

DEMIFER

Demographic and Migratory Flows affecting European Regions and Cities

Applied Research Project 2013/1/3

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List of authors

Joop De Beer (NIDI)

Nicole Van der Gaag (NIDI)

Rob Van der Erf (NIDI)

Ramon Bauer (UNIVIE)

Heinz Fassmann (UNIVIE)

Dorota Kupiszewska (IOM/CEFMR)

Marek Kupiszewski (IOM/CEFMR)

Phil Rees (University of Leeds)

Peter Boden (University of Leeds)

Adam Dennett (University of Leeds)

John Stillwell (University of Leeds)

Andries De Jong (NEAA)

Mark Ter Veer (NEAA)

Jonathan Metzger (Nordregio)

Johanna Roto (Nordregio)

Lisa Van Well (Nordregio)

Frank Heins (CNR)

Corrado Bonifazi (CNR)

Giuseppe Gesano (CNR)

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List of Abbreviations

ASDR	Age-Specific Death Rate
CEC	Commission of the European Communities
CME	Challenged Market Europe
DAR	Destination Attractiveness Ratio
DEMIFER	Demographic and migratory flows affecting European regions and cities
EME	Expanding Market Europe
ESPON	European Spatial Observation Network
EU	European Union
GDP	Gross Domestic Product
GSE	Growing Social Europe
LSE	Limited Social Europe
NUTS	Nomenclature of Units for Territorial Statistics
ODR	Old Dependency Ratio
PPP	Purchasing Power Parity
SMR	Standardised Mortality Ratio
TFR	Total Fertility Rate
TPG	Transnational Project Group
VODR	Very Old Dependency Ratio

Executive summary

The aim of DEMIFER (the project DEMography and MIgratory Flows for European Regions) is to assess future changes in population growth, the size of the labour force and the ageing of the population, and to explore different policy options aiming at regional competitiveness and social cohesion

One of the major priorities of the ESPON 2013 Programme is to observe demographic trends in Europe, to look into future demographic developments and to link these to economic, social and environmental development issues in European regions and cities. Within this Programme, ESPON initiated and funded the research project DEMIFER: Demographic and migratory flows affecting European regions and cities. The objective of DEMIFER is to assess the effects of demographic trends and migratory flows on European regions and cities and to examine the implications for regional competitiveness and cohesion. The specific aims of the project are to assess future changes in population growth, the size of the labour force and the ageing of the population and to explore policy options.

The European territorial development debate is framed within several seminal strategies and agendas to achieve regional competitiveness and territorial cohesion. These include the Lisbon Strategy, the Territorial Agenda, the Commission's Green Paper on Territorial Cohesion and most recently the Europe 2020 discussions for smart, sustainable and inclusive growth. The European policy territorial debate, while not specifically assuming that demographic changes result in altered economic performance, does repeatedly discuss how demographic changes (at least at the regional level - NUTS2) hinder development. Thus demographic and migratory developments are discussed within these broad policy contexts as challenges to be overcome.

Combinations of principle-based and capacity-based policy considerations will be explored in accordance with the territorial diversity of the ESPON space

Policy considerations should be made in accordance with the territorial diversity of the ESPON space. Policy combinations should be aimed to bridge the gap between policies oriented towards competitiveness of the European territory and cohesion of the territory at all levels. It is useful to distinguish principle-based (goal oriented, normative or top-down) policies and capacity-based (action oriented or bottom-up) policies. Both of these types of policy combinations can address the goals of regional competitiveness and territorial cohesion, but principle-based orientations tend to be more focused on achieving regional competitiveness through market-based mechanisms and structural measures while capacity-based orientations often rely on cohesion-based policies that stress the social capacity and institutional learning.

There is not one unambiguous effect of migration and demography on the competitiveness of European regions and thus policies stimulating mobility may have different impacts on different types of regions

The main demographic changes across Europe are the slowing of population growth, the ageing of the population, the decline in the growth rate of the working age population and the switch from natural growth to migration as main driver of population growth. The main force behind ageing has been the sustained low level of fertility for the past four decades. Even though population ageing will affect regions all across Europe, different types of regions will be affected in different ways. Levels of fertility differ across European regions. Whereas in some regions the effect of ageing on the size of the working age population may be mitigated by in-migration flows either from other regions or from other countries, in other regions outflows of young migrants may reinforce the

effects of ageing. Thus even though mobility between regions may be beneficial in solving shortages and surpluses in labour markets in some regions, policies stimulating mobility may not have a positive impact on *all* regions and regional disparities may increase. This implies that there is not one unambiguous future effect of migration on the competitiveness of European regions.

Population scenarios are important devices for thinking about alternative futures taking into account both the mutual relationship between demography and economy and the linkages between economic and social policies and demographic and migratory developments

Demographic and economic developments have a mutual relationship. The level of fertility and the size and direction of migration flows lead to differences in the growth and ageing of the labour force, while in turn differences in economic developments affect the level of fertility and the direction of migration flows. To take into account this mutual relationship, the DEMIFER project has developed four sets of population scenarios that take into account alternative future economic developments in combination with alternative policy options. The DEMIFER scenarios link policy bundles to demographic effects using two axes of policy variation: a Distribution-Fairness axis and an Economy-Environment axis. At one end of the Economy-Environment dimension we envisage a situation where sustainable growth has been achieved through technical and social innovation. At the other end of the Economy-Environment dimension we envisage a situation where the environmental challenges have not been met and growth as traditionally measured has fallen. The Distribution-Fairness dimension varies from a bundle of policies designed to achieve social solidarity on the one end, to a set of policies designed to improve the operation of markets and the achievement of greater competitiveness in a global market place on the other end. The "Distribution-Fairness" dimension more or less covers both principle- and capacity-based policy considerations.

Crossing the two axes produces four Policy Scenarios, which we call GROWING SOCIAL EUROPE, EXPANDING MARKET EUROPE, LIMITED SOCIAL EUROPE and CHALLENGED MARKET EUROPE. Each of these scenarios is associated with a set of policies that we may expect to impact, to a greater or lesser degree, future patterns of mortality, fertility and migration. The different scenarios assess the future impact of different developments in mortality, fertility and migration on changes in population growth, particularly in the growth of the size of the working age population, and on population ageing. As the growth of the labour force does not just depend on the size of the working age population but also on the level of labour force participation rates, alternative assumptions on future changes in labour force participation rates are included in the specification of the scenarios.

The scenarios show that there is a complex interrelationship between implications of one policy option and another. Policy makers may have to make difficult trade-offs between different goals. Demographic developments will be influenced by policy decisions such as whether to pursue a competitive-oriented policy or a cohesion-oriented policy. At the same time demographic developments are also affected by long-term economic growth rates and environmental developments. The effects of alternative policy options therefore will vary by economic and environmental developments. Given these complex interrelationships between demography, migration, economy and policy, it is not possible to make definite statements about the impact of various bundles of policies on demographic and migratory trends. The scenarios, however, are important intellectual devices for thinking about alternative futures. They show what may be expected to happen if certain policy combinations are followed within the drivers of mortality, fertility, migration and labour markets.

In all four DEMIFER policy scenarios mortality is expected to decline but not in all regions to the same degree; fertility is expected to increase or to be maintained at the current level in most scenarios; inter-state migration within the ESPON area and net extra-Europe migration to the ESPON area are assumed to increase in most scenarios while the level of internal migration within ESPON countries is assumed to remain constant; for all components of population change different levels of convergence or divergence of regional inequalities are assumed for the different scenarios

In terms of demographic key drivers the four DEMIFER policy scenarios can be characterized as follows: the GROWING SOCIAL EUROPE scenario is most likely to come true in times of successful economy-environment policies resulting in sustainable growth and effective cohesion policies. Relatively large decreases in mortality are foreseen together with relatively large increases in fertility. Migration levels will increase significantly, but not as much as in the EXPANDING MARKET EUROPE scenario. For all components of growth, regional differences will decrease substantially.

The EXPANDING MARKET EUROPE scenario might come into force in case of sustainable economic growth and strong competitive goals. Slightly less favourable developments in mortality and fertility are assumed to go hand in hand with large increases in migration and further diverging regional inequalities.

In times of low economic growth, growing environmental problems and effective cohesion policies, the LIMITED SOCIAL EUROPE scenario may occur. This future is characterized by relatively small decreases in mortality, constant fertility patterns and declining migration levels. Regional inequalities in the drivers of population change are expected to decline, but not as much as in the GROWING SOCIAL EUROPE scenario.

Finally, the CHALLENGED MARKET EUROPE scenario might be realised in times of low economic growth where environmental challenges are not met, and strong competitive goals. In terms of demographic and migratory drivers, this is the least favourable scenario with only slightly decreasing mortality, declining fertility, more or less constant migration levels and increasing regional inequalities.

The policy scenarios take into account to more or lesser degree extra migrants generated by climate change

The GROWING SOCIAL EUROPE and EXPANDING MARKET EUROPE scenarios assume that climate change threats have been solved, partly by mitigation as a result of adaptation responses and partly by migration. The migration assumptions in these scenarios certainly account for any extra migrants generated by climate change events. The LIMITED SOCIAL EUROPE and the CHALLENGED MARKET EUROPE scenarios assume that climate change challenges have not been successfully addressed and the assumed number of climate change driven migrants in these scenarios is considerably lower than in the other two scenarios.

Most climate driven migration will be regional rather than international in its impact as people most affected by climate change events are unlikely to have the means to move far

Migration in Europe could be affected in two ways by the impacts of climate change: people from areas affected within the European space might move into other regions of Europe and people affected by climate change from outside the European region can migrate into Europe. The key challenges Europe will face from climate change are winter floods, the rising sea-level, differences in water availability and rising temperatures higher than projected global warming. Droughts and water stress will increase particularly in the south and in summer due lower river flows.

On global scale, poverty, failing ecosystems, vulnerability to natural hazards and gradual climate-driven environmental changes are all linked to environmental migration. Warming will affect agricultural productivity, natural disaster such as floods will cause mass displacement and sea level rise will destroy productive low level lands leading to more mass displacement. Climate migration fears, however, seem to be misplaced as it are often the poorest people that are affected most by climate change events and they will not have the necessary resources to migrate to richest countries.

Mortality may be more influenced by cohesion policy interventions than by market-oriented growth interventions; the challenges of ageing, however, could better be achieved through a focus on cost-effective growth

Scenario results for mortality for the CHALLENGED MARKET EUROPE scenario display very large disparities between disadvantaged regions in the East and the longevity advantaged regions in the west and north. The disparities are less pronounced in the GROWING SOCIAL EUROPE scenario and the LIMITED SOCIAL EUROPE scenario and somewhat more in the EXPANDING MARKET EUROPE Scenario. In this regard mortality rates may be more influenced by cohesion policy interventions than by market-oriented growth interventions. Yet in addition to changing trends in mortality through better healthcare etc, it is also important to be able to meet the challenges of an ageing population and this could better be achieved through a focus on cost-effective growth in the GROWING SOCIAL EUROPE and the EXPANDING MARKET EUROPE scenarios.

To raise fertility family-friendly social welfare policies are of vital importance

According to the scenarios, variations in fertility rates will be highest in the EXPANDING MARKET EUROPE scenario. This is because in the EXPANDING MARKET EUROPE there are pockets of regions with very high total fertility rates in the Northern and Western European countries and very low fertility rates in the southern, central and eastern regions. Within the GROWING SOCIAL EUROPE scenario these disparities narrow, making it, from a European point of view, vital to pursue family-friendly social welfare policies that boost fertility rates in the Northern countries, also in other parts of Europe.

Contrary to the United States and Australia, internal migration in Europe seems to be relatively stable and not very responsive to regional economic change

The policy scenarios show fairly little difference in internal migration between the four scenarios. Also the evidence for many European countries suggests stability in the internal migration system: the same regions continue to be attractive and the same regions continue to be unattractive for decades and European internal migration levels are fairly low compared with North America or Australia where migration is much more responsive to regional economic change.

Territorial cohesion policies may restrain labour migration from European states lagging behind to affluent regions in more prosperous European countries

International migration scenarios indicate that total migration is moderate in the GROWING SOCIAL EUROPE and CHALLENGED MARKET EUROPE, high in the EXPANDING MARKET EUROPE scenario and low in the LIMITED SOCIAL EUROPE scenario. Thus if high economic growth in certain areas of Europe is not checked by territorial cohesion policies the result may be greater movement of job seekers from lagging regions of Europe into the already affluent regions. If the goal is to retain people and workers in countries with higher emigration rates, such as the Eastern European countries, then territorial cohesion considerations, as expounded in the Territorial agenda are appropriate.

Extra-European migration will become increasingly important to address demographic and labour market challenges while at the same time it will require social policies to integrate large groups of immigrants

Extra-European migration will become increasingly important to deal with the ageing population of the European space. In the EXPANDING MARKET EUROPE scenario extra-European immigration is expected to be very high, especially in major cities such as Madrid or Paris. This pattern is also seen, although not quite as strong in the GROWING SOCIAL EUROPE scenario and is faintest in the LIMITED SOCIAL EUROPE scenario. While a great influx of extra-European immigration will help many regions address demographic and labour market challenges, it will also require social policies to integrate a large group of immigrants into society as well as greater inter-state coordination in immigration policy.

To measure the impact of the policy bundles behind the assumptions of the policy scenarios, a STATUS QUO scenario has been used as benchmark for the results of the policy scenarios

The projection results of a set of reference scenarios give an anchor against which we can compare the projection results of the policy scenarios. In the STATUS QUO scenario the demographic and migration input of the years 2003-2006 with start populations as of 1-1-2005 are assumed constant over the time interval 2005-2050 (the projection period). To assess the impact of migration on the population and labour force in the ESPON area, two additional reference scenarios are calculated: in the NO MIGRATION scenario all migration streams are blocked and populations of the regions change only due to births and deaths, while in the NO EXTRA-EUROPE MIGRATION scenario regional populations change also due to internal and inter-state migration.

The growth of the labour force does not just depend on the size of the working age population but also on the level of labour force participation rates; therefore alternative assumptions on future changes in labour force participation rates are included in the specification of the scenarios

In the GROWING SOCIAL EUROPE and EXPANDING MARKET EUROPE scenarios high economic growth will lead to an increasing trend in labour force participation rates. Both the GROWING SOCIAL EUROPE and the LIMITED SOCIAL EUROPE scenarios assume that policies are aimed at improving cohesion and reducing regional disparities. The rise of activity rates in the GROWING SOCIAL EUROPE scenario allows economically weaker regions with low activity rates to catch up and approach the higher rates of the stronger regions. In contrast, in the LIMITED SOCIAL EUROPE scenario the poor economic and environmental developments lead to falling activity rates everywhere. Even though policies may ease the economic pain of the weaker regions, they will not succeed in catching up with the strong regions. The other scenarios assume that the market has to do the work. This works fine for the economic stronger regions but not so much for the economic weaker regions. Notwithstanding a general strong rise in the activity rates due to a rather high economic growth, regional disparities are becoming larger in the EXPANDING MARKET EUROPE scenario as stronger regions shows a higher rise. In the CHALLENGED MARKET EUROPE scenario activity rates are falling due to a sustained economic downturn. Disparities are growing as weaker regions have to face a steeper fall in activity rates than the stronger regions.

At present more than one quarter of the NUTS2 regions in the ESPON area experiences population decline

Total population size of the ESPON countries equals 515 million inhabitants. During the last decades the population of Europe has been increasing slowly. At the regional level there have been significant differences in population growth. Since 2000 there has been population loss for one out of four NUTS2 regions, whereas 60 per cent of regions have experienced an average annual population growth of less than 1 per cent. In only one out of seven regions population growth has exceeded one per cent.

Without changes in demographic and migratory flows, one third of the regions will face considerable population decline (more than 20 per cent by 2050)

Without changes in the levels of fertility, mortality and migration the overall ESPON population will reduce by about 40 million until 2050, i.e. a decline of about 8 per cent. There are considerable regional differences: 40 per cent of the regions would experience a population increase and 60 per cent a decrease. In most of the regions with an increasing population, this is caused by extra-European migration. In those regions where the population would decline, the main cause is the negative natural change. Eleven regions would even face a decline by over 50 per cent. These regions can be found in Romania, Bulgaria, Poland and Germany. In 86 other regions population would decline by 20 per cent or more.

Migration has a significant impact on population developments of regions

The overall impact of migration on population size is considerable. Three quarters of all regions will have a larger population in 2050 if current migration flows will continue than if there would have been no migration. In one quarter of the regions, the 2050 population size will be 30 per cent higher. In one third of the regions intra-Europe migration has a larger impact on population change than extra-Europe migration. This is true in particular in the regions of Bulgaria, Poland, Romania and Slovakia, where population decreases significantly through intra-Europe migration. In the majority of regions in Western Europe, extra-Europe migration is more significant than intra-Europe migration. In these regions extra-Europe migration reduces population decline or even causes an increase. Most of the European regions will gain population due to extra-European migration. In some regions, especially in Italy, but also in Algarve and Inner London, without extra-European migration the population in 2050 would be almost one third smaller.

The impact of migration goes beyond population growth and may lead to an increase in regional disparities

The impact of migration goes beyond the simple increase or decrease of population. It also affects the age structures of populations and the labour force resources. Without migration in 70 per cent of European regions the old age dependency ratio would be higher. As most migrants are in the young adult age group, their emigration raises the old age dependency ratio as it reduces the number of economically active persons. At the same time, in the regions attracting migrants the newcomers will raise the number of young adults and the economically active population will increase.

In general migration would be beneficial for most affluent regions, whereas poor regions would lose population due to migration. Migration thus would reduce ageing in affluent regions and increase it in poor ones. Therefore, migration may be expected to be a strong factor increasing regional disparities.

Under the four policy scenarios the regional pattern of future population resembles the status quo pattern; the policy scenarios however shift the regions across the growth classification to a lesser or greater extent from their status quo position

According to the STATUS QUO scenario the majority of regions in Central and Eastern Europe as well as in Germany, northern France, Northern Scandinavia, Greece, southern Italy, north and west Spain and Portugal will lose population. Most of the rest of Western Europe will experience small population gains. The patterns of future population change under the four policy scenarios resemble the status quo pattern. This is not surprising as their benchmark data inputs are closely aligned though not exactly the same. What each policy scenario does is to shift the regions across the growth classification to a lesser or greater extent from their status quo position. The EXPANDING MARKET EUROPE scenario lifts regions most and sees most regions in Scandinavia, the British Isles, France, north and central Italy and south and east Spain in the top growth classes of more than 25 per cent. The GROWING SOCIAL EUROPE map is a smoothing of the EME map with fewer regions in the top or bottom classes and thus represents a gain in terms of cohesion. In the CHALLENGED MARKET EUROPE scenario the majority of regions now show losses in population while the LIMITED SOCIAL EUROPE shrinks the variation so that there are fewer regions in the highest loss category (less than -50 per cent).

From the start of this century, the size of the working age population declined in 25 per cent of all NUTS2 regions; at the same time there are more than 50 regions where the working age population has increased by more than one per cent per year

In more than one quarter of the NUTS2 regions the size of the working age population declined since 2000. In three out of every four German regions the working age population has decreased. Other countries where relatively many regions experience a decline in the working age population are the United Kingdom, Bulgaria, Hungary, Denmark and Sweden. On the other hand, there are more than 50 regions where the working age population has increased by more than one per cent per year. Many of these regions can be found in the eastern part of Spain, the southern part of France, in Ireland, and in Poland. Especially big cities attract labour migrants.

Cohort turnover is the main cause of change in the size of the working age population; only in very few regions the negative effect of ageing on labour supply is compensated for by migration

In most regions the main cause of changes in the size of the working age population is cohort turn-over, i.e. the replacement of the outflow of older generations by the inflow of young generations. In 80 percent of the regions the effect of cohort turnover on the size of the working age population is still positive. In one out of seven regions the size of the working age population declines despite positive cohort turnover due to outflow of active migrants. Most of the regions can be found in the UK. Moreover, in one out of five regions the working age population still grows due to positive cohort turnover but is negatively affected by out migration. These regions are typically found in Poland, Slovakia and the United Kingdom, but also in the Czech Republic and France. In contrast, in only seven percent of regions the size of the working age population increases despite negative cohort turnover due to positive net migration. Most of these regions can be found in Italy and Germany. Thus so far in only few regions the negative effect of ageing on labour supply is compensated for by migration.

If labour force participation rates would not change, the size of the labour force in the ESPON area will decline by 17 per cent until 2050

If labour force participation rates would not change, the size of the labour force in the ESPON area will decline by 17 per cent until 2050. In 23 regions the labour force would shrink by more than 50 per cent. Only in one quarter of the regions the labour force would increase.

In 90 per cent of the European regions the labour force would be smaller without extra-European migration. In all European regions, the ratio of the inactive to the active population would be higher without extra-European migration. Therefore extra-European migration would have a beneficial, albeit unequal impact on the balance between the labour force and economically inactive population.

Also in most of the policy scenarios the size of the labour force will decline in most regions

In the EXPANDING MARKET EUROPE scenario a third of the regions will be facing a declining labour force. In the GROWING SOCIAL EUROPE scenario this percentage is somewhat higher (40 per cent). In the other two scenarios more than half of all regions will see their labour force decline, in the LIMITED SOCIAL EUROPE scenario even round 70 per cent of the regions. In this scenario most regions located in the eastern part of the ESPON space and a lot of regions in the southern part will suffer a decline of the labour force by more than 30 per cent. Also many regions in Germany and Austria will have to deal with such losses of labour supply. In the EXPANING MARKET EUROPE scenario many regions in the western and northern part of the ESPON territory will have a substantially growing labour force. The contrast with the eastern part is sharp, where a majority of the regions will have an enduring shrinking labour force. In the GROWING SOCIAL EUROPE scenario the contrast between regions with a severe decline of the labour force and those with a steep growth is much smaller.

Population ageing remains the most important demographic challenge and may be greater than hitherto appreciated

As expected both the old-age dependency ratios (the ratio of population aged 65 and more to population in the age group 15-64, ODR) and the very old-age dependency ratios (the ratio of the population aged 75+ to total economically active population aged 15+, VODR) all rise steadily, but slightly more in the social scenarios than in the market scenarios, and much more than in the Status Quo scenario. The gap between the ODR and VODR is larger in the 'successful' scenarios (GROWING SOCIAL EUROPE and EXPANDING MARKET EUROPE) than in the 'unsuccessful' scenarios (LIMITED SOCIAL EUROPE and CHALLENGED MARKET EUROPE).

On regional level all ODR and VODR variables are positive indicating increases in the dependency ratios. The successful scenarios come with higher increases in ODRs and more differences between regions. Hot spots will be in central and eastern regions, where many regions face increases in ODR and VODR of 200 per cent. By mid-century this part of Europe will be a land of the old.

A typology of regions based on demographic, labour market and migratory data sheds light on the demographic pluralism across European regions

DEMIFER has developed a typology of regions based on demographic, labour market and migratory data. The 286 NUTS 2 regions have been classified in seven types on the basis of four demographic key variables: 1) the share of young adults as indicator of both the younger working age population as well as the population at the prime productive age, 2) the share of the elder population as indicator of ageing, 3) natural population balance,

and 4) net migration rate. The resulting seven types reflect different demographic and migratory regimes, each having its own demographic, economic and policy challenges.

Types of regions retaining favourable trends: 'Euro Standard' and 'Family Potentials'

The *Euro Standard* type of region is close to the overall average of the ESPON area, but the age structure is slightly older. Overall, a stagnating natural population balance and a positive net migration rate is prevalent. This type of region has a fairly positive population development and an age structure predominantly focused on the age group 35-55 years. The total fertility rate is above the ESPON average and life expectancy is overall average. The net migration rate into the regions is largely positive, thus contributing to an overall positive population development. Low fertility is not a major problem, although ageing could be.

The *Family Potentials* type has a strong population development, with a good balance between younger and older age groups. Because of high birth rates and moderate in-migration, the share of elderly is below the ESPON average, despite the relatively high life expectancy.

The *Euro Standard* and *Family Potentials* types have above average GDP-PPP per capita and below average GDP-PPP growth rates. The share of migrants is above average. The education level is high as is labour force participation. Unemployment is below average. These regions are doing well by both socio-economic and demographic standards. The principle-based goal for these regions would then be to retain the favourable trends and focus on competitive regional development and continued pursuance of the Lisbon agenda goals and "smart growth" as advocated by Europe 2020.

Types of regions dealing with population decline: 'Challenge of Labour Force' and 'Challenge of Decline'

The *Challenge of Labour Force* type of region is characterised by a rather high share of young people, but the challenge is to bring them into the labour force. Despite a large "potential" work force, this type of region is losing population, both through a negative natural population balance and through migration. A low total fertility rate exacerbates the out-migration population decline.

The *Challenge of Decline* type of regions has a negative population development, due both to low total fertility rates and negative net migration. These are some of the "shrinking" regions of Europe. The proportion of older workers (above 55 years) is significantly higher than in the rest of the ESPON space and the share of younger adults (20-39 years) is below average, thus leading to a potential problem in maintaining sufficient workforce to uphold social welfare schemes.

These two types of regions are distinctive to many of the EU-12 and the eastern part of Europe, as well as shrinking regions peripheral areas of Scandinavia, Southern Europe and in Germany. In general the GDP-PPP per capita is below average, as are growth rates. The share of migrants as well as labour force participation is also below average. In most of these regions (especially the *Challenge of the Labour Force*) the share of highly educated people is lower than the ESPON space average.

Many of these regions are lagging behind and these are the regions that the Territorial Agenda and the Green Paper on Territorial Cohesion specifically point out as challenged for territorial development. Policy goals for these regions will mainly be focused on retaining population and boosting natural population growth, attracting immigrants (both international and non-EU) and increasing opportunities for the labour force.

Types of regions challenging disparities: ‘Challenge of Ageing’ and ‘Young Potentials’

The *Challenge of Ageing* type regions are experiencing positive population development driven by a positive net migration rate, but the proportion of the older age groups is significantly higher than it is in the ESPON space age structure. Life expectancy is high and the share of elderly is significant. Birth rates are low, but migration, especially from non-EU countries can partly mitigate the low fertility and ageing population to some extent. Education levels are low, but so are unemployment rates (although the gender gap is the widest in Europe).

The *Young Potentials* type regions have a young age structure and positive population development due to both national population balance and positive net migration. This is partly due to the strong inflow of migrants from non-EU countries. Disparities in education are apparent in these regions as they have simultaneously a high share of people with tertiary education and a high share with only basic education. There is also a considerable gender gap in labour market participation.

These two types of regions are found mainly in the Mediterranean regions, English coastal areas, in the former Cohesion country of Ireland and in some urban enclaves (such as Vienna). They constitute demographic growth regions with above average GDP-PPP per capita and average labour force participation (which does exhibit great gender and educational disparities). In the *Young Potential* regions the GDP-PPP growth rates are above average, but in the *Challenge of Ageing* regions they are below average. The unifying factors for these regions are strong net migration gains and population increases. The labour force in these regions is over-represented (relative to the ESPON space average) by fairly low-qualified, low-wage sectors such as agriculture, hotel and restaurants, construction and fishing (the *Challenge of Ageing* regions). Tourism is an important industry in many of these regions and attracts non-EU immigrants and young people into low-qualified, often seasonal work.

The first challenge that these regions face is orienting their economies towards more Lisbon-flavoured goals, such as the knowledge economy and innovation to create not just more, but better jobs in the regions. The second challenge is to ensure sustainable economic, social and development in light of the increasing pressure that the growing population exerts on natural and cultural resources.

To cover the diversity of European regions at lower regional level, twelve case studies have been carried out

To study the relationship between demographic and migratory flows on the one hand and economic and social dynamics on the other in more regional detail, in depth studies were done for twelve regions. The studies focus on the interdependence between the urban areas and their hinterland and cover, with the exception of the *Overseas* regions, at least one region for each of the different types. In most cases the regions under study extends to the NUTS3 level and a more detailed regional scale where data are available.

The case studies show that international migration is closely linked to the economic performance of the region: the most dynamic regions satisfy their labour demand through immigration

Even though demographic ageing touches all NUTS2 regions, there are considerable differences within several regions. The interdependence between the urban areas and their hinterland causes short-distance migration flows with young adults migrating towards the urban centres and the other age groups towards the hinterland. As a consequence commuter flows gain considerable importance. The areas with a well performing labour market and high levels of GDP per capita are characterised by relative high international net-migration, whereas, for example, Eastern Romania with a high share of working age population and few economic opportunities experiences a high out-migration.

The dynamics of economic cycles and demographic developments differ. As demography is very slow to react through natural growth, it is obvious that economic cycles affect migration flows in order to satisfy labour demand. Most case studies show the ability of major cities and agglomerations to attract working age migrants and to counterbalance a shrinking and ageing working age population. Thus it seems that a well-off region is able to deal with change in the quantity and the structure of the population, whereas regions with less economic potentials would be prone to negative effects of population change.

Policy options aimed to affect demographic trends and migratory flows should not be considered in isolation from policies in other areas such as education, housing, labour market, integration of migrants, innovation and the quality of the environment.

If current demographic trends and migratory flows will continue the European working age population will shrink and disparities across regions will increase. This calls for policy options to improve European competitiveness and regional cohesion. Growth cannot simply be enhanced and disparities cannot simply be reduced by policies aimed at directly affecting demographic developments and migratory flows since these depend on the economic situation. If young couples do not have faith in the future they tend to have only a small number of children. Therefore, policies aiming to raise the level of fertility will not be effective if the general economic situation will not improve. Moreover, policies affecting the level of fertility will have effects on the growth of the working age population in the long run only. These policies will not help in reducing labour shortages in the next two decades or so. Policies aimed at increasing mobility between European regions and countries may reduce rather than increase cohesion since young adults tend to migrate from disadvantaged to affluent regions. Thus policies aimed to stimulate migration can be effective only if they are part of policy bundles aimed to improve living conditions in poor regions, for example by improving the availability of jobs, housing, schools and the quality of the environment. Policies which are aimed to allow economic migration from outside Europe in order to meet the needs of the labour market will be effective only if integration policies are successful. Furthermore, as migrants tend to move to economically healthy regions, regional disparities may increase, particularly as regions with a healthy economy tend to be better able to attract higher skilled migrants. Thus policies to address demographic challenges should not just be aimed to affect the size and direction of demographic trends and migratory flows, but should be combined with policies in other areas as well.

1 Introduction

While the relatively dense urban network of the European Union contains thousands of towns and city centres for economic, social and cultural activity, it contains only few very large cities. This unique settlement pattern contributes to the quality of life of their inhabitants and is relatively more resource-efficient compared to settlement patterns with many large agglomerations and spacious rural areas. Disadvantages are the costs from congestion, high property prices and pollution (CEC, 2008a). Having mainly one economic integration zone (marked by the corners London-Paris-Milan-Munich-Hamburg) also results in a less competitive economy (Faludi, 2006). In order to achieve a greater European competitiveness one of the priorities adopted in the Territorial Agenda is to promote polycentric developments and urban-rural partnerships. City regions and peripheral areas are stimulated to cooperate with each other, and local authorities facing population decline and ageing are encouraged to cooperate to maintain services and infrastructures. This notion of territorial cohesion extends beyond the one of economic and social cohesion. It implies a more balanced and sustainable development and aims to fully integrate the EU in the global economy.

In the near future European regions have to face four major challenges: globalisation, demographic change, climate change and sustainable energy (CEC, 2008b). In order to adjust to the new opportunities and consequences of globalisation, the Lisbon Agenda requires European economies to increase productivity growth, employment levels and human capital. The main demographic challenges are decreasing population growth and increasing proportions of the elderly. Ageing and declining populations strongly influence (regional) labour markets, health care expenditure and social security systems. Together with its proximity to some of the world's poorest and fastest growing populations, these demographic developments will continue to put a strong migration pressure on Europe. Climate change will put high demands on economic, social and environmental systems, while resource depletion, rising oil and gas prices, and a switch to bio-fuels potentially affect the competitiveness of energy intensive sectors.

The ESPON 2013 Programme supports policy development in relation to the aim of territorial cohesion. One of the major priorities of the Programme is to observe demographic trends in Europe, to look into future demographic developments and to link these to economic, social and environmental development issues in European regions and cities. Within this Programme, ESPON initiated and funded the research project DEMographic and MIGratory Flows affecting European Regions and cities (DEMIFER). The objective of DEMIFER is to assess the effects of demographic trends and migratory flows on European regions and cities and to examine the implications for regional competitiveness and European cohesion. The specific aims of the project are:

1. to determine how distinctive are current trends in migration, fertility, and mortality and how they affect differences across regions in population growth, the size of the working age population and the ageing of the population;
2. to review the extent to which the effects of internal migration, migration between European countries and migration to Europe compensate or reinforce each other;
3. to assess the effects of economy and policy options on natural growth, migration and labour force participation;
4. to forecast how future developments in migration, fertility and mortality will affect population growth and changes in the age structure in different types of regions;
5. to analyse the extent to which the labour force in different types of regions will change due to increases in natural growth, internal migration, international migration and participation rates;
6. to assess the future effects of environmental change on migration flows within, between and into countries and regions;

7. to examine the implications of demographic and migratory developments and to translate the output of the policy oriented activities into more specific regional settings.

The main demographic perspective of the project is the ageing of the population and its relationship with regional economic developments. In analysing the relationship between demographic and economic differences across regions it is important to note that this relationship is mutual. On the one hand the levels of fertility and mortality and the direction of migration flows are affected by economic conditions. On the other hand changes in population growth and ageing (which depend on developments in fertility, mortality and migration) affect both the supply and demand side of the economy of regions. The second basic principle is that even though climatic crises in Europe have been rare in the past, in the future environmental changes may affect regional developments, particularly climate change and limitations in the availability of energy.

A major consequence of the ageing of the population is that the working age population will decline which may have a downward effect on economic growth and competitiveness in many European regions. In order to achieve the Lisbon goals of long term economic growth, full employment, social cohesion and sustainable development, the ageing of the working age population asks for policies aimed at increasing the size of the (potential) labour force, raising employment rates and improving productivity growth. Furthermore, looking at the ageing of the population it is important to make a distinction between the 'young elderly' and the 'oldest old'. Increases in the number of the oldest old will have an effect on the demand of health care and long term care. Increases in the size of the young elderly population on the other hand, may help in bridging the gap between the increase in the demand of care caused by the increase in the number of oldest old and the decrease in the growth rate of the working age population, as many of the young elderly are still in reasonably good health and may well provide informal care. Even though population ageing will affect regions all across Europe, different types of regions may be affected in different ways.

The (draft) final report of DEMIFER provides an overview of the most important recent and future regional demographic developments in the ESPON area and the corresponding policy considerations for regional competitiveness and territorial cohesion. To serve the first aim of the project, chapter 2 reflects on the demographic regimes that characterize the regions of Europe. The focus is on the impact of migration, mortality and ageing on the working age population. In chapter 3 the demographic regimes are synthesized to derive a summary typology of European regions. Special attention is given to the main demographic challenges of low fertility levels, population ageing and the slowing down of the growth of the working age population. In the second part of this chapter the typology of demographic status is linked to socio-economic data providing to each type regional characteristics in terms of economic performance, level of educational attainment of the population, labour force status, and economic structure.

To answer questions such as 'What would be the population in the ESPON area in 2050 if there were no migration in the future?' we calculated a set of reference scenarios (answering aim 2). The first reference scenario assesses what will happen if the demographic regimes of mid-decade (2005) continue to 2050. Subsequently we explored what happens when various migration streams are turned off. Two 'no migration' scenarios were compiled. In the first we assumed no internal and international migration at all, while in the second free movement within the ESPON area was assumed, but no migration to and from the rest of the world. The main conclusions of these scenarios are given in chapter 4.

The interrelationship between ageing and migration on the one hand and economic performance and structure on the other, comes up for discussion in several chapters. Since it is uncertain to what extent territorial policies will be effective we examined a

number of policy scenarios based on alternative assumptions about 1) future developments in economic trends, innovation and climate change, and 2) the implementation and effectiveness of regional cohesion policies. Scenarios in which policies will succeed in narrowing regional disparities are compared with scenarios in which well-off regions will benefit more than regions lagging behind. The ideas behind the set of policy scenarios are described in chapter 5 (aim 3).

Chapter 6 sketches the outcomes of the policy scenarios with respect to the components of population change, ageing, the relationship between migration and population redistribution as well as the relationship between population redistribution and population density (aim 4). What are the consequences of the scenarios in terms of population growth and decline and the ageing of the population? In this respect it is important to note that due to the effect of the post war baby boom in the next decades the number of young elderly will rise strongly, but that in the long run these people will become the oldest old. Thus whereas in the coming decades we may expect an increase in the supply of informal care, in the long run the gap between supply and demand of care may well increase sharply.

Chapter 7 focuses on linkages of economic developments and demographic changes through the labour market (aim 5). Since the scenarios include labour force participation rates, we could analyse the impact of demographic and migration trends on the future size of the estimated actual labour force (in addition to the future size of the estimated potential labour force).

Europe's cities and regions face several important challenges from environmental changes. Temperatures are rising, sea levels increasing and rain patterns altering. Oil and gas resources shrink, prices rise, and a switch into alternative bio-fuels occurs. Chapter 8 addresses future effects of environmental changes on migration flows within, between and into European countries and regions (aim 6).

The demographic analyses, typology and scenarios mainly refer to the NUTS2 scale for which the required data are largely available or could be estimated without too many difficulties. To understand the processes at work and to study into more spatial detail the many ways in which demographic and migratory flows may affect European regions and cities, a number of case studies have been carried out that employ NUTS3 level data and, where possible, lower level regional areas as well. The main conclusions of the case studies are summarized in chapter 9 (aim 7).

While chapters 2 to 9 describe current and future regional demographic and migratory developments, chapter 10 discusses the key points for consideration in policies for regional competitiveness and territorial cohesion. In what way do European demographic developments contribute to positive regional developments and what parts of Europe are confronted by unfavourable territorial developments today or will most likely have to face these in the (near) future?

The final chapter of the report (chapter 11) discusses the options for policy makers to address the demographic challenges for European countries and regions.

More detailed descriptions of the research questions and design, data issues, applied methodologies, outcomes of the scenarios and the individual case studies, can be found in the scientific report of DEMIFER that is annexed to the final report (see list of deliverables at the end of this report).

2 Demographic regimes of European regions

Key findings

- *More than one quarter of the NUTS2 regions in the ESPON area experience the impacts of population decline.*
- *Urban regions often face a negative internal migration balance as a result of suburbanization, but, at the same time, attract international migrants.*
- *Migration has increasingly not been sufficient to compensate the decline in the potential labour force due to cohort turn-over.*

2.1 Population development in the ESPON area

The population of Europe is increasing slowly. Currently the number of inhabitants in the countries of the ESPON area is around 515 million. Since 2000 the annual average growth rate has been below 0.5 per cent per year, which is similar compared to other developed countries but modest in comparison to other world regions. Population growth is unevenly distributed across the ESPON countries. The highest growth in 2007 took place in Ireland and Spain, while most of the Eastern European countries had to face stagnating populations or population decline. Also at NUTS2 level significant differences in population growth are witnessed. Over the period 2000-2007 there was population loss for 75 of the 287 NUTS2 regions, 171 regions experienced an average annual population growth of less than 1 per cent, and in only 41 NUTS2 regions this percentage was above 1. The largest population losses were recorded in Bulgarian and German regions, while the largest gains were observed in the south of Spain. In the period since 2000 the number of NUTS3 regions with population growth dropped to less than 60 per cent. Contrary to the general trend, in Spain and Italy the number of regions with population growth increased substantially, mainly due to increasing levels of migration from outside of Europe. Splitting up the NUTS3 regions into three groups with different degrees of urbanization shows that for all groups the percentage of regions with population growth has declined since the start of this millennium. While still two-thirds of the urban regions and 62 per cent of the intermediate regions experience population growth, more than half of the rural NUTS3 regions are currently characterized by population losses.

The slow pace of European population growth gives rise to the major demographic challenge of population ageing. Although population ageing affects all regions of the world, it is most advanced in Europe. The old age dependency ratio serves as an indicator of the pressure placed on the working age population (age 20-64) to take care of the old (age 65 and over). In 2007 the vast majority of NUTS2 regions were confronted with old age dependency ratios between 20 and 35. Higher values were mainly found in Italy, Greece and Germany, while lower values were found in Iceland, Ireland and some regions in Poland and Slovenia. For assessing the effect of ageing on the increase in the demand of care the rise in the number of persons aged 75 or over per 100 people aged 20-64 is a better indicator. In the whole ESPON area this 'very old dependency ratio' (VODR) increased from 11.0 in 2000 to 12.7 in 2007. The number of regions with a ratio below 10 halved (from 96 to 46), while the number of regions with a ratio above 15 more than doubled (from 30 to 70). In 21 regions there has been a decline in the VODR. Many of these regions include big cities (e.g. London, Stockholm, Brussels, Oslo, and Wien).

The driving forces of population ageing are sustained low fertility and increasing longevity. Fertility in the ESPON area is among the lowest in the world. Currently, women in the European Union on average have 1.5 children. Differences between countries gradually become smaller. The highest fertility levels are observed in France and Ireland (2.0), while Slovakia, Romania and Poland have the lowest rates (1.3). In more than half of the NUTS2 regions the TFR is 1.5 or lower, while only for seven regions the TFR

amounts 2 or higher. Life expectancy at birth in the ESPON area is among the highest in the world. With only a few exceptions (Lithuania and Latvia for men) longevity continues to increase in all countries. Currently, European women on average may expect to live 82 years and men 76 years. The gender gap in longevity is slowly narrowing. While life expectancy is high in Italy, Spain and most of the regions in Western and Northern European countries, it is low in Eastern Europe.

2.2 The impact of migration

Contrary to the past, natural population development (the difference between the numbers of births and deaths) has only limited impact on population change. Today, by far the most important force behind European population change is international migration.

As the main driver of European population growth, in 2007 international migration amounted to 4 per thousand for the ESPON area as a whole, against only 1 per thousand through natural increase. It is estimated that more than half of the total number of international immigrants in the ESPON area arrives from outside the area, while somewhat less than half of the international emigrants departs to a country outside ESPON. These proportions vary strongly between countries. For example, only 5 per cent of all immigrants in Luxembourg arrived from a country outside the ESPON area in 2007, against around 70 per cent of the Italian immigrants.

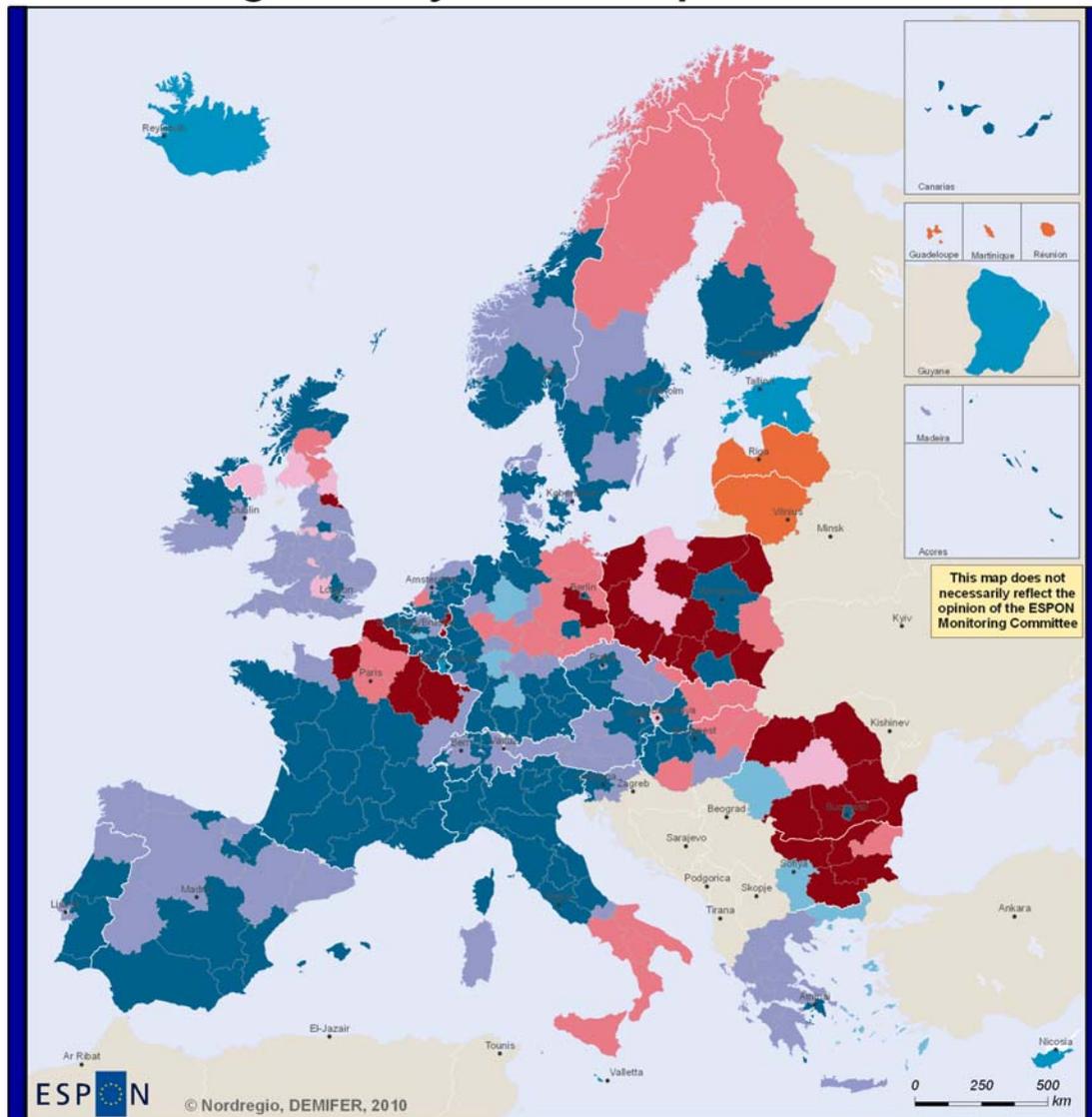
In 21 of the 23 countries that reported population growth during 2007 this growth was mainly caused by migration. Only in France and the Netherlands natural increase dominated. In 2007, the Netherlands was the only Western European country with a negative international migration balance. In seven of the eight (mostly Eastern European) countries that reported a population decrease, the deficit was mainly caused by negative natural growth. Poland was the only country in 2007 with a population decrease mainly caused by negative net migration.

At the regional level, population change through migration consists of two different components: internal migration between regions within individual countries and international migration to and from different countries. The influence of these components varies considerably from region to region (Map 1). For about 75 per cent of all regions the total migration balance was positive for the period 2000-2007. The combination positive internal and positive external occurred most (40 per cent), followed by the combination positive total, negative internal and positive external (30 per cent). Conversely, there are hardly regions with positive internal migration and negative external migration. Regions with both components negative (10 per cent) can mainly be found in Poland, Bulgaria and Romania.

Urban regions often face a negative internal migration balance as a result of suburbanization. At the same time, these urban areas usually attract international migrants because of the availability of cheap housing and jobs and the presence of a resident migrant population. In more attractive regions on the other hand, the available housing tends to be occupied primarily by internal migrants, restricting the possibilities for international migrants to settle in these regions. Urban regions, especially those that encompass big cities, also often attract young populations (students, young active and foreign immigrants) and expulse older active ones. A clear example is Inner London. During the period 2000-2004 the population aged 20-39 increased by 24 per cent through migration, while the population 40-64 decreased by 23 per cent through migration. On the other hand, there are regions too that either attract both young and older migrants (e.g. various regions in Spain) or expulse both (e.g. various regions in Poland).

Map 1 Net migration by components, 2000-2007

Net Migration by Main Components 2000-07



Internal and international migration balance in the NUTS2 Regions in 2000-2007*

Positive Net Migration

 Positive Internal and International Migration	(112)
 Positive Internal and Negative International Migration	(10)
 Negative Internal and Positive International Migration	(82)
 No Differentiation	(7)

Negative Net Migration

 Positive Internal and Negative International Migration	(12)
 Negative Internal and Positive International Migration	(31)
 Negative Internal and International Migration	(28)
 No Differentiation	(5)

No differentiation between internal- and international migration (Countries with only one NUTS2 region & French overseas regions)

(x) - number of regions per category

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Regional level: NUTS 2
Source: ESPON 2013 Database 2010
Origin of data: Eurostat 2009, NSIs 2009, University of Leeds 2009
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Total migration: FR 2000-2006; Domestic- & international migration: CH 01-04, DE 02-07, DK 06-07, FR 06, GR & PT 01, IE 02-06, IT 00-05

2.3 Dynamics of the working age population

In a large majority of the ESPON countries the size of the working age population increased in the period 2000-2007. However, in more than one quarter of the NUTS2 regions the potential labour force declined (Map 2). In this context Germany is head and shoulders above the rest: the 20-64 year old population decreased in three out of every four German NUTS2 regions. Other countries with relatively many regions in which the working age population declined are the United Kingdom, Bulgaria, Hungary, Denmark and Sweden. On the other hand, there are almost 50 regions where this population increased by more than one per cent per year. Many of these regions can be found in the eastern part of Spain, the southern part of France, in Ireland, and in Poland. Here too, the proposition that big cities attract labour migrants is confirmed.

Changes over time in the working age population occur because of the simultaneous operation of cohort turn-over (the gradual replacement of earlier born cohorts by later ones), migration and mortality. Most regions still experience growth of the working age population due to cohort turn-over as well as positive net migration (type 1 in Table 1). These regions are found in almost all countries with the exception of Germany and the Baltic States. In most Western European countries this is the dominant class of regions.¹

Table 1 Type of growth of working age population, NUTS2 regions, 2000-2004

	1	2	3	4	5	6	7		1	2	3	4	5	6	7
AT	8	1						IT	3	4	10		1	3	
BE	11							LI	1						
BG	1	1			4			LT					1		
CH	6		1					LU	1						
CY	1							LV					1		
CZ	3	5						MT	1						
DE			7		3	24	5	NL	11				1		
DK	2				2	1		NO	5	1				1	
EE				1				PL	4	12					
ES	17	2						PT	6		1				
FI	3	1			1			RO	3	3				2	
FR	17	9						SE	5					3	
GR	12			1				SI	2						
HU	3	1			3			SK	1	3					
IE	2							UK	10	11			16		
IS	1							Total	140	54	19	2	39	28	5

1 total growth +, cohort turn-over +, migration +; 2 total growth +, cohort turn-over +, migration -
 3 total growth +, cohort turn-over -, migration +; 4 total growth -, cohort turn-over +, migration +
 5 total growth -, cohort turn-over +, migration -; 6 total growth -, cohort turn-over -, migration +
 7 total growth -, cohort turn-over -, migration -
 UK: 2000-2003

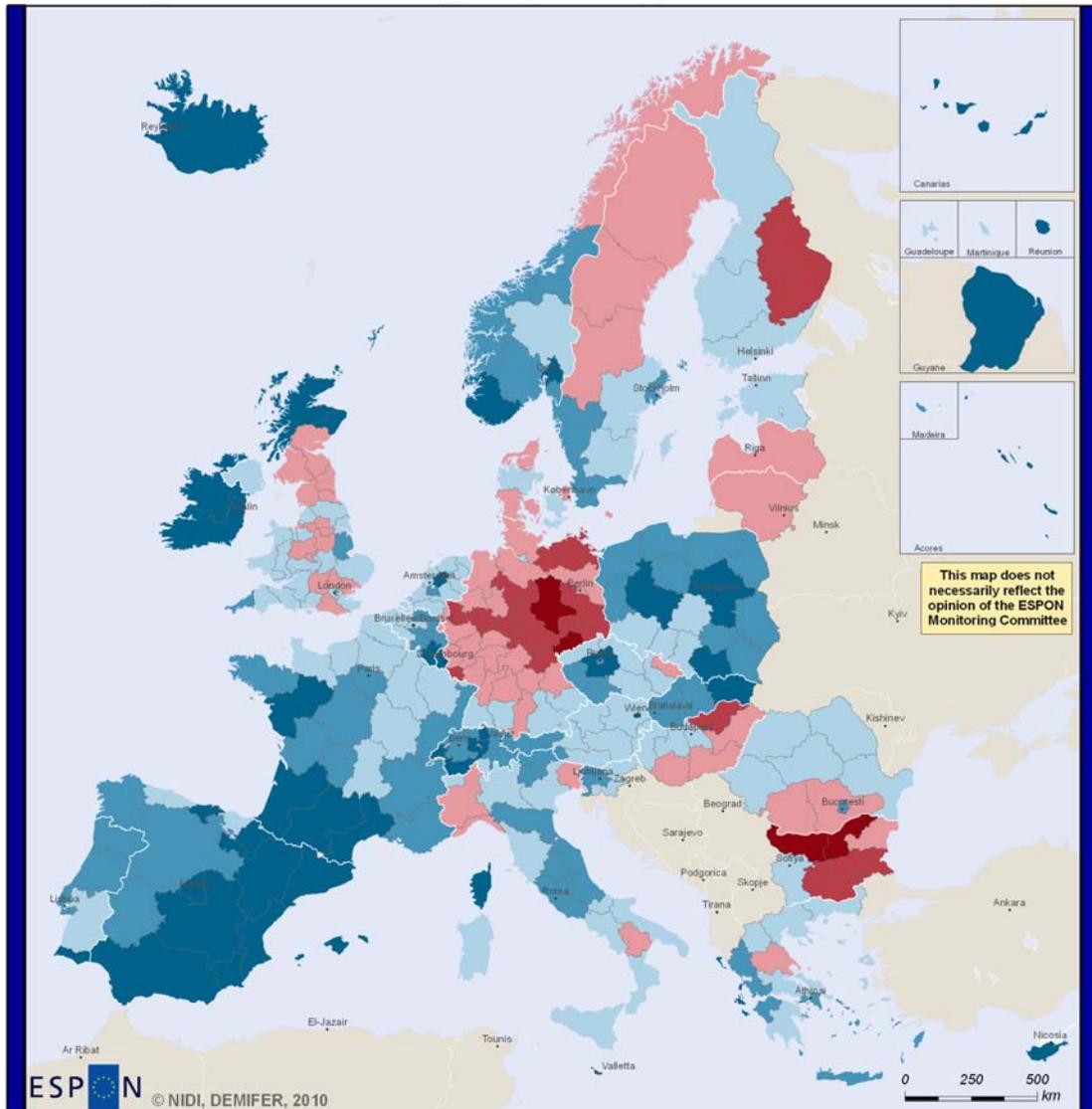
The second largest class contains of regions with positive total growth due to positive cohort turn-over that exceeds negative net migration (type 2). These regions are typically found in Poland, Slovakia and the United Kingdom, but also in the Czech Republic and France. If current trends continue for most of these regions the transition to a declining potential labour force will only be a matter of time. In the regions with type 5 the negative net migration already outweighs the positive cohort turn-over. Various examples of these regions are found in the UK. In type 3 the total growth is positive due to positive net migration that exceeds negative cohort turn-over.

Almost all of the regions with this type can be found in Italy and Germany. However, many more regions in Germany are of type 6: negative total growth as a result of negative turn-over that is not compensated by migration. Regions where the decline of the working age population may be attributed entirely to mortality (type 4) are very few in number and are found in Estonia and Greece. Finally, in five regions in Germany all three factors of change, i.e. cohort turn-over, migration and mortality, contribute to the shrinking potential labour force (type 7).

¹ Because of different periods, the totals in Table 1 slightly deviate from those in Map 1.

Map 2 Annual change in working age population, 2000-2007 (%)

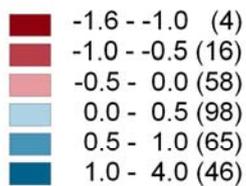
Change in Working Age Population 2000-2007



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Regional level: NUTS 2
Source: ESPON Database 2010
Origin of data: Eurostat, NSIs 2010
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Annual Average Change in Population Aged 20-64, in %



(x) = number of regions per category

3 Typology of regions

Key findings

- *By 2005, the demographic landscape of European regions offers diverse and heterogeneous spatial patterns beyond traditional categories like growth and decline.*
- *The new typology of the demographic status reveals seven types of regions and sheds light on the prevailing demographic pluralism across European regions.*
- *Migration is the main driver of a predominately positive population development in most regions. Only a small number of regions are affected by distinct depopulation.*
- *Fertility levels are below replacement level in the majority of regions, but most populations are increasing due to moderate to strong influx of international migrants.*
- *Demographic ageing, although varying by extent and rate of increase, prevails across Europe. However, population ageing and growth don't exclude each other.*
- *In general, the share of the working age population (20-64 years) is still increasing, but the proportion of the younger workforce is already declining in many regions.*

3.1 Regional typology of the demographic status by 2005

The demographic typology of 286 NUTS2 regions is a comprehensive classification of the demographic structure and short-term trends in the ESPON area by 2005, based on four key variables: the share of the age groups 20 to 39 years and 65 years and over in 2005, as well as the annual average natural population increase and net migration rate during the period 2001 to 2005. These two age groups are representing the young adults and the elder population, also meeting the peak ages of mobility. The age group 20 to 39 years matches the prime reproductive age, as well as the younger working age population. The share of the age group 65+ is an indicator for the stage of ageing. The natural population balance indicates the extent of the population increase or decrease based solely on the difference between births and deaths, while the net migration rate expresses the gain or loss of population due to migration. The aggregate of both, i.e. the total population change, decides whether a population is increasing or decreasing by size.

The typology distinguishes between seven types of regions, which are affected differently by demographic and migratory flows. This classification enables one to capture the demographic diversity of European regions by 2005 at first glance (Map 3 and Figure 1).

- "Type 1 – Euro Standard" is coming close to the overall average of the ESPON area with respect to the indicators used in the cluster analysis. However, the age structure is slightly older than the average. Overall, a stagnating natural population balance and a positive net migration rate is prevalent.
- "Type 2 – Challenge of Labour Force" features a high share of population in young working ages and a slight population decline, driven by a negative natural population development.
- "Type 3 – Family Potentials" has a slightly younger than average age structure and high natural population increases, as well as a positive net migration rate.
- "Type 4 – Challenge of Ageing" is characterised by older populations and natural population decreases. Nevertheless, the overall population size is still increasing due to a strong net migration surplus.
- "Type 5 – Challenge of Decline" is shaped by a negative natural population balance, as well as a negative migratory balance. In consequence, this leads to depopulation accompanied by demographic ageing.
- "Type 6 – Young Potentials" features a young age structure, a positive natural population increase, as well as a strong migratory surplus.

- “Type 7 – Overseas” is featuring considerable high shares in the young ages and by far the lowest share of elder population. The strong natural population increase is more than counterbalancing the negative migratory balance.

Beyond demographic characteristics, the typology reveals spatial pattern with respect to the geographical distribution of the different types of regions, such as distinctive Northern and Western European types (Type 1 and Type 3), Eastern European and peripheral types (Type 2 and Type 5, which includes Eastern Germany) and rather Southern European types (Type 4 and Type 6, including also Ireland), as well as a non-European mainland type (Type 7, consisting of the French Overseas Territories and the Spanish exclaves of Ceuta and Melilla).

3.2 Demographic challenges per type of region

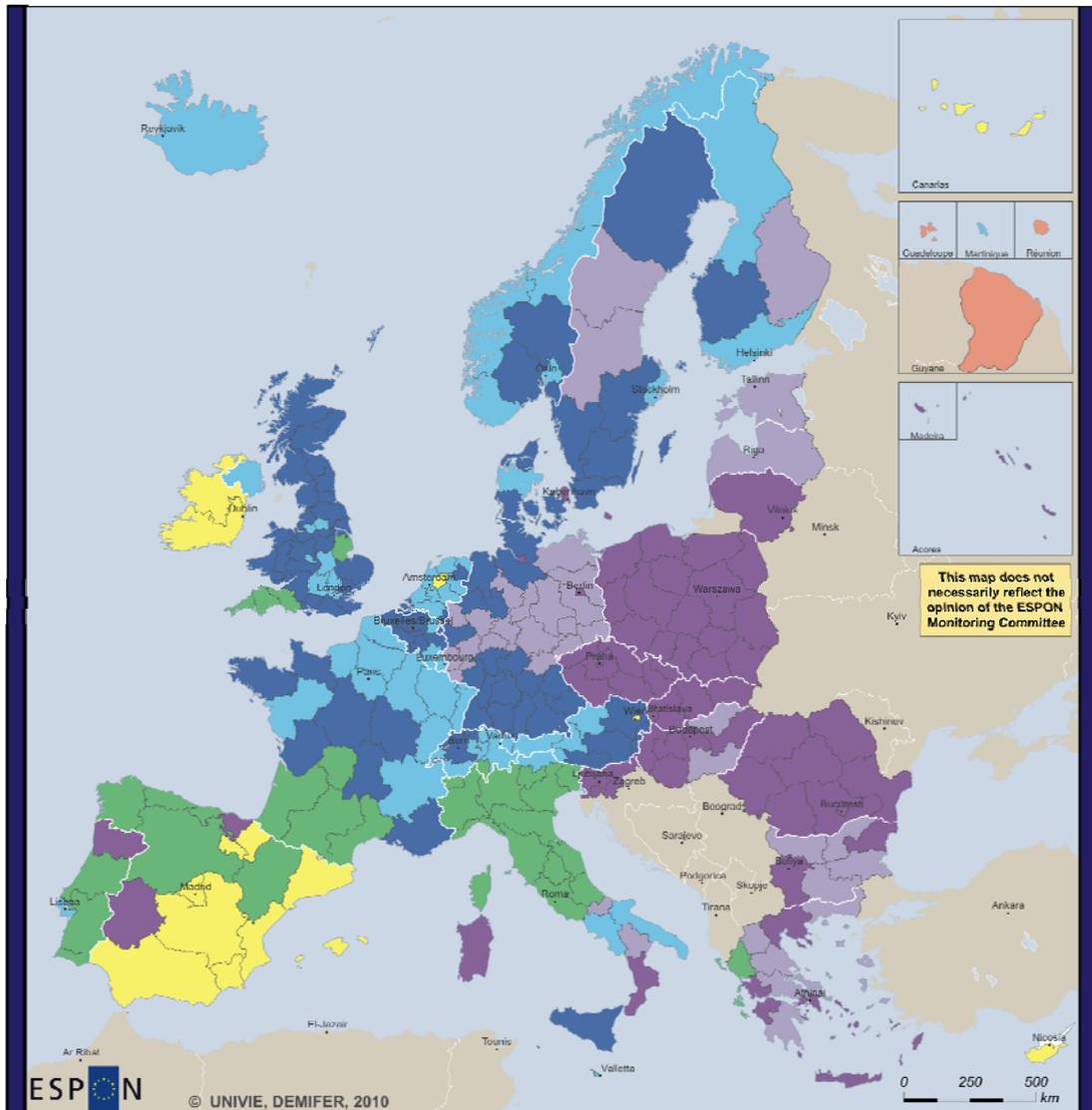
Population decline is a demographic challenge, first and foremost, for the two distinctive Eastern European types of regions of Type 2 and even more for Type 5. All other types of regions had a positive population development during the period 2001 and 2005. These two types of regions, and also Type 4 to some extent, must be alerted by the impact of low fertility. All other types of regions have higher levels of fertility, although still below the replacement level. Only in regions of Type 7, the level of fertility is predominately around or above two children per woman. With respect to the population development, indeed all other types of regions, besides Type 2 and Type 5, were able to compensate the below replacement fertility by immigration between 2001 and 2005.

Demographic Ageing is measured by the share of the older age groups, most commonly by the age group 65 years and over, which is in general the strongest growing age groups. Above average proportions of elder populations can be observed in regions of Type 1, Type 4 and Type 5. The highest shares can be found in Type 4, which also features the highest life expectancy of all types of regions. However, in Type 4 the impacts of demographic ageing are mitigated by a strong influx of younger migrants. Although the average life expectancy in regions of Type 5 is the lowest besides Type 2, the widespread emigration of the younger is driving the already prevalent process of demographic ageing even further. In Type 1, the speed of ageing is rather moderate due to reasonable fertility rates and a predominately positive migratory balance. All other types of regions show below average shares of elderly people, supported either by higher levels of fertility (Type 3 and Type 7), or by strong migratory surpluses (Type 6). By contrast, the relatively low share of elderly in regions of Type 2 is due to the momentum originating from the last strong birth cohorts born before 1990, and because of the lowest life expectancy of all types of regions – both characteristics are typical for Eastern European populations.

When it comes to the size of the labour force, which is almost exclusively constituted by people in the main working ages between 20 to 64 years, challenges are bound to occur in the foreseeable future in all types of regions, besides Type 2 and Type 6. The share of working age population is around average in Type 1, Type 3, Type 4 and Type 5. Only in regions of Type 7, this proportion is clearly below the average. Nevertheless, if Type 7 can prevent its high proportion of younger people from emigrating in large numbers, the share of the working age population will increase considerably in the coming years. In Type 1, Type 3 and Type 4, the share of the working age population is still increasing. However, this growth is driven by increases in the older working age population (55 to 64 years), while the proportion of younger adults (20 to 39 years) was already decreasing during the period 2001 to 2005. Only in regions of Type 5, the size of the entire working age population is already shrinking. On top of that, it is especially the decrease in the share of the younger working age population, which is the decisive factor for the shrinking labour force of Type 5. In regions of Type 2 and Type 6, the proportion of the population in working age is not only clearly above the overall average, it is even still increasing, especially the younger working age population.

Map 3 Typology of the demographic status in 2005

Typology of the Demographic Status in 2005

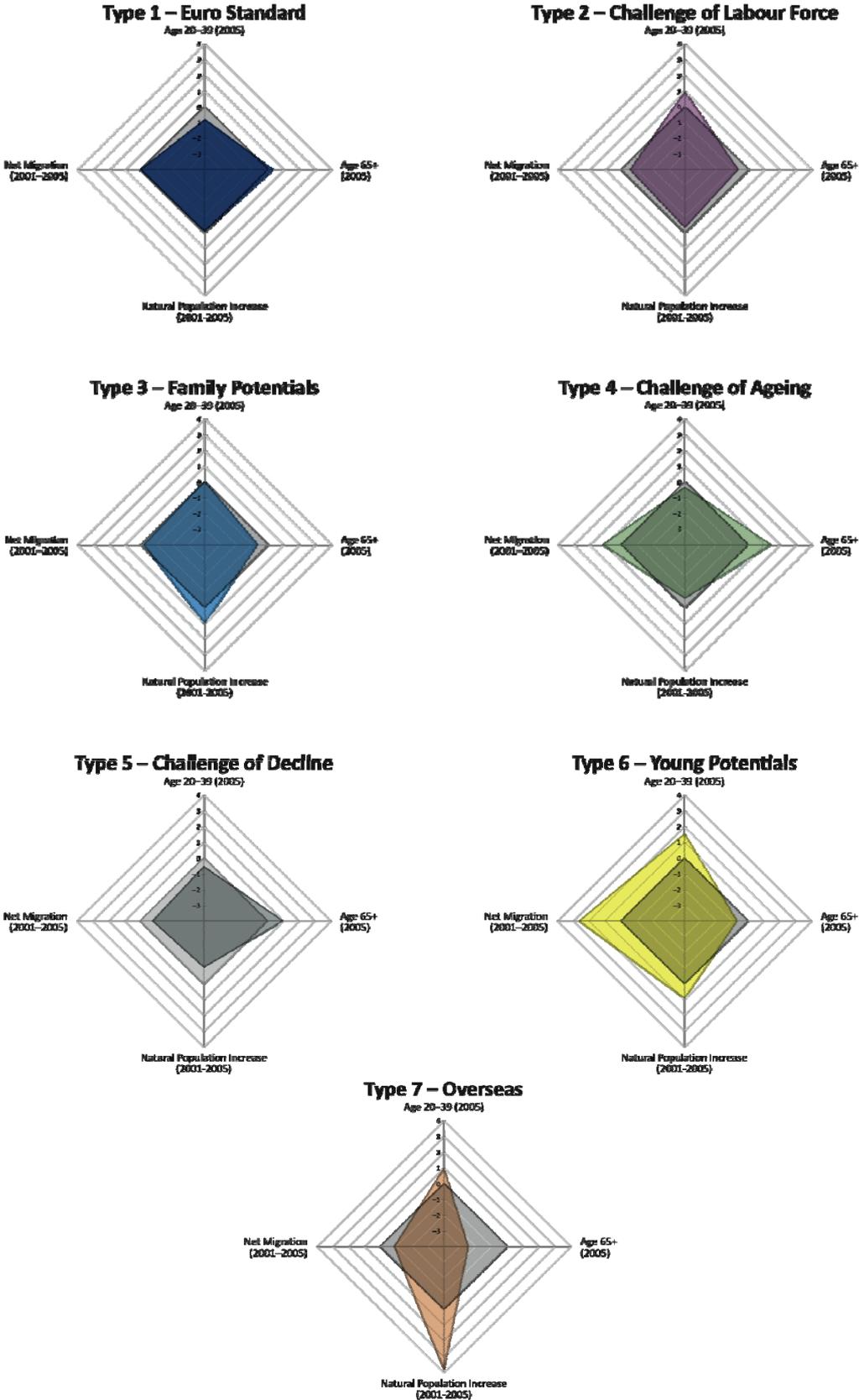


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Regional level: NUTS 2, except UK1 NUTS1
Source: ESPON 2013 Database 2010
Origin of data: Eurostat, NSIs 2008/09
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Type	Classification	Cases	Population	Age Group 20-39 (%)			Age Group 65+ (%)			Natural Population Increase (per 1000)			Net Migration (per 1000)			
				2005						average per annum 2001-2005						
				avg	min	max	avg	min	max	avg	min	max	avg	min	max	
1	Euro Standard	79	127 915 217	25.41%	25.68	22.57	28.72	17.46	15.33	20.30	0.01	-2.67	2.47	3.43	-2.11	9.36
2	Challenge of Labour Force	61	116 767 795	23.20%	30.43	28.33	33.84	14.51	10.60	18.96	-0.78	-4.76	2.89	0.08	-7.35	9.19
3	Family Potentials	55	104 556 600	20.77%	28.15	24.80	36.32	14.57	11.13	16.96	3.72	1.06	9.00	2.12	-3.51	9.59
4	Challenge of Ageing	33	63 838 208	12.68%	26.87	21.52	31.19	20.83	18.51	26.51	-1.74	-6.19	1.43	9.42	4.14	16.99
5	Challenge of Decline	38	50 166 688	9.97%	26.32	21.47	30.04	19.49	15.89	22.55	-3.39	-10.35	-0.59	-1.20	-11.25	3.70
6	Young Potentials	15	38 542 821	7.66%	32.26	29.36	35.86	14.45	8.70	19.03	3.61	-0.15	9.78	17.10	9.96	26.30
7	Overseas	5	1 555 069	0.31%	30.40	27.02	32.55	9.04	3.71	11.81	13.56	8.40	25.28	-1.78	-8.18	9.07
EU 27+4	ESPON Space	286	503 342 399	100%	27.82	21.47	36.32	16.63	3.71	26.51	0.33	-10.35	25.28	3.16	-11.25	26.30

Figure 1 Cluster profiles



3.3 Socio-economic illustration of the classification

In the course of the analyses of the socio-economic characteristics, obtained from the ESPON 2013 Database as well as the European Labour Force Survey 2007 (Eurostat, 2008), a special emphasis was placed on the foreign population, distinguishing between national population and immigrants with a foreign citizenship, either from another EU27 country or from outside the EU27. When differentiating by economic performance, those type of regions with GDP-PPP per capita levels above the EU27 average (by 2005), i.e. Type 1, Type 3, Type 4 and Type 6, do show GDP-PPP per capita growth rates (2001-2005) below the EU27 average. Only in Type 6, the annual average GDP-PPP per capita growth rate is close to the EU27 average. In types of regions with below EU27 GDP-PPP per capita levels, i.e. Type 2 and Type 5, quite the reverse is true. Considerable stocks of foreign populations can be found in those types of regions with above average GDP-PPP per capita levels.

The highest proportion of foreign population (by 2007) and also the strongest net migration gains (2001-2005), can be observed in regions of Type 6, and the highest stock of foreign population (2007) by absolute numbers in Type 1. There are considerable differences with respect to the origin of the foreign population, as well as in regard to the length of stay. In regions of the ESPON area, the stock of non-EU citizens is almost twice as high as the stock of EU27 migrants. The highest proportions of immigrants from other EU27 countries can be found in Type 1 and Type 3. Differentiated by the length of stay, Type 4 and Type 6 constitute "new demographic growth regions", as the majority of the foreign population immigrated during the last ten years. By contrast, about two thirds of the foreign population stocks of Type 1 and Type 3 is living in these kind of regions since ten years or longer.

Taking the share of tertiary educated people aged 15 years and over (by 2007) as an indicator for the human capital stock, this proportion is highest in Type 6 and Type 3, followed by Type 1. In regions of Type 5, the share of higher educated people is around the overall average, but not increasing in younger ages, as it does in all other types of regions. On average, the share of tertiary educated persons is lowest in regions of Type 2 and Type 4. With respect to the foreign population, the share of EU27 citizens with higher education is surpassing those of the national population, especially in Type 6, while non-EU citizens are in general less educated.

By far the highest unemployment rates (2007) can be observed in regions of Type 5, followed by Type 2 and Type 6, while the unemployment is below the overall average in Type 1, Type 3 and lowest in Type 4. In general, the unemployment rate of the national population and EU27 citizens is about equal, while the unemployment rate of non-EU citizens is almost twice as high. Long-term unemployment of one year and longer is prevalent in regions of Type 2 and Type 5, while the majority of all unemployed persons in Type 4 and Type 6 is jobless for less than six months. In regions of Type 1 and Type 3, the distribution of long-term and short-term unemployment is quite balanced. The labour force participation rate (2007) is highest in Type 1 and lowest in Type 2. All other types of regions feature participation rates close to the overall average. When differentiating the labour force participation by age, sex and origin, more pronounced distinctions are striking. The participation of the younger (15 to 24 years) and the older (55 to 64 years) is far below the average of all ages (15 to 64 years) and there is a considerable gender gap to the disadvantage of women, in fact at all ages and in all types of regions. Focussing on the foreign labour force, the participation rate of EU27 citizens is not only above those of non-EU citizens, but even higher than those of nationals. That proves to be true for all types of regions, except for Type 5 and Type 6. With respect to Type 5, the low share of foreign population might bias this result. However, the labour force participation of the foreign population of Type 6, be it EU27 citizens or non-EU citizens, is higher compared to those of the national working age population.

4 The impact of migration on population change

Key findings

- *Migration, both extra-Europe and intra-Europe, will have a significant impact on demographic and labour force development of regions.*
- *It will benefit affluent regions, whereas poor regions will lose population due to migration. Similarly, migration will reduce ageing in affluent regions and increase in poor ones.*
- *We may expect that migration will be a strong factor increasing regional disparities.*
- *Most regions experiencing population decrease do so mainly due to natural change. Most regions gaining populations do so mainly due to extra-Europe migration.*

4.1 Introduction

To assess the impact of migration on the population and labour force in the ESPON area in the period 2005-2050, we have calculated three reference scenarios. The first one (*Status Quo*) is a simulation of what would happen if the demographic regimes of mid-decade (2005) continued unchanged until 2050. In two other scenarios all or some migration streams are blocked: in the *No migration* scenario population of the regions changes due to births and deaths only, while in the *No-extra Europe migration* scenario it changes also due to internal and international intra ESPON space migration. A comparison of the results of the three simulations yields estimates of the impact of migration on population change. Deliverable 4 of the scientific report ('Multilevel scenario model') contains a description of the MULTIPOLES model used to prepare the projections. A more detailed analysis of the results can be found in Deliverable 5 'Reference scenarios'.

4.2 Long term consequences of existing demographic and labour market trends (*Status Quo* projection 2005-2050)

The *Status Quo* projection calculates the population and labour force under assumption that there would be no change in age, sex and region specific rates of fertility, mortality, emigration and labour force participation. Therefore, it shows the long term consequences of observed demographic and labour market patterns for future population and labour force size and structure. The overall ESPON population would reduce from 503,5 million in 2005 to 463,2 million in 2050, that is to 92 per cent of the initial population. On the regional level the differentiation is substantial: out of 287 regions, 119 (41 per cent) would experience a population increase and 168 – a decrease. An increase of population would take place in Iceland, Ireland, most of the UK, southern and western France, southern Spain, northern and central Italy, in selected (mostly southern) regions of the countries occupying the Scandinavian Peninsula and in Austria. Notably, not a single region in Central and Eastern Europe (new 8+2 EU member states) could expect a population increase. To the contrary: the highest decrease, by over 50 per cent, would be expected in all the regions of Romania, except Bucharest and its hinterland – the Sud Muntenia region. An over 50 per cent reduction in regional populations would also occur in northern Bulgaria, Opolskie and Śląskie regions in Poland and in Chemnitz (Germany). The *Status Quo* projection is not a forecast, however these results should ring alarm bells in these 11 regions as well as in 86 regions in which the population decrease would be within the range between 20 and 50 per cent.

The labour force would drop from 236,8 million in 2005 to 196,2 in 2050, that is to 83 per cent of the initial value. Regional labour force would increase in 76 (26 per cent) of regions and decrease in 211. An increase would be observed in Iceland, Ireland, Luxembourg, England, in France along the Bay of Biscay, Pyrenees and Mediterranean, in central and northern Italy, and in isolated regions of Spain, Sweden, Norway, the Netherlands, Belgium and Greece. More worrying are the regions with decreasing labour

force. In 23 regions labour resources would shrink by 50 per cent or more. These regions are: Latvia, most regions of Romania and Bulgaria (in the case of the two latter, all but the capital cities and their immediate hinterland, in which the labour force decrease would be significant but below the 50 per cent mark), regions in western part of the former East Germany and selected regions of Poland. Even if we put aside the extreme cases, the decrease in labour force would be almost universal in the part of Europe from the east of German western border down to the Adriatic coast and Black Sea. Also Portugal and northern Spain would expect a decrease in labour resources.

4.3 The impact of migration on population and labour force development and distribution

To better understand the processes of population change in individual countries and regions, it is important to look at the relative impact of natural change and the impact of various migration streams: extra-Europe migration, international migration within Europe and internal migration. This can be done in two ways. The first one is based on the analysis of the values of the components of population change. It shows that in most of the regions natural change of population (births minus deaths) has larger impact on population than migration flows. Still, in 115 regions (41 per cent) the opposite is true.

To take into account that migration has additional indirect impact by changing the natural increase and to isolate the role of different migration streams, we have compared the results of three reference scenarios. In 32 per cent of regions intra-Europe migration has a larger impact on population change than extra-Europe migration. This is true in particular in the regions of Bulgaria, Poland, Romania and Slovakia, where population decreases significantly through intra-Europe migration. In the majority of regions in Western Europe, extra-Europe migration is more significant than intra-Europe migration and is the factor that reduces population decline or even causes an increase. Generally, out of 119 regions that would experience an increase of population, 92 would do so mainly as the result of extra-Europe migration, 22 mainly due to intra-Europe migration and 5 due to natural change. Out of 168 regions which would lose population, a majority (149) would do so mainly because of natural change and 18 (including 11 regions in France) predominantly due to intra-Europe migration.

The overall impact of migration streams on regional populations is illustrated on Map 4, which presents the differences between 2050 populations in the *Status Quo* and *No Migration* scenario, scaled to the latter. Clearly a vast majority (over 75 per cent) of the regions are gainers. In 24 per cent of the regions, 2050 population would be higher by 30 per cent or more compared to the *No migration* scenario. In the EU-15 almost all regions, except those in north-eastern France, north-eastern Finland and in south-eastern former East Germany profit from migration. The most profound gains would take place in Italy south of Naples, some south-western regions of Spain, western France, all forming a broad Mediterranean crescent, and east and west England. They will be "financed" from three sources: extra-Europe migration, international intra-Europe migration and internal migration. The European regions which would pay for these gains are located in the East, especially in Romania and southern Poland. Internal migration also plays a role and would fuel for example the increase of Bucharest, Mazowsze and the hinterland of Prague.

Overall, the divide goes along the wealth and accessibility lines: affluent regions, including large agglomerations in Central and Eastern Europe would gain on migration whereas far away and poor regions would lose. Keeping in mind that migration is a powerful component of population dynamics, we should be aware of general consequences of migration, namely two interlinked processes: (i) regional and in some cases even national depopulation in areas most negatively affected by migration, and (ii) concentration of population in the regions offering a combination of accessibility, affluence and nice climate. Far going decrease of population cannot be isolated from

regional economic development. Therefore, migration as an important factor of depopulation, may lead to an increase in regional disparities.

The impact of migration goes beyond the simple increase or decrease of population. It affects the age structures of populations and the labour force resources. As most migrants are in the young adult age group, their emigration raises the very old age dependency ratio (VODR; defined as the population at the age 75+ to total economically active population aged 15+), as it reduces the number of economically active persons. At the same time, in the regions attracting migrants newcomers increase younger and more economically active population, reducing the proportion of very old. There will be no surprise that the patterns of decrease and increase of VODR as the result of migration (Map 5) resembles strongly the pattern of migration induced population gains and losses, respectively. 71 per cent of European regions would experience lower VODR because of migration, 35 of them by more than 30 per cent.

One of the hot topics in research and in public debate is the assessment of the impact extra-European migration on population development in Europe. First observation based on the model results is that most of European regions gain population due to extra-European migration. This is not the case in 11 per cent of regions, mostly located in the EU10+2, especially the Czech Republic, Romania and Bulgaria. In some regions, especially in Italy, but also in Algarve and Inner London, extra-European migration would generate populations larger by over 40 per cent than in the scenario with no extra-Europe migration. Extra-European migration would also substantially reduce the value of the old-age dependency ratios (ODR; the indicator defined as the ratio of population aged 65 and more to population in the age group 15-64 years) in all European regions. In some Italian and Spanish regions this reduction exceeds 40 per cent.

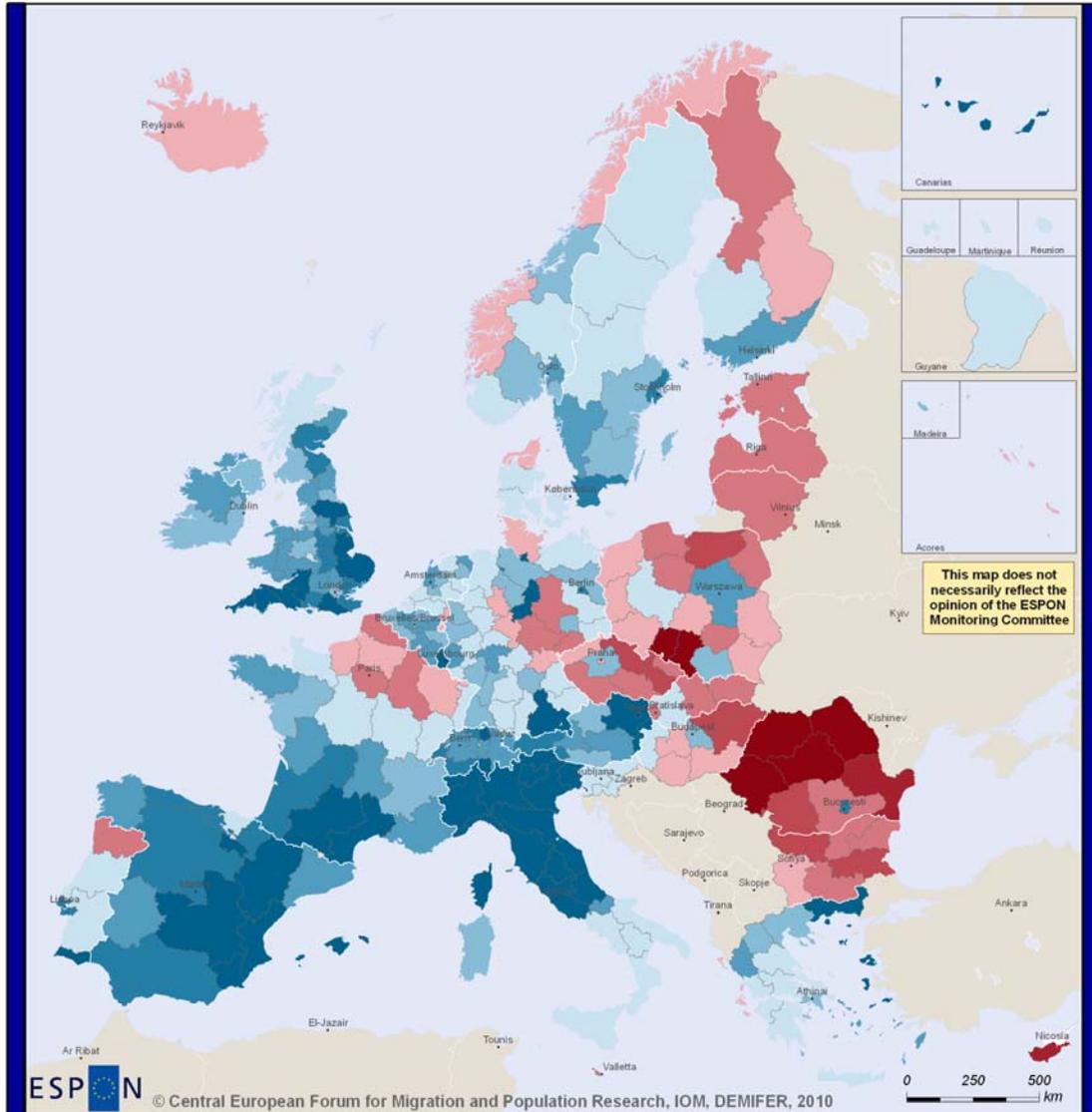
Extra-European migration enhances regional labour forces in 90 per cent of investigated regions. In 43 regions (15 per cent) the differences between labour force in the *Status Quo* and *No Extra-Europe migration* simulations exceed 30 per cent. However in the Baltic States, Cyprus and regions in the Czech Republic, Romania and Bulgaria extra-Europe migration would lower the labour force, however, the reduction is moderate in most cases. In all European regions, the labour market dependency ratios (LMDR; defined as the ratio of the whole economically inactive population to the whole active population) will be smaller due to extra-Europe migration. In Austria and Switzerland and a large part of the UK and Italy the difference would be within the 10 to 20 percent bracket, therefore very significant. The difference would be smaller in the rest of Europe, especially Central and Eastern Europe. Therefore extra-European migration would have a beneficial, albeit unequal impact on the balance between the labour force and economically inactive population.

4.4 Conclusions

In general our research shows that migration, both extra-European and migration in general, would have a significant impact on demographic and labour force development of regions. Importantly, it would benefit most affluent regions, whereas poor regions would loose population due to migration. Similarly, migration would reduce ageing in affluent regions and increase in poor ones. Therefore we may expect that migration would be a strong factor increasing regional disparities. This is the aspect of regional policies which is not disputed much yet, but perhaps quite crucial for future regional developments. The only way to prevent the growth of regional disparities is to stimulate policies reducing incentives to emigrate from poor to wealthy regions and policies allowing poor regions to attract more extra-European migrants.

Map 4 Impact of migration on population in 2050

Impact of Migration on Population in 2050



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Impact of Migration on Population in 2050, Difference in Population in %

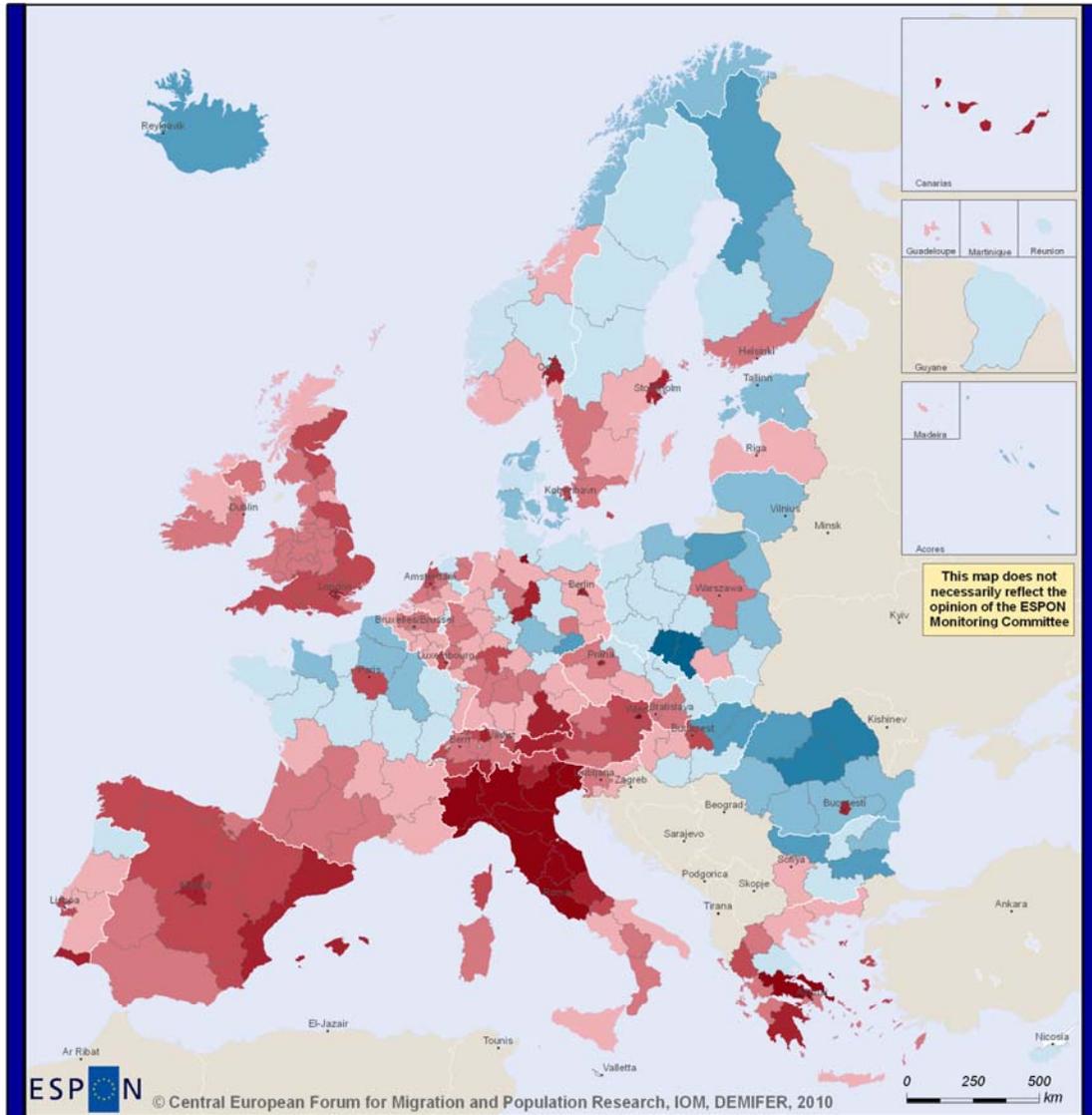
Dark Red	-60.0 – -40.0	(7)
Red	-40.0 – -30.0	(2)
Light Red	-30.0 – -20.0	(8)
Light Red	-20.0 – -10.0	(26)
Light Red	-10.0 – 0.0	(28)
Light Blue	0.0 – 10.0	(63)
Light Blue	10.0 – 20.0	(42)
Light Blue	20.0 – 30.0	(43)
Light Blue	30.0 – 40.0	(24)
Dark Blue	40.0 – 107.0	(44)
White	no data	

Regional level: NUTS 2
 Source: ESPON 2013 Database, 2010
 Origin of data: Eurostat, NSIs, Estimations, 2010
 © EuroGeographics Association for administrative boundaries

Impact of migration on population in 2050,
 calculated as the difference in population
 in the Status Quo and No Migration
 scenarios in % of the population in the
 No Migration scenario

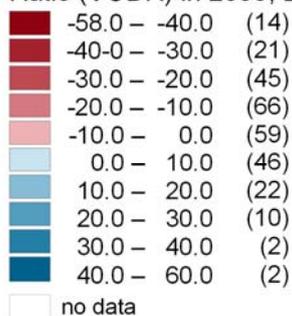
Map 5 Impact of migration on Very Old Age Dependency Ratio (VODR) in 2050

Impact of Migration on VODR in 2050



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Impact of Migration on Very Old Age Dependency Ratio (VODR) in 2050, Difference in VODR in %



Regional level: NUTS 2
 Source: ESPON 2013 Database, 2010
 Origin of data: Eurostat, NSIs, Estimations, 2010
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Impact of migration on Very Old Age Dependency Ratio (VODR) in 2050, calculated as a difference in VODR between the Status Quo and No Migration scenarios in % of VODR in the No Migration scenario

5 Two dimensions of policy scenarios: the “Economy-Environment” and “Distribution-Fairness”

Key findings

- *Migration between ESPON states will increase in most scenarios.*
- *Although there are policies oriented at stimulating weaker regions, there are hardly any policies oriented at stimulating migration to other regions.*
- *High economic growth and free entry policies will lead to high extra-Europe migration.*

There is substantial evidence that adoption of specific policies can have short-term impacts on particular components of demographic change. Examples include investment in medical and health research which yields over time better treatments and preventive therapies and hence continuing increases in longevity. However, the impact of such advances is modified by socio-economic variables such as degree of poverty and degree of inequality. Poorer people benefit later than richer people from health policies and differences between countries and within countries between regions persist because of international and intra-national inequalities. There is no way of being precise about the impacts of a given set of policies on demographic behaviour. History provides a number of natural experiments in the impact of policies but these are specific to time and place. Nevertheless it is useful to put in place scenario studies that reveal the choices that European societies face. In DEMIFER, four policy scenarios of demographic development have been compiled.

5.1 The four DEMIFER policy scenarios of demographic development

The DEMIFER policy scenarios link policy bundles to demographic effects using two axes of policy variation: a Distribution-Fairness dichotomous axis and an Economy-Environment dichotomous axis. At the top end of the Economy-Environment dimension we envisage a situation where sustainable growth has been achieved through technical and social innovation. Problems posed by environmental challenges such as climate change and “the end of oil” have been solved through a combination of renewable technologies and resource conservation made possible by technological breakthroughs and governmental planning. At the bottom end of the Economy-Environment dimension we envisage a situation where the environmental challenges have not been met and growth as traditionally measured has fallen. Consumption has been cut back because climate change has affected production and because hydrocarbon depletion has occurred with resulting increases in energy prices. A simpler world with many features of the past is a consequence.

On the left hand side of the Distribution-Fairness dimension we imagine in operation a bundle of policies designed to achieve social solidarity. There is societal agreement that the difference between the poorest and richest people should be only moderate. Public expenditure policies include strong elements that favour more deprived places (countries and regions). Policies aim to reduce inequalities and the achievement of greater equality raises overall welfare of all (Wilkinson and Pickett, 2009). On the right hand side of the Distribution-Fairness dimension we imagine in operation sets of policies designed to improve the operation of markets and the achievement of greater competitiveness in a global market place.

Crossing the two axes produces four Policy Scenarios (see Figure 2), which we call Growing Social Europe (GSE), Expanding Market Europe (EME), Limited Social Europe (LSE) and Challenged Market Europe (CME).

Figure 2 The four DEMIFER scenarios based on the dimensions “economy-environment” and “distribution-fairness”

ECONOMY-ENVIRONMENT	Growth enabled by technical and social innovation	GROWING SOCIAL EUROPE High Growth/Collectivism GSE	EXPANDING MARKET EUROPE High Growth/Individualism EME
	Growth limited by environmental constraints	LIMITED SOCIAL EUROPE Low Growth/Collectivism LSE	CHALLENGED MARKET EUROPE Low Growth/Individualism CME
		Collectivism	Individualism
		DISTRIBUTION-FAIRNESS	

Each of these scenarios is associated with a set of policies that we may expect to impact, to a greater or lesser degree, future patterns of mortality, fertility, migration and labour force participation.

5.2 Future paths of mortality

With respect to mortality most societies are agreed that living longer is “a good thing” that should be strived for. Preventing premature death (before a “respectable” old age) is the goal of much health sector policy and the by-product of various social and economic policies. In Table 2 we set out the factors affecting health.

Table 2 Qualitative aspects of mortality scenarios

Mortality: Trend or Policy	GSE	EME	LSE	CME
Lifestyle: Smoking	Prevalence falls	Trend continues	Prevalence falls	Trend continues
Lifestyle: Diet/Obesity	No epidemic	No epidemic	Epidemic	Epidemic
Lifestyle: Drinking & Drug Use	Prevalence falls	Trend continues	Prevalence falls	Trend continues
Medical advances	High	High-medium	Medium-low	Low
National/Regional Health Inequalities	Strong convergence	Strong divergence	Convergence	Divergence

The first three rows of the table list the life style health risks for developed country populations. Smoking is still the underlying cause of most cancers of the lung, throat and oesophagus but also implicated in other cancers and in cardio-vascular disease (heart attacks and strokes). Since the links between smoking and lung cancer were established, national health departments have run campaigns to persuade smokers to give up smoking and non-smokers not to start and national Parliaments have increased taxes on tobacco and steadily restricted the places where smoking can be carried out. A life style factor which is increasing rapidly in its prevalence is obesity. Obesity increases the risk of a number of diseases, particularly diabetes leading to premature mortality. A third life style factor which increases mortality is excessive consumption of alcohol and use of addictive drugs. Alcohol is a main cause of liver disease and a contributor to many others. Drug abuse causes mental trauma and addiction leads to rapid downward mobility, which is associated with higher mortality. All three life style factors are linked to social class and cultural attitudes which vary across countries in Europe and across regions within countries. Apart from life style factors, medical advances have been crucial to achieving decreases in age specific mortality in the past century, although societies should not take for granted continued efficacy of particular treatments (e.g. antibiotics) or listen to false claims about vaccines (e.g. about the Mumps-Rubella-Whooping Cough vaccine).

Table 2 also contains a qualitative judgement about what the trends in these factors would look like under the four policy scenarios. In the two high growth scenarios (GSE and EME) medical advances will be higher than in the other two scenarios. In the two cohesion scenarios (GSE and LME) national and regional health inequalities will decline, in the other two scenarios there will be a diverging trend. As a consequence it is expected that in the GSE scenario the decline in mortality will be large and regional differences will decline. In the EME scenario mortality will decline strongly in some regions, but not in others, so disparities will increase. The CME scenario will both have an only moderate decline in mortality and growing differences.

5.3 Future paths of fertility

National population growth is to a large extent dependent on trends in fertility, although in recent decades international migration has become ever more important. In order to sustain a population it is necessary that women give birth to just over 2 children. In current days this level is hardly attained in any European country. In fact, in several countries the average number of children per woman is far below 1.5 children. Notwithstanding this low level of fertility governments are much more reserved with policies stimulating fertility, compared to policies trying to curtail mortality. Table 3 describes the factors affecting fertility in each of the four scenarios. The first factor refers to the balance between family goals (for instance getting children) and individual goals (such as striving for a professional career). The second factor refers to family friendly policies like financial support of child care facilities, financial allowances and/or tax reductions for families with children or special regulations to promote flexible working hours or part-time work. Another way of raising fertility is to assist couples with fertility problems. Abortion laws may also have a profound influence on the level of fertility. Finally, migration from countries with high levels of fertility may contribute to raise fertility in host countries. Especially national inequalities in fertility are impressive, but also regional inequalities within countries do exist. To a large part these inequalities can be explained by differences in welfare.

Table 3 Qualitative aspects of fertility scenarios

Fertility: Trend or Policy	GSE	EME	LSE	CME
Family versus Individual Goals	Family goals, small positive impact	Individual goals, no impact	Family goals, no impact	Individual goals, strong negative impact
Family Friendly Policies	Strong positive impact	Weak, no impact	Strong positive impact	Weak, no impact
Assisted Conception	Socially supported, strong positive impact	Privately supported, small positive impact	Socially supported, small positive impact	Privately supported, no impact
Abortion Law	Permissive, small negative impact	Restrictive, small positive impact	Permissive, strong negative impact	Restrictive, no impact
Extra-Europe Migration	High, small positive impact	Low, no impact	Low, no impact	Low, no impact
National/Regional Fertility Inequalities	Strong convergence	Strong divergence	Convergence	Divergence

We expect that in the GSE and LSE scenarios family friendly policies will have a strong positive impact on the level of fertility. Moreover assisting couples with fertility problems may raise the level of fertility, especially in the GSE scenario. In addition we expect that in the GSE scenarios family goals will prevail over individual goals. As a consequence the level of fertility is expected to be high in the GSE scenario. We expect that the national and regional fertility inequalities will be reduced in the two solidarity scenarios and will increase in the two market scenarios.

5.4 Future paths of inter-region migration

In several countries regional trends in population growth are clearly divergent: mostly central region are still growing, while peripheral regions are shrinking or have hardly any population growth. This disparity might be explained by the fact that capital cities are generally located in central regions. Especially, many internal migrants move from peripheral regions to central regions. To a large part, it concerns youngsters moving to the central cities, which have universities and institutions for higher education in combination with an abundance of jobs for starters on the labour market. Notwithstanding these divergent patterns, hardly any political actions are oriented at stimulating migration to other regions within a country. Although policies oriented at influencing internal migrants are in general weak, this does not apply to policies oriented at stimulating weaker regions.

Internal migration is positively related to economic growth. On the one hand, a higher income leads to more housing consumption and a higher level of residential mobility; on the other hand, high economic growth increases job mobility and hence job-related migration. The DEMIFER scenarios on internal migration are driven by adjustments to the relative attractiveness of individual destinations. The GSE and LSE scenarios assume greater cohesion between regions and a convergence in the relative attractiveness of individual NUTS2 regions as migrant destinations. Different scales of cohesion and convergence are reflected. The EME and CME scenarios assume the opposite, with expanding market economies leading to less cohesion between regions and greater divergence in the relative attractiveness.

5.5 Future paths of inter-state migration

Ever since the start of the Schengen agreement people have the right to migrate between the countries of the ESPON space (except Romania and Bulgaria) without many rules and regulations. This leads to large numbers of inter-country migrants. Regarding inter-state migration in the ESPON area, no need was signalled to stimulate permanent out-migration, although out-migration of (PhD) students is generally encouraged. More political measures are expected on the attraction of skilled labour. These policies could be enhanced as a result of the ongoing globalization and competition between countries. A stronger tendency was expected of political measures directed at the improvement of living and working conditions for immigrants. Immigration was seen as a powerful instrument to counteract declining populations.

For the DEMIFER scenarios on inter-state migration, four driving forces are identified (see Table 4): the total level of migration, inter-state out-migration, inter-state in-migration and inter-state migration policies.

Table 4 Qualitative aspects of scenarios for inter-state migration

Inter-State migration: Trend or Policy	GSE	EME	LSE	CME
Total Level of Inter-State Migration	Moderate increase	High increase	Moderate decrease	Low increase
Origins: Inter-State Out-Migration	Convergent	Divergent	Convergent	Divergent
Destinations: Inter-State In-Migrations	Convergent	Divergent	Convergent	Divergent
Explicit Inter-State Migration Policy	Some restrictions	Free migration	Some restrictions	Free migration

In three scenarios the level of inter-state migration is assumed to increase, while only in the LSE scenario a moderate decrease is expected. As convergence and divergence trends in out-migration and in-migration are often highly correlated, origin and destination assumptions are treated similarly. In the GSE and LSE scenarios converging inter-state patterns are assumed, while the EME and CME scenarios assume diverging patterns. In the final step the inter-country out-migration flows are distributed over the regions. This distribution is considered constant. The final factor refers to inter-state migration policy. Under the GSE and LSE scenario cohesion policy will aim for more equal regional developments and therefore some impact of policies is expected, mainly related to measures concerning the duration of stay of migrants. For example, labour migrants

are assumed to be allowed in another country for a certain period of time only. In the EME and CME scenario competitiveness will lead to free movement in the sense of absolutely no restrictions. People may live in other countries, work in different areas and move across Europe whenever and where-ever they like.

5.6 Future paths of extra-Europe migration

The final component of migration refers to extra-Europe migration, i.e. migration from outside the ESPON area to NUTS2 regions inside the ESPON space. In the last decades the population growth in several Western countries has become more or less dependent on the influx of foreign migrants. In view of the growing importance of immigration for the population growth of countries it is no surprise that politicians give much attention to stimulating or discouraging extra-Europe migration. Also many political actions are developed on specific topics such as origin of migrants, type of migrants and duration of stay. The focus of policies trying to influence immigration is apparent in all regions of the ESPON space.

For extra-Europe migration similar forces are identified as for inter-state migration (see Table 5). In the EME scenario we expect high extra-Europe migration due to high economic growth and policies aiming at free entry. Differences across European countries will increase. In the GSE scenario economic growth is high as well, but migration policies allow selective entry only. Thus immigration will be moderate. The LSE scenario has low migration from outside Europe due to low economic growth and restrictive immigration policies. In the CME scenario economic growth is low as well, but there immigration policies are less restrictive than in the LSE scenario, and thus we expect somewhat higher immigration.

Table 5 Qualitative aspects of scenarios for extra-Europe migration

Extra-Europe migration: Trend or Policy	GSE	EME	LSE	CME
Total Level of Extra-Europe Migration	Moderate	High	Low	Moderate
Origins: Emigration	Stable origins	Divergent Origins	Stable origins	Divergent Origins
Destinations: Immigrations	Stable Destinations	Divergent Destinations	Stable Destinations	Divergent Destinations
Explicit Extra-Europe Migration Policy	Selective entry	Free entry	Restricted entry	Moderate entry

5.7 Future paths of labour force participation

In the second half of the previous century impressive changes in labour force participation were witnessed. Since 1960 all over Europe male labour force participation has been decreasing while female participation has been on the increase. Up to 1980 the decrease of male participation was much larger than the increase in female participation, while after 1980 female increase surpassed male decrease. At older ages (above 50 years) in many countries a steep fall in labour force participation was witnessed, due to the trend of early retirement. Especially in periods of rising unemployment, policy was oriented at stimulating employees to leave the labour force at early ages. Lately, this trend has been reversed in several countries, due to the rising costs related to population ageing. At younger ages contrasting trends in labour force participation applied. Prolonged educational careers had a negative effect on labour force participation. However, the increased tendency to combine education with having (a small) job had a positive effect on labour force participation.

In most countries the labour force has been growing in the past. A growing population in combination with rising labour force participation rates contributed to this growth. Nowadays, the inclination of politicians to raise labour force participation is rather prominent. This active attitude concerns not only labour force participation in general,

but also participation of several groups which used to have a rather weak position on the labour market, such as women (in the phase of raising children), youngsters (combining education with small jobs), and elderly people (to counteract the negative effects of ageing). The interest of policy goes even further and extends to issues such as the discourse on working fulltime or part-time, or being self employed, increasing labour productivity and the level of investments in the education system.

How labour force participation will develop in the future, depends on trends in the determinants of labour force participation (see Table 6). In the GSW and EME scenarios high economic growth will result in high labour demand and this will result in increases in labour force participation rates. The opposite applies to the LSE and CME scenarios. I

Table 6 Qualitative aspects of scenarios for labour force participation

Labour force participation: Trend or Policy	GSE	EME	LSE	CME
Trends in Participation	Increasing	Increasing	Decreasing	Decreasing
Participation of young persons	Increasing	Increasing	Decreasing	Decreasing
Female Participation	Friendly policies	Unfriendly policies	Friendly policies	Unfriendly policies
Participation of elderly persons	Favourable	Stressful	Favourable	Stressful
Full Time/Part time/ Self Employed	High participation	High participation	Moderate participation	Low participation
National/Regional participation Inequalities	Reduced	Increased	Persistent	Increased

5.8 The linkage of scenarios to demographic futures

How do we move from the qualitative scenarios to quantitative assumptions? For mortality we computed Standardised Mortality Ratios (SMRs) for a region by dividing the total deaths in a region by the sum of the European standard age-specific death rates (ASDRs) multiplied by the estimated regional populations. We modify the dispersion of regional SMRs across Europe to reflect the trend built into the scenarios. Age sex-profiles therefore shift in two ways: first through variation across scenarios in the assumed Europe wide decline rate and second through the assumed degree of convergence or divergence in the inter-regional variation. Values below one refer to converging patterns and values above one to diverging trends. Assumptions on fertility are expressed in terms of Total Fertility Rates (TFRs). Scenarios on inter-region migration are driven by adjustments to the relative attractiveness of individual destinations. The attractiveness is measured using a destination attractiveness ratio (DAR) which is calculated as the share of the migration flow divided by the share of the population. The base period DAR value for each region is modified over the projection period leading to greater convergence or divergence in country-wide DAR values. The scenarios only modify the range of the values, not the scale. For inter-state migration, sex and region-specific multipliers were calculated leading to increasing or decreasing numbers of migrants. Extra-Europe migration is expressed in net immigration numbers.

6 Regional population dynamics

Key findings

- *While under the Status Quo scenario the population of Europe declines by 40 million persons over the next 45 years, under the four policy scenarios the total population remains steady or increases; several regions however will be confronted with population decline*
- *The regional pattern of future population resembles the status quo pattern; the policy scenarios however shift the regions across the growth classification to a lesser or greater extent from their status quo position*
- *Population ageing remains the most important demographic challenge and may be greater than hitherto appreciated*

In this chapter we bring together the results of the policy scenarios as regards the regional population dynamics. To measure the impact of the policy bundles behind the four scenarios, the results of the Status Quo scenario have been used as benchmark. First we examine the changes in the total population, then we turn to population redistribution using density and income gradients and finally we turn our attention to the ageing of Europe.

6.1 Total population change

Under the Status Quo scenario the population of Europe declines by 40 million over the 45 years. In all of the policy scenarios the population remains steady or increases, even for the LSE and CME scenarios under which fertility remains low and immigration from the rest of the world moderate. The difference is explained by the lives saved as a result of lower mortality over the forty five years. So Europe is likely to see 40 million extra old people by mid-century provided that health services do not collapse.

In terms of total population the main difference within the policy scenarios is between the “successful” and “unsuccessful” scenarios. Within each pair the social versus market orientation of policy appears not to make much difference. However, that is a product of our assumptions: what the projections do is to reveal the fuller implications of those assumptions. Natural increase is mildly positive in the GSE and EME projections but increasingly negative in the LSE and CME scenarios though not as negative as in the Status Quo scenario. The net migration is positive in all scenarios except for the CME where the European economy has become unattractive to immigrants and many have returned to their emerging country economies which are experiencing much better growth (the pattern of the last two decades). However, the EME and GSE assume much higher levels of immigration to supply the labour needs of successful Europe. Under the EME scenario the net immigration rises to circa 4.8 per thousand population. This level will require Europe to commit to be a world region that welcomes and integrates its immigrant population in a much more positive way than at present.

For the comparison of the scenarios at regional scale we focus on the change between the start and end years of the projection, 2005 and 2050, although we recognize that sometimes this may disguise intermediate behaviour where trends have ups and downs. Under the status quo scenario the majority of regions in Central and Eastern Europe as well as in Germany, northern France, Northern Scandinavia, Greece, southern Italy, north and west Spain and Portugal will lose population. Most of the rest of Western Europe will experience small population gains.

The patterns of future population change under the four policy scenarios resemble the status quo pattern. This is not surprising as their benchmark data inputs are closely aligned though not exactly the same. What each policy scenario does is to shift the

regions across the growth classification to a lesser or greater extent from their status quo position. Map 6 shows the percentage change between 2005 and 2050 in the projected population of each region for all four scenarios.

The EME scenario lifts regions most and sees most regions in Scandinavia, the British Isles, France, north and central Italy and south and east Spain in the top growth classes of more than 25 per cent. Most of the former Iron curtain regions are projected to lose population but in the capital city regions of Warsaw, Prague, Budapest and Bucharest this loss is small. The regions of western Germany, parts of northern France and western Spain fall in the small (0 to -25 per cent) class. The GSE map is a smoothing of the EME map with fewer regions in the top or bottom classes and thus represents a gain in terms of cohesion. In the CME scenario the majority of regions now show losses in population while the LSE scenario shrinks the variation so that there are fewer regions in the highest loss category (less than -50%).

6.2 Population redistribution using density and income gradients

To understand some of the implications of the shifts in population recorded in the scenario projections, it is useful to carry out a regional gradient analysis. Here we define two gradient variables: GDP per capita and population density. GDP per capita is a reasonable proxy for household and personal income while population density serves as a continuous measure of the urban/rural continuum. We sort the regions into quintiles on the basis of their income and density and aggregate the projected regional populations to quintile classes. The populations are then converted in percentage shares in 2005 and in 2050, by scenario.

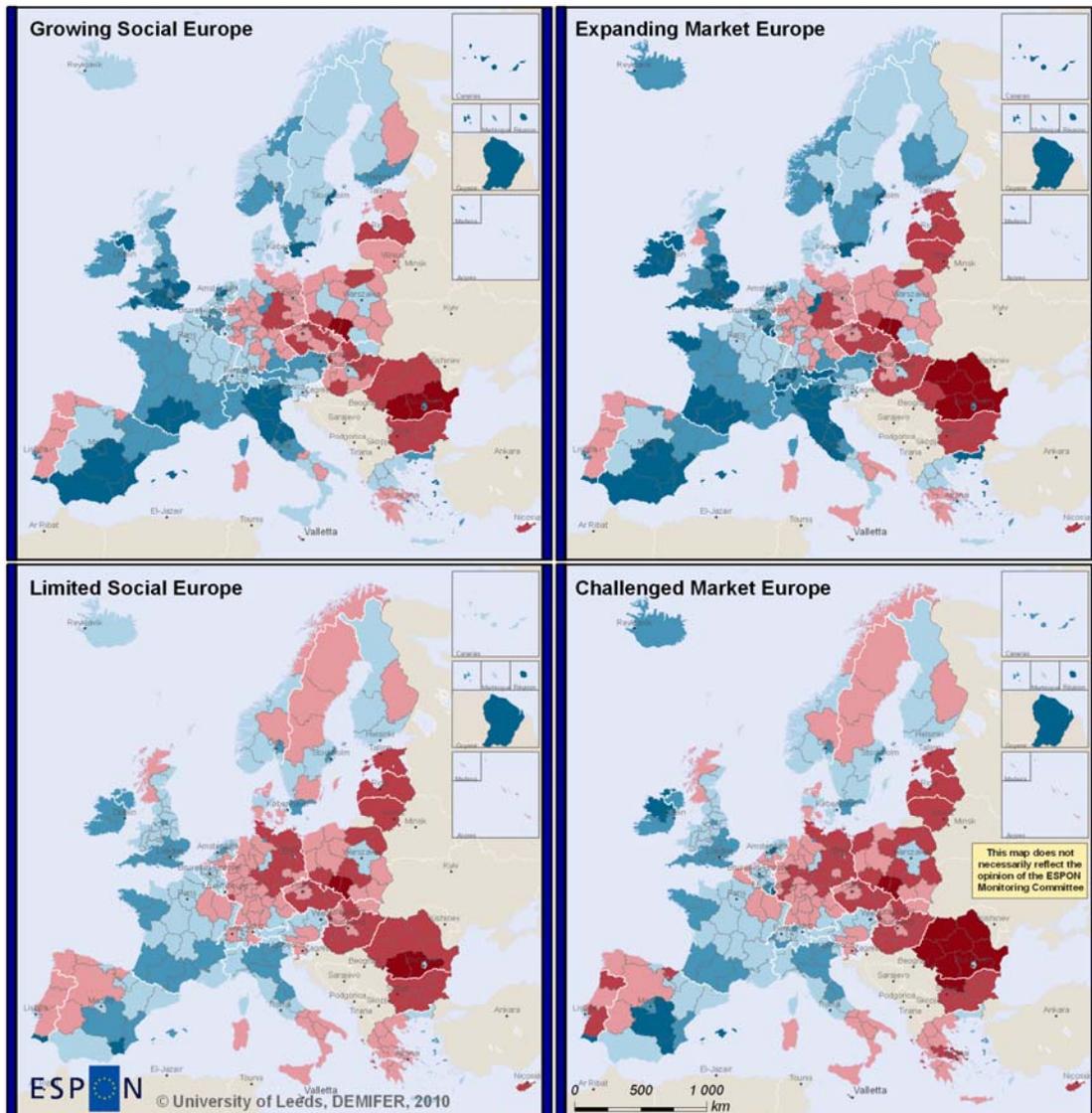
In 2005 the regional populations of Europe are concentrated in the higher density quintiles. This is simply a function of how the quintiles were defined. More interesting is the shifts by 2050 between the quintile classes (fixed at their definition in 2005). The changes are quite small and fairly uniform across density quintile. There are small falls in the lowest density quintiles (Q4 and Q5) and small gains in the highest density quintiles (Q1 and Q2). This indicates that, overall, the process of urbanization or per-urbanization continues.

The redistribution is much stronger when we use the income quintiles. The percentages in the lowest quintile nearly halve and those in the highest quintile increase by 8-9 per cent with smaller gains in Q2 and smaller losses in Q4. The scenarios project substantial redistribution of the population from the poorest to the richest areas.

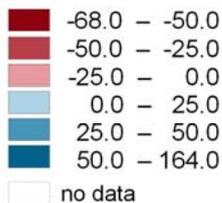
6.3 The ageing of Europe

The ageing of Europe's population is a longstanding process, which is a consequence of two demographic transitions: the first consisted of a mortality decline followed by fertility decline which reduced the populations of younger age groups and kept older age groups larger for longer. The second demographic transition took fertility rates in nearly all countries in Europe to new lows well below replacement total fertility rates (2.05-2.15 depending on female mortality regime). In between these transitions was a 1950s and 1960s baby boom which will precipitate "super-ageing" as the baby boomers move into the older ages from 2010 onwards. A third demographic transition is currently underway in which gaps in the populations and labour forces of Europe are being filled by new migrants, who are also contributing to natural increase as they form families.

Change in Population 2005-2050 - Scenarios



Change in population in 2005-2050, in % after DEMIFER Policy Scenarios



Regional level: NUTS 2
 Source: ESPON 2013 Database, 2010
 Origin of data: Eurostat, NSIs, Estimations, 2010
 © EuroGeographics Association for administrative boundaries

In northern Europe a small fertility rise has occurred in several countries driven by a catch-up among native-born women of postponed births and higher contributions by foreign-born women. We can expect to see the consequences of this fertility history playing out in various ways in our projections. In this section we examine the ageing projected by the status quo and policy scenarios.

For the description of the results, the population is divided into three age groups, which are conventionally used with projection models employing five year age groups: 0-14, 15-64 and 65+, designated somewhat approximately as the childhood, working and retired ages respectively. In fact, the age of exit from compulsory schooling is usually higher than 15 (16, 17 or 18 depending on country). Adolescents continue in school, further education or university until age 21 or 22 taking first level qualifications and then until 25, 26 or older if taking second level qualifications or doctoral degrees. Students at these ages also work part-time. The working ages in fact hold populations who are working full-time, part-time, seeking work or being economically inactive. The same fuzziness occurs at the boundary between working ages and retirement. Large numbers of men and women have retired well before age 65 under favourable pension and social security arrangements which governments, firms and individuals are recognizing as unviable.

The working age population shrinks between 2005 and 2050 in all scenarios except the EME and then grows only by 1 per cent. The populations aged 65+ by contrast expand by 87 to 111 per cent depending on policy scenario but only by 40 per cent in the Status Quo projection. The population of children expands a little under the GSE scenario and the EME scenario but falls considerably under the LSE and CME scenarios with their lower fertility assumptions. The age composition of Europe's population changes radically over the 45 years: the working age population shrinks from 67 per cent to 56 to 57 per cent depending on policy scenario whereas the 65+ population expands from 17 per cent to 29 to 32 per cent. There is little difference across the policy scenarios in the degree of ageing though collectively they exhibit additional ageing compared with the Status Quo scenario, mainly due to increase longevity. This degree of additional ageing in the projection horizon should be regarded as a triumph of human endeavour and social organization.

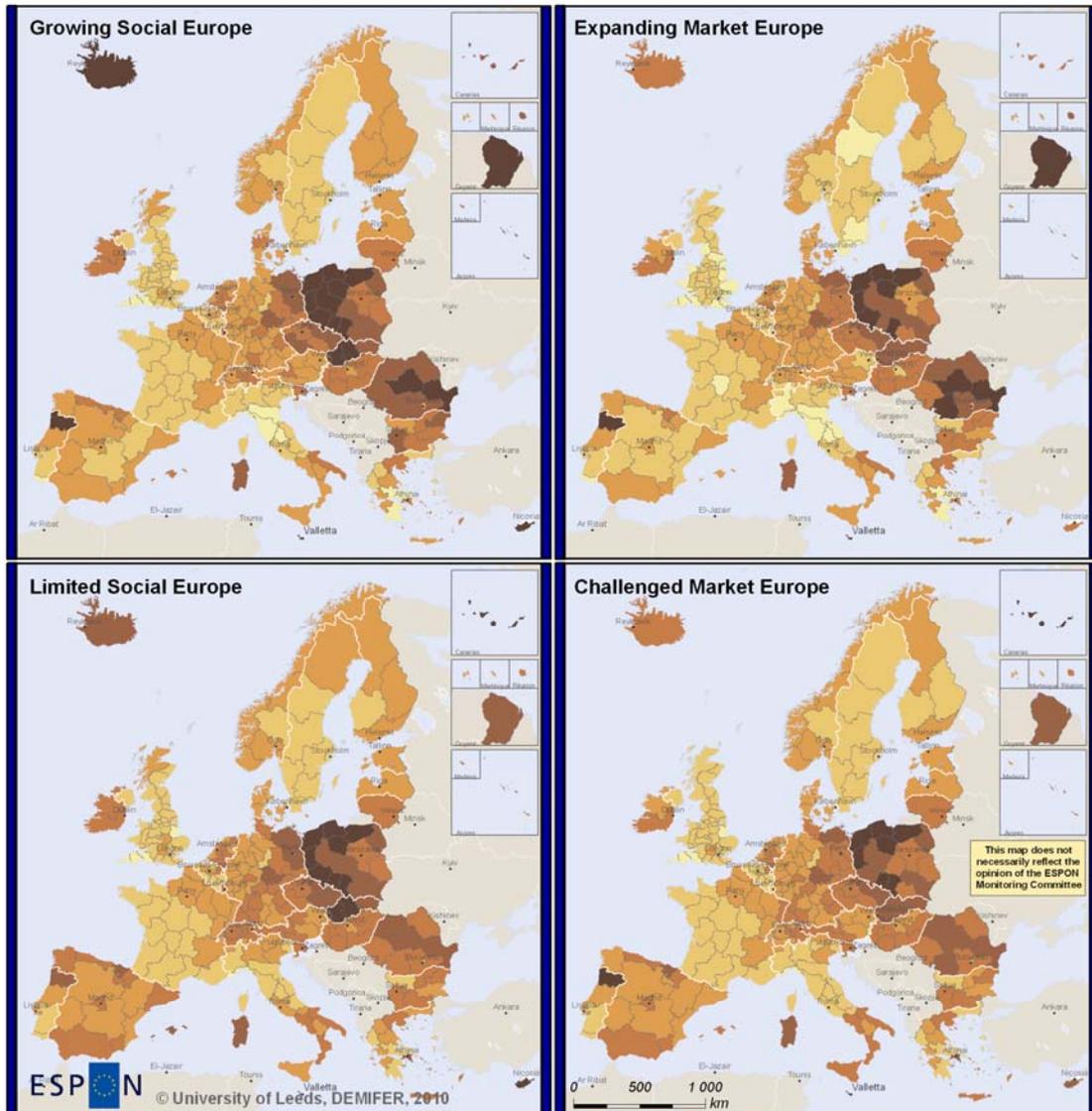
The old-age dependency ratios (defined as the ratio of population aged 65 and more to population in the age group 15-64, ODR) and the very old-age dependency ratios (defined as the population aged 75+ to total economically active population aged 15+, VODR) all rise steadily, as expected but slightly more in the social scenarios (GSE, LSE) than in the market scenarios (EME, CME) and much more than in the Status Quo scenario. The gap between the ODR and VODR is larger in the successful scenarios (GSE, EME) than in the unsuccessful scenarios (LSE, CME).

Looking at the regional variation of population ageing, the most hot spots of growth in working ages occur in the EME scenario in southern England, Ireland, north and central Italy and south central Spain with lesser growth in France, Austria, other regions in Spain, Austria and the southern populated parts of the Nordic countries (except Denmark). Regions in central and eastern Europe are projected to see declines in the working ages. These declines expand in extent as you move from EME scenario to GSE scenario to CME scenario to LSE scenario to Status Quo scenario.

On regional level all ODR (see Map 7) and VODR variables are positive indicating increases in the dependency ratios. The successful scenarios (GSE and EME) come with higher increases in ODRs and more differences between regions. Hot spots will be in central and eastern regions, where many regions face increases in ODR and VODR of 200 per cent. By mid-century this part of Europe will be a land of the old.

Map 7 Change in old age dependency 2005-2050 – four policy scenarios

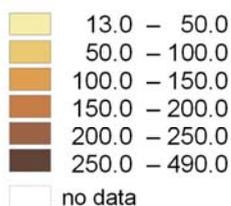
Change in Old Age Dependency 2005-2050 - Scenarios



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Change in old age dependency ratio in 2005-2050,
in % after DEMIFER Policy Scenarios

Regional level: NUTS 2
Source: ESPON 2013 Database, 2010
Origin of data: Eurostat, NSIs, Estimations, 2010
© EuroGeographics Association for administrative boundaries



7 Future trends in the labour force

Key findings

- *The age pattern of female labour force participation differs considerably across types of regions.*
- *Regional disparities in activity rates depend on economic developments.*
- *In the future a lot of regions will be struck by a shrinking labour force. The Limited Social Europe scenario sketches the most dramatic setback. Least dramatic is the setback in the Expanding Market Europe scenario.*

7.1 Introduction

The policy scenarios on labour force participation provide an array of possible territorial trends in the labour force in Europe based on different economic, environmental and policy hypotheses. Two of these scenarios are cohesion oriented and explore the effect of policies trying to diminish regional disparities in the labour force participation. However, the economic and environmental circumstances in which these policies have to operate are contrasting. The Growing Social Europe scenario operates in favourable economic and environmental settings while the Limited Social Europe scenario has to deal with scant economic and environmental prospects. The trends in the age specific activity rates are diverging: going up in the first scenario and going down in the latter. Due to these contrasting trends the policies on regional cohesion have more effect on the participation rates in the first scenario. The rising trend in the Growing Social Europe scenario allows economically weaker regions with low activity rates to catch up and approach the higher rates of the stronger regions. In the Limited Social Europe scenario the activity rates are falling everywhere, but the economic pain of the weaker region is eased by the fact that those regions get more support from governments in order to prevent a steep fall in the activity rates.

In the two other scenarios public policies are focused on competitiveness. The philosophy of the politics belonging to these scenarios is that the economic market has to do its work, so barriers which impede its functioning are being removed. This works fine for the economic stronger regions but not so much for the economic weaker regions. Notwithstanding a general and fierce rise in the activity rates due to a rather high economic growth, regional disparities are becoming larger in the Expanding Market Europe scenario as stronger regions show a higher rise. In the Challenged Market Europe scenario activity rates are falling due to a sustained economic downturn. Disparities are growing as weaker regions have to face a steeper fall in activity rates than the stronger regions.

7.2 ESPON space

In 2005 the labour force of the countries belonging to the ESPON space amounted nearly 240 million (Table 7). The prospects on growth of the labour force differ considerable between the four policy scenarios. Only in the Expanding Market Europe scenario a growing labour force is foreseen: about 20 per cent larger by 2050. This is solely due to higher activity rates as the population in the age bracket 15-65 will be stable up to 2050. According to the Growing Social Europe scenario, in spite of rising labour force participation rates the size of the labour force won't grow anymore in the future, as the positive effects of more participation are kept in check by a slight negative population growth. The two other policy scenarios sketch a future with a considerable shrinking labour force. In the Challenged Market Europe scenario the downfall is still limited to 10 per cent. As the age pattern of activity rates resemble the current pattern to a high degree, the decrease of the labour force is mainly caused by the shrinking population. In the Limited Social Europe the fall of the size of the labour force is impressive: a combination of falling activity rates and a negative population growth causes a decline of

20 per cent by 2050. This imposes a major financial issue as the pressure on the labour force to provide for the non working population will increase from 1.1 in 2005 to 1.7 in 2050. This increase of the so called dependency ratio, does not come as a great surprise as the demographic and economic conditions are not favourable in this scenario. However, also the flourishing economic circumstances depicted in the Expanding Market Scenario cannot prevent a huge rise of the dependency ratio, namely to 1.4 by 2050. In the other two scenarios the rise is in between that of the previous two scenarios. The main contributor to this rise is the grey pressure: in all scenarios the share of the elderly in the population will rise significantly and this will put a high pressure on the labour force. In case of the Limited Social Europe scenario the pressure is even aggravated through more people at prime working ages who keep out of the labour force because a severe lack of job have discouraged them to look for work.

Table 7 Labour force, ESPON space (x mln)

	2005	2050			
		Challenged Market Europe	Expanding Market Europe	Growing Social Europe	Limited Social Europe
Male	131	114	141	134	108
Female	106	87	112	108	80
Total	237	201	254	241	189

7.3 Countries

At the country level policies oriented at cohesion or competitiveness have a large impact on international trends in the labour force. Policies striving for cohesion in the degree of labour force participation work out different for males and females in the international context. In the Growing Social Europe scenario economic growth is high and ways have been found to cope with the risks of climate change leading to sustainable environmental conditions. Age specific activity rates are going to rise right down the line. For women, the gap between countries with a modern activity pattern and those with a traditional pattern will nearly be bridged. The traditional activity pattern is characterized by a peak in the age bracket 20-24 years, followed by falling participation rates at higher ages due to withdrawal of women from the labour market after marriage or childbirth. In contrast, the modern pattern is marked by high activity rates up to the age of 50, as having children has no effect on women's economic activity anymore. Especially in the southern countries, where the traditional pattern still dominates, this leads to rising activity rates in order to approach the activity rates of the northern countries, which have taken the lead in the modern pattern. For males international disparities in participation are mainly present at low and high ages. Again the northern countries stand out for their high participation rates. The combination of following education and having (small part-time) job leads to high activity at young ages. Males keep on working up to high ages; early retirement is more common in other parts of Europe. Again in the Growing Social Europe scenario international differences in participation will diminish in the future. The example set by northern countries, such as Denmark, will be followed by other countries across the whole ESPON territory, which implicates a move to retirement at higher ages and a higher inclination to combine education with paid work at young ages. Also in the Limited Social Europe scenario the policy strives for more international cohesion, but its efforts have less positive results due to the bleak economic growth everywhere. In the Expanding Market Scenario the political focus is on global and international competitiveness. Leading countries even strengthen their advantageous positions and the rise in labour participation will be not be met by that of the lagging countries. In the Challenged Market Europe scenario labour participation falls somewhat in line with an economic downturn. The leading countries try to consolidate their favourable positions, but that is not feasible for the weaker regions who will suffer a serious fall.

The international pattern of labour force growth deviates strongly between the four policy scenarios (see Table 8). In the Expanding Market Europe scenario about half of the countries will experience a growing labour force, while the other half will have to cope

with a shrinking labour force. In the other three scenarios most countries will be confronted with a more or less severe decreasing labour force. Especially in the Limited Social Europe scenario the prospects are quite dramatic. Almost all countries will face a declining labour force and in nearly half of the countries the decline will amount to almost 40 per cent. For women the negative trend is even more serious than for males in this scenario.

The trends in the labour force in relation to those in the population will have strong effect on the dependency ratio. In 2005 the international dependency ratios vary between well under 1 to almost 1.5. This interval is lifted in the Limited Social Europe scenario, running from 1.4 to 2.3 by 2050. The 'green pressure' (in order to provide for the population up to 15 years) is by then still roughly the same as in 2005. In contrast, the 'prime age pressure' (in order to provide for the non working part of the population in the age bracket 15 up 65 years) has increased in most countries. However, the largest contribution to the rising dependency ratio in the future is made by the eldest age group (above 65 years): the 'grey pressure' has more than doubled in most countries. In the Expanding Market Europe scenario the international dependency ratios are much lower, varying from 0.8 up to 1.9. In this scenario especially the prime age pressure is much lower. The rise of the grey pressure in the future is also in this scenario impressive.

Table 8 Labour force, countries (x mln)

	2005	2050					2005	2050			
		Challenged	Expanding	Growing	Limited			Challenged	Expanding	Growing	Limited
		Market	Market	Social	Social			Market	Market	Social	Social
	Europe	Europe	Europe	Europe		Europe	Europe	Europe	Europe		
AT	4.0	3.9	5.1	4.4	3.3	IT	24.4	24.0	33.4	32.2	21.5
BE	4.6	4.5	5.6	5.1	4.0	LI	0.0	0.0	0.0	0.0	0.0
BG	3.3	1.6	1.8	1.9	1.7	LT	1.6	0.9	1.0	1.0	0.9
CH	4.1	4.2	5.6	4.3	3.3	LU	0.2	0.3	0.4	0.2	0.2
CY	0.4	0.2	0.3	0.2	0.2	LV	1.1	0.5	0.6	0.7	0.6
CZ	5.1	2.9	3.2	3.3	2.9	MT	0.2	0.1	0.1	0.1	0.1
DE	40.4	26.9	33.4	32.3	25.9	NL	8.5	7.2	8.9	8.5	7.0
DK	2.9	2.5	3.1	2.8	2.4	NO	2.4	2.4	3.0	2.8	2.3
EE	0.7	0.4	0.4	0.4	0.4	PL	17.1	10.2	12.0	12.0	10.3
ES	20.5	19.5	26.0	24.0	17.3	PT	5.5	4.2	5.1	5.1	4.1
FI	2.6	2.4	2.9	2.7	2.3	RO	9.9	4.6	4.9	5.4	5.1
FR	28.0	27.7	33.0	32.6	27.0	SE	4.6	4.9	6.3	5.7	4.5
GR	4.8	3.6	4.7	4.6	3.5	SI	1.0	0.6	0.7	0.8	0.6
HU	4.2	2.4	2.8	3.0	2.6	SK	2.6	1.7	2.1	1.8	1.6
IE	2.0	2.6	3.1	2.5	2.1	UK	29.7	34.2	43.9	40.8	31.2
IS	0.2	0.2	0.2	0.2	0.2						

7.4 Clusters

In order to get a comprehensive picture of demographic and economic characteristics of regions, a typology has been developed. With respect to male participation the differences in the age patterns of activity rates between the distinguished 7 clusters are rather small. Only the Overseas cluster stands out for having substantial lower participation rates. In contrast, with respect to female participation important deviations between the clusters in the age pattern of activity rates are visible. Again the Overseas cluster is an outlier showing much lower participation rates, but also the age pattern of the Young Potential cluster is quite different. The age pattern of activity rates of the latter cluster has a rather old fashioned appearance, characterised by steep falling participation rates after childbirth. In both the Challenge of Ageing cluster and the Challenge of Transition cluster the activity rates at higher ages are significantly lower than in the Euro Standard cluster and the Challenge of Decline cluster. According to the Growing Social Europe scenario, in the future a strong regional convergence between the age patterns of the clusters will happen. This causes the traditional age pattern of the Young Potential cluster to be transformed into a modern age pattern, with no signs of falling activity rates after childbirth. In the Limited Social Europe this tendency to convergence is blocked by the meagre economic circumstances in spite of policies

oriented at regional cohesion. According to the two other scenarios with strong market tendencies, the cluster specific patterns of activity rates will not change significantly in the future. Policies oriented at regional competitiveness intervene with trends leading to more regional convergence.

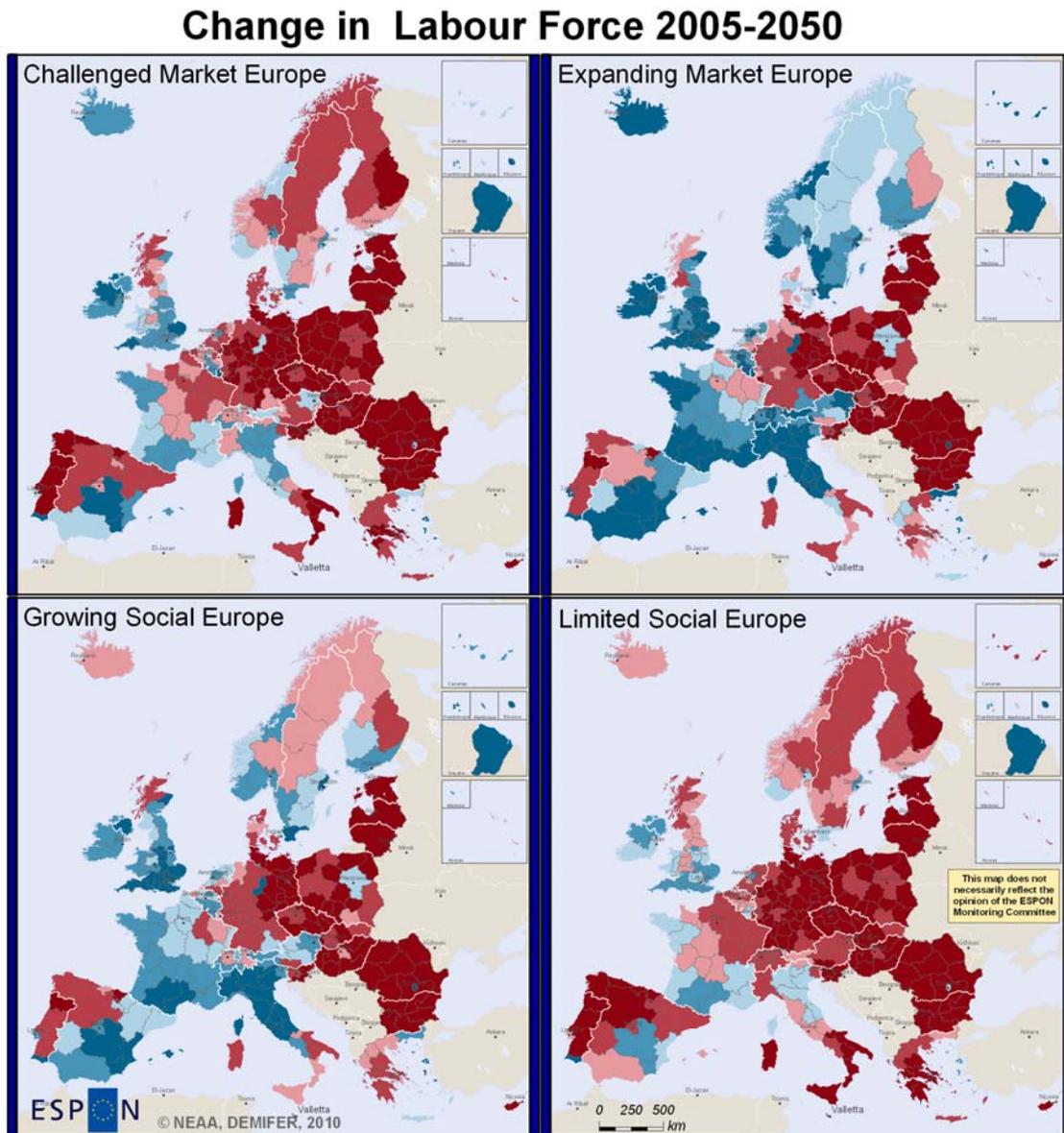
With respect to cluster trends in the growth of the labour force, the patterns of the Challenged Market Europe scenario and the Limited Social Europe scenario are more or less the same. The two clusters Challenge of Transition and Challenge of Decline will face a drastic downsizing of the labour force by 40 per cent between 2005 and 2050. In contrast, the Overseas cluster may expect a growth of 40 per cent. In the other two scenarios, the Expanding Market Europe and the Growing Social Europe scenario, the decline of the labour force in the two clusters Challenge of Transition and Challenge of Decline is considerably lower with about -30 per cent. The Overseas cluster may count on a huge growth of the labour force with 60 per cent. Also the clusters Young Potentials and Challenge of Ageing are heading for a considerable growing labour force. Also for the Family Potential cluster a respectable growth of the labour force is envisaged.

The disparity in the dependency ratios of the 7 clusters is very small in 2005. The only exception consists of the Overseas cluster with a much higher dependency ratio, namely 1.7 against round 1.1 for the other 6 clusters. Both the green pressure and the prime age pressure is considerably higher in the Overseas cluster, while the grey pressure is in line with that of the other clusters. In the future, according to all four scenarios the gap between the dependency ratio of the Overseas cluster and the other clusters is going to get much smaller, although its 'leading position' will remain. Notably in the Growing Social Europe scenario the Overseas cluster has no longer a significantly higher dependency ratio.

7.5 Regions

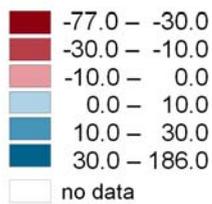
In the future a lot of regions will be struck by a shrinking labour force. Dependent on the specific policy scenario, the seriousness of the decline of the labour force will be less or more (see Map 8). In the Expanding Market Europe scenario a minority of the regions will be facing a declining labour force: only 35 per cent of the regions of the ESPON space will have a shrinking labour force (of more than 10 per cent) between 2005 and 2050. In the Growing Social Europe scenario this percentage is somewhat higher with 40 per cent. In the Challenged Market Europe scenario the percentage regions with a shrinking labour force is much higher with 55 per cent. The Limited Social Europe scenario sketches the most dramatic future with a large majority of the regions to be confronted with a setback: round 70 per cent of the regions will see the labour force decline with over 10 per cent. In this scenario most regions located in the eastern part of the ESPON space and a lot of regions in the southern part will suffer a decline of the labour force with more than 30 per cent. Also a lot of regions located in Germany and Austria will have to deal with such losses of labourers. In the Expanding Market Europe scenario a lot of regions located in the western and northern part of the ESPON territory will have a substantially growing labour force. The contrast with the eastern part is sharp, where a majority of the regions will have an enduring shrinking labour force. In the Growing Social Europe scenario the contrast between regions with a severe decline of the labour force and those with a steep growth is much smaller. This is due to the convergence assumption of this scenario, leading to more regional cohesion than in the Expanding Market Europe scenario (where a divergence assumption has been applied).

Map 8 Change in labour force between 2005 and 2050, according to different DEMIFER scenarios



EUROPEAN UNION
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Change in number of Persons in Labour Force
in 2005-2050, in % after Different DEMIFER
Scenarios



Regional level: NUTS 2
Source: ESPON 2013 Database, 2010
Origin of data: Eurostat, NSIs, Estimations, 2010
© EuroGeographics Association for administrative boundaries

8 The impact of climate change on migration

Key findings

- *Most climate driven migration will be regional rather than international in its impact as people most affected by climate change events are unlikely to have the means to move far*
- *The estimates of the number of global migrants caused by climate change are “guesstimates” at best and guesses at worst; the apparent consensus on a 200-250 million estimate is simply the result of repeating the UN figure*

It is anticipated that climate change will affect future demographic trends in various ways, the least in regards to morbidity, mortality and migration (Lutz, 2009). In DEMIFER however, we will focus on exploring the impact of climate change induced migration on the European population in the course of the next 40 years.

Migration in Europe could be affected in two ways by the impacts of climate change. First, people from areas affected within the European space might move into other regions of Europe. Second, people affected by climate change from outside the European region will migrate into Europe. To estimate additional climate change induced migration into Europe, we would need to have good estimates on how many people will be affected by climate change to that extent that they will leave their homes to find livelihood somewhere else and in a second step we would need to establish how many people will actually enter the European region for that reason.

8.1 Climate change within Europe

IPCC (2007) discusses the key challenges Europe will face from climate change: winter floods are likely to increase, sea-level rise will affect an additional 1.6 million people a year, differences in water availability between areas with water stress increasing over central and southern Europe with 35 per cent under water stress by the 2070s. Other features and threats of European climate change are given by EEA (2008). Temperature in Europe is predicted to increase between 1.0 and 5.5°C by the end of the century, higher than projected global warming. Droughts and water stress will increase, particularly in the south and in summer due lower river flows. Annual precipitation changes are already exacerbating differences between a wet northern part (an increase of 10 to 40 per cent during the 20th century) and a dry southern part (a decrease of up to 20 per cent in some parts of southern Europe). The report estimates that 90 per cent of all natural disasters that occurred in Europe since 1980 are directly or indirectly attributable to weather and climate, representing about 95 per cent of the economic losses caused by catastrophic events. The large number of additional deaths during the 2003 summer heat wave (more than 70 000 excess deaths reported in 12 European countries) pointed to the need for adaptation actions, such as heat health action plans.

The European Commission has funded important research on the ground where climate change impacts are being felt. EACH-FOR (2008) looks at common problems within some European countries such as water shortages and desertification. The researchers indicate the problems of climate change will lead to out migration from areas within European countries as temperature increases. In Spain and Portugal rises of 5 to 7 degrees Celsius are projected, making the Iberian Peninsula the most affected area in Europe. A case study of Turkey shows the effect of development projects on migrants. Some 28 villages and 48 hamlets affected by the building of the Ataturk Dam in central Turkey were given the choice of either compensation and self relocation or relocation by the state. Relocation occurred from the S.E. of Turkey and to the West of Turkey. The Ataturk dam also affected traditional agriculture that relied on groundwater leading to seasonal migration. Whether we can classify these events as a direct effect of climate change is

debatable, but they do illustrate that the displacement effects occurred within the country not to Europe.

Bogardi (2007) highlights key areas of vulnerability due to climate change. His world desertification map shows a high risk in Southern Spain and a moderate risk in Greece. Maps in the report show the vulnerability of areas to sea level rise with the coasts of the Netherlands, Denmark, northern Germany and the east coast of Britain likely to be affected by a sea level rise of 1m.

8.2 Climate change from outside Europe into the ESPON area

The Refugee Studies Centre (2008) has published a report entitled 'Forced Migration Review, Climate Change and Displacement'. The papers in the collection argue that climate and environmentally induced migration will become a key issue over the next century. Poverty, failing ecosystems, vulnerability to natural hazards and gradual climate-driven environmental changes are all linked to environmental migration. Warming will affect agricultural productivity, natural disaster such as floods will cause mass displacement and sea level rise will destroy productive low level lands leading to more mass displacement. The authors cite the UN prediction of 200 million migrants displaced by climate change and they identify the need to improve the predictions and to solve the problem of distinguishing the role of climate change from other environmental, economic and social factors. Climate change is likely to increase numbers that migrate to urban areas. The report highlights the need for a clearer definition of environmental migration. It is widely believed that the majority of people who flee natural disasters remain in their own country. There is the obvious need of humanitarian assistance but they do not fear persecution so cannot be termed refugees. The European Court of Human Rights ruled that governments must enact laws to mitigate the risks posed by climate change.

Warner et al. (2009) studied the extent to which climate change is already contributing to displacement and migration. Environmental, economic and political factors combine to force movements. Conflicts over resources such as water influence migration, particularly in the Sahel region. Disasters lead to shorter-term displacement and migration is a survival strategy. There is a need to understand the pattern of migration as both a fast process (in response to a climatic event such as a storm) and as a slow process of adaptation to a changing environment. Seasonal migration is already a key adaptive measure used in many countries affected. Climate change is likely to lead to long term migration when it affects whole livelihoods.

The report by Christian Aid (2007) on Human Tide: 'The Real Migration Crisis' estimates that 5 million people will flee their own countries and be accepted as refugees. Spread over 45 years and all continents suggest that the numbers likely to come to Europe will be small.

8.3 Responses to adapt to threats of climate change

Lutz (2009) discusses the contribution that demographic analysis can make to the understanding of the relationships between population and climate change. He highlights the need to strengthen human capacity through education which also reduces population growth and enhances economic growth. This is seen as the most promising investment for adaptation to climate change. He cites the WHO Report on Climate Change and Human Health: "In general, countries with more 'human capital' or knowledge have greater adaptive capacity. Illiteracy increases a population's vulnerability to many problems." Research has shown that changes in population growth, age structure and spatial distribution interact closely with the environment and with development. Rapid population growth has exacerbated freshwater depletion, climate change, biodiversity loss, depletion of fisheries and other coastal resources, and degradation of agricultural

lands. Fertility decline, driven in part by women's increasing participation in education at all levels, slows population growth.

The European Commission (2009) highlights two kinds of responses that are needed to adapt to the threat of climate change. The first is to reduce greenhouse gas emissions and the second is to adapt to unavoidable consequences of climate change. Increasing the resilience of Europe to climate change will involve investing in renewable technologies as part of the Economic Recovery Plan. The paper highlights the most vulnerable regions as Southern Europe and the Mediterranean basin, with coastal regions being most severely affected due to failing crops, lack of access to water resources and rising temperatures. The White Paper recommends action against climate change needs to be taken at local, national and regional levels but it requires support and integration for the EU to make a coordinated approach. In their 'Action against climate change' (European Commission, 2008) the Commission highlights particular pieces of EU legislation, such as the need to manage flood risks, to help mitigate the potential effects of climate change. The document stresses the need for action at all levels from individuals to councils to regional strategies in the EU itself. EU strategy should be based on solidarity for affected member states and other countries outside of the EU. The report highlights a range of consequences of climate change from effects on natural ecosystems to climate refugees citing predictions of 1 billion people migrating due to climate change by 2050. In its 'Foresight Land Use Futures Project' the UK Government Office for Science estimates that without any increased flood protection 800,000 homes will be at risk rather than the current 500,000.

8.4 A climate change and migration scenario design

Although the literature on the impact of climate change on migration is highly speculative and there are hardly any reliable statistics on past migration linked to climate change, it is worth finding out whether the impact of climate change on migration in the ESPON area is likely to be small or large. One way to do this is by integrating a climate factors analysis with one of the four DEMIFER policy scenarios.

The climate change and migration scenario will need two sets of building blocks: an environmental and a demographic. First you have to assume which climate change scenario design best describe the future you want to investigate. We suggest to adopt the B1 storyline of the IPCC (2007) Special Reports on Emission Scenarios (SRES) to describe the future we want to investigate: "The B1 storyline and scenario family describes a convergent world with the same global population that peaks in mid-century and declines thereafter with rapid changes in economic structures toward a service and information economy, with reductions in material intensity, and the introduction of clean and resource-efficient technologies. The emphasis is on global solutions to economic, social, and environmental sustainability, including improved equity, but without additional climate initiatives." Second, you have to choose or formulate a demographic scenario. In this case we suggest to use the demographic inputs of the Limited Social Europe scenario. We have chosen the LSE scenario as the other policy scenarios to more or lesser degree already account for extra migrants generated by climate change. In the next step the migration input for the LSE scenario will have to be modified to reflect the impact of climate change.

Given that it is widely believed that the majority of people who flee natural disasters remain in their own country, the incorporation of climate change induced migration into the scenario design could mainly focus on European internal migration. Note that you need to import knowledge about the trade off applied in the different countries between mitigation and migration. The Netherlands, for example, has a long history of engineering barriers to keep out both river and sea flood waters. Nearly 25 per cent of the country is already below sea level. On the other hand the UK Environment Agency plans to protect only the most valuable part of the UK's North Sea coast (the Thames Estuary and

London) and to let the processes of wave erosion and sea flooding work through, learning from the experience of King Canute.

A first approach could look into the three main climate change predictions which would affect inner European migration: sea level rise, increased temperature and increased storminess and river flooding. To identify areas which are predicted to be impacted by the IPPC (2007) SRES B1 scenario, a simple map overlay technique could be used. From the overlap analysis a set of scores can be generated indicating the impact of the three climate change factors. By exploring both the metrics for these scores and the ways of transforming them into indexes that alter both the propensity to out-migrate and the destination attractiveness ratios for the regions, you could model the climate induced migration by each of the three environmental factors. In the final step you could feed these values into a model that generates a new matrix of climate migrants by origin and destination for both the internal migration matrices and the inter-state matrix for Europe.

9 The DEMIFER case studies

Key findings

- *Areas with low population density attract in general less interregional and international immigrants.*
- *Low economic performance leads to an acceleration of population decline and demographic ageing.*
- *Internal migration flows play in most cases a minor role*
- *During the last decade international net migration is closely linked to the economic performance of the region: the economically most dynamic case study areas satisfied their labour force demand through immigration.*
- *Economic effects of the ageing of the population and the working age population are hardly felt in the economic well-off areas.*
- *Areas with a well performing research and development sector of the economy attract more international migrants. But the information available regarding the level of qualification and education of immigrants is scarce.*
- *Future trends: even if population ageing does not yet influence economic growth in the economically well-off case study regions, it is not certain that all regions can confront continuous ageing of the total and working age population.*
- *The results of the policy scenarios would create considerable challenges to the economic and social fabric: housing and integration of immigrants in the growing areas and adaptation to a shrinking population in the areas of population decline.*

9.1 Introduction

The case studies contribute to improve the knowledge on and the understanding of demographic and migratory flows at the regional and local level. They focus on internal and international migration as the component with stronger links to the regional socio-economic situation and dynamics. In addition in the case studies the output of the policy oriented activities of the DEMIFER project are translated into specific regional settings. The specific research questions and the specific aims of the case studies are:

- how are demographic and migratory flows affecting the entire case study area, its regional subdivisions and its cities?
- how do demographic change and migratory movements bring about population change – growth or decline –, population ageing and ageing of the working age population?
- what are the factors of attraction or the causes of interregional and international migration at the regional level?
- is information regarding the skill level of interregional, intra EU and international migrants available?
- what are the economic and social consequences of migratory flows in the case study area, or, more in general, what are the links between 'demography' and 'economy' in the case study areas?

The focus of the case studies is on the description of the socio-demographic structure, demographic and interregional and international migratory processes and their economic and social consequences. The sustainability of the demographic system and the migration process – migration gains and migration losses - at the sub-regional level are considered in all case studies. The interdependence in the urban areas and between the urban areas and their hinterland is highlighted.

9.2 Existing literature

In each case study report a concise review of the existing literature dealing with population, migration and its interrelation with economic and social change in the case study region is included. Regional demographic structure and change are obviously important characteristics of a region. However their impact on the economic and social situation is not straight forward, but depends on the regional situation. Among the most discussed aspects are the ageing of the population and the working age population. Many studies seem to indicate a strong link between the economy and interregional and international immigration, setting in motion a virtuous circle of creating a less older and often more qualified working age population.

9.3 The selection of the case studies

The selection of the 12 case studies is based on the results of the DEMIFER regional typology of demographic status. From each of the types defined, with the exception of the type 'Overseas', at least one NUTS2 region or a combination of NUTS2 regions was selected. To be representative the case studies were selected from the NUTS2 regions closest to the centre of the respective typology. A total of 12 case studies were selected to cover the diversity of European regions regarding the demographic and migratory flows. Obviously the case studies cannot cover the entire socio-economic diversity of the European regions, since the regional types of demographic status are not homogeneous regarding socio-economic situation.

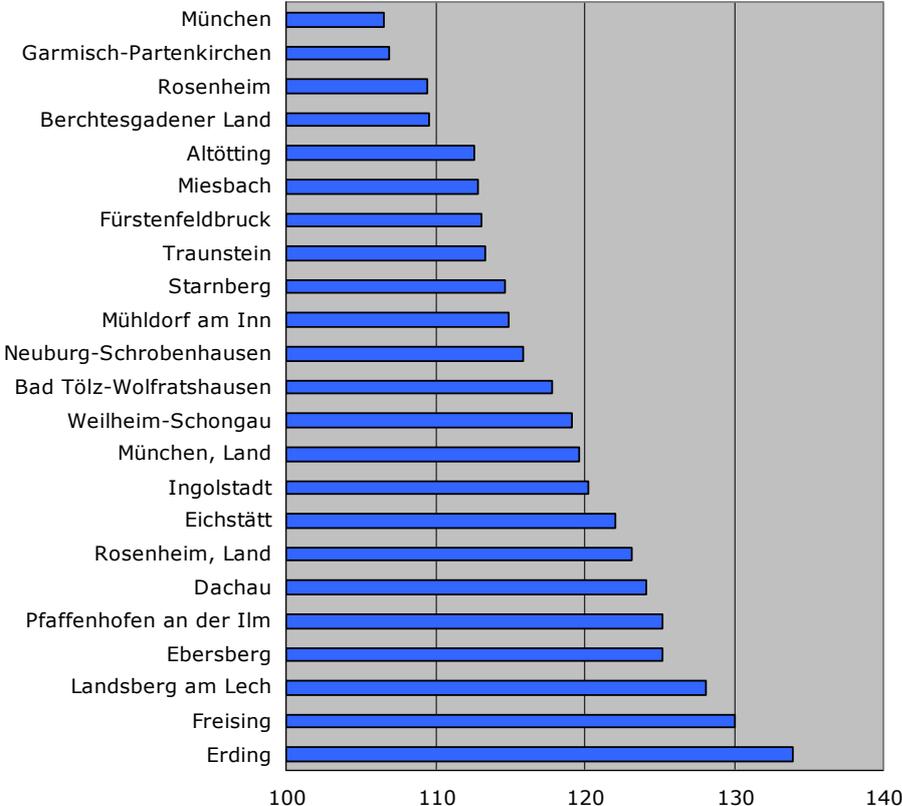
Table 9 Key information of the case study areas

Case study (main city)	Demographic type	Population 2005			Natural population change	Net migration	GDP per inhabitant, PPS
		total 1,000	20-39 %	65+ %	2001-2005 ‰	2001-2005 ‰	2007
1 Jihovýchod-CZ06 (Brno)	Challenge of Labour Force	1,640	30.4	14.5	-1.2	-0.6	17,900
2 Oberbayern-DE21 (Munich)	Euro Standard	4,211	28.4	17.1	0.7	4.8	41,000
3 Mecklenburg-Vorpommern-DE80 – North-Eastern Germany (Rostock)	Challenge of Decline	1,720	25.5	18.7	-2.7	-4.5	20,200
4 Arnsberg-DEA5 – South-eastern Ruhr agglomeration (Dortmund and Bochum)	Challenge of Decline	3,777	25.7	19.3	-2.5	-1.0	26,500
5 Cataluña-ES51 (Barcelona)	Young Potentials	6,784	32.2	16.9	2.0	17.7	30,700
6 Thessalia-GR14 (Larissa)	Challenge of Decline	738	27.5	20.1	-1.3	0.4	17,000
7 Piemonte-ITC1 (Turin)	Challenge of Ageing	4,330	26.9	22.1	-2.7	8.8	28,300
8 Molise-ITF2 (Campobasso)	Challenge of Decline	322	27.6	21.8	-3.0	2.1	19,400
9 Nord-Est-RO21 and Sud-Est-RO22 – Eastern Romania (Iasi and Constantia)	Challenge of Labour Force	6,585	31.2	14.3	-0.3	-1.3	7,400
10 Sydsverige-SE04, Hovedstaden-DK01 and Sjælland-DK02 (Malmö and Copenhagen)	Euro Standard (Sydsverige)	3,749	27.2	15.9	0.9	3.3	30,800
11 West Yorkshire-UKE4 (Bradford and Leeds)	Family Potentials	2,128	28.0	15.1	2.4	1.4	25,800
12 London-UKI1 and UKI2	Family Potentials - World cities	7,435	36.3	11.9	6.7	-0.8	49,100
ESPON space – EU27+4		503,362	27.8	16.6	0.3	3.2	24,900

Source: Eurostat.

The case studies refer in most cases to the NUTS3 level and a more detailed regional scale where data are available. Depending on the case study geographic homogeneity and heterogeneity regarding the demographic and migratory flows are observed. The 12 case study areas and their sub-divisions are listed in the scientific report.

Figure 3 Population change 1990-2007, Munich and its hinterland (1990=100)



Source: Eurostat.

9.4 Demographic stocks and flows

The demographic ageing process touches all case study areas, with the Piemonte region as the vanguard with 22.1 per cent of inhabitants 65 years and older. The share of the young working age population is highest in Cataluña as a representative of the Young Potentials type and the two Eastern European case studies (the Czech region of Jihovýchod and Eastern Romania).

Regional variations in the case study areas of demographic change and its components are observed. They are the result of the differences in the age structure, the components of natural change (fertility and mortality) and of migration processes. Several case studies show a considerable internal variability of the age structure with younger populations concentrated in the urban centres. Demographic change in recent years was in most cases determined by interregional and, more importantly, by international migration processes. The case studies show that international in- and out-migration varies considerably over time and that in many cases the beginning of the new millennium was characterised by important international in-flows. As expected, urban areas seem to attract more often international immigrants. All case studies experiencing important immigration underline the importance of the change in the ethnic composition of the population and a trend toward a multiethnic society is observed. Especially the UK case studies show the formation of ethnic enclaves.

International and long-distance interregional migration flows are usually driven by economic (work) motives. In addition the case studies demonstrate the importance of the location of higher education (university towns) for the migration patterns of young adults and the existence of attractive areas (mountainous areas, coastal areas etc.) for the migration patterns of retired persons or the elderly in general.

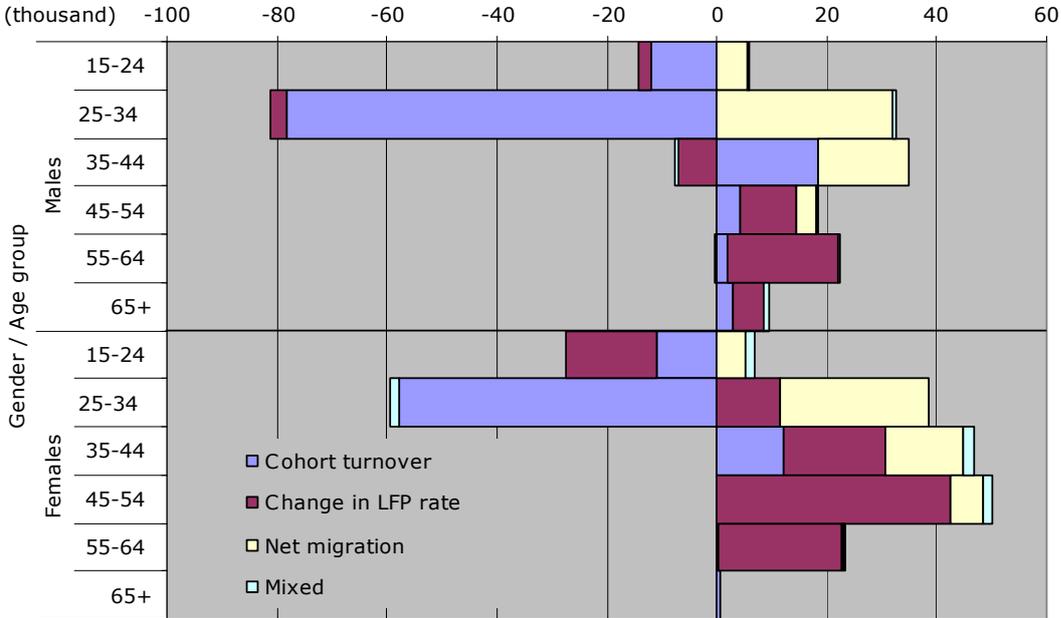
Several case studies highlight the interdependence between the urban areas and their hinterland, through short-distance migration flows with young adults migrating towards the urban centres and the other age groups towards the hinterland. As a consequence of these changes in residence commuter flows gain considerable importance.

9.5 Economic change and population

Economic and demographic change meet most predominantly on the labour market. The economic well-being and unemployment can vary considerably in the case study areas. Whereas the socio-economic situation influences the level and timing of fertility and mortality, the labour market and the economic situation acts upon the demographic situation through interregional and international migration processes. The analyses of most case studies show the predominance of international migration flows in recent years. The study areas with a well performing labour market (and high levels of GDP) are characterised by relative high international net-migration, whereas, for example, Eastern Romania with a high share of working age population and few economic opportunities experiences a high out-migration.

A detailed analysis of demographic flows for the working age population in Piemonte shows a sharp reduction in the number of younger employees due to smaller cohorts entering the labour market and an increase in older workers due to cohort turnover, positive net-migration and an increase in employment rates, especially for women.

Figure 4 Change of the working population by sex, age and component, 1990-2007, the Piemonte region



Source: Eurostat.

The case studies with a post-industrial employment structure with a high share of employment in research and the financial sector invest in institutions of higher education and to attract highly qualified immigrants.

The change of the political and economic system in Eastern Europe around 1990 had a considerable impact on demographic change – lower fertility, lower mortality and an increase in interregional and international in- and out-migration flows.

Important great events like the Olympic games and important infrastructure projects like the Öresund Link seem to have an impact on regional development ensuing demographic change, mainly through immigration.

The Cataluña and Piemonte case studies stress the importance of a long-term perspective in analysing the regional situation. In these regions an alternation of phases of economic growth, economic slowdown and economic restructuring are observed. These long economic cycles, as well as the short economic cycles, are linked to processes of emigration and immigration. The economic system encounters a demographic system that is very slow to react through natural growth. So it is obvious that the economic system tends to call for migration as a way to satisfy the demand for labour. In fact, most case studies showed the ability of major cities and agglomerations to attract working age population and to counterbalance a shrinking and ageing working age population.

9.6 Economic and social consequences of demographic change

The case studies do not allow identifying demographic change per se as an important driver of social and economic change. It seems that a well-off region is able to deal with change in the quantity and the structure of the population, whereas regions with less economic potentials would be prone to negative effects of population change. It is important to underline that the more rapidly changing migratory flows show immediate economic and social consequences. For example, the boroughs of London are the most ethnically diverse in the UK and the ESPON space. One third of all London residents have been born outside the UK and this share increases to over 50 per cent for Brent and Westminster. Adding the second generation of immigrants the impact of ethnic diversity increases.

9.7 The results of the DEMIFER scenarios in the case study areas

The case studies cover a wide range of possible demographic futures of the European regions with London as a fast growing global city and eastern Romania as a region facing population decline.

Apart from the changes in the number of inhabitants, the DEMIFER scenarios indicate a continuous trend towards the ageing of the total population and the working age population. Obviously this ageing process is slower in the growing case study areas. The differences in the ageing process do not vary considerably between the different scenarios. The share of the young working age population of the total population will decrease in all case study areas.

9.8 Policy issues

The policies regarding demographic change at the regional level are in most cases soft policies and linked more often to the aim of furthering socio-economic development in the region. Regarding the demographic change the policy domains of greatest interest are policies towards the elderly and towards immigrants.

Table 10 Population change in the case study areas 1993-2025 for different policy scenarios (Population 1993=100)

Case study (main city)	2005	2025			
		Limited Social Europe	Growing Social Europe	Challenged Market Europe	Expanding Market Europe
1 Jihovýchod-CZ06 (Brno)	98.7	84.0	84.8	81.5	82.8
2 Oberbayern-DE21 (Munich)	107.5	121.1	124.1	120.3	125.5
3 Mecklenburg-Vorpommern-DE80 – North-Eastern Germany (Rostock)	92.2	81.3	84.1	80.4	82.9
4 Arnsberg-DEA5 – South-eastern Ruhr agglomeration (Dortmund and Bochum)	99.7	90.0	93.0	88.7	92.4
5 Cataluña-ES51 (Barcelona)	111.4	117.8	124.2	118.5	125.3
6 Thessalia-GR14 (Larissa)	100.3	95.0	98.9	94.2	98.9
7 Piemonte-ITC1 (Turin)	101.0	107.1	115.9	108.0	117.1
8 Molise-ITF2 (Campobasso)	97.6	91.5	94.4	92.2	94.9
9 Nord-Est-RO21 and Sud-Est-RO22 (Iasi and Constantia)	97.8	73.6	72.1	70.1	69.1
10 Sydsverige-SE04, Hovedstaden-DK01 and Sjælland-DK02 (Malmö)	105.6	114.2	119.3	115.2	121.2
11 West Yorkshire-UK4 (Bradford and Leeds)	101.5	119.8	127.0	120.2	128.8
12 London-UKI1 and UKI2	107.6	128.1	140.0	132.6	146.1

9.9 Data issues

In each case study the characteristics and the quality of the data used are discussed. Whereas population, birth and death data are easily comparable, migration data pose a special challenge. The source and quality of interregional and international migration data vary considerably between countries where the case studies are located. Especially international out-migration – in the case of in-migration countries, as well as in countries with considerable outflows over the last years, like Romania – is measured with difficulties and is usually underestimated. The quantity and quality of statistical information varies considerably not only between countries. The case studies show that in some situations regional organisations, like for example the Greater London Authority, can provide additional statistical information. So even intra-nation differences in the availability and quality of statistical information exist.

The case studies further underlined the importance of geographic scale in studying the demographic and migratory flows. As it is well-known migration flows gain in importance for population change the smaller the areas are. For example, the London case study employing statistical information for the 32 boroughs offers a very differentiated view compared to a study at the level of 5 NUTS3 regions.

10 Policy considerations

Key findings

- *The normative European goals of territorial cohesion and regional competitiveness have a great bearing on how regions can deal with demographic challenges*
- *The various types of regions in Europe with regard to demographic trends can largely rely on policy interventions to make regions more attractive to potential immigrants and family-friendly social policies that encourage higher fertility rates and longer careers for women on the labour market*
- *Both principle-based policy considerations and capacity-based considerations should be explored.*

This chapter sketches the policy considerations resulting from the DEMIFER analyses. It places demographic and migratory flows into perspective with regard to their potential contributions to economic growth, sustainable development and EU policy goals of regional competitiveness and territorial cohesion.

The aim of this chapter is two-fold. First it provides some general policy “recommendations” or implications for each of the six main types of regions as delineated in the demographic typology in chapter 3. The DEMIFER scenarios in chapters 5, 6 and 7 chronicle the implication of various bundles or combinations of policies on future demographic and migratory trends. Implications from the scenario work are recapped as the second aim of this chapter. Thus it will answer the question of what current policies can do respond to alleviate the negative aspects of demographic and migratory trends, capitalise on the positive aspects or work to turn trends where desired. However prior to this the first section in this chapter on policy considerations puts policy-making, economic growth and territorial development into context

10.1 Policy implications for the demography in the European territorial development context

10.1.1 Considering policy on multi-levels

Demographic developments in Europe are multi-faceted and no one size fits all with regard to the relationship between economic performance and demography and migratory flows. Making policy recommendations to deal with demographic developments or considering policy implications of such developments is extremely difficult. For instance there is no clear-cut causality between a change in age structure and its economic effects. Rather it is also the institutional and organisational structural changes that take place concurrently which determine if age structure change has a negative or positive effect on economic performance. Neither is the relationship between economic performance and migration straightforward. Much has to do with the absence of homogeneous migration data in Europe and the variety of definitions used to classify an immigrant/emigrant. Even rigorous scientific exercises which informed by established theory, such as the DEMIFER policy scenarios elaborated in this report, cannot make definite statements about the impact of various bundles of policies on demographic and migratory trends. The scenarios, however, are important intellectual devices for thinking about alternative futures.

Thus considerations for policy should also be made in accordance with the territorial diversity of the ESPON space and with consideration to scale, or the level on which policy is most viable. The multi-level, intersectoral nature of various policy options can give rise to both synergistic policies as well as conflicting policy goals. In the ESPON 2006 programme the ESPON project on Enlargement of the European Union (ESPON 1.1.3) discussed the idea of policy combinations to describe the processes of coordinating

coherent combinations of policies as a way to bridge the gap between policies oriented towards competitiveness of the European territory and cohesion of the territory at all levels. These *principle-based* (goal oriented, normative or top-down) policy combinations as well as capacity-based (action oriented or bottom-up) were delineated (ESPON 1.1.3 final report 2006, Persson and Van Well 2005).

Both of these types of policy combinations can address the goals of regional competitiveness and territorial cohesion, but principle-based orientations tend to be more focused on achieving regional competitiveness through market-based mechanisms and structural measures while capacity-based orientations often rely on cohesion-based policies that stress the social capacity and institutional learning. As such they mirror to some extent the "Distribution-Fairness" dimension of the policy scenarios.

10.1.2 European territorial development debate and demographic considerations

The European territorial development debate is framed within several seminal strategies and agendas to achieve regional competitiveness and territorial cohesion. These include the Lisbon Strategy, the Territorial Agenda, the Commission's Green Paper on Territorial Cohesion and most recently the Europe 2020 discussions for smart, sustainable and inclusive growth. The European policy territorial debate, while not specifically assuming that demographic changes result in altered economic performance, does repeatedly discuss how demographic changes (at least at the regional level - NUTS2) hinder development. Thus demographic and migratory developments are discussed within these broad policy contexts as challenges to be overcome.

10.2 Typology of demographic status and policy implications

These DEMIFER typologies in chapter 3 were based on current data (2005) and reflect the present, short-term trend of ESPON. They thus depict a snapshot of demographic, labour market and migratory developments in a generalised fashion. One of the values that spatial typologies provide is that they help to suggest what types of policy interventions are most applicable to a set of regions. Thus typologies help to design and prioritise policy measures to cope with the challenges and potentials in Europe. This in turn helps provide the basis for intervention developments for improving European competitiveness and cohesion

10.2.1 Retaining favourable trends

The **Euro Standard** type of region has a fairly positive population development and an age structure predominantly focused on the age group 35-55 years. The total fertility rate is above the ESPON average and life expectancy is overall average. The net migration rate into the regions is largely positive, thus contributing to an overall positive population development. Low fertility is not a major problem, although ageing could be.

The **Family Potentials** type has a strong population development, with a good balance between younger and older age groups. Because of high birth rates and moderate in-migration, the share of elderly is below the ESPON average, despite the relatively high life expectancy.

The EU-LFS 2007 data patterns show that the Euro Standard and Family Potentials types have above average GDP-PPP per capita and below average GDP-PPP growth rates. The share of migrants is above average. The education level is high as is labour force participation. Unemployment is below average.

These regions are doing well by both socio-economic and demographic standards. The *principle-based* goal for these regions would then be to retain the favourable trends and focus on competitive regional development and continued pursuance of the Lisbon agenda goals and "smart growth" as advocated by Europe 2020. If greater convergence within the regions is desired, cohesion oriented measures to ensure that intra-regional or urban-rural disparities do not become a problem should also be encouraged. Capacity-

based measures such as building of social capital and networks within the INTERREG or LEADER programmes are examples. Particularly projects that strive towards greater social inclusion such as integrating immigrants, youth and/ or women into local labour markets, would help to ensure a favourable regional development.

10.2.2 Dealing with population decline

The **Challenge of Labour Force** type of region is characterised by a rather high share of young people, but the challenge is to bring them into the labour force. Despite a large “potential” work force, this type of region is losing population, both through a negative natural population balance and through migration. A low total fertility rate exacerbates the out-migration population decline.

The **Challenge of Decline** type of regions have a negative population development, due both to low total fertility rates and negative net migration. These are some of the “shrinking” regions of Europe. The proportion of older workers (above 55 years) is significantly higher than in the rest of the ESPON space and the share of younger adults (20-39 years) is below average, thus leading to a potential problem in maintaining sufficient workforce to uphold social welfare schemes.

These types of regions are distinctive to many of the EU-12 and the eastern part of Europe, as well as shrinking regions peripheral areas of Scandinavia, Southern Europe and in Germany. In general the GDP-PPP per capita is below average, as are growth rates. The share of migrants as well as labour force participation is also below average. In most of these regions (especially the Challenge of the Labour Force) the share of highly educated people is lower than the ESPON space average.

Many of the regions are lagging behind and population decline may be a major reason for this together with unemployment rates. The peripheral location of these regions in relation to the “Pentagon” may also be a contributing factor. These are the regions that the Territorial Agenda and the Green Paper on Territorial Cohesion specifically point out as challenged for territorial development. Policy goals for these regions will mainly be focused on retaining population and boosting natural population growth, attracting immigrants (both international and non-EU) and increasing opportunities for the labour force. Due to the territorial challenges it is important to coordinate, as the Green Paper on Territorial Cohesion recommends, various *principle-based* EU policies – transport and ICT infrastructure, energy and environmental policy in order to make the regions attractive for industrial location, improve the nearness to markets and increase regional competitiveness.

At the same time *capacity-based* measures are also needed to make the regions attractive places to live and work. Family-friendly policies such as subsidized childcare and generous parental leave (for both mothers and fathers) are expected to help increase fertility rates and keep a large share of women in their fertile years in employment and at the same time providing them with incentives to remain in the region. This is an important precondition in dealing with declining populations, but alone is not sufficient as witnessed by the Swedish and Finnish regions which fall into this category, despite the renowned social welfare systems in these countries. The targets of Europe 2020 are particularly important for these regions and many of the Europe 2020 flagship initiatives are pertinent, especially more digitalisation, energy efficiency initiatives, support so that businesses and industries can compete globally capacity building for new skills to increase labour participation. These types of interventions can help attract migrants from within and without Europe.

10.2.3 Challenging the disparities

The **Challenge of Ageing** type regions are experiencing positive population development driven by a positive net migration rate, but the proportion of the older age groups is significantly higher than it is in the ESPON space age structure. Life expectancy

is high and the share of elderly is significant. Birth rates are low, but migration, especially from non-EU countries can partly mitigate the low fertility and ageing population to some extent. Education levels are low, but so are unemployment rates (although the gender gap is the widest in Europe).

The **Young Potentials** type regions have a young age structure and positive population development due to both national population balance and positive net migration. This is partly due to the strong inflow of migrants from non-EU countries. Disparities in education are apparent in these regions as they have simultaneously a high share of people with tertiary education and a high share with only basic education. There is also a considerable gender gap in labour market participation.

These types of regions are found mainly in the Mediterranean regions, English coastal areas, in the former Cohesion country of Ireland and in some urban enclaves (such as Vienna). They constitute demographic growth regions with above average GDP-PPP per capita and average labour force participation (which does exhibit great gender and educational disparities). In the Young Potential regions the GDP-PPP growth rates are above average, but in the Challenge of Ageing regions they are below average. The unifying factors for these regions are strong net migration gains and population increases. The labour force in these regions is over-represented (relative to the ESPON space average) by fairly low-qualified, low-wage sectors such as agriculture, hotel and restaurants, construction and fishing (the Challenge of Ageing regions). Tourism is an important industry in many of these regions and attracts non-EU immigrants and young people into low-qualified, often seasonal work.

The first challenge that these regions face is orienting their economies towards more Lisbon-flavoured goals, such as the knowledge economy and innovation to create not just more, but *better* jobs in the regions. The second challenge of these types of regions is to ensure sustainable economic, social and development in light of the increasing pressure that the growing population exerts on natural and cultural resources. *Principle-based* policy options could thus be based on achieving sustainable and smart growth, as advocated by the Lisbon Agenda and Europe 2020 in developing synergies between economic growth, high quality job creation, environmental technologies and renewable energy provision – synergies that can be applied in the traditional sectors like agriculture, fishing, tourism and construction. This also meshes well with patterns of how regions in these countries already utilise 2007-2013 Cohesion Policy instruments in light of the Lisbon and Göteborg agendas (Nordregio 2009).

Capacity-based policy options in these regions would help to absorb migrant workers into the labour market and aid in their integration into society. This can be done policy interventions at the national level to raise education levels, build capacity for learning new skills, and fight pockets of poverty and social exclusion, as Europe 2020 stresses in its flagship initiatives. Family-friendly policies are also essential in these regions to narrow the gender-gap and reduce disparities. Local and regional level projects within EU programmes such as INTERREG or LEADER can be useful in creating social networks, and learning from experience how to change attitudes, especially for excluded groups in labour market segments (integration or women or immigrants).

10.3 Policy scenario implications

The scenarios developed within the DEMIFER project use various policy bundles as the basis for different trajectories of demographic and migratory development. The basic hypothesis is that specific policies relating directly to health, family and migration incentives and barriers, as well as social and welfare policies will have significant impacts on demographic behaviour, at least in the short-term. However as the scenarios warn, it is difficult to be precise about the impacts of a set of policies on demography, as there may be other context-specific variables that intervene.

The overall framework for policy choices are depicted on two axes: Economy/Environment where the strategic choices in Europe are either based on sluggish growth that is linked to the existing resource base and current patterns of energy use, or growth that is de-coupled from the use of environmental assets, and has solved the coming energy needs in an innovative and sustainable way. The other strategic choice of policies is made by focusing on either European competitiveness driven largely by market forces, or territorial cohesion driven to a greater degree by social equity concerns. These five policy scenarios show what may be expected to happen if certain policy combinations are followed within the drivers of mortality, fertility, migration and labour markets.

10.3.1 Policy scenario implications for mortality

Scenario results for mortality for the SMR for the Challenged Market Europe scenario display very large disparities between disadvantaged regions in the East and the longevity advantaged regions in the west and north. The disparities are less pronounced in the Growing Social Europe scenario, the Limited Social Europe Scenario and somewhat in the Expanding Market Scenario. In this regard mortality rates may be more influenced by cohesion policy interventions than by market-oriented growth interventions. Yet in addition to changing trends in mortality through better healthcare etc, it is also important to be able to meet the challenges of an ageing population and this could better be achieved through a focus on cost-effective growth in the Growing Social Europe and the Expanding Market Europe scenarios.

10.3.2 Policy scenario implications for fertility

According to the scenarios, fertility rates will be highest in the Expanding Market Europe scenario, even higher than in the Growing Social Europe scenario as might be expected, This is because in the Expanding Market Europe there are pockets of regions with very high total fertility rates in the Northern and Western European countries and very low fertility rates in the southern, central and eastern regions. Within the Growing Social Europe scenario these disparities narrow, making it, from a European point of view, vital to pursue family-friendly social welfare policies that boost fertility rates in the Northern countries, also in other parts of Europe.

10.3.3 Policy scenario implications for migration

The policy scenarios show fairly little difference in internal migration (at least as calculated as destination attractiveness ration, DAR) between the four scenarios. Also the evidence for many European countries suggests stability in the internal migration system: the same regions continue to be attractive and the same regions continue to be unattractive for decades and European internal migration levels are fairly low compared with North America or Australian where migration is much more responsive to regional economic change.

International migration scenarios indicate that total migration is moderate in the Growing Social Europe and Challenged Market Europe, high in the Expanding Market Europe scenario and low in the Limited Social Europe scenario. Thus if high economic growth in certain areas of Europe is not checked by territorial cohesion policies the result may be greater movement of job seekers from lagging regions of Europe into the already affluent regions. If the goal is to retain people and workers in countries with higher emigration rates, such as the Eastern European countries, then territorial cohesion considerations, as expounded in the Territorial agenda are appropriate.

Extra-European migration will become increasingly important help deal with the ageing population of the European space. In the Expanding Market Europe scenario extra-European immigration is expected to be very high, especially in major cities such as Madrid or Paris. This pattern is also seen, although not quite as strong in the Growing Social Europe scenario and is faintest in the Limited Social Europe scenario. While a great influx off extra-European Immigration will help many regions address demographic and labour market challenges, it will also require social policies to integrate a large group of immigrants into society as well as greater inter-state coordination in immigration policy.

10.3.4 Policy scenario implications for the labour market

A shrinking labour force will be a problem for many regions in the future, but this will affect fewer regions under the Expanding Market Europe scenario and to a slightly lesser extent the Growing Social Europe scenario more than in the other scenarios. Thus the labour market is expected to be much more vital in more regions of Europe under a general policy scenario axis where resources are used in such a sustainable and cost-efficient manner that the post-carbon economy as a whole continues to grow. Thus pursuing policies that can help implement the Lisbon agenda and the sustainable development strategy will have positive implications on labour market dynamics.

10.4 Conclusions

Results from developing a typology for demography and policy scenarios within the DEMIFER project show that there is a complex interrelationship between implications of one policy and another and that policy makers may be required to make difficult trade-offs between goals. The scenarios indicate that demographic developments may be highly influenced by strategic, normative policy decisions such whether to pursue a competitive-oriented policy or a cohesion-oriented policy. Demographic developments are also influenced by the long-term growth rates in the economy and therefore expanding but sustainable growth will generally be better attuned to dealing with demographic problems than sluggish growth fuelled by a carbon and traditional energy sources.

11 Discussion

The main demographic trends across Europe are the decline in population growth, the ageing of the population, the shift from births to migration as main source of population growth and the reduction in the growth rate of the working age population. If the size and direction of migration flows and reproductive behaviour will not change, the size of the working age population will decline in the next decades, while at the same time the number of elderly people will increase. This will be a risk for European competitiveness since the working age population in many other parts of the world is expected to continue to grow in the foreseeable future. In addition, disparities across European regions may increase. In general the level of fertility and the inflow of migrants are high in affluent regions, whereas fertility is low and there is an outflow of young migrants in poor regions. Moreover, premature mortality is high in poor regions. This raises the question which policy options are available to policy makers in order to improve both European competitiveness and regional cohesion.

The growth rate of labour supply depends on both changes in the size and age structure of the working age population and the level of labour force participation rates. Thus the growth of labour supply can be raised by policies aimed at affecting changes in the size and age structure of the population and policies aimed at improving the dynamics of the labour market. The size and age structure of the population depend on the levels of fertility and - to a lesser extent - of mortality and on the size and direction of migration flows. Thus policies affecting demographic and migratory flows will have an effect on the growth of the labour force.

One of the main causes of the decline in the growth of the working age population is the low level of fertility. If policies aimed at increasing the level of fertility would lead to a decrease in the labour supply of women, for instance due to a reduction in the number of working hours per week or due to an increase in maternity and parental leave, the immediate effect on the size of the labour force would be negative. Thus policies should aim at improving facilities for women to combine having a paid job and the raising of children. However, providing facilities may not be enough since the level of fertility depends on the general economic situation as well. If young couples do not have faith in the future, for instance if the level of unemployment is high and income levels are low, they tend to have only a small number of children. Therefore policies aiming to raise the level of fertility will not be effective if the general economic situation will not improve. Moreover, disparities in the level of fertility across regions and countries will not be reduced if economic differences are persistent. Obviously policies affecting the level of fertility will have effects on the growth of the working age population in the long run only. These policies will not help in reducing labour shortages in the next two decades or so.

All across Europe life expectancy has been increasing during the last decades. In most countries, mortality rates at higher ages have been declining. To the extent that the additional years are spent in good health, this trend makes it possible to increase the statutory age of retirement. An increasing number of European governments have already decided or are considering to raise the retirement age. There are sharp differences in the level of mortality across European regions. Especially in eastern parts of Europe there are regions where the level of premature deaths is very high. However, in western countries there are big differences between rich and poor regions as well. Reduction of premature mortality will have a positive impact on the size of the working age population. However, in order to have an impact on labour supply, it is not sufficient to increase life expectancy. The additional years alive should be spent in good health. One of the main causes of differences in life expectancy and in health are life style factors, such as smoking, unhealthy diets and lack of exercise. Thus in order to reduce inequalities,

policies aimed at increasing the age of retirement should be combined with policies stimulating healthy behaviour.

If migrants move from regions with high unemployment to regions with shortages in the labour market, that may help in solving labour market problems in the affluent regions. However, outflow of young migrants may cause a negative vicious circle in poor regions, as population size may shrink, the working age population may age strongly and the number of young families may drop which may cause a decline in economic growth and as a consequence unemployment may increase further which in turn may increase the outflow of young adults. Thus migration between regions may increase rather than decrease regional disparities. The same applies to migration between ESPON countries, as migrants tend to move from poor to rich countries. Thus policies aimed at increasing mobility between European regions and countries may reduce rather than increase cohesion. They tend not to result in win-win outcomes but rather in zero-sum results: gains for some regions imply losses for others. Policies aimed to stimulate migration should not be developed in isolation but can be effective only if they are part of policy bundles aimed to improve living conditions in poor regions, for example by improving the availability of jobs, housing, schools and the quality of the environment.

Migration from outside Europe may increase the size of the working age population without leading to decreases in labour supply in other European regions. Even though governments of many European countries have a restrictive immigration policy, shortages in the labour market due to ageing may lead to an increase in immigration from outside Europe. The European Commission has suggested that policies should be developed for allowing economic migration in order to meet the needs of the labour market. However, past experiences have shown that massive streams of migrants may cause social problems as the current cultural abilities to integrate migrants are inappropriate. There is a tension between preserving the national identity and developing multiculturalism. Thus immigration policies may be beneficial only if integration policies are successful. Furthermore, as migrants tend to move to economically healthy regions, regional disparities may increase, particularly as regions with a healthy economy tend to be better able to attract higher skilled migrants.

Apart from economic reasons, migration may result from climate change. Migration in Europe may be affected in two ways by the impacts of climate change. People from European regions which are affected may move to other regions and people affected by climate change from outside Europe can migrate to Europe. Within Europe temperature increases may affect southern regions in Spain and Portugal. However, it is still highly speculative to estimate the size of migration flows which may be the result of climate change. On global scale warming will affect agricultural productivity and may cause natural disaster such as floods. Even though this might lead to massive migration flows, it is expected that this will not lead to very high migration flows to Europe since the poorest people are likely to be affected most and they will not have the necessary resources to migrate to Europe.

In addition to influencing the size of the working age population, policies may be aimed to raise labour force participation. Since in poor regions labour force participation rates tend to be lower than in affluent regions, raising labour force participation rates may be helpful in decreasing disparities across regions. However, increases in labour force participation will be effective only if the labour market performs well, otherwise it may lead to an increase in unemployment. In several regions labour force participation of women can be increased strongly. This requires policies to improve the compatibility of work and child care and actions aimed at reducing gender discrimination in the area of career development. An increasing number of countries has been introducing policies to increase the retirement age. However, this will be effective only if employers are prepared to employ older employees, if the aged will remain healthy and if employees

are able to attempt career changes. Thus policies to raise the statutory age of retirement are not sufficient.

It should be noted that economic growth is not just determined by the volume of labour supply, but by labour productivity as well. Growth in labour productivity may be raised by technological progress and by investments in education and training. To the extent that policies aimed to increase the size of the labour force would not be effective, increases in labour productivity will be needed to compensate for the effects of demographic ageing rather than to contribute to further improving living standards.

This report presents much information about the demographic future of Europe, its countries and its regions. The projections have implications for two policy concerns of European regional development policy: cohesion and competitiveness. As to cohesion one conclusion is that Europe is still strongly divided in its demographic regimes and potentials. Many regions in central and eastern Europe face population decline and far more ageing than those in western, northern and southern Europe. The policy scenarios show that these gaps will not easily be narrowed. However, there are some reasons for optimism. The experience of southern European countries has been of some convergence and the demographic position of the eastern parts of Germany is less extreme than that of countries such as Romania and Bulgaria. So the European Union has to address the issue of how much it is prepared to invest in its new members. Cohesion will also be an issue for the demographically favoured regions. Their future population growth and slower ageing is a consequence of immigration from other regions, countries and continents. The integration of these newcomers through programmes of language and skills training will be vital. As to competitiveness those countries and regions which are growing could be viewed as favoured by expanding markets and increasing labour supply, while those countries and regions which are declining could be viewed as disadvantaged. Regions with declining populations are not attractive to economic enterprises that create jobs, although they may attract retired migrants. The countries and regions which will be most competitive will be those with the largest concentration of their populations in the working ages.

In conclusion, if current demographic trends and migratory flows will continue the European working age population will shrink and disparities across regions will increase. This calls for policy options to improve European competitiveness and regional cohesion. Growth cannot simply be enhanced and disparities cannot simply be reduced by policies aimed at directly affecting demographic developments and migratory flows since these depend on the economic situation. Thus policies aimed at affecting demographic and migratory flows should not be considered in isolation from policies in other areas such as education, housing, labour market, integration of migrants, innovation and the quality of the environment.

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List of Deliverables

- D1 Report on effects of demographic and migratory flows on European regions
- D2 Causes and impacts of migration
- D3 Typology of regions
- D4 Multilevel scenario model
- D5 Reference scenarios
- D6 Report on scenarios and a database of scenario drivers
- D7 Regional population dynamics: a report assessing the effects of demographic developments on regional competitiveness and cohesion
- D8 Report on climate change and migration scenario
- D9 Report on policy implications
- D10 Database
- D11 Atlas of maps
- D12 Case studies

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