.	65.	287.	37.	1618.	1222.	4537.	1153.	500.	261.	106.
40	233425.	789.	657.	58.	39.	172.	23.	969.	731.	2709.	690.	299.	155.	64.
45	235546.	59.	993.	41.	27.	119.	15.	664.	507.	1902.	472.	209.	108.	44.
50	223448.	0.	1538.	39.	13.	96.	8.	552.	380.	1892.	321.	207.	97.	24.
55	150317.	0.	1561.	25.	8.	59.	5.	341.	235.	1177.	196.	127.	60.	15.
60	212096.	0.	3648.	30.	11.	73.	7.	423.	293.	1471.	242.	158.	73.	18.
65	200384.	0.	5644.	22.	10.	84.	4.	517.	279.	1584.	236.	138.	96.	31.
70	157436.	0.	7522.	15.	7.	58.	3.	359.	194.	1095.	163.	95.	67.	21.
75	95555.	0.	7423.	9.	5.	38.	2.	231.	124.	700.	105.	61.	43.	14.
80	49376.	0.	6314.	6.	3.	21.	1.	129.	70.	389.	59.	34.	23.	8.
85	24828.	0.	5373.	4.	2.	15.	0.	95.	51.	287.	43.	25.	17.	6.
total	3687561.	35875.	43487.	1627.	797.	4048.	423.	24091.	18290.	82818.	17284.	7542.	5402.	1795.

region bad-wurt

age	population	births	deaths	migration from bad-wurt to schl-hols	hamburg	l.sax	bremen	n.r-w.p	hesse	rhine-pl	bad-wurt	bavaria	saarland	w.berlin
0	560734.	0.	2138.	240.	124.	621.	60.	1344.	1279.	1065.	21853.	2735.	144.	234.
5	762596.	0.	342.	187.	97.	486.	47.	1048.	997.	832.	17055.	2134.	112.	182.
10	782911.	0.	241.	103.	53.	267.	26.	574.	545.	455.	9334.	1169.	62.	100.
15	690698.	9808.	628.	381.	185.	825.	101.	1787.	1695.	1406.	29825.	3946.	259.	542.
20	660811.	32211.	657.	1054.	496.	2101.	285.	4377.	4290.	3566.	75107.	10466.	748.	1697.
25	612639.	29903.	570.	744.	542.	1844.	280.	4314.	3603.	2544.	45193.	6692.	484.	899.
30	712028.	19559.	899.	412.	348.	1218.	157.	3195.	2516.	1958.	29546.	4706.	274.	507.
35	750974.	8631.	1301.	279.	236.	828.	107.	2183.	1708.	1334.	19980.	3200.	188.	344.
40	591296.	1953.	1579.	179.	153.	537.	68.	1416.	1105.	864.	12906.	2071.	123.	222.
45	561860.	121.	2239.	114.	96.	338.	44.	887.	699.	544.	8209.	1307.	76.	141.
50	528636.	0.	3200.	78.	43.	192.	20.	409.	418.	351.	6337.	1039.	39.	99.
55	328008.	0.	3065.	48.	26.	117.	11.	246.	253.	207.	3846.	625.	23.	62.
60	496175.	0.	7613.	55.	31.	135.	14.	279.	292.	231.	4433.	715.	26.	74.
65	453165.	0.	12079.	71.	33.	171.	13.	331.	313.	240.	5571.	827.	25.	91.
70	349589.	0.	15521.	42.	20.	101.	8.	195.	185.	140.	3301.	482.	15.	55.
75	216092.	0.	15829.	25.	11.	60.	5.	116.	110.	82.	1977.	284.	9.	33.
80	111814.	0.	13347.	14.	7.	33.	3.	64.	61.	45.	1090.	156.	5.	18.
85	56213.	0.	11880.	9.	4.	21.	2.	40.	38.	29.	683.	98.	3.	12.
total	9226239.	102186.	93128.	4035.	2505.	9895.	1251.	22765.	20107.	15893.	295846.	42652.	2615.	5312.

APPENDIX A *Continued.*

region bavaria

age	population	births	deaths	migration from bavaria to sch-hols	hamburg	l.sax	bremen	n.r-w.p	hesse	rhine-pl	bad-wurt	bavaria	saarland	w.berlin
0	622087.	0.	2757.	201.	113.	547.	61.	1195.	1094.	448.	2542.	31480.	72.	270.
5	859649.	0.	358.	151.	86.	411.	46.	899.	824.	334.	1913.	23695.	53.	203.
10	897980.	0.	257.	86.	49.	232.	26.	508.	466.	189.	1083.	13426.	30.	115.
15	791428.	9728.	880.	311.	164.	637.	81.	1391.	1266.	516.	3271.	33222.	107.	410.
20	756406.	36627.	798.	1048.	520.	1840.	253.	3983.	3573.	1478.	9869.	88107.	350.	1337.
25	719981.	32928.	761.	692.	491.	1583.	267.	4067.	2882.	1086.	6704.	54686.	219.	959.
30	817157.	21078.	1029.	386.	369.	1155.	157.	3091.	2218.	802.	4599.	40875.	133.	619.
35	848351.	10721.	1516.	239.	231.	724.	98.	1945.	1385.	503.	2878.	25272.	83.	386.
40	666340.	2741.	932.	145.	141.	440.	59.	1183.	841.	305.	1748.	15265.	50.	235.
45	661342.	218.	3754.	93.	88.	277.	38.	742.	531.	192.	1103.	9803.	32.	148.
50	657719.	0.	4293.	63.	41.	203.	13.	459.	368.	135.	782.	10134.	23.	115.
55	418172.	0.	4118.	37.	23.	116.	7.	262.	210.	78.	455.	5927.	14.	67.
60	621236.	0.	10083.	44.	25.	134.	8.	299.	239.	92.	536.	7055.	17.	80.
65	565673.	0.	15142.	53.	33.	147.	15.	299.	255.	111.	553.	7759.	16.	93.
70	452208.	0.	21204.	36.	22.	100.	9.	205.	174.	77.	378.	5329.	11.	64.
75	282039.	0.	22005.	22.	14.	61.	6.	125.	107.	47.	231.	3273.	6.	39.
80	145972.	0.	18413.	11.	7.	31.	3.	64.	55.	25.	118.	1686.	4.	20.
85	73383.	0.	15688.	7.	5.	21.	2.	43.	37.	17.	79.	1124.	2.	13.
total	10849123.	114037.	123980.	3625.	2422.	8619.	1149.	20760.	16521.	6431.	38834.	378118.	1222.	5173.

region saarland

age	population	births	deaths	migration from saarland to sch-hols	hamburg	l.sax	bremen	n.r-w.p	hesse	rhine-pl	bad-wurt	bavaria	saarland	w.berlin
0	55407.	0.	284.	16.	3.	27.	3.	147.	103.	428.	182.	78.	1048.	13.
5	85507.	0.	46.	14.	3.	24.	3.	131.	93.	384.	163.	70.	939.	11.
10	99368.	0.	27.	11.	3.	20.	2.	107.	76.	311.	133.	58.	767.	9.
15	91887.	1373.	90.	68.	20.	85.	10.	343.	277.	1007.	500.	224.	1785.	51.
20	80706.	3559.	87.	207.	61.	230.	30.	796.	680.	2305.	1251.	578.	3037.	152.
25	62787.	2443.	69.	77.	33.	123.	18.	689.	390.	909.	659.	353.	2066.	97.
30	72157.	1488.	112.	33.	20.	98.	10.	459.	271.	621.	430.	229.	1497.	61.
35	86524.	783.	167.	19.	11.	55.	5.	260.	153.	349.	243.	129.	837.	34.
40	71077.	204.	227.	11.	6.	32.	4.	151.	88.	203.	141.	75.	487.	20.
45	72585.	16.	317.	7.	4.	22.	3.	102.	61.	141.	96.	52.	345.	14.
50	72459.	0.	462.	6.	3.	15.	2.	54.	38.	143.	69.	34.	375.	7.
55	43520.	0.	441.	4.	2.	10.	2.	33.	22.	87.	42.	21.	236.	5.
60	62529.	0.	1420.	5.	2.	12.	2.	38.	26.	104.	49.	24.	285.	6.
65	58549.	0.	1724.	2.	2.	12.	0.	42.	26.	108.	38.	22.	321.	4.
70	44821.	0.	2276.	1.	1.	9.	0.	27.	18.	70.	24.	15.	215.	3.
75	24453.	0.	2333.	0.	0.	5.	0.	17.	11.	45.	15.	9.	137.	1.
80	12635.	0.	1943.	0.	0.	4.	0.	12.	8.	30.	11.	7.	96.	1.
85	6354.	0.	1215.	0.	0.	3.	0.	8.	5.	21.	7.	4.	63.	1.
total	1103325.	9866.	13240.	481.	174.	786.	94.	3416.	2346.	7266.	4053.	1982.	14536.	490.

region w.berlin

age	population	births	deaths	migration from w.berlin to sch-hols	hamburg	l.sax	bremen	n.r-w.p	hesse	rhine-pl	bad-wurt	bavaria	saarland	w.berlin
0	92538.	0.	409.	284.	76.	715.	43.	554.	316.	113.	346.	485.	26.	0.
5	117959.	0.	43.	249.	66.	624.	38.	483.	276.	99.	302.	423.	22.	0.
10	112942.	0.	40.	149.	40.	375.	23.	290.	166.	60.	181.	254.	13.	0.
15	95020.	1646.	65.	168.	78.	436.	36.	455.	228.	86.	291.	333.	21.	0.
20	137619.	5700.	150.	531.	352.	1425.	147.	1834.	845.	335.	1187.	1192.	88.	0.
25	141606.	5559.	184.	518.	379.	1432.	193.	1809.	867.	308.	1079.	1157.	67.	0.
30	177898.	3759.	324.	469.	302.	1330.	128.	1455.	769.	216.	826.	1100.	55.	0.
35	153267.	1337.	397.	259.	167.	735.	70.	804.	425.	119.	456.	608.	30.	0.
40	105980.	237.	407.	149.	95.	423.	40.	458.	245.	68.	262.	350.	17.	0.
45	104375.	15.	687.	121.	76.	347.	32.	367.	201.	54.	213.	288.	13.	0.
50	107671.	0.	888.	98.	37.	376.	17.	248.	191.	59.	179.	384.	8.	0.
55	87548.	0.	1124.	86.	32.	329.	14.	218.	168.	52.	158.	336.	7.	0.
60	148344.	0.	2785.	132.	49.	508.	22.	336.	258.	80.	244.	518.	11.	0.
65	155705.	0.	4963.	155.	51.	469.	20.	428.	265.	86.	296.	500.	8.	0.
70	126369.	0.	6369.	90.	30.	269.	12.	251.	153.	48.	170.	282.	5.	0.
75	94837.	0.	7047.	54.	18.	160.	8.	153.	91.	28.	101.	167.	3.	0.
80	49740.	0.	6644.	33.	11.	97.	5.	94.	56.	17.	61.	101.	1.	0.
85	24948.	0.	5966.	21.	7.	62.	3.	60.	36.	11.	39.	64.	1.	0.
total	2034366.	18243.	38492.	3562.	1866.	10112.	851.	10297.	5556.	1839.	6391.	8542.	396.	0.

Appendix B

AGE-SPECIFIC MORTALITY, FERTILITY, AND MIGRATION RATES (1974)

APPENDIX B

Death rates: total population.

age	sch-hols	hamburg	l.sax.	bremen	n.r-w.p	hesse	rhine-pl	bad-wurt	bavaria	saarland	w.berlin
0	0.003785	0.004153	0.004562	0.004179	0.004779	0.004338	0.004580	0.003813	0.004432	0.005126	0.004420
5	0.000427	0.000392	0.000417	0.000402	0.000480	0.000409	0.000450	0.000448	0.000412	0.000538	0.000365
10	0.000310	0.000220	0.000292	0.000220	0.000319	0.000219	0.000302	0.000308	0.000286	0.000272	0.000354
15	0.000857	0.000606	0.001138	0.000607	0.000762	0.000942	0.000965	0.000909	0.001112	0.000979	0.000684
20	0.001189	0.000907	0.001157	0.000901	0.000934	0.001017	0.001057	0.000994	0.001050	0.001078	0.001090
25	0.001011	0.001019	0.001054	0.001023	0.000897	0.000845	0.001053	0.000930	0.001057	0.001099	0.001299
30	0.001336	0.001455	0.001809	0.001456	0.001235	0.001254	0.001406	0.001263	0.001259	0.001552	0.001821
35	0.001898	0.001903	0.001948	0.001909	0.001767	0.001676	0.001930	0.001732	0.001795	0.001930	0.002590
40	0.002810	0.003567	0.003249	0.003581	0.002837	0.002356	0.002815	0.002670	0.001399	0.003194	0.003840
45	0.005274	0.004927	0.004733	0.004927	0.004622	0.004343	0.004216	0.003985	0.005676	0.004367	0.006582
50	0.007522	0.007697	0.007082	0.007627	0.007142	0.006510	0.006883	0.006053	0.006527	0.006376	0.008247
55	0.010835	0.011291	0.010548	0.011800	0.011043	0.009276	0.010385	0.009348	0.009943	0.010133	0.012839
60	0.013685	0.016673	0.015325	0.016807	0.017900	0.015217	0.017200	0.015383	0.016231	0.022709	0.018774
65	0.029522	0.028996	0.029089	0.029118	0.030268	0.027847	0.028166	0.026655	0.026768	0.029485	0.031878
70	0.048335	0.045957	0.047942	0.046269	0.049821	0.046560	0.047778	0.044398	0.046890	0.050780	0.050400
75	0.070946	0.070535	0.074622	0.070945	0.078724	0.073187	0.077683	0.073251	0.078021	0.095408	0.074306
80	0.115280	0.119516	0.120871	0.120056	0.125016	0.124849	0.127876	0.119368	0.126141	0.153779	0.133575
85	0.228968	0.221072	0.203663	0.221661	0.211782	0.226459	0.216409	0.211339	0.213782	0.191218	0.239137
gross	2.717922	2.703977	2.685889	2.715850	2.751448	2.736514	2.755759	2.618026	2.713904	2.899920	2.960993
crude	0.012813	0.014587	0.012027	0.012863	0.011893	0.011557	0.011793	0.010094	0.011428	0.012000	0.018921
m.age	79.0441	78.8274	78.4839	78.8175	78.6031	79.2211	78.7999	79.0705	78.8929	78.2369	78.6491

Fertility rates: total population.

age	sch-hols	hamburg	l.sax	bremen	n.r-w.p	hesse	rhine-pl	bad-wurt	bavaria	saarland	w.berlin
0	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
5	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
10	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
15	0.015011	0.011870	0.013202	0.016330	0.013543	0.013538	0.016025	0.014200	0.012292	0.018942	0.017323
20	0.048478	0.036548	0.051173	0.046211	0.046218	0.045953	0.047810	0.048785	0.048822	0.044098	0.041819
25	0.046967	0.037999	0.050615	0.041597	0.046967	0.043701	0.046698	0.048810	0.045735	0.038909	0.039222
30	0.023118	0.019973	0.028604	0.020583	0.024098	0.022854	0.021872	0.027869	0.025789	0.020622	0.021102
35	0.009352	0.007110	0.013141	0.008337	0.010074	0.009916	0.010550	0.011893	0.012697	0.009050	0.008723
40	0.002471	0.001721	0.004481	0.002106	0.002845	0.002983	0.003380	0.003303	0.004114	0.002870	0.002236
45	0.000216	0.000121	0.000313	0.000205	0.000196	0.000172	0.000250	0.000215	0.000330	0.000220	0.000148
50	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
55	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
60	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
65	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
70	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
75	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
80	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
85	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
gross	0.728049	0.576695	0.807482	0.676848	0.719683	0.695588	0.732929	0.771178	0.746893	0.653559	0.650841
crude	0.009880	0.007800	0.010702	0.009128	0.009814	0.009877	0.009729	0.011076	0.010511	0.008942	0.008967
m.age	26.5249	26.6137	27.2487	26.2267	26.8185	26.7558	26.6219	26.9839	27.2268	26.5142	26.3387

Out-migration rates: total population.

	migration from sch-hols to										
age	total	sch-hols	hamburg	l.sax	bremen	n.r-w.p	hesse	rhine-pl	bad-wurt	bavaria	saarland	w.berlin
0	0.066578	0.041145	0.008915	0.005790	0.000613	0.004104	0.001366	0.000653	0.001506	0.001459	0.000153	0.000873
5	0.038959	0.024070	0.005219	0.003387	0.000355	0.002407	0.000804	0.000382	0.000885	0.000853	0.000090	0.000508
10	0.023535	0.014545	0.003150	0.002047	0.000216	0.001451	0.000484	0.000230	0.000535	0.000516	0.000056	0.000305
15	0.063287	0.035574	0.009251	0.006102	0.000764	0.004377	0.001430	0.000718	0.001928	0.001818	0.000168	0.001158
20	0.191923	0.101339	0.027964	0.020504	0.002819	0.014605	0.004437	0.002488	0.006618	0.006392	0.000528	0.004228
25	0.122372	0.061183	0.021662	0.012267	0.002158	0.009123	0.003273	0.001818	0.004235	0.004408	0.000327	0.002318
30	0.077581	0.038715	0.014095	0.007758	0.001135	0.006337	0.002114	0.000984	0.002566	0.002410	0.000171	0.001296
35	0.040551	0.020216	0.007378	0.004062	0.000599	0.003315	0.001104	0.000514	0.001341	0.001256	0.000090	0.000675
40	0.029477	0.014691	0.005364	0.002955	0.000436	0.002410	0.000803	0.000374	0.000973	0.000912	0.000068	0.000490
45	0.020754	0.010380	0.003755	0.002062	0.000300	0.001693	0.000571	0.000265	0.000690	0.000648	0.000049	0.000341
50	0.016860	0.008999	0.002812	0.001586	0.000169	0.001193	0.000454	0.000230	0.000508	0.000549	0.000020	0.000339
55	0.016866	0.009016	0.002770	0.001584	0.000174	0.001196	0.000450	0.000245	0.000511	0.000552	0.000020	0.000348
60	0.012879	0.006876	0.002085	0.001219	0.000133	0.000926	0.000346	0.000187	0.000393	0.000426	0.000013	0.000273
65	0.011148	0.008239	0.001889	0.001226	0.000128	0.001062	0.000299	0.000157	0.000456	0.000413	0.000007	0.000271
70	0.012355	0.007182	0.001657	0.001057	0.000115	0.000943	0.000264	0.000132	0.000397	0.000352	0.000009	0.000247
75	0.012797	0.007423	0.001725	0.001100	0.000112	0.001000	0.000275	0.000137	0.000412	0.000350	0.000012	0.000250
80	0.016489	0.009574	0.002200	0.001426	0.000169	0.001281	0.000363	0.000169	0.000508	0.000459	0.000024	0.000314
85	0.023320	0.013607	0.003125	0.002019	0.000192	0.001779	0.000481	0.000288	0.000721	0.000625	0.000000	0.000481
gross	4.003648	2.163869	0.625084	0.390763	0.052936	0.296016	0.096593	0.047862	0.125920	0.122001	0.009033	0.073572
crude	0.050490	0.027190	0.007946	0.004961	0.000680	0.003726	0.001225	0.000603	0.001585	0.001539	0.000120	0.000917
m.age	30.881%	30.587%	31.213%	30.5622	30.1133	31.8200	31.3562	31.6054	31.8125	31.5035	25.9429	32.0648

	migration from hamburg to										
age	total	sch-hols	hamburg	l.sax	bremen	n.r-w.p	hesse	rhine-pl	bad-wurt	bavaria	saarland	w.berlin
0	0.052925	0.026259	0.000000	0.016163	0.000624	0.003664	0.001561	0.000448	0.001683	0.001900	0.000054	0.000570
5	0.033032	0.016374	0.000000	0.010077	0.000383	0.002292	0.000990	0.000285	0.001052	0.001177	0.000045	0.000357
10	0.019814	0.009828	0.000000	0.006039	0.000237	0.001371	0.000589	0.000167	0.000633	0.000712	0.000026	0.000211
15	0.029080	0.013859	0.000000	0.008176	0.000495	0.002100	0.001070	0.000252	0.001120	0.001252	0.000050	0.000707
20	0.099394	0.045763	0.000000	0.026116	0.002125	0.007481	0.004184	0.000888	0.004260	0.004912	0.000236	0.003429
25	0.080119	0.034239	0.000000	0.020336	0.002313	0.008121	0.003786	0.000797	0.003812	0.004249	0.000308	0.002159
30	0.062695	0.028392	0.000000	0.016635	0.001167	0.005931	0.002685	0.000752	0.002593	0.003106	0.000119	0.001314
35	0.036109	0.016335	0.000000	0.009563	0.000677	0.003425	0.001543	0.000437	0.001494	0.001797	0.000070	0.000768
40	0.026529	0.012008	0.000000	0.007029	0.000493	0.002514	0.001141	0.000319	0.001092	0.001315	0.000058	0.000561
45	0.018312	0.008310	0.000000	0.004880	0.000335	0.001710	0.000781	0.000223	0.000753	0.000911	0.000028	0.000381
50	0.015637	0.007382	0.000000	0.004888	0.000189	0.000954	0.000567	0.000188	0.000612	0.000693	0.000027	0.000180
55	0.015512	0.007312	0.000000	0.004852	0.000175	0.000954	0.000565	0.000148	0.000605	0.000686	0.000027	0.000180
60	0.012807	0.006036	0.000000	0.004007	0.000149	0.000796	0.000464	0.000114	0.000499	0.000569	0.000026	0.000149
65	0.012741	0.006264	0.000000	0.003581	0.000125	0.000863	0.000516	0.000151	0.000507	0.000614	0.000036	0.000125
70	0.009912	0.004906	0.000000	0.002729	0.000099	0.000685	0.000387	0.000122	0.000387	0.000475	0.000022	0.000099
75	0.010764	0.005359	0.000000	0.002920	0.000109	0.000746	0.000419	0.000124	0.000404	0.000528	0.000031	0.000124
80	0.015302	0.007621	0.000000	0.004154	0.000179	0.001076	0.000568	0.000209	0.000568	0.000747	0.000030	0.000149
85	0.024035	0.011958	0.000000	0.006544	0.000297	0.001725	0.000892	0.000297	0.000892	0.001130	0.000059	0.000238
gross	2.873594	1.341019	0.000000	0.793250	0.050853	0.232041	0.113536	0.029387	0.114832	0.133861	0.006272	0.058542
crude	0.038814	0.015919	0.000000	0.009446	0.000635	0.002852	0.001384	0.000352	0.001395	0.001619	0.000076	0.000737
m.age	33.5065	33.6294	0.0000	33.2542	31.6351	33.2119	34.2576	36.0256	33.9354	34.6605	35.4604	30.4934

APPENDIX B *Continued.*

migration from l.sax to

age	total	soh-hols	hamburg	l.sax	bremen	n.r-w.p	hesse	rhine-pl	bad-wurt	bavaria	saarland	w.berlin
0	0.049909	0.001762	0.001753	0.032327	0.002495	0.005836	0.001669	0.000581	0.001396	0.001281	0.000068	0.000740
5	0.030033	0.001060	0.001054	0.019452	0.001502	0.003511	0.001004	0.000351	0.000841	0.000772	0.000042	0.000445
10	0.017339	0.000612	0.000609	0.011229	0.000868	0.002026	0.000580	0.000202	0.000486	0.000446	0.000024	0.000257
15	0.051948	0.002191	0.002004	0.032075	0.002673	0.006543	0.001788	0.000532	0.001613	0.001362	0.000076	0.001091
20	0.157398	0.007685	0.006304	0.093842	0.008461	0.020690	0.005393	0.001519	0.005052	0.004205	0.000244	0.004002
25	0.103600	0.004353	0.005414	0.057607	0.005356	0.014626	0.004201	0.001428	0.004260	0.003918	0.000252	0.002184
30	0.063845	0.002523	0.002943	0.035858	0.003003	0.009211	0.002785	0.000931	0.002614	0.002487	0.000114	0.001376
35	0.035053	0.001387	0.001620	0.019646	0.001656	0.005084	0.001526	0.000513	0.001435	0.001368	0.000062	0.000757
40	0.024351	0.000964	0.001125	0.013649	0.001151	0.003531	0.001061	0.000356	0.000998	0.000950	0.000048	0.000525
45	0.015626	0.000616	0.000717	0.008815	0.000728	0.002231	0.000685	0.000226	0.000637	0.000607	0.000027	0.000336
50	0.013989	0.000476	0.000441	0.008483	0.000535	0.001671	0.000628	0.000240	0.000558	0.000586	0.000028	0.000343
55	0.014749	0.000510	0.000470	0.008920	0.000557	0.001769	0.000659	0.000255	0.000593	0.000619	0.000029	0.000368
60	0.012245	0.000428	0.000390	0.007398	0.000461	0.001470	0.000546	0.000213	0.000494	0.000515	0.000026	0.000307
65	0.014832	0.000499	0.000440	0.009059	0.000499	0.001913	0.000676	0.000249	0.000573	0.000530	0.000031	0.000365
70	0.012697	0.000426	0.000375	0.007748	0.000432	0.001650	0.000580	0.000208	0.000487	0.000448	0.000026	0.000317
75	0.012831	0.000430	0.000382	0.007824	0.000440	0.001672	0.000585	0.000208	0.000488	0.000449	0.000029	0.000324
80	0.014968	0.000495	0.000439	0.009143	0.000524	0.001954	0.000682	0.000234	0.000561	0.000524	0.000028	0.000383
85	0.020991	0.000707	0.000632	0.012773	0.000725	0.002733	0.000967	0.000335	0.000799	0.000725	0.000056	0.000539
gross	3.332018	0.135623	0.135566	1.979223	0.160326	0.440596	0.130068	0.042904	0.119437	0.108955	0.006036	0.073285
crude	0.041306	0.001703	0.001708	0.024538	0.002034	0.005463	0.001584	0.000518	0.001463	0.001330	0.000072	0.000893
m.age	32.0652	30.8525	30.8541	31.8227	29.6468	32.3934	34.2634	35.1814	33.8558	34.4340	34.7280	34.0306

migration from bremen to

age	total	soh-hols	hamburg	l.sax	bremen	n.r-w.p	hesse	rhine-pl	bad-wurt	bavaria	saarland	w.berlin
0	0.059134	0.002513	0.001093	0.043346	0.001803	0.004097	0.001885	0.000628	0.001639	0.001475	0.000055	0.000601
5	0.035327	0.001518	0.000659	0.025887	0.001079	0.002433	0.001116	0.000366	0.000988	0.000878	0.000037	0.000366
10	0.020837	0.000899	0.000385	0.015279	0.000624	0.001449	0.000660	0.000202	0.000587	0.000532	0.000018	0.000202
15	0.045890	0.003873	0.001445	0.027949	0.001591	0.004145	0.001821	0.000502	0.001821	0.001591	0.000105	0.001047
20	0.141871	0.016962	0.005254	0.076382	0.005211	0.014217	0.006004	0.001694	0.006176	0.005339	0.000472	0.004160
25	0.101019	0.005693	0.004584	0.057887	0.003923	0.011172	0.004072	0.001642	0.004584	0.004435	0.000192	0.002836
30	0.074261	0.003451	0.002786	0.046182	0.002768	0.008287	0.002696	0.000827	0.002984	0.002714	0.000036	0.001528
35	0.041003	0.001909	0.001541	0.025484	0.001524	0.004571	0.001489	0.000455	0.001664	0.001489	0.000035	0.000841
40	0.028223	0.001311	0.001053	0.017552	0.001053	0.003159	0.001006	0.000328	0.001147	0.001030	0.000000	0.000585
45	0.019115	0.000867	0.000707	0.012044	0.000684	0.002076	0.000707	0.000205	0.000753	0.000684	0.000000	0.000388
50	0.014249	0.000568	0.000328	0.009857	0.000372	0.000962	0.000568	0.000197	0.000525	0.000546	0.000022	0.000306
55	0.014234	0.000554	0.000326	0.009837	0.000391	0.000977	0.000554	0.000195	0.000521	0.000554	0.000033	0.000293
60	0.012060	0.000496	0.000280	0.008285	0.000302	0.000841	0.000475	0.000173	0.000453	0.000475	0.000022	0.000259
65	0.011913	0.000350	0.000350	0.007950	0.000210	0.001049	0.000483	0.000233	0.000490	0.000560	0.000047	0.000233
70	0.010489	0.000306	0.000336	0.007034	0.000214	0.000917	0.000367	0.000214	0.000428	0.000459	0.000031	0.000183
75	0.011030	0.000318	0.000363	0.007399	0.000227	0.000953	0.000363	0.000227	0.000454	0.000499	0.000045	0.000182
80	0.016713	0.000438	0.000525	0.011376	0.000350	0.001400	0.000525	0.000350	0.000613	0.000700	0.000088	0.000350
85	0.025074	0.000697	0.000871	0.016890	0.000522	0.002090	0.000871	0.000522	0.001045	0.001045	0.000000	0.000522
gross	3.412216	0.213605	0.114427	2.133088	0.114240	0.323985	0.128114	0.044803	0.134350	0.125023	0.006175	0.074406
crude	0.041954	0.002720	0.001420	0.026032	0.001449	0.004050	0.001586	0.000526	0.001655	0.001522	0.000073	0.000921
m.age	31.9698	27.5189	33.1143	32.1245	29.7821	32.2345	31.8307	35.9688	32.9973	34.2438	33.4548	32.7887

migration from n.r-w.p to

age	total	sch-hols	hamburg	l.sax	bremen	n.r-w.p	hesse	rhine-pl	bad-wurt	bavaria	saarland	w.berlin
0	0.053921	0.000774	0.000277	0.003223	0.000168	0.042004	0.001794	0.001819	0.001683	0.001614	0.000116	0.000449
5	0.030337	0.000435	0.000155	0.001816	0.000095	0.023629	0.001009	0.001024	0.000948	0.000908	0.000066	0.000253
10	0.016946	0.000243	0.000087	0.001015	0.000053	0.013196	0.000564	0.000572	0.000530	0.000508	0.000037	0.000142
15	0.041810	0.000834	0.000310	0.002912	0.000189	0.031053	0.001553	0.001324	0.001513	0.001390	0.000099	0.000632
20	0.121222	0.002890	0.001050	0.009222	0.000646	0.087419	0.004735	0.003748	0.004650	0.004248	0.000298	0.002318
25	0.090869	0.001316	0.001027	0.005725	0.000654	0.066066	0.003840	0.002803	0.004057	0.003686	0.000274	0.001422
30	0.060335	0.000886	0.000626	0.003608	0.000341	0.044146	0.002490	0.002164	0.002639	0.002557	0.000152	0.000726
35	0.036364	0.000532	0.000379	0.002178	0.000207	0.026594	0.001500	0.001305	0.001593	0.001543	0.000092	0.000441
40	0.027254	0.000398	0.000284	0.001633	0.000155	0.019931	0.001124	0.000978	0.001194	0.001157	0.000068	0.000331
45	0.017724	0.000261	0.000182	0.001058	0.000099	0.012976	0.000731	0.000636	0.000774	0.000751	0.000045	0.000211
50	0.015786	0.000307	0.000089	0.001027	0.000061	0.010946	0.000692	0.000973	0.000721	0.000795	0.000037	0.000138
55	0.016654	0.000327	0.000091	0.001078	0.000063	0.011555	0.000728	0.001025	0.000764	0.000837	0.000038	0.000147
60	0.015140	0.000298	0.000082	0.000977	0.000058	0.010509	0.000663	0.000930	0.000695	0.000760	0.000035	0.000133
65	0.017351	0.000259	0.000099	0.001136	0.000051	0.012251	0.000806	0.001035	0.000750	0.000753	0.000046	0.000166
70	0.013203	0.000191	0.000078	0.000852	0.000039	0.009394	0.000605	0.000762	0.000559	0.000559	0.000035	0.000131
75	0.012706	0.000183	0.000075	0.000813	0.000036	0.009079	0.000579	0.000719	0.000531	0.000531	0.000034	0.000128
80	0.014775	0.000209	0.000084	0.000939	0.000042	0.010599	0.000670	0.000823	0.000609	0.000609	0.000037	0.000153
85	0.019952	0.000287	0.000120	0.001268	0.000065	0.014307	0.000898	0.001111	0.000824	0.000824	0.000046	0.000204
gross	3.111755	0.053162	0.025470	0.202410	0.015109	2.278262	0.124905	0.118742	0.125153	0.120143	0.007776	0.040622
crude	0.038595	0.000667	0.000325	0.002514	0.000193	0.028342	0.001529	0.001398	0.001543	0.001473	0.000096	0.000515
m.age	33.2088	32.3216	32.6085	32.9958	31.9075	32.7081	35.0129	38.2743	34.8907	35.6407	33.6406	31.5598

migration from hesse to

age	total	sch-hols	hamburg	l.sax	bremen	n.r-w.p	hesse	rhine-pl	bad-wurt	bavaria	saarland	w.berlin
0	0.058123	0.000657	0.000361	0.002315	0.000233	0.004745	0.037942	0.003215	0.004042	0.003756	0.000289	0.000568
5	0.034099	0.000386	0.000208	0.001359	0.000137	0.002784	0.022261	0.001886	0.002372	0.002206	0.000168	0.000331
10	0.019615	0.000222	0.000120	0.000780	0.000081	0.001600	0.012809	0.001085	0.001364	0.001265	0.000097	0.000192
15	0.052070	0.000665	0.000376	0.002321	0.000211	0.004157	0.033122	0.003036	0.003800	0.003320	0.000279	0.000782
20	0.133488	0.001849	0.001065	0.006325	0.000548	0.010642	0.083269	0.008063	0.009999	0.008491	0.000758	0.002479
25	0.106812	0.001221	0.001079	0.004565	0.000642	0.010829	0.063800	0.006180	0.008538	0.007693	0.000687	0.001579
30	0.073395	0.000820	0.000743	0.003102	0.000355	0.008287	0.043164	0.004112	0.005786	0.005596	0.000381	0.001049
35	0.046172	0.000508	0.000468	0.001952	0.000226	0.005280	0.027052	0.002598	0.003658	0.003527	0.000242	0.000662
40	0.036327	0.000397	0.000368	0.001536	0.000175	0.004182	0.021244	0.002051	0.002885	0.002776	0.000193	0.000521
45	0.022901	0.000259	0.000231	0.000967	0.000110	0.002558	0.013511	0.001277	0.001799	0.001743	0.000118	0.000327
50	0.020023	0.000184	0.000120	0.000777	0.000034	0.001486	0.013097	0.001144	0.001302	0.001566	0.000106	0.000206
55	0.019239	0.000179	0.000118	0.000749	0.000038	0.001417	0.012591	0.001088	0.001257	0.001497	0.000104	0.000202
60	0.016393	0.000157	0.000097	0.000639	0.000034	0.001191	0.010738	0.000918	0.001075	0.001276	0.000091	0.000176
65	0.018207	0.000169	0.000073	0.000757	0.000040	0.001474	0.011812	0.000983	0.001169	0.001395	0.000083	0.000252
70	0.014825	0.000143	0.000059	0.000619	0.000034	0.001212	0.009597	0.000804	0.000956	0.001128	0.000067	0.000206
75	0.014754	0.000146	0.000060	0.000618	0.000027	0.001222	0.009533	0.000804	0.000943	0.001116	0.000073	0.000213
80	0.017518	0.000167	0.000064	0.000733	0.000039	0.001465	0.011310	0.000951	0.001131	0.001324	0.000077	0.000257
85	0.023745	0.000230	0.000077	0.000997	0.000051	0.001994	0.015361	0.001278	0.001534	0.001789	0.000102	0.000332
gross	3.638533	0.041790	0.028436	0.155551	0.015077	0.332625	2.261069	0.207371	0.268048	0.257316	0.019574	0.051675
crude	0.045894	0.000536	0.000378	0.001970	0.000200	0.004260	0.028360	0.002627	0.003428	0.003226	0.000250	0.000658
m.age	33.5286	31.7983	31.2106	33.2607	29.8384	33.6817	33.5756	33.1869	32.8507	34.8508	32.6813	33.6690

APPENDIX B *Continued.*

migration from rhine-pl to

age	total	sch-hols	hamburg	l.sax	bremen	n.r-w.p	hesse	rhine-pl	bad-wurt	bavaria	saarland	w.berlin
0	0.054208	0.000427	0.000142	0.001222	0.000098	0.007294	0.005355	0.031114	0.004427	0.002032	0.001738	0.000358
5	0.031928	0.000250	0.000085	0.000720	0.000059	0.004295	0.003151	0.018330	0.002606	0.001199	0.001025	0.000207
10	0.020492	0.000160	0.000053	0.000462	0.000038	0.002761	0.002026	0.011757	0.001674	0.000770	0.000656	0.000135
15	0.063948	0.000641	0.000258	0.001409	0.000131	0.008639	0.006703	0.033944	0.006531	0.002697	0.002315	0.000679
20	0.158763	0.001895	0.000812	0.003538	0.000347	0.021632	0.017320	0.079017	0.018434	0.007348	0.006285	0.002179
25	0.114566	0.001048	0.000675	0.002853	0.000378	0.017586	0.014355	0.053825	0.013160	0.005363	0.003775	0.001547
30	0.067058	0.000666	0.000432	0.001947	0.000245	0.010886	0.008288	0.030982	0.007739	0.003396	0.001760	0.000717
35	0.036817	0.000361	0.000242	0.001069	0.000138	0.006028	0.004552	0.016902	0.004295	0.001863	0.000972	0.000395
40	0.025314	0.000248	0.000167	0.000737	0.000099	0.004151	0.003132	0.011605	0.002956	0.001281	0.000664	0.000274
45	0.017440	0.000174	0.000115	0.000505	0.000068	0.002819	0.002152	0.008075	0.002004	0.000887	0.000459	0.000187
50	0.016281	0.000175	0.000058	0.000430	0.000036	0.002470	0.001701	0.008467	0.001837	0.000926	0.000438	0.000107
55	0.014955	0.000166	0.000053	0.000393	0.000033	0.002269	0.001563	0.007830	0.001304	0.000845	0.000399	0.000100
60	0.013197	0.000141	0.000052	0.000348	0.000033	0.001994	0.001381	0.006936	0.001141	0.000745	0.000348	0.000085
65	0.014976	0.000110	0.000050	0.000419	0.000020	0.002580	0.001392	0.007905	0.001178	0.000689	0.000479	0.000155
70	0.013193	0.000095	0.000044	0.000368	0.000019	0.002280	0.001232	0.006955	0.001035	0.000603	0.000426	0.000133
75	0.013940	0.000094	0.000052	0.000398	0.000021	0.002417	0.001298	0.007326	0.001099	0.000638	0.000450	0.000147
80	0.015048	0.000122	0.000061	0.000425	0.000020	0.002613	0.001418	0.007878	0.001195	0.000689	0.000466	0.000162
85	0.021951	0.000161	0.000081	0.000604	0.000000	0.003826	0.002054	0.011560	0.001732	0.001007	0.000685	0.000242
gross	3.570175	0.034678	0.017171	0.089195	0.008895	0.532699	0.395371	1.802041	0.369732	0.164891	0.116462	0.039039
crude	0.044506	0.000441	0.000216	0.001098	0.000115	0.006533	0.004960	0.022459	0.004687	0.002045	0.001465	0.000487
m.age	31.7694	30.9944	32.2538	33.4075	30.2953	33.4012	31.4340	31.4284	30.9337	33.0191	30.5859	31.8742

migration from bad-wurt to

age	total	sch-hols	hamburg	l.sax	bremen	n.r-w.p	hesse	rhine-pl	bad-wurt	bavaria	saarland	w.berlin
0	0.052965	0.000428	0.000221	0.001107	0.000107	0.002397	0.002281	0.001899	0.038972	0.004878	0.000257	0.000417
5	0.030392	0.000245	0.000127	0.000637	0.000062	0.001374	0.001307	0.001091	0.022364	0.002798	0.000147	0.000239
10	0.016206	0.000132	0.000068	0.000341	0.000033	0.000733	0.000696	0.000581	0.011922	0.001493	0.000079	0.000128
15	0.058654	0.000552	0.000268	0.001194	0.000146	0.002529	0.002458	0.002036	0.042602	0.005713	0.000375	0.000785
20	0.157665	0.001595	0.000751	0.003179	0.000431	0.006624	0.006892	0.005396	0.113659	0.015838	0.001132	0.002568
25	0.109590	0.001214	0.000885	0.003010	0.000457	0.007042	0.005881	0.004153	0.073768	0.010923	0.000790	0.001467
30	0.062971	0.000579	0.000489	0.001711	0.000220	0.004487	0.003534	0.002750	0.041496	0.006609	0.000385	0.000712
35	0.040463	0.000372	0.000314	0.001103	0.000142	0.002907	0.002274	0.001776	0.026605	0.004261	0.000250	0.000458
40	0.033222	0.000303	0.000259	0.000908	0.000115	0.002395	0.001869	0.001461	0.021827	0.003502	0.000208	0.000375
45	0.022167	0.000203	0.000171	0.000602	0.000078	0.001579	0.001244	0.000968	0.014610	0.002326	0.000135	0.000251
50	0.017072	0.000148	0.000081	0.000363	0.000038	0.000774	0.000791	0.000664	0.011987	0.001965	0.000074	0.000187
55	0.016658	0.000146	0.000079	0.000357	0.000034	0.000750	0.000771	0.000631	0.011725	0.001905	0.000070	0.000189
60	0.012667	0.000111	0.000062	0.000272	0.000028	0.000562	0.000589	0.000466	0.008934	0.001481	0.000052	0.000149
65	0.016961	0.000157	0.000073	0.000377	0.000029	0.000730	0.000691	0.000530	0.012298	0.001825	0.000055	0.000201
70	0.012998	0.000120	0.000057	0.000289	0.000023	0.000558	0.000529	0.000400	0.009443	0.001379	0.000043	0.000157
75	0.012550	0.000116	0.000051	0.000278	0.000023	0.000537	0.000509	0.000379	0.009149	0.001314	0.000042	0.000153
80	0.013379	0.000125	0.000063	0.000295	0.000027	0.000572	0.000546	0.000402	0.009748	0.001395	0.000045	0.000161
85	0.016704	0.000160	0.000071	0.000374	0.000036	0.000712	0.000676	0.000516	0.012150	0.001743	0.000053	0.000213
gross	3.516428	0.033521	0.020448	0.081986	0.010147	0.186307	0.165667	0.130501	2.466279	0.356555	0.020962	0.044056
crude	0.045834	0.000437	0.000272	0.001072	0.000136	0.002467	0.002179	0.001723	0.032066	0.004623	0.000283	0.000576
m.age	31.9223	31.9819	32.3193	32.4869	31.2834	32.3050	32.1381	31.7349	31.7611	32.7856	29.3991	32.1492

migration from bavaria to

age	total	sch-hols	hamburg	l.sax	bremen	n.r-w.p	hesse	rhine-pl	bad-wurt	bavaria	saarland	w.berlin
0	0.061115	0.000323	0.000182	0.000879	0.000098	0.001921	0.001759	0.000714	0.004086	0.050604	0.000116	0.000434
5	0.033287	0.000176	0.000100	0.000478	0.000054	0.001046	0.000959	0.000389	0.002225	0.027564	0.000062	0.000236
10	0.018052	0.000096	0.000055	0.000258	0.000029	0.000566	0.000519	0.000210	0.001206	0.014951	0.000033	0.000128
15	0.052280	0.000393	0.000207	0.000805	0.000102	0.001758	0.001600	0.000652	0.004133	0.041977	0.000135	0.000518
20	0.148542	0.001385	0.000687	0.002433	0.000334	0.005266	0.004728	0.001954	0.013047	0.116481	0.000463	0.001768
25	0.102219	0.000961	0.000682	0.002143	0.000371	0.005649	0.004003	0.001508	0.009311	0.075955	0.000304	0.001332
30	0.066572	0.000472	0.000452	0.001413	0.000192	0.003783	0.002709	0.000981	0.005628	0.050021	0.000163	0.000758
35	0.039960	0.000283	0.000274	0.000857	0.000116	0.002304	0.001640	0.000596	0.003404	0.029931	0.000098	0.000457
40	0.030627	0.000218	0.000212	0.000660	0.000089	0.001775	0.001262	0.000458	0.002617	0.022909	0.000075	0.000353
45	0.019728	0.000141	0.000133	0.000419	0.000057	0.001122	0.000803	0.000290	0.001668	0.014823	0.000048	0.000224
50	0.018756	0.000096	0.000062	0.000309	0.000020	0.000698	0.000560	0.000205	0.001189	0.015408	0.000035	0.000175
55	0.017374	0.000089	0.000056	0.000280	0.000017	0.000633	0.000507	0.000188	0.001099	0.014310	0.000034	0.000162
60	0.013729	0.000071	0.000040	0.000216	0.000013	0.000481	0.000385	0.000148	0.000863	0.011356	0.000027	0.000129
65	0.016501	0.000094	0.000058	0.000260	0.000027	0.000529	0.000451	0.000196	0.000978	0.013716	0.000028	0.000164
70	0.014164	0.000080	0.000049	0.000221	0.000020	0.000453	0.000385	0.000170	0.000836	0.011784	0.000024	0.000142
75	0.013938	0.000078	0.000050	0.000216	0.000021	0.000443	0.000379	0.000167	0.000819	0.011605	0.000021	0.000138
80	0.013866	0.000075	0.000048	0.000212	0.000021	0.000438	0.000377	0.000171	0.000808	0.011550	0.000027	0.000137
85	0.018397	0.000095	0.000068	0.000286	0.000027	0.000586	0.000504	0.000232	0.001077	0.015317	0.000027	0.000177
gross	3.495531	0.025629	0.017068	0.061733	0.008037	0.147246	0.117621	0.046150	0.274970	2.751313	0.008610	0.037154
crude	0.044508	0.000334	0.000223	0.000794	0.000106	0.001914	0.001523	0.000593	0.003579	0.034852	0.000113	0.000477
m.age	32.0599	30.6286	32.2816	32.5192	30.7252	32.4554	31.8513	32.0074	30.8291	32.1744	30.3309	32.6633

migration from saarland to

age	total	sch-hols	hamburg	l.sax	bremen	n.r-w.p	hesse	rhine-pl	bad-wurt	bavaria	saarland	w.berlin
0	0.036963	0.000289	0.000054	0.000487	0.000054	0.002653	0.001859	0.007725	0.003285	0.001408	0.018915	0.000235
5	0.021460	0.000164	0.000035	0.000281	0.000035	0.001532	0.001088	0.004491	0.001906	0.000819	0.010982	0.000129
10	0.015065	0.000111	0.000030	0.000201	0.000020	0.001077	0.000765	0.003130	0.001338	0.000584	0.007719	0.000091
15	0.047558	0.000740	0.000218	0.000925	0.000109	0.003733	0.003015	0.010959	0.005441	0.002438	0.019426	0.000555
20	0.115568	0.002565	0.000756	0.002850	0.000372	0.009863	0.008426	0.028560	0.015501	0.007162	0.037630	0.001883
25	0.086228	0.001226	0.000526	0.001959	0.000287	0.010974	0.006211	0.014478	0.010496	0.005622	0.032905	0.001545
30	0.051679	0.000457	0.000277	0.001358	0.000139	0.006361	0.003756	0.008606	0.005959	0.003174	0.020746	0.000845
35	0.024213	0.000220	0.000127	0.000636	0.000058	0.003005	0.001768	0.004034	0.002808	0.001491	0.009674	0.000393
40	0.017136	0.000155	0.000084	0.000450	0.000056	0.002124	0.001238	0.002856	0.001984	0.001055	0.006852	0.000281
45	0.011669	0.000096	0.000055	0.000303	0.000041	0.001405	0.000840	0.001943	0.001323	0.000716	0.004753	0.000193
50	0.010295	0.000083	0.000041	0.000207	0.000028	0.000745	0.000524	0.001974	0.000952	0.000469	0.005175	0.000097
55	0.010662	0.000092	0.000046	0.000230	0.000046	0.000758	0.000506	0.001999	0.000965	0.000483	0.005423	0.000115
60	0.008844	0.000080	0.000032	0.000192	0.000032	0.000608	0.000416	0.001663	0.000784	0.000384	0.004558	0.000096
65	0.008855	0.000034	0.000034	0.000205	0.000000	0.000717	0.000444	0.001845	0.000649	0.000376	0.005483	0.000068
70	0.008545	0.000022	0.000022	0.000201	0.000000	0.000602	0.000402	0.001562	0.000535	0.000335	0.004797	0.000067
75	0.009815	0.000000	0.000000	0.000204	0.000000	0.000695	0.000450	0.001840	0.000613	0.000368	0.005603	0.000041
80	0.013376	0.000000	0.000000	0.000317	0.000000	0.000950	0.000633	0.002374	0.000871	0.000554	0.007598	0.000079
85	0.017627	0.000000	0.000000	0.000472	0.000000	0.001259	0.000787	0.003305	0.001102	0.000630	0.009915	0.000157
gross	2.582790	0.031669	0.011691	0.057390	0.006381	0.245311	0.165635	0.516713	0.282563	0.140328	1.090760	0.034349
crude	0.032288	0.000436	0.000158	0.000712	0.000085	0.003096	0.002126	0.006586	0.003673	0.001796	0.013175	0.000444
m.age	31.9676	25.3449	28.5584	33.9151	28.1470	31.6387	30.6111	30.5508	29.5658	30.9491	33.8593	30.7426

APPENDIX B *Continued.*

	migration from w.berlin to										
age	total	sch-hols	hamburg	l.sax	bremen	n.r-w.p	hesse	rhine-pl	bad-wurt	bavaria	saarland	w.berlin
0	0.031965	0.003069	0.000821	0.007727	0.000465	0.005987	0.003415	0.001221	0.003739	0.005241	0.000281	0.000000
5	0.021889	0.002111	0.000560	0.005290	0.000322	0.004095	0.002340	0.000839	0.002560	0.003586	0.000187	0.000000
10	0.013733	0.001319	0.000354	0.003320	0.000204	0.002568	0.001470	0.000531	0.001603	0.002249	0.000115	0.000000
15	0.022437	0.001768	0.000821	0.004589	0.000379	0.004788	0.002399	0.000905	0.003063	0.003505	0.000221	0.000000
20	0.057666	0.003858	0.002558	0.010355	0.001068	0.013327	0.006140	0.002434	0.008625	0.008662	0.000639	0.000000
25	0.055118	0.003630	0.002676	0.010113	0.001363	0.012775	0.006123	0.002175	0.007620	0.008171	0.000473	0.000000
30	0.037381	0.002636	0.001698	0.007476	0.000720	0.008179	0.004323	0.001214	0.004643	0.006183	0.000309	0.000000
35	0.023965	0.001690	0.001090	0.004796	0.000457	0.005246	0.002773	0.000776	0.002975	0.003967	0.000196	0.000000
40	0.019881	0.001406	0.000896	0.003991	0.000377	0.004322	0.002312	0.000642	0.002472	0.003303	0.000160	0.000000
45	0.016402	0.001159	0.000728	0.003325	0.000307	0.003516	0.001926	0.000517	0.002041	0.002759	0.000125	0.000000
50	0.014832	0.000910	0.000344	0.003492	0.000158	0.002303	0.001774	0.000548	0.001662	0.003566	0.000074	0.000000
55	0.015991	0.000982	0.000366	0.003758	0.000160	0.002490	0.001919	0.000594	0.001805	0.003838	0.000080	0.000000
60	0.014547	0.000890	0.000330	0.003424	0.000148	0.002265	0.001739	0.000539	0.001645	0.003492	0.000074	0.000000
65	0.014630	0.000995	0.000328	0.003012	0.000128	0.002749	0.001702	0.000552	0.001901	0.003211	0.000051	0.000000
70	0.010366	0.000712	0.000237	0.002129	0.000095	0.001986	0.001211	0.000380	0.001345	0.002232	0.000040	0.000000
75	0.008256	0.000569	0.000190	0.001687	0.000084	0.001613	0.000960	0.000295	0.001065	0.001761	0.000032	0.000000
80	0.009570	0.000663	0.000221	0.001950	0.000101	0.001890	0.001126	0.000342	0.001226	0.002031	0.000020	0.000000
85	0.012185	0.000842	0.000281	0.002485	0.000120	0.002405	0.001443	0.000441	0.001563	0.002565	0.000040	0.000000
gross	2.004082	0.146057	0.072489	0.434590	0.033277	0.412515	0.225465	0.074735	0.257767	0.351603	0.015586	0.000000
crude	0.024289	0.001751	0.000917	0.004971	0.000418	0.005062	0.002731	0.000904	0.003142	0.004199	0.000195	0.000000
m.age	35.4310	33.2974	33.2078	35.2446	32.0110	34.5749	36.2697	34.6517	35.1181	38.4428	29.5184	0.0000

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THE AUTHORS

Reinhold Koch studied social geography, sociology, and regional planning at Munich Technical University from 1968 to 1973 and received a diploma in geography. In 1975 he completed his dissertation on retirement migration and regional planning. From 1973 to 1979 he worked at the Federal Research Institute for Applied Geography and Regional Planning. Since early 1980 he has been working at the Ministry of State for Regional Planning and Environment in Munich. Dr. Koch's present activities include migration analysis, regional population forecasting, regional monitoring, and thematic cartography.

Hans-Peter Gatzweiler has been working at the Federal Research Institute for Applied Geography and Regional Planning since 1972. Between 1968 and 1972 he studied applied geography, statistical analysis, and urban planning at Bonn University. In 1972 he received his diploma in applied geography and in 1974 completed his dissertation on the analysis and forecasting of age-specific interregional migration. Dr. Gatzweiler's present interests include the improvement of regional planning, decision-making using indicators, the use of sample data for the analysis of regional problems over a short time-scale, and the establishment of an information system for urban development.