INTRA – COMMUNITY MIGRATION AND ITS IMPACT ON THE DEMOGRAPHIC STRUCTURE AT THE REGIONAL LEVEL

Philip Rees, John Stillwell & Andrew Convey

WORKING PAPER 92/1

SCHOOL OF GEOGRAPHY • UNIVERSITY OF LEEDS

Working Paper 92/1

INTRA-COMMUNITY MIGRATION AND ITS IMPACT ON THE DEMOGRAPHIC STRUCTURE AT THE REGIONAL LEVEL

Philip Rees, John Stillwell & Andrew Convey

School of Geography
University of Leeds
Leeds LS2 9JT
United Kingdom

January 1992

Paper prepared for the Session on 'European Population: Towards the Year 2000', at the Institute of British Geographers Annual Conference, 7-10 January, 1992, University College of Swansea.

The authors are grateful to EUROSTAT for their extensive help in providing access to the latest statistical publications and reports, and for their support during preparation of the projections. The authors also thank Pangiras Michael for his help in map production.

CONTENTS

ABSTRACT

Population growth in the member countries of the European Communities (EC) has been decelerating over the last decade as a result of low and falling fertility and is expected to become negative in the first part of the twenty-first century. The populations of regions in the northern UK, Denmark, most of Germany, Wallonia, Nord-Pas-de-Calais, and northwestern Italy experienced zero or negative population growth in the 1978-88 decade. At the same time, the populations of most regions, though not all, are ageing rapidly.

Under such conditions, both international and internal migration play vital roles in determining whether regions gain or lose populations. The paper seeks to explore the consequences of current migration patterns for regional demographic structures in the 1990s and to develop and explore new scenarios for intra-Community migration.

Internal migration within member states can be characterised by three patterns: (1) flows from peripheral regions to core regions (structural migration), (2) flows out of the centres of core regions to less densely developed areas (decentralisation) and (3) flows from more urbanised regions to higher amenity, more rural regions (counterurbanisation). Intra-Community migration between member states also involves the first and last processes. Migration into the EC from outside is focussed on core regions offering new economic opportunities. All migration flows are heavily influenced by the distances between regions (in both economic and cultural terms) and by prior historical channels.

The paper describes a prototype model that projects the populations of Level 1 regions in the EC in such a way that the impact of current demographic and mobility trends can be tracked. The prototype model has a hierarchical design recognising the following spatial layers: (1) international, extra-Community, (2) inter-member state, intra-Community and (3) inter-region, intra-member state. The model uses two sexes, quinary ages and five year projection intervals.

Two alternative scenarios are explored beyond the continuation of current trends: (1) an increase in migration to high growth (income) regions from low growth (income) regions, and (2) a combination of continued counterurbanisation in northern (core) member states and urbanisation in southern (periphery) member states. All of the scenarios and associated projections are speculative. The prototype model uses best estimates from published data and involves numerous simplifications. However, the model does attempt to answer "What if?" questions that policy makers are asking, and we hope its results will be of interest.

1. INTRODUCTION

Modelling the future population distribution and demographic structure of the European Community (EC) is an activity which involves generating a vision of tomorrow's world by thinking through what might happen under particular assumptions of fertility, mortality and migration. It provides an important framework within which researchers and policy makers can discipline their thoughts whilst experimenting with alternative scenarios. This paper attempts to establish the possible trends that might occur in the migration flows between regions within the EC in the rest of this century and the first two decades beyond 2000. It also seeks to evaluate the impact of intra-Community migration on the spatial distribution and demographic structure of regional populations. A great deal of attention in the media in the past couple of years and at the EC Maastricht Conference in December 1991 has focussed on international migration into the EC from outside (from Eastern Europe and North Africa in particular) and commentators have begun to argue the case for a European migration policy (Tapinos 1991, Straubhaar and Zimmermann 1991). Such flows, which include an increasing proportion of asylum seekers, have been very substantial in the 1989-91 period and may continue to be large. However, this should not be allowed to detract from the importance of *intra-Community* migration.

1.1 *Intra-Community migration defined*

Intra-Community migration can be regarded as consisting of three sets of flows of people from one place to another: (1) international migration between the 12 member states of the EC, (2) inter-regional migration between the geographical regions of each member state and (3) intra-regional migration at the local scale. In this paper, our operational definition of the region is the Level I set adopted by the Statistical Office of the European Communities (EUROSTAT). We concentrate on the first and second set of intra-Community flows in the paper because, although extremely significant, intra-regional migration does not affect the size or structure of regional populations.

Table 1 presents a tentative estimate (taken from one of the projections described later in the paper) of the volume of extra-Community, inter-member state and inter-regional migration occurring during the first five years of the present decade. The figures are not precisely comparable because the extra-Community estimate is expressed in net terms while the other two refer to gross flows. The total inter-regional figure consists mainly of register-based counts but includes census counts (France) which under-estimate the true volume of migration that takes place, though not necessarily the net transfers. The bulk of migration (over 95%) that affects regional population structures is migration within the EC, and most of that is within member states themselves. Note, however, that just over 2.2 million migrations are estimated to occur between the 12 member states during the period 1990-95.

1.2 *Migration plays a more important role*

Intra-Community migration has come to play an ever increasing role in population redistribution as natural increase has shrunk (and in some regions been replaced by natural decrease) and will continue to shrink in the next few decades. In 1986, for example, the positive population growth rates in the states of Hessen, Nordrhein Westfalen and Berlin (West) were due to net inmigration compensating for natural decrease. Recently published data from EUROSTAT (1991a) confirms the relationship between the spatial pattern of rates of population change (Figure 1) and net migration (Figure 2) at the NUTS 1 region scale in 1988.

Table 1. *Migration levels in the European Community*

Migration component	Total migration in EUR 12 projected for 1990-95	
	Number (1000s)	Per cent
Total net migration into the Community from outside	717.5	4.3
Total migration between member states	2,215.0	13.3
Total migration between regions within member state	13,748.3	82.4
Total	16,680.8	100.0

Source: Projection by the authors assuming constant rates.

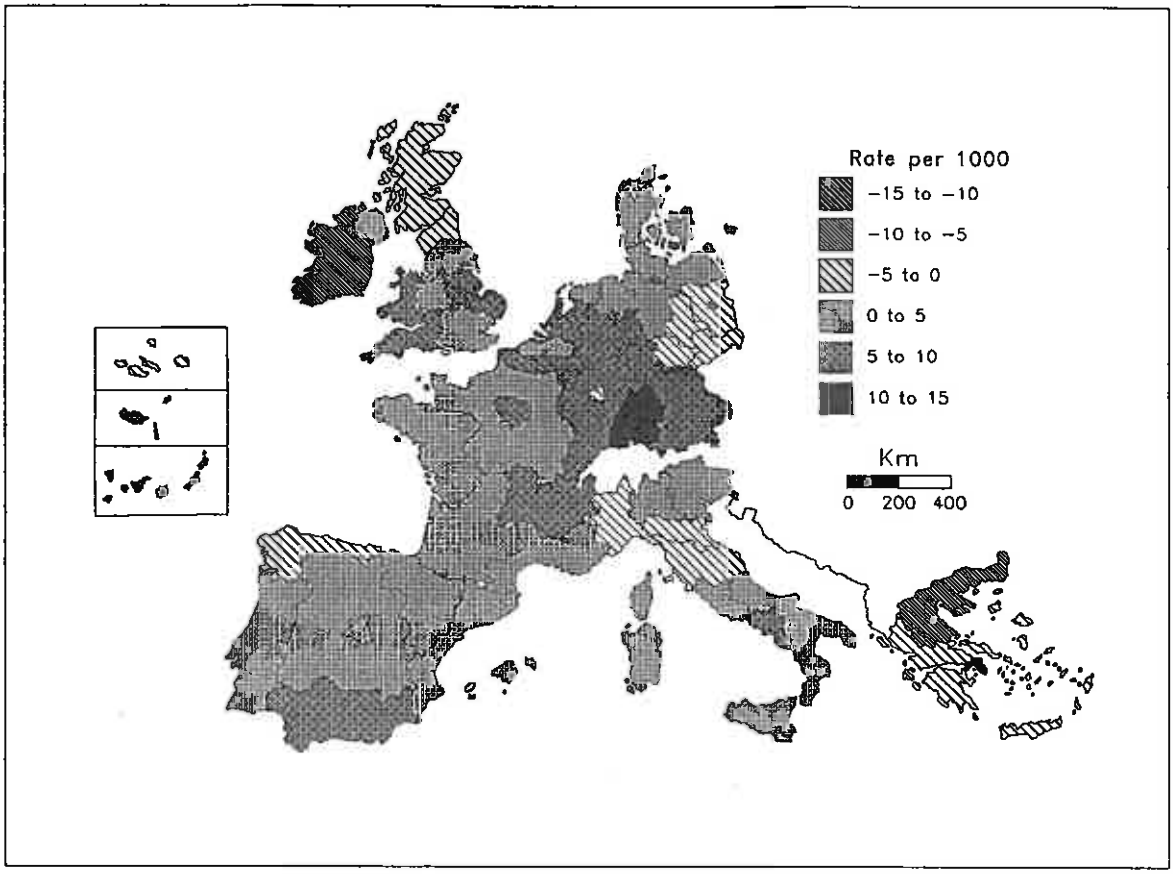

Figure 1: Population change rates, EC Level I regions, 1988

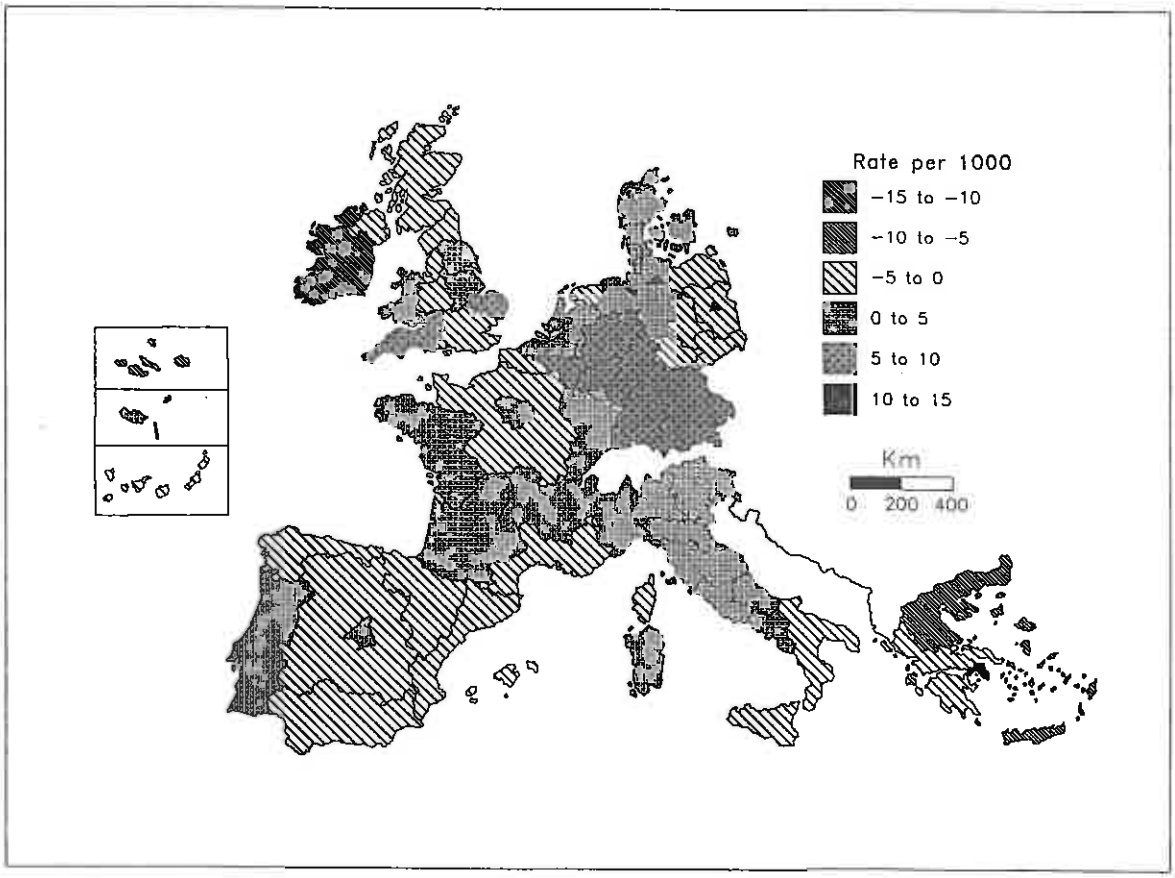

Figure 2: Net migration rates, EC Level I regions, 1988

1.3 *The temporal variability of migration*

Intra-Community migration patterns have proved to have both constant and volatile elements in the recent past. Many countries have an established pattern of net migration into the most economically dynamic areas. In Germany it has dominantly been southward into the states of Bayern and Baden-Wuerttemburg, but in 1989-91 all western Länder have gained from migrants from eastern Länder. In the United Kingdom the dominant inter-regional shift has been a combination of net outflows from the northern regions to the southern combined with some outflows from the capital region (the South East) resulting from both overspill of jobs growth and commuters into other regions. Unusually, in 1989, the latter process meant that northern regions were net gainers from southern (see Stillwell, Rees and Boden 1992 for fuller analyses).

1.4 *The processes of population redistribution*

The processes of population redistribution ongoing in the European Community are complex and intertwined. We can, however, distinguish three sets of processes at the regional scale: (1) migration out of old industrial regions to regions with more dynamic economies, (2) migration out of poor, rural regions into more urbanized industrial regions and (3) migration out of the most densely developed urban cores to smaller cities and towns in less densely inhabited regions. The first migration process contributes to population redistribution as a result of the different rates of regional economic growth; the second process is part of the world-wide phenomenon of urbanization; while the third process is more recent, has been termed counterurbanization (a term still controversial in meaning) and is characteristic of some of the northern regions of the EC (see Champion 1989 for a further discussion).

1.5 *Changes in demographic structures*

Each of these processes affects subgroups within the population to differing degrees. Migration is predominantly a phenomenon associated with young adulthood with a peak in a person's early twenties. Rather fewer middle-aged and elderly persons migrate though there are streams of elderly migration which have an important impact on the demographic structure of particular regions. One of the most important changes currently occurring in the demographic structure of EC populations is ageing (Loriaux 1991). The numbers of elderly and their relative share in the population are rising in most EC regions (though over the period 1990-2005 both Denmark and the United Kingdom are exceptions because they have reached the end of the first ageing transition). Simultaneously, the numbers of children are falling substantially as a consequence of about fifteen years of below replacement fertility (Calot 1991). The working ages, in between, are changing less in overall numbers, but are seeing, and will see, a shift from younger to middle ages in the potential workforce (Schippers and Siegers 1991). Later our projections are used to establish the extent to which intra-Community migration affects these changes in demographic structures in EC re-

gions.

1.6 *Outline of the paper*

The focus of the paper is on the impact of intra-Community migration on population redistribution and restructuring at the regional level. To assess this impact we construct a population projection model that incorporates inter-member state and inter-regional migration as well as the more traditional inputs of fertility, mortality and international migration. We explore the consequences of letting current migration patterns run their course and also look at possible alternative futures.

In Section 2 of the paper the need for a new model is established, while in Section 3 the broad structure of the model is described. The fourth section outlines the datasets employed to compute the benchmark rates for components and the estimation methods needed to fill data gaps. Section 5 of the paper develops the migration scenarios to be used in the projections, linking to the preliminary discussion above. The sixth section presents an overview of the results of four selected projections and interprets the new population geographies of the EC they imply. The final section evaluates the projection model, input database and projection assumptions and makes recommendations for the improvement of this preliminary attempt.

2. WHY CONSTRUCT ANOTHER MODEL OF REGIONAL POPULATION CHANGE?

2.1 *The NEI model and projections*

Several teams of researchers have recently produced projections for the regions of the EC (e.g. Cambridge Econometrics 1991), but the most important is undoubtedly the work of Haverkate and van Haselen (1990) of the Netherlands Economic Institute (NEI). The results of their work, sponsored by the Directorate-General for Regional Policy of the European Commission are being incorporated in major reports (Commission of the European Communities 1991) and adopted as the demographic inputs to other studies such as the Transnational and External Impact Studies supported by the Directorate-General for Regional Policy. It is useful, therefore, to describe the main features of the NEI projections in order to establish why we felt it necessary to construct another model.

The NEI model projects the populations of EC countries and their constituent NUTS Level II regions, using five year projection intervals and therefore five year age groups (and two sexes). The national projections are made principally through use of cohort-survival and a standard fertility model (female dominant). External migration assumptions are adopted, for the first two projection intervals only, for Germany (experiencing a large net inflow) and for Ireland (experiencing heavy net emigration), but otherwise net external migration is assumed to be zero. The regional projections make use of national fertility and mortality rates in the estimation of region-specific rates and add to this an inter-regional migration model which computes

the relevant rates from available aggregate flow tables and which adopts national migration rate schedules by age to disaggregate the crude inter-regional rates to the relevant period-cohorts. In their DEMETER 2015 version of the projections, Haverkate and van Haselen (1990) carry out projections for the former East Germany and project the rate of movement from there to western regions. To the demographic projections are added projections of activity rates to yield labour force projections.

2.2 *Modifications needed*

Excellent and innovative though the NEI model is, it would need further development before it could be used for the purposes of the present paper. The following improvements are needed: (1) the incorporation of all migration components (extra-Community, inter-member state and inter-regional); (2) the ability to alter the inter-regional migration variables used in the projection in the same way as fertility and mortality components are altered to explore the consequences of alternative assumptions. Only when all migration components are included can we be sure population change is fully "accounted" for, and only when we have developed methods of altering inter-regional migration assumptions can we begin to link migration to views about the development of regional economies and societies. The analysis should include in due course the ability to include policy variables which might constrain the numbers of migrants.

2.3 *Data problems confronted*

It is important to emphasize that the absence of age-specific data across the EC necessitates the adoption of a variety of data estimation techniques for base populations, births, deaths and migrations which utilise existing national or aggregate regional onformation in combination with sets of assumptions. The inconsistency of defintions and measurement and the non-alignment of time periods for available data add to the level of difficulty in generating benchmark datasets, let alone forecasting future trends.

3. THE MODEL FOR PROJECTING REGIONAL POPULATIONS

In order to effect the improvements suggested in the previous section, a projection model has been constructed with the following features, building on the work of Haverkate and van Haselen.

3.1 *Two levels*

The model projects the populations of EC member states and of NUTS I regions within those states. The projections at regional level are linked to those at the national level through the distribution to regions of projected national levels of net external migration and inter-member state migration (though currently regional populations and components are not constrained to national projections). The model uses five year age groups (to 90 and over) and two sexes.

3.2 *The population projection relationships*

The *national* populations in each period-cohort and sex are projected by computing the variables on the right hand side of the following relationship:

end of period population
= start of period population
- deaths
+ net external migration
- out-migration to other EC member states
+ in-migration from other EC member states

The *regional* populations are projected by computing the variables on the right hand side of an extended relationship:

end of period population
= start of period population
- deaths
+ net external migration
- out-migration to other EC member states
+ in-migration from other EC member states
- out-migration to other regions in the same member state
+ in-migration from other regions in the same member state

We now describe how each of the terms on the right hand side of these two relationships are produced.

3.3 *Births*

Births are regarded as the equivalent in the accounting relations of start of period population for the first period-cohort (birth in a five year interval to survival aged 0-4 at its end). These new populations, born in the projection interval, are generated using a simple female-dominant fertility model. Fertility rates are themselves projected using national total fertility rates (TFRs), the trajectory for which is established outside the projection. Age- and region-specific fertility rates are adjusted up or down according to the ratio of current period TFR to that of the previous period.

3.4 *Deaths*

These are projected by applying age-specific mortality rates to the start of period populations. The age-specific mortality rates are adjusted down (normally) in each projection period by multiplication by the ratio of projected life expectancies in the previous period to those in the current. The life expectancy trajectories are established prior to the projection.

3.5 *Net external migration*

Assumptions about the net volume of in-migration to each member state from outside the EC are prepared for each projection period outside of the projection. Within the model these are distribut-

ed to age and sex groups using proportions derived from the general parameters of the model migration schedule developed by Rogers and Castro (1981). National net flows are distributed to regions in proportion to their current starting populations, although in future it would be preferable to use a more relevant indicator such as the foreign born population (available via national censuses or the EC-wide Labour Force Surveys - see Commission of the European Communities 1991, Map 4).

3.6 *Out-migration to other member states*

Total out-migration from each member state to other member states is projected by applying rates of inter-member state migration to national starting populations and summing over all destinations (eleven in number). The numbers of out-migrants by age and sex are projected by applying model migration rates to starting populations and constraining the projected flows to add up to the out-migration total. National totals are divided among regions in relation to their starting populations.

3.7 *In-migration from other member states*

The projected inter-member state migration flows are summed over all origins. The in-migration total is used to constrain projected flows derived by applying model migration rates (acting this time as admission rates) to starting populations in each age-sex group. National totals are allocated to regions in proportion to their current period starting populations.

3.8 *Out-migration to other regions*

The out-migration from each region to other regions within a member state is projected by applying rates of inter-regional migration to regional starting populations and summing over all destinations. The out-migration in each age-sex group is projected by applying model migration rates to starting populations and constraining the projected flows to add up to the out-migration total.

3.9 *In-migration from other regions*

The projected inter-regional flows are summed over all origins and used to constrain projected flows derived by applying model migration rates to starting populations in each age-sex group.

3.10 *Modifying migration rates in the projection*

A simple mechanism is introduced to shift in-migration rates (inter-member state or inter-region) up or down. Time series indicators in percentage form are developed (with the benchmark rates input at the start of the projection assumed to be of a level set at 100) for each nation and each region as a destination. Migration rates are shifted up or down by multiplication by the appropriate time series indicator for the current period (divided by 100). Migration rates by origin are assumed to shift by whatever the net effect is over the destinations.

This technique enables us to develop alternative scenarios for the development of intra-Community migration (described in Section 5). This technique is a compromise between the simple "push-model" of migration adopted in the NEI projections or in most multiregional projections (e.g. Rogers 1986) and the various spatial interaction approaches adopted by geographers and economists (see Stillwell and Congdon 1991 for reviews of these approaches). In future, it would be valuable to develop an inter-regional migration model that linked migration to its origin and destination region determinants (employment change, housing change, amenities) and the impedance between them.

4. BENCHMARK DATASETS AND ESTIMATION METHODS

In this section of the paper we review the sources used for the input data and the methods employed to estimate the variables required as input to the projection model described in the previous section. The strategy used was, in the main, to use EUROSTAT publications as sources of the most comparable data. It proved impossible to standardize on a single calendar year for any input dataset, though most data derive from the years 1986 to 1989. On occasion where we attempted to use the latest available data (for UK and former East German migration) this turned out not to be the wisest decision and in future work we would recommend the averaging of several recent years to smooth out volatile migration time series and the more intensive use of national datasets.

4.1 *Age groups, period-cohorts and time intervals*

Five year age groups are used to classify population stocks and five year period-cohorts are employed to classify all the change components. The last age used is 90 and over for populations and the last period-cohort involves transition from being aged 90+ to being aged 95+, five years later. It is important to extend the age range to the most elderly ages as people are living longer and there is a steep increase in care needs with age within the elderly age group. Haverkate and van Haselen (1990) report only on a final age group 70 and above.

4.2 *Base populations*

National populations are available for 1.1.1990 by sex and five year age groups to 90 and over (EUROSTAT 1991a, Table B-6) together with regional totals (EUROSTAT 1991c) and regional popula-

tions by sex and broad age (<15, 15-24,25-34, 35-44, 45-54, 55-64, 65+) are provided for 1.1.1986 (EUROSTAT 1990). These three pieces of information are used to estimate the distribution of regional population at 1.1.1990 by sex and five year age group to 90+ using iterative proportional fitting.

4.3 *Fertility rates*

Table 2 provides details on the fertility variables used. EUROSTAT (1991a, Table E-7) provides fertility rates conveniently organized by period-cohort. These are converted to a five year basis for use in the national level projections. Regional rates are estimated by an extension of a method used in developing standardized rates. National fertility rates are applied to regional female populations at risk and summed to produce an expected total of regional births. The ratio of the observed (1988) to the expected births is used to adjust national rates up or down to match observed births. The technique is the same as that used by Haverkate and van Haselen (1990).

4.4 *Mortality rates*

Table 2 again sets out the datasets used to estimate national and regional mortality rates. Deaths by single year of age (most usually for 1989) are extrapolated over five years and summed by period-cohort before being divided by the initial populations in each period-cohort. Births by sex are used as the divisor for the first period-cohort.

Regional mortality rates are estimated by adjusting national rates to yield observed deaths in 1988 when multiplied by regional populations in the appropriate ages (cf. fertility rates).

Note that because regional rates of both fertility and mortality refer to 1988 and most national rates to 1989, there will be a slight discrepancy between the national projections and the sum of the regional.

4.5 *Net extra-Community migration*

Estimates were prepared for net external migration based on national sources but these were replaced by the scenario figures prepared by EUROSTAT (1991b). These scenarios assume some diminution of net inward flows after the first period of projection (1990-95) which encompasses the unification of the two Germanies and the heavy in-migration of Volk Deutsch into the Federal Republic from eastern Europe. Before entry into the projections, however, the levels of net in-migration due to flows between member states were subtracted from the EUROSTAT (1991b) figures to convert net external migration into net in-migration from outside the EC.

Table 2. *Data on fertility, mortality and net external migration used for benchmark rates and scenario assumptions*

Units	Date	Sources and notes
Fertility		
	Rates	
Belgium	1987	(1) EUROSTAT (1991a), Table E-7 is used to estimate age-specific fertility rates for 5 year period-cohorts.
Denmark	1989	
Germany	1989	
Greece	1989	
Spain	1986	
France	1989	(2) EUROSTAT (1991a), Table E-9 is used to establish 1989 TFRs.
Ireland	1989	
Italy	1988	
Luxembourg	1989	(3) EUROSTAT (1991b), Table A3, gives high and low scenarios which are averaged to yield a middle scenario used here.
Netherlands	1989	
Portugal	1989	
United Kingdom	1989	
NUTS I regions	1988	(4) EUROSTAT (1991a), Table C-1, gives total births for regions.
Mortality		
	Deaths by sex & age	
Belgium	1987	(1) EUROSTAT (1991a), Table G-4 is used to estimate age-specific deaths for 5 year period-cohorts.
Denmark	1989	
Germany	1989	
Greece	1989 (est)	
Spain	1987	
France	1989	(2) EUROSTAT (1991a), Table G-15 is used to establish 1989 life expectancies by sex.
Ireland	1988	
Italy	1988	
Luxembourg	1989	(3) EUROSTAT (1991b), Tables A4 and A5 give high and low scenarios which are averaged for middle scenario used here.
Netherlands	1989	
Portugal	1989	
United Kingdom	1989	
NUTS I regions	1988	(4) EUROSTAT (1991a), Table C-1, gives total deaths for regions.
Net extra-Community migration		
Member states	1990-2020	EUROSTAT (1991B), Table A6 gives high and low scenarios which are averaged to provide a middle scenario used here.

4.6 *Inter-member state migration*

For estimates of the migration flows between member states of the EC, reliance is placed on the report to EUROSTAT by Poulain, Debuisson and Eggerickx (1991). In the course of the report the authors put together tables of inter-member state migration for 1982, 1986, 1986, 1987 and 1988. The tables contain, where available, both origin country and destination country statistics. Normally, destination figures (counts of immigration) are regarded as truer estimates but to discard origin figures entirely would leave a large number of holes in the matrix. Also earlier matrices were fuller than later matrices because of publication lags.

The procedure in using these figures was as follows. All entries for a member state to member state flow were regarded as "sample observations". They were summed and averaged by the number of counts involved (between 1 and 8 depending on the cell) to yield an annual average reflecting migration conditions in 1982 and 1986-88, which was multiplied by five and divided by origin population for entry into the projection model.

One vital pair of flows (and rates) was missing from the matrix - that between Ireland and the UK. Using knowledge of the likely net migration out of Ireland and the 2 to 1 ratio between out- and in-migration between Northern Ireland and Great Britain, an estimate was made of an annual flow of 38 thousand from Ireland to the UK and 19 thousand in the reverse direction. These are the largest flows in the matrix.

4.7 *Inter-region migration*

Table 3 gives details of the datasets used to establish the current pattern of inter-region migration. Data on inter-region migration were needed for 9 member states, with Denmark, Ireland and Luxembourg constituting single NUTS I regions. The data on migration flows between NUTS I regions were drawn from tables available in EUROSTAT (1990) for Germany (West), Greece, Spain, France, Italy and the Netherlands. There were no data available for migration between Portuguese regions.

For Belgium, migration data were extracted from Belgian information at arrondissement level because the NUTS I regions for the country are not a simple aggregation of the NUTS II regions (provinces) reported in EUROSTAT (1990).

For Germany, estimates of 1989 and 1990 flows derived in part from Haverkate and van Haselen (1990) and from the Statistisches Jahrbuch for 1990 were used to estimate the flows from the eastern Länder to the western, using mainly the pattern of migration from West Berlin as a guide. The resulting matrix is a mixture of 1986 and 1990 conditions, which turned out to be so unusual (see Section 6) that further work on this dataset is needed.

Table 3. *Migration data used to establish benchmark rates*

Member state	Dates	Sources and notes
Inter-member state migration	1982, 1986-88	Poulain,Debuisson & Eggerickx (1991) from national register and other sources. UK/Ireland flows estimated by the authors.
Inter-region migration		
Belgium	1988	Annuaire Statistique de la Belgique, Tome 109, 1989, Table 10. Aggregation of inter-arrondissement migration.
Denmark	-	No inter-region migration at NUTS I level.
Germany	1986	EUROSTAT (1990), Table I.4 for the BRD. Author's estimates for flows from & to the new Federal States.
Greece	1984	EUROSTAT (1990), Table I.4. Authors' estimated aggregation to NUTS I regions.
Spain	1986	EUROSTAT (1990), Table I.4. Authors' aggregation to NUTS I regions.
France	1975-82	EUROSTAT (1990), Table I.4, from 1982 Census.
Ireland	-	No inter-region migration at NUTS I level.
Italy	1986	EUROSTAT (1990), Table I.4. Authors' aggregation to NUTS I regions.
Luxembourg	-	No inter-region migration at NUTS I level.
Netherlands	1986	EUROSTAT (1990), Table I.4. Authors' aggregation to NUTS I regions.
Portugal	-	No data available in EUROSTAT (1989).
United Kingdom	1989	Central Statistical Office (1991), Table 4.7 derived from OPCS's NHSCR migration system.

For the United Kingdom, the migration figures derived from the National Health Service Central Register (NHSCR) for 1989 were used, which turned out to be atypical of the past decade (see Stillwell, Rees and Boden 1992 for a full discussion of temporal fluctuations in UK inter-regional migration).

The migration flows are multiplied by five to reflect conditions over a five year period, with the exception of the French inter-regional flows, which refer to 1975-82 and are multiplied by 5/7ths. Being based on a retrospective census question, the French data substantially underestimate the volume of inter-regional movement.

4.8 *The migration pattern across the EC*

The harmonization of these extra-Community, inter-member state and inter-region statistics on migration statistics on migration is a task still to be accomplished and their use in projection in the current paper must be regarded with caution. It is, nevertheless, very useful to examine briefly the resulting migration estimates.

Table 4 sets out the summary migration flows for each member state and each NUTS I region, distinguishing between the three sources and giving outflow and inflow totals for the two intra-Community streams. The figures for inter-regional migration located in the member state rows are the sum of the regional numbers.

What immediately stands out is the very high level of migration activity in two countries - Germany and the United Kingdom. The German flows are exaggerated as long term indicators by the eastern to western flows precipitated in 1990 by the crisis in the DDR and subsequent unification. The losses of Brandenburg, Sachsen and Sachsen-Anhalt and the corresponding gains of Niedersachsen and Nordrhein Westfalen are probably short terms features only. Similarly, the level of migration in the UK in 1989 was very high in relation to earlier and later years, seeing the peak of an economic and housing boom which disappeared in 1990. Some 9 inter-regional migrations per 100 persons occur in Britain over a five year period, some 6 per 100 in Germany, but only 3 per 100 in Italy. However, the volume differences may not carry over into the net column and so have relative little influence on the population redistribution effected by intra-Community migration.

Table 4. *Migration projected for 1990-95 under the constant scenario for intra-Community movement*

Region	Migration in 1000s					
	External	Inter-member		Inter-region		Total
	Net	Out	In	Out	In	Net
Belgium	13.5	115.7	121.4	285.8	285.8	19.2
Vlaams Gewest	7.8	67.5	70.9	92.6	82.4	1.0
Région Wallonne	4.4	37.7	39.5	90.7	74.4	-10.1
Bruxelles/Brussel	1.3	10.7	11.2	102.5	129.0	28.3
Denmark	7.5	34.9	44.7	0.0	0.0	17.3
Denmark	7.5	34.8	44.5	0.0	0.0	17.2
Germany	385.0	543.8	669.8	5093.4	5093.3	511.0
Baden-Wuertemburg	47.7	67.6	83.3	431.5	686.6	318.5
Bayern	55.0	77.6	95.6	386.8	854.7	540.9
Berlin	16.5	23.2	28.6	261.8	290.8	50.9
Brandenburg	13.3	18.9	23.3	538.9	53.2	-468.0
Bremen	3.2	4.5	5.5	109.7	91.9	-13.6
Hamburg	7.5	10.6	12.9	224.7	235.8	20.9
Hessen	27.1	38.3	47.1	348.7	462.8	150.0
Mecklenburg-Vorpommern	10.2	14.6	18.1	134.9	120.5	-0.7
Niedersachsen	35.6	50.1	61.8	505.5	705.9	247.7
Nordrhein-Westfalen	82.9	117.2	144.4	691.6	784.5	203.0
Rheinland-Pfalz	18.0	25.4	31.3	297.7	301.1	27.3
Saarland	5.1	7.3	9.0	73.4	55.2	-11.4
Sachsen	23.6	33.1	40.7	164.7	15.0	-118.5
Sachsen-Anhalt	14.3	20.1	24.7	624.4	55.0	-550.5
Schleswig-Holstein	12.7	17.9	22.1	254.1	375.3	138.1
Thuringen	13.3	18.9	23.3	45.0	5.0	-22.3
Greece	33.5	123.0	97.6	236.0	236.0	8.1
Voreia Ellada	10.7	39.2	31.1	60.3	45.0	-12.7
Kentriki Ellada	7.3	26.6	21.1	85.0	78.3	-4.9
Attiki	12.7	46.5	36.9	68.7	53.7	-11.9
Nisia	3.1	11.2	8.9	22.0	59.0	37.8
Spain	43.0	180.4	106.3	436.6	436.5	-31.1
Noroeste	4.7	19.6	11.6	38.2	26.5	-15.0
Noreste	4.5	18.7	11.0	56.4	42.8	-16.8
Madrid	5.4	22.9	13.5	60.5	91.1	26.6
Centro	6.0	24.8	14.6	94.9	72.0	-27.1
Este	11.4	47.7	28.2	101.1	84.1	-25.1
Sur	9.3	39.5	23.2	68.9	84.9	9.0
Canarias	1.7	7.5	4.4	16.6	35.1	17.1
France	73.5	245.3	131.2	387.9	387.8	-40.6
Ile de France	14.2	48.1	25.7	121.6	76.3	-53.5
Bassin Parisien	13.4	44.8	23.9	75.7	79.1	-4.1
Nord-Pas-de-Calais	5.3	18.1	9.6	24.8	11.6	-16.4
Est	6.7	22.5	12.1	30.8	20.0	-14.5
Ouest	9.6	31.9	17.1	37.8	48.1	5.1

Table 4. Continued

Region	Migration in 1000s External Net	Inter-member Out	Inter-member In	Inter-region Out	Inter-region In	Total Net
Sud-Ouest	7.4	24.2	13.0	30.3	46.3	12.2
Centre-Est	8.6	28.8	15.4	35.2	40.3	0.3
Méditerranée	8.3	27.3	14.6	31.7	66.1	30.0
Ireland	1.0	212.4	109.6	0.0	0.0	-101.8
Ireland	1.0	212.7	109.7	0.0	0.0	-102.0
Italy	81.0	246.1	286.5	1475.0	1474.9	121.4
Nord-Ovest	8.1	24.1	28.1	199.4	176.1	-11.2
Lombardia	12.2	37.3	43.4	225.2	240.6	33.7
Nord-Est	9.0	27.5	31.9	87.5	111.2	37.1
Emilia-Romagna	5.1	15.2	17.7	75.4	113.8	46.0
Centro	7.7	22.9	26.7	107.7	161.8	65.6
Lazio	7.3	22.4	26.1	164.4	183.3	29.9
Campania	9.0	27.6	32.2	167.6	98.8	-55.2
Abruzzi-Molise	2.3	6.8	7.9	46.9	51.4	7.9
Sud	10.4	31.8	37.0	217.3	171.6	-30.1
Sicilia	7.8	23.6	27.5	141.4	120.7	-9.0
Sardegna	2.5	7.6	8.9	42.2	45.6	7.2
Luxembourg	1.0	20.1	29.5	0.0	0.0	10.4
Luxembourg	1.0	20.2	29.6	0.0	0.0	10.4
Netherlands	38.5	120.2	126.1	786.6	786.7	44.4
Noord-Nederland	4.1	12.7	13.4	113.3	90.7	-17.8
Oost-Nederland	7.9	24.8	26.0	224.4	253.8	38.5
West-Nederland	17.9	55.6	58.4	294.2	287.9	14.4
Zuid-Nederland	8.5	26.9	28.2	154.7	154.3	9.4
Portugal	20.5	45.3	37.1	0.0	0.0	12.3
Continente	19.4	43.0	35.2	0.0	0.0	11.6
Açores	0.5	1.1	0.9	0.0	0.0	0.3
Madeira	0.6	1.2	1.0	0.0	0.0	0.4
United Kingdom	19.5	327.7	455.2	5047.0	5047.0	147.0
North	1.0	17.4	24.2	273.5	274.5	8.8
Yorks. & Humb.	1.7	28.2	39.2	450.5	481.0	43.2
East Midlands	1.4	22.8	31.7	438.0	483.5	55.8
East Anglia	0.7	11.5	16.0	258.0	289.5	36.7
South East	6.0	100.5	139.4	1461.0	1255.5	-160.6
South West	1.5	25.7	35.6	528.5	640.0	122.9
West Midlands	1.8	30.0	41.8	480.5	425.0	-41.9
North West	2.2	36.6	50.9	529.5	514.5	1.5
Wales	1.0	16.1	22.4	253.5	309.0	62.8
Scotland	1.8	29.6	41.2	296.0	324.5	41.9
Northern Ireland	0.6	9.8	13.7	78.0	50.0	-23.5
EUR 12	717.5	2214.5	2215.0	13748.3	13748.0	717.5

5. CHANGES IN REGIONAL DEMOGRAPHIC STRUCTURES AND PROJECTION SCENARIOS

To explore the influence of migration on future regional population distribution in the EC, scenarios can be constructed, comparison of the projected outcomes of which will reveal migration impacts. The purpose of scenario-building is not to say what will happen in the future but to provide a framework for researchers and policy makers to organise their thinking about what might happen. Whilst scenario projections will allow insight to be gained from recognition of the implications of broad assumptions, reality is likely to reflect a complex combination of the effects which inidividual scenarios present.

5.1 *The scenario for fertility, mortality and extra-Community migration*

The first decision taken was to exclude from the analysis the influence of possible variations in future fertility, mortality and extra-Community migration and adopt a single set of assumptions. EUROSTAT (1991b) develops two long term population scenarios for member states. The low scenario assumes continuation of current low fertility levels and rather little improvement in mortality. The high projection scenario envisages rising fertility (though not quite to replacement level), substantial gains in life expectancy and moderate inflows from outside the EC. Here we simply average these two scenarios and take a middle route.

5.2 *The intra-Community migration scenarios*

Some four scenarios for intra-Community migration are developed:

(1) the zero migration scenario
(2) the constant migration scenario
(3) a "growth regions" scenario
(4) a "counterurbanization/urbanization" scenario.

The basis of each scenario is explained below. The first two parallel those used by the Commission for the European Communities (1991).

5.2.1 The zero migration scenario

This scenario, in which only natural increase and extra-Community net migration affect the population, serves as a marker against which intra-Community migration impacts can be measured. Technically, this is accomplished by setting all destination time series indicators (both national and regional) to zero.

5.2.2 The constant migration scenario

This scenario envisages the continuation of mid-to-late 1980s migration rates through the rest of the century and into the next. Migration volumes will change over time, however, as population redistribution occurs and as age structures change.

5.2.3 The scenario for inter-member state migration

A single scenario for inter-member state migration is developed that is used in both the third and fourth scenarios.

Conventional economic equilibrium arguments suggest that as disparities are reduced, the level of employment-related migration will decline. However, our view is that several forces are serving to increase the volume of migration between member states.

(1) The completion of the Single European Market (SEM) will have a positive effect on the migration of business executives and skilled workers, though the proportion of this mobility which constitutes actual relocation of permanent residences remains to be determined.

(2) The exchange of students between higher education institutions is increasing in line with the EC policy for at least 10% of students in EC higher education institutions to spend a specified part of their course in another member state, and encouraged by EC programmes such as ERASMUS.

(3) Migration will increase as cultural and linguistic barriers become less evident and as further integration of societies occurs.

(4) The EC commitment (through the Structural Funds) to reducing regional disparities has not yet succeeded in significantly reducing inequalities across regions and the incentive to migrate from poorer to richer regions will persist. We should note, however, that this situation may alter in the future if measures agreed at the Maastricht Conference concerning "cohesion funds", additional regional aid and the convergence of fiscal and monetary policy come to fruition and are effective.
It is therefore envisaged that migration between member states will increase steadily at about 2% per quinquennium and continue to be focussed on the higher income countries. Table 5 translates this view into quantitative guesstimates, placing member states in three income categories, with greatest gains being made in arrivals in the wealthiest states.

5.2.4 The regional patterns

A systematic study of the evolution of the volumes and rates of migration across the EC remains to be done. Most work concentrates on net migration (Fielding 1982) or is confined to single countries or subsets of EC members (Champion 1989, Stillwell, Rees and Boden 1992). There is evidence from the Netherlands and the UK of substantial fluctuations over time in migration volumes with peaks reached in the early 1970s followed by substantial declines to the early 1980s and some recovery since. These fluctuations reflect the course of both long term structural changes in the West European economy (more unemployment generally

Table 5. *Scenario of migration growth adopted for the member states of the EC for inter-member state migration*

Member state	Group	Level of in-migration (benchmark = 100)					
		1990 -95	1995 -00	2000 -05	2005 -10	2010 -15	2015 -20
Belgium	(2)	104	106	109	111	113	115
Denmark	(2)	104	106	109	111	113	115
Germany	(3)	105	107	111	113	116	118
Greece	(1)	102	104	106	108	110	112
Spain	(1)	102	104	106	108	110	112
France	(2)	104	106	109	111	113	115
Ireland	(1)	102	104	106	108	110	112
Italy	(2)	104	106	109	111	113	115
Luxembourg	(3)	105	107	111	113	116	118
Netherlands	(2)	104	106	109	111	113	115
Portugal	(1)	102	104	106	108	110	112
United Kingdom	(2)	104	106	109	111	113	115

Notes: The groups are defined as:
(1) States with GDP/capita below the EUR 12 average.
(2) States with GDP/capita up to 10% above the EUR 12 average.
(3) States with GDP/capita more than 10% above the EUR 12 average.

depressing the volume of migration) and of periodic, short term business cycles.

In the introduction to the paper (section 1.4) we identified three processes of migration exchange occurring in the EC which can be termed (1) migration due regional economic restructuring, (2) counterurbanization and (3) urbanization. In the event of wide disparities in regional incomes and unemployment persisting across the EC (Commission for the European Communities 1991), we should expect continued net migration of labour from low income, high unemployment regions to high income, lower unemployment regions. Although the high tide of population deconcentration from the older metropolitan cores of Northern member states may have passed, recent censuses (UK, France) indicate that these cores continue to lose population to less densely inhabited peripheries. At the same time the problems of structural adjustment in agriculture in the Southern member states continue to produce flows of migrants to city regions.

5.2.5 The regional scenarios

Two scenarios in the development of in-migration to destination regions are therefore proposed: (1) a "growth regions" scenario and (2) a "counterurbanization/urbanization" scenario.

In the first scenario EC NUTS I regions are divided into four categories in terms of GDP/capita (Table 6, bottom panel) and associate a different trajectory of migration change with each category (Table 6, top panel). High income regions increase their attraction to in-migration by 5% per quinquennium until a level 20% above the current benchmark is reached. Medium high income regions also experience growth in the volume of in-migration but only to 8% above current levels by 2005-10. In contrast, the scenario sees medium-low income regions decline in attractiveness to in-migrants by 8% by 2005, while the poorest regions decline by 20%. These numbers are purely arbitrary, but will provide, when input to the regional projection model, some indication of the impact of a combination of increasing mobility and widening income disparities among regions.

In the second scenario, the continuing processes of counter-urbanization and urbanization are combined. NUTS I regions are divided into seven categories on the basis of North/South location (though Ireland and Northern Ireland are also included in the latter) and regional density (Table 7, bottom panel). High and medium density regions in northern member states are projected to lose in-migrants while medium-low and low density regions gain in-migrants, the process occurring first in the former. On the other hand, southern high density regions continue strong gains in in-migrants from medium and low density areas. Again the numbers are arbitrary but will provide some indication of the impact of an intensification of these processes on population redistribution between the regions of the EC.

Table 6. *"Growth regions" scenario adopted for inter-region migration in the EC*

GDP/capita category	Level of in-migration (benchmark = 100)					
	1990-95	1995-00	2000-05	2005-10	2010-15	2015-20
High	105	110	115	120	120	120
Medium High	102	104	106	108	108	108
Medium Low	98	96	94	92	92	92
Low	95	90	85	80	80	80

Regions by GDP/capita category (1986-88 average)

High, >20% above EUR 12 mean

Hamburg, Ile de France, Bruxelles, Bremen, Lombardia, South East, Hessen, Emilia-Romagna, Berlin, Noord Nederland, Luxembourg

Medium high, 0-20% above EUR 12 mean

Baden-Wuerttemburg, Lazio, Nord Ovest, Nord Est, Bayern, Denmark, Centro (Italia), West Nederland, Nordrhein Westfalen, Saarland, Centre Est, East Anglia, South West, Rheinland Pfalz, Vlaams Gewest, East Midlands, Bassin Parisien

Medium low, 0-20% below EUR 12 mean

Scotland, Est, North West, Niedersachsen, Yorkshire & Humberside, West Midlands, Zuid Nederland, Schleswig-Holstein,Méditerranée, Sud Ouest, Wales, Nord-Pas-de-Calais, Abruzzi-Molise, Noreste, Oost Nederland, Madrid, Région Wallonne, Este, Northern Ireland

Low, > 20% below EUR 12 mean

Sardegna, Canarias, Sicilia, Noroeste, Sud, Campania, Ireland, Centro (España), Sur, Attiki, Kentriki, Continente, Voreia, Nisia

Where no data available, assigned to low category

Açores, Madeira, Sachsen, Sachsen-Anhalt, Brandenburg, Mecklenburg-Vorpommern, Thuringen

Source: GDP/capita figures - Commission for the European Communities, Directorate-General for Regional Policy (1991).

Table 7. *"Counterurbanization/urbanization" scenario adopted for inter-region migration in the EC*

Area/density category	Level of in-migration (benchmark = 100)					
	1990-95	1995-00	2000-05	2005-10	2010-15	2015-20
North						
High	95	90	87	84	84	84
Medium high	98	96	94	92	92	92
Medium low	105	110	112	114	114	114
Low	102	104	109	114	114	114
South/Periphery						
High	105	110	115	120	120	120
Medium	98	96	94	92	92	92
Low	95	90	87	84	84	84

Regions by area and density (persons per square km or psk, 1988)

North, high density (>= 500 psk)
Bruxelles, Berlin, Hamburg, Bremen, Ile de France, North West, South East, West Nederland, Nordrhein Westfalen

North, medium high density (200-499 psk)
Zuid Nederland, Vlaams Gewest, Saarland, West Midlands, Yorkshire & Humberside, Nord-Pas-de-Calais, Oost Nederland, Baden Wuerttemburg, Hessen, Sachsen, East Midlands, North

North, medium low density (120-199 psk)
South West, Région Wallonne, Rheinland Pfalz, Schleswig-Holstein, Thuringen, East Anglia, Bayern, Niedersachsen, Luxembourg, Sachsen-Anhalt, Noord Nederland

North, low density (<120 psk)
Denmark, Est, Méditerranée, Centre Est, Brandenburg, Ouest, Mecklenburg-Vorpommern, Bassin Parisien, Scotland, Sud-Ouest

South/Periphery, high density (>= 200 psk)
Attiki, Madrid, Campania, Lombardia, Madeira, Lazio, Canarias, Sicilia

South/Periphery, medium density (80-199 psk)
Nord Ovest, Emilia Romagna, Este, Nord Est, Sud, Centro (Italia), Açores, Northern Ireland, Continente, Abruzzi, Noroeste, Sur

South/Periphery, low density (< 80 psk)
Sardegna, Noroeste, Nisia, Ireland, Kentriki Ellada, Voreia Ellada, Centro (España)

6. PROJECTION RESULTS AND INTERPRETATION

The principal results of the four projections carried out are summarized here. It should be stressed that none can yet be offered as a definitive forecast upon which decisions can be based. They should be regarded as "what happens if" projections.

The base population for 1.1.1990 and the projected populations for 1.1.2000 and 1.1.2020 for the 12 member states and 70 NUTS I regions of the EC are laid out in Table 8 for the "zero" and "constant" scenarios and in Table 9 for the "growth regions" and "counterurbanization/urbanization" scenarios. These summarize much more detailed tabulations of the populations of each member state and region by 19 age groups, 2 sexes, 8 components and 6 projection periods.

The zero intra-EC migration and constant intra-EC migration scenarios are first compared to assess the impact on regional population of properly accounting for all migration streams. Then the more speculative migration scenarios are compared with the constant scenario to explore what would happen if current patterns were exaggerated or exacerbated in future years. Finally, the likely changes in regional age structures are analysed using the constant scenario.

6.1 *What happens when we add intra-Community migration to natural increase?*

If we examine the populations of the 12 member states we find only small changes occur when intra-member state migration is introduced over the first decade of the projection but moderate changes will have occurred by 2020. Germany will have gained just over 1 million persons and the UK 900 thousand through inter-member state migration, on current trends. Italy gains just over 250 thousand while Belgium, Denmark and Luxembourg post gains of 50 to 70 thousand each. The Netherlands will be almost in balance. The principal losers are France (871 thousand loss), Ireland (785 thousand), Spain (518 thousand) and Greece (175 thousand) with Portugal (64 thousand). In relative terms the greatest impacts are on Ireland (18% lower population under the constant migration scenario) and Luxembourg (16% higher population). Other impacts are all within plus or minus 2% of the zero intra-EC migration scenario.

These national impacts are reflected at the regional scale but to them is added the influence of inter-region migration. The influence of inter-region migration can be gauged by a comparison of Figures 3 and 4. In these figures are plotted, for the zero and constant scenarios, the ratio of projected regional populations in 2020 to estimated populations in 1990. For most member states the impact of inter-region migration is to widen considerably the disparities in regional population growth in future, as it has done in the past.

Table 8. *Projected populations at 2000 and 2020 under the zero and constant intra-Community migration scenarios*

Region	Population in 1000s				
	Base	Zero scenario		Constant Scenario	
	1990	2000	2020	2000	2020
Belgium	9948	10047	9675	10061	9732
Vlaams Gewest	5740	5841	5638	5828	5617
Région Wallonne	3244	3284	3218	3256	3148
Bruxelles/Brussel	964	970	941	1026	1096
Denmark	5135	5188	4988	5209	5055
Denmark	5135	5163	4913	5184	4980
Germany	79113	78870	71835	79140	72843
Baden-Wuerttemburg	9619	9827	9242	10360	10594
Bayern	11221	11336	10533	12292	12941
Berlin	3410	3375	3104	3447	3303
Brandenburg	2641	2672	2547	1760	631
Bremen	674	653	562	622	515
Hamburg	1626	1572	1332	1600	1444
Hessen	5651	5626	5028	5866	5642
Mecklenburg-Vorpommern	1964	2032	2011	2006	1893
Niedersachsen	7284	7251	6599	7647	7387
Nordrhein-Westfalen	17104	17147	15552	17364	15982
Rheinland-Pfalz	3702	3697	3363	3714	3400
Saarland	1065	1051	923	1018	838
Sachsen	4901	4817	4447	4528	3607
Sachsen-Anhalt	2965	2949	2765	1888	598
Schleswig-Holstein	2595	2577	2337	2811	2794
Thuringen	2684	2685	2537	2612	2316
Greece	10019	10031	9717	9979	9542
Voreia Ellada	3174	3253	3269	3204	3108
Kentriki Ellada	2154	2168	2137	2144	2071
Attiki	3796	3890	3845	3838	3678
Nisia	895	918	946	990	1166
Spain	38925	39993	39364	39836	38846
Noroeste	4464	4419	4030	4379	3915
Noreste	4125	4148	3853	4105	3727
Madrid	4870	5065	5068	5108	5189
Centro	5470	5539	5268	5471	5068
Este	10466	10671	10356	10596	10122
Sur	8051	8557	9178	8554	9128
Canarias	1478	1578	1694	1610	1788
France	56304	59015	60878	58769	60007
Ile de France	10602	11533	12337	11385	11809
Bassin Parisien	10212	10719	11227	10682	11092
Nord-Pas-de-Calais	3944	4254	4724	4207	4548
Est	5000	5297	5548	5251	5388
Ouest	7409	7707	7954	7697	7916

Table 8. Continued

Region	Population in 1000s				
	Base	Zero scenario		Constant scenario	
	1990	2000	2020	2000	2020
Sud-Ouest	7409	7707	7954	7697	7916
Centre-Est	6636	6958	7169	6941	7105
Méditerranée	6585	6749	6668	6796	6833
Ireland	3507	3754	4279	3536	3494
Ireland	3507	3761	4303	3544	3515
Italy	57577	58196	54390	58278	54653
Nord-Ovest	6200	5943	4958	5912	4980
Lombardia	8912	8876	7923	8923	8123
Nord-Est	6475	6432	5764	6490	5957
Emilia-Romagna	3922	3756	3088	3842	3385
Centro	5812	5659	4859	5782	5275
Lazio	5171	5273	4939	5319	5097
Campania	5809	6300	6882	6159	6335
Abruzzi-Molise	1602	1623	1529	1635	1567
Sud	6845	7318	7747	7226	7345
Sicilia	5173	5484	5736	5444	5543
Sardegna	1658	1714	1687	1722	1698
Luxembourg	378	384	362	403	421
Luxembourg	378	387	370	407	430
Netherlands	14893	15649	15816	15659	15824
Noord-Nederland	1594	1656	1666	1611	1543
Oost-Nederland	3037	3222	3342	3283	3474
West-Nederland	6968	7303	7304	7296	7306
Zuid-Nederland	3294	3479	3501	3480	3500
Portugal	10337	10572	10516	10554	10452
Continente	9809	10012	9932	9995	9872
Açores	253	269	296	269	294
Madeira	275	288	301	287	299
United Kingdom	57309	58343	58077	58612	58981
North	3084	3105	3045	3124	3125
Yorks. & Humb.	4934	5023	5018	5109	5275
East Midlands	3987	4075	4064	4184	4363
East Anglia	2043	2080	2068	2153	2257
South East	17418	17961	18059	17619	17208
South West	4654	4673	4525	4921	5239
West Midlands	5229	5377	5443	5289	5201
North West	6391	6519	6596	6521	6607
Wales	2869	2915	2917	3042	3280
Scotland	5116	5158	5052	5243	5324
Northern Ireland	1585	1710	1981	1658	1773
EUR 12	343443	350040	339896	350036	339850

Table 9. *Projected populations at 2000 and 2020 under the growth region and counterurbanization/urbanization scenarios*

Region	Population in 1000s				
	Base	Growth region Sc.		Counter/urb. Sc.	
	1990	2000	2020	2000	2020
Belgium	9948	10062	9747	10062	9747
Vlaams Gewest	5740	5820	5539	5826	5589
Région Wallonne	3244	3233	2854	3283	3471
Bruxelles/Brussel	964	1052	1477	994	800
Denmark	5135	5210	5073	5210	5073
Denmark	5135	5182	4992	5182	4992
Germany	79113	79190	73583	79190	73583
Baden-Wuerttemburg	9619	10379	10763	10285	9741
Bayern	11221	12327	13277	12489	15102
Berlin	3410	3499	4066	3379	2651
Brandenburg	2641	1727	413	1749	601
Bremen	674	642	748	598	316
Hamburg	1626	1653	2081	1532	883
Hessen	5651	5940	6696	5822	5125
Mecklenburg-Vorpommern	1964	1999	1797	2011	2004
Niedersachsen	7284	7541	6154	7782	8781
Nordrhein-Westfalen	17104	17387	16185	17176	14283
Rheinland-Pfalz	3702	3714	3380	3795	4278
Saarland	1065	1001	668	1012	774
Sachsen	4901	4517	3495	4521	3541
Sachsen-Anhalt	2965	1850	374	1879	575
Schleswig-Holstein	2595	2757	2175	2902	3595
Thuringen	2684	2609	2292	2611	2323
Greece	10019	9966	9379	9966	9379
Voreia Ellada	3174	3201	3084	3196	3012
Kentriki Ellada	2154	2141	2038	2125	1839
Attiki	3796	3835	3645	3856	3922
Nisia	895	980	1073	979	1065
Spain	38925	39814	38546	39814	38546
Noroeste	4464	4373	3873	4371	3825
Noreste	4125	4105	3742	4099	3667
Madrid	4870	5103	5165	5125	5502
Centro	5470	5460	4983	5445	4799
Este	10466	10590	10122	10577	9958
Sur	8051	8528	8941	8529	8905
Canarias	1478	1602	1720	1615	1895
France	56304	58751	59709	58751	59709
Ile de France	10602	11389	12023	11346	11325
Bassin Parisien	10212	10673	11062	10678	11143
Nord-Pas-de-Calais	3944	4198	4473	4199	4477
Est	5000	5242	5306	5246	5359
Ouest	7409	7682	7750	7603	7944

Table 9. Continued

Region	Population in 1000s				
	Base	Growth region Sc.		Counter/urb. Sc.	
	1990	2000	2020	2000	2020
Sud-Ouest	5917	5956	5616	5966	5764
Centre-Est	6636	6936	7099	6935	7101
Méditerranée	6585	6782	6685	6795	6901
Ireland	3507	3514	3217	3514	3217
Ireland	3507	3517	3228	3516	3228
Italy	57577	58279	54657	58279	54657
Nord-Ovest	6200	5930	5165	5894	4736
Lombardia	8912	8977	8953	8982	9032
Nord-Est	6475	6492	5991	6461	5661
Emilia-Romagna	3922	3863	3729	3831	3238
Centro	5812	5791	5400	5763	5036
Lazio	5171	5334	5285	5360	5738
Campania	5809	6121	5904	6167	6518
Abruzzi-Molise	1602	1628	1477	1627	1462
Sud	6845	7167	6655	7195	6944
Sicilia	5173	5403	5063	5424	5286
Sardegna	1658	1709	1547	1711	1575
Luxembourg	378	406	451	406	451
Luxembourg	378	409	460	409	460
Netherlands	14893	15659	15812	15659	15812
Noord-Nederland	1594	1629	1845	1645	1953
Oost-Nederland	3037	3245	2982	3283	3439
West-Nederland	6968	7327	7726	7245	6841
Zuid-Nederland	3294	3460	3237	3487	3558
Portugal	10337	10550	10397	10550	10397
Continente	9809	9980	9798	9980	9798
Açores	253	268	292	268	292
Madeira	275	287	297	287	297
United Kingdom	57309	58637	59267	58637	59267
North	3084	3090	2683	3123	3051
Yorks. & Humb.	4934	5050	4505	5104	5130
East Midlands	3987	4208	4618	4172	4146
East Anglia	2043	2154	2245	2237	3164
South East	17418	17879	21311	17303	14087
South West	4654	4935	5339	5102	7210
West Midlands	5229	5226	4391	5274	4943
North West	6391	6454	5726	6440	5825
Wales	2869	3002	2745	3126	4280
Scotland	5116	5194	4674	5294	6188
Northern Ireland	1585	1647	1631	1660	1805
EUR 12	343443	350036	339838	350036	339838

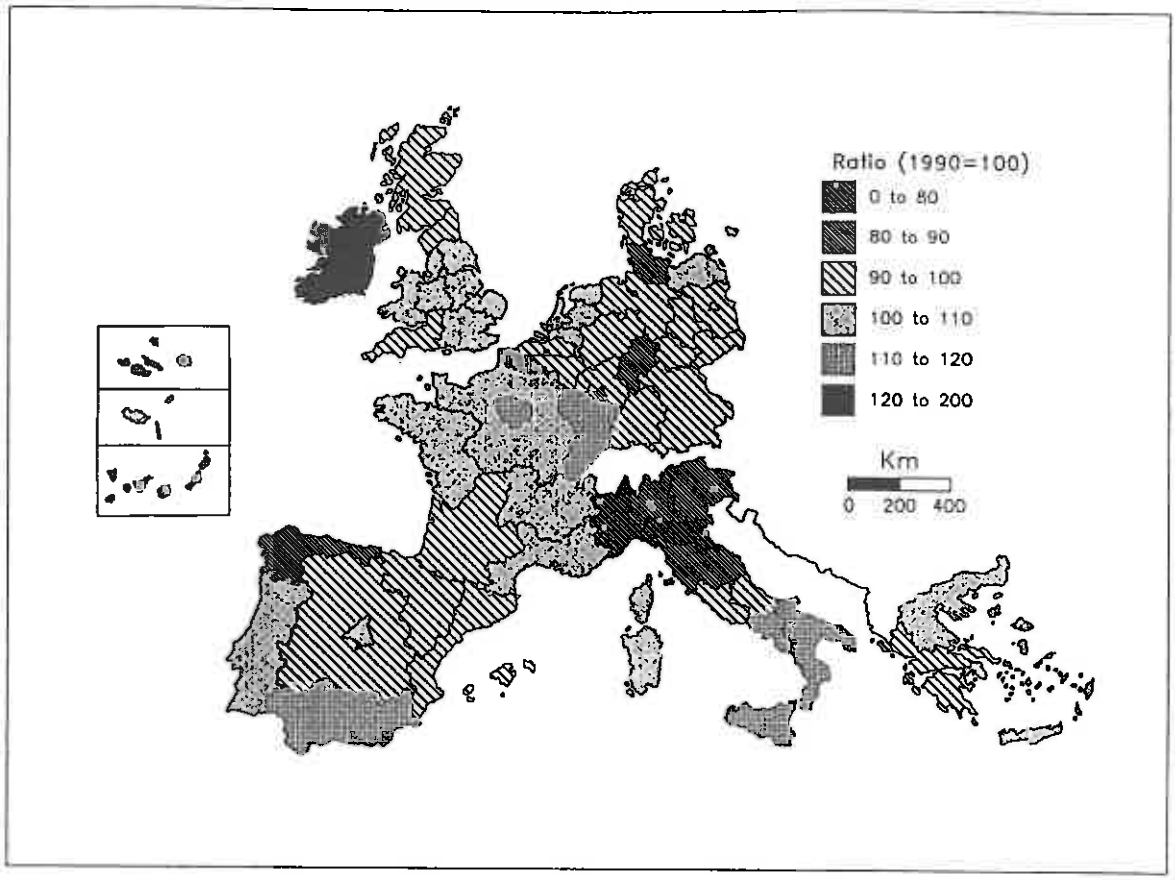

Figure 3: Index of population change for EC Level I regions, 1990-2020, under 'zero migration' scenario assumptions

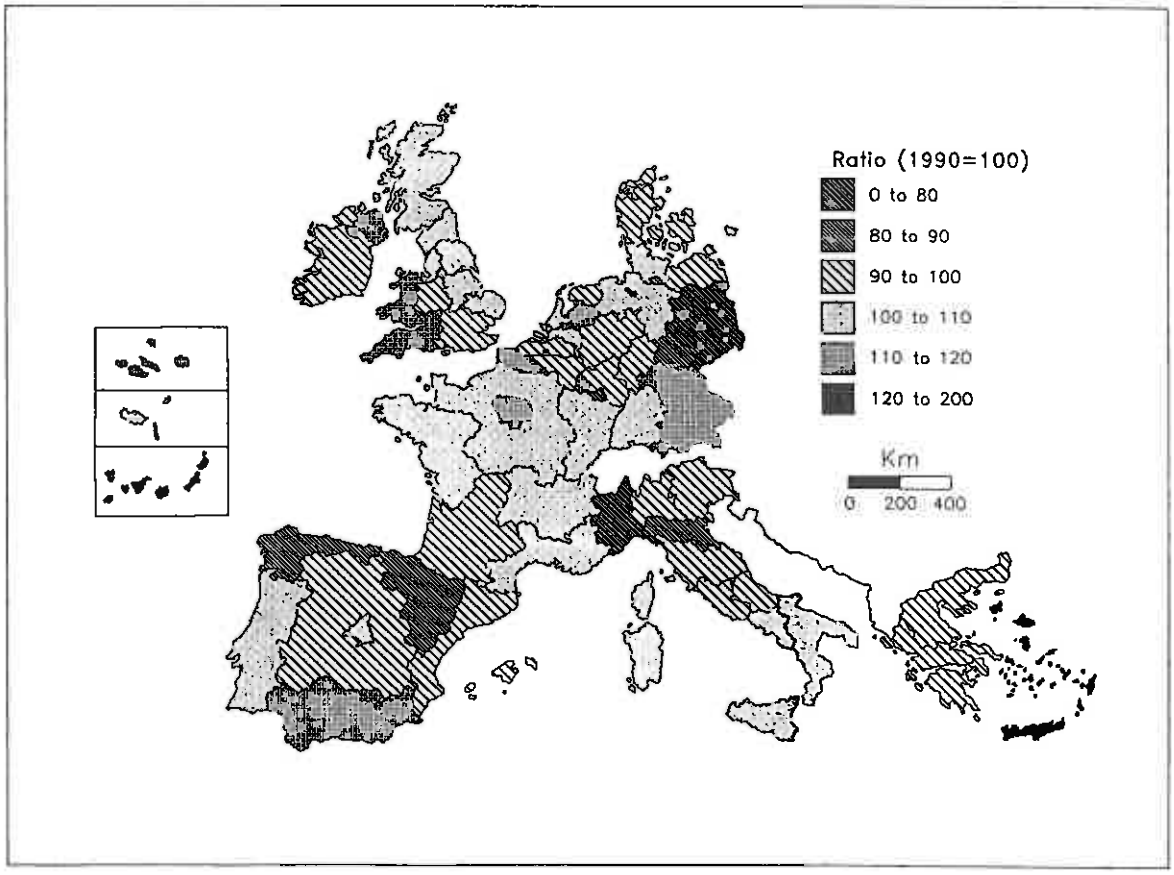

Figure 4: Index of population change for EC Level I regions, 1990-2020, under 'constant' scenario assumptions

In Belgium, if no intra-Community migration is involved, the population of Bruxelles/Brussel will have declined by 4% by 2020, whereas if intra-Community migration is introduced the principal seat of the Commission of the European Communities increases by 14% (there being some linkage there).

The picture of population decline through natural decrease in the Länder of Germany is rather uniform under zero intra-Community migration assumptions (with 2020 ratios mainly in the range 87-95) but dramatically varied under constant migration assumptions (Figure 4). The eastern Länder empty themselves of population under 1990 conditions, which it is clearly unreasonable to assume continue much longer because massive interventions and transformations are currently in train that must create viable economies in eastern Germany within the decade. Similarly, the positive effects on the populations of western Länder are likely to be dampened, but the patterns of gains and losses is likely to persist with gains being made by the southern states.

In Greece the constant migration scenario favours population growth in the Greek Islands only, with tourism providing the basis of development. The other Greek regions, including the capital region, show losses.

In Spain, the capital region and the Canarias (islands) region gain under the migration scenario compared with the zero assumption.

In the Netherlands, the main impacts of intra-Community migration are to emphasize the growth of Oost Nederland (a retirement region) and reduce population of the more rural Noord Nederland region.

In the United Kingdom introduction of the constant migration scenario changes the growth or decline picture radically. The loss experienced by the South East is balanced by strong gains to the South West (a retirement region) and East Anglia. Northern Ireland's strong natural increase leaks away through migration. Whether the growth additions posted by the northern regions persist is more in doubt because the pattern of migration in 1989 will probably turn out to have been an atypical one.

Inter-regional migration in France and Italy produces different impacts from the other states, serving to dampen the differences in natural population change in regional populations. In France, northern regions exhibit higher rates of natural increase but inter-regional migration towards southern regions reduces this growth. In Italy, strong natural increase in the Mezzogiorno is substantially reduced by the out-migration to northern and central regions.

6.2 *What happens if new patterns of migration arise?*

Figures 5 and 6 display the projected population gains or losses under the "growth regions" scenario and the "counterurbanization/urbanization" scenario. These are, of course, the result of the assumptions made about changing destination attractiveness and must be viewed sceptically.

In general, the "growth regions" scenario produces an exaggeration of the trends revealed by the constant migration scenario. In some senses it encapsulates the situation where policies aimed at reducing regional inequalities have either failed or been abandoned. The rich capital cities or core regions increase their populations at the expense of poorer, peripheral regions. For example, Bruxelles/Brussel posts a 53% increase over the 1990 levels of population by 2020, the South East population increases by 22%, Hamburg's population grows by 28% and Lombardia's population remains stationary compared with changes of +14%, -1%, -11% and -9% under the constant scenario.

Out-migration levels from poorer, peripheral regions rise sufficiently under this scenario to reduce or wipe out natural increase based gains. This happens in southern Italia, Ireland and Northern Ireland.

The fourth scenario of "counterurbanization/urbanization" has contrasting effects in southern and northern member states. In southern Europe the projected populations are not very different from those under the "growth regions" scenario because the highly urbanized, dense regions are also those, within those member states, with the highest per capita incomes. In the northern EC states, the scenario produces effects often in the reverse direction to those of the "growth regions" scenario. Bruxelles/Brussel moves from posting a 53% gain over the 1990-2020 period to producing a 17% loss, the population having been displaced outward into Brabant province (a trend already, according to press reports, disturbing the local inhabitants). Hamburg experiences a halving in population under this decentralization hypothesis and the South East faces a 19% decrease rather than a 22% gain.

It is clear that each of these speculative scenarios captures some features of current population trends but that neither represents a probable future. The constant scenario produces more intuitively reasonable outcomes (barring the exceptional situations in Germany and the United Kingdom), and we return to this scenario to examine likely changes in regional age structures.

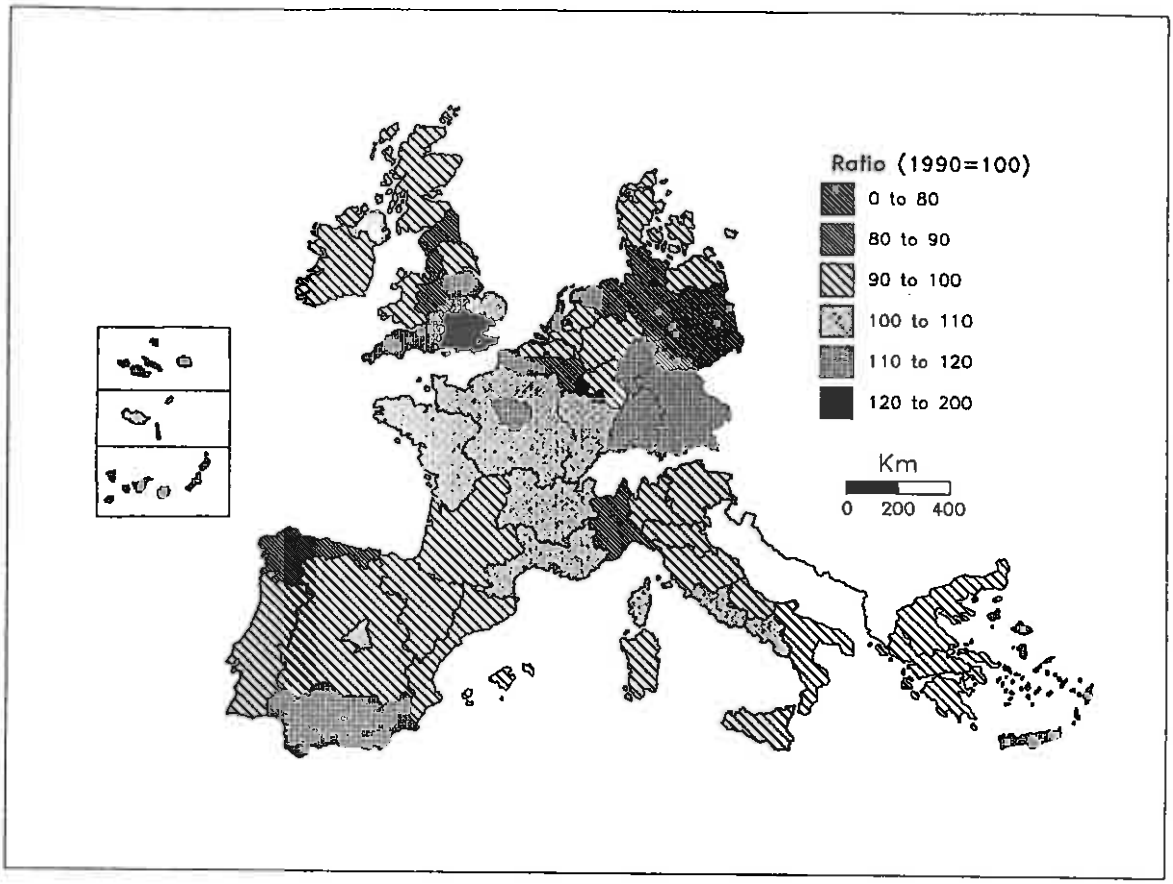

Figure 5: Index of population change for EC Level I regions, 1990-2020, under 'growth region' scenario assumptions

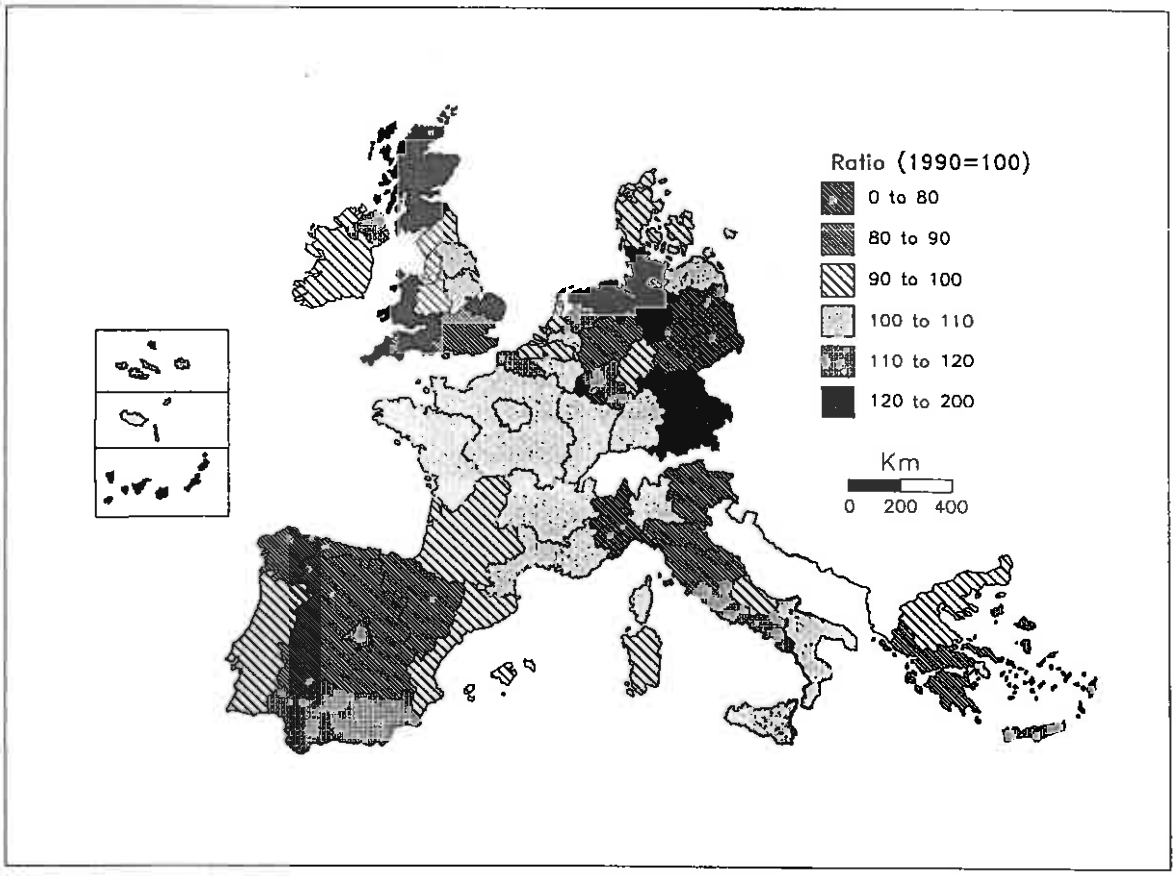

Figure 6: Index of population change for EC Level I regions, 1990-2020, under 'counterurbanisation-urbanisation' assumptions

6.3 *Changes in regional age structures*

Figure 7 provides a picture of the changes in the size of the 20-59 age groups, which can be regarded as an approximation to the labour force ages. The final map, Figure 8, provides the pattern of changes projected in the age group 60 and over, most of whom will have retired from the labour force.

Populations through most of the EC regions are ageing. The changes in the labour force ages (Figure 7) are below those of the general population (Figure 4) while those for the elderly (Figure 8) are substantially above. The pattern of elderly population increase is not affected by migration to anything like the extent of the labour force ages. It is probable that "ageing in place" is the dominant influence, coupled with lower mortality at the elderly ages. This, for example, would explain the 85% increase projected for the elderly population of the Ile de France.

However, the model, as currently specified, fails to capture adequately the likely impact of retirement migration. Very many of the Parisien elderly will migrate to other parts of France on retirement (see Ledent and Courgeau 1982). The general model migration schedule does not feature a retirement peak, but such a peak needs to be added only to a few selected, metropolitan core to peripheral region migration streams.

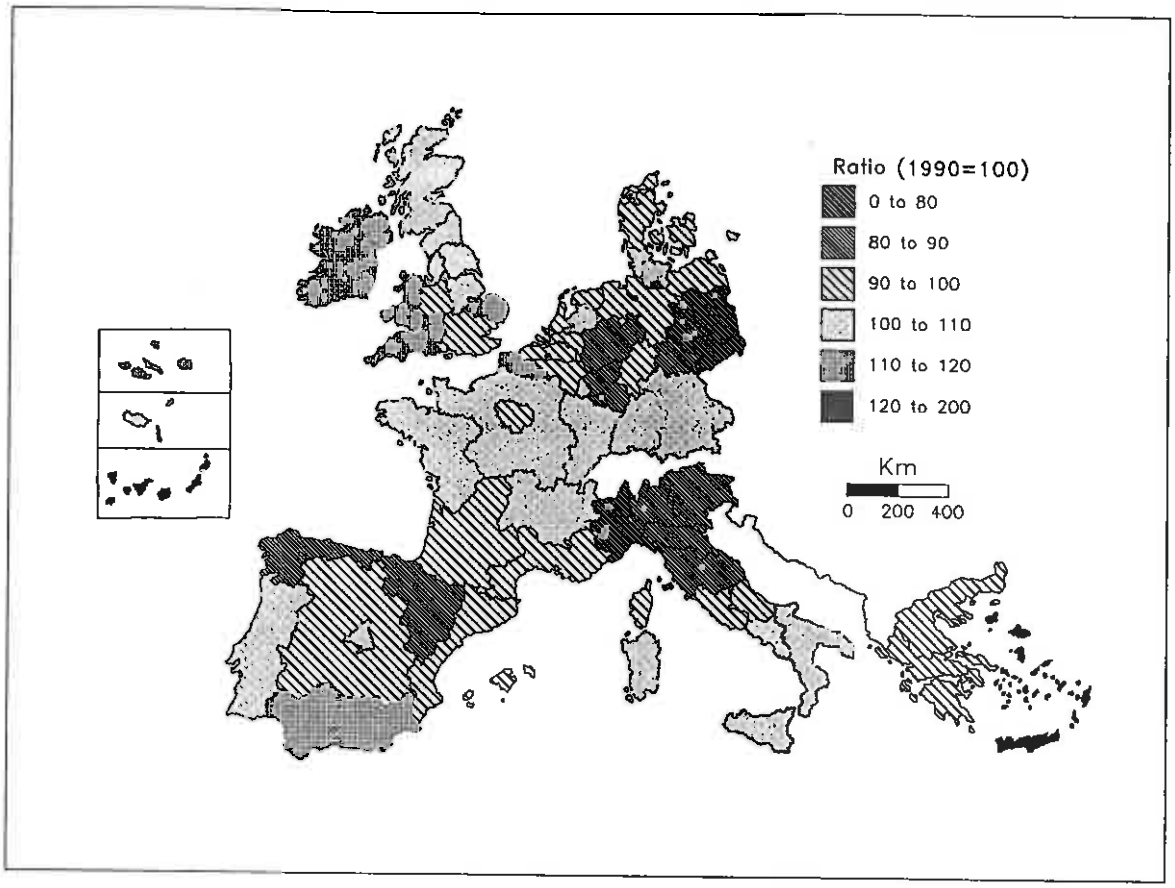

Figure 7: Index of population change for EC Level I regions, working ages (20-59), 1990-2020, under 'constant' scenario assumptions

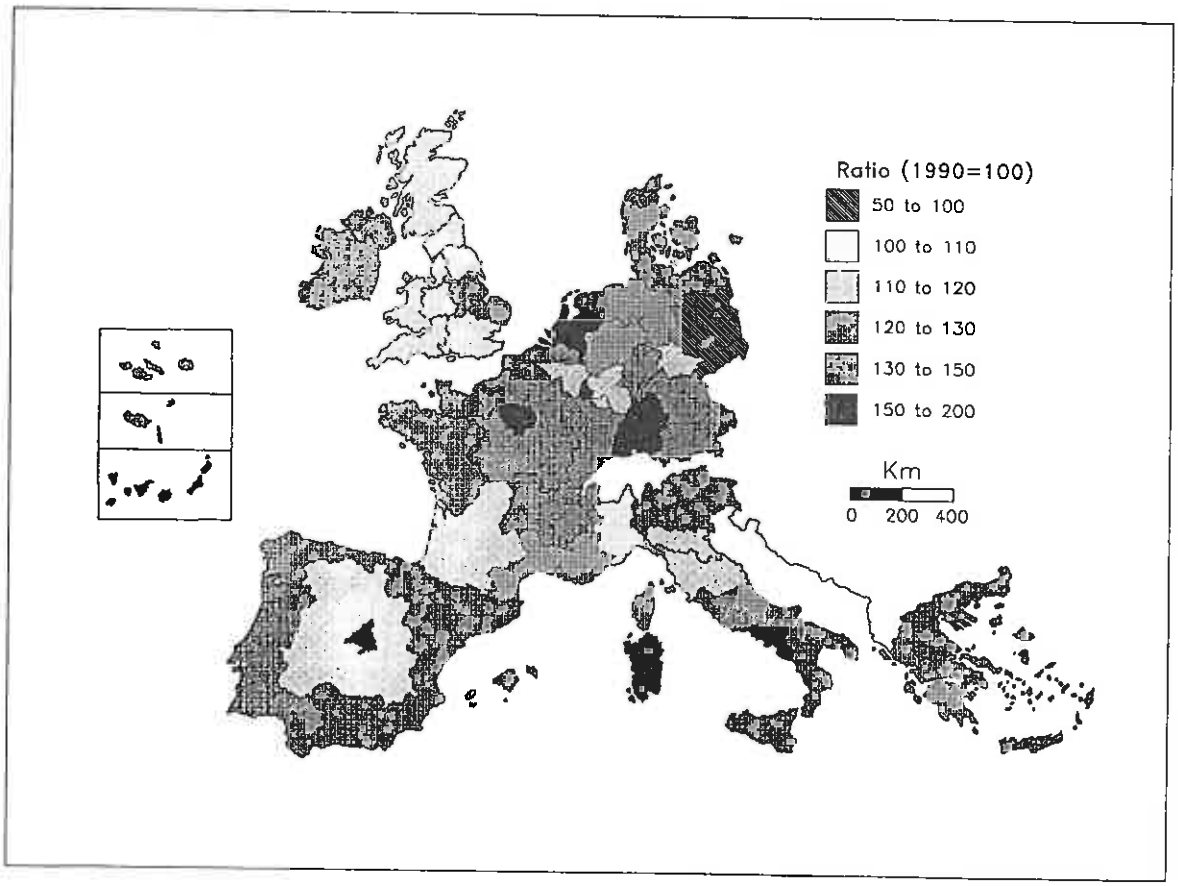

Figure 8: Index of population change for EC Level I regions, elderly (60+), 1990-2020, under 'constant' scenario assumptions

7. EVALUATION

In the paper, a new model for assessing the impact of intra-Community migration on the demographic structure at the regional level has been described. This model projects the population of EC NUTS I regions incorporating not only natural increase and external migration influences but also the migration streams between member states and between regions within them. The model has been used with four alternative views of migration in the future (zero, constant, income-related and density related patterns) to examine the range of possible impacts. These projections have shown a profound and complex pattern of redistribution and restructuring which will repay further analysis.

This paper describes the end of the beginning of the investigation. In order to proceed further, several improvements are needed. The model needs extension to the NUTS 2 regional scale, where many of the processes discussed in the paper are more clearly visible. The inter-regional migration dataset needs to encompass many years rather than a single year. An improved submodel of migration within each member state is needed that properly decomposes level, origin and destination influences. A retirement migration component needs inclusion in this submodel. The outputs of the model need extension through an analysis of population ageing in place versus migration effects. Finally, a greater degree of linkage to policy, especially to policy in the regions, is required. This is particularly significant currently in view of the development of common EC approaches to immigration, political asylum and other matters, which were initiated at the EC Maastricht Conference in December 1991.

The EC Maastricht Conference discussed the German-backed proposals on Immigration Policy and the rules for Political Asylum. In brief, the member states have decided that they will produce a common ploicy on accepting political refugees by the end of 1992, and produce agreed common rules on immigration by the end of 1995, with no opt outs. We have to decide to what extent such moves would affect the analysis presented in this paper, and how we should respond with improvements to the model. Equally, the new post-Maastricht moves towards greater "cohesion" in the EC and the corresponding new support given to even out the north-south divisions might well affect approaches to the basic assumption that migrants tend to move from poorer to richer areas. If the poverty gradient becomes less steep, will there be a reduction in internal migration up the slope or will the direction of migration streams change? Will the new emphasis being given to European Citizenship mean that non-citizens will not have the same rights for moving between member states? Finally, though we have for the moment assumed that the EC has 12 members, the future will see an expansion of members first to the EFTA countries (in the early 1990s) and then to Poland, Czechoslovakia and Hungary (in the late 1990s). Intra-Community migration will take on new meanings and have new effects in those contexts.

REFERENCES

Calot, G. (1991) La fécondité en Europe: evolutions passées, perspectives d'avenir. Les actions possibles et leur efficacité. Paper presented at the International Conference on 'Human Resources in Europe at the Dawn of the 21st Century', under the aegis of EUROSTAT and the Luxembourg Government, Luxembourg, 27-29 November 1991.

Cambridge Econometrics (1991) *European regional prospects*. Analysis and forcasts to the year 1995 for European cities and regions (abridged version). Cambridge: Cambridge Econometrics.

Champion, A. (ed.) (1989) *Counterurbanization: the changing pace and nature of population deconcentration*. London: Edward Arnold.

Central Statistical Office (1991) *Regional trends 26. 1991 edition*. London: Her Majesty's Stationery Office.

Commission of the European Communities, Directorate-General for Regional Policy (1991) *The regions in the 1990s: fourth periodic report on the social and economic situation and development of the regions of the Community*. Luxembourg: Office for Official Publications of the European Communities.

EUROSTAT (1990) *Regions: statistical yearbook 1989*. Luxembourg: Office for Official Publications of the European Communities. (EUROSTAT = Statistical Office of the European Communities)

EUROSTAT (1991a) *Demographic statistics 1991*. Luxembourg: Office for Official Publications of the European Communities.

EUROSTAT (1991b) Two long term population scenarios for the European Community: principal assumptions and results. Social and Regional Statistics Directorate. Scenarios prepared for the Congress "Human Resources in Europe at the Dawn of the 21st Century", Luxembourg, 27-29 November 1991.

Fielding, A. (1982) Counterurbanization in Western Europe. *Progress in Planning*, 17, 1-52.

Haverkate, R. and van Haselen, H. (1990) *Demographic evolution through time in European regions (Demeter 2015)*. Report to the Commission of the European Communities, Directorate-General for Regional Policy. Rotterdam: Netherlands Economic Institute.

Ledent, J. and Courgeau, D. (1982) *Migration and settlement: 15. France*. Research Report RR-82-28. Laxenburg, Austria: International Institute for Applied Systems Analysis.

Loriaux, M. (1991) Le vieillisement de la société européenne. Paper presented at the International Conference on 'Human Resources in Europe at the Dawn of the 21st Century', under the aegis of EUROSTAT and the Luxembourg Government, Luxembourg, 27-29 November 1991.

Poulain, M., Debuisson, M. and Eggerickx, T. (1991) *Proposals for the harmonization of the European Community statistics on international migration.* Catholic University of Louvain, Louvain-la-Neuve, Belgique. Report to EUROSTAT.

Rogers, A. (1986) Projections. Chapter 9 in A. Rogers and F. Willekens (eds.) *Migration and settlement: a comparative study.* Dordrecht: Reidel.

Rogers, A. and Castro, L. (1981) *Model migration schedules.* Research Report RR-81-30. Laxenburg, Austria: International Institute for Applied Systems Analysis.

Schippers, J. and Siegers, J. (1991) Labour markets and the ageing labour force: a comparative study of government ploicy in some European countries. Paper prepared for the International Conference on 'Human Resources in Europe at the Dawn of the 21st Century', under the aegis of EUROSTAT and the Luxembourg Government, Luxembourg, 27-29 November 1991.

Stillwell, J. and Congdon, P. (eds) (1991) *Migration models: macro and micro approaches.* London: Belhaven.

Stillwell, J., Rees, P. and Boden, P. (eds.) (1992) *Population redistribution in Britain.* Vol. II of *Migration patterns and processes.* London: Belhaven.

Straubhaar, T. and Zimmermann, K.F. (1991) Wanderungsbewegungen und ausländische Bevölkerung.Paper presented at the International Conference on 'Human Resources in Europe at the Dawn of the 21st Century', under the aegis of EUROSTAT and the Luxembourg Government, Luxembourg, 27-29 November 1991.

Tapinos, G. (1991) Les migrations extra-Communautaires et l'avenir des populations étrangères. Paper presented at the International Conference on 'Human Resources in Europe at the Dawn of the 21st Century', under the aegis of EUROSTAT and the Luxembourg Government, Luxembourg, 27-29 November 1991.