DEMOGRAPHY OF EUROPEAN REGIONS

A Spatial Perspective on Current Population Patterns
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A SPATIAL PERSPECTIVE ON CURRENT POPULATION PATTERNS
This thesis, originally written in Vienna between Christmas 2009 and Easter 2010 and self-published in August 2010, marks the highlight of my career as a geographer yet. I started my studies at the Department of Geography and Regional Research at the University of Vienna in Summer 2004. Between finishing secondary school, which we call “Gymnasium” in Austria, and starting to study I spent the most part of the 15 years in between working – indicating that my personal life cycle is not necessarily following a mainstream sequence – in the fields of music, design and internet productions. Then why become a geographer?

I am quite interested in how contemporary societies work. This keeps me curious about nearly all circumstances of life on planet earth, especially those related to places, which are – to my understanding – spaces and locations with meanings. To gain more understanding about how societies work in different places, basic knowledge in demography, ecology, economy, sociology, cultural backgrounds and governance structures are necessary ingredients. Aiming to achieve some of this knowledge is enough reason to become a geographer.

“Without a spatial thinking we miss the visual power, the spatial exploratory investigation, and the understanding of the impacts that space can have in life outcomes.”
Marcia CALDAS DE CASTRO (2007:16)

During my studies I specialised in spatial demography, a discipline that concentrates on the outcomes of life by studying populations in different spaces and places. It is all about questions addressing the social coexistence of people in different places (where?), by different age, sex and qualities (who?), at different times (when?) and under different social, economical, environmental and political circumstances (how?). Such differences are caused by a complex micro-macro level interplay of individuals and societies. Spatial demography, at its best, indeed sheds light on how all this is connected.

“In doing more and more sophisticated investigations on more and more trivial problems, (...) the results of such research (...) add something to our understanding of how the world works.”
Paul R. EHRlich (2008:108)

Since January 2009 I am working as a research assistant for Professor Heinz Fassmann, who is not only the director of the Workgroup of Applied Geography at the Department of Geography, but also the head of the local DEMIFER research team at the University of Vienna, besides holding numerous other leading positions in academia and beyond. Within the DEMIFER project team, I was provided with the opportunity to develop a demographic classification of European regions, which is not only a great task but also the centrepiece of this thesis.
ACKNOWLEDGEMENTS

My sincere thanks go, first and foremost, to the three women in my life: to my mother, to my partner in life Tina and to my daughter Emma – without them nothing would have been possible. My thesis adviser Professor Heinz Fassmann and Associate Professor Karl Husa deserve the credits for engaging and promoting my interest in spatial demography. Many heartfelt thanks go to my friends and colleagues at the Department of Geography and Regional Research at the time, above all, to Lisi Gruber for her sharp analytical skills, to Michael Holzapfel for being the solution for every cartographic problem, to Markus Speringer for the methodical inspirations, to Susanne Hanger for brightening my English – all remaining errors are of course of my sole responsibility, to Werner Dietl for not letting me down on statistical abysms and to Yvonne Franz and Alois Humer for their patient consultancy.

Last but not least, my thanks go to the European Union for making projects like DEMIFER possible, which is funded by the ESPON 2013 Programme and part-financed by the European Regional Development under Objective 3 for European Territorial Cooperation.

Vienna – August 2010
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LIST OF ABBREVIATIONS
ANAEM  Agence nationale de l'accueil des étrangers et des migrations (French National Agency for the Reception of Foreigners and Migration).
COE  Council of Europe
CDR  Committee of the Regions (i.e. the EU's Assembly of Regional and Local Representatives)
CBR  Crude Birth Rate
CDR  Crude Death Rate
CEE  Central and Eastern Europe
CNR  Consiglio Nazionale delle Ricerche (Italian National Research Council)
DEMIFER  Demographic and Migratory Flows Affecting European Regions and Cities
IIASA  International Institute for Applied Systems Analysis
ILO  International Labour Organization
IMR  Infant Mortality Rate
IOM  International Organization for Migration
ISCED  International Standard Classification of Education
ISCO  The International Standard Classification of Occupations
EC  European Commission
EEA  European Economic Area
EFTA  European Free Trade Association
(i.e. Iceland, Liechtenstein, Norway and Switzerland)
EHEMU  European Health Expectancy Monitoring Unit
ESPON  European Spatial Planning Observation Network
ESPON space  The present 27 EU Member States and the 4 EFTA countries
EU  European Union
EU15  The EU Member prior to the eastward enlargement on 1 May 2004
(i.e. Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden and the United Kingdom)
EU25  The present 27 EU Member States without Bulgaria and Romania
EU27  The present 27 EU Member States
EU27+4  The present 27 EU Member States plus the 4 EFTA countries
EU-LFS  European Labour Force Survey
FDT  First Demographic Transition
FSU  Former Soviet Union
GDP  Gross Domestic Production
HLY  Healthy Life Years
ILO  International Labour Organization
INSEE: Institut National de Statistica (Romanian National Statistical Institute)
IOM/CEFMR: International Organization for Migration/Central European Forum for Migration and Population Research (Warsaw)
ISCED: International Standard Classification of Education
ISCO: International Standard Classification of Occupations
LAI: Local Area Unit
LFS space: Countries/regions covered by the EU-LFS (i.e. EU27+4 or ESPON space minus Iceland, Malta, Switzerland, Liechtenstein and the French Overseas Departments and Territories (Martinique, Guadeloupe, Guyane and Réunion)
MAFB: Mean Age at First Birth
MS: Member State (of the EU)
NACE: Classification of Economic Activities in the European Community
NEEA: Netherlands Environmental Assessment Agency
NIDI: Netherlands Interdisciplinary Demographic Institute
NMS: New Member States (of the EU) – i.e. Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia, which joined the EU on 1 May 2004, plus Bulgaria and Romania acceded on 1 January 2007.
NRC: National Research Council (Washington, D.C.)
NSI: National Statistical Institute
NUTS: Nomenclature d’Unités Territoriales Statistiques (Nomenclature of Territorial Units for Statistics)
OECD: Organisation for Economic Cooperation and Development
PPP: Purchasing Power Parity
PRB: Population Reference Bureau
SDT: Second Demographic Transition
SILC: Statistics of Income and Living Conditions
SoG: School of Geography (University of Leeds)
SSR: Soviet Socialist Republic
TFR: Total Fertility Rate
TPG: Transnational Project Group
UN: United Nations
UNDP: United Nations Development Programme
UNECE: United Nations Economic Commission for Europe
UNIVIE: University of Vienna
UK: United Kingdom
USCB: United States Census Bureau
INTRODUCTION

Europe is a continent of rich territorial diversity, which implicates manifold assets and challenges. On the one hand, the positive assets can contribute to consolidate and progress Europe’s position as a competitive, attractive and liveable place, on the other hand, its diversity – especially in the form of disparities – constitutes a challenge to European efforts to strengthen economic and social cohesion and integration (ESPON 2007:17; EC 2007a:3).

1. THESIS BACKGROUND

1.1 ESPON – THE EUROPEAN SPATIAL PLANNING OBSERVATION NETWORK

Corresponding to its self-description, ESPON was set up in 2002 by the European Union to provide policy makers on the European national and regional level with systematic and new knowledge on territorial trends and impacts. Today the network includes all 27 EU Member States, plus Iceland, Liechtenstein, Norway and Switzerland (i.e. EU27+4). Researchers from more than 100 institutions from all over Europe are connected in Transnational Project Groups (TPG) within ESPON’s applied research activities.

Research under the ESPON banner is explicitly demand-driven and is claiming a strong usability. Consequently, the research activities are orientated towards the actual policy demand and its results and outputs shall be made available to potential users, i.e. policy makers and practitioners at EU and Member State levels, as well as research institutes and universities (ESPON 2007:16; ESPON 2007:41). Hence, ESPON is not conducting bottom-up research; in fact, it is conducting applied research, inspired by the policy priorities of the Commission and EU Member States. In doing so, the scientific added value can be seen as a well-desired side effect (ESPON 2007:25; FASSMANN 2008).

The recent ESPON 2013 Programme, covering the period 2007 to 2013, is aiming to reinforce European regional policies with studies, data and observations of development trends (ESPON 2007:5). During the preceded EU Programming Period (2000–2006), accelerated globalisation, a new energy paradigm and demographic change were identified as the ongoing mega trends the European territory is facing (ibid., p.24). Taking a closer look on demographic issues, the ESPON 2013 Programme concludes that an ageing European population and migration is affecting the regions differently and enhance the competition for skilled labour (ibid., p.5).

1 Extensive information on ESPON (programming, projects, events, publications, tools, etc.) is available on the ESPON website at http://www.espon.eu. (retrieved 03.07.2009)
A SWOT analysis carried out by ESPON addresses the European territory and its evaluation and consequently specifies demographic ageing as one of the main threats (ESPON 2007:18f):

“Demographic development in Europe will be a particular challenge; regions facing ageing and out-migration may loose their economic base. This development threat may hit peripheral and rural areas first.”

In the context of population mobility and dynamics the topic of “socio-economic integration” was identified as another main threat (ibid.):

“Integration of specific population groups progressively becomes a serious issue in numerous European countries, in particular in larger urban agglomerations.”

These two threats, seen in a spatial context, affect all kinds of regions. On the one hand, peripheral and rural regions are facing the challenge of ageing and depopulation due to out-migration and a general decline in birth rates. On the other hand, urban regions have to manage the integration of more and more immigrants. Confronted with these structural changes in regional demography, Europe’s policy makers at all levels have to keep up with the connected potential implications for regional competitiveness and European social cohesion.

1.1.2 THE ESPON PROJECT “DEMIFER”

The ESPON project “DEMIFER” (Demographic and Migratory Flows Affecting European Regions and Cities) is making reference to the above-mentioned challenges. Population ageing and migratory flows already making a major impact on EU societies and economies. Hence, these demographic developments and their effects on different kinds of regions are framing the thematic scope and policy context of the DEMIFER project (ESPON 2008a:4f).

KEY POLICY QUESTIONS

According to the project specifications, the DEMIFER key policy questions read as follows (ESPON 2008a:5f):

- How will the demographic development, i.e. natural development of population as well as migration, affect different types of regions and cities?
- How and to which degree will future effects of climate change influence migration flows?
- What is the need for increasing the labour force in order to avoid negative impact on the economic performance and on the social cohesion of these regions and cities?
- Which skills are needed in different types of regions and cities in order to meet the demands of the economic base and to make better use of development opportunities?
- To what extent could such skills be provided by internal migration in Europe?

- What should be the profile of skills of migration to Europe to maximise the contribution of regions and cities to European competitiveness?
- Which factors could have a positive effect on natural population development in Europe?

RESEARCH QUESTIONS

In order to address these key policy questions the following research questions will have to be addressed (ibid., p.7):

- What are current demographic developments and migration flows like? How distinct are they? What are the regions of destination? Are there flows that are more pronounced than others, and if so, why?
- Why do some regions attract highly skilled people whereas others do not?
- What are the causes of migration (e.g. economic development, development on labour market)? What are the impacts on different types of European regions and cities (e.g. regarding regional competitiveness, provision of public services) and which effects will migration have on European cohesion?
- What are the relations between migration flows to the ESPON countries and other major territorial challenges like accelerating globalisation and particularly climate change?
- What are the financial consequences for the regions of origin of migrants (e.g. size of remittances of migrants)?
- Who is migrating? What are the qualifications of migrants coming to Europe? Do they meet the need of the labour market as such? How do their profile fit different types of regions and cities of Europe?
- How and to which degree does the development of different individual factors (economic, social, environmental) impact on demographic and migration flows?

Indeed, these policy and research question cover a wide range of socio-economic, demographic and geographic issues. Because of that, DEMIFER – supported by the ESPON 2013 Programme – is carried out by an interdisciplinary team of researchers from the Netherlands Interdisciplinary Demographic Institute (NIDI, Netherlands), the University of Vienna (UNIVIE, Austria), the International Organization for Migration/ Central European Forum for Migration and Population Research (IOM/CEFMR, Poland), the University of Leeds/School of Geography (SoG, United Kingdom), the Netherlands Environmental Assessment Agency (NEEA, Netherlands), the Nordic Centre for Spatial Development (Nordregio, Sweden), and the National Research Council (CNR, Italy).

The research within DEMIFER includes seven activities (ESPON 2008b:40):

- Activity 1: Demography and migration (coordinated by NIDI)
- Activity 2: Typology of regions and cities (coordinated by UNIVIE)
- Activity 3: Multilevel scenario model and reference scenarios (coordinated by IOM/CEFMR)
- Activity 4: Regional scenarios (coordinated by SoG)
- Activity 5: Policy implications (coordinated by NEEA)
- Activity 6: Data, indicators and maps (coordinated by Nordregio)
- Activity 7: Case studies (coordinated by CNR)
1.2 AIMS & OBJECTIVES

This diploma thesis is covering the DEMIFER research resumed under Activity 2 (cf. Chapter 1.1), coordinated and conducted by the local DEMIFER research team at the University of Vienna (UNIVIE) under the direction of Professor Heinz Fassmann, who is the head of the Workgroup of Applied Geography, Spatial Research and Spatial Planning at the Department of Geography and Regional Research. 2 As a research assistant of Prof. Fassmann, I was provided with the opportunity to develop a regional demographic classification under his guidance.

The main research question regarding DEMIFER Activity 2 – and therefore also of this thesis – was specified within the DEMIFER Inception Report (eSPon 2008b:7 – see also Chapter 1.1) and reads as follows:

“How will the demographic development, i.e. natural development of population as well as migration, affect different types of regions and cities?”

Consequently, the effects of demographic and migratory flows on the size and structure of the population and particularly on the labour force need to be assessed. The conceptual framework of DEMIFER Activity 2 focuses on the size and structure of the population and particularly on the labour force (ESPON 2008b:7f). This brings us to the first and principal aim of this diploma thesis, also defined within the DEMIFER Inception Report for Activity 2 (ibid.; p. 40), namely:

“(…) to develop a typology of regions and cities based on demographic variables and to link the resulting typology to economic (…) variables.”

This newly developed typology shall serve as basis for subsequently elaborated models, projections and case studies within the DEMIFER project. 3

To achieve this superior aim (see above), some further aims need to be set:

- Aim 2: Make out the drivers of demographic change in Europe.
- Aim 3: Valuate the plausibility of the developed classification.
- Aim 4: Link the demographic typology with socio-economic variables.

The objectives to achieve these aims are the following:

- Present the demographic status and trends in Europe, as well as the underlying dynamics. (aim 1+2)
- Reveal, if a distinguished European demographic regime exists. (aim 1+2)
- Assess, whether recent demographic trends in Europe are converging or diverging, and if so, at which scale(s). (aim 1+2)
- Point out the importance of regions in terms of population development. (aim 1+2)
- Investigate the available data sources and the applicability of the considered variables. (aim 1)
- Summarise previously developed demographic typologies of (already completed) ESPON projects. (aim 1)
- Develop a methodological approach to conduct hierarchical and non-hierarchical cluster analyses in order to classify European regions by demographic characteristics. (aim 1+3)
- Illustrate the developed classification. (aim 1+3)
- Carry out different cluster analyses and compare the classification results. (aim 3)
- Investigate the essential structure and possibilities of the LFS data set in order to link it to the newly developed typology. (aim 4)
- Use the LFS data as dependent variables for a further illustration of the classification result. (aim 4)

2 See: http://raumforschung.univie.ac.at (retrieved 01.07.2009)
3 The envisaged applications of the demographic typology are specified in Chapter 4.1.1.
1.3 THESES STRUCTURE

After revealing the thesis background, the motivation, as well as the aims and objectives in the introduction, Chapter 2 provides the demographic toolbox, briefly explaining the data background, as well as demographic models, theories and projections for a better understanding of the descriptions and analyses ahead.

Chapter 3 will set the demographic scene for the following topics. Based on an analysis of the demographic status and trends of Europe, the question will be discussed, if anything like a European demographic regime exists and to which extent demographic developments in Europe show converging and/or diverging trends. In doing so, particular attention is paid to the regional perspective of population dynamics, before coming to the central part of this thesis in Chapter 4.

Chapter 4.1 covers the topic of the development of the classification, outlining the principles of spatial classifications and investigating available data sources and potential variables for the cluster analysis and further analyses. The methodological approach to conduct and realise hierarchical and non-hierarchical cluster analyses is also specified in this Chapter. The empirical aspects of this thesis will be treated from Chapter 4.2 on, starting with a compilation of previously developed demographic typologies within the framework of completed (and ongoing) ESPON projects. Chapter 4.2 highlights the newly developed typology of European regions. The classification result will be illustrated in detail in Chapter 4.3. Finally, Chapter 5 demonstrates that the strategy to link the demographic typology with socio-economic variables obtained from the latest European Labour Force Survey (EU-LFS), indeed offers new insights in the principal research question of DEMIFER, which reads as follows: How do demographic and migratory flows affect European regions and cities?

For ease of exposition, a brief summary of the respective empirical findings can be found at the end of Chapter 3, 4 and 5. The closing Chapter 6 concludes the research findings, first of all in the context of the implications caused by demographic change. In further consequence, the limitations and potentials of the classification result are discussed, before closing with the challenges for future research arising from the results presented in this thesis.

Last but not least, a considerable amount of maps at the national and regional scale were produced in the course of this thesis. Although the textual content often refers directly to these maps, most of them are compiled in the appendices 1 to 4 for a better readability of the thesis. In doing so, a small but fine atlas of the demography of Europe emerged, more or less, by accident.
2. DEMOGRAPHIC TOOLBOX

This chapter aims to outline the basics of demography by addressing common measures (Chapter 2.1), underlying theories and models (2.2), and the principles of population projections (2.3). However, the reader might prefer to read the coming empirical parts first (from Chapter 3 on) and come back to the here presented fundamentals and theories later.

WHAT IS A POPULATION AND WHAT DOES A DEMOGRAHER DO?

“To a statistician, the term 'population' refers to a collective of items, for example, balls in an urn.”
PRESTON et al. (2001:1)

Scholars and researchers in the wide field of population studies use the term in a similar way to label a collection of persons. They refer to people alive at a certain time (or date), anchored to a certain territory. The members of these collectives are changing continuously through attrition and accession (cf. PRESTON et al. 2001:1). Furthermore, a population is not only defined by the quantity (of persons), but also by qualitative characteristics expressed by the state of education, health, and socio-economic status. Consequently, we can define a population as follows:

“The population of a certain territory is a quantity, consisting of (qualitative) distinguishable persons, which belong to the territory for a certain time.”
HEINRICHS (1973)5; modified by the author.

Demographic analysis focuses on the changes in the size of populations, on its growth rates and its composition. These aggregate processes are the consequences of (changes in) individual-level behaviour. In this sense, demography is a social science considering the linkage of micro- and macro-level attentively (cf. PRESTON et al. 2001:1f).

4 Population Studies is a more comprehensive term than demography. Besides (formal) demography, it incorporates a wide range of scientific disciplines: e.g. statistics, geography, sociology, history, economy, medicine, anthropology, educational science, etc. (cf. HUSA & WOHLISCHLAGL 2004:5).

5 Cited after HUSA & WOHLISCHLAGL (2004:4)
2.1 DEMOGRAPHIC DATA, VARIABLES & INDICATORS

All main demographic measures are based on events allowing a person to enter or leave a population. Determined by the laws of biology, one has to be born to come into the world and one has to die to leave it. Spatial mobility comes into play as a third possible event, when we see the world as an aggregation of different populations in different territories (world regions, nation states, provinces, districts, etc.). Hence, immigration is another way to enter a population and emigration a way to leave it. Demographic processes on the macro-level (i.e. fertility, mortality and migration) emerge from these demographic events on the micro-level (i.e. births, deaths and spatial mobility).

Population changes are attributable to the magnitude of these flows. Knowing the population stock for a specific date \( N(0) \) and also the number of births \( B \), deaths \( D \), in- and out-migrations \( I \) and \( O \) between time 0 and time \( T \), the population stock at another date \( N(T) \) can be easily calculated by means of the so-called Basic Demographic Equation or Balancing Equation of Population Change (see PRESTON et al. 2001:239):

\[
N(T) = N(0) + B(0,T) - D(0,T) + I(0,T) - O(0,T)
\]

where \( I(0,T) - O(0,T) = \) net migration, \( B(0,T) - D(0,T) = \) natural increase.

This smart equation is the basic framework to understand population change.

2.1.1 THE [MIGRATION] DATA PROBLEM

The availability of demographic data (stocks and flows) cannot always be taken for granted. The most prominent source on population stock data is a census, which is held about every decade in most countries of the world. Besides various non-demographic information, a census captures the stock of the resident population at a specific date (by age, sex, place of birth or citizenship, formal education, occupation, etc.). Because a census does not take place every year, population stocks in between two censuses must be taken from population registers or must be calculated by means of the Basic Demographic Equation (see above). In general, the necessary data on births and deaths (vital statistics) is quite good, because (more or less) reasonable registers exist in almost all countries of the world. The problem is migration statistics, especially when differentiating between stock and flow figures.\(^9\)

Statistics on international migration are difficult to get, most of the time inconsistent and sometimes hard to believe. Unlike registering births and deaths, individual mobility in terms of migration is depending on proactive registration, making it tricky to capture. Apart from that, it is necessary to clarify the questions: Who is an international migrant and how and where shall international migration be recorded? The UN defines a (long-term) migrant by the length of stay:\(^{10}\)

“A person who moves to a country other than that of his or her usual residence for a period of at least a year (12 months), so that the country of destination effectively becomes his or her new country of usual residence.”

In regard to the definition of migrants, the EU issued a regulation in 2007 which is based on the UN criterion, i.e. a period of residence of at least one year (cf. EC 2007b:24).

Another problem is how to register migrants. A census reveals only the migrant stock by asking for the place of birth or the citizenship and the length of stay.\(^{11}\) Most EU Member States register immigrants by means of population registers (e.g. Germany, Italy, Spain and many others), the UK conducts border surveys and France depends on interviews during medical examinations conducted by ANAEM – the National Agency for the Reception of Foreigners and Migration (THIERRY 2008:2). By doing so, the UK and France are confronted with the problem, that immigrants have to declare their intention with respect to the (planned) length of stay a priori to classify them as (long-term) migrants. Even if the registration of immigrants can be managed in a proper way, one is still far away from consistent data on migration flows. To achieve reliable figures on net migration (i.e. the difference of in- and out-migration in a given period), it is also necessary to know about the flow of emigrants. Therefore, migrants would have to report their departure from the previous place of residence, which is often not done at all.\(^{12}\)

\(^{9}\) The flow of migrants is the number of migrants who enter or leave a country in a given period (usually a year). The stock of migrants is the number of migrants present in a country at a specific date (CASTLES & MILLER 2009:xviii).


\(^{11}\) Foreign born or foreign national is another criterion often used to define migrants. This reflects the perception of laws of different types of immigration countries and does not simplify the comparability of migration statistics (CASTLES & MILLER 2009:xviii).

\(^{12}\) An example of biased registration (data of migration flows is the case of Romanian migration to Spain. The Romanian Census of 2002 yielded that around 600,000 people were “missing”. Taking a closer look, most of these missing Romanians might be found in the Member States of the EU15, especially in Spain and Italy. According to the Romanian Statistical Institute (INSSE), the annual net out-migration in the period 2000 to 2006 was around or below 10,000 persons each year. In contrast, Spanish immigration data reveals that almost half a million Romanian citizens settled in Spain between 2000 and 2006. For sure, the Spanish data seems rather trustworthy, as migrants gain access to the Spanish social and health system when registering, whereby they may
Following these arguments, it should be understandable that data on migration (both stocks and flows), if existing at all, can be very unreliable. Because of that, net migration rates are often calculated by means of the basic demographic equation as a residuum of the other known components:

\[ I(0,T) - O(0,T) = N(T) - N(0) + B(0,T) - D(0,T) \]

### 2.1.2 DEMOGRAPHIC INDICATORS

Going into details and explain all kinds of demographic indicators would take us too far afield. At this point, only the most important and common indicators should be mentioned briefly. However, each indicator used in this thesis will be further explained in the coming chapters when (first) mentioned.

**FERTILITY**

The most common way to measure fertility is the *Total Fertility Rate* (TFR):

“The period TFR measures the average number of children who would be born to a hypothetical cohort of women who survive to the end of their reproductive period and who bear children at each age at the rate observed during a particular period.”

Preston et al. (2001:95)

As mentioned in the definition above, the TFR is a hypothetical measure, based on the number of births during a given period (usually a year). This can and shall not be misinterpreted as the “mean number of children per woman”, a notion that only makes sense under a cohort perspective (Sobotka & Lutz 2009:2ff).

In general, demographic indicators can be applied to two different concepts: (1) the concept of a cohort (i.e. longitudinal studies) and (2) the concept of a period (cross-sectional studies). According to Preston et al. (2001:16), a cohort is the aggregate of all units (usually people) that experience a particular demographic event during a specific time interval, e.g. the birth (or marriage) cohort of 1969, which refers to all persons born (or married) in the calendar year 1969. By contrast, a period measure is limited to events during a given time span, e.g. the total number of births of all women during the year 2009, regardless of the mother’s actual age.

A clear statement of the completed fertility of a woman (or of a cohort of women) can only be done ex-post, when this women (or cohort) reaches the end of the reproductive age (i.e. the 50th birthday). The problems connected to this indicator will be further discussed in Chapter 3.2.3. However, the TFR will still be applied in this thesis, because it is commonly used and it is widely understood that a TFR below 2.1 indicates that a population is not reproducing itself – an average of exactly two children per woman is not sufficient for population replacement, if mortality risks of women before age 49 and the sex ratio at birth are incorporated into the calculation.14

Another way to measure fertility is the *Crude Birth Rate* (CBR). Contrary to the TFR, the CBR is an empirical measure displaying the actual number of births over a given period divided by the total population over that period. It is expressed as the number of births per thousand population.15 But also the CBR bears some restrictions: It is a “crude” rate, thus it is distorted by the actual age structure of a population.16 Because of that, the choice of the indicator depends on the actual scope of the measurement. If the focus of interest is to measure the fertility per woman, the TFR is the right choice. In case the scope is set to the number of births in respect to the overall population development in a particular territory, the CBR should be used.

**MORTALITY**

The most common indicator for mortality is the *Life Expectancy* (by sex), expressed by the average number of years of life expected by a hypothetical cohort of individuals who would be subject to the mortality rates of a given period throughout their entire life. The life expectancy is usually applied to newborns (life expectancy at birth), but can also be used with regard to the remaining life expectancy at a certain age. Just as fertility, also mortality can be measured by means of a crude rate; in this case the *Crude Death Rate* (CDR) expresses the number of deaths per thousand population.

**MIGRATION**

Migration flows are usually measured by the number of immigrants and emigrants in a particular area during a given period. The *Net Migration Rate* is the number of immigrants minus emigrants, divided by the (total) population of the destination country or region over that period – expressed per thousand population. The extent of migrant stocks is usually described by the share of migrants (by means of the length of stay, place of birth and/or citizenship) in relation to the total population.

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13 Statistically speaking, the reproductive period of a woman is assumed by the age 15 to 49 years.

14 The replacement level in more developed world regions like Europe is 2.06 children per women, whereas the additional 0.06 children compensate for the fact that 5% more boy than girl babies are born (0.05) and for all women not reaching the age of 50 (0.01). In countries of the developing world, the replacement level is often much higher than 2.06, because of higher mortality. In South Africa, for instance, the compensation for the risk of mortality of women below age 40 is 0.43 children, which sets the South African replacement level to 2.48 children per women (cf. Houb 2010).


16 Imagine a region with massive out-migration, especially of younger persons (women) in their reproductive age, leaving a relatively high share of elderly behind. Even if the TFR (of the remaining women) is relatively high, the CBR might be still lower compared to a region with a low TFR, but with a high share of women in the reproductive age (15 to 49 years).
AGE STRUCTURE
These three main population processes (fertility, mortality and migration) are determining the age structure of a population, as well as the quantitative population development in general. Population change is the aggregation of Natural Population Balance (birth minus deaths) and net migration (immigrants minus emigrants) in a given period, as the basic demographic equation shows. The age structure of a population at a certain date can be best displayed by means of an Age Pyramid – the demographers favourite toy. 17

“A population pyramid tells us about the past, present and future of populations.”
Carl HAUB (2009)18, Senior Demographer at PRB, Washington DC.

Basically, a population pyramid is a bar graph that can be interpreted as a kind of a photograph of how a population looks like (cf. HAUB 2009). Figure 1 shows the population pyramid of (1) Europe (as defined by the UN) and (2) those of the EU27 by 2005, signifying the various delimitations of “Europe” (cf. Chapter 3.1.1). On the left side is the male and on the right side the female population, both depicted by 5-year age groups of birth cohorts. It is striking that there are more women than men at older ages. In the case of the oldest old (i.e. 80+), this is not only because women live longer than men, but also because of non-biological reasons, e.g. the death toll of (male) soldiers during World War II. The historical information to be gained from a population pyramid is much more detailed when looking at those of individual countries or regions. Like reading tree rings, a population pyramid reveals the demographic consequences of the preceding century, e.g. war times, natural disasters, economic crises, societal changes.

The population pyramids of Europe (shown in Fig. 1) do not look exactly like pyramids because of their narrowing bases. The ideal shape for the population structure would be a pillar, which narrows only at the very top as people die of old age. Especially in the EU27, the youngest age group below five years is smaller than the subsequent age group, a pattern that goes on until the age group 35 to 39 years, i.e. the last birth cohorts of the so-called baby boom generation. What does this tell us about the future? Over time, the smaller age groups will move up into the childbearing years. Consequently, the number of potential parents will decrease and the number of births will go down resulting in a shrinking population. 19 But also the stronger age groups in the middle of the pyramid will move up to the retirement age, causing great concern for the social security of those societies affected by population ageing (cf. EC 2008d:20; HAUB 2009).

The share and also the ratio of certain age groups are also commonly used for demographic indicators. With regard to population ageing (see also Chapter 3.2.7 and 4.3.4), the share of the age group 60 years and older (and/or 65+, 80+) indicates the extent of the ageing of a society.20 Related to demo-economic issues, the Dependency Ratio depicts the (quantitative) relation between economically active age groups (15 to 64 years) and the so-called dependent age groups, i.e. the younger age groups (below 15 years) and the age groups in retirement (65+ years). In the case of the EU27 the dependency ratio is 49 (see Tab. 1), which means that 100 people of working age (15–64 years) are opposed to 49 “dependent” persons that are either aged less than 15 years or 65 years and more. The dependency ratio alone does not say anything about the weighting of the index either to the youth or to the elderly. For this reason, the dependency ratio can be divided into a Youth Dependency Ratio (aged 0–14 to 15–64 years) and an Old Age Dependency Ratio (aged 65+ to 15–64 years), which will be addressed in the coming chapters.

17 The terms “age pyramid” and “population pyramid” are used synonymously.
19 This is another useful illustration of the difference in interpreting TFR and CBR: Even if all future mothers would have more children per woman (TFR) compared to their parents generation, the total number of births (CBR) would decline.
20 In this context it is necessary to clarify that a certain age (especially on the individual level) does not say anything about the status of ageing of a person. This is very much dependent on life expectancies in general and physical and mental health in particular.
21 In other publications and context, age groups used for the dependency ratio may be different, e.g. age groups 0–19 / 20–64 / 65+ or 0–14 / 15–59 / 60+ are also commonly used. For this thesis, the age group 15 to 64 years represents the potential labour force, because this comes closest to the situation in the EU27+4 (i.e. the space of actual interest), where people do not start working before age 15 and the official retirement age is around 65 years.
Many other and often much more refined demographic indicators do exist and are applied by scholars in demography. For now, these remarks shall be a sufficient overview of basic demographic measures and indicators.

### 2.2 DEMOGRAPHIC THEORIES & MODELS

What are the reasons behind structural differences of populations and demographic change per se? Various demographic theories and models try to explain differences in fertility behaviour and mortality, as well as the reasons and motivations behind migration movements. In the following, only the most important theories and models will get a mention.

#### 2.2.1 EARLY POPULATION THEORIES

An important demographic principle is thinking in long-term categories (i.e. generations). This basic idea was already known in the ancient world. It lasted until the end of the 18th century, when the first general population theories were developed in the UK. At that time and under the impression of a (formerly unknown) steady population growth, several and often diverging assumptions on the consequences of population development were expressed. By 1761, Robert Wallace argued that mankind would be destroyed by itself due to over-population and suggested to adopt such drastic measures as castration and executions when reaching a certain age. Contrary to that, William Godwin drew a more positive picture in 1793 postulating that there is enough space and food in paradise on earth.

The most famous publication from that time, Thomas Malthus’ Essay on the Principle of Population (1798/1803) is generally acknowledged as the outset of modern demography. The Malthusian view emphasises the negative effects of population growth, assuming that population and food production (by means of subsistence) increase with different ratios to reach a level where no more people can be sustained and any surplus population will die of starvation or other so-called “positive checks” like epidemics, wars or plagues. Malthus believed that mankind could avoid this fate only through moral restraint in order to limit the number of births by postponement of marriage or contraceptives – i.e. so-called “preventive checks”. Although history has proved certain assumptions to be too simple or incorrect, terms like “Malthusian”, “Anti-Malthusian” and “Neo-Malthusian” are still used in demographic discussions, demonstrating the importance of Malthus’ beliefs in respect to the limits of growth of resources and populations.

<table>
<thead>
<tr>
<th>Selected Demographic Indicators (2005)</th>
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<tr>
<td>Population (thousands)</td>
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<td>-------------------------</td>
</tr>
<tr>
<td>World</td>
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<tr>
<td>Europe (UN Def.)</td>
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<td>EU27</td>
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*Population aged 0-14 and 65 and more to pop. aged 15-64

** EU25

Table 1: Selected demographic indicators (2005)

Data source: UN Population Division - World Population Prospects 2008 Revision; Eurostat.

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23 In: Enquiry Concerning Political Justice (cited after LEBHART 2005). To stick with William GODWIN for a moment, interestingly enough (although off-topic) his daughter Mary WOLLSTONE-CRAFT SHALLEY wrote the Gothic horror story Frankenstein, which is somehow in contrast to the positive humanistic attitude of her father. See: http://www.online-literature.com/shelley_mary/ (retrieved 04.01.2010)

24 Following the Malthusian idea, the capacity of human populations to reproduce itself is following a geometrical (exponential) ratio, while the capacity of food production is limited and increases at best in arithmetic (linear) fashion (see BRUIJN 1999:42).
2.2.2 DEMOGRAPHIC TRANSITION

Constant high fertility and mortality levels determined the demography of the pre-industrial era. By contrast, the demography of the industrial era shows low levels of fertility and mortality. The Demographic Transition is (although often referred to as a theory) a model or a narrative describing the way in which, from the 18th century onward, fertility and mortality in several European countries declined in response to changes in the economic structure, the technology and the culture of those societies.\(^{25}\)

"Any society having to face the heavy mortality characteristics of the pre-modern era must have high fertility to survive."

Dirk J. van de KAA (2008:16)

In the course of demographic transition, first mortality declines due to reductions in contagious and infectious diseases, a process that is driven by progress in hygiene and public health measures (LEE 2003:170). As fertility remains high at first, the excess of births over deaths leads to a period of accelerated population growth, as shown schematically in Figure 2.\(^{26}\) This unprecedented natural population growth was, to some extent, compensated by out-migration (van de KAA 2008:13). Fertility begins to decline when couples respond to a greater number of births surviving by voluntarily limiting the family size (ibid., p.1). At the end of the demographic transition, mortality and fertility are in balance again, resulting in enlarged populations within a different demographic regime. Family sizes have become much smaller and life expectancy at birth has increased by several decades.

2.2.3 DEMOGRAPHIC DIVIDEND

As a consequence of the demographic transition, a unique baby-boom generation (i.e. the last strong birth cohorts, before fertility is decreasing) will appear at the basis of the population pyramid. The result is a “bulge” in the age structure, similar to a “demographic wave” which works its way up towards the peak of the population pyramid over time (BLOOM, CANNING & SEVILLA 2002:30). That “bulge” is also evident in the population pyramid of the EU27 (by 2005), affecting especially the age group 35 to 44 years, i.e. the birth cohorts of the 1960s (see Fig. 1).

2.2.4 THEORETICAL APPROACHES TO FERTILITY

But how and why are mortality and fertility declining in response to changes in the economic structure, technology and culture as outlined by the model of demographic transition? The decline of mortality can easily be explained by progress in public health measures and improved personal hygiene, affecting not only the mortality

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25 The concept of the demographic transition is attributed to Frank W. NOTESTEIN (1945). Actually three persons developed it independently. Besides Notestein, those were Adolphe LAUNDRY (1929) and Warren S. THOMPSON (1934) – see van de KAA 2008:3ff.

26 According to LEE (2003:170), there are cases in which fertility declined first, notably the USA and France.

27 Edward Hugh is Barcelona based economist of British extraction, see: http://demography.matters.googlepages.com/edwardhugh (retrieved 06.01.2010)

28 It should be pointed out that a demographic dividend only can be distributed, if appropriate efforts are made to develop and strengthen the human capital (i.e. education and health), especially those of the last strong birth cohorts.
at older ages, but also the prevailing high mortality in infancy and childhood at that time. The increase in life expectancy was driven first and foremost by the decrease of mortality at young ages. Mortality decline must be assumed to be a necessary condition for fertility decline, because low fertility is not compatible with high mortality. However, mortality is not the sole agent of fertility decline.

“Both mortality and fertility decline are likely to be responses to broad changes in society, such as improvements in standard of living, increased urbanisation, rising aspirations and so on.”

Dick van de KAA (2008:29)

According to the Neo-classical Theory of Fertility Decline – referable to Gary S. BECKER (1960) – the demand for children is subject of a cost-benefit consideration and hence varying with household income. Consequently, the “utility” of children can be compared to other “consumer” goods. By maximising that utility, parents are rather seeking for quality (education and health) than for quantity in regard to their offspring (van de KAA 2008:19). The Easterlin Hypothesis (or Synthesis) extended the economical approach by a demand/supply-framework, connecting fertility decisions to the family’s preferences for consumption (MACUNOVICH 1997:121; van de KAA 2009:20). The Wealth Flows Theory of Fertility Decline, developed by John CALDWELL (in 1976) is based on the direction in which wealth flows within a family. In traditional societies, this intergenerational flow goes from children to their parents, whereas the direction changes in modern societies. The explanatory model for still having a “non-zero fertility” is based on so-called “emotion flows” which can best be explained by a culturally induced ideal family size (HUSA & WOHLSCHLÄGL 2004:118ff).

These important (economical) theories of fertility decline assume a rational behaviour behind fertility intentions. As soon as mortality declines and children are not considered anymore as labour force for familial production and a pension plan (at least, where public old-age pension schemes exist), it would be irrational to maintain the population – slightly more than two babies per woman.

However, mortality is not the sole agent of fertility decline. According to van de KAA (2008:7), the demographic transition did not make a soft landing. By the late 1970s the demographic community agreed that something special was taking place in Western Europe. Since the mid 1960s the high levels of fertility – generating the so-called baby boom – disappeared as rapidly as snow is melting in the sun. It became evident that this downturn of birth rates (below replacement level) represented more than a temporary fluctuation. In a joint article (in 1986), Ron LESTAEGHE and Dirk van de KAA identified many trends and behaviour regarding family foundation and fertility that they posed the question whether one should not speak about a Second Demographic Transition (van de KAA 2008:9ff)?

“The first and the second demographic transition are characterised by opposite trends in mean ages at marriage, cohabitation and illegitimacy.”

Ron LESTAEGHE & Karle NEELS (2002:7)

While during the first demographic transition (FDT) the family became a stronger institution, van de KAA (2008:11) argues that its weakening can be considered characteristic for the second demographic transition (SDT). Contrary to the FDT, divorce rates and cohabitation are rising and remarriages are declining (in favour of post-marital cohabitation) in the course of the SDT. Accelerated postponement of parenthood and rising childlessness in unions pushes fertility levels down to record low levels (LESTAEGHE & NEELS 2002:8).

The SDT stresses elements of social and cultural change, highlighting people’s views on life, their social philosophy and their ideological orientation on the actions they take. People in contemporary Western societies internalised post-modern values such as self-fulfilment, personal freedom of choice, individual life styles and emancipation (van de KAA 2008:23). On the one hand, the expansion of the educational system enables women to invest in themselves and thus increasing their desire to be an active member of the labour force. On the other hand, it leads to growing conflicts between female employment and motherhood (SOBOTKA 2004:14ff).

2.2.5 A SECOND DEMOGRAPHIC TRANSITION?

The demographic transition (see Chapter 2.2.2) explains the path from high to low levels of fertility and mortality. At the beginning and at the end of this transitional phase, the growth of population is moderate. It was generally accepted that the post-transition stage would achieve a new long-term equilibrium, i.e. an approximate balance of birth and death rates (van de KAA 2008:7).

“Demographers assumed that fertility would settle down at about the level required to maintain the population – slightly more than two babies per woman. The trouble is, nobody told Europe’s women.”

Fred PEARCE (2010), The Guardian.

Referring to the demographic transition, the so-called Epidemiological Transition explains the shift in mortality patterns from infectious diseases in pre-industrial societies to chronical diseases in contemporary higher developed societies (BAHR 2004:172ff).

The article “Two Demographic Transitions?” was originally published in Dutch language, in a special issue of the sociological journal Mens en Maatschappij. It is worth mentioning that the article’s title contained a question mark (cf. LESTAEGHE & NEELS 2002; van de KAA 2008).
“Transition is usually conceived in an evolutional and unidimensional way, with a clear view of the starting and finishing points as well as the path.”

Saul Estrin (2009:7) 31

Although the SDT constitutes the current mainstream concept among population scholars dealing with demographic change in European societies, it should be noted that a dividing line between supporters and sceptics of the ideas behind the SDT exists in the scientific community.32 However, it is indisputable that new values induce new behaviours and new behaviours affecting family foundation do have demographic consequences (cf. Billari & LiebRöR 2005:1f). In the case of the SDT, these consequences can be summarised as follows: Fertility dropped close to or below replacement levels and natural population growth rates are becoming negative. As shown in Figure 3 and true for large parts of Europe, population numbers are kept from falling dramatically only because of the influx of migrants (van de Kaa 2008:14).

2.2.6 FORMS AND THEORIES OF MIGRATION

After clarifying the definition of international migrants in Chapter 2.1.1 by means of the length of stay (of at least one year), we will now turn the attention to the various forms and theories of migration. With respect to migration theories, it should be said in advance that migration research must be seen as a multidisciplinary field. Although migration is one of the three main variables of demography, the process of migration is a topic involving as many scientific fields as the term “population studies” captures.33

FORMS OF MIGRATION

According to UN definition (UN 2009a:15) “human mobility” is the ability of individuals, families or groups of people to choose their place of residence, whereas “human movement” is the act of changing the place of residence. Correspondingly, the second important key term for the definition of a migrant – besides the length of stay – is the act of changing the “place of residence”. In this sense, commuting (i.e. travelling) between home and work is not a form of migration per se. This thesis will stick to classical forms of migration (see Fig. 4), implying the act of changing the place of residence for longer than a year.34

MIGRATION THEORIES

Although it is international migration, which is first and foremost in the public eye, the quantity of internal migration is far larger.35 Nevertheless, most migration

31 Saul Estrin is Head of the Department of Management at the London School of Economics.

32 Some scholars challenge the uniqueness of the SDT, arguing that it is a continuation of the FDT and that the empirical validation outside North-western Europe, North America, Australia and New Zealand is missing (Coleman 2005;119f). According to Billari & LiebRöR (2005:2), van de Kaa suggested to replace the term “transition” by “revolution” in order to defuse the topic – see also the quote of Saul Estrin above.

33 See (4)

34 Contrary to short or medium-distance commuting, the more recent concept of Transnational Mobility can be classified as migration. Thereby, a secondary place of residence is established in order to work at a more distant place beyond a border. Circular Migration starts a regular migration (or human movement), but ends with returning to the usual place of residence (cf. FASSMANN 2008b:21).

35 “Internal migration” means human movement within the borders of a country, usually measured across regional, district or municipal boundaries. “International migration” is a human movement across international borders, resulting in a change of country of residence (UN 2009a:15).
theories are conceptualised with respect to international migration, implying different institutional settings of nation states. To shed some light on the motivations and structural forces of contemporary migration, the most important theories shall be outlined in brief.

Based on the Neo-classical Theory of Economics, the Neo-classical Theory of Migration became very popular in the second half of the 20th century. It is based on the assumption that regional disparities in labour markets (and wages) generate migrant flows, affected by so-called “push and pull factors”. Such flows then equalize wages towards economic equilibrium. In terms of the neo-classical theory, migrants act strictly rational – by weighing up the costs and benefits of a potential migration decision – and the migration process works as a compensating mechanism for regional disparities (CASTLES & MILLER 2009:21f).

Another economically influenced migration theory is the Dual (or Segmented) Labour Market Theory, amplifying the importance of institutional factors, as well as race and gender. This theory, developed in the late 1970s, stresses that international migration is driven by structural demand for highly and lower skilled labour in advanced economies (CASTLES & MILLER 2009:23). In terms of labour market bifurcation, the primary sector provides high wages and steady jobs (for native workers), while the secondary sector offers low wages, little stability and opportunities for advancement (MASSEY 2002:146). Because natives hardly accept such secondary sector jobs, a structural demand for immigrant workers is generated.

The New Economics of Labour Migration places special emphasis on social groups (families, households and communities), arguing that isolated individuals do not make migration decisions (CASTLES & MILLER 2009:24). Effectively, a family or household diversifies the sources of income through migration. Emerged in the early 1990s, this approach specifically implies the phenomenon of international remittances flows (MASSEY 2002:145).

Taking today’s accelerated globalisation into account, the World Systems Theory is based on the disparities between (economic) centres and peripheries. The existence of so-called “global cities” in less developed countries accelerates rural-urban migration associated with growing informal economies as well as rural change and rapid urbanisation (CASTLES & MILLER 2009:26). Rapid technological improvements in transportation and communication are important drivers of globalisation. These developments enable migrants to maintain close links with their places of origin and facilitate the growth of circular and temporary mobility. In this context, the Theory of Transnationalism stresses the emergence of “transnational communities” when people migrate repeatedly between two or more places where they have economic, social or cultural links (ibid., p. 30f).

Continuation and amplification of existing migration flows are in the focus of the Migration Networks Theory. It is based on the assumption that networks supply migrants with information in regard of the destination (e.g. housing, job opportunities) and are hence reducing the costs and risks of migration decisions. Additionally, networks enable migrants to interact with their family and friends who stayed behind in the country of origin (IDM 2003:15).

“Migration is a process which affects every dimension of social existence, and which develops its own complex dynamics.”

Stephen CASTLES & Mark J. MILLER (2009:21)

A single theory cannot deliver a comprehensive explanatory model for all factors and interactions of contemporary international migration. Therefore, one should be aware that every migration theory responds to a specific perspective of the phenomenon and thus highlights only certain aspects of the complex process of migration.

EUROPEAN MIGRATION SYSTEMS
According to CASTLES & MILLER (2009:27) a migration system is constituted by two or more countries, which exchange migrants with each other. Such a system arises from the existence of historic links between sending and receiving countries based on colonisation, political influence, trade, investment or cultural ties. In this respect, migration systems explain why flows from certain countries of origin to particular destinations continue to exist (ibid., p. 27f).

36 Push factors (demographic growth, low living standards, lack of economic opportunities, political repression, etc.) impel people to leave the areas of origin and pull factors (demand for labour, economic opportunities, political freedom, etc.) attract them to certain receiving countries (CASTLES & MILLER 2009:22).

37 Global Cities are considered as important node points in the global economic system. According to Saskia SASSEN (2001:viii), the analysis of such cities can be described, amongst others, by terms like “practices of global control” and the “infrastructure of low wage jobs necessary to serve the global economy”.

38 A much older term for transnational communities is “diaspora”. However, the term diaspora has strong emotional connotations, while the notion of a transnational community is more neutral (CASTLES & MILLER 2009:31).

39 For further reading on current European migration systems, see the (German-language) article “Das europäische Migrationssystem – Facetten einer neuen Geographie der Migration” by Felicia tas HILLMANN (2008).
Over centuries, Europe was the prime source region of world migration. In the course of the second half of the 20th century, all countries of Western Europe became destinations of international migration (MÜNZ 2009:5). Since the 1950s some countries (like Germany, Austria and Switzerland) actively recruited labour migrants. Other countries (e.g. Belgium, France, Italy, the Netherlands and the UK) experienced the return of settlers and labour immigration from their former colonies (FASSMANN & MÜNZ 1996:29; CASTLES & MILLER 2009:102). The oil price shock in 1973 – connected with the stop of labour recruitment and the simultaneously beginning of family reunion and settlement – can be considered as the first break of the ongoing influx (FASSMANN & MÜNZ 1996:22f; CASTLES & MILLER 2009:100).

“As population projections will also be a topic in the coming chapters, this concept should not go unmentioned.”
Paul DEMEY (2003:28)

2.3 POPULATION PROJECTIONS

As population projections will also be a topic in the coming chapters, this concept should not go unmentioned. Projections are always based on the current age structure and assumptions about future developments of the three demographic main variables, operationalised by age- and sex-specific rates of births, deaths and net migration (BIRG 2001:88). The best-known global population projections are produced by the UN (since the 1950s), but also by other institutions like the United States Census Bureau (USCB), the International Institute for Applied Systems Analysis (IIASA), and the World Bank (cf. O’NEILL et al. 2001:206). Referring to the EU, especially the (national and regional) population projections of EUROSTAT must be considered highly relevant.

2.3.1 ASSUMPTIONS & VARIANTS

Assumptions on European fertility developments differ between UN and EUROSTAT. In the case of the UN, all European countries are categorised as “low-fertility countries” (i.e. countries with a fertility at or below 2.1). The UN assumes that all these low-fertility countries will remain a TFR below 2.1 in the course of the next decades, whereas those countries with a current TFR below 1.85 will stay below this threshold (UN 2003:12). By contrast, EUROSTAT recognises that fertility patterns of the EU Member States must be characterised by different stages of transition towards late childbearing (see also Chapter 3.2.3). On average, the TFR across EU countries is assumed to be between 1.4 and 1.9 until 2050 (LANZIERI 2006:7).

“The future is not set in stone.”
Tadeusz KUGLER & Siddhart SWAMINATHAN (2006:593)

With respect to mortality, both UN and EUROSTAT assume that life expectancy at birth will further increase (by a fixed number of years per decennial), whereas EUROSTAT expects mortality trends in the New Member States to converge to EU15 rates (LANZIERI 2006:7; SKRIBEK et al. 2007:5). Contrary to fertility and mortality trends, migration flows – as mentioned above – depend on a large range of factors, including short-term policy measures. The associated uncertainties make migration assumptions hard to predict. This is of particular importance to smaller projection areas like regions and municipalities.

“Immigration is much easier to start than to stop.”
Douglas MASSEY (2002:152)

During the Cold War, East-West migration within Europe occurred only in the course of political crises. However, since 1989 intra East-West migration regained momentum. As a result, first Germany and since the late 1990s also Spain and Italy – both previously recognised as “classical” out-migration countries – became the prime destinations for labour migrants from Central and Eastern Europe (MÜNZ 2009:5).

“Immigration is much easier to start than to stop.”

For more information on the (German) Guestworker System, see e.g. CASTLES & MILLER (2009:100).

40 During and after the Hungarian Uprises (1956), the Prague Spring (1968), the Solidarity, Freedom and Economical Crisis in Poland (1980–81) and the Yugoslav Wars (in the 1990s), Western Europe received hundreds of thousands of refugees from these countries (FASSMANN & MÜNZ, 1996:24f).

41 Often, the terms “projection” and “forecast” are used interchangeably. However, in some cases demographers differentiate between the terms based on the implied likelihood of the outcome. Projections are defined as the numerical consequences of an assumed set of future paths, whereas a forecast is defined as the most likely projection (cf. O’NEILL et al. 2001:72).

42 At the global scale, migration does have no effect on population projections.
The combination of such assumptions produces different variants, which are based on certain scenarios for each demographic component (i.e. “what-if-models”). These scenarios might vary widely by outcome. However, the most common variants are based on “low”, “medium”, “high” and “constant” future development paths in regard to fertility, mortality and migration. Figure 5 demonstrates the different results of the UN projections under four fertility assumptions for Europe (by UN definition) and the EU27 until 2050.

2.3.2 Accuracy of Population Projections

Several population projection techniques do exist. No single model or technique is more suitable for all purposes than others, as each has its strengths and weaknesses (SKRIBEK et al. 2007:19). However, a further explanation would go beyond the scope of this thesis. In general, all projections are simplifications and hence are prone to serious errors if extended beyond realistic limits (KUGLER & SWAMINATHAN, 2006:582f).

According to O’NEILL et al. (2001:265f) projections have tended to become more accurate over time. Generally speaking, projections are less accurate at the country level than at global levels, and errors grow with the duration of the projection (PRB 2001:2). Finally, the quality of a projection’s output is strongly dependent on the quality of its input (based on accurate data and assumptions).

**OF COURSE …**

A lot more could be said about demographic data, indicators, projections as well as theories and models – as implied by this chapter’s inflation of footnotes and references. However, these accomplishments should be sufficient for understanding the state of the demography of Europe at the beginning of the 21st century.
After outlining the underlying theoretical aspects of demography in general, from now on emphasis will be placed on empirical findings, starting with a description of the state of demography in Europe. The status quo will be first summarised at the scale of European countries and broader regions (Chapter 3.2), before also focussing at the regional level perspective of the EU27+4 (Chapter 3.3). Considering demographic trends on different scales since 1950, the question will be discussed, whether something like a European demographic regime exists, and if the demography of Europe is on a converging or diverging pathway (Chapter 3.4).

### 3.1 DATA SOURCES

The most recent demographic data for European countries is available for 2007 (UN Population Division – World Population Prospects: 2008 Revision) and 2008/09 (Eurostat). Nevertheless, the presented analyses will stick to the base year 2005 with good reason. The core of this thesis – i.e. the demographic typology of European regions (see Chapter 4) – is based on regional data at NUTS 2 level, which was available for 2005 in a reasonable consistent form by the time the typology was developed.

Even by today, the year 2005 can be assumed as virtually up-to-date, because demographic structures are rather persistent in the short-term; contrary to e.g. economic developments. This phenomenon is known as “population momentum”, which refers to the demographic dynamics, which are inherent to a particular age structure.\(^{46}\) Past and possible future demographic trends will be made apparent by the period 1950 to 2005 and by population projections to 2050. These projections refer to the UN medium variant, unless otherwise stated.

Since Eurostat provides national and also regional data especially for EU Member States (plus candidate and EFTA countries), it will be used as the source for Chapter 3.3 and beyond. The descriptive analysis of European countries and broad regions in Chapter 3.2 is mainly based on UN data, providing data also for Non-EU countries, complemented with data from Eurostat and various other sources.

\(^{46}\) Take, for example, the young age structure of a considerably increasing population: in a young population, even if fertility falls sharply, the numbers of potential mothers will continue to increase for another generation when these last strong cohorts get into fertile age (Keyfitz 1971; cited after O’Neill et al. 2001:258).
3.2 THE STATE OF DEMOGRAPHY IN EUROPE

Before going into detail on the demography of Europe, it should be made clear what is meant by the term Europe. What is Europe? Where does Europe end? Just throw this questions into a group of people and you might launch an inspired discussion. This question is by far not restricted to academic cycles. Thinking of recent discussions on future EU expansions, it is certainly also a political topic.47

"Europe is so well gardened that it resembles a work of art, a scientific theory, a neat metaphysical system. Man has recreated Europe in his own image."  
Aldous HUXLEY (1929:128)

To curtail this issue, from the geographical perspective it is beyond question that Europe’s boundaries are relative. Delimitations of areas always are social constructs. Besides geographical arguments, the question can also be discussed by means of historical and cultural arguments (i.e. the “Christian Europe”, origin of the Enlightenment and subsequently of democracy, market economy, as well as humanism, capitalism and socialism) and, last but not least, in terms of incorporation and membership of “European” institutions (cf. FASSMANN 2007).

3.2.1 EUROPE OF THE NATIONS

Without digging too deep into the “What is Europe”-topic, it appears reasonable to stick to the institutional perspective for the coverage of the demographic status of Europe. For sure, this approach makes sense when covering a EU/ESPOn project like DEMIFER (see Chapter 1.1).

But even within an institutional framework, many different definitions of Europe exist, simply because many institutions cover European perspectives. In the following, a short overview of organisations contributing valuable (demographic and socio-economic) data on Europe shall be given. Since such data will be used throughout this thesis, it should be made clear from the beginning, which definitions of Europe are applied by the different data suppliers (i.e. institutions). The differences between the two main definitions – Europe by UN-definition and EU/EFTA Europe – can be gathered at best and in detail from Map 1 and 2.

The United Nations (UN), literally a global organisation, is sub-dividing the entire world in several major areas.48 Thereby “UN Europe” is including 48 countries and ter-

47 Since 1999 Turkey is a pre-accession country of the EU. Nevertheless, European politicians (and citizens) are still discussing, if Turkey shall be assumed as part of Europe.
ritories from the Atlantic Ocean to the Black Sea, further divided into four geographical distinguished groups (see Map 1). According to the UN definition, Cyprus, Turkey, as well as the Caucasian countries (i.e. Georgia, Armenia and Azerbaijan) are not part of Europe.

Today, the European Union (EU) consists of 27 Member States (see Map 2). In 1957, six nations (Germany, France, Italy, Belgium, The Netherlands and Luxembourg) were laying out the foundation of the modern EU by signing the Treaty of Rome. Several countries joined during the 1970s (UK, Ireland and Denmark), 1980s (Greece, Spain and Portugal) and 1990s (Austria, Finland and Sweden). This Union of 15 members, the so-called EU15, expanded in 2004 by ten more Member States.

Besides the two Mediterranean island states of Malta and Cyprus, eight former Eastern Bloc countries (Poland, Slovakia, Slovenia, the Czech Republic, Hungary, Estonia, Latvia and Lithuania) joined the EU by 1st May 2004, only a decade and a half after the fall of the Iron Curtain. Together with Romania and Bulgaria, which entered the EU in 2007, these twelve New Member States (NMS) became also known as EU12. At the moment three candidate countries (Turkey, Croatia and the Former Yugoslavian Republic of Macedonia/FYROM) are queuing up, and the remaining Balkan countries (Serbia, Montenegro, Bosnia and Herzegovina, as well as Albania and Kosovo) hold the status of potential candidate countries (EUROPÄISCHES PARLAMENT 2008:8ff).

The European Free Trade Association (EFTA) consists of four countries – Iceland, Norway, Switzerland and Liechtenstein (see Map 2) – and is closely associated with the EU. Switzerland is anyway strongly connected with the EU by bilateral agreements. Through the Agreement on the European Economic Area (EEA), the other three EFTA countries constitute a single internal market together with the 27 EU Members. Also Iceland is currently abandoning its reservations against a EU membership in the aftermath of the banking crisis, which shook its economy to the very foundations. Together, the 27 EU countries and the four EFTA countries form the ESPON space, also referred to as EU27+4 (see Chapter 1.1.1).

In the case of the Organisation for Economic Cooperation and Development (OECD), the definition of Europe is simply depending on the membership of a country in this particular organisation – just same as with the EU and EFTA, and the Council of Europe (see below). “OECD Europe” comprises the EU15 countries plus the Czech Republic, Hungary, Iceland, Norway, Poland, Slovakia, Switzerland and Turkey.

With its 47 member countries (including the Caucasian countries and Turkey), the Council of Europe (COE) virtually covers the entire European continent, besides Kosovo and Belarus. The exclusion of Belarus is related to the obvious discrepancies in

50 See: http://www.efta.int/content/eea/eea-agreement (retrieved 07.07.2009)
3.2.2 POPULATION SIZE

In 2005, the population of Europe (by UN definition) amounted to 729 million people, whereof 490 million lived in the EU27. With respect to the global scale, DEMENY (2003:4) complains about the demographic marginalisation of Europe, as it happened during the 20th century and which will further accelerate in the 21st century. Today, Europe accounts for 13.4% of the world’s population, whereas half a century ago, the share of Europe was still above 20%. Since 1950 Europe’s population has been growing by around 180 million people, and still continues to grow. However, the rest of the world, especially Asia and Africa, was and still is growing much faster (see Fig. 6 and 7).

Population sizes of European countries vary substantially. The Russian Federation (2005: 143 million) is the biggest European country (both by population and area) while Liechtenstein, Monaco and San Marino (all between 30,000 to 35,000 inhabitants) are the smallest, apart from the Holy See (with a resident population of less than 1,000). However, the actual size of a population does not constitute a challenge or potential per se – but rather its density, which also varies extremely (see Tab. 2). What matters more is the population’s structure – characterised by age, sex and further characteristics such as educational attainment, skills, health, etc. – and the underlying dynamics (i.e. demographic trends).

POPULATION GROWTH

The further elaborations of the state of demography in Europe will concentrate mainly on the demographic structure and dynamics. In this respect, the first interesting question is: Which European countries are (still) growing and to which extent?

Between 2000 and 2005 the whole of Europe (without Cyprus, Turkey and the Caucasian countries) was growing on average by 0.08% per year. This stagnating trend can be observed since the early 1990s (see also Fig. 6 above). The dichotomy of countries with increasing and decreasing populations is illustrated in Map A1.01 (in Annex 1), which is featuring the short-term trends in population growth between 2000 and 2005 in Europe by country. Keeping the UN definition of European regions in mind, more or less all Northern, Western and Southern European countries have growing populations, with the exception of the three Baltic States as well as the former Yugoslavian countries Serbia, Montenegro and Croatia. By contrast, almost all Eastern European countries experienced a population decline in the first years of the 21st century.

When looking at the long-term trend in population growth of the four geographically distinguished European regions (see Fig. 8), it was Eastern Europe, which had the strongest population growth rates (around 1.5% per year) in the early 1950s. Since then the population growth declined steadily and, as a consequence of the political and societal turmoil, became negative since the early 1990s. The Republic of Moldova was affected strongest by the shift in population growth. During the period 1950 to 1955, it had the highest population growth rate of all European countries, reaching annual average growth rates of 2.31%. Contrary to that, during the period 2000 to 2005 Moldova had the most negative growth rate (avg. p.a. – 1.72%) in Europe (see also Fig. 33 in the forthcoming Chapter 3.4.1). The population growth rates of Northern and Western Europe were increasing from 1950 onwards, reaching a peak of 0.8% during the period 1960 to 1965. In the 1970s and early 1980s the annual average growth rates declined below 0.2%. Since then, growth rates of Northern and during the 1990s especially those of Western Europe were increasing again, reaching a level of around 0.4% by 2005. Among the Northern

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54 The EU27 population exceeded 500 million in the course of the year 2009.
55 Depending on perspectives and authors, the Baltic and former Yugoslavian countries can be also considered as Central and Eastern European (CEE), or Central European (Baltics) and South-Eastern European (Ex-Yugoslavia) as done by the Council of Europe (cf. KUPIZEW/SiO et al. 2006:9f).
56 Assuming that the rate would stay constant over time, an average annual growth rate of 2.31% means that the population would double within roughly 30 years.
European countries, the Baltic States (of Estonia, Latvia and Lithuania) are the only countries with negative growth rates – for the same reasons as the Eastern European countries. Ireland, which was the only Northern European country with negative growth rate in 1950/55, was exhibiting the strongest population growth rate (of nearly 2% p.a.) in Europe during the period 2000 to 2005. All Western European countries had a positive population growth in 2000/05, whereby Luxembourg was experiencing the strongest growth (1.2% p.a.).

Southern Europe had a constant population growth of around 0.75% per year during the period 1950 to 1980, followed by a period of decreasing population growth until the end of the 20th century. Since then – in only 5 years – it recovered from 0.2% to 0.65% per year, which makes it the strongest growing region in Europe by 2000/05. Apart from the former Eastern Bloc countries, also Albania and Bosnia-Herzegovina are examples for sudden changes in the rate of population growth. In the aftermath of the downfall of Albania’s communist regime after the death of Enver Hoxha in 1985, the population growth rate of the by then absolutely isolated country declined from 2% to –1% within 5 years. Even more drastically, the annual average population growth rate of Bosnia-Herzegovina declined from around 1% to less than –5% in the course of the Bosnian War (1992–1995) – see also Figure 32 in Chapter 3.4.1.

Since 1950, the annual average population growth rate of Europe was at no time negative, but rather stagnating (~0.02%) during the period 1995 to 2000. By 2000/05 the population of the European continent was growing by 0.08% per year. The question, which demographic factors or variables (i.e. fertility, mortality and migration) determine the population growth or decline, shall be discussed in the coming chapters.

3.2.3 Fertility

The annual average number of births in Europe declined steadily from 12.4 million in 1950/55, to around 10 million in 1980/85 and to less than 7.5 million in 2000/05. That trend is clearly recognisable when looking at the population pyramid of Europe, which rather looks like a rugby ball because of the decreasing number of births (see Fig. 1 in Chapter 2.1.2).

CRUDE BIRTH RATE (CBR)

The CBR – expressed as the number of births per thousand population – offers the possibility to put these millions of births in a clearly understandable relation, e.g. to compare countries or regions of different population sizes and numbers of births with each other. Most European countries had a CBR below 10 births per 1,000 population in 2000/05 (see Map A1.02). Besides Turkey and Azerbaijan, only Ireland has a CBR of more than 15, with Iceland, Albania, Montenegro and France close behind. The whole of Europe reaches a CBR of just above 10, which is less than half as much as it was in 1950/55.

As with the population growth rate, it was Eastern Europe, which had the highest CBR by the mid 20th century (above 25) and also from 1975 to 1990 (around 16). Since then the Eastern European CBR fell below 10 (see Fig. 9). On the country level, Poland and the Republic of Moldova showed the highest CBR of around 30 by 1950/55. Half a century later, Moldova is the only Eastern European country with a CBR of more than 10 (see also Fig. 27 in Chapter 3.4.1).

From 1950 to 1970, the CBR of Southern Europe was stable at a level of around 20. From then on it declined steadily, before levelling at 10 births per 1,000 population in the period 1995 to 2005. It was the Balkan countries of Albania, Bosnia-Herzegovina and Macedonia, which featured the highest CBR (of around 40) in the 1950s. Today, Albania is still responsible for the highest Southern European CBR of about 15. By contrast, the CBR of Italy is below 10 since 1985. The only Southern European country, which strives against the stream of declining birth rates, is Montenegro. During decades (and as an autonomous republic of the former Federal Republic of Yugoslavia), this tiny Balkan country featured the lowest CBR of all European countries. However, between 1985/90 and 1990/95 the CBR of Montenegro was rising from 8.2 to 13.5 (per 1,000).

In Northern and Western Europe, the trend in the CBR followed a similar path of a moderate decline. From 1950 to 1970 the CBR of both regions was stable at around 17 – by then the lowest level in Europe – and declined (a bit stronger in Western Europe) during the 1970s. Today, these two regions have the highest birth rates of eleven births per thousand population. While the development of the CBR was relatively similar among Western European countries (only the Netherlands had substantially higher birth rates in the 1950s and 1960s), the Northern European birth rates were more heterogeneous in the course of the last 55 years. While Ireland and Iceland
always featured the highest birth rates, the Baltic countries have the lowest CBR (below 10). Today, all other Northern European countries have a CBR between 11 and 15 by 2000/05 (see also Fig. 27 in Chapter 3.4.1).

**TOTAL FERTILITY RATE (TFR)**
The absolute number of children born is strongly depending on a population’s actual age structure, i.e. the size of the cohorts of woman of childbearing age. In Europe, the cohort size of women aged 15 to 49 years was increasing since the mid 20th century, from 151.4 million in 1950, to 172.2 million in 1980 and 183.9 million in 2005. In this respect, it is obvious that the decline in European birth rates cannot be solely explained by a structural effect caused by the declining cohort size of woman in childbearing age. To answer the question why European women have fewer and fewer babies, the changing reproductive behaviour must be taken into account. Indications for these behavioural changes can be gained from the previously discussed theories of fertility decline and the model of demographic transition (see Chapter 2.2).

As mentioned in Chapter 2.1.2, the CBR is an appropriate fertility indicator when measuring the overall population development in a particular territory. Because it is measuring births per thousand population, it is strongly related to the actual age structure of a population. For that reason, the CBR might deliver a distorted picture when focussing on fertility behaviour at the individual level (i.e. births per woman). The period TFR of a given year is clearly the right choice to quantify the fertility behaviour of women during their reproductive age. Nevertheless, it is worth noting that the TFR is a hypothetical indicator, based on childbearing probabilities currently observed for women of different cohorts (cf. EC 2008d:28).

When looking at the TFR of European countries during the period 2000 to 2005, only Turkey shows a fertility rate above the replacement level of 2.1 children per woman. Apart from Turkey, only Iceland, Ireland and Albania – all with a TFR of around 2 children per woman – are getting close to this “magic number” (see Map A1.03). For European standards, also France, the Netherlands, the Scandinavian countries, as well as Serbia and Montenegro show relatively high fertility rates above 1.7. Nonetheless, 17 out of 43 countries feature a so-called lowest-low fertility (of 1.3 or less children per woman) during the period 2000 to 2005.

Corresponding to the CBR, the lowest total fertility rates by 2000/05 can be observed in Eastern and Southern Europe (see Fig. 10), with Ukraine (1.15) on the forefront, followed by the Czech Republic, Slovakia, Slovenia, Belarus, Bulgaria, Poland, Croatia and Italy (all below or close to 1.25) – see Fig. 27 in Chapter 3.4.1. As CBR and TFR share the same numerator (i.e. children born during a certain period), the trend of the TFR is similar to those of the CBR (cf. Fig. 9 and Fig. 10). By 1950/55, both Southern and Eastern Europe had the highest TFR of 2.8 and 2.6 respectively. The TFR of Eastern

Europe declined rapidly until 1965 and stayed relatively constant around replacement level until 1996. From then on it declined steeply to below 1.3. By contrast, the TFR in Southern European increased to 2.7 until 1965/70, before steadily declining to 1.3 in 1995/2000.

In Northern and Western Europe, the TFR was increasing between 1950/55 and 1960/65 from 2.4 to 2.7. These strong birth cohorts from the late 1950s and 1960s generated the so-called “baby-boom generation” in Northern and Western Europe, as birth rates were declining drastically during the 1970s. By 2000/05, Northern and Western Europe again featured the highest TFR (of 1.7 and 1.6 respectively) of all European regions. Overall, the European TFR nearly halved from 2.6 in 1950/55 to 1.4 children per woman in 2000/05.

**CHILDLESSNESS**
Voluntary childlessness is one reason for the downturn in European birth rates. Logically, this indicator can only be applied to those cohorts of women who are at the end or beyond their reproductive age. Data from Italy and the Netherlands – two of the few countries with time series on childlessness – show that the share of childless women nearly doubled to approximately 20% for the birth cohort of 1965, when compared to women born in 1935 (roughly 13% in both countries). Other countries with exceptionally high rates of childless women (aged 40 or older) are Austria, Finland, (West) Germany and Ireland (SOBOTKA 2005:21). According to NIDI (EC 2005a:61f), the proportion of childless women born in 1965 was 15.7% in the EU25. However, this

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57 Per definition (see also Chapter 2.1.2), the period TFR is the mean number of children that would be born alive to a woman during her lifetime, if she were to pass through her childbearing years conforming to the fertility rates by age of a given year (EC 2008d:28).
58 Data Source: Demography Monitor 2005 (EC 2005a:61f – Tab. 2.4); calculations by NIDI.
59 Please note: Although beyond the prime age of childbearing, the birth cohort of women of 1965 (i.e. 40 years in 2005) was still in their reproductive period by 2005.
By the mid-40s, one in three German women live in a childless household, which gives Germany, along with Austria, the highest proportion of such households in Europe.  

It is fair to say that European women are not getting fewer and fewer babies per se, but rather that fewer and fewer European women become mothers. This again gives the number of children per women an even higher importance. Especially the parity of three children and more can determine if the overall birth rate is relatively high or low. Ireland, for example, has a very high share of childless women, but simultaneously 46% of women born in 1960 had three or more children. In Austria, on the contrary, only 15% of the female birth cohort of 1960 had three or more children (EC 2008d:29).

MEAN AGE AT FIRST BIRTH
Another reason for the decreasing number of births in Europe is the change in the timing. By 2005, the Mean Age of First Birth (MAFB) for women in the EU15 Member States was on average 28 years and hence around three to four years higher compared to 1980 (EC 2008d:30). The highest MAFB of around 30 years can be found in the UK, Germany, Switzerland and Spain and the lowest (with less than 25 years) in most Eastern European countries (see Map A1.04).

There is no lack of explanations for fertility postponement. The SDT model offers arguments like self-fulfilment, personal freedom of choice, individual life styles, emancipation, as well as the expansion of the higher female enrolment rates in tertiary education (cf. Chapter 2.2.5). One can assume that the later a woman gives birth to her first child, the less children she will have – simply because the postponement of births to higher ages reduces the time left before the end of the reproductive life span (EC 2008d:31). However, this cannot be the whole truth, as the TFR of European countries does not correlate negatively with the MAFB. In fact, by 2005 the TFR is often higher in the countries with the highest MAFB (e.g. in Ireland, the UK, France and in the Scandinavian countries). In this context, demographers argue that the postponement of childbirth to higher ages makes it more difficult to estimate total fertility rates (ibid.; p.33).

TEMPO-ADJUSTED TFR
As already mentioned several times, the period TFR has to be handled with care. It is based on the assumption that the probability for a woman to have a child when she reaches a certain age will be the same as the probability of giving birth for women who are in this age group today. For that reason the period TFR is sensitive on changes of the MAFB, because a postponement of the first birth, e.g. from 25 to 30 years, means that the probability of giving birth at ages 25 to 29 will fall. Such a process is in strong contrast to the assumptions behind the TFR and generates a downward bias of the indicator, even though women who are postponing may have exactly the same number of children at the end of their reproductive life span (EC 2008d:33).

"Postponement (...) depresses the TFR until the process has come to an end."

Hence it is not merely a behavioural effect (i.e. the actual MAFB), but rather a tempo effect (i.e. the speed of postponement), which distort the period TFR. In order to avoid tempo effect distortions, the Vienna Institute of Demography (VID) developed the Tempo-adjusted TFR (adjusted TFR).

The example of the Czech Republic (Fig. 11) demonstrates that period and adjusted TFR has been just around the same level as long as the MAFB remained constant. From the early 1990s on, the MAFB was steadily increasing and the period TFR was falling sharply due to the tempo effect caused by postponement. By contrast, the adjusted TFR remained on a relatively high level, until it declined a few years later (from the mid 1990s on) because of a decrease in the actual quantum of births.

"It is likely that some of the lowest TFR values in the EU are in fact the result of postponement."
COMMISSION OF THE EUROPEAN COMMUNITIES (EC 2008d:33)

When taking this tempo effect into account (i.e. postponement of births to higher ages), the fertility map of Europe looks somehow different (see Map A1.05) compared to the map of the period TFR (Map A1.03). Around 2005 the MAFB was increasing in almost all European countries and was hence raising the adjusted TFR in relation to the period TFR. Only the Netherlands feature similar values of period and adjusted TFR by 2005, because the postponement process already came to a halt in the early 1990s. Especially in some Eastern European countries, where the postponement process started later compared to Western European countries and was strongly progressing during the first years of the new millennium (e.g. in the Czech Republic, Hungary, Romania, as well as Estonia), the adjusted TFR is considerably higher (up to 0.5) than the period TFR.

"Extreme low levels of the period TFR are closely associated with a rapid postponement of parenthood towards higher reproductive ages and are likely to be temporary."
Tomas SOBOTKA (2008:32)

Recent data suggests that the postponement process has been slowing down in the course of the last few years in many European countries. In fact, the period TFR was resurrecting in almost all lowest-low fertility countries. According to the HUMAN

60 Unlike other demographic indicators, data on MAFB varies strongly from source to source. The UN rather underestimates the MAFB, compared to other data sources (e.g. the Human Fertility Database – http://www.humanfertility.org).
FERTILITY DATABASE, the TFR of the Czech Republic increased from 1.2 in 2004 to 1.5 in 2008. However, a clear statement of recent fertility behaviour can only be made when today’s women in their prime childbearing age (which is roughly equitable with the MAFB) will have completed their reproductive time span in about 20 years.

Using the example of Austria, Figure 12 shows how such an ex post perspective of the period and completed cohort fertility looks like. For a better comparison of the two TFR indicators, the time series of the cohort TFR at age 40 (born between 1936 to 1967) is shifted forward by 26 years – and thus roughly matching the MAFB – against the period TFR (1962 to 2007). It is striking that the two indicators do not match each other. The baby boom, which peaked in the mid 1960s, was accompanied by a decreasing MAFB, which started to increase again from the early 1980s on. In a nutshell, the hypothetical period TFR is overrated compared to the empirical cohort TFR during a period of MAFB decrease, while it is underrated when the MAFB increases.

Beyond that, the cohort TFR is less sensitive against short-term trends in fertility behaviour induced by policy measures like the introduction or suspension of child benefits. However, both the period TFR as well as the cohort TFR delivers informative features, depending on the actual scope of interest.

CHILDREARING INTENTIONS
Finally, the vital point of fertility behaviour on the individual level shall be stressed: What is the intended family size of today’s young adults in Europe? Again, a cross-country comparison delivers a heterogeneous picture.

“Most women can fulfil a typical desire for a two-child family even when they have a first child after age 30.”
Tomas SOBOTKA (2008:34)

According to TESTA (2006:19), the mean ideal family size in the EU is still above two children. A special Eurobarometer 2006 Survey (TESTA 2006:85 – Fig. 24) reveals that women (aged 25 to 39 years) in the Nordic countries, as well as in Ireland, the UK, France and Cyprus intend to have the biggest family sizes of close to and above 2.5 children, while the lowest intentions for larger families are found in Romania (1.8) and Austria (1.7). Comparing these intentions with values of the actual TFR, it seems that the desired (or ideal) family size cannot be realised in any European country by today.

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61 The Human Fertility Database, launched in October 2009, is a joint project of the Max Planck Institute for Demographic Research and the Vienna Institute of Demography. See: http://www.humanfertility.org (retrieved 01.02.2010)

62 Some women in the birth cohorts (1936 to 1967) may still have been in their reproductive period (15 to 49 years). Nevertheless, the cohort TFR at age 40 – which is used in Figure 12 in order to extend the time series – can be assumed as representative, as it deviates by less than 0.1 (children/woman) against the cohort TFR at the end of their reproductive period.
3.2.4 MORTALITY

According to the UN, between 2000 and 2005 around 8.5 million deaths were registered in Europe every year, opposed to less than 7.5 million births. That means that the population of contemporary Europe is not capable to reproduce itself. It has not always been like that. During the 1950s, twice as much births (around 12 million) as deaths (roughly 6 million) were recorded every year. Since then, the number of births and deaths were following a mirror-inverted trend. Expressed on a less positive note, everyone has to die — but that is not the point. For scholars in population studies — and also for individuals — it is more important, at which age (when?) and under which circumstances (why?) people are dying.

CRUDE DEATH RATE (CDR)

The CDR — expressed as the number of deaths per thousand population — presents a good overview for the number of deaths in relation to the overall population and for the comparison of different populations. Showing the death rate for all ages, the CDR is strongly dependent on the actual age structure and thus provides no indication of how to interpret this indicator.

“The crude death rate is a weighted average of age-specific death rates, where the weights are supplied by a population’s proportionate age structure.”

PRESTON et al. (2001:23)

In this respect, it may well be that such (demographically) different countries like Sweden and Gabon feature the same CDR of 10 deaths per 1,000 population per year during the period 2000 to 2005 for both countries. In Gabon, around a quarter of all deaths must be attributed to the youngest age group below 5 years as well as to the oldest age group 70 years and older. In Sweden, by contrast, the age group 0 to 4 years contributes only 0.5% of all deaths, while around 80% occurs in the age group 70 years and older.

That does not mean that the CDR is only relevant for funeral businesses. A wide variety of death rates do exist among European countries by 2000/05 (see Map A1.06). When comparing the CDR of European countries, some important questions become apparent, for instance: Why are 16 out of 1,000 Russians dying every year, while only 6 out of 1,000 Icelanders do? To answer such a question, one would need more sophisticated indicators like age-adjusted death rates, which require more detailed raw data. Another way to decipher the drivers behind mortality is to look at other meaningful measures, e.g. Infant Mortality Rate (IMR) and Life Expectancy at Birth.

INFANT MORTALITY RATE (IMR)

The IMR is the number of infant deaths (below age 1) per 1,000 live births. By 2000/05 the IMR of Europe was as low as 9, corresponding roughly to the average IMR of more developed countries in general. By contrast, the global IMR was above 50 and those of Africa nearly reached 100, which means that every 10th newborn did not survive until the first birthday during that period.

Infant mortality rates of most European countries were very low by 2000/05, but not everywhere (see Map A1.07). Eastern European countries have a considerably higher IMR, especially Albania, Macedonia, Romania, Moldova and Russia (all above 15). Taking the relatively high Russian IMR of 17 into account (compared to just 3 in Iceland) might contribute to a better understanding why the Russian CDR is more than three times higher than the CBR of Iceland.

In the course of the last half a century, the European IMR was declining dramatically from more than 70 (in 1950/55) to below 10 (see Fig. 13). By the mid 20th century, the Eastern European IMR was as high as 91, followed by Southern Europe with 76. Only the Northern and Western European IMR of 33 and 45 were relatively moderate. Indeed, the IMR substantially declined in all European regions during the second half of the 20th century. However, by 2000/05 the IMR in Eastern Europe (14.2) was still three times higher than in the rest of Europe, leaving a great potential for improvement in the survival rate of infants, which are our most precious resource. According to the Demography Report 2008 (EC 2008d:37), Romania could gain about one year of life expectancy by reducing infant mortality to the EU average.

LIFE EXPECTANCY

The IMR is directly affecting a population’s average life expectancy at birth, simply because the less people die in younger ages, the higher is the life expectancy in general. Taking into account the already almost infinitesimally small mortality of infants and children in most parts of Europe, further gains will have to be achieved by reducing mortality in the second half of life ages — apart from reducing the behavioural induced
increased risk of death for (male) teens and young adults between 15 and 24 years.  

Across Europe, an obvious East-West divide exists in regard to life expectancy (see Map A1.08). By 2000/05, average life spans were longest in Iceland, Sweden, Italy and Switzerland (80 years and more) and shortest in Russia (less than 65 years), Belarus, Ukraine and Moldova (less than 70 years). These low life expectancies are the result of failed health care and social reforms during and after the soviet era (LINDNER, 2008:8).

In the last 50 years, European life expectancy increased by nearly a decade, from 66 years (1950/55) to 75 years (2000/05). It was steadily rising in all European regions besides Eastern Europe, where it was almost constant between 1960 and 1990, but decreased during the early 1990s to the level of the late 1960s (see Fig. 14). The reduction in life expectancy was strongest in the Former Soviet Republics of Russia, Belarus, Ukraine and the Baltic countries (see Fig. 30 in Chapter 3.4.1). The strongest increase in life expectancy since 1950 can be observed in Southern Europe, from 63.5 to 78.7 years in 2000/05 – i.e. a gain of more than four month every year.

GENDER GAP
Notable differences in life expectancy not only exist between social groups, but also between men and women. In general, women have a higher life expectancy, referable first and foremost to a different behaviour in respect to their personal health. This gender (and again the East-West) gap becomes obvious when comparing the country-specific life expectancy for men and women (see Map A1.09 and A1.10), illustrated at a glance by Map A1.11.  

“On average, people with lower levels of education, wealth or occupational status have shorter lives and suffer more often from disease and illness than more well-off groups and these gaps are not declining.”

EUROPEAN COMMISSION AND COUNCIL (EC 2008d:11)

In the European countries of the Former Soviet Union (FSU), not only life expectancy is lowest but also the gender gap is highest. In this respect, it is again Russia, which is boasting the highest difference of more than 13 years in 2000/05. According to LINDNER (2008:8), the probability for Russian men to die between age 15 and 60 is nearly 50% – outperformed only by Afghanistan, Sierra Leone and Zimbabwe. The worst enemy of life expectancy is war, as shown by the example of Bosnia-Herzegovina. During the Bosnian War (1992-1995), the life expectancy for men declined by about 13 years.

64 The higher mortality risk of young men (aged 15 to 24) in more developed countries is related to alcohol and drug abuse, traffic accidents and higher suicide rates (cf. KRUGER & NESSE 2004:68).

65 Please note that the legend ranges of Map A1.09 and A1.10 is not identical. The highest life expectancy is depicted in dark brown in both cases, whereas this class refers to 75 and more years for men and 80 and more years for women.

66 The reason for the high risk of death of adult men in Afghanistan must be attributed to decade-long war-times, in Zimbabwe it is the extra-ordinarily high HIV prevalence rate, and in Sierra Leone it can be ascribed to both arguments.
3.2.5 MIGRATION

The basics of migration theories, forms, systems, definitions as well as data sources and its constraints have already been explained in Chapter 2. At this point, the quantitative dimension of international migration flows and stocks in Europe shall be outlined in brief.

In a nutshell, the definition of international migrants either follows the concept of “citizenship” or “place of birth”; hence international comparisons are complicated by the inconsistent data situation alone. Not even the Population Division – where “citizenship” or “place of birth” are collected – is able to harmonise migration data on a global level with respect to both attributes. To avoid misinterpretations, the here used data is labelled accordingly – see also the remarks on Map A1.12.

FOREIGN POPULATION STOCK

According to the International Migration Report 2006 (UN 2009b), around 64 million migrants were registered in Europe by 2005, corresponding roughly to 9% of the total population (see Tab. 3). Western and Eastern Europe came up for around 22 million migrants each (i.e. 11.9% and 7.5% of the resident population), whereby more than 50% of the Eastern European migrant stock must be accounted to Russia alone. Mainly ethnic Russians (from the successor states of the former Soviet Union) migrate or repatriate to the Russian Federation (CASTLES & MILLER 2009:115). By 2005, the Southern European countries were home to around 11 million migrants, constituting a share of 7.2%. The share of foreign population in Northern Europe (i.e. 9 million people) comes up to 9.3%.

Besides Russia, the largest migrant stocks by 2005 were to be found in Germany (10.1 million / 12.3%) and the Ukraine (6.8 million / 14.7%). The latter is distinguished by a similar migration system like that of Russia. Also France, the UK and Spain have quantitatively strong migrants stocks of each around 5 million foreigners. When looking at the share of foreigners (Map A1.12), it strikes that this share is particularly high in smaller countries like Luxembourg (37.4%), Switzerland (22.9%), Latvia (19.5%), Estonia (15.2%) or Austria (15.1%). For the Holy See (i.e. Vatican State), the UN (2009b) assumes the highest possible share of migrants of 100% – an indisputable fact, both in a secular and a sacred perspective. Besides Turkey and Azerbaijan, the smallest shares of foreign population in Europe can be observed in Romania (0.6%), Bosnia-Herzegovina (1.0%), Bulgaria (1.3%), Poland (1.8%) and Slovakia (2.3%).

According to the MIGRATION POLICY INSTITUTE, the vast majority of the foreign population in Latvia and Estonia, as well as in Ukraine and Belarus are Russians. In the case of the Republic of Moldova more than 80% are Russians and Ukrainians. The relatively high proportion of foreign population in Croatia is attributable to ethnic Croats from other Former Yugoslavian Republics, especially from Bosnia-Herzegovina and Serbia and Montenegro. Until the early 1970s, Southern European countries like Italy, Spain, Portugal and Greece were considered lands of emigration (CASTLES & MILLER 2009:111). Since then they underwent a migratory transition, whereas their role as lands of immigration have become more pronounced. As a result, they now share many of the concerns and characteristics of their EU partner states in Northern and Western Europe (ibid.).

MIGRATION FLOWS

Migration stocks are not set in stone. In fact, they are the result of migration flows from the past. Hereafter, these migration flows shall be illustrated over time by means of the net migration rate of the period 1950 to 2005.

Until the early 1970s the net migration rate of Europe was negative, mainly because of the strong out-migration in Southern Europe (see Fig. 16). Since then, the overall net migration rate of Europe has been positive and steadily rising, strongest in Southern Europe. Contrary to the since 1950 constantly positive Western European migration balance, the Northern European net migration rate was following a pathway from negative to positive. In the transition from Communist rule to democracy and market economies, many formally socialist states in Eastern (and Southern)

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67 From the countries mentioned in this paragraph, only Germany and Luxembourg are following the migrant definition by citizenship. The data for Bosnia-Herzegovina is imputed, all other countries refer to the place of birth – see also the explanatory remarks of Map A1.12.

68 Data on the origin of foreign population stocks from the Migration Policy Institute refer to 2001. See also: http://www.migrationinformation.org/databank/comparative.cfm (retrieved 05.02.2010)

69 By 2010, Portugal, Ireland, Greece and Spain are also known under the now very flattering acronym PIGS. Financial market experts have coined this new term to sum up troubled eurozone states. These four countries all had a long boom, but crashed hardest during the recent financial turmoil (cf. GROS 2010).
Europe witnessed significant outflows (CASTLES & MILLER 2009:113f). Worst affected by emigration were the Baltic countries, Bulgaria, Romania, Moldova, as well as Montenegro and Albania (see Fig. 32 in Chapter 3.4.1). By 2000/05, the Eastern European net migration rate stagnated around zero, while all other European regions had distinct positive net migration rates.

The average annual net migration rate between 2000 and 2005 was positive in most of Europe, confirming the status of a continent of immigration (see Map A1.13). Besides Turkey and the Caucasian countries, only former socialist countries in Eastern Europe (including the Baltic countries) and Balkans countries show negative net migration rates. Worst affected by emigration is the Republic of Moldova, where the net out-migration affected on average 16 out of 1,000 people every year. Strong out-migration can also be observed on the Balkans, especially in Serbia, Montenegro and Albania.

FROM EMIGRATION TO IMMIGRATION

When looking at Figure 16, some regularity behind the transformation of European countries from emigration to immigration countries can be detected. Based on this perception, FASSMANN (2009:9ff) developed a new conceptual explanatory model that goes beyond established migration theories (cf. Chapter 2.2.6). This model is deduced from actual migratory processes in Germany and Austria and was adjusted to other European countries. It assumes that, sooner or later, every EU27 member state will shift from a place of origin of migrants to a destination for migrants. The main drivers behind this process are specific European pull-factors and especially the demand of labour, which changes over time. This demand is connected to other factors like demography and economy, which is reflected in the three stages of this cyclical model (ibid.: p.17):

- Stage 1 (initial situation): A young age structure produces excess supply on the labour market, which leads to unemployment and emigration.
- Stage 2 ( tipping point): Because of the decrease in birth rates, the oversupply of labour is reduced with some demographical induced time lag, whereas the labour demand increases due to economical growth. As a result, the migratory balance switches from negative to positive.
- Stage 3 (adaptation): Because of the reduction in labour supply coupled with ongoing economic growth, the positive migratory balance is kept constant.

When assigning this model to EU27 countries, FASSMANN (2009:19f) distinguishes between four groups:

- Not-yet-immigration countries: Eastern European countries,
- young immigration countries: the Southern European countries,
- matured immigration countries: Northern and Western European countries, as well as
- former colonial powers: e.g. France and UK.

In the group of former colonial countries, migratory processes seem to follow other factors than those described above. However, when comparing the first three groups and the three stages with the net migration rates of broader European regions (see Fig. 16), this cyclical model seems to be empirically grounded.70

FREEDOM OF MOVEMENT IN THE EU

It needs to be stressed that today’s EU27 is as an internal market, based on the freedom of movement of goods, capital, services, and especially persons across political borders (FAVELL 2007:274). In this respect, any EU (and EFTA) citizen can move and stay within the EU27 without a visa and to commit oneself to becoming a citizen one day (ibid.).

“If one was to go looking for a possible new cosmopolitan or transnational society order in our given world of nation–states, the EU is one of the best places to look.”

Adrian FAVELL (2007:275)

70 It should be mentioned, that this model is not thought to be a teleological concept, but rather a generalising descriptive scheme. As a consequence, stage 3 is not meant to be a final stage, the possibility of a further development is within the realms of possibility (cf. FASSMANN 2009:19). Such a development might be already on the way. Recent data from Germany shows that also a traditional or “matured” immigration country can shift back again – if only temporary – to a country of emigration, or to both: a country of immigration and emigration with a relatively balanced net migration rate. According to the German Federal Institute for Population Research, Germany’s migratory balance of 2008 was negative for the first time in decades, due to stagnating immigration and increasing emigration - see: http://www.bibdemografie.de/cln_090/mn_145576/DE/DatenundBefunde/02/Ausbildungen/0__02__04__wandbilanz__d__1991__2008.html (retrieved 13.04.2010).
EU immigration laws only restrict citizens from so-called third countries in movement and settlement, i.e. citizens from outside the EU27 and the four EFTA countries. According to the most recent round of the European Labour Force Survey of 2007 (EU-ROSTat 2008), around two thirds of the EU’s foreign population is still holding a Non-EU27 citizenship. In this context and in view of the continued demand of labour, the EU Member States show more concerted efforts to regulate international migration and to promote circular migration, instead of a permanent settlement of Non-EU citizens.71

3.2.6 POPULATION DEVELOPMENT

Coming back to the first question of this chapter: Which European countries are (still) growing and to which extent? As just illustrated, most European countries benefit quantitatively from immigration. To get the full picture in regard to the extent of population development, one has to complement the net migration rate by the natural population balance. The latter is simply the difference of birth and deaths (per thousand population).

The natural population balance of European countries, shown in Map A1.14 for the period 2000 to 2005, looks less positive compared to the migratory balance (cf. Map A1.13). A distinct gradient from the West – where natural population balances are predominately positive – to the East is obvious. The strongest surplus of deaths over births can be observed in Russia, Belarus, Ukraine, the Baltic countries, Hungary and Bulgaria. The natural population balance is also negative in other former socialist countries of Eastern Europe, as well as in Germany, Italy and Greece. The strongest natural population increases between 2000 and 2005 were recorded in Iceland, Ireland, and first and foremost in Albania and Turkey.

“Europe (…) badly needs foreign hands to keep its societies and economies functioning, and should stop pretending otherwise.”
Fred PEARCE (2010), The Guardian.

Based on the Basic Demographic Equation (cf. Chapter 2.1), total population change (illustrated in Map A1.15 per thousand population) is the sum of the natural population balance and net migration. By the nature of this equation, the total population balance is equal to population growth (see Map A1.01).

Since the European natural population balance (i.e. births minus deaths) was negative over the period 2000 to 2005, the marginal overall population growth in Europe during that time (avg. 0.08% per year) was exclusively referable to the overall migration surplus.

71 These efforts are indicated by many recently published EU papers on circular migration and mobility partnerships (e.g. EC 2005b, EC 2005c, EC 2007b, EC 2007d).

3.2.7 AGE STRUCTURE AND THE IMPLICATIONS OF POPULATION DYNAMICS

This chapter demonstrates the impacts of population dynamics. Current trends in fertility, mortality and migration determine the facets of demographic change by affecting the future age structure. In this respect, the timeframe will be extended into the future – or rather into one of many possible demographic futures, represented by the medium variant of the UN’s population projections (see also Chapter 2.3).

“Population change reflects the interplay of fertility, mortality, and migration.”
POPULATION REFERENCE BUREAU (PRB 2001:2)

AGE STRUCTURE

When it comes to the representation and comparison of age structures, nothing works better than population pyramids. Figure 17 shows the population pyramid of Europe by 2005, overlaid by the pyramids of 1950 (left) as well as 2050 (right) – both illustrated in grey.

The significant changes between 1950 and 2005, as well as between 2005 and 2050, are striking. The 1950’s age structure still had roughly the shape of a pyramid, although humped and bumped by the death toll of two world wars and the subsequent increases and decreases in birth rates. This is at best noticeable by the notch of the age group 30 to 35 years in 1950. The pyramid of 2005 differs in many ways. Most eye-catching is the massive reduction at the pyramid’s base as well as the increase at the top. The share of the youngest age group (below 5 years) nearly halved since 1950, while the older age groups (above age 50) increased considerably. By 2050, the age group 40 to 44 years – born at the peak of the baby boom – is still the strongest.
If the medium variant of the UN’s population projection proves to be true, Europe’s age structure will see further drastic changes in the course of the coming decades. By 2050, baby boomers will be the oldest-old (80 years and older) and the share of the elderly (60 years and older) will increase tremendously. As a result, the age group 60 to 69 years will be the strongest by then, while the share of the youngest will consolidate on the low level of 2005. However, Europe’s population will change first and foremost in regard to the age structure and not in absolute numbers. Following the results of the UN’s medium variant projection, the total population of Europe will decrease only moderately (by roughly 5%), from 729.4 million in 2005 to around 691 million in 2050.

In relative terms, Northern Europe experienced the most modest fertility decline of all European regions since 1950. As a consequence, the reduction at the base and the increase at the top of its population pyramid of 2005 are rather moderate compared to other European regions (see Fig. 18). The pyramid of 2005 clearly uncovers the extent of the baby boom of the 1950s and 1960s, which happened to be a pronounced Northern and Western European phenomenon. According to the medium variant of the UN, the Northern European age structure will evolve towards a stable population. By the mid 21st century the pyramid will approach the form of a pillar (or rocket), narrowing only at the very top as people die of old age. In doing so, the population of Northern Europe will increase by more than 35% between 2005 (96.4 million) and 2050 (112.5 million).

Eastern Europe’s age structure was already battered by 1950, as this part of Europe got hit hardest by the times of unrest during and in between both world wars. Even in 2005, the age structure has not yet been recovered. The base of the pyramid became very narrow and the same is true for the share of men in the older ages – not to mention the extremely weak post World War II birth cohorts aged 60 to 64 by 2005. Furthermore, Eastern European did not experience a baby boom similar to Northern and Western Europe. In fact, it experienced two. The first one peaked in the late 1950s and early 1960s, when life went back to (some kind of) normal. The second one occurred about 25 years later and was, to a large extent, an echo effect of the first one. This second baby boom ended abruptly around 1990 with the fall of Communism in Eastern Europe. For 2050, the UN medium variant assumptions envisage a higher life expectancy for Eastern Europe, rising from 68 to 77 years with a stronger increase for men of around 10 more years. Although it is assumed that the TFR will also increase, resulting in a small widening of the base, considerable population ageing seems to be inevitable. In the course of this process, the pyramid will become extremely top-

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Figure 18: Age structure of European regions (1950, 2005 and 2050). Data source: UN Population Division – World Population Prospects 2008 Revision (medium variant)
Heavy and the size of the Eastern European population will decline substantially from 297 million (2005) to 240 million (2050).73

Indeed, by 1950 the Southern European age structure had the shape of a pyramid (see Fig. 18), apart from the reduced number of births during and after World War I (i.e. the cohorts aged 30 to 34 by 1950) and the associated echo effect 25 years later. However, Southern Europe underwent a strong demographic transition during the second half of the 20th century. Due to the strongest fertility decline compared to other European regions (cf. Fig. 10), accompanied by considerable increases in life expectancy (Fig. 14), the base of the population pyramid was more than halved by 2005. As a result, the population’s “centre of gravity” shifted from young to old. The UN assumes that life expectancy will further increase until 2050, while fertility will remain below the replacement level. Although the population of Southern Europe will slightly increase (if net migration will continue to be positive), the pyramid will become more top-heavy (assuming the shape of a water tower), though not necessarily to the same extent as in Eastern Europe.

The Western European population pyramid of 1950 is pretty similar to the Northern European, except that the base was already narrower back then. Furthermore the world wars left their mark to a greater extent – most noticeable when looking at the age group 30 to 35 years by 1950. Because Western Europe experienced a stronger fertility decline since the 1960s, the baby boom generation – around 40 to 50 years by 2005 – is even more pronounced. Compared to 2005, the size of the Western European population will stay just around the same by 2050, but further variations in the age structure must be anticipated. The strongest age groups will be around age 60, while younger age groups will be less pronounced, giving the pyramid the shape of a classical flower vase.

Figure 19 illustrates the development of three broad age groups (i.e. below 15 years, 15 to 64 years and 65 years and older) for the period 1950 to 2050 in Europe. This process seems rather unspectacular, especially when looking at the changes in the share of the potential working age population, here represented by the age group 15 to 64 years. Over decades, the share of this age group was roughly staying at the same level of around 65%, but we will start to decrease at last from 2025/30 on. The general shift from young to old is more pronounced. On the one hand, the share of young people decreased from 1950 to 2005 from 26% to 16%, on the other hand, the share of elderly doubled from 8% to 16%, equalling the proportion of the young by 2005. The coming years until 2050 will bring a quantitative shift from the potential working age population to the elderly. While the first will decline significantly for the first time by ten percent points, the latter will reach an all time high of more than 27% by 2050.

**IMPLICATIONS OF POPULATION DYNAMICS**

Age structural effects have an intrinsic and deterministic momentum. In the course of the life cycle, every birth cohort makes its way from the base to the top of the population pyramid. In doing so, these cohorts move like waves along the age structure, altering the population’s composition by age and initiating further so-called echo-effects. To some extent, Figure 19 demonstrates the impact of such a “cohort wave”. After passing working age, the youth bulge of the 1960s will enter the (open) age group 65+ in the course of the 2020s and will thereby amplify the share of the elderly in a readable manner.

**DEMOGRAPHIC AGEING**

The process shown in Figure 19 demonstrates a sequence, which inevitably leads to an ageing population. The reasons behind this process, which is determined by the specific combination of declining fertility and increasing life expectancy, were already explained within the framework of the demographic transition (see Chapter 2.2.2).

“Demographic ageing can be defined as the process by which older individuals become a proportionally larger share of the total population.”

UNITED NATIONS (2002:1)

A population pyramid is a great tool to visualise and compare the full age distribution of a population. Additionally, other generic measures enable demographers to summarise the age distribution and thus the extent of demographic ageing by a single number (GOLDSTEIN, 2009:8).

**MEDIAN AGE**

A common measure is the median age, dividing the population in two equal halves. In this respect, one half is older and the other half younger compared to the median. The median age is easy to understand, but does not make a clear statement with

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73 For Eastern Europe, the UN medium variant assumes no significant in-migration until 2050.
respects to the actual age distribution. Hungary and the Netherlands, for instance, apparently have different age compositions, while sharing the same median age (both 39.1 years in 2005). Nevertheless, the trend of the median age is a useful first approach to determine the process and extent of population ageing.

By 2005, the median age of European countries was spreading from 28.5 years in Albania (and 26.5 in Turkey) to 42.1 years in Germany (see Map A1.16). Because the median age is above 35 years in the majority of countries, Albania and Turkey must be seen as juvenile outliers. Besides these two countries, only Iceland, Ireland, Montenegro, Macedonia and Moldova as well as Armenia and Azerbaijan can be assumed as young populations in a European sense.74

The median age of Europe was increasing by 9 years since 1950, reaching 39.1 years by 2005 and will further increase to around 47 years before levelling off from 2040 on (see Fig. 20). In 1950, the median age of Northern Europe (33.4 years) was around one year below those of Western Europe (34.5 years), whereas 55 years later this gap remained constant, although on a higher level of 38.9 and 40.5 years respectively. Nevertheless, this gap might widen to more than 4 years in the coming decades. By 2050, the Western European median age – driven by strong increases in Germany and Austria – will amount to 47.6 years, while the Northern European median age will increase to just 43 years.

Eastern and Southern Europe also started at a similar level by 1950 (26.4 and 27.4 years respectively), and approached the European average not much later. Like Western Europe, both the Eastern and the Southern European median age will increase considerably until 2040 before levelling off at 46 and 49 years. In doing so, Eastern Europe will pass the attribute "lowest median age" to Northern Europe around 2020. By the mid 21st century, not even Albania or Turkey will have a median age below 40 years, although both will still be considered as relatively young in comparison with other European populations. A predictive cross-country comparison shows that by 2050 Bosnia-Herzegovina will have the highest median age of 52.7 years – followed by Germany, Poland, Italy and Malta (all above 50 years).

OLD AND OLD-EST-OLD

To determine the actual share of elderly, the proportion of the population aged 65+ (or 60+) is commonly used. In the European context, the age limit of 65 years seems to be appropriate, marking the structural line between working age and retired population. The extent of demographic ageing, expressed by the 65+ proportions, varies widely across Europe and ranges from 8.7% in Albania (and 5.7% in Turkey) to 19.6% in Italy – with Greece and Germany following with more than 18% each. In contemporary Europe, the median age is strongly correlating with the share of elderly, aged 65 years and older. For a visual confirmation, one might simply compare the characteristics of Map A1.16, showing the proportion of people aged 65 years and older, with the map of the median age (Map A1.17).

74 From a global perspective, Uganda features the youngest median age by 2005 (15.3 years) and Japan the oldest with 43.1 years.
The continuous progression of the ageing process in terms of the proportion of elderly, illustrated in Figure 21 for European regions, follows a similar upward path as the median age. As mentioned before when discussing broad age groups, the share of people aged 65 years and older in Europe doubled between 1950 and 2005 and will further increase until and beyond the year 2050. Because of the different age structure, Eastern Europe will surpass Northern Europe in regard to the share of the age group 65+ by 2040, which is 20 years after the Eastern European median age surpassed those of Northern Europe (cf. Fig. 20).

By 2000/05, the share of elderly is highest in Southern and Western Europe (around 17.5%) and both regions will still have the highest proportions by 2050 (31.4% and 28.9% respectively), while following different pathways of ageing. The strong baby boom generation in Western Europe will start to enter the age group 65+ by 2020 and the share of elderly will increase even stronger. However, between 2030 and 2035 the last baby boomers will have reached retirement age, hence the speed of ageing will be slower from then on. The ageing process in Southern Europe, by contrast, is not driven by a particular baby boom generation, but is rather determined by a strong fertility decline coupled with an increasing life expectancy. This results in a prolonged, if not necessarily sustained, increase in the older population (see Fig. 21 and also the population pyramids in Fig. 18).

“I recently turned sixty. Practically a third of my life is over.”
Woody Allen (1996)75

Because of the increasing longevity, the term “older people” – in general attributed to all people older than 60 years – comprises an expanding age group spreading over more than 40 years. In this respect researchers in the field of demography, biodemography, gerontology, and sociology attempted to define subgroups of the elder population to specify factors linked to the heterogeneity of older populations in terms of social participation and service needs (Smith 2000:3).

“Retirement from productive participation in the workforce is usually regarded as defining the beginning of the Third Age, there is less agreement about the definition of entry to the Fourth Age.”
Jacqui Smith (2000:1)

Following the mainstream in population studies, the “fourth age” shall here be used for those, whose life can be characterised by an increased need for care coupled with decreasing self-dependency. In respect to the average life expectancy of contemporary Europeans (i.e. 70 years for men and 78 years for women), one can assume that the above mentioned characteristics can be attributed to most people aged 80 years and older.76

When looking at the proportion of the “oldest-old” aged 80 years and older (see Map A1.18), it becomes apparent that this indicator does not strongly correlate with other already presented ageing indicators like median age and share of the population aged 65 years and older. In fact, the spatial distribution of the “80+” indicator is rather in accord with the level of life expectancy (cf. Map A1.08). Both indicate a distinct East-West divide. The similarity with life expectancy is logical, as nobody can expect a high share of people aged 80 years and older, if the average life expectancy is below 65 years – as it is the case in Russia. However, even in Russia, around 3 million people (roughly 2% of the population in 2005) are 80 years and older.

On the country level, the highest proportion of the age group 80+ can be found in Sweden and Italy (above 5% in 2005), as well as in Germany, Switzerland, Norway, France and the UK (all close to 5%). By 2050, this share will be highest in Germany (14.3%) and Italy (13.4%), as well as in Austria, Switzerland, France, Spain and Portugal (all above 11%). However, in Sweden and the UK the share of the oldest old will increase rather moderately from roughly 5% in 2005 to around 9% until 2050, even though it is assumed that life expectancy will further increase in both countries, while the median age will increase only by a margin.

“Population changes over time. Arrivals come in form of births and immigrants. Departures go in form of deaths and emigrants.”
Joshua R. Goldstein (2009:10)

Demographic arrivals (births and immigrants) and departures (deaths and emigrants) shape a population’s age structure. In Sweden and the UK, for example, these arrivals will happen to a large extent below the median age. Since births arrive at age zero, they will always make a population younger (Goldstein 2009:10). The fertility rates of Sweden and the UK – although slightly below the level required to maintain the population size – are relatively high compared to other European countries (see Fig. 28 in Chapter 3.4.1). Although migration occurs at all ages, it is concentrated on the younger adult years (Preston et al. 2001:208; Goldstein 2009:10). As the median age in Sweden and the UK is around 40 years (see Fig. 37 in Chapter 3.4.1), it can be assumed that the vast majority of migrants are younger than that, at least when they arrive. Beyond that, most immigrants are also in the prime age of start a family, so they might further contribute with more arrivals in the form of their children.

Sweden and the UK are both immigration countries, showing positive net migration rates since decades (see Fig. 32 in Chapter 3.4.1). Hence, these arrivals below the median (or mean) age counterbalance the ageing process, driven – in the case of Sweden and the UK – by an increasing life expectancy, which contributes to population ageing by delaying demographic departures (i.e. deaths) beyond the median age.77

75 In: The Observer Review (10.03.1996), see: http://www.mantex.co.uk/reviews/oxf-cdqs.htm (retrieved 30.08.2007).
76 When describing the “third age” as an era of personal achievement and fulfilment, as Smith (2000:5) argues, it must be admitted that the boundary to the “fourth age” may be dynamic.
77 Goldstein (2009:10) stresses that additional deaths have an ambiguous effect on the population’s mean age. Deaths of the young, e.g. infant mortality, make a population older, while deaths of the old make a population younger. With the increases in adult survival, recent mortality decline is a contributor to population ageing.
However, in many other European countries the main driver of population ageing is the low level of fertility, especially when coupled with out-migration.

**ALTERNATIVE INDICATORS OF AGE AND POPULATION AGEING**

Taking into account that demographic ageing is accompanied by a longer lifespan of (most) individuals, the associated negative connotations are usually connected to economic deliberations (see also next section of this chapter). On a personal level, a longer life can never be assumed as a disadvantage per se. The question is rather, whether a longer life also means better health (ROBINE et al. 2009:14).

The European Health Expectancy Monitor (EHEMU) used the Statistics of Income and Living Conditions (SILC) – a data set provided by Eurostat – to calculate Healthy Life Years (HLY) by gender for the EU25 countries. People in Denmark, Poland, Greece and Italy can expect to live longest without health limitations (see Map A1.19 and A1.20), if not necessarily longest at all. Although this indicator is based on a subjective survey, it gives some indication on the ability of the working age population to work until the actual age of retirement and from which age on higher health efforts and spending can be expected. Cross-country differences in respect to the HLY measure (i.e. 20 years for men and 18 years for women) imply that the employment rate of older workers cannot be expected to be the same throughout Europe (ROBINE et al. 2009:15).

Furthermore, the HLY measure indicates the individual quality of a (longer) life, especially in relation to the actual life expectancy at birth (see Map A1.21 and A1.22). This ratio of HLY and life expectancy at birth – expressed in per cent – is highest in Denmark, Poland, Greece and Italy, where people can expect to spend 80% of their life time in healthy condition, and lowest in Finland (below 70%).

“Both the biological and social dimension of age are not only a function of time since birth but also of expected time to death.”

Vienna Institute of Demography (VID 2008)

When comparing demographic ageing by the rate of ageing and by the remaining years to live over time, a person of age 60 in the year 1900 can hardly be compared to a 60-year-old in the year 2000 (LUZ2 et al. 2008:16). In this respect, population ageing can also be considered from the perspective of “remaining life expectancy”. This concept goes back to Norman RYDER (1975), who highlighted the relative age of a population by the distance to death, rather than how many years passed since birth. This perspective enables to treat a population, which has many years to live as a young population (GOLDSTEIN 2009:16).

When defining the “oldest-old” population by the remaining life expectancy of 15 years or less (see Map A1.23), a somehow different picture unfolds compared to Map A1.18, which shows the proportion of the population 80 years and older. In this respect, many former socialist countries like Russia, Belarus, Ukraine, Latvia, Bulgaria, Croatia and especially Serbia can be regarded as the oldest, because they feature the highest share (of 15% or more) of people with a remaining life expectancy of 15 years or less.

These two alternative ageing indicators demonstrate that age and ageing must be assumed as relative dimensions, depending on the health status and on the perspective whether the years already lived or those still to come are taken into account. Nevertheless, conventional age in terms of “years since birth” shall not be neglected by any means, but must not be interpreted in a too deterministic way.

**WORKING AGE POPULATION**

Changes in the age structure, especially in connection with demographic ageing, affect the quantity of the labour force, which is based on the working age population. The so-called working age population is a good example for the relativity of the term “age”. On the one hand, the age group 15 to 64 years is commonly used to determine the working age population, e.g. for the calculation of dependency ratios (see below), on the other hand – and especially in more developed world regions – the age group 20 to 64 is meant by working age population. The latter considers the increasing enrolment in upper secondary and tertiary education and the associated low labour force participation rates below age 20, while the age group 15 to 64 years describes the potential working age, as many people still start working before age 20 – even in more developed economies. On the upper end of this age scale, the 65th birthday cannot be assumed as the ultimate end-point of working age. Although it marks the age of retirement in many European countries, most people are already inactive before age 65, while others again extend their working life beyond that age. One way or another, age limits are exemplary and must be seen as an approximate simplification of reality, which is often a premise in both qualitative and quantitative studies.

**DEPENDENCY RATIOS**

Dependency ratios depict the quantitative relation between the potentially economically active age group 15 to 64 years and the so-called dependent younger and older age groups. For reasons of comparability, these common age limits will remain unaffected but shall be interpreted with caution in terms of the just mentioned premises. The advantage of interpreting dependency ratios is justified in terms of transfer rates and tax rates, especially in a pay-as-you-go-pension system, where retirees are paid by taxes on current workers (GOLDSTEIN 2009:9).

A first insight into the development of these three broad age groups in Europe and its broader regions was already given in Figure 19, demonstrating how the proportion of the young decreased during the second half of the 20th century, while the working age population remained more or less constant. During the coming decades, the share of the elder population will increase, above all at the expense of the proportion of the working age population.

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78 Negative connotations of population ageing are more pronounced in German speaking countries. A term like “Überalterung” – loosely and therefore wrongly translated as “over-aged” – is not that common in other languages, particularly not in the English-speaking world.
“Both populations that are very young and very old have high ‘dependency’ burdens, with a relatively small portion of the population in active working ages.”

Joshua GOLDSTEIN (2009:7)

The concept of dependency ratios is based on the exemplary assumption that any economic output is exclusively achieved by the working age population (15 to 64 years). Thus it is assumed that the other two age groups – the young below 15 years and the elderly of 65 years and older – are economically inactive and consequently dependent on the working age population (cf. WEIL 2006:3).79 In this way, three different dependency ratios can be distinguished:

- Old Age Dependency Ratio (OADR) ... the ratio of “old” to “active”,
- Youth Dependency Ratio (YDR) ... the ratio of “young” to “active”, and
- (Total) Dependency Ratio ... the sum of OADR and YDR.

By 2005, the old age dependency ratio of Europe was 23/100, i.e. 23 elderly per 100 persons of working age or four “workers” per “retiree”, when expressed by the reciprocal. Map A1.26, featuring the old age dependency ratio by 2005, delivers a similar picture compared to other (conventional) ageing indicators (e.g. 65+). Italy (30/100), as well as Germany, Belgium and Sweden (each more than 25/100) have to bear the highest dependency “burdens”, while many Eastern European countries, besides Iceland and Ireland, seem to be well off with an OADR of less than 20/100 – only Turkey had an OADR of less than 10/100 in 2005.

Figure 23 illustrates the shift in the proportion of the elderly in relation to the potentially economically active population over time. As already mentioned, the OADR was only increased moderately during the second half of the 20th century in all European regions, but will increase strongly in the coming decades. Like other ageing indicators, the OADR might more than double until 2050 except in Northern Europe – if the assumptions of the UN medium variant will prove to be true. In this respect, there will be only two or less workers per retiree by 2050, while it will be almost 3:1 (or 39/100) in Northern Europe. At the country level, the highest OADR’s by 2050 (of around 60/100) can be expected for Bosnia-Herzegovina, Italy, Spain and Germany (see also Fig. 50 in Chapter 3.4.1).

The youth dependency ratio by 2005 is virtually inverted by proportion compared to the old age dependency ratio, with the highest ratios of 40/100 and higher in Albania and Turkey, and 33/100 in Iceland (see Map A1.27). Nevertheless, the proportion is not inverted in every country or region. In Russia, but also in Poland, Slovakia and in the Czech Republic, both the YDR (less than 20/100) as well as the OADR (less than 25/100) are relatively low.

79 Although ignored by the assumptions of the dependency ratio, at least three mechanisms exist, which can provide material security for economically inactive persons: (a) savings, (b) institutions (governmental as well as non-governmental) and (c) the family (WEIL 2006:5f).
Contrary to the OADR, the YDR decreased in the past decades and is predicted to stay at around the low levels achieved by today in the foreseeable future (see Fig. 24). The graph showing the YDR-trend since 1950 reveals the extent of different baby booms in different parts of European, especially the two booming phases in Eastern Europe. Consequently, those countries with a low OADR as well as a low YDR have also the lowest total dependency ratio, i.e. Russia, Poland, Slovakia, the Czech Republic and also Slovenia (see Map A1.28). West of the former system border, which was marked by the “Iron Curtain”, only Ireland, Spain, as well as Austria and Switzerland do have moderate dependency ratios. In 2005, the highest dependency ratios of more than 52/100 can be observed in Sweden, France and in Albania. In the case of Albania, the considerably high YDR is the decisive factor for the high overall dependency ratio.

In the course of time and while shifting the “centre of gravity” from YDR to OADR, the (total) dependency ratio was relatively constant in all European regions (see Fig. 25). Around 2005, the dependency ratio is lowest in Eastern Europe with 42/100 and is, in fact, lower then it was in 1950. This situation, when the proportion of the economically active population is increasing in relation to the potentially dependent young and old population, constitutes the phenomenon known as Demographic Bonus or Demographic Dividend, which was already explained in Chapter 2.2.3).

It must be stressed that the model describing the demographic bonus does not stipulate the term of a dividend; moreover it predicts an economic window of opportunity, based on age structural shifts. This window will close again and population ageing will follow. Keeping this in mind, a short analysis of the share of the working age population will complete this tour of demographic indicators of European countries and regions.

The share of the working age population in Europe is usually equated with the age group 20 to 64 years, because a majority of the age group 15 to 19 years is still in education. Even if this age group is not identical with those used for the calculation of the dependency ratio (namely 15 to 64 years for the economically active population), both groups of indicators can be assumed to be at least roughly comparable. Correspondingly, the share of the working age population is high, when the total dependency ratio is low and vice versa. This strong negative correlation becomes obvious when comparing the maps depicting the share of the age group 20 to 64 years (Map A1.29) and the dependency ratio (Map A1.28). In a nutshell, the share of people in working ages is highest in Eastern Europe – especially in Russia, Poland, Slovakia, in the Czech Republic and in Slovenia – and lowest in Northern Europe. Furthermore, it is relatively high in countries with high net migration gains (e.g. Spain, Italy, Ireland and the German speaking countries).

The trend in the share of the working age population and the speed of change is illustrated in Figure 26 for European regions. In respect to the whole of Europe, the proportion of the age group 20 to 64 years was relatively constant (at around 57%) until the mid 1970s. From then on the baby boom generation reached adulthood and thus the proportion was increasing to more than 61% until 2005. After peaking around 2010, it will decrease at least until 2050 and will reach a level well below those of 1950. The baby boom effect is affecting the share of the working age population strongest in Western and Eastern Europe.80 The share of the working age population started to decline first in Western Europe during the mid 1990s.

The speed of decline will accelerate in all regions during the 2020s and 2030s. From 2040 on, when the last baby boomers will have passed through working age, the proportion will get more stable again in Northern and Western Europe, while Eastern and Southern Europe will experience further declines.

Within the scope of the demographic dividend, the window of opportunity – i.e. the unique period in the course of the demographic transition, when the share of the young is declining, while the share of the elderly is not yet increasing – is already closing. Only Eastern Europe is given a short extension until the mid 2030s, before the share of the working age population will fall beyond the level of 60% without any short-term recovery in sight.

80 In regard to Eastern Europe, it is rather a “baby bust” effect, initialised by the unprecedented shortfall in births after 1989.
3.3 THE REGIONAL PERSPECTIVE

After discussing the demographic status and trends in Europe at the level of nation states and beyond, the smaller scale of European regions below the national level will be applied in the following solely for the territory of the EU27+4 (i.e. the current 27 EU Member States plus the four EFTA countries – see Map 2 in Chapter 3.2.1). In doing so, the spatial scope will zoom to the area of interest of this thesis, i.e. the territory of the EU27+4 (or ESPON space), excluding those countries which are neither member of the EU nor the EFTA. A regional analysis including Non-EU and non-EFTA countries would be a rather fruitless attempt, because of missing comparable regional data or, to put it in another way, because of the missing comparability of regions. The availability of these two essential preconditions can be assumed at the EU27+4 level.

3.3.1 EUROPE OF THE REGIONS

Nowadays much emphasis is laid at the regional level aspects of Europe. According to BORRAS-ALOMAR et al. (1994:27ff) the term “Europe of the Regions” has almost become a commonplace, since first coined by Denis de Rogemont. But what exactly is a region?

“We have long had mechanisms for recognizing the existence of nations, but below the national level, unstable and abstract though it is, we take regions and localities as we find them and as we need them.”

Celso APPLÉGATE (1999)

Are regions really only arbitrary constructs? For some, regions are ethnic and cultural units, for others, economic or geographical ones, and for yet others, they are simply political subdivisions of the nation state (cf. APPLÉGATE 1999). What a terminological mess! To put things straight and shortcutting a potentially extensive discussion about society, identity and territory, the conceptual meaning shall be restricted to the appropriate use within the (here relevant) disciplines of Geography, Spatial Research and Spatial Planning.

The typology of Martin BOESCH (1989:72) differentiates three types of regions: (1) homogenous, (2) functional and (3) normative regions. Homogenous (or structural) regions are defined by the similarity of a certain attribute, e.g. wine-growing regions or demographically ageing regions; functional regions feature linkages based on interactions, e.g. commuter relations; normative regions constitute political-administrative territories (cf. BOESCH 1989:70f; WEICHHART 2005).

The EU holds the regional concept in high esteem. First and foremost, the EU regional policy is a vehicle to reduce structural disparities between regions by means of a variety of financing operations. The Union’s regional policy is the second largest budget item with an allocation of 348 billion Euro over the period 2007 to 2013 (EC 2008b:2). Since the implementation of the Maastricht Treaty (in 1993), regions have an institutional representation by the Committee of the Regions (COR), the EU’s assembly of regional and local representatives. This political representation involves regional and local authorities in the European decision-making process. Furthermore, the Treaty of Lisbon (ratified in December 2009) will bring a better differentiation of the rights and duties of the regions, member states and the EU-level. (WEIDENFELD & WESSELS 2007:137ff; COR 2009:1). Corresponding to the EU concept of “Europe of the Regions”, i.e. politically participating and structurally profiting EU regions, there is a need for comparable and well-elaborated regions.

NUTS CLASSIFICATION

Coherent regions of normative character – the so-called NUTS regions (Nomenclature of Territorial Units for Statistics) – were first determined during the 1970s by Eurostat for the production of regional statistics for the EU. The structure behind the NUTS classification allows authorities to take administrative, budgetary or policy decisions for the area within the legal and institutional framework of the country and of the EU. Ideally, administrative regions require boundaries, which are appropriate in terms of homogeneity of the unit and suitability of its size and at the same time stable to permit data collection over an extended time frame (EC 2009a:3).

Even under a strictly statistical point of view, our world is not an ideal place and not immune against changes at all. In this respect, Eurostat is regularly updating the NUTS classification. The most recent NUTS revision was conducted in 2006 and was coming into force on 1st January 2008. The next NUTS revision is foreseen for 2010 and will come into force on 1st January 2012 (ibid., p.8f). For that reason the currently valid NUTS 2006 classification is used for the coming analyses elaborated in this thesis.

The NUTS classification is not assembled by means of the area’s size, instead minimum and maximum population thresholds (see Tab. 4) are used for the average size of NUTS regions, which are illustrated in Map 3. NUTS is a hierarchical classification of three levels. Based on the administrative structure of the Member States, the level
of NUTS 1 corresponds to “Länder” in Germany, NUTS 2 is equal to “régions” in France (or “Bundesländer” in Austria) and NUTS 3 can be conceived as “provincias” in Spain (EC 2009a:5).

At the local scale, i.e. below NUTS regions, two more levels – the so-called Local Area Units (LAU) – have been defined in accordance with NUTS principles, but only the smallest of these (i.e. LAU level 2, which is usually corresponding to municipalities) has been set for all Member States (EC 2009a:7).

The normative administrative character of the NUTS classification matches the European territorial structures on which regional policy is applied. Therefore NUTS regions are also adopted by national statistical systems as the most appropriate units for data collection, processing and dissemination (EC 2009a:4f). This implicates that comparable regional statistics on EU level are only available at NUTS level. The disadvantage of normative regions with respect to quantitative analyses is grounded within its strict boundaries. From the analytical point of view, functional regions that incorporate economic, social and also geographic criteria would be preferable (ibid.). However, the day when available data can be applied across spatial units of different dimension and character (e.g. structural, functional and normative regions) has yet to come. Meanwhile, one has to stay pragmatic and has to accept the drawbacks of regional data based on normative regions. Keeping this in mind, the NUTS classification is way better than no classification at all.

3.3.2 DEMOGRAPHIC INDICATORS AT THE REGIONAL SCALE

The NUTS 2 level (Map 3) will be within the scope when analysing “Europe of the Regions”, as well as when discussing the development of the regional classification (in Chapter 4). The NUTS 2 classification of 2006 comprises 287 regions in 31 countries of the EU27+4. Considering this territory a puzzle containing 287 instead of 31 parts might be unfamiliar at first sight, but enables the viewer to overcome the geography of nation-states. This analysis will try to find out, if the patterns revealed at the country level will sustain when changing to the regional scale of NUTS 2.

“Areal distributions are essentially impermanent. Even while we are, so to speak, photographing it, the picture changes.”

George H. T. KIMBLE (1951)27, Canadian Geographer.

In this chapter, exemplary demographic indicators on fertility, mortality, migration, population development and age structure will be presented at NUTS 2 level. For reasons of data availability, it is not possible to trace regional demographic trends over

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83 To display the different NUTS levels country by country, see: http://ec.europa.eu/eurostat/ramon/nuts/overview_maps_en.cfm (retrieved 21.07.2009)
84 As cited in HAGERSTRAND (1967:3)
time, as done at country level. Because of that, the regional demographic situation will be presented only for the year 2005 and for the short time trends prior to that. Even though this point in time is only a temporal snapshot without consideration of long-term trends in population dynamics, the current status should be absolutely sufficient for a comparison of the different scales.

FERTILITY
When taking the TFR into account, national patterns also persist at the regional level (cf. Map A1.03 and Map A2.06). The highest regional fertility can be observed in the Scandinavian countries (including Finland and Iceland), as well as in the UK, Ireland, France and the Benelux countries. All in all, during the period 2002 to 2004 not even every tenth European region had a TFR of 2 or higher (ESPON 2009:29). It seems that fertility behaviour is strongly influenced by national particularities. It is indisputable that uniform national systems of taxation and family welfare affect fertility behaviour (cf. COLEMAN 2002:323). This argumentation is well in accordance with the framework of theoretical approaches to fertility decline (discussed in Chapter 2.2.4).

Nevertheless, noticeable regional differences can be observed within a few European countries. In Finland, for example, fertility is following a North-South gradient, with the highest regional TFR of 2.2 in the sparsely populated and most Northern region of Pohjanmaa-Suomi (FI1A), and the lowest with 1.7 – still clearly surpassing the European average – in the Southern region of Etelä-Suomi (FI18) which covers the Greater Helsinki area. Contrary to Finland, in Metropolitan France – i.e. France excluding Overseas Departments and Territories like Guyane (with a TFR of close to 4 in 2005) – the highest rates of fertility of more than two children per woman are recorded in the capital region Île de France (FR10), as well as in Picardie (FR22) just north of Paris, and in Pays de la Loire (FR51) with Nantes. Corsica (FR 83) shows the lowest French TFR of still 1.6 children per woman. Besides that, considerable regional fertility differences can be observed also in the Netherlands. Aside from the fact that such regional fertility contrasts only appear in countries with anyhow relatively high rates of fertility, these differences become less pronounced when contrasting the map of the TFR (Map A2.06) with the one of the CBR (Map A2.07), which is influenced by the actual age structure.

MORTALITY / LIFE EXPECTANCY
Also regional patterns of life expectancy (Map A2.08) follow those drawn at the country level (cf. Map A1.08). However, the spatial distribution of longevity does not show as much respect of national boundaries as the TFR does. On the supra-national dimension, the Southern European “olive oil belt” becomes clearly evident with respect to its higher life expectancy at birth – besides the obvious European East-West divide. There are also considerable differences within countries. In the UK and in Sweden, for instance, life expectancy is higher in the South, compared to the more peripheral and rural North. Similar disparities in life expectancy can also be observed in Austria, where life expectancy is higher in the Western regions.

Considering life expectancy by gender (Map A2.09 and A2.10), the numerical and geographical differences are much bigger for men than for women. While female life expectancy is even more homogeneous than the combined life expectancy for both sexes, those of men show stronger deviations, amplifying the just mentioned regional differences (e.g. in the UK). Additional differences become apparent at the regional scale, e.g. disparities between East and West Germany as well as between North and South France. The highest life expectancy at birth for both sexes combined of more than 82 years is recorded on the Finnish island Åland (FI20). Women become oldest (more than 85 years) in the Spanish region Foral de Navarra (ES22) and men can expect to live longest (more than 79 years) in Iceland and Åland.

MIGRATION
Looking at international migration, the concentration of migrant stocks is quite selective. Map A4.05 reveals that some urban regions and not particular countries feature the highest proportions of foreign population of close to 10% or even more (e.g. London, Paris, Berlin, Hamburg, the Rhine-Ruhr area, the Vienna region, Stockholm, Oslo, Athens, Madrid, Barcelona and Valencia). Also Cyprus and the Spanish islands show high proportions of foreign citizens. The high share of foreign nationals in Estonia is due to the large number of ethnic Russians, which became foreigners without moving after the Baltic Republics regained independence in 1991. Besides that, no significant stocks of foreign population can be found in regions of the former socialist countries of Eastern Europe.

The net migration rate (shown in Map A2.04) refers to the annual average during the period 2001 and 2005 and thus represents the short-term trend at the beginning of the 21st century. Contrary to foreign population stocks, which result from long-term migration flows, recent positive net migration rates cannot be related exclusively to urban areas. Besides the “new growth regions” of Ireland, Cyprus, Eastern Spain and Northern Italy, also many Eastern European regions (e.g. Közép-Magyarság/HU10 with Budapest and Stredny Cechy/CO2, i.e. the surrounding region of Prague) show a high net migration surplus. Even in these former socialist countries, considerable negative net migration rates do not spread all over Eastern Europe, as the country-level perspective would suggest (cf. Map A1.13).

Extreme out-migration concerns certain regions, especially in Bulgaria, Poland and Eastern Germany. The high net in-migration rates of the Dutch region of Flevoland (NL23) and some rural areas in the UK are eye-catching. Flevoland is literally a new land, which was wrested from the North Sea during the 1950s and 1960s and was ready for settlement from 1968 on. Since then nearly 400,000 people moved to this new province. According to KRÖHNERT et al. (2008:138), Flevoland is still attracting

85  Map A4.05 is based on data retrieved from the most recent Labour Force Survey (EU LFS 2007). However, the EU LFS data set does not include Iceland, Switzerland and Malta. Although the LFS’ spatial aggregation is based at NUTS 2 level, data for the UK, Germany and Austria are available for NUTS 1 regions and the Netherlands are aggregated on the nation level (i.e. NUTS 0). Migration data of Ireland is inconsistent and therefore not included.
more people and is ranked among the top growing regions in Europe. The strong net migration in some rural regions in the UK – for instance Lincolnshire (UKF3), which has the third lowest population density of England, but undergoes the strongest population growth in the UK – must be contributed to the wave of immigration from the new EU countries in Eastern Europe, as well as from Portugal (KRÖHNERT et al. 2008:97; TiViG 2009:46).

**POPULATION DEVELOPMENT**

The overall population development (or growth) is an aggregate of the net migration balance (i.e. immigrants minus emigrants) and the natural population balance (i.e. births minus deaths) – see also Chapter 3.2.6. Like the net migration rate, the natural population increase among NUTS 2 regions is distinctly heterogeneous. In terms of spatial characteristics, the natural population balance (Map A2.03) varies strongly from the net migration rate.

Natural population increase seems to be rather unimpressed by national borders. Strong disparities within countries can be observed, apart from those countries that consist of only one or two NUTS 2 regions (e.g. the Baltic States). Only a few countries with more than two NUTS 2 regions have a solely positive or negative natural population balance at the regional level. These exceptions are Bulgaria, Hungary and the Czech Republic, where the overall population development is negative. Exclusively positive natural population increases at the regional level can only be observed in the Netherlands (besides those countries with only one or two NUTS regions like Iceland, Ireland, Luxembourg, Liechtenstein, Malta and Cyprus). Even in countries with a considerable surplus of births over deaths (see Map A1.1a), regional differences are often distinctive. In Sweden, for instance, only a few regions feature a positive natural population balance. The same is true in the UK, Spain and Portugal. However, these naturally growing regions are often identical with the most populous regions.

In most countries with an overall negative natural population balance like Germany, Italy, Greece, as well as Poland and Romania, at least a few regions show a positive balance. Contrary to the Eastern European countries of Poland and Romania, where these are first and foremost peripheral regions, positive natural population balances in Germany (e.g. Oberbayern/DE21 with Munich) or Greece (Attiki/GR30 with Athens and Kentriki Makedonia/GR12 with Thessaloniki) are often found in economically dynamic and urban regions.

The interplay of the three demographic main events (births, deaths and mobility) decides whether a population is growing or shrinking. Combining net migration balance with natural population balance results in total population development. The annual average population change over the period 2001 to 2005 at NUTS 2 level delivers a diversified demographic image of the “Europe of the Regions”. Map A2.05 reveals that not necessarily those regions with a double positive balance (i.e. positive natural population balance as well as positive net migration) also have the strongest overall population increases. This can be explained by the different impacts of both components of population growth. At least since the early 1990s, European population growth has been mainly caused by international migration and some 80% of recent overall population growth results from migration (ESPON 2009:22).

In fact, those regions with the highest net migration rates and at least moderate natural population increases feature the highest population growth. Apart from Guyane (FR93), the top 10 NUTS 2 regions with respect to population growth are primarily driven by a strong net migration surplus of close to 2% (i.e. 20 per 1,000 population) or more per year. Out of these ten regions only two – Flevoland (NL23) and Southern and Eastern Ireland (IE02) – feature considerable natural population increases close to 1% per year. From those 33 regions with a total population increase of 10 per 1,000 or more, five regions even have a negative natural population balance (i.e. Algarve/PT15, Ioni nisia/GR22, Lincolnshire/UKF3, Emilia-Romagna/ITD5 and Umbria/ITE2). Conversely, regions with the strongest total population decreases have to bear strong out-migration. Only a few of these shrinking regions have a positive natural population balance (e.g. Warminsko-Mazurskie/PL62 in north-eastern Poland).

“Low fertility in Europe [...] is a regional problem that has most serious consequences in parts of Europe recording a troubling mix of low fertility, emigration and, in some countries, also a relatively high mortality.”

Tomas SOBOTKA (2008:61)

On the contrary, regions affected worst by depopulation (i.e. most Bulgarian regions, as well as Sachsen-Anhalt/DE08 and Chemnitz/DE01 in Eastern Germany) can be labelled “double negative”, featuring negative natural population balances as well as negative net migration rates.

The components of population development will be further discussed in Chapter 4.3.4 with a special emphasis on different types of regions. Thereby, the typology of demographic status will be compared with the previously developed ESPON typology of population development.

**AGE STRUCTURE**

An analysis of the share of the elderly, as well as of the old age dependency ratio and the proportion of working age population shall be sufficient to emphasise the regional differences of the age structure across the EU27.

The share of elderly – be it the old (65+) or oldest-old (80+) – constitutes a subset of the age group 65 years and older – also shows regional variations. Concentrating first on the countries with the highest shares, the proportion

86 A simple correlation exercise of 284 European NUTS 2 regions yields that, of course, both components of population growth are strongly correlating with the total population balance. However, based on the annual average of the period 2001 to 2005, the correlation coefficient of net migration and total population increase (0.867) is considerably stronger compared to the coefficient of natural population increase and total population increase (0.623).

87 Guyane (FR93), which is located in South America, is a French overseas department, and therefore also a European NUTS 2 region. So much on the topic of “what is Europe?” (see Chapter 3.2.1).
of the elderly in Germany and Greece is quite equally distributed, while the regional differences in Italy and Sweden (as well as in Spain, France and the UK) are more pronounced (see Map A2.02 and A2.13). Countries with a relatively small proportion of elderly, to be found first and foremost in Eastern Europe, do not show strong regional variations. Except for Bulgaria, where the Northern regions of Severozapaden (BG31) and Severen tsentralen (BG32) feature proportions of close to 20% and more of people aged 65 years and older, which is clearly above the national average.

Regions with a high share of elderly are simultaneously often regions with a negative natural balance, but do not necessarily show the highest life expectancies. In the majority of regions, an over proportional share of elderly is referable to distortions in the age structure, often triggered by strong out-migration of young adults and amplified by low rates of fertility. This combination of factors is applicable for the above-mentioned Bulgarian regions.

When measuring demographic ageing by the share of elderly, the oldest region overall is Liguria (ITC3) with a share of more than 26% of the population aged 65+ and 7% of oldest olds (80+). Not far behind are other Italian regions, namely Toscana (ITE3) and Umbria (ITE2) with around 23% and 6.5% respectively. Compared to that, Guyane/FR93 (with less than 4% aged 65 or older) and Réunion/FR94 are the youngest European regions, although both are French Overseas Departments and thus not even located in continental Europe. Apart from those, Flevoland/NL23 and Inner London/UK1 are the only regions with a share of elderly of less than 10% in 2005.

The old age dependency ratio (OADR) – i.e. the ratio of the “older or retired population” and the “economically active” population (aged 15 to 64 years) – is quite balanced at the regional level. Almost 70% of all nuTS 2 regions had an OADR between 20/100 and 30/100 by 2005. Only Liguria is bearing an OADR of more than 40/100, while the ratio is below 20/100 in Flevoland, Inner London, in both Irish nuTS 2 regions and in Iceland, as well as in many Eastern European regions of Poland, Slovakia and Romania (see Map A2.16) – aside from the French Overseas Departments, which must be assumed as demographic (and geographic) outlier in the European sense. However, those regions with a high proportion of elderly also have a relatively high OADR.

WORKING AGE
The regional distribution of the proportion of the working age population between 20 to 64 years (see Map A2.21) is quite selective and not comparable with the country level (cf. Map A1.26). Only throughout Eastern Europe the share of the working age population is relatively even distributed and relatively high, reaching 60% and more by 2005. In the rest of the EU27+4, high shares of the population in working ages can be found predominantly in urban areas and economically dynamic regions, which is where the jobs are. In this respect, the share of the working age population in 2005 was highest (65% and more) in Inner London (UK11), Bratislava (SK01), Prague (CZ01), and Bucharest (RO32), on the Canaries (ES70) and in Berlin (DE30).

The share of working age population was still increasing between 2001 and 2005 in the vast majority of regions. The strongest annual average increases of 3% and more were recorded in the Spanish regions of Valencia (ES52), Murcia (ES62) and the Balearic Islands (ES53), as well as in Cyprus and in the Borders, Midland and Western region (IE02) of Ireland. It is striking that those 15 regions that show the strongest decreases (of more than – 0.5%) are all in Germany and Bulgaria. In Bulgarian regions and also in some parts of Eastern Germany, the decrease in the share of the working age population is the result of massive out-migration. In other German regions, the decline of the working age population is referable to demographic ageing. In the most notably affected Bulgarian regions (Yuzhen tsentralen/BG22, Severozapaden/ BG31 and Severen tsentralen/BG32) the share of the younger active population (i.e. the age group 15 to 34 years) will halve in the course of the next 25 years (cf. TIVIG et al. 2009:242ff).

Apart from that, decreases in the working age population can be observed in peripheral regions of Scandinavia and Scotland, as well as in Estonia, Latvia, some regions of Poland, Romania, Greece, Italy and in the Danish Capital region Hovedstaden (DK01) with Copenhagen (see Map A2.23). The latter must be filed under “exceptional case”, because of the strong and increasing linkage of the Copenhagen region with Southern Sweden. Since the opening of the Oresund Bridge in 2000, more and more Danish citizens live in the region Sydsverige (SE22) because of lower housing costs, while commuting to Copenhagen on a daily basis.

88 The correlation between the share of the age group 65+ and the natural population balance is pronounced negative (r = –0.686), implicating that the higher the share of elderly, the lower the natural population increase.

89 In Guyane, the annual increase was also above 3%, albeit driven solely by the extremely young age structure, which is atypical in comparison with any region in continental European.
3.4 IS THERE A EUROPEAN DEMOGRAPHIC REGIME?

Before summarising the demographic status and trends of Europe, which was discussed at different scales in the previous chapters, the question of convergence or divergence of demographic characteristics across Europe shall be addressed by means of the well-acquainted demographic indicators. Due to the inappropriate data availability at the regional level of NUTS 2 (over time), this analysis is restricted to the scale of nation states.

3.4.1 CONVERGENCE & DIVERGENCE OF DEMOGRAPHIC DEVELOPMENTS

According to WordNet – a lexical database run by the Princeton University – the term convergence, by its basic meaning, describes “the occurrence of two or more things coming together”.90 For sure, more and more detailed definitions of convergence – and its contrary “divergence” – exist, especially in the field of economics. However, the above-mentioned definition is absolutely appropriate for the here-discussed demographic trends. A complete workup of this topic in terms of a separate research question goes beyond the scope of this thesis and would require an extended statistical exercise. In the following, the question of demographic convergence or divergence will be exclusively discussed by the demographic variables of fertility, mortality, migration and the resultant population dynamics. Furthermore, the trends will be discussed exclusively on the country level, due to the lack of corresponding time series at the regional level of NUTS 2.

The idea or ideal of socio-economic convergence is a well-known concept. In Marxism, convergence is a more or less inevitable process, while neo-classical economic theory is assuming that free markets lead to economic convergence (cf. COLEMAN 2002:320). Moreover, EU principles and policies are orientated on social and regional convergence, implicating common economic and social structures (ibid., p.319).

“The end-point of demographic transition is often assumed to be convergence to a new stable post-transitional regime.”

David A. COLEMAN (2002:336)

Even in demography, convergence seems to be an important concept. The assumption of convergence can be referred to both, the first and the second demographic transition, although the SDT is rather relating to the diffusion of post-modern values, while the FDT stresses the conformation to low levels of births and deaths rates (see Chapter 2.2.2 and 2.2.5). Furthermore, most underlying scenarios of population projections are based on the convergence of (one or more) demographic indicators (see Chapter 2.3.1). The following examination of demographic trends in Europe since 1950 – a somehow eclectic starting date, but still describing the development since the end of World War II – might enable a general view, whether demographic convergence or divergence is characterising the European demographic regime.

FERTILITY

Figure 26 and 27 display the trend in CBR and TFR by European countries grouped by geographical regions (according to UN definition) show that fertility declined in every European country since 1950. By the mid 20th century the European CBR was considerably above 15 births (per 1,000 population), with the lowest values of just below 15 in Luxembourg and Austria and the highest in Albania (39.3 per 1,000). By 2005, the CBR of European countries was around or beneath that minimum mark of 1950, spanning from 8.8 in Germany to 15.2 in Ireland. The same trend of fertility decline can be read off the TFR, which was around or above the replacement level of 2.1 children per woman in almost every country by 1950, ranging from 1.98 in Luxembourg to 5.6 in Albania. Fiftyfive years later, not a single European country reached this “line of maintenance”. The TFR was lowest in Ukraine (1.15) and highest in Iceland and Albania (just below 2.0). For sure, the TFR is the better choice when measuring the fertility behaviour (per woman), because the CBR is distorted by the age structure of the total population (cf. Chapter 2.1.2). The trend of both indicators is clearly pointing into the same direction, namely downwards.

Fertility decline did not follow the same pathway in every country or geographical region. Developments in the Western European subgroup were relatively homogeneous, with a peaking “baby boom” in all countries around 1965 and a subsequent decline. Since 1990, the Western European trend in fertility was actually rather diverging (see Fig. 28). In other geographical distinguished groups of countries, the picture is different. Even when subsuming the former socialist countries of Central and Eastern Europe in one group (not illustrated in the figures above), the trend does not become as smooth as might be imagined. While the Baltic Republics of Estonia and Latvia were relatively constant over time, other countries like Romania experienced considerable ups and downs.91 In respect to the former Eastern Bloc, the only similarity is the unprecedented “baby bust” after 1989.

Consistent time series on (voluntarily) childlessness and mean age at first birth, both essential indicators when analysing the SDT, are not available for all European countries, therefore these indicators are not included in this brief analyses.

90 See: http://wordnet.princeton.edu/ (retrieved 18.02.2010)

91 In the Romanian case, these up and down swings in fertility are the result of a brutal pro-natalistic population policy during the Ceausescu regime (see BIRERSON 1979; BACHMAN 1989; MEADOWS 1990; LATAIANU 2001).
Figure 30: Life expectancy at birth in European countries (1950-2005)
Data source: UN Population Division – World Population Prospects 2008 Revision

Figure 31: Gender gap in life expectancy in European countries (1950-2005)
Data source: UN Population Division – World Population Prospects 2008 Revision
Mortality

The trend of the IMR, describing the mortality of the youngest (below one year), suggests a nearly completed convergence (see Fig. 29). The IMR declined dramatically in all European countries, which truly is a great achievement. In 1950, mortality rates of 10% (i.e. 100 infant deaths per 1,000 live births) were widespread, especially in Eastern Europe and also in some Balkan states like Albania, Macedonia and Bosnia-Herzegovina. Today, all over Europe the IMR is below 2% (i.e. 20 per 1,000).

While the IMR values of 1950 spread from 20 infant deaths per 1,000 live births (in Sweden) to 145 in Albania, the spectrum tightened considerably until 2005, ranging from 3 (per 1,000) in Iceland to 19 in Macedonia. However, 19 infant deaths per 1,000 births is still a very high death toll, considering the medical progress of the past 55 years. Aside from absolute values, the ratio between lowest and highest IMR was only declining from a factor of around 7 (by 1950) to a factor of 6 (by 2005).

Although life expectancy at birth increased considerably in most countries since 1950, at least two different pathways can be observed. Increases in live expectancy in Eastern Europe and on the Balkans were levelling off since the early 1960s and were even decreasing after 1989, while Northern, Western and Southern European countries experienced a steady increase from 1950 onwards (see Fig. 30). This negative trend affected the former Eastern Bloc countries more than the Balkan countries. Nevertheless, Bosnia-Herzegovina experienced the worst decrease in life expectancy in post-World War II Europe, caused by years of war between 1992 and 1995.

Letting the figures speak for themselves, in 1950 life expectancy at birth was spanning from 43.8 years in Bosnia-Herzegovina to more than 72 years in the Netherlands, Iceland and Norway. By 2005, the lowest life expectancy was observed in Russia (64.8 years, which is only 0.3 years above 1950/55) and the highest in Iceland (81 years).

Considering gender differences in life expectancy (see Fig. 31), no convergence can be detected. On the contrary, an increasing divergence must be discerned, which was even amplified after 1989. By 1950, there was no gender gap at all in Macedonia, while the gap was about 9 years in Belarus. Fifty-five years later the smallest gap was to be observed in Iceland (3.4 years) and the widest in Russia (13.3 years). However, the range of existing gender gaps across European countries by 2005 would be considerably smaller – around 4 years instead of nearly 10 years – if the Eastern European and Balkan countries would be excluded from the analysis.

Migration

Trends in migration, the third component of population development, can be best described on the basis of net migration rates; admittedly, not because it is the best indicator, but rather because it is often the only available measure of migratory trends (cf. Chapter 2.1.1).

In visual and hence superficial terms, the graphs of the net migration rates (1950 to 2005) do not provide any evidence for convergence. They rather look like displaying nervous stock markets than a steady demographic pathway. In fact, migration – the most volatile demographic variable – is often influenced by economics and political, rather than by demographic logic. Although there is no distinct trend over time, there are at least a few similarities across countries.

Generally speaking, the vast majority of European countries featured a relatively balanced net migration over time, resulting in an annual average net migration rate of around 2 (per 1,000 population). Nevertheless, there are many exceptions and outlier. Sticking to similarities for a moment, in the course of the second half of the 20th century more regions turned from emigration to immigration countries instead the other way round (as already discussed in Chapter 2.2.6). The most noticeable similarity is the wave of out-migration from Eastern European countries after the fall of the Iron Curtain. Before 1989, citizens of the former socialist countries had no opportunity to emigrate legally, while the few exceptions were usually not on a voluntary basis. After 1989, they had the opportunity to do so, and they did. Since the mid-1990s, the process of massive emigration is slowly levelling off and some Eastern, or rather Central European countries like Hungary, the Czech Republic and Slovakia became destination countries of international migration – just like their western neighbours.

Southern European countries like Italy, Spain, Portugal and Greece, which constituted the pool of labour supply for Western and Northern European countries for a long time, transformed to immigration countries since the late 1970s. The same is true for Ireland since the 1990s. By contrast, all Balkan countries are (still) countries of emigration. The extreme emigration from Bosnia-Herzegovina during the early 1990s is, of course, due to the Bosnian War, which triggered an unprecedented flow of refugees in post-World War II Europe.

Back to crude numbers, by 1950 the net migration rate was spanning from –18 (per 1,000 population) in Malta to +8 in Moldova. Half a century later, Moldova featured the most negative net migration rates of –16 (per 1,000), while Spain and Ireland had the most positive balance of around +12 (per 1,000). Insofar, the migration history of Moldova is absolutely inverted compared to the general European trend – i.e. from a negative to a possible migration balance.

92 No gender gap in life expectancy at all, as it was recorded in Macedonia in 1950, is an exceptional phenomenon. Without questioning the figures provided by the UN, it could be attributable to a statistical artefact, especially when taking into account that Macedonia did not become independent before 1991 and was an autonomous republic of the Federal Republic of Yugoslavia in 1950. However, evidence for higher life expectancies of men exists, if mainly in the historical perspective. In India, for example, female life expectancy was below those of men until 1990. In this case, it was due to a strong culturally induced male preference, which also affected the female health care negatively. In China, with an equally strong prevalence for men, by 1951 the IMR for girls was more than 50% higher than those for boys, before levelling in the course of the 1970s.

93 According to FEDOR (1995), ethnic Russians and Ukrainians moved to the newly formed Moldavian SSR to alleviate the post World War II labour shortage, while since the early 1990s, there was significant emigration from the republic, primarily from urban areas and by Romanian minorities.
Figure 34: Age group below 15 years in European countries (1950-2005)
Data source: UN Population Division – World Population Prospects 2008 Revision

Figure 35: Age group 15 to 64 years in European countries (1950-2005)
Data source: UN Population Division – World Population Prospects 2008 Revision
Figure 36: Age group 65 years and more in European countries (1950-2005)
Data source: UN Population Division – World Population Prospects 2008 Revision

Figure 37: Median age in European countries (1950-2005)
Data source: UN Population Division – World Population Prospects 2008 Revision
Population Development

The alerted reader may have noticed, that population growth – based on the basic demographic equation (see Chapter 2.1) – is simply the aggregate of trends in fertility, mortality and migration.

In a global context, population growth of European countries was relatively moderate during the second half of the 20th century, hovering in the just positive range of up to 2% per year. Only some countries had higher annual population growth rates during certain periods, e.g. Moldova and Switzerland (until 1965), Iceland (in the 1950s), as well as Albania (until 1990) and Ireland (since 2000). Only the former socialist countries of the Eastern Bloc drop out from this trend of steady and moderate growth. Most of these Eastern European countries are facing negative rates since the 1990s, while they were showing the highest growth rates until the early 1960s. As extensively discussed, the drivers of growth changed over time and from country to country.

By 1950/55, Ireland had a negative annual population growth of –0.6%, while Albania experienced the strongest rates of population growth with more than 3% per year. During the period 2000/05, Moldova’s population was shrinking by 1.75% every year, while the population of Ireland was growing by nearly 2% per year. Compared to 1950, the diversity of population growth rates across European countries did not change at all.

Age Structure

Finally, the age structure of populations, determined by trends in fertility, mortality and migration, will be briefly examined by means of the development of broad age groups and the consequent median age.

The young population, represented by the age group below 15 years, was declining dramatically without exception. Southern Europe saw a relatively steady decline since the 1970s, while more or less distinctive swings – triggered by diverse baby booms and busts – characterised the general downward movement in other European countries and regions. By 2005, the share of the younger population ranged from 13.7% in Bulgaria to 26.5% in Albania, while the range of 1950 was spanning from 19.9% in Luxembourg to 38.9% in Albania. This can be interpreted as a convergence on a lower level.

The age group 15 to 64 years – representing the adult population – was slightly increasing since the 1960s and early 1970s in all European countries, after decreasing in many countries during the 1950s. Since the dawn of the new millennium, the proportion of adults is already declining again, especially in Southern and – even more pronounced – Western European countries. Around 1950, the share of the adult population ranged from 54% in Albania to 70% in Luxembourg. In 2005, the lowest proportions of 65% were to be found in Albania and the highest in Slovenia with 70%. Indeed, these figures were “coming together” and thus constituting a convergence.

By 1950/55, Ireland had a negative annual population growth of –0.6%, while Albania experienced the strongest rates of population growth with more than 3% per year. During the period 2000/05, Moldova’s population was shrinking by 1.75% every year, while the population of Ireland was growing by nearly 2% per year. Compared to 1950, the diversity of population growth rates across European countries did not change at all.

3.4.2 Population Dynamics in Europe – A Brief Summary

Before concentrating on the development and outcome of a regional demographic classification of NUTS 2 regions in the coming sections of this thesis, a short summary of the previously discussed state of demography in Europe shall be given.

“(…) the twentieth century saw so many upheavals that its outcome is beyond the reach of theory.”

David A. Coleman (2002:341)

Trends of Convergence and Divergence

As demonstrated in the previous chapter, for the most part demographic developments of European countries follow the same trends, if only by direction and not necessarily in respect to particular pathways and similar outcomes. Compared with 1950, demographic variables by 2005 still show a strong variety.

Fertility has been considerably declining since the 1970s across Europe, except of Eastern Europe, where fertility started to decline not before the early 1990s. Assuming the demographic replacement level of a TFR of 2.1 as a potential yardstick for convergence (at the lower end), every European country converged beyond this level already before 2005. Even the closing gap in absolute values imposes convergence in fertility behaviour. While the bandwidth of the TFR in European countries amounted to 3.6 in 1950, it was only 0.8 by 2005. However, most recent developments in the TFR – supported by new evidence of the process of fertility postponement – suggest that the low point of lowest-low fertility has been already overcome in some countries. This might lead to a new divergence below (or around) the threshold.
of replacement. With respect to social divergences, not all social groups have postponed parenthood to the same extent. Women with tertiary education have frequently shifted birth of their first child beyond the age of 30, whereas women with low qualification usually give birth to their first child at an early age, often as teenagers (SOBOTKA 2008:35).

Today, the state of mortality, both at young ages (measured by the IMR) as well as at older ages (expressed by the life expectancy at birth), is much better than anyone might have imagined in 1950. The IMR was steadily declining since 1950 and reached an all-time low by 2005 everywhere across Europe. Even the span of minimum to maximum IMR among European countries by 2005 (i.e. 16 infant deaths per 1,000 live births) seems to be infinitesimal small compared to 125 in 1950. Nevertheless, the remaining bandwidth is an indication for an incomplete conversion of (reproductive) health systems across Europe. Simultaneously to the decline of mortality rates of the youngest, longevity reached an extent, which was unforeseeable a few decades ago. Today, life expectancy at birth across Europe is much higher than it was in 1950, except for Russia and other European countries of the Former Soviet Union (FSU). Despite the positive developments during the second half of the 20th century, several disparities are undeniable. Geographically, an enormous gap between Eastern Europe and the rest of Europe must be ascertained. Furthermore, the EU Demography Report 2008 (EC 2008d:40) stresses the strong disparities in mortality between social groups. Mortality of the lowest socio-economic categories is 30% to 60% higher than for the highest socio-economic categories, whereas the difference for men is even larger than for women (ibid.). The gender gap in life expectancy is not only large when differentiating between social groups, as supported by the findings in respect to the HILY indicator. In general, the gap between male and female life expectancy at birth has been increasing since 1950, while differences in life expectancy (of both sexes) has been decreasing considerably among European countries since 1950. The gender gap in longevity widened especially in Eastern European countries, where many countries are facing premature mortality of middle-aged men (ibid., p.29). Although mortality is in general more concentrated in the older ages then it was by 1950, a clear convergence in mortality cannot be discerned.

In respect to migration flows – measured by the net migration rate – convergence is only detectable in terms of direction. Taking the zero line of net migration as the yardstick of convergence, most of those countries, which were sources of emigration by 1950 (especially Southern European countries like Spain, Portugal, Italy and Greece), became destinations for migrants in the course of the late 20th century. Anyway, there is no convergence detectable across European countries with respect to migration rates. Since 1990, Eastern European countries took over the role of the Southern European countries, spreading their citizens all over Northern, Western and Southern Europe and beyond. Although the strong negative net migration balance is gradually cooling off, many former socialist countries in Eastern Europe as well as from the Balkans must still be considered as places of emigration. Statistically, the span from minimum to maximum net migration rate did not change at all between the starting and the end point of this analysis. In 1950, the net migration rate across European countries had a range of 26 (per 1,000), while it was 28 by 2005. The impact of these partially ambivalent trends of demographic processes results in an ambivalent picture when it comes to population growth of European countries. The difference between minimum and maximum growth by 1950 was 3.7%; by 2005 it is still (or again) 3.7%. Compared to 2005, the initial situation of 1950 was a different one in many countries. In general, population growth decreased in most parts of Europe, while some countries like Ireland followed the opposite path, which again resulted in the same overall range. Only when neglecting migration, a trend of convergence is noticeable with respect to population development. The natural population balance converges towards the threshold of natural population growth and decline, approaching the zero-line in most countries of Europe by now. This development emphasises the (even) growing importance of migration as the driver of population gain or loss throughout Europe. Although migration is not the solution for all demographical challenges in Western societies, it mitigates the speed of demographic ageing and can be rated, to some extent, as a substitute for the shrinking (endogenous) working age population (cf. UN 2001). When it comes to population ageing – measured by conventional indicators like the share of elderly – every European country is ageing compared to 1950, when this phenomenon was not on the demographical agenda at all. Today, European countries are ageing at different speeds and are affected differently by the underlying factors of fertility decline, increases in life expectancy and migration flows. Looking at relevant indicators like the share of elderly it is obvious that “things are not coming together”, as supposed by the definition of convergence. Even if alternative indicators of population ageing (e.g. remaining life expectancy) would be already established in the mainstream of population research, one must assume that Europe is ageing on divergent pathways. However, the application of such alternative measures makes more sense, when the retirement age is linked to changes in life expectancy, as already implemented in a few European countries like Sweden, Denmark, Norway, Poland, Slovakia or Hungary (cf. WHITEHOUSE 2007:31f). Flexible retirement schemes would also loosen the definition of the working age population, which is in Europe commonly assumed to be the age group 20 to 64 years.

During the first decades of the 21st century (i.e. now), the share of the age group 20 to 64 years is peaking all over Europe. Looking back over the past five decades, a convergence in the proportion of the working age population was most likely achieved during the late 1960s and early 1970s. Since then, the share of this particular age group is rather drifting apart, when looking at different European countries and regions. During the coming decades, the size of the working age population will decrease all over Europe and hence the OADR will further increase. To compensate the associated negative economic effects, European societies will have to target higher labour force participations (especially of women, older workers and under-employed persons) and an increase in productivity (GOLSTEIN 2009:10). It would be most

94 Extreme low fertility in Europe is linked to the rapid postponement of childbearing, which is likely to be temporary (SOBOTKA 2008:30).
95 In this context, socio-economic status was measured by means of the educational attainment level, manual versus professional levels of occupation or housing quality.
reasonable to do this in conjunction with the introduction of a flexible retirement age – even if that means to breach a societal taboo.

When aiming for a satisfying answer, the question of convergence and divergence of demographic developments must be considered more in-depth. This brief analysis of demographic trends since 1950 did not even consider such important factors like: rural and urban disparities or changes in household types; or in a more qualitative approach, the topics of education, gender equality, and changes in values and family types. In general, all these factors do have a strong influence on European societies, not only on the demographic behaviour.

REGIONAL HETEROGENEITY
Chapter 3.3 presented the regional demography of NUTS 2 regions by 2005, enabling a less common view on the state of demography across the EU27+4.

“While the European Union may have a relatively stable or slightly rising population and stagnating labour force size, different European regions may be set on widely diverging pathways.”

Tomas SOBOTKA (2008:51)

At the regional level, it becomes obvious that fertility behaviour (expressed by the TFR) is strongly influenced by national systems of family welfare. Regional pockets of higher fertility (close to the replacement level) are sparsely represented on the map of Europe. In general, differences in fertility are still stronger between countries than within countries. Contrary to fertility, spatial patterns in life expectancy at birth are much less bound to national border. East-West disparities on the European scale were already mentioned, as well as social and gender gaps. However, also considerable regional differences exist, e.g. in France and the UK.

Besides rural regions with a stronger demand for agricultural workers (e.g. in Spain or in the UK), major stocks of foreign citizens are concentrated in a few regions, which are predominately urban or feature dynamic economies. No considerable stocks of migrant populations can be found in Eastern European regions (yet). In respect to migration flows, extreme out-migration is also concentrated in some regions, generally in Eastern Europe and especially in Bulgaria, Romania and Eastern Germany. Aside from that, modest out-migration is pervasive all over Eastern Europe, as well as in peripheral regions in Scandinavia, North-eastern France and in southern Italy.

Natural population balance is predominately negative in Eastern Europe, with only a few exceptions in some Polish regions and in north-eastern Romania. For the rest of Europe, some strong regional differences within national borders are striking, e.g. in the UK, Spain and Italy and in Scandinavia. A predominately positive natural population increase at the regional level is observable only in France and in the Netherlands, while it is negative in nearly all regions of Germany, besides a few exceptions in the South. As already mentioned, migration is the driver of population development in Europe. Most regions experience a net migration surplus; therefore they also feature a positive (total) population increase. This is true for most regions in the EU27+4, except for the Eastern European part, where even regions with a positive natural population balance are lose population due to out-migration. Disparities within countries are strongest in Germany, where the East is shrinking, while the population development of West German regions is predominately positive. In general, the strongest growing regions are those with strong net migration surpluses, as it is the case in the “new growth regions” of Ireland, South-eastern Spain and Northern Italy. Besides that, large parts of the UK, France, of the Benelux countries, Switzerland, Austria and of the southern regions of Scandinavia feature considerable population growth. In a nutshell, due to the strong effect of positive net migration rates, the overall population replacement rates are close to the threshold necessary for a stable or increasing population in most European regions (cf. SOBOTKA 2008:30).

When taking the share of elder population into account, demographic ageing is most progressed and widespread in countries like Germany and Greece, whereas pronounced regional differences can be found in the UK, France, Spain and in Bulgaria. By contrast, all over Eastern Europe as well as in the Netherlands and in Ireland, the process of demographic ageing is regionally rather balanced and modest by extent. Regions with a high share of working age population are most common in the Eastern European part of the EU27+4, where the age group 20 to 64 years is not only strong in general, but also evenly distributed among NUTS 2 regions. Besides that, high proportions of working age populations are concentrated in urban regions and in some northern regions of Italy, as well as in Sardinia, in the Mediterranean regions of Spain, and on the Canaries. Because of the concentration of working age population in urban regions, OADR’s are highest in rural and peripheral regions of Greece, Italy, Spain, Portugal, France, the UK, Sweden and Germany. The latter, especially East Germany is most affected by the strongest increases in the OADR of more than 4% per year between 2001 and 2005.

STATE OF CONFUSION
In summary it can be stated, that some demographic developments across European countries are following the same trends since 1950, e.g. declining fertility or increasing life expectancy, while others again, e.g. net migration rates or population growth rates, do not show any convergence at all. In general, the developments of particular indicators are heading in similar directions, rather than converging. The process of convergence assumes a “coming together of things“, which is not the case for many demographic indicators (e.g. gender differences in life expectancy or net migration rates). Beyond that, a considerable heterogeneity across countries, and even more pronounced at the regional level of NUTS 2, must be ascertained in respect to demographic characteristics by 2005.

“While some regions are likely to experience considerable and long-lasting population decline, other regions may see continuing population increase (...)”

Tomas SOBOTKA (2008:30)
It seems that the spectre of population decline is a regional problem rather than a threat for Europe as a whole (cf. SOBOTKA 2008:30). However, weak trends of demographic convergence across Europe, coupled with regional heterogeneity, cause a state of confusion. Different countries and regions are affected differently by different demographic trends. How can policy measures address such significant challenges like the (spatial) impacts of demographical change, on the basis of such a vague statement?

“(…) if population issues are to be addressed properly by policy measures, they require a prior spatial assessment.”

David A. COLEMAN (2002:232)

A first step to put things straight might be the development of a demographic classification of European regions. The making of such a typology, which is based on the demographic status of NUTS 2 regions by 2005, will be presented in the following chapters.
4. A NEW DEMOGRAPHIC TYPOLOGY

This Chapter marks the start of the centrepiece of this thesis, focussing on the development of the demographic typology (Chapter 4.1), the presentation of the result (Chapter 4.2) and its further illustration (Chapter 4.3), before linking the typology to socio-economic variables obtained from the most recent European Labour Force Survey (Chapter 5).

4.1 DATA & METHODOLOGY

Before finally presenting the result of the principal aim of this thesis, i.e. the typology of European regions based on demographic variables, a few more preliminary remarks will address the DEMIFER project requirements in regard to the regional classification (4.1.1), the topic of data sources and availability (Chapter 4.1.2), as well as the development of the demographic typology. Namely the spatial and temporal principles, the choice of the input variables and the applied methodology with regard to cluster analysis (Chapter 4.1.3).

4.1.1 DEMIFER REQUIREMENTS

The ESPON project DEMIFER (see also Chapter 1.1) is the decisive factor for the development of a typology of regions based on demographic variables. Without repeating from the top, only the specific project requirements and the envisaged applications of the typology within DEMIFER shall be briefly explained at this point.

As a matter of fact, regions are affected differently by the ongoing demographic changes with an ageing European population, in addition to migration (ESPON 2009:21ff). The research and policy questions DEMIFER is aiming to address (see Chapter 1.1.2) involve, among others, the effects of future demographic developments (i.e. natural development of population as well as migration and the changing age structure) and the related changes in the labour force in different kind of regions. Therefore, it is necessary to identify types of territories, regions and cities that share common development challenges and are affected most (positively or negatively) by the identified structures, trends and perspectives.

A demographic typology that includes indicators of population development, especially of the working age population as well as population ageing shall be developed in order to assess the impact of demographic and migration developments on social and economic cohesion. The typology shall enable to examine the relationship between demographic differences and social, economic and territorial differences for each type of region.

ENVISAGED APPLICATIONS OF THE TYPOLOGY WITHIN DEMIFER

The final classification of European regions (see Chapter 4.2) will serve as the basis for models, projections and case studies, which will be elaborated by several transnational project partners as specified in the DEMIFER Inception Report (ESPON 2008b).

Coordinated by researchers of the School of Geography at the University of Leeds, scenarios with a scope on the development of the labour force will be developed (based on scenarios of the ESPON 2006 Programme). These scenarios will be linked to demographic developments by specifying alternative futures for fertility, mortality,
intra-EU/ESPON and extra-EU/ESPON migrations at the regional scale along the dimensions of long-term growth versus limited growth and competitiveness versus social cohesion. The demographic typology will be used to analyse the future demographic and economic development of different types of regions.

IOM/CEFMR is coordinating the development of multinational and multiregional population projections with a focus on the regional dimension of population processes. The underlying model will track internal EU/ESPON, intra-EU/ESPON and extra-EU/ESPON migration and regional population dynamics in the ESPON countries. It will enable scenarios to be run based on assumptions about changes of demographic and labour force related variables, which are related to socio-economic developments. Besides the level of nation states and NUTS 2 regions, the types of regions of the demographic typology will be used as input and output areas for the projections.

Since detailed data, especially on internal and international migration, is not available for all regions, case studies – prepared under the coordination of CNR – will provide in-depth analyses for specific regions. The demographic typology is providing the basis for the choice of a broad variety of different types of regions for these case studies.

4.1.2 DATA SOURCES & AVAILABILITY

ESPCON maintains a series of quantitative research projects, generating a big demand for all kinds of data at different regional levels. Therefore ESPON is establishing its own “ESPCON 2013 Database” to integrate data from different scales, which is constantly collected from a combination of heterogeneous sources. The establishment of this database – constituting a major project by itself – was not completed by the time the final typology was produced (i.e. by mid-2009). For this reason, primarily data from EUROSTAT and National Statistical Institutes (NSI), as well as from other (previously completed) ESPON projects has been used for the DEMIFER project.

“Spatial demography (…) is only viable due to the availability of data that contain geographical information (location).”
Marcia CALDAS DE CASTRO (2007:11)

Cluster analysis (see also Chapter 4.1.3), the tool to construct the demographic typology, requires a complete set of data. Gaps will result in clustering “no data regions”; hence the provided data set must at least allow interpolations in order to fill the gaps. Missing data of a single region for any point in time compels either an exclusion of the region in question or the fallback to the next higher regional aggregation where data is available (e.g. from NUTS 2 to NUTS 4), which is far from being desirable.

The demographic data necessary for the project was already specified in the DEMIFER Inception Report (ESPCON, 2008b:49), shown by variable and availability in Table 5. Besides the applicable data by July 2009, more (and as consistent as possible) data at the level of NUTS regions – e.g. internal and external migration (with respect to the ESPON space) by sex and age, and population by citizenship, country of birth and educational attainment – would have been preferable for the development of an even more refined demographic typology. Nevertheless, the existing data for NUTS 2 regions was certainly appropriate to work with. Relating to the area and population covered by today’s EU27, such a spatially inclusive and comprehensive classification would have been not feasible just a few years ago, before the accession of 12 more European Member States.

“Not everything that counts can be counted, and not everything that can be counted counts.”
Albert Einstein98

When it comes to socio-economic data necessary for the construction of a combined demographic and socio-economic typology, available data on employment (economically active population, employment rates, etc.) and on economic performance (GDP per capita) is showing even more regional and temporal gaps, compared to demographic data. To gather more valuable data, the most recent European Labour Force Survey (EU-LFS) of 2007 was used as an additional source for socio-economic variables (see Chapter 5).

96 See: http://www.espon.eu/main/Menu_Projects/ (retrieved 02.03.2010)
98 It is not revealed whether or not this quote is actually a statement of Albert Einstein. For sure, it was on a small hanging in Einstein’s office at Princeton. See: http://en.wikiquote.org/wiki/Talk:Albert_Einstein (retrieved 07.07.2009)
4.1.3 Developing a Regional Classification

When developing a typology, some basic principles as well as the methodology should be clarified before starting with any statistical exercise. Aiming to reduce the large number of 287 NUTS 2 regions into a small number of types, the methodology to be applied is obviously cluster analysis. Like factor analysis, cluster analysis is a statistical technique to reduce data, whereas the first is looking for similar variables and the latter’s objective is the grouping together of similar observations (ROGERSON 2006:262). Generally speaking, a cluster analysis is grouping cases of data based on the similarity of various variables. In the case of a geodemographic classification, it is necessary to clarify the spatial and temporal principles first, before choosing the appropriate input variables for the cluster analysis.

Spatial & Temporal Principles

According to the DEMIFER project requirements (ESPON 2008b:31ff), NUTS 2 (see Map 3) is the prior regional scale for constructing the classification. On the one hand, NUTS 3 (Map 3/bottom right) would be preferable from the analytical point of view, especially when smaller functional areas (e.g. urban regions) shall be analysed. Due to the given data situation it appeared to be realistic to elaborate the final classification at NUTS 2 level. On the other hand, the fact of using NUTS 2 will bear the advantage of a direct compatibility with all other research activities within the DEMIFER project, as they are also working at the regional level of NUTS 2.

Because of the temporal restriction of the available data the timeframe to be analysed is embedded within the period 1990/2000 to 2008 (latest). This period enables an accurate analysis of the current status and the so connected short-term trends. It seems realistic to target the year 2005 for an up-to-date statistical analysis, while the period 2001 to 2005 is used to cover the short-term on which the current status (i.e. the year 2005) is based on. By the nature of demographic developments long-term analyses are crucial to shed more light on the background of current population dynamics. However, due to the lack of sufficient data these long-term developments will not be included in the construction of the typology.

Input Variables

The available data restricted the choice of demographic variables to population by age and sex and the components of population development (births, deaths and net migration). Even then a wide range of possible variables is unfolding, simply by figuring out one or more convenient age groups. To include a minimum number of variables, it was feasible to compare them by means of a simple correlation matrix as shown in Table 6.

On the one hand, strong correlations within a data set are undesirable for cluster analysis, because they represent data redundancy. On the other hand, highly correlating variables imply a predictive and descriptive power, which is advantageous for a classification. In this respect highly correlated variables – at least those who do not share the same denominator – shall not be dropped automatically, but judged on the individual merits of each variable against every other variable (cf. VICKERS et al. 2005:8ff). Following this principle, the choice of input variables was made after testing a whole set of different indicators for the cluster analysis (see Chapter 4.2.2).

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The number of variables used should be as small as possible to ensure a satisfactory representation of the intended main dimensions of the classification (VICKERS 2006a:117). In order to avoid a weighing of the variables, which would further complicate the interpretation of the achieved classification result, the process of choosing the right variables should be distinctly selective (ibid., p. 132).

The Application of Cluster Analysis

The variables used as input for a cluster analysis might be differing by scale, e.g. shares of age groups ranging from 0% to 100%, demographic rates that can be positive and negative, or life expectancies in years with a theoretically open interval to the top. To ensure that each variable has the same weighting in the classification, the variables need to be standardised over the same range (VICKERS et al. 2005:28). The here applied and most common form of standardisation is to create z-scores. This method expresses the difference of the values to the mean by standard deviations, whereas the mean of z-scores is always 0 and the standard deviation is 1 (JANSEN & LAATZ 2005:218).

When clustering a set of data points into non-overlapping groups of points (i.e. clusters), the points in a cluster are more similar to one another than to points in other clusters (FABER 1994:138). By doing so, every cluster can be characterised by a single reference point, usually an average of the points in the cluster, i.e. the cluster centre (ibid., p. 139). Several clustering methods exist, whereas Ward’s hierarchical method and the non-hierarchical k-Means approach are the most widely used.

Ward’s method is following a bottom up approach starting with n groups of one case each. At the first stage of agglomeration, two of these cases will be combined to form a cluster. At the next step of agglomeration, either a third case is added to the cluster or two other cases are merged into a new cluster; and so on, until all cases belong to one cluster (see Fig. 38). However, once a cluster is formed, it cannot be split (VICKERS 2006b).

99 Data updates until July 2009 were considered for the elaboration of the demographic typology.
Contrary to hierarchical methods, the non-hierarchical k-means approach is top-down orientated and requires the number of clusters to be specified in advance. By means of an iterative relocation algorithm, the cases are moved from one cluster to another (see Fig. 38) – allowing already formed clusters to be split again – until the greatest improvement in the sum of squares within each cluster is obtained (cf. VICKERS 2006b). Generally speaking, a “good” clustering result is achieved, when the within-cluster sum-of-squares, signifying the proximity of cases within a cluster, is as small as possible and the between-cluster sum-of-squares, expressing the distance of clusters to each other, is as high as possible.

The clustering technique to be applied for the development of the demographic typology was already determined in the DemIFeR Inception Report (eSPon 2008b:25): “The method used for constructing a typology will be hierarchical cluster analyses to gain an overview about the similarity structure of the regional units and to extract a starting configuration of cluster centres which will be improved by a non-hierarchical cluster procedure (see e.g. VICKERS et al. 2005). The combination of a hierarchical and a non-hierarchical cluster procedure delivers the most reliable outcome.”

Taking this into account, the result of the hierarchical cluster analysis (Ward’s method) was refined by a non-hierarchical cluster analysis (k-means). The cluster centres generated by the Ward method were used as initial cluster centres for the k-means cluster analysis (cf. JANSSSEN & LAATZ 2007:454). Before doing so, the number of clusters must be designated by means of hierarchical cluster analyses.

The optimal number of types of regions (i.e. clusters) to be achieved was roughly set to the range of 4 to 10, because cluster groups of around six in number enable a good visualisation and ensure descriptive names. Therefore, clusters from 2 to 12 were produced to see how the average within-cluster distance changes (cf. VICKERS et al. 2005:35ff). There is no distinctive rule determining an ideal number of clusters. According to VICKERS et al. (2005:34), the following issues should be considered when choosing the number of clusters:

- Analysis of average distance from cluster centre for each cluster number option. The ideal solution would be the number of clusters, which gives smallest average distance from the cluster centre across all clusters.
- Analysis of cluster size homogeneity for each cluster number option. It would be useful, where possible, to have clusters of as similar size as possible in terms of the number of members within each cluster. This makes the clusters more comparable with each other.
- The number of clusters produced should be as close to the perceived ideal as possible. This means that the number of clusters needs to be of a size that is useful for further analysis.

According to BACKHAUS et al. (2007:430f), the so-called “elbow-criteria” – describing a significant difference in the increase in the average distance from the cluster centre

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4.2

DEMOGRAPHIC TYPOLGY OF EUROPEAN REGIONS

At last, the different types of regions resulting from the demographic typology of European (NUTS 2) regions are presented in Chapter 4.2.3. In order to establish a connection between this newly developed typology and previously elaborated demographic classifications under the ESPON banner, a brief compilation of existing ESPON typologies will be presented right at the outset of this section (4.2.1). In another brief section the final input variables of the classification will be described (4.2.2).

4.2.1 PREVIOUSLY DEVELOPED ESPON TYPOLGIES

Since 2002, ESPON – the European Spatial Planning Observation Network (see Chapter 1.1.1) – is conducting projects at the European national and regional level with respect to territorial trends and impacts. In the course of these projects a large variety of different typologies were already developed. By far not all of them are demographic typologies, but rather deal with other spatial phenomena and purposes. Table 8 offers an overview of previously developed ESPON typologies. Specific demographic typologies (highlighted in Tab. 8) were mainly produced in the course of the ESPON project 1.1.4 “The Spatial effects of Demographic Change and migration” (ESPON 2005) and for the ESPON Territorial observation no. 1 “Territorial dynamics in Europe: Trends in population development” (ESPON 2008c).

The main objective of the already completed ESPON project 1.1.4 was to describe and analyse the variety of demographic situations in different parts of Europe. In order to classify the regions with respect to the total population development, natural population development and migration, a base typology covering the period 1996 to 1999 and consisting of six different combinations was constructed (ESPON 2005:11f).

Sharp thresholds of either positive or negative balances with respect to the three main categories determine the six individual characteristics. This meaningful regional classification was later updated for the period 2001 to 2005 (see map 4) and published in the ESPON Territorial Observation no. 1 (ESPON 2008c). Because of the focus on population development, which also plays a prominent role in the analyses DEMIFER is conducting, this particular typology will be further explained and also linked to the newly developed demographic typology.

Another typology developed by the ESPON 1.1.4 TPG is based on age and migration profiles (Map 5) and illustrates which kinds of (functional and geographic) regions are attractive for which age group of migrants.

A third demographic typology taken from ESPON 1.1.4 is analysing the level of mobility based on a combination of mobility and migration (see Map 6). In this case, mobility was measured as the sum of in-flow and out-flow of people in relation to the population size, while migratory movements were split into two categories: net in-migration and net out-
Table 8: Previously developed ESPON typologies (demographic typologies are highlighted)

<table>
<thead>
<tr>
<th>Typology</th>
<th>Publication</th>
<th>Created</th>
<th>Period</th>
<th>Spatial scope</th>
<th>Regional level</th>
<th>Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>FUA (functional urban area)</td>
<td>ESPON 1.1.1</td>
<td>2003/04</td>
<td>2000</td>
<td>EU 27+4</td>
<td>NUTS 3</td>
<td>3</td>
</tr>
<tr>
<td>MEGAs</td>
<td>ESPON 1.1.2</td>
<td>2001</td>
<td>2001</td>
<td>EU 27+4</td>
<td>NUTS 3</td>
<td>4</td>
</tr>
<tr>
<td>Intra-urban settlement structure</td>
<td>ESPON 1.1.3</td>
<td>2002</td>
<td>2002</td>
<td>EU 27+4</td>
<td>NUTS 3</td>
<td>4</td>
</tr>
<tr>
<td>MNTS 3 FUA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>NUTS 3</td>
<td>6 (19)</td>
</tr>
<tr>
<td>Urban-rural</td>
<td></td>
<td>1986-01</td>
<td></td>
<td>EU 27+CH</td>
<td>NUTS 3</td>
<td>6 (10)</td>
</tr>
<tr>
<td>Cross-border functionality and participation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>NUTS 3</td>
<td>6</td>
</tr>
<tr>
<td>Population development by components</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>NUTS 3</td>
<td>6</td>
</tr>
<tr>
<td>Demographic typologies</td>
<td></td>
<td>1996-99</td>
<td></td>
<td>EU 27+4</td>
<td>NUTS 23</td>
<td>5</td>
</tr>
<tr>
<td>Mobility balances by age</td>
<td></td>
<td>1995-99</td>
<td></td>
<td>EU 27+4</td>
<td>NUTS 23</td>
<td>8</td>
</tr>
<tr>
<td>Accessibility and GDP</td>
<td></td>
<td>2000/01</td>
<td></td>
<td>EU 27+4</td>
<td>NUTS 23</td>
<td>8</td>
</tr>
<tr>
<td>Household telecommunications access and uptake</td>
<td></td>
<td>2004</td>
<td></td>
<td>EU 27+4</td>
<td>NUTS 23</td>
<td>8</td>
</tr>
<tr>
<td>Business telecommunications access and uptake</td>
<td></td>
<td>2004</td>
<td></td>
<td>EU 27+4</td>
<td>NUTS 23</td>
<td>8</td>
</tr>
<tr>
<td>Broadband penetration</td>
<td></td>
<td>2001-04</td>
<td></td>
<td>EU 27+4</td>
<td>NUTS 23</td>
<td>8</td>
</tr>
<tr>
<td>Introduction of Competitive provision</td>
<td></td>
<td>2004</td>
<td></td>
<td>EU 27+4</td>
<td>NUTS 23</td>
<td>8</td>
</tr>
<tr>
<td>Broadband penetration / Introduction of Competitive provision</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>NUTS 23</td>
<td>8</td>
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<tr>
<td>Regional R&amp;D performance</td>
<td></td>
<td>2004</td>
<td></td>
<td></td>
<td>NUTS 23</td>
<td>8</td>
</tr>
<tr>
<td>Log-Log Regions</td>
<td></td>
<td>1999-2003</td>
<td></td>
<td></td>
<td>NUTS 3</td>
<td>9</td>
</tr>
<tr>
<td>Dominant Structural Funds spending</td>
<td></td>
<td>1998</td>
<td></td>
<td>EU 15</td>
<td>NUTS 3</td>
<td>9</td>
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<tr>
<td>Rural Areas (EU 15 / N 12)</td>
<td></td>
<td>2004</td>
<td></td>
<td>EU 27+4</td>
<td>NUTS 3</td>
<td>4 (6)</td>
</tr>
<tr>
<td>Structural Fund spending and (change of) regional performance ranking</td>
<td></td>
<td>1998</td>
<td></td>
<td>EU 15</td>
<td>NUTS 3</td>
<td>4 (6)</td>
</tr>
<tr>
<td>Sectoral Economic structure in the Candidate Countries</td>
<td></td>
<td>2004</td>
<td></td>
<td></td>
<td>NUTS 23</td>
<td>5</td>
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<tr>
<td>Regional conditions on potentials and bottlenecks</td>
<td></td>
<td>2004</td>
<td></td>
<td>EU 27+4</td>
<td>NUTS 23</td>
<td>5</td>
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<tr>
<td>Settlement Structure</td>
<td></td>
<td>2004</td>
<td></td>
<td>EU 27+4</td>
<td>NUTS 23</td>
<td>5</td>
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<tr>
<td>Synthetic typology of joint demographic and economic evolutions</td>
<td></td>
<td>2005</td>
<td></td>
<td>EU 27+4</td>
<td>NUTS 23</td>
<td>5 (20)</td>
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<tr>
<td>Synthesis of the regional insertion in the world economy</td>
<td></td>
<td>2005</td>
<td></td>
<td>EU 27+4</td>
<td>NUTS 23</td>
<td>5</td>
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<tr>
<td>Economic typology of European regions</td>
<td></td>
<td>2005</td>
<td></td>
<td>EU 27+4</td>
<td>NUTS 23</td>
<td>5</td>
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<tr>
<td>Population development by components</td>
<td></td>
<td>2005</td>
<td></td>
<td>EU 27+4</td>
<td>NUTS 23</td>
<td>5</td>
</tr>
<tr>
<td>Typology yet to be developed</td>
<td></td>
<td>2005</td>
<td></td>
<td>EU 27+4</td>
<td>NUTS 23</td>
<td>5</td>
</tr>
</tbody>
</table>

Table 8: Previously developed ESPON typologies (demographic typologies are highlighted)
Map 5: Typology of migratory balances by age classes, 1995-2000
Source: ESPON (2005:105 – Map 3.12)

Map 6: Typology crossing mobility and migratory balances, 1995-2000
Migration. The objective of this typology is to distinguish between attractive regions with many movements or other regions with only a few movements (ESPON 2005:106f).

Finally, the ESPON 1.1.4 project group also constructed a “first sketch or idea” of a typology that highlights the different forms of depopulation. Map 7 displays all combinations of total population change and the contributions (negative or positive) by the two main components of change (migratory balance and natural population change) for regions with population decline (ESPON 2005:157).

All these typologies refer to some kind of population change, be it naturally induced or by migration. The temporal scope of these classifications is set to the second half of the 1990s, apart from the later updated typology of population development (see Map 4). Because of a revision of the NUTS classification in 2006, a direct comparability cannot be assumed. This makes it difficult to link these valuable concepts to recent regional data and to the newly developed demographic typology, too. However, an attempt to link the typology of population development to the demographic typology was conducted and produced interesting and corroborative results (see Chapter 4.1.3).

4.2.2 INPUT VARIABLES & OUTPUT NAMES

The typology claims to match the demographic status of European regions in 2005. The result should be easy to overview and to understand. Therefore the right choice of variables is a vitally important criterion for the quality of the classification’s outcome. With respect to an unambiguous understanding of the result, the naming of the types of regions resulting from the classification is another important task.

FINAL CLUSTER VARIABLES

The variables used for the construction of the typology represent specific demographic characteristics, which describe the age structure of the population and the components of population change.

AGE GROUPS

Two of the four variables included in the classification deal with proportions of meaningful age groups (by 2005). These age groups – 20 to 39 years and 65 years and older – do not only represent the young adults and the elder population, but also meet the peak ages of mobility.

“Migration often occurs in conjunction with some transition in the life course, such as entry in the college, a change of job, or retirement. Since these underlying transitions are more frequent at certain ages than at other, pronounced age selectivity can be expected with respect to migration too. Adult migration rates often peak in the young adult ages. A second lesser peak around retirement age has also become apparent in the more developed countries. Migration rates during childhood reflect parents’ migration.”

PRESTON et al. (2001:208)
Furthermore, the age groups 20 to 39 years and 65+ roughly reflect a generation step, whereas the age group 20 to 39 years matches the prime reproductive age and the share of the age group 65 years and older is an indicator for the stage of ageing.

A high share of elderly is connected with additional expenditures and less revenues for the social system, because of a higher share of economically inactive people. Looking beyond a strictly demographic point of view, the age group 20 to 39 years characterises each region in terms of the younger working age population. In general, a high proportion of young adults ensure that the labour force does not lack any supplies. However, if not enough appropriate jobs are available, regions with high proportions of people in their 20s and 30s constitute a pool of potential emigrants, who could be heading to those regions where labour force is scarce. From a strictly demographic standpoint, a high share of young adults means a high share of potential parents. On the contrary, a low share of young adults means a lack of potential parents and could lead to labour market shortages, especially in economically dynamic regions based on labour-intensive sectors. With respect to the challenges associated with population ageing, high proportions of young adults are a reasonable precaution against eventually unbearable costs for the social system, which is in turn a threat for social equity.

COMPONENTS OF POPULATION DEVELOPMENT

The other two variables used in the cluster analysis – i.e. the natural population balance and the net migration rate – represent the population development by components. The natural population balance (per 1,000 population) indicates the extent of the population increase or decrease based solely on the difference between births and deaths and, by implication, the crude trends in fertility and mortality too. The net migration rate (per 1,000) indicates the gain or loss of population due to migration. The aggregate of both variables – i.e. the total population change – decides whether a population increases or decreases by size.

Measured by the annual average over the period 2001 to 2005, these variables are indicating the short-term trend prior to the base year 2005. Using the average of a five-year period has the additional advantage of being less sensible for selective fluctuations caused by political measures, e.g. changes in family policy, or exogenous factors like a global financial crisis, which affect the demographic or migratory behaviour.

OTHER POTENTIAL INPUT VARIABLES

Apart from these four variables, a whole array of other indicators was considered as potential input variables for the classification, e.g. the share or the growth rate of other particular age groups, and other demographic indicators like TFR, life expectancy or dependency ratios. All these other variables were extensively discussed within the DEMIFER project group and a number of different cluster analyses were carried out. The results either did not exhibit a strong enough explanatory power, or the classifications achieved were not as suitable as the result of the elaborated demographic typology (see Chapter 4.2.3). Nevertheless, most of these potential input variables are used to illustrate the demographic characteristics of the final classification (see Chapter 4.3).

Especially the choice of the indicator representing demographic ageing – be it the old (65+), the oldest old (75+/80+) or the life expectancy (at birth) – caused long discussions, fuelled by various arguments. The age group 65+ might be mainly important for pension schemes, which are more nationally determined, while the demand for elderly care, which has a stronger regional component, is more influenced by the share of the oldest old. Finally, the share of the age group 65+ became prevalent, because it is a broad age group including also the oldest old. Furthermore, data used in a cluster analysis should not only be consistent, but should also have the same meaning with respect to all regions included. This does not hold true with respect to the oldest old. Life expectancy varies between 65 years and 82 years across European regions. The broad range distorts the meaning of age 75+ or 80+. Indeed, it would have been interesting to apply the concept of “prospective age”, but a “remaining life years”-indicator (cf. Chapter 3.2.4) could not be applied because it requires a data set of 1-year age groups. However, such a data set was not available at NUTS 2 level by the time the classification was produced.

Other potential indicators did not produce suitable results when used as input variables. The TFR, for instance, shows a very low variance at the regional level. The “fertility factor” and also the “mortality factor” are represented by the natural population balance, which can be read as the aggregation of CBR and CDR. In contrast to TFR and life expectancy at birth, these crude rates are distorted by the actual age structure of a population (cf. Chapter 2.1.2 and 3.2.3). In fact, this particular distortion is definitely desirable, when developing a classification that aims to address the territorial effects of demographic developments. Such crude rates – i.e. births and deaths per 1,000 population – highlight demographic effects with respect to particular regions.

WHY NOT MORE?

The reason why not more input variables were used for the construction of the classification is connected to the availability of a sole indicator for migration: the net migration. If more variables would have been used, the process of migration as the main driver of population development in Europe would have been underrepresented in the classification in regard to the weight of each input variable. In any case, the number of variables used should be as small as possible with respect to a satisfactory representation of the intended main dimensions of this classification (see Chapter 4.1.1).

NAMING THE CLUSTERS

The outcome of the final classification results in seven types of regions, each type further subdivided into two to four sub-clusters. Only the seven main types are named, while the sub-clusters – produced for an additional quantitative differentiation – have no particular titles. Although naming seven types of regions does not sound like a complicated task, it is far from being trivial. It needed some rounds of considerations.110

110At the level of NUTS 2 regions, the age groups 65+ and 75+ are highly correlating (0.93). Further on, the variance of the indicator 75+/80+ is relatively low, which results in a low explanatory power when used in a cluster analysis.
and extensive discussions with several colleagues to figure out which titles represent the clusters appropriately. In doing so, it was important to keep two general principles in mind (VICKERS 2006a:153):

“The titles (...) must not offend residents and they must not contradict other official classifications or use already established names.”

After some rounds of discussion, the impression evolved that it might not be possible to find titles, which would perfectly please everyone involved. Accepting this fact, the process of naming the types of regions focused on short titles, transporting a clear impression of the particular demographic status. Therefore, the target was to strive after demographic (and geographic) connotations that focus on challenges and potentials affecting the different types of regions.

4.2.3 TYPES OF REGIONS

The result is a classification of European regions based on the demographic status (2005) and short-term trends (2001 to 2005). The spatial scope covers the entire ESPON space (EU 27+4), i.e. the present 27 EU Member States and the four EFTA countries Iceland, Liechtenstein, Norway and Switzerland. At the regional level, NUTS 2 is the focus of this spatial analysis. The only exception is London with two NUTS 2 regions (Inner London/UK1 and Outer London/UK2). In the course of the adaption of outlier regions, it proved to be necessary to aggregate these two regions to one NUTS 1 region (London/UK). Therefore, the typology comprises 286 regions in total (285 NUTS 2 regions and one NUTS 1 region). For more details on the assignment process of outlier regions, see Annex 6 – “Assignment of Outlier Regions”.

Map 8 presents the achieved demographic classification based on four variables: the share of the age groups 20 to 39 years and 65 years and older in 2005, as well as the natural population increase and the net migration rate as the annual average of the period 2001–2005. The legend of the map is a table revealing the minimum, maximum and average values of these four variables with respect to each type of region, as well as the number of cases (regions) and the population size in absolute and relative numbers. For an overall comparison the table also includes the respective values of the entire EU27+4 (i.e. ESPON space).

EXPLANATORY NOTES

Two to four sub-clusters (i.e. subtypes) of each type of region were produced for a better quantitative differentiation of the seven main types, except for Type 7 consisting of only five regions. The same methodology was applied as already used for the elaboration of the main typology (cf. Chapter 4.1.3). The characteristics of the subtypes are explained in the course of the description of the respective main types. Maps of these subtypes (see Annex 3) provide insight into the distribution of these even more homogenous regions.

In the following description of the typology, two different kinds of charts are used to characterise the classification’s result. First, the cluster profiles are portrayed by means of radar charts (Fig. 41), featuring the standardised values of each variable used in the cluster analysis. This chart type enables to identify the deviation of each type from the overall average of the entire EU27+4, which is depicted as the mean of the standardised values and is visualised by the grey shaded area delimited by the zeroline. In this respect, 0 marks the EU27+4 mean and a standard deviation is 1 (see also Chapter 4.3.1).

Second, a bar (or candlestick) chart depicting all types simultaneously is used to illustrate the characteristics of the cluster variables and external variables (see e.g. Fig. 42). This kind of chart represents the range of a certain indicator, featuring the minimum and maximum value (bar) and including the particular mean of each type of region (short blue line inside the bar). The black horizontal line across the chart area indicates the overall average with respect to the EU27+4. Beyond that, a summary of the different indicators characterising the different types of regions can be found in Table A5.01 (in Annex 5).

TYPE 1 – EURO STANDARD

Type 1 – Euro Standard comprises around 28% of all NUTS regions included in the typology (79 from 286) and has a total population of nearly 128 million people, which is more than 25% of the population of the EU27+4. The title “Euro Standard” seems to be adequate, because all four cluster-indicators display values close to the EU27+4 average – the variable characteristics per type of region can be gathered at best from the cluster profiles (see Fig. 41). Only the age group 20 to 39 years (avg. 25.68%) is slightly below the overall average (27.82%). Although the annual natural population balance is just positive (avg. 0.01 per 1,000), the total population increases due to a predominately positive migratory balance (avg. 0.34 per 1,000).

GEOGRAPHICAL DISTRIBUTION

Except for Sicily, this type is a distinct Western and Northern European type, to be found in Scandinavia, the United Kingdom, the Benelux countries, Southern and Western France, some western parts of Germany and also in Switzerland, Northern Italy and in the South East of Austria.

SUBTYPES

The subdivision of Type 1 – Euro Standard resulted in four subtypes (Type 11 to 14) with no distinct geographical pattern (see Map A3.01). In terms of a quantitative differentiation, Type 12 and 13 show the highest annual average net migration rates (5.18 and 4.56 per 1,000), whereby Type 12 has a younger age structure with respect to the share of the two age groups used for the cluster analysis. Furthermore, the annual average natural population balance of Type 12 is just positive (0.72 per 1,000), contrary to Type 13 (–1.31 per 1,000). In Type 14, both components of the total population development – the natural population increase and the migratory balance – are not very pronounced, but still positive. Type 11 – covering the South of Germany and Austria, some parts of West Germany, Belgium, the UK as well as Sicily – gets closest to this type and also to the overall EU27+4 average and can thus be characterised as the “standard of Euro Standard”.

0 marks the eu27+4 mean and a standard deviation is 1 (see also Chapter 4.3.1).
Map 8: Typology of the demographic status in 2005.

### Typology of the Demographic Status (2005)

<table>
<thead>
<tr>
<th>Type</th>
<th>Classification</th>
<th>Class</th>
<th>Population</th>
<th>Age Group 20–39 (%)</th>
<th>Age Group 65+ (%)</th>
<th>Natural Population Increase (per 1000)</th>
<th>Net Migration (2001–2005)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Euro Standard</td>
<td>79</td>
<td>308,312</td>
<td>20–39 22.7</td>
<td>65+ 32.5</td>
<td>28.98 24.7</td>
<td>17.62 17.46</td>
</tr>
<tr>
<td>2</td>
<td>Challenge of Labour Force</td>
<td>61</td>
<td>155,727.75</td>
<td>20–39 22.7</td>
<td>65+ 32.5</td>
<td>28.98 24.7</td>
<td>17.62 17.46</td>
</tr>
<tr>
<td>3</td>
<td>Family Potential</td>
<td>55</td>
<td>164,518.05</td>
<td>20–39 22.7</td>
<td>65+ 32.5</td>
<td>28.98 24.7</td>
<td>17.62 17.46</td>
</tr>
<tr>
<td>4</td>
<td>Challenge of Decline</td>
<td>33</td>
<td>125,036.35</td>
<td>20–39 22.7</td>
<td>65+ 32.5</td>
<td>28.98 24.7</td>
<td>17.62 17.46</td>
</tr>
<tr>
<td>5</td>
<td>Challenge of Decline</td>
<td>38</td>
<td>169,164.41</td>
<td>20–39 22.7</td>
<td>65+ 32.5</td>
<td>28.98 24.7</td>
<td>17.62 17.46</td>
</tr>
<tr>
<td>6</td>
<td>Young Potential</td>
<td>15</td>
<td>164,524.21</td>
<td>20–39 22.7</td>
<td>65+ 32.5</td>
<td>28.98 24.7</td>
<td>17.62 17.46</td>
</tr>
<tr>
<td>7</td>
<td>Overseas</td>
<td>5</td>
<td>1,553,072</td>
<td>20–39 22.7</td>
<td>65+ 32.5</td>
<td>28.98 24.7</td>
<td>17.62 17.46</td>
</tr>
<tr>
<td>EU 27+</td>
<td>ESPON Space</td>
<td>286</td>
<td>103,363.36</td>
<td>20–39 22.7</td>
<td>65+ 32.5</td>
<td>28.98 24.7</td>
<td>17.62 17.46</td>
</tr>
</tbody>
</table>

- Type 1 – Euro Standard
- Type 2 – Challenge of Labour Force
- Type 3 – Family Potential
- Type 4 – Challenge of Ageing
- Type 5 – Challenge of Decline
- Type 6 – Young Potential
- Type 7 – Overseas

This map does not necessarily reflect the opinion of the ESPON Monitoring Committee.
TYPE 2 – CHALLENGE OF LABOUR FORCE

Compared to the EU27+4 average, this type consisting of 61 regions with a population of 116.7 million people (23.20% of the EU27+4) features a relatively young age structure due to higher shares of the population in the 20 to 39 age group (avg. 30.43%), and slightly lower shares of the age group 65+ (avg. 14.51%). Although the annual average migratory balance is just positive (+0.08 per 1,000), the total population growth is stagnating, respectively declining on a low level due to a weak natural population decrease (avg. p.a. – 0.78 per 1,000). The spectrum of this type includes regions with both positive and negative natural population and migration balance.

GEOGRAPHICAL DISTRIBUTION

The title “Challenge of Labour Force” takes the remarkable high share of young adults into account, which is connected to the relative high fertility before 1990 in the former socialist countries of Eastern Europe, where this type of region is prevalent. However, these high rates of fertility were turned upside down to a low fertility regime after 1989. The demographic effect of this abrupt change in fertility behaviour resulted in a bulge in the age structure, induced by young adults born before 1989 and aged 15 to 34 years by 2005 (see also Fig. 44 in Chapter 4.3.1).

As mentioned above, this type can be found most notably in the New EU Member States (NMS) of Central and Eastern Europe (CEE), the so-called transition countries. Besides that, regions in Western Greece, Southern Italy, on the Iberian Peninsula as well as on the Portuguese islands of Madeira and the Azores, and also some distinctly urban regions in Germany and Denmark (Berlin, Hamburg and Copenhagen) belong to this category.

SUBTYPES

Type 2 – Challenge of Labour Force is split just into two subtypes, each representing more than 10% of the total population of the entire EU27+4. Type 21 can be differentiated from Type 22 in regard to its lower share of elderly people: on average 13.11% and 16.05% respectively. The annual average natural population balance is slightly positive in Type 21 and negative in Type 22 (~1.83 per 1,000). Looking at the annual average migration balance, the situation is just the other way round and therefore negative in Type 21 (~1.56 per 1,000) and positive in Type 22 (1.89 per 1,000).

Type 21 can be found in large parts of Poland, the Czech Republic, Romania and Slovakia, but also in the North of Portugal, on some Greek islands as well as in the Danish capitol region with Copenhagen. Type 22 – featuring a positive migration balance – covers central Poland, the south-western parts of the Czech Republic, the South of Romania – in each case including the capital region, as well as Berlin, Hamburg, Slovenia, large parts of Hungary (with Budapest) and Greece (including Athens) and some regions in Spain and in the South of Italy (see Map A3.02).

Figure 42: Cluster variables per type of region
Data source: ESPON 2013 Database

TYPE 3 – FAMILY POTENTIALS

Around 20% of the population of the EU27+4 or 104.5 million people live in the 55 regions of this type of region. The demographic characteristics are also very close to the EU27+4 average, but can be clearly distinguished from Type 1 – Euro Standard due to its younger age structure and the strictly positive natural population increase (see Fig. 5). The title “Family Potentials” is attributed to the combination of these two factors. Compared to the overall average, the age group 20 to 39 years (avg. 28.35%) shows higher and the age group 65+ (avg. 14.75%) lower values. The annual natural population increase (avg. 3.72 per 1,000) is the highest overall, besides Type 7 – Overseas. The migratory balance within Type 3 varies, but is still positive in most regions (avg. p.a. 2.12 per 1,000), which results in a noticeable increase of the total population of Type 3 between 2001 and 2005.

GEOGRAPHICAL DISTRIBUTION

Apart from a few occurrences in the South of Europe (in the southern parts of Italy, Malta and the Lisbon region) and the island of Martinique, this type shows a similar geographical distribution compared to Type 1 – Euro Standard and can also be found mainly in Western and Northern Europe: in Scandinavia, the United Kingdom, the Benelux countries, northern and eastern parts of France, Switzerland and Western Austria.

SUBTYPES

One of the three subtypes of Type 3 – Family Potentials (Type 31 to 33), Type 33 includes only two regions: London and Ile de France (Paris). These two regions, both originally outlier regions (see Annex 6) because of their extraordinary high share of population in the age group 20 to 39 years (avg. 33.35%), can be further distinguished from other Family Potential subtypes by the significantly positive annual average natural population increase (8.15 per 1,000) and the low share of elderly people (avg. 12.23%).

101 The term “transition countries” refers first and foremost to changes of the political and economic system after 1989, but can also be applied to the interconnected and ongoing demographic changes since then.
The net migration indicator is the most meaningful when differentiating the two other subtypes. Type 31 – to be found in Norway, Finland, in the northern parts of France, the Netherlands, in the UK (Northern Ireland and around London), as well as in parts of Denmark, Switzerland, Austria and Southern Italy – has a positive but weak annual net migration rate (avg. 0.40 per 1,000). By contrast, Type 32 – including Iceland, Luxembourg, the urban regions of Oslo, Stockholm and Amsterdam, as well as Western Austria, eastern regions of France, parts of Switzerland and the UK (see Map A3.03) – features a strictly positive annual net migration balance (4.92 per 1,000).

TYPE 4 – CHALLENGE OF AGEING
This type consists of 33 regions with a population of 63.8 million people (12.68% of the population of the EU27+4). The title “Challenge of Ageing” is self-explaining and is, indeed, inspired by the high share of elder population (avg. 20.83%), which clearly surpasses the EU27+4 average (see Fig. 3). Albeit the high share of 65+, the proportion of the population aged 20 to 39 years (avg. 26.87%) is still relatively high. Despite this reasonable share of young adults in reproductive age, the natural population balance shows an annual average decrease of – 1.74 per 1,000 – a value, which is significantly below the overall average. Adding the higher share of elderly people and the thus resulting higher numbers of deaths, the population of this type of region would be already decreasing, if there was not such a significant positive annual average net migration rate of +9.42 (per 1,000).

GEOGRAPHICAL DISTRIBUTION
This type of region can be found nearly exclusively in the South of Europe: in Greek regions (along the Albanian border), Northern Italy, in the northern and eastern parts of Spain, in Portugal and also in the South of France. Besides that, this kind of regions can also be found in the South-eastern regions of England (e.g. Lincolnshire/UK3).

SUBTYPES
Looking at the geographical distribution of the three subtypes, Type 43 – including those just mentioned South-eastern regions in England and some regions in the South of France – features the highest net migration rate (avg. 10.52 per 1,000), but also the lowest share of young adults (avg. 23.79%). The other two subtypes are located exclusively in Europe’s South (see Map A3.04). Type 41 comes very close to the previously described Type 43, but can be distinguished by the relatively high share of people between 20 and 39 years (avg. 28.69%). Among all Challenge of Ageing subtypes, Type 42 has the highest share of 65+ (avg. 22.87%). Apart from that, the natural population balance (avg. – 3.39 per 1,000) is negative in all regions.

TYPE 5 – CHALLENGE OF DECLINE
These 38 regions, with a population of around 50.2 million people (nearly 10% of the EU27+4 population), face severe demographic challenges. In fact, the depopulation regions of the EU27+4 are concentrated within this type. This is attributable to a negative natural population balance (avg. p.a. – 3.39 per 1,000) and a negative migration balance (avg. p.a. –1.20 per 1,000). In addition, this type is confronted with the second highest share (next to Type 4 – Challenge of Ageing) of elderly people aged 65 and older (avg. 19.49%).

GEOGRAPHICAL DISTRIBUTION
Besides East Germany, this type also includes peripheral regions of Scandinavia and some parts of West Germany, Southern Italy and Greece and covers Central and Eastern European regions in Bulgaria, Hungary as well as Latvia and Estonia.

SUBTYPES
Challenge of Decline regions can be subdivide into four subtypes (51 to 54), whereas Type 53 and 54 can be found exclusively in Bulgaria (see Map A3.05). Severozapaden (BG31) in the Northwest of Bulgaria is the sole Type 54 region and features a considerable population decline due to a distinctly negative development of both components of population change: a natural population decrease of – 10.35 per 1,000 and a negative annual net migration rate of –11.25 per 1,000. Furthermore the proportion of elderly people (21.37%) is clearly above the EU27+4 average (16.63%) and the share of the age group 20 to 39 (23.93%) is one of the lowest in the EU27+4. The other three Bulgarian Type 5 regions (i.e. Type 53) also have a negative annual average natural population and migratory balance, but to a lesser extent (~ 5.44 and ~ 9.37 per 1,000). Most notably for Type 53, the share of people aged 65+ (avg. 17.14%) is just half a percentage point above the overall average, and hence relatively low compared to the other Type 5 subtypes.

Together, Type 51 (nearly 30 million people) and Type 52 (15.7 million people) represent around 11% of the EU27+4 population. Type 51 covers the entire East of Germany except for Berlin (DE30) and Leipzig (DE63), as well as parts of West Germany and peripheral regions of Sweden and Finland. Type 52 is also affected by population decline, due to negative average values for both components of population development (an average natural population decrease of ~5.44 per 1,000 and a negative migratory balance of ~1.20 per 1,000). Furthermore, the share of the age group 20 to 39 (avg. 24.69%) is relatively low, even compared to the already low Type 5 average (26.32%). The age structure of Type 53 – to be found in Estonia, Latvia, parts of West and East Germany (Leipzig), Hungary, Southern Italy and large parts of Greece – is very close to the overall average of Type 5. Although the natural population balance is negative in all 17 regions of Type 53, the total population development of this type is just slightly negative, due to a positive average net migration rate of 0.83 (per 1,000).

TYPE 6 – YOUNG POTENTIALS
The 35 regions of this type represent 7.66% of the EU27+4 population and can be characterised by a relatively young age structure and a consistently positive population development of both components: a positive natural population development and a positive net migration balance. The age groups 20 to 39 years (avg. 32.26%) and 65+ ( avg. 14.45%) clearly show higher respectively lower proportions compared to the EU27+4 average (see Fig. 41 as well as Map A1.01 and Map A1.02). The prevailing population increase of this type of region is driven by an above average annual natural population increase (avg. 3.61 per 1,000) and the strongest overall net migration gains (avg. p.a. 17.10 per 1,000) – see also Figure 41.
GEOGRAPHICAL DISTRIBUTION
Apart from the Republic of Ireland, Cyprus, Vienna (AT13) and Flevoland (NL23), this type can be found on the Spanish mainland and islands (Canaries/ES70 and Baleares/ES53).

SUBTYPES
Type 6 comprises three subtypes (Type 61 to 63 – see Map A3.06), whereby Type 63 (Ireland, Flevoland and Cyprus) shows the lowest share of the population 65+ (avg. 10.90%) and the highest annual average natural population increase (7.14 per 1,000). Type 62 contains only Spanish regions (Madrid/ES30, the islands and two more regions at the East Coast) and features the highest share of the age group 20 to 39 (avg. 34.39%) and the strongest net migration gains (avg. p.a. 22.24 per 1,000) within Type 6. The third subtype (61), including the remaining Spanish Type 6 regions as well as Vienna, can be distinguished from other subtypes by the relatively high share of people aged 65+ (avg. 17.09%, which is just above the EU27+4 average) and a relative low natural population increase (avg. p.a. 1.15 per 1,000).

TYPE 7 – OVERSEAS
This special type of five regions (the French overseas departments of Guyane/FR93, Guadeloupe/FR91 and Réunion/FR94, as well as the Spanish exclaves of Ceuta/ES63 and Melilla/ES64) summarises the regions outside of the European mainland (continent) – with the exception of Martinique/FR92 (which belongs to Type 3 – Family Potentials), the Portuguese islands of Madeira (PT30) and the Azores/PT12 (Type 2 – Challenge of Labour Force) as well as the Canaries (Type 6 – Young Potentials). Compared to the other six types of regions, this category features significantly different and hardly comparable demographic characteristics with very low shares of elderly people (i.e. an average of only 9.04% people aged 65+) as well as a very strong annual average natural population increase (13.56 per 1,000). In quantitative terms, this type of only 1.5 million people (i.e. 0.31% of the EU27+4 population) is almost negligible.

A further quantitative differentiation within Type 7 makes no sense, because of the relatively small population size, the demographic heterogeneity within this type and, above all, the small amount of cases (five regions). Therefore, no subtypes were elaborated for Type 7 – Overseas.

4.2.4 GEOGRAPHICAL PATTERNS
Referring to the map of the typology of the demographic status (Map B), some geographical patterns can be revealed. The regions of Type 1 – Euro Standard and Type 3 – Family Potentials, both featuring values close to the overall average in respect to the cluster variables, are concentrated in the northern and central-western parts of the EU27+4 territory. These two types of regions constitute the demographic “centre of gravity” by means of the combined population size of 46% of the EU27+4 population. Both types of regions experience a total population increase, driven by a positive migratory balance, especially in the case of Type 1 – Euro Standard.

Apart from that, two distinctive Eastern European types, including a third of the EU27+4 population, can be distinguished: Type 2 – Challenge of Labour Force (also appearing in Southern Europe and covering some urban regions like Berlin/DE30, Hamburg/DE60 and Copenhagen/DK01) and Type 5 – Challenge of Decline, which also includes peripheral regions of Sweden, Finland and large parts of Greece. Distinguishing these two types of regions, Type 2 rather allegorises regions that feature a younger age structure and a stagnating population development, whereas Type 5 is characterised by an older than average age structure and a pronounced population decrease, resulting in regions challenged by depopulation.

The regions covered by Type 4 – Challenge of Ageing and Type 6 – Young Potentials (together around 20% of the EU27+4 population) are mainly situated in the southwestern parts of Europe (on the Iberian Peninsula, Southern France, Northern Italy, as well as Ireland, some parts of England, Flevoland/NL23, Vienna/AT13, Cyprus and the Greek Ipeiros region/GR24). Both types show a strong positive net migration balance and overall population increases, which constitutes these regions as “demographic growth regions”. As the name of the type suggests, a high share of elderly people coins Type 4 – Challenge of Ageing. By contrast, Type 6 – Young Potentials features a pronounced young age structure.

Focussing on the European core and periphery, the “European Pentagon area” stretches mainly across regions of Type 1 – Euro Standard and Type 3 – Family Potentials, but also covers Type 4 – Challenge of Ageing regions (Lombardia/ITC4) and even some Type 5 – Challenge of Decline regions (in central-western Germany).102 The geographical periphery of Europe stretches over Type 2 – Challenge of Labour Force (in Eastern Europe and at the southern edges of the EU27+4 territory) and Type 5 – Challenge of Decline regions (peripheral regions of Scandinavia and the Baltic States).

Any spatial pattern depends on the scale. Acknowledging the fact that the scale of this analysis is the NUTS 2 level, the resolution is clearly too low to detect smaller scaled spatial patterns like urban areas or coastal regions. Focussing on a wider scale, the demographic patterns drawn at the level of nation states (cf. Chapter 3.2) are also roughly reflected at NUTS 2 level. Indeed, demographic behaviour and thus demographic characteristics are strongly affected by the political, social and economic systems of nation states. However, as the analysis of regional demographic indicators in Chapter 3.3 revealed, and as confirmed by the regional demographic classification, a regional heterogeneity of demographic characteristics cannot be questioned.

102 The “European Pentagon” is a spatial term, describing the larger geographical zone of global economic integration defined by the metropolises of London, Paris, Milan, Munich and Hamburg. This zone offers strong global economic functions and services, which enable a high-income level and a well-developed infrastructure (EC 1999:20).
4.2.5 The classification reveals ...

The typology of 286 European NUTS 2 regions reveals seven types of regions of distinctive demographic characteristics. Type 1 “Euro Standard” is relatively close to the EU27+4 average in respect to the variables used for this classification. The demographic profile shows a stagnation of the natural population increase, but a positive net migration balance. The second type “Challenge of Labour Force” can be characterised by its high share of young adults, which generates a challenge to bring and establish these young people into the labour force. The title of Type 3 “Family Potentials” refers to the relatively young age structure and the strong natural population increase between 2001 and 2005. Type 4 “Challenge of Ageing” can be distinguished from the other types of regions by its high proportion of elderly people (aged 65 years and older). It also features a slightly negative natural population balance (albeit a high share of young adults in the reproductive age) and a strong in-migration surplus. The title of Type 5 “Challenge of Decline” refers to the negative population development, driven by a negative natural population balance as well as a negative net migration rate. Together this leads to a significant population decrease coupled with population ageing. Type 6 “Young Potentials” can be characterised by its young age structure and a strictly positive population development of both components: a positive natural increase and a positive net migration. The title of Type 7 “Overseas” reflects the geographical position of these five regions, which are all located outside of the European mainland.

Furthermore, the typology reveals spatial patterns with respect to the geographical distribution of the different types of regions, i.e. distinctive Northern and Western European types (Type 1 and 3), Eastern European types (Type 2 and 5) and Southern European types (Type 4 and 6) as well as a Non-European mainland type (Type 7). Beyond that, the classification demonstrates that national borders, although strongly affecting, do not ultimately determine demographic characteristics. Demographic behaviour is obviously affected by people’s view of live (as discussed in Chapter 2.2.5), which in turn is influenced by a bundle of political, social, economic and, last but not least, individual factors. And all of these factors do have a strong regional impact.

4.3 Demographic illustration of the classification

For a further illustration of the just presented demographic typology, the resulting types of regions will be explained by external demographic indicators – i.e. variables that are not directly included into the cluster analysis. First of all, these indicators refer to the typology by addressing the two components of the classification: on the one hand, the various paths of population development and, on the other hand, the variations in the age structure of the different kinds of regions. Furthermore, this demographic analysis responds to the three main processes in demography (fertility, mortality and migration) and highlights the demographic challenges with respect to low fertility, population ageing and the size of the labour force.

Additionally, an extensive collection of maps (see Annex 1 to 4) and an overview-table of the demographic indicators per type (Tab. A5.01 in Annex 5) shall provide visual and quantitative support for the understanding of this extended demographic illustration of the typology.

4.3.1 Population development

Both components of population development, the natural population increase and the net migration rate, were used as input variables for the cluster analysis (see Chapter 4.2.2). The resultant aggregated indicator “total population development” will be examined with respect to the demographic typology.

The total population development during the period 2001 to 2005 in all 286 regions included in the cluster analysis (see also Map A2.05) results in an average annual increase of 3.49 (per 1,000) – indicated by the horizontal line in Figure 42. The average annual population increase of Type 1 – Euro Standard (3.44 per 1,000) comes very close to the overall average. During this period the population size of Type 2 – Challenge of Labour Force was slightly declining (avg. p.a. – 0.71 per 1,000).

Both, Type 3 – Family Potentials and Type 4 – Challenge of Ageing, were experiencing an average annual population increase of 5.84 and 7.67 (per 1,000) between 2001 and 2005, which is clearly above the EU27+4 average. In the case of Type 3 – Family Potentials, a natural population increase and a positive migratory balance drive the prevailing population increase. Type 4 – Challenge of Ageing, by contrast, is featuring a negative natural population balance and the total population increase is hence the result of a strong positive net migration rate.

In the course of the period 2001 to 2005, the population of Type 5 – Challenge of Decline was, literally, declining by – 4.59 per 1,000 every year. The figures of Type 5 regions range from – 21.60 per 1,000 (in the Bulgarian region of Severozapaden/ BG32 – i.e. Subtype 54) to 0.69 per 1,000 in Bremen (De50). Type 6 – Young Potentials
presents the opposite picture, featuring the strongest average increase of the total population (avg. p.a. 20.71 per 1,000), next to the rather atypical Type 7 – Overseas.

**TYPOLOGY OF POPULATION DEVELOPMENT**

As mentioned in Chapter 4.2.1, a typology of the components of population development for the period 1996 to 1999 was already developed for the ESPON 1.1.4 project “The Spatial Effects of Demographic Change and Migration” (ESPON 2005:66 – Map 3.2) and was recently updated for the period 2001 to 2005 (ESPON 2008c:7 – Map 1). This typology distinguishes six types of regions (at NUTS 3 level) depending on the question, whether the total population growth, the natural growth (births minus deaths) and the net migration (in-migration minus out-migration) were positive or negative.

Taking advantage of both, the straightforward expressiveness and applicability of this demographic classification, the typology of population development was adapted to NUTS 2 for the period 2001 to 2005 (see Map 9) in order to link it with the newly developed typology of the demographic status.

When comparing both typologies (see Tab. 9), nearly half of all Type 1 – Euro Standard regions (39 from 79) match the “double positive” category 1 of the typology of population development, i.e. regions with population growth through both positive natural population and migration development (see Map 9). Another 33 Euro Standard regions (Type 1) can be assigned to category 2 of population development – i.e. population growth by means of a positive migratory balance, although the natural population is decreasing. Only 7 of 79 Euro Standard regions (Type 1) match the negative population development categories 4 to 6 and have to bear a decline of the total population.

Type 2 – Challenge of Labour Force appears to be a very heterogeneous type when it comes to the components of population development. Type 2 regions sprawl over all six categories of the classification of population development, albeit a third (20 of 61 regions) are in line with the “double negative” population development type – i.e. negative natural population and migratory balance. Apart from that, more than 40% of all Challenge of Labour Force regions (i.e. 26) have population increases, and 10 of these regions even match the “double positive” type.

Family Potential regions (Type 3) offer a more distinctive picture, with all but two regions featuring a population increase. The picture becomes even clearer when realising that more than two thirds of the regions (40 out of 55) can be declared as “double positive”. Just like Type 3, all but one Type 4 – Challenge of Ageing regions experience a population increase, driven by a clearly positive net migration rate. It is not too amazing that 24 of 33 Challenge of Ageing regions match category 2 of the population development typology – i.e. population increase with positive migratory and negative natural population balance. Compared with Type 3 and 4 of the demographic typology, Type 5 – Challenge of Decline is showing the opposite characteristics when it comes to the components of population development with 36 of 38 regions facing population decline. In fact, 17 of these regions match the “double negative” population development category 6.

Young Potentials regions (Type 6) are nearly entirely absorbed by the “double positive” category 1 of the population development typology. Only one Type 6 region (Vienna/AT13) has a slightly negative natural population balance, relegating this region to category 2 within the typology of population development – i.e. population increase with positive migratory and negative natural population balance. Two of the five Overseas regions (of Type 7) can be classified as “double positive” with respect to total population increase. Although the three other Type 7 regions do feature a negative migratory balance, their populations still increase due to pronounced positive natural population balances.

In a nutshell, five of seven types of regions emerging from the demographic typology can be roughly assigned to the positive categories of the typology of population development. Only Type 5 – Challenge of Decline had a predominately negative population development during the period 2001 to 2005. The regions of Type 2 – Chal-
leleng of Labour Force must be rated as ambivalent with respect to the components of population development. Generally speaking, the vast majority of all regions (205 of 286) feature a positive population development, whereas 113 regions are so-called “double positive” with respect to both components population development. All together, only 39 regions – i.e. not even 15% of all NUTS 2 regions – are “double negative” and thus affected by a natural population decrease as well as a negative net migration balance. All but two of these “double negative” regions must be ascribed to the two distinctive Eastern European types of regions: Challenge of Labour Force (Type 2) and Challenge of Decline (Type 5).

4.3.2 AGE STRUCTURE

Apart from the components of population development, the age structure of a population – expressed by two significant age groups: 20 to 39 years and 65 years and older – constitutes the second pillar of input variables for the demographic typology (see Chapter 4.2.2). Consequently, the entire age structure of all seven types of regions shall be also discussed by means of 5-year groups.

As already mentioned in Chapter 2.1.2, the most common way of representing an age structure is a “population pyramid”. Because the typology of the demographic status does not explicitly distinguish between male and female population as population pyramid’s do, hereafter a slightly modified form will be used to represent the age structure. Figure 43 portrays the age structures of the seven types of regions in comparison with the age structure of the entire EU27+4 (i.e. ESPON space) – depicted by light grey bars – by showing the share of all 5-year age groups up to 85 years and older.

In order to stress the demographic model of a stable population – i.e. a population with an invariable age structure and a fixed rate of natural increase – the shape of a corresponding population pyramid would look like a pillar.\(^\text{103}\) In the case of the representation in Figure 44, a stable population would appear as a flat horizontal line reaching from the outer left edge of the chart (i.e. from the youngest age group) to an age of around 60 years and would be narrowing only at the very right side as people die of old age (EC 2008d:9).

The age structure of the entire EU27+4 (or ESPON space) population (Fig. 44; bottom right) can be read as a bow with the apex at the age group 35 to 44 years, which represents the baby boom cohorts of the 1950s and 60s in Northern and Western Europe. This feature makes it directly comparable to the population pyramid of the EU27 by 2005 positioned (see Fig. 1 in Chapter 2.1.2), only cut in half (aggregating both sexes) and horizontal positioned (to be read from left to right instead from the bottom to the top). Comparing the EU27+4 age structure with the age structure of Type 1 – Euro Standard, the baby boom bulge of Type 1 is even more pronounced due to the weaker
The age structure of Type 2 – Challenge of Labour Force clearly differs from that of the EU27+4 (or ESPON space), because of the lower proportion of the young (10 years and younger) and older population (55 years and older). This distinctive Central and Eastern European type features age groups between age 45 and 54 (i.e. the cohorts born after World War II) and 15 to 34 years (i.e. the last strong birth cohorts before the fall of the Iron Curtain), which are clearly stronger than the corresponding age groups of the EU27+4 population. However, the age groups in between (35 to 44 years) are less pronounced. This could be either explained by the demographic echo effect caused by the weaker cohorts of their parents (55 years and older), or by strong out-migration of these selective age groups – or by a combination of both.

Type 1 – Euro Standard features age groups between age 45 and 54 (i.e. the cohorts born between 1957 and 1960) and 55 to 64 years (i.e. the prime age of the labour force). Younger and older age groups below 20 and above 60 years reveal a favourable weighting, as the younger population’s share is much lower compared to the EU27+4 age structure.

A very diversified age structure can be observed for Type 5 – Challenge of Decline, a type of region that can be mainly found in former Eastern Bloc regions and peripheral regions of Northern and Southern Europe. Compared to the EU27+4 age structure, the age group 15 years and younger (i.e. those born after 1988) and 25 to 34 years are clearly underrepresented. Taking this type’s strictly negative migratory balance into account (cf. Chapter 4.2.3), one could assume that these young adults are missing because of emigration. The only age group of this type of region, which is overrepresented with respect to the age distribution of the EU27+4 population, are elderly people (60 years and older).

Type 6 – Young Potentials shows considerable high shares of people aged 20 to 44 years and below 5 years. Contrary to Type 2 and Type 5, this bulge of young adults (or young workforce) seems to be the result of significant immigration to this type of region (see also Chapter 4.2.3). The high share of children below 5 years could be interpreted as the demographic echo of the high proportion of young adults, i.e. their offspring.

The age structure of Type 7 – Overseas is completely different in regard to the “continental” types of regions (Type 1 to 6). Driven by a strong natural population increase, the youngest age group (below 5 years) shows the highest proportions. Indeed, each age group is stronger compared to the subsequent age groups of higher age, apart from the very mobile age group 20 to 34 years. This results in a very low share of people older then 45 years.

Figure 44: Age structure per type of region (2005)
Data source: ESPON 2013 Database
4.3.3 DEMOGRAPHIC INDICATORS

After discussing the population development by components as well as the age structure by type of region, the next step of this analysis focuses on the three main population processes (fertility, mortality and migration), which determine the previously discussed age structure (Chapter 4.3.3), as well as the population development in general (Chapter 4.3.2).

FERTILITY

Again, two indicators are considered for the analysis of fertility characteristics of the different types of regions: the total fertility rate (TFR) in 2005 and the crude birth rate (CBR) over the period 2001 to 2005 (avg. p.a.) – see Figure 44 and the Maps A2.06 and A2.07.

As already discussed at some detail, the CBR is an empirical measure expressed as the number of births (per 1,000 population), whereas the TFR is a hypothetical indicator weighted per woman and thus indicates the number of children per women aged 15 to 49 years (cf. Chapter 2.1.2 and 2.1.3). In this respect, the TFR is more responsive to changes in the fertility behaviour (e.g. postponements of births). Both indicators have pros and cons, so the question which measure should be taken into account depends on the actual scope of the analysis. When analysing the spatial impact of fertility in the context of population development, the CBR has a stronger explanatory power, although or precisely because it is influenced by the age structure of the total population.

The average TFR of the 286 regions included in this analysis was 1.53 (children per woman) by 2005, which is clearly below the replacement level of roughly 2.1. The average annual CBR during the period 2001 to 2005 was 10.32 births (per 1,000). When looking at Figure 45, the black horizontal lines illustrate the average values with respect to all regions of the EU27+4.

In 2005, regions of Type 1 – Euro Standard had an average TFR of 1.64, which is clearly above the overall average. However, the average CBR of 10.18 per 1,000 is actually slightly below the EU27+4 average. The explanation for the contrasting direction with respect to the overall mean of these two fertility indicators can be explained by the underlying age structure. The age structure of Type 1 is “older” compared the overall average. Consequently, the proportion of the rather younger age group in the main reproductive age is also below average. The TFR confirms, that an average “Type 1 woman” in fertile years bears more children compared to the average “EU27+4 woman”. Because the cohorts of potential mothers between 15 and 49 years are quantitatively weaker than the EU27+4 average, the ratio of births (per 1,000) is suppressed, resulting in a relatively low CBR.

Type 2 – Challenge of Labour Force regions clearly is a low fertility type, with both fertility indicators showing below EU27+4 average values (avg. TFR: 1.29; avg. CBR: 9.62 per 1,000). These fertility figures must be interpreted as a very reduced desire for having children when taking the relatively favourable age structure of Type 2 into account; the average share of young adults aged 20 to 39 years in the prime age of childbearing is clearly above the EU27+4 average, while the share of elderly people is relatively low. As the title of Type 3 “Family Potentials” implies, both fertility measures of this type of region are relatively high (i.e. clearly above the overall average), featuring an average TFR of 1.75 and an average CBR of 12.18 (per 1,000).

Type 4 – Challenge of Ageing and Type 5 – Challenge of Decline have very similar characteristics in regard to the average TFR (1.41 and 1.36) and CBR (9.14 and 8.34). Both fertility indicators are below EU27+4 average in both types of regions. It should be mentioned that the CBR of both types is even below the CBR of Type 2 – Challenge of Labour Force, although the TFR is higher in Type 4 and Type 5 compared to Type 2. Again, the age structure effect is obvious and attributable to the younger age structure of Type 2 (Challenge of Labour Force) compared to the age structure of Type 4 (Challenge of Ageing) and Type 5 (Challenge of Decline).

This same age structural effect can also be observed for Type 6 – Young Potentials, a type with a pronounced young age structure. In the case of Type 6 the TFR of 1.50 is slightly below the EU27+4 average, while the CBR (11.71 per 1,000) is above average. Due to this relatively high CBR (and a low CDR – see below), regions of Type 6 experience a relatively strong natural population increase (see also Chapter 4.2.3), which is not clearly reflected by the TFR. Finally, the rather atypical Type 7 – Overseas has the highest fertility by far, both in terms of TFR and CBR.

MORTALITY

As with fertility, again, we consider two indicators for the discussion of mortality characteristics in respect to the different types of regions: (a) life expectancy at birth (of both sexes combined) during the period 2002 to 2004 and (b) the crude death rate (CDR) for the period 2001 to 2005 – see Figure 46 and the Maps A2.08 to A2.11.

104 Besides the combined life expectancy of both sexes (Map A2.08), the Maps A2.09 and A2.10 portray the often very divergent life expectancies of men and women separately (see also Chapter 3.2.4 and 3.3.2).
The accuracy of the life expectancy indicator can only be verified ex post, when the last member of the particular cohort has experienced that certain and, in this case, inevitable demographic event. By contrast, the CDR can be interpreted the same way as the CBR, only taking the number of deaths instead of births into account. Like the CBR, also the CDR is distorted by the age structure of a population. In the EU27+4, where mortality rates at younger ages are relatively low, the CDR strongly responds to the proportion of older people. In any case, the higher the proportion of people in age groups around the actual life expectancy the higher is the crude death rate.

During the period 2002 to 2004, the average life expectancy at birth in all EU27+4 regions was 78.14 years, whereas the average life expectancy of women (81.12 years) was six years higher than that of men (75.10 years). The annual average CDR across EU27+4 regions amounted to 10.02 (deaths per 1,000).

In regions of Type 1 – Euro Standard, the average life expectancy at birth (79.10 years) is higher than the EU27+4 average, while the CDR (avg. p.a. 10.17 per 1,000) is just about average. Type 2 – Challenge of Labour Force has nearly the same CDR (avg. p.a. 10.41 per 1,000) as Type 1, but the life expectancy in Type 2 (75.13 years) is the lowest of all types or regions, except of Type 7. Although the share of older people is much higher in Type 1 (see also Chapter 4.2.3), the number of deaths in Type 2 exceeds Type 1 due to a lower life expectancy whilst the share of elderly (65+) is about the same (see Fig. 36 in Chapter 3.3.2).

Type 3 – Family Potentials displays an above average life expectancy (79.36 years) and a below average CDR (8.56 per 1,000) with regard to the overall average. Again, this discrepancy can be explained by the relatively young age structure of Type 3 (see Chapter 4.2.3), which results in fewer deaths per 1,000 population, as long as people die first and foremost in older ages (as the vast majority of Europeans do). The other rather “young” type of region “Type 6 – Young Potentials” features similar values in regard to life expectancy (79.76 years) and CDR (8.10 per 1,000).

The “older” types of regions, Type 4 – Challenge of Ageing and Type 5 – Challenge of Decline, both have a CDR (10.88 and 11.73 per 1,000) above the EU27+4 average. Although the share of older people is higher in Type 4 compared to Type 5, the CDR of Type 4 is below the CDR of Type 5. Again, the reason is the lower life expectancy of Type 5 (77.28 years, i.e. lower than the overall average) compared to the highest life expectancy of all types of regions achieved in Type 4 (80.18 years). The average share of elderly aged 65 years and older is around 20% in both types.

Although Type 7 – Overseas features the lowest life expectancy of all types of regions (74.94 years), it shows the lowest CDR (avg. p.a. 5.85 per 1,000) because of its pronounced young age structure (see Fig. 44). These examples demonstrate that a young age structure has a positive effect on the natural population development by implicating a low CDR and a high CBR (see Type 3, Type 6 and Type 7); and vice versa, as demonstrated by Type 4 and Type 5.

**MIGRATION**

The only available migratory indicator – the net migration rate – has to illustrate the complex process of migration. This rate is simply a residual of the difference between the total population change and the natural population change. Because the net migration rate (see also Map A2.04) was used as an input variable for the cluster analysis and was therefore already explained (see Chapter 4.2.2). At this point the characteristics of this indicator with respect to the different types of regions will be only summarised in brief – the stock of foreign population by type of region will be discussed in Chapter 5.2.2 by means of the European Labour Force Survey data set. The strongest annual average net migration gains occur in Type 6 – Young Potentials (17.10 per 1,000) and Type 4 – Challenge of Ageing (9.42 per 1,000). Type 1 – Euro Standard (3.43 per 1,000) and Type 3 – Family Potentials (2.12 per 1,000) feature positive net migration rates around the EU27+4 average (0.33 per 1,000). Type 2 – Challenge of Labour Force has a rather balanced net migration rate of 0.08 per 1,000. The only types of regions with negative net migration rates are Type 5 – Challenge of Decline (avg. p.a. – 4.59 per 1,000) and Type 7 – Overseas (avg. p.a. – 1.78 per 1,000).
4.3.4 Demographic Challenges and Potentials

According to the DEMIFER Interim Report (ESPON 2009:21ff), the biggest demographic challenges the European population are facing are threefold:

- A low level of fertility – leading to a reduced contribution of natural growth to population growth.
- Population Ageing – due to low fertility levels and the increase in life expectancy in most countries and regions.
- The size of the working age population – a persistently low level of fertility and the so connected population ageing is slowing the growth of the working age population.

The DEMIFER Interim Report (ESPON 2009a:25) further clarifies that, due to the decrease in fertility levels and the increase in international migration, migration has become the main driver of European population growth. About 80% of the overall population growth in the European Union is caused by migration (EC 2008a:25). Although high in-migration cannot compensate all possible demographic challenges, those kinds of regions with positive net migration rates hold the highest potentials in approaching these challenges. In regard to the demographic typology, those types of regions with positive average net migration rates are Type 1 – Euro Standard, Type 3 – Family Potentials and especially Type 4 – Challenge of Ageing and Type 6 – Young Potentials. Just the opposite can be said for the distinctive Eastern European types of regions. The regions of Type 2 – Challenge of Labour Force show rather ambivalent net migration rates, while out-migration is prevailing in regions of Type 5 – Challenge of Decline. Hence, these two types, especially Type 5, might be facing the biggest demographic challenges ahead.

**Low Fertility**

The topic of fertility was already discussed in the previous chapter by means of the total fertility rate (TFR) and the crude birth rate (CBR). At this point, the nearly perfect positive correlation between the share of children below 5 years and the CBR shall be demonstrated (see Fig. 48). This relation is once more highlighting the (sometimes underestimated) explanatory power of the CBR – the higher the CBR, the higher the share of children (below 5 years) – with respect to the spatial impacts of (natural) population development in a particular area.\(^{105}\)

Those types of regions with an above average share of children below five years also have an above average CBR, i.e. Type 3 – Family Potentials, Type 6 – Young Potentials and Type 7 – Overseas. Even if the in-flow of migrants is not further increasing, a high potential for sustained natural population growth can be awarded to these three types, which represent around 29% of the EU27+4 population. However, migration does not play the same pivotal role in all three types or regions. While a positive net migration rate is certainly the main driver of population development in Type 6 – Young Potentials, the net migration rate is rather ambivalent in regions of Type 3 – Family Potentials and even negative on average in Type 7 – Overseas. Nevertheless, these three types of regions can boast themselves with a strictly positive natural population balance, contrary to all other types.

The manifold reasons for the sustaining low fertility rates in more developed countries over the last decades and the (political) measures to increase fertility are the topic of extended research. Meanwhile the scientific community agrees, that the drivers of low fertility are behavioural aspects in connection with societal changes (as explained by the concept of the SDT – see Chapter 2.2.5). Furthermore, certain demographic structures (i.e. age structural effects) contribute to low rates of fertility – when measured by the CBR. It was already demonstrated in the previous chapter that a higher proportion of people in the reproductive age can lead to a higher number of births (e.g. Type 3 – Family Potentials and Type 6 – Young Potentials).

**Missing Mothers**

But it always takes two to become parents; thanks to the progress made in reproductive technologies, nowadays it takes, at the very least, only a mother. By no way, however, more children will be born, if there are not enough mothers. Indeed, a distorted sex ratio in the prime reproductive age is also influencing fertility rates. Some regions, especially peripheral regions of Type 5 – Challenge of Decline, are lacking potential mothers due to out-migration of young women aged 20 to 29 years (see Map A2.12). In some regions the sex ratio of the age group 20 to 29 is heavily distorted. The most constrained ratios close to 180 men to 100 women can be observed on some Aegean islands and in North-eastern Greece.\(^{106}\) But also some other regions of Type 5 are potentially affected by “missing mothers”, e.g. the entire East of Germany, except of the urban regions of Berlin (De30) and Leipzig (DeD3), and peripheral areas of Sweden and Finland.

\(^{105}\) At the level of NUTS 2 regions, the correlation coefficient of the proportion of the age group below 5 years (by 2005) and the CBR (avg. p.a. 2001–2005) is 0.984: The higher the CBR, the higher the share of children (below 5 years).

\(^{106}\) The corresponding average sex ratio at age 20 to 29 years of all ESPON space regions is 106 men to 100 women.
POPUlAtIon AGeIng
According to the DEMIFER Interim Report (ESPRON 2009:37), the main effects of population ageing arise from the increase in the costs of retirement schemes, the increase in demand for health care and long-term care and the slowing growth of the working age population. Especially the latter two arguments affect the regional scale, whereby pension schemes are solely discussed and applied on the supra-regional level of nation states.

While connecting the ageing indicators to the types of regions of the demographic typology, we will start with the share and growth rates of the old and oldest old (aged 65+ and 80+), before portraying the old age dependency ratio (i.e. the number of persons 65 years and over per one hundred persons 15 to 64 years). This ratio provides the information, how many persons aged 15 to 64 years will potentially come up for the increasing costs of a higher share of retired persons and the connected higher expenses for health care. Finally, the potentials of long-term elderly care within families will be discussed by means of the Parent Support Ratio (PaSR), which is the number of persons 85 years old and over per one hundred persons 50 to 64 years – i.e. the children of those aged 85 years and older.

THE OLD AND THE OLDEST OLD
The share of people 65+ was already discussed in Chapter 4.2.2 with respect to the input variables of the cluster analysis. Especially Type 4 – Challenge of Ageing and Type 5 – Challenge of Decline feature high proportions of people aged 65 years and older. This also holds true for the share of the “oldest old” (i.e. 80+), with the addition of Type 1 – Euro Standard (see Fig. 49 and also Map A1.02 and A2.13). The latter can be explained by the relative high life expectancy of Type 1. Because regions of Type 4 – Challenge of Ageing have the highest average life expectancy of all types of regions (see also Chapter B.3), the proportion of the oldest old (avg. 5.63%) is also the highest across the EU27+4. With respect to the high share of people aged 65+ in Type 5 – Challenge of Decline, the proportion of people 80 years and older (avg. 4.28%) is relatively small due to the lower life expectancy in this type of region. Below average proportions of people aged 65+ and 80+ can be found in Type 2 – Challenge of Labour Force, Type 3 – Family Potentials, Type 6 – Young Potentials and Type 7 – Overseas.

Because of the strongly varying life expectancy among the different kinds of regions, the increase of the age group 80+ delivers a partially different picture. Again, the young types of regions (Type 6 – Young Potentials and Type 7 – Overseas) have above average increases in the age group 80+, but simultaneously also a very low share. Type 1 – Euro Standard, with an above average proportion of people in the age group 80 years and older display below average increases, as does Type 3 – Family Potentials. Type 4 – Challenge of Ageing, with the highest overall share of people 80+ and the highest life expectancy, still shows above average increases. The highest increases of the age group 80+ can be observed in Type 2 – Challenge of Transition, illustrating that this type is coined by the lowest – but fortunately increasing – average life expectancy.
OLD AGE DEPENDENCY RATIO

In 2005, the old age dependency ratio (OADR) was 25/100 in the EU27+4. That means that there were 25 persons aged 65 years and older per one hundred persons between 15 and 64 years (see Fig. 50 and also Map A2.16). Above average values can be found in Type 4 – Challenge of Ageing (avg. 32/100), Type 5 – Challenge of Decline (avg. 29/100) and in Type 1 – Euro Standard (avg. 27/100). The highest OADR (avg. 42/100) can be found in the region of Liguria (Italy), which also has the highest share of people 65+ (26.51%). All other types of regions feature below average ratios, the lowest in Type 7 – Overseas (avg. 14/100).

Compared with the overall annual average increase of the OADR between 2001 and 2005 (1.01%), Type 5 – Challenge of Decline has to burden the highest annual average increase (2.32%), especially East Germany and the northern regions of Greece (up to 5.5%). Type 6 – Young Potentials is the only type with a decreasing OADR (~0.55%) due to the high share of (young) immigrants. All other types of regions display increases around the overall average (between 0.60% and 1.51%).

PARENT SUPPORT RATIO

One can assume that people at a certain old age are in the pronounced need for long-term care or, at best, need some help to master the routines of daily life. The parent support ratio (PaSR) supposes that this is the fact for most people aged 85 years and older. In this respect the PaSR is a measure for potential elderly care within families, represented by the number of persons 85 years and older per one hundred persons 50 to 64 years – i.e. the children of those aged 85 years and older (see Fig. 51).

By 2005, the PaSR in the EU27+4 was around 9/100, i.e. nine people aged 85+ per one hundred persons of their children’s generation (aged 50 to 64 years). One has to realise that the care of elderly might be a fulltime job without any compensatory time. Keeping this in mind, the reciprocal ratio of around eleven persons aged 55 to 64 years per every person aged 85+ implies that nearly 10% of the older workforce would be needed to care for the oldest old, if there would be no public elderly care. Because elderly care within families is still almost exclusively conducted by women, the labour force participation of women aged 55 to 64 would decrease dramatically within a scenario of a higher share of oldest old in need of care and no social safety net available.

The lowest PaSR can be observed in those types of regions with the lowest life expectancies: i.e. Type 2 – Challenge of Labour Force (avg. 6/100) and Type 7 – Overseas (avg. 7/100). Consequently, the highest PaSR can be found where the life expectancy is highest, i.e. Type 4 – Challenge of Ageing (avg. 12/100). The PaSR of Type 1 – Euro Standard (avg. 10/100) is slightly above average. Type 3 – Family Potentials and Type 6 – Young Potentials show ratios around the overall average. The highest regional PaSR of more than 15/100 – i.e. not even 7 persons aged 55 to 64 years per every person aged 85 years and older – can be found in the regions of Liguria/ITC3 (Italy), Castilla y Leon/ES41 and Aragon/ES24 (both Spain), which are all regions of Type 4 – Challenge of Ageing (see Map A2.18).

LABOUR FORCE

The biggest demographic challenge in regard to the labour force is a slowing growth of the working age population (Fig. 26 and Map A2.21). The age group 20 to 64 years constitutes the core of the labour force, because of a generally increasing educational attainment – nowadays only a few people start working fulltime before age 20 – because of an official retirement entry age around age 65 in most European countries. Another age structural aspect in respect to the economic performance of a society is the dependency ratio (Fig. 52 and Map A2.19), which is the sum of the old age dependency ratio (see above) and the youth dependency ratio (Map A2.16 and A2.20).

DEPENDENCY RATIO

The (total) dependency ratio is providing an overview of the ratio of the potentially economic active population (age 15 to 64) in relation to the not yet active age group below age 15 and the not anymore economically active age group above age 65. All other types of regions display increases around the overall average (between 0.60% and 1.51%).

Type 2 – Challenge of Labour Force with an average total dependency ratio of 44/100, boasts the highest demographic bonus. On the one hand, this can be explained by the fact that fertility started to decline not so long ago – from 1990 on – in the former socialist CEE countries. However, by 2005 the last strong birth cohorts, which were born before 1990, were already older than 15 years, resulting in a very low youth dependency ratio (YDR). On the other hand, population ageing is not very advanced (yet) in Type 2 regions, due to the low life expectancy in this type of region. Apart from Type 2 – Challenge of Labour Force, also Type 6 – Young Potentials features a relatively low total dependency ratio (avg. 45/100).

107 The simplifying assumptions, on which the concept of dependency ratios is based on, were already discussed in Chapter 2.1.2.
Dependency ratios above EU27+4 average can be observed in Type 7 – Overseas (avg. 54/100), Type 4 – Challenge of Ageing and in Type 1 – Euro Standard (both avg. 53/100). In the case of Type 4, the high dependency ratio is determined by a high OA DR. By contrast, a high YDR (avg. 40/100) causes the high dependency ratio in Type 7. The dependency ratio of Type 1 – Euro Standard is nearly equally affected by the YDR (avg. 26/100) and the OA DR (avg. 27/100). The highest dependency ratios overall (of more than 60/100) can be found in the regions of Liguria/ITC3, Limousin/FR63 and Dorset and Somerset/UKK2 (all Type 4 – Challenge of Decline regions) and in Guyane/FR93 (Type 7 – Overseas) – see Map A2.19.

WORKING AGE POPULATION
Figure 53 illustrates the proportion of the working age population in 2005, i.e. the population aged 20 to 64 years, and the corresponding annual average growth rates for the period 2001 to 2005. The also portrayed age groups (20 to 39 years and 50 to 64 years – see Map A2.01 and A2.22) represent the younger, respectively older working age population. The proportion of the younger working age population (20 to 39 years) is also used as an input variable of the cluster analysis (see Chapter 4.2.2). These two age groups are shown separately because of the relationship of age and productivity (GÖBEL & ZWICK 2009). In general, it is assumed that the younger working age population is more innovative, while the older working age population is benefiting from long-term experience. The question, if either the younger or the older working age population is more productive, is generally hard to measure and still in discussion (cf. ESPON 2009b:9ff).

The share of the working age population is directly connected to the dependency ratios. Practically, the principles of the model of the “Demographic Dividend” (see Chapter 2.2.3) can also be expressed by means of the proportion of the age group 20 to 64 years (i.e. 60.65% in the EU27+4). The regions with the highest proportions are often urban regions, with shares of 65% and more (see Map A2.21).

Type 6 – Young Potentials and Type 2 – Challenge of Labour Force feature the highest average shares of the age group 20 to 64 years (62.88% and 62.72%), and also of the young working age population aged 20 to 39 years (avg. 32.26% and 30.43%). Type 7 – Overseas also shows a very high proportion of the young working age population (avg. 30.40%). Because Type 7 has the lowest average share of older workers aged 50 to 64 years (12.57%), the share of the age group 20 to 64 years in Type 7 (avg. 57.14%) is also below the overall average. The average proportion of the working age population in regions of Type 3 – Family Potentials, Type 4 – Challenge of Ageing and Type 5 – Challenge of Decline is around the EU27+4 average of 60%. In regard to both working age groups, Type 3 – Family Potentials has above average proportions of the younger working age population and below average proportions of the older working age population. This is exactly the opposite in regions of Type 4 – Challenge of Ageing and Type 5 – Challenge of Decline. Besides Type 7 – Overseas, only Type 1 – Euro Standard features below EU27+4 proportions of people in the working age (avg. 59.35%), but –

108 Please note that the here used definition of working age population (20 to 64 years) and (potentially) economically active population (15 to 64 years) are not equivalent.
contrary to Type 7 – simultaneously above average proportions of the older working age population. Therefore, regions of Type 1 – Euro Standard have the lowest share of younger working age population (avg. 25.68%).

In general, the highest proportions of the younger working age population (35% and more) can be found in urban regions and, apart from that, in regions of Type 6 – Young Potentials (see Map A2.01). By contrast, the regions with the highest shares of older working age population (20% and more) are located in Type 2 – Challenge of Labour Force (including the entire Czech Republic), Type 4 – Challenge of Ageing, Type 5 – Challenge of Decline, as well as in some Type 3 – Family Potentials regions in Southern Norway and the UK.

The overall annual average increase of the working age population (20 to 64 years) in regions of the EU27+4 during the period 2001 to 2005 was 0.50%. Type 6 – Young Potentials shows the highest overall annual average increases (2.66%), whereby both the younger and the older working age population were increasing. Type 7 – Overseas also has a strongly increasing working age population (avg. p.a. 1.47%), but, contrary to Type 6, only the older working age population is growing in Type 7, while the younger working age population is stagnating. The annual average growth rate of the working age population of Type 1 – Family Potentials (0.31%) and of Type 5 – Challenge of Decline (~1.25%) are both below average, whereby the working age population of Type 1 is still increasing, while it is already declining in Type 5. The younger working age population of both types of regions was declining on average by around one percent every year between 2001 and 2005, while the older working age population was increasing in Type 1 (avg. p.a. 1.15%) and declining in Type 5 (avg. p.a. 0.11%).

In all other types of regions (Type 2 – Challenge of Labour Force, Type 3 – Family Potentials and Type 4 – Challenge of Ageing), a slight increase of the age group 20 to 64 years can be observed for the period 2001 to 2005. While the younger working age population increased on a low level in Type 2 (avg. p.a. 0.26%), it is even decreasing in Type 3 and Type 4 (avg. p.a. –0.51% and –0.15% respectively). The older working age population is increasing in all three types on average between one and two percent per year. For a further differentiation on the scale of NUTS 2, see Maps A2.23 to A2.25, which are illustrating the annual average increase of the working age population aged 20 to 64 years.

LABOUR FORCE REPLACEMENT RATIO

The Labour Force Replacement Ratio (Fig. 54 and Map A2.26) is the ratio of the working age population who will retire in the course of the next ten years and of the age group 10 to 19 years, which should replace them. A value of 100 means that the older workforce will be replaced by the endogenous youth aged 10 to 19 years (in 2005) by 1:1; a value below 100 means that the replacement level will not be reached. The highest labour force replacement potential can be awarded to Type 7 – Overseas, where every older worker can be potentially replaced by nearly 2.4 younger workers. Keeping in mind that this type of region shows a negative migration rate, one can assume that not all those teenagers (aged 10 to 19 years by 2005) will join the local workforce during the next ten years and that, at least, some of them will migrate to mainland Europe, and thus to one of the other six types of regions.

Far below the ratio of Type 7, but still above the EU27+4 average of 110/100 is the labour force replacement ratio of Type 2 – Challenge of Labour Force (avg. 123/100), Type 3 – Family Potentials and of Type 6 – Young Potentials (both avg. 117/100). Because Type 6 also features a very strong in-migration, the actual replacement potential might be even higher.

The labour force replacement ratio of Type 1 – Euro Standard (avg. 103/100) is relatively balanced and close to the EU27+4 average. Because of the positive net migration rate of Type 1, these regions can also assume to replace their older working age population in the years until 2015 without any problems.

A sub-replacement ratio can be observed for Type 5 – Challenge of Decline (avg. 97/100) and especially for Type 4 – Challenge of Ageing (avg. 81/100). In the case of Type 4, this very low labour force replacement ratio could be balanced, if the strictly positive migration rate of the period 2001 to 2005 can be prolonged; quite contrary to the regions of Type 5 – Challenge of Decline, which are featuring a clearly negative average migration rate.

4.3.5 DEMOGRAPHY BY TYPE OF REGION – A BRIEF SUMMARY

This chapter aims to summarize the demographic characteristics of each type of region by 2005 beyond the variables used in the cluster analysis. Special emphasis is placed on the population development and the demographic challenges of low fertility, population ageing and the size of the working age population.

TYPE 1 – EURO STANDARD

The total population development in regions of Type 1 was predominately positive during the period 2001 and 2005 (avg. p.a. 3.5 per 1,000) and is closely matching the EU27+4 average. In fact, only 7 of the 79 regions of Type 1 have a negative population development and 39 regions can be labelled “double positive” when referring to both components of the population balance: the natural population balance as well as the net migration balance. The other 33 regions have a negative population balance but still feature overall population increases due to positive migratory balances. The age structure of Type 1 is comparable to that of the entire EU27+4 population, whereas the baby boom bulge of the age group 35 to 55 years is strongly pronounced because of weaker cohorts in the younger ages.
In 2005, regions of Type 1 – Euro Standard had an average TFR of 1.64, which is above the EU27+4 average (1.53), while also the life expectancy at birth (79.1 years) is one year above the overall average. Furthermore, a predominately positive net migration rate contributes to the overall positive population development in this type of region. Speaking of demographic challenges, low fertility seems not to be the major problem in regions of Type 1. However, the process of population ageing – measured by the share of the old (65+) and oldest old (80+) – is well advanced compared to the EU27+4 average. This results in a below average share of working age population, especially when considering that the younger working age population (20 to 39 years) even decreased during the period 2001 to 2005.

**TYPE 2 – CHALLENGE OF LABOUR FORCE**

Type 2 is rather ambivalent when it comes to the components of population development and is stagnating with respect to population growth (avg. p.a. –0.71 per 1,000). However, the majority of regions of this type show a negative population development, whereas a third of all Type 2 regions are “double negative” referring to the natural population balance and the migratory balance. The age structure clearly differs from that of the EU27+4 population, because of the lower proportion of the younger (below 10 years) and older population (55 years and older). The age group between 15 and 29 years is above average, while people between 35 and 44 years show proportions below the overall average.

The average total fertility rate (1.29) of Type 2 regions was the lowest of all types of regions in 2005, as is the life expectancy of 75.1 years. The annual average net migration rate (0.88 per 1,000) is rather balanced and hence below the EU27+4 average.

The low levels of fertility, if prevailing, will be a major challenge for this type of region. The last strong birth cohorts entered the labour market between 2005 and 2010. This contributes to an above LFS space average share of younger adults aged 20 to 29 years, while the proportion of the entire working age population is just around average. Further sufficient labour supply might not be provided without increasing immigration. At the moment, the relatively low life expectancy is mitigating population ageing. However, with no further in-migration and an ongoing lowest-low fertility, the demographic table might turn to the worse for this type of region.

**TYPE 3 – FAMILY POTENTIALS**

All but two regions of Type 3 feature a population increase and 40 out of 55 regions can be declared as “double positive” with respect to both components of the population development. This results in a strong annual average population increase of 5.84 (per 1,000). Type 3 features an age structure, which matches the overall average in the prime age of the labour force (20 to 59 years). Younger and older age groups reveal a favourable weighting.

As the title “Family Potentials” implies, the average TFR of 1.75 does not pose a serious challenge for this type of region. The average life expectancy of 79.3 years is also relatively high and thus above the EU27+4 average. Because of the considerable high birth rates and a moderate in-migration, the share of the elderly is below the overall average, despite the relative high life expectancy at birth in this type of region. The share of the working age population is around average, and was still increasing between 2001 and 2005.

**TYPE 4 – CHALLENGE OF AGEING**

Similar to Type 3, all Type 4 regions but one experience population increases, although 24 of the 33 regions feature a negative natural population development. Hence the population increase is driven by a strictly positive net migration rate, on average 9.42 per 1,000. As the title of this type indicates, the share of the younger population below age 30 is clearly underrepresented, while the proportion of the older age groups (55 years and older) is significantly higher in comparison to the EU27+4 age structure.

The average TFR of Type 4 regions amounts to 1.41 and is below the overall average. However, the average life expectancy of 80.2 years is the highest of all types of regions. As a result, the share of elderly in Type 4, be it the old or oldest old, is by far the highest. Albeit the low birth rates and the high share of elderly people, the proportion of the working age population is just slightly below the EU27+4 average and was even increasing between 2001 and 2005. This proves that migration can mitigate low fertility and population ageing to some extent, especially when tackling the challenge of maintaining the size of the labour force.

**TYPE 5 – CHALLENGE OF DECLINE**

Out of the 38 regions of this type, only two regions withstand a decline of population size because of their positive migratory balance. In fact, 17 regions are in line with the “double negative” type of population development. Taking the low TFR (1.36) and the strictly negative net migration balance (avg. p.a. – 4.59 per 1,000) into account, the age groups 15 years and younger and 25 to 34 years are clearly underrepresented in the age structure of Type 5. Only the proportion of the older age groups above age 55 is significantly higher compared to the EU27+4. Because of this rather unfavourable age structure, the share of the elderly population is clearly above the overall average, although the average life expectancy at birth (77.3 years) is relatively low.

Such a demographic setting also affects the working age population. At a glance, the proportion of people aged 20 to 64 years is just slightly below the EU27+4 average. However, the share of younger adults aged 20 to 39 years is clearly below that average, while the share of older workers aged 55 to 64 years is above the overall average. The share of the working age population, especially of the younger workforce, already declined during the period 2001 to 2005.

**TYPE 6 – YOUNG POTENTIALS**

Type 6 regions are nearly entirely absorbed by the “double positive” category of population development. Only one region had a slightly negative natural population balance between 2001 and 2005, but was still showing a population increase due to a positive migratory balance. As the title of this type of region suggests, Type 6 – Young
Potentials shows considerable high shares in the younger ages, especially in the age groups 20 to 44 years and below 5 years.

The average TFR of Type 6 regions (1.50) is very close to the EU27+4 average, while the life expectancy (79.8 years) is above average. The strictly positive population development is driven by strong annual average net migration gains (17.1 per 1,000 between 2001 and 2005). These considerable in-flows are also reflected by the young age structure and contribute to the relatively low proportions of elderly people in this type of region. The share of the working age population is not only above the EU27+4 average, it is also the youngest and features the strongest increases of all types of regions.

TYPE 7 – OVERSEAS

The demographic characteristics of Type 7 are strongly contrasted from those of the six main types. The positive population development in all five regions of this type is driven by a strong natural population increase, while the average net migration balance was negative between 2001 and 2005. Because of a TFR of around 2.5 and a life expectancy of just 75.1 years, the age structure of Type 7 could be indeed depicted in the form of a pyramid, where each age group is stronger than the subsequent age group of higher age.

The proportion of elderly people is by far the lowest of all types of regions. The same can be said about the share of working age population. However, the share of the younger working age population aged 20 to 39 years is the second highest next to Type 2.
In order to achieve the principle aim of this thesis, i.e. the development of a typology of European regions based on demographic variables and the linkage of the resulting typology to socio-economic variables (cf. Chapter 1.2), this chapter describes the process and results of connecting the European Labour Force Survey (EU-LFS) to the demographic typology.

5.1 LINKING THE DEMOGRAPHIC TYPOLOGY WITH SOCIO-ECONOMIC VARIABLES

First, the state of research with respect to the relationship of demography and economy will be pointed out in brief, before sketching out the EU-LFS and the necessary steps in order to link the EU-LFS data set to the demographic typology.

5.1.1 THE RELATIONSHIP OF DEMOGRAPHY & ECONOMY

In a report on the interrelationship of demography and economy, published in an annex to the DEMIFER report, RAUHUT (2009:58ff) argues that the causality – both in terms of direction and magnitude – between demographic changes and economic performance is, at least, unclear:

“(…) we appear to be stuck in the hen-and-the-egg dilemma as science has not been able so far to show which came first.”

Daniel RAUHUT (2009:58)

The main arguments behind that conclusion are based on a number of theoretical and methodological aspects. Basically, the relationship between demography and economic performance is systemic rather than linear (RAUHUT 2009:44ff). Nevertheless, most analyses – often based on the neoclassical economic theory (cf. Chapter 2.2.4) – concentrate on the direct economic effects of demographic change, without taking the manifold indirect effects (e.g. political, institutional, social and psychological aspects) into account (ibid.; p. 58). Furthermore, the question of scale cannot be ignored. Although most analyses focus on the national level, the regional and local level might reveal a better picture of the underlying processes. In fact, demographic and economic developments at the regional level are often contradictory to the national level, while corresponding policies are generally made and implemented at the national level (ibid.; p. 45f).

5.1.2 TOWARDS A COMBINED SOCIO-ECONOMIC & DEMOGRAPHIC TYPOLOGY?

The examination of the effects of demographic developments and migration flows in various types of regions with respect to socio-economic characteristics is an explicit requirement of the DEMIFER project (cf. ESPON 2008b:6). Avoiding to build theoretical models to achieve a consistent view of the mechanisms actually in place, the coming analysis (starting with Chapter 5.2) will go the “agnostic way” – as CROIX, LINDH & MALMBERG (2006:1) call it, analysing solely the empirical relationship between demographic and socio-economic variables at the regional level of NUTS 2.
Based on the final cluster solution, i.e. the typology of the demographic status in 2005 (see Chapter 4.2), there are two ways to construct a combined demographic and socio-economic typology:

- Extension of the demographic data set with socio-economic variables to construct an extended typology with the method of cluster analysis.
- Linkage of the demographic typology with the European Labour Force Survey. In this case the EU-LFS indicators will not be included in the typology, but will instead be used as dependent variables for a further illustration of the classification result achieved by the cluster analysis.

Due to the mutual relationship between demography and economy (cf. Chapter 5.1.1), adding economic variables to the demographic data set of the typology (“extension”) would complicate the interpretation of the classification. Therefore, the typology will be kept strictly demographic and the EU-LFS data set will be linked in order to describe the economic performance of the types of regions resulting from the demographic typology.

### 5.1.3 THE EUROPEAN LABOUR FORCE SURVEY (EU-LFS)

The EU-LFS is a quarterly household sample survey, conducted in the 27 Member States of the EU, as well as in the Candidate Countries and in (some) EFTA countries (EC 2009b:ii). This survey provides results on labour participation of people aged 15+ as well as of persons outside the labour force. Since 1983, the Labour Force Survey is conducted by National Statistical Institutes (NSI) across Europe and is centrally processed by Eurostat.110

“By its very nature it is a particularly rich database relating to various conditions and opportunities in the working life of individuals (...) and on other aspects of the social structures of European societies.”

Walter MÜLLER & Markus GANGL (2000:1)

Compared to other databases the LFS offers several advantages, especially when used for comparative studies: e.g. rather large samples of respondents that allow stable estimates even for selected social groups (cf. MÜLLER & GANGL 2000:1f). In general, the information is based on detailed classification schemas, such as NACE for economic activity, ISCO for occupation, ISCED for education and NUTS for regional data.111

### 5.1.4 LINKING THE LABOUR FORCE SURVEY TO THE DEMOGRAPHIC TYPOLOGY

Having said that the EU-LFS relies on detailed information schemes, in fact the data set is not as consistent as it would be desirable. Because of its sample structure – especially the spatial aggregation (see below) – the EU-LFS indicators could not be used as input variables for the cluster analysis. Nevertheless, the cluster solution (i.e. types of regions) can be described even more accurately by using the EU-LFS.

#### SPATIAL ADAPTATION OF THE DEMOGRAPHIC TYPOLOGY

Two major spatial restrictions regarding the EU-LFS data set prevented the use of EU-LFS indicators as input variables for the cluster analysis of European (NUTS 2) regions. First, the EU-LFS data set does not cover the entire EU27+4 (or ESPON space); the following ESPON countries and regions are missing:

- Malta, Iceland, Switzerland and Liechtenstein, as well as
- the French Overseas Departments and Territories of Martinique, Guadeloupe, Guayane and Réunion

Second, the spatial structure of the EU-LFS data set, although aiming to stick to NUTS 2 level, shows a few exceptions with respect to the consistency of the spatial aggregation. In the case of some countries, the edited data is not following the principle of NUTS 2 aggregation, i.e.:

- NUTS 1 level ... Austria, Germany and the UK
- NUTS 0 level ... the Netherlands

In order to analyse the EU-LFS data set linked to the demographic typology, the actual EU-LFS spatial aggregation had to be taken into account. Another cluster analysis was carried out, based on the same input variables and methodology as applied for the original demographic typology (see Chapter 4.1.3). The result of the adapted cluster solution proved to be stable in regard to the original typology (for details see Annex 6 – “Adapting the Typology to the EU-LFS 2007 Data Set”).

The main changes of the adapted typology with respect to the original typology can be summarised as follows:

- Reduced number of regions – due to missing countries and different NUTS levels (see above). Around 2% of the EU27+4 (or ESPON space) population and 14 regions are not covered by the EU-LFS 2007 data set (i.e. “Type 0”).
- Different population size (and number of regions) per type of region – especially Type 5 – Challenge of Decline diminished due to the aggregation to the NUTS 1 level. In the case of Germany, only two West German NUTS 1 regions remained in Type 5, contrary to the classification at NUTS 2 level – resulting in the conventional German East-West-divide.
- Variable ranges and average values per type of region changed slightly – due to the differences in the spatial aggregation.

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110 For more information on the EU-LFS, please visit the Eurostat website at: http://epp.eurostat.ec.europa.eu/portal/page/portal/microdata/lfs (retrieved 25.03.2010).

111 A full list (and explanation) of all EU-LFS indicators can be obtained from the EU Labour Force Survey Database User Guide (EC 2009c).
Type 7 – Overseas became irrelevant for the EU-LFS analysis – due to the exclusion of the French Overseas Departments and Territories (see above), only two regions remain in this type in the LFS adapted version of the demographic typology. These two regions, Ceuta and Melilla, constitute just about 0.03% of the entire EU27+4 (or ESPON space) population.

In the EU-LFS adapted typology (see Map 10 below), the EU27+4 (or eSPon space) consists of 222 regions at different nuTS levels, instead of 286 regions in the final classification at the scale of nuTS 2 (cf. Map 8). Out of these 222 regions, the EU-LFS 2007 is covering 208 regions (i.e. the “LFS space”). The remaining 14 regions (i.e. Malta, Iceland, Switzerland and Liechtenstein, as well as the French overseas Departments and Territories) were not analysed and are listed as “Type 0” (see Map 10).
5.2 SOCIO-ECONOMIC INDICATORS

Based on the most recent EU-LFS 2007 data set, the economic performance of the demographically distinguished types of regions (Chapter 5.2.1) will be discussed by means of socio-economic characteristics, with a special emphasis on the foreign population (5.2.2), educational composition (5.2.3), as well as labour status (5.2.4) and economic activity (5.2.5) by age, sex and origin. Additional figures, maps and tables of the therefore used indicators (by type of region) can be found in Appendix 4.

As just mentioned in Chapter 5.1.4, the LFS data set is – contrary to the demographic typology – not strictly aligned to the NUTS 2 level and thus does not cover all EU27+4 (or ESPON space) regions. For that reason this analysis is restricted to the so-called “LFS space”, i.e. the EU27+4 without Malta, Switzerland, Liechtenstein, Iceland and the French Overseas Departments and Territories of Martinique, Guadeloupe, Guyane and Réunion. Furthermore, the EU-LFS indicators mentioned in the following are based on the year 2007, only the GDP figures (Chapter 5.2.1) were taken from the ESPON 2013 Database and thus relate to 2005, matching the base year of the demographic typology.

5.2.1 ECONOMIC PERFORMANCE (GDP)

The gross domestic product (GDP) is a general accepted measure for economic performance – which should not be equated with “wealth” in any way.112 When comparing differences by GDP, it makes sense to take (also) the purchasing power parity (PPP) into account and to apply a per capita approach. It is worth noting that the here used GDP figures are based on data of the year (2001 to) 2005. Consequently, this analysis does not reflect any effects of the recent global economic downturn.

In terms of GDP level by 2005 and the annual average GDP growth between 2001 and 2005, Figure 55 illustrates the range (bar) and the average (short blue line) of every type of region (Type 1–6) in regard to the overall average of all LFS space regions (horizontal line across the chart area).

In general, the comparison of GDP/Euro and GDP/PPP, both by level and growth, does not reveal significant differences for any type of region, neither in regard to each other, nor with respect to the overall average. However, differences between GDP/Euro and GDP/PPP can be found in the range of each type of region – see also Map A4.01 to A4.04.

112 According to the definition of Eurostat/OECD (EC 2006:254), GDP can be estimated using three alternative approaches, which in theory yield the same result, namely: (a) the production approach – which sums all the value added generated by the country’s resident institutional sectors during the accounting period; (b) the expenditure approach – which sums all the final expenditures incurred by the country’s resident institutional sectors during the accounting period; and (c) the income approach – which sums all the factor incomes paid by the country’s resident institutional sectors engaged in domestic production during the accounting period.
Looking at the average annual GDP growth between 2001 and 2005, the economically better performing (“richer”) types of regions have the weakest GDP growth, i.e. Type 1, Type 3 and also Type 4 – all below the overall average (indicated by the horizontal line across the chart area of Fig. 55). In the case of Type 3, the negative GDP growth between 2001 and 2005 in some northern Italian regions (e.g. Abruzzo/ITF1, Emilia-Romagna/ITD5, Provincia Autonoma Trento/ITD2, Umbria/ITE2, Lombardia/ITC4 and Piemonte/ITC1 – see Map A4.04) contributes to the weak overall GDP growth of this type of region. The GDP growth per capita of Type 6 – Young Potentials roughly matches the overall average of the LFS space (i.e. 5% GDP/Euro p.a., respectively 4% GDP/PPP p.a.). Generally speaking, the highest GDP growth can be found in those types of regions with the weakest GDP values: i.e. Type 2 – Challenge of Labour Force and Type 5 – Challenge of Decline.113 However, the average values per type of region do not reflect the heterogeneity (i.e. the broad range) of regional GDP growth (2001-2005) within the different types of regions, especially within Type 2 – Challenge of Labour Force. Some “double weak GDP” regions – i.e. regions with a low GDP per capita level (2005) on the one hand and weak GDP per capita growth rates (2001-2005) on the other hand – can be found e.g. in Poland, Slovakia and Hungary (Type 2) and also in Bulgaria (Type 5) – cf. Map A4.01 – A4.04.

5.2.2 FOREIGN POPULATION

The demographic typology comprises only a single migratory indicator: the net migration rate (cf. Chapter 4.2.2). The EU-LFS data set sheds more light on the foreign population (by 2007) of each particular type of region. In this respect, this chapter aims to deliver an extended description of the migrant stock by type of region.

The EU-LFS offers two indicators with respect to the migratory background: “country of birth” and “citizenship (nationality)”. Additional (stock) indicators can be further distinguished by the “years of residence in this member State”.114 Unfortunately, an analysis of the indicator “country of birth” is not possible, because this particular indicator is missing for Germany and Ireland. In the case of Ireland, the indicator “years of residence in this Member State” is also not available.

113 A correlation calculation of GDP/Euro 2005 and GDP/Euro growth 2001-2005 (by NUTS regions) revealed a coefficient of –0.545 (and –0.375 for GDP/PPP). This means: The higher the GDP level, the lower the GDP growth.

114 The terms “citizenship” and “nationality” are used synonymously in this thesis.

For this reasons, the analysis of the foreign population is limited to the citizenship indicator, distinguishing between three groups:

− National ... non migrants (citizenship of the Member State)
− EU27 ... migrants with a citizenship from another EU27 country and
− Non-EU ... so-called third-country migrants with a citizenship from a Non-EU country.

POPULATION BY CITIZENSHIP

Certainly, the nationality is by far, not the perfect indicator. It would be preferable to have the country of birth available, in fact in relation to the nationality and the years of residence (in this member State). However, the citizenship (nationality) is a commonly used and understood indicator, which can be applied without further explanation when illustrating the migrant stock per type of region.115 A first overview of the population by sex and origin (citizenship) can be obtained from Table 10 and Map A4.05 – A4.07.

Across the LFS space, the foreign population (measured by citizenship) amounts to around 25 million people or 5% of the total population. Differentiated by origin (EU27 and Non-EU), it is striking that the stock of Non-EU migrants (3.31%) is almost twice as high as the stock of EU27 migrants (1.75%). The overall sex ratio is generally well balanced, although female migrants are slightly outnumbering male migrants.

115 If not otherwise mentioned, the terms “migrants” or “foreign population” refers to the nationality (citizenship) only.

116 In the context of the indicator “nationality” it is worth noting that EU (or EFTA) citizens living in another EU country might have only minor intentions to gain the citizenship of the country they are living in – in sharp contrast to Non-EU migrants (cf. Chapter 3.2.5).
The largest migrant stocks in absolute numbers (see Tab. 10) can be found in Type 1 – Euro Standard (around 9 million) and Type 3 – Family Potentials (around 6 million). Further significant migrant stocks can be observed in the regions of Type 6 – Young Potentials and Type 4 – Challenge of Decline. By 2007, around 7.5 million foreigners, i.e. roughly 30% of all migrants in the LFS space, were living in the “new growth regions” of Type 4 and Type 6, although the combined population of these two types of regions amounts to just about 20% of the total LFS space population. The two distinctive Eastern European types of regions, i.e. Type 2 – Challenge of Labour Force and Type 5 – Challenge of Decline, constitute around 30% of the overall LFS space population, but account only for less than 10% of its foreign population.

By far the largest shares of foreign population by 2007 (see Tab 10 and also Map A4.05) can be found in the regions of Type 6 – Young Potentials (avg. 10.8%), especially in the Spanish regions of Valencia/ES52 and Andalucia/ES61 as well as on the Balearics/ES53 (15% and more). Closest to that by some distance are the regions of Type 4 – Challenge of Ageing (avg. 6.9%). Both, Type 1 – Euro Standard and Type 3 – Family Potentials, have an average share of 5.7% of foreign citizens, with outstanding high shares of 20% and more in the urban regions of London/UK1, Brussels/BE10 and Luxembourg/LU00 (all Type 3). Only Type 5 – Challenge of Decline (avg. 2.2%) and Type 2 – Challenge of Labour Force (avg. 1.4%) feature foreign population stocks below the LFS space average (of 5.1%), whereby some distinctive urban regions (Berlin/DE20, Hamburg/DE60, Copenhagen/DK01, Athens/GR30 – all Type 2) have considerable higher shares of migrants of close to 10%. In terms of the other regions of Type 5, Estonia has a considerable high share of foreign population (roughly 16%), which is related to the high amount of Russian citizens in the Baltic countries in general (cf. Chapter 2.2.6 and 3.3.5).

### Ratio of EU27 to Non-EU Migrants

When analysing the foreign population stocks in LFS space regions by origin (EU27 vs. Non-EU citizens), it is striking that nearly twice as many migrants have a Non-EU citizenship (16.2 million) compared to those with a citizenship from another EU27 country (8.6 million). Indeed, not only the total number and the proportion of the foreign population is differing by type of region, also the origin of the respective migrant population varies strongly (see Tab. 11 and also Map A4.06 and A4.07). This particular differentiation between EU27 and Non-EU citizens is far more than a subtle distinction, because any EU27 citizen can move and stay within the EU (and EEA) without those restrictions applied to Non-EU citizens – e.g. freedom of establishment or labour laws. Furthermore, the host society applies different standards to EU citizens – especially from EU15 countries – and Non-EU-citizens when it comes to the topic of integration.

Taking only the foreign population by nationality into account, the highest ratios of three to four Non-EU citizens per every EU27 citizen can be observed in those types of regions with the smallest foreign population stocks, i.e. Type 5 – Challenge of Decline and Type 2 – Challenge of Labour Force. Other types of regions with above LFS space average ratios of 2.8 and 2.2 (Non-EU citizens per every EU27 citizen) are Type 4 – Challenge of Ageing and Type 6 – Young Potentials. Those types of regions, which feature the highest migrant stocks by absolute numbers, i.e. Type 1 – Euro Standard and Type 3 – Family Potentials, show the smallest ratios of 1.6 and 1.5 when differentiating between Non-EU and EU27 citizens.

### Foreign Population by Age

The age of immigrants is of special interest when analysing the role of migration with respect to the quantitative demands of the labour market. Figure 56 shows the size of the foreign population by age, which is further distinguished between EU27 and Non-EU citizens in Figure 56. Across all types of regions, the peak age of the foreign population is between 20 to 39 years (see Fig. 56). In regions of Type 6 – Young Potentials, with its extraordinary high share of migrants, more than 20% of the population aged 25 to 34 years holds a foreign citizenship. With respect to all regions of the LFS space, this proportion is close to 10%. In general, the foreign population is clearly clustered around working age in all types of regions, apart from Type 2 – Challenge of Labour Force and Type 5 – Challenge of Decline, where the foreign population stock is nearly non-existing or very low.

The age distribution of the foreign population from other EU27 countries is more balanced compared to Non-EU citizens (cf. Fig. 57). In regions of Type 6 – Young Potentials (with the highest migrants stocks relative to the total population) and of Type 3 – Family Potentials, the share of EU27 migrants in the older age groups (above age 60) is remarkable high, even though there are only minor differences by age in Type 3. A high share of older foreigners either indicates that those regions are traditional migrant destinations with ongoing migration flows and a hence culminated foreign population stock, or that these regions are attractive for retirement migration. When looking at the geographical distribution of Type 6 – Young Potentials, the latter could be true, at least to some extent. Spanish Type 6 regions like the Balearics/ES53 and Canaries/ES50 are both very popular domiciles of German retirees, while wealthy British pensioners favour the south coast of the Spanish mainland (cf. KROHNER et al. 2008:76). However, retirement migration is only very rarely, if ever, the main aspect of a high proportion of foreign population. Older migrants are usually rather wealthy and demand a certain degree of services, which are in turn often supplied by even more and younger migrant labourers.

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<tbody>
<tr>
<td>Type 1</td>
<td>3,480</td>
<td>5,472</td>
<td>8,992</td>
<td>2.20</td>
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<tr>
<td>Type 2</td>
<td>2,375</td>
<td>3,593</td>
<td>5,968</td>
<td>0.35</td>
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<tr>
<td>Type 3</td>
<td>2,230</td>
<td>2,636</td>
<td>4,866</td>
<td>2.71</td>
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<tr>
<td>Type 4</td>
<td>903</td>
<td>2,521</td>
<td>3,424</td>
<td>1.49</td>
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<tr>
<td>Type 5</td>
<td>407</td>
<td>1,228</td>
<td>1,635</td>
<td>0.45</td>
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<tr>
<td>Type 6</td>
<td>139</td>
<td>534</td>
<td>673</td>
<td>3.36</td>
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<tr>
<td>Total LFS</td>
<td>8,581</td>
<td>16,184</td>
<td>24,765</td>
<td>1.75</td>
</tr>
</tbody>
</table>

Data source: EU-LFS 2007 (EUROSTAT 2008)
Looking at the numerically superior group of migrants with Non-EU citizenships (Fig. 57/bottom), the age-specific migrant stocks of Type 1 – Euro Standard, Type 3 – Family Potentials and Type 4 – Challenge of Ageing are relatively similar and very close to the LFS space average. Type 4 – Challenge of Ageing features an extraordinary high share of very young migrants (below age 20). This could be an indication that Non-EU citizens, contrary to EU27 citizens, are bringing their children with them to a large extent when migrating to this type of region. The foreign population stock is nearly non-existing or very low in regions of Type 2 – Challenge of Labour Force and Type 5 – Challenge of Decline, but the age distribution of these few migrants is quite comparable.

LENGTH OF STAY
The validity of the indicator “length of stay”, which refers to the years of residence in the Member State (MS) – and thus not necessarily to the same NUTS region – is restricted due to the missing data for Ireland. However, at this point the indicator “length of stay” is used to differentiate between traditional and relatively new migrant destinations with respect to the different types of regions. Table 12 features the population of every type of region by years of residency, distinguishing between “natives” (born in the MS), recently settled migrants (1 to 5 years), longer-settled migrants (5 to 10 years) and long-term migrants (10 years and more).

Type 4 – Challenge of Ageing and especially Type 6 – Young Potentials, indeed seem to be “new growth regions”, as the length of stay of the majority of the migrant stock is less than 10 years. Contrary to that, Type 1 – Euro Standard and Type 3 – Family Potentials, can be seen as traditional migrant destinations, simply because the majority of the migrant population settles in these types of regions since more than a decade. Logically, those types of regions with no significant foreign population stocks – i.e. Type 2 – Challenge of Labour Force and Type 5 – Challenge of Decline – also did not experience any significant in-migration recently. In these types of regions, the vast majority of the anyhow minor stock of migrants is attributable to in-migrations, which took place more than 10 years ago (i.e. before 1997).

5.2.3 EDUCATIONAL LEVEL
After illustrating the economic performance (by GDP level and growth) and the quantities of particular migrant populations (by 2007) for each of the demographically distinguished types of regions, this chapter examines the population characteristics in respect to education (by age, sex and origin) of each type of region.\footnote{Type 7 – Overseas, consisting of only two NUTS 2 regions (Ceuta and Melilla) will not be explicitly discussed.}
In regard to the human capital – which is according to LUTZ & SCHERBOV (2005:18) defined by the health (often measured by life expectancy) and the educational level of a population – the highest level of formal education (age 15+) will be discussed by aggregating the ISCED classification into four groups:

1. No formal education – ISCED 0
2. Basic education (compulsory education) – ISCED 1 and 2
3. Secondary education – ISCED 3 and 4
4. Tertiary education – ISCED 5 and 6

In terms of the educational composition only the population 15+ is taken into account. A breakdown by highest educational level below age 15 would make no sense, as younger age groups did not even finish compulsory education (i.e. basic education). Moreover, at age 15 most people can still expect a transition to a higher educational level. When determining solely the share of tertiary educated people, the age group 25+ is commonly applied because of the associated longer educational attainment. For practical reasons, the age group 15+ will be used for the coming analysis.

Taking the overall LFS space population aged 15 years and older into account, less than two percent have no formal education, around one third (35%) have only basic or compulsory education, nearly half of the population enjoyed a upper secondary education and around 19% gained a tertiary education (see Fig. 58). The highest shares of tertiary educated people (15+) can be found in Type 6 – Young Potentials, Type 3 – Family Potentials and Type 1 – euro Standard (all above 20%). By contrast, the lowest shares (below 15%) must be attributed to Type 2 – Challenge of Labour Force and Type 4 – Challenge of Ageing.

By focusing on the other end of the educational scale, the highest shares of lower educated people (i.e. no formal education and basic education combined) can be observed in Type 4 – Challenge of Ageing and Type 6 – Young Potentials with more than 50%. In the case of Type 6, this results in a very low share of secondary educated persons and in a rather imbalanced educational composition with a high proportion of both higher (tertiary) and lower educated people. By contrast, the proportion of secondary educated people is highest with more than 50% in the distinctive Eastern European types of regions – i.e. Type 2 – Challenge of Labour Force and Type 5 – Challenge of Decline. The proportion of people without any formal education is indeed infinitesimal small in all types of regions (below 2.5%), besides Type 4 – Challenge of Ageing with more than four percent.

The gender perspective shows a clear female overrepresentation in the lower educational levels (no formal and basic education), while men are overrepresented at the higher educational levels (secondary and tertiary education). However, the future of higher education will be female. The gender gap is shifting to female advantage at younger ages, resulting in a higher female proportion of tertiary educated people below 40 years.

When differentiating the educational level by age and type of region, the share of the population (15+) with tertiary education might be the most meaningful indicator (see Fig. 59 and Map A4.08). In general, the proportion of persons with tertiary education is decreasing by age, signifying the increasing importance of higher education. Only in regions of Type 5 – Challenge of Decline, there is no increase in the proportion of tertiary educated people in the younger ages below 40 years, while this type of region achieves the highest proportions of tertiary education among the elder population aged 55 and older. Taking the considerable negative migration balance of Type 5 regions into account, one could assume that the younger and better-educated people might have emigrated first.

However, the figures indicate that tertiary educational attainment is changing to the better in all other types of regions, especially in Type 3 – Family Potentials and Type 6 – Young Potentials. These two types of regions show the highest proportions of younger people below age 35 with a tertiary education (of more than 40%). Also in regions of Type 2 – Challenge of Labour Force and Type 4 – Challenge of Ageing, significant progress is being made when comparing the tertiary educational attainment of the younger between 25 and 30 years (above 25%) and the older population, let’s say above age 50 with less than 15%.

Considering the migratory background of the entire LFS space population by nationality – distinguishing between nationals, EU27 citizens and migrants from non-EU countries – the educational composition of the national population and the foreign population from other EU27 countries is very similar (see Tab. 13). Compared to these two groups, migrants from non-EU countries are clearly less educated. Nearly 50% of the non-EU foreign population aged 15 years and older only has a lower education.
(i.e. no formal or basic education). Generally speaking, migrants from another EU27 country are higher educated than Non-EU migrants. When considering only the tertiary education of people older than 15 years, this proportion of highly educated people is even considerably higher among EU27 citizens (23.5%) when compared to the national population (18.8%). Looking at the different types of regions, by far the highest shares of highly educated migrants from other EU27 countries (31%) can be observed in Type 6 – Young Potentials. Besides that, the educational level of EU27 citizens succeed the national population also in all other types of regions, except for Type 1 – Euro Standard.

Nevertheless, the foreign population from Non-EU countries is clearly over-represented compared to EU27 citizens, but clearly underrepresented when it comes to higher education. This educational gap clearly becomes apparent, when looking at the share with no formal education at all (4.2%). The proportion of migrants from Non-EU countries with no formal education is highest in Type 3 – Family Potentials and Type 4 – Challenge of Ageing (both more than 8%). In fact, when looking at these educational figures and considering the labour market bifurcation in accordance to the theory of “Dual Labour Market” (see Chapter 2.2.6), one might feel compelled to ascribe nationals and EU27 citizens strictly to the primary sector (providing high wages and steady jobs for the better educated), while migrants from outside the EU27 must be attributed to the secondary sector (offering only low wages, as well as little stability and opportunities for advancement). An analysis of the labour status and economic activity in the coming chapters will show if migrants from Non-EU countries really occupy especially the low segments of production and services.

5.2.4 LABOUR STATUS

The labour status (by ILO definition) will be approached by the unemployment rate and the labour force participation rate, focussing not only on the total working age population (15 to 64 years), but also looking at the younger (15 to 24 years) and older labour force (55 to 64 years), with a special emphasis on the migrant labour force.\footnote{For labour force concepts and definitions, see: http://epp.eurostat.ec.europa.eu/portal/page/portal/employment_unemployment_lfs/methodology/definitions (accessed 09.11.2009)} Beyond that, the “Real” Dependency Ratio will be examined, which depicts the ratio of the actually economical active population (i.e. all employed persons aged 15 to 74 years) in respect to the economical inactive population (i.e. all others).

UNEMPLOYMENT RATE (2007)

By 2007, the LFS space unemployment rate (15 to 64 years) amounted to 7.2% (see Fig. 60/lef), which closely corresponds with the unemployment rate of the EU27 (7.1%) published by Eurostat. Compared to the overall figures (15 to 64 years), the youth unemployment (15-3 in the age 15 to 24 years) is more than twice as high. By contrast, the unemployment rate of older workers (5.5%) is considerably lower, even in regard
to the overall unemployment rate. The female unemployment rate is higher in all age groups when compared to men. Differentiating by nationality (see Fig. 60/right), the unemployment rate of the national population is the lowest (6.9%), whereby the unemployment rate of EU27 migrants (7.6%) is just slightly higher. Compared to these two groups, the unemployment rate of Non-EU citizens (13.6%) is nearly twice as high.

Type 5 – Challenge of Decline had by far the highest unemployment rate by 2007 (11.1%). In all other types of regions, the unemployment rate was ranging between 5.4% (Type 4 – Challenge of Ageing) and 8.3% (Challenge of Ageing). When differentiating by age (see Tab. A5.03), Type 2 – Challenge of Labour Force has the highest youth unemployment (18.7%), while the lowest can be observed in Type 1 – Euro Standard (13.0%). With respect to the older workforce (55 to 64 years), the highest unemployment rates must be attributed to Type 5 – Challenge of Decline (12.4%) and the lowest to Type 4 – Challenge of Ageing (2.9%). In all other types of regions, the unemployment rate of older workers is between 4.3% (Type 3 – Family Potentials) and 5.8% (Type 6 – Young Potentials).

As mentioned before, the female unemployment rate is higher when compared to men, which is true for all types of regions (see Tab. A5.06). The widest gender gap can be observed in regions of Type 6 – Young Potentials: women: 10.2%; men: 6.4%. In Type 1 – Euro Standard, not only the general unemployment rate but also the gender gap is the smallest of all types of regions: 6.5% for women and 6.2% for men. By 2007, the highest female unemployment rate was observed in Type 5 – Challenge of Decline (11.8%). The extent of the gender gap in respect to the unemployment rate is also differing by age and type of region. For the younger female labour force (15 to 24 years), the gap is widest in Type 4 – Challenge of Ageing (women: 19.0%; men: 13.2%) and Type 6 – Young Potentials (women: 19.3%; men: 14.9%). In regions of Type 1 – Euro Standard and Type 3 – Family Potentials, this particular gender gap is not only the smallest of all types of regions, beyond that, it is even to the advantage of young women. For the older female labour force (55 to 64 years), the gender gap in the unemployment rate is less distinct and most likely recognisable in Type 5 – Challenge of Decline and Type 6 – Young Potentials. In both types of regions, the female unemployment rate (55 to 64 years) surpasses those of men by roughly two percent.

DURATION OF UNEMPLOYMENT

Taking the duration of unemployment into account (see Tab. A5.04 and Map A4.10), the age group 15 to 64 years is equally balanced in regard to short-term and long-term unemployment: 42% of all unemployed persons are jobless since less than 6 month, while 42% are without employment since one year or longer – indicating that only 16% are unemployed between 6 and 12 month. In the age group 15 to 24 years, more

120 The relatively low unemployment rate of older workers (aged 15 to 64 years) in Type 4 – Challenge of Ageing, which includes many northern Italian regions, might be biased by the Italian retirement scheme. The age of retirement in Italy varies between 57 and 65 years, resulting in an effective retirement age of 59 years for men and 62 years for women. From 2008 on, the Italian retirement age will be steadily increased (RYMKIEVITCH & VILLOSI 2007:18).
than 50% are short-term unemployed, contrary to the group of older workers aged 55 to 64 years, where more than 60% are unemployed since one year or longer. When it comes to the duration of unemployment, there are no significant gender differences recognisable for any age group.

Differentiating by type of region, Type 3 – Family Potentials and especially Type 1 – Euro Standard are very close to the LFS space average when it comes to the duration of employment. In the distinctive Eastern European regions of Type 2 – Challenge of Labour Force and Type 5 – Challenge of Decline, more than 50% of all unemployed persons are long-term unemployed – i.e. out of work since more than one year. Contrary to that, short-term unemployment of less than half a year is prevailing in regions of Type 4 – Challenge of Ageing (51%) and Type 6 – Young Potentials (66%).

**Labour Force Participation Rate (2007)**

The labour force participation rate (15 to 64 years) amounted to 65.4% in the LFS space by 2007 (see Fig. 61 below and map A4.11). Differentiating between younger (15 to 24 years) and older workforce (55 to 64 years), it is worth noting that both age groups feature considerably lower participation rates compared to all ages. Distinguishing between these two age groups, the labour force participation rate of older workers (44.9%) is higher than those of the younger (57.4%). However, the very low labour force participation of younger people aged 15 to 24 years must be seen in the context of a prolonged educational period in upper secondary and tertiary education (cf. Chapter 5.2.3). The labour force participation rate of the elderly (65 years and older) is 4.7% across the LFS space.

The gender perspective delivers a clear picture: The LFS space labour force participation rate of women (58.4% for the age group 15 to 64 years) is clearly lagging behind those of men (72.4%), in fact in all age groups and types of regions. Taking the migratory background into account, EU27 citizens show the highest labour force participation rate (70.2%), clearly above the national working age population (65.5%). With only 59.3%, Non-EU citizens have the lowest labour force participation rate.

The highest labour force participation rate (15 to 64 years) can be observed in Type 1 – Euro Standard (69.0%) and the lowest in regions of Type 2 – Challenge of Labour Force (60.3%). In all other types of regions, the labour force participation rate is closely around the LFS space average of 65.4%.

When distinguishing by age, the same patterns as observed for the entire labour force (15 to 64 years) are prevailing. In the age group 15 to 24 years, the highest participation rates can be found in regions of Type 1 – Euro Standard (44.7%), followed by Type 6 – Young Potentials (41.2%) and Type 3 – Family Potentials (40.9%). In all other types of regions, the labour force participation rate of the younger is below the LFS space average, while it is the lowest in regions of Type 2 – Challenge of Labour Force (27.9%). The same is true for the older labour force (55 to 64 years). In this age group, the highest participation rates can be observed again in Type 1 (51.8%) and the lowest in Type 2 and Type 4 (both around 38%).

Focussing on the foreign labour force, the participation rate of EU27 citizens is – as already mentioned – 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 – Challenge of Decline and Type 6 – Young Potentials. In regions of Type 5, with a very low share of foreign population, the participation rates of nationals and Non-EU citizens are just about equal (64.0% and 63.2% respectively). The labour force participation rate of EU27 citizens in Type 5 of 57.8% is remarkably low compared to all other types of regions. However, in regions of Type 6, the labour force participation rate of nationals (65.2%) is lower than those of foreign citizens, whereas EU27 citizens and Non-EU citizens feature nearly equal rates of 70.0% and 69.6% respectively.

**Real Dependency Ratio**

Contrary to the commonly used age-related dependency ratio (cf. Chapter 3.1.2), the “Real” Dependency Ratio (or “worker to non-worker ratio”) – i.e. the ratio of all employed persons aged 15 to 74 years in regard to the rest of the population (unemployed and inactive persons at all ages) – demonstrates that by 2007 around 121 non-employed persons at all ages were actually dependent on the labour productivity of 100 employed persons, when taking the entire LFS space into account (see Fig. 62 and also Map A4.12).

This ratio is by far the lowest in Type 1 – Euro Standard, where 100 employed persons aged 15 to 74 years are opposed to 113 unemployed and inactive persons (at all ages). Besides that, this “real” dependency ratio is below the LFS space average in regions of Type 6 – Young Potentials (115/100) and Type 3 – Young Potentials (118/100).

121 According to the ILO definition, the labour force participation rate is the share of all employed and unemployed persons relative to all persons in the respective age group.

122 Please note, that this ratio does not take savings into account, which are contributing, at least to some extent, to the livelihood of retired persons.
Above LFS space average ratios can be observed in Type 2 – Challenge of Labour Force (132/100), Type 4 – Challenge of Ageing and Type 5 – Challenge of Decline (both 128/100).

When looking at these figures, it becomes obvious that this ratio is not only determined by demographic factors, but also by the participation in the labour force or – to be exact – by the employment rate at all ages. For sure, the low ratio of Type 1 – Euro Standard must be attributed to the considerable high labour force participation in this type of region (cf. Fig. 61), while the relative high proportion of people in the working age contributes to the low ratios in Type 6 – Young Potentials and Type 3 – Young Potentials. With respect to Type 4 – Challenge of Ageing and Type 5 – Challenge of Decline, the opposite is true.

Type 2 – Challenge of Labour Force is a good example, that a favourable age structure alone is not the panacea for a high share of economic active people. This type features a relatively high share of people in the working age and also shows only a moderate proportion of elderly people aged 65 years and older. Nonetheless, because the labour force participation rate of Type 2 is the lowest of all types of regions (see Fig. 61), it also has to bear the highest “real” dependency ratio.

5.2.5 ECONOMIC ACTIVITY (OCCUPATION)

Coming to the economic activity of the LFS space population, first the three main economic sectors are in the spotlight (Fig. 63). In this respect, the service sector is clearly the dominating economic activity, employing more than two thirds (67%) of the LFS space labour force. Around 28% work in the industrial sector and the remaining five percent work in the primary agricultural sector.

The highest proportion of people employed in the service sector can be found in Type 1 – Euro Standard and Type 3 – Family Potentials (in both cases above 70%), while it is by far the lowest in Type 2 – Challenge of Labour Force (57%). In return, the industrial sector is the strongest in Type 2 (30.7%) and the lowest in Type 3 (22.7%). Some sharp distinctions between the different types of regions become apparent when looking at the agricultural sector, which is considerably strong in regions of Type 2 (11.5%) and just very weak in regions of Type 1 and Type 3 (both around 2.5%).

Because these three main economic sectors do not provide enough detailed information about the actual economic activity – especially in the extremely broad service sector – a further differentiation of the total labour force (aged 15 to 64 years) by nationality was conducted according to the more detailed ISCo-88 classification (see Tab. A5.05). With respect to the share of all employed persons aged 15 to 64 years in the entire LFS space, the main activities in the service sector are “wholesale and retail trade” (14.2%), “health and social work” (9.8%), “real estate, renting and business activities” (9.6%), “construction” (8.2%), “public administration” (7.2%), “education” (7.0%) and “hotels and restaurants” (4.2%).

It was already mentioned before, that regions of Type 2 – Challenge of Labour Force feature the highest proportions in the agricultural sector, which is only differentiated between “agriculture” and “fishing” when referring to the ISCo-88 classification (see Tab. A5.05). In the industrial sector, the relatively low shares in “manufacturing” of Type 3 – Family Potentials and Type 6 – Young Potentials (both below 15%) is most striking. When differentiating within the very broad service sector, a more refined distinction is possible by using the ISCo-88 classification.124 Considering the different types of regions, some noticeable deviations from the LFS space average can be distinguished. In regions of Type 1 – Euro Standard and Type 3 – Family Potentials, for instance, the sector “health and social work” is more pronounced (both 12.3%) than in other types of regions (LFS space avg.: 9.8%). The same is true for the sector “financial intermediation”, although this sector is not particularly labour intensive. Employees in “private households” are overrepresented in regions of Type 4 – Challenge of Ageing and Type 6 – Young Potentials – i.e. two to three times higher compared to the LFS space average.125 Moreover, in regions of Type 6, the sectors “construction” (13.2%) and “hotels and restaurants” (7.2%) are much more pronounced compared to the LFS space average (8.2% and 4.2% respectively). The sector “real estate” (LFS space avg.: 9.6%) is however clearly underrepresented in the distinctive Eastern European regions of Type 2 (6.8%) and Type 5 (7.3%).

Considering only the foreign labour force (see Tab. A5.06), especially Non-EU citizens are clearly overrepresented in the service sectors “private households”, “hotels and restaurants”, “construction” and “extraterritorial organisations”. Conversely, the

123 For more information on the ISCo (88) classification, see: http://www.ilo.org/public/english/bureau/stat/isco/index.htm (retrieved 11.11.2009)
124 The ISCo-88 classification is subdividing the service sector into 12 economic activities.
125 One might doubt that all employees in private households are properly registered.
migrant labour force of the LFS space is underrepresented in sectors like “public administration”, “education”, the (often state-owned) industrial sector “electricity, gas and water supply” and also in the agricultural sector. When differentiating by types of regions and compared to the national labour force, it is striking that the foreign labour force, especially from other EU27 countries, is clearly overrepresented in the agricultural sector in regions of Type 4 – Challenge of Ageing and Type 6 – Young Potentials. In the industrial sector “manufacturing”, by comparison, foreign citizens show a relatively high proportion in Type 1 – Euro Standard, Type 4 – Challenge of Ageing, and also in regions of Type 5 – Challenge of Decline. When speaking about the above-mentioned high share of foreign workers in the service sector “construction”, this applies to all types of regions, besides Type 1 – Euro Standard, where this sector is quite evenly stocked with nationals and foreigners.

5.3  SOCIO-ECONOMIC CHARACTERISTICS BY TYPE OF REGION

Hereafter, the six main types of the demographic typology (cf. Chapter 4.2.3) will be discussed individually by the socio-economic indicators obtained from the EU-LFS 2007 data set, complemented by GDP data from the period 2001 to 2005.

5.3.1  TYPE 1 – EURO STANDARD

Demographically, Type 1 – Euro Standard is relatively close to the EU27+4 and LFS space average in respect to the variables used for the demographic typology: the share of the age groups 20 to 39 years and 65 years and older, as well as the components of population development, i.e. the natural population balance and the net migration rate (cf. Chapter 4.2.2).

In terms of economic performance, Type 1 – Euro Standard shows an above average GDP-PPP per capita level of 109% of the EU27 average (= 100), spanning from 67% (Sicily/ITG1) to 143% (Antwerpen/BE21). Like other regions with above average GDP levels, Type 1 regions featured a below average annual GDP growth of 2.9% between 2001 and 2005 compared to the GDP growth of the entire LFS space (3.9%).

Type 1 – Euro Standard has a foreign population of nearly 9 million people. This is the largest migrant stock of all types of regions, while the share of the foreign population (5.7%) is just above the LFS space average (5.1%). The vast majority of the foreign population live in this type of region for 10 years or more.

Referring to the highest formal education of persons above age 15, Type 1 features above average shares of upper secondary (51.3%) and tertiary educated people (20.6%). Unlike in other types of regions, the national population of Type 1 shows higher proportions of tertiary educated people compared to foreigners with a EU27 citizenship. People above age 15 with no formal education (0.8%) are literally imperceptible in this type of region.

The unemployment rate of Type 1 (6.3%) is below the LFS space average, whereas the unemployment rate of the foreign labour force – EU27 citizens (7.6%) and Non-EU citizens (15.5%) – is slightly above the LFS space average. The labour force participation rate of 69.0% is the highest of all types of regions. Especially the participation of women (63.0%) is far above the LFS space average (58.4%). Only the labour force participation rate of Non-EU citizens (53.8%) is below the overall average of 59.3%.

In regard to the economic activities of the labour force, Type 1 has the second highest share of people employed in the broad service sector (70.7%) and particularly in the “health and social work” sector (12.3%). Focussing on the economic activity of the migrant workforce in Type 1, foreign citizens are clearly overrepresented within
services like “hotels and restaurants” and “private households” and also in the “manufacturing” industry, but underrepresented within service sectors like “public administration” and – speaking especially of Non-EU citizens – “financial intermediation” and “education”. Besides that, employees with a foreign citizenship rarely work in the agricultural or industrial sector.

5.3.2 TYPE 2 – CHALLENGE OF LABOUR FORCE

This type of region can be demographically characterised by its high share of young adults (cf. Chapter 4.2.2) and is challenged to bring and establish these young people into the labour force.

Regions of Type 2 are clearly underperforming in terms of GDP-PPP per capita level with only 66% of the EU27 average. On the one hand, Type 2 covers Bulgarian and Romanian regions with a GDP-PPP level of less than 30% of the EU27 average, on the other hand, it also includes Western European urban regions like Hamburg with a GDP-PPP per capita level that is twice as high as the EU27 average. Apart from that, the annual average GDP-PPP growth rate between 2001 and 2005 (5.7%) is the highest of all types of regions, whereby those regions with the lowest GDP-PPP level show the highest annual growth rates of 10% and more. Besides the lowest GDP-PPP level of all types of regions, Type 2 also features the lowest share of foreign population (1.4%). The majority of this migrant population is already established since 10 years or longer in regions of Type 2, a clear indication that no significant in-flows occurred in recent years.

Although less than one third of the population (aged 15 years or older) has only a basic or no formal education, the share of tertiary educated people (14.8%) is still below the LFS space average (18.8%). Hence, the share of the population with secondary education (51.7%) is the highest of all types of regions. Looking only at the younger adults with a tertiary education, this share has nearly reached the LFS space average. Interestingly, although irrelevant by quantity, the foreign population shows a significantly higher share of tertiary educated people compared to the national population.

Speaking of the labour status of Type 2 – Challenge of Labour Force, the unemployment rate was 8.3% in 2007, and thus just one percentage point above the LFS space average. Focussing on the younger labour force, the strong age group between 15 to 24 years has to bear an unemployment rate of 18.7%, which is the highest youth unemployment rate of all types of regions. Despite that, Type 2 also has the lowest labour force participation rate, especially in the younger age groups (27.1%) when compared to LFS space average (37.6%). But then again, the labour force participation of people aged 65+ (6.6%) is the highest, especially for men (9.4%).

In terms of the economic activities, Type 2 shows the highest proportion of people working in the agricultural (11.5%) and industrial sector (31.5%) and the lowest in services (57.0%). Further differentiated, the high proportion of employees in the industrial sector can be traced back to a relatively strong mining industry, besides an overall high share of employees in the manufacturing sector. Contrary to that, many service sectors show below LFS space average proportions of employees (i.e. “private households”, “health and social work”, “financial intermediation”, “real estate, renting and business activities” and “hotels and restaurants”). Despite the minor stock of foreign population, their workforce seems to be concentrated in just a few sectors. Above all, there is a considerable concentration in the sector “private households”, where the share of migrant workers is 20 to 25 times higher compared to the national population.

5.3.3 TYPE 3 – FAMILY POTENTIALS

The demographically motivated title of Type 3 – Family Potentials refers to the relatively young age structure and the strictly positive natural population balance between 2001 and 2005 (cf. Chapter 4.2.2).

In 2005, the average GDP-PPP per capita level of Type 3 regions amounted to 124% of the EU27 average and is the highest of all types of regions, ranging from 68% in Puglia (ITF4) to 262% in Luxembourg (LU00). The average GDP-PPP growth rate between 2001 and 2005 of 2.6% per year is, however, below the LFS space average. Contrary to the overall trend of high GDP growth in regions with low GDP levels (cf. Chapter 5.2.1), those regions with the lowest GDP levels – i.e. the Italian regions of Puglia (ITF4) and Campania (ITF3) – have also the weakest or even a negative GDP growth (~0.1% and 0.5%), while some regions with high GDP levels also feature above LFS space average GDP growth, e.g. London (UK1), Stockholm (SE11), and especially Luxembourg with an average annual GDP-PPP growth of 6.3%.

Regions of Type 3 – Family Potentials have the second highest proportion of foreign population (6.0%), of which nearly two thirds are residing in this type of region since more than 10 years. Similar to Type 1 – Euro Standard, two out of three immigrants hold a Non-EU citizenship.

In terms of the human capital stock, the proportion of tertiary educated people amounts to 22.9% (LFS space average: 18.8%) and is increasing strongly in younger ages – at age 35, for instance, this share is around 37%. The proportion of higher educated EU27 citizens in Type 3 regions is 27% and hence also clearly above the LFS space average. The remarkably high share of younger adults with higher education is even more contrasted from the LFS space average. Apart from that, the proportion of people with no formal education is relatively high (2.4%).

The unemployment rate of 6.8% is relatively low, as is the unemployment rate of older workers aged 55 to 64 years of 4.3%. The youth unemployment rate of 14.8% is also below the LFS space average (15.3%). Remarkably, the female youth unemployment rate is even below those of young men. Furthermore, the average duration of unemployment is rather short-termed at all ages. Considering the foreign labour force, the unemployment rate of EU27 citizens (6.3%) is even below those of the national labour force (6.5%) – a phenomenon unique to Type 3. In general, the labour
force participation rate of EU27 citizens of more than 70% is outstanding compared to other types of regions.

When it comes to economic activities, Type 3 – Family Potentials features the strongest service sector (14.8%), and thus the weakest agricultural and industrial sectors. Within the broad service sector, especially “financial intermediation”, “real estate, renting and business activities” and “health and social work” are much more pronounced compared to the LFS space average. Looking at the differences between the national and the foreign workforce, above all, immigrants are overrepresented in sectors attributed to the secondary labour market, for instance in the “private households” sector. Differentiated by origin, especially EU27 migrants are employed in “construction”, whereas Non-EU migrants are overrepresented within sectors like “hotels and restaurants”, “real estate, renting and business activities”; and also in the “mining” sector.

5.3.4 TYPE 4 – CHALLENGE OF AGEING

A considerable high proportion of elderly people (aged 65 years and older) distinguish this type of region from the others. Besides that, Type 4 has a strongly negative natural population balance, albeit a high share of young adults in the reproductive age. A strong in-migration surplus is the driver of the prevalent population development (cf. Chapter 4.2.2).

The GDP-PPP per capita level matches the EU27 average and is slightly above the LFS space average. Compared to other types of regions, Type 4 only has a relative narrow regional GDP-PPP variance, ranging from 64% of the EU27 average in Portugal’s Centro region (PT16) to 136% in Lombardia (ITC4). The average GDP-PPP per capita growth between 2001 and 2005 (1.85% p.a.) was only half of the LFS space growth. Further differentiated, many Italian regions of Type 4 had a negative or just a very weak GDP-PPP growth (of less than 0.25% p.a.), while Spanish Type 4 regions featured annual growth rates of 5% and more.

As mentioned above, this type of region is experiencing a strong in-migration resulting in a proportion of the population with a foreign citizenship of 5.7% by 2007, which equals Type 1. The majority of the foreign population just immigrated recently (less than 5 years ago) and is of Non-EU origin. A peculiarity of this type of region is the relative high share of young migrants below age 20 from Non-EU countries.

More than 50% of the population aged 15+ only have a basic or no formal education at all. The share of the latter (4.3%) is the highest and the proportion of tertiary educated people (12.8%) is the lowest of all types of regions. In regard to the foreign population, the educational composition is similar to the LFS space distribution: EU27 citizens are better educated and Non-EU migrants are less educated in comparison to the national population.

Type 4 – Challenge of Ageing has the lowest overall unemployment rates (5.4%), while the gender gap is the widest: 4.2% for men and 7.0% for women. The same is true in terms of the youth unemployment rate (15.6%), which is 3.2% for men and 17.1% for women. Apart from that, also the unemployment rate of the foreign labour force is the lowest of all types of regions, especially for Non-EU citizens (10.2%). Beyond that, the majority of all unemployed persons are short-term unemployed. In general, the labour force participation rate corresponds to the LFS space average and is relatively balanced in terms of national population, EU27 and Non-EU citizens.

The distribution of the labour force with regard to the economic activity is comparable to the distribution in the entire LFS space, only the sectors “hotels and restaurants”, “private households” and especially “fishing” are stronger represented. Like in other types of regions, foreign citizens are overrepresented in sectors like “hotels and restaurants”, and especially EU27 citizens – contrary to other types of regions – also in the agricultural sector.

5.3.5 TYPE 5 – CHALLENGE OF DECLINE

The title of Type 5 – Challenge of Decline refers to a strictly negative population development, driven by both a negative natural population balance as well as a negative net migration rate (cf. Chapter 4.2.2). Together this leads to a significant population decrease coupled with population ageing.

In terms of economic performance, the average GDP-PPP per capita level of 2005 was similar to Type 2, and thus below the LFS space average. The regional bandwidth ranges from just 27% of the EU27 average in Severozapaden (BG31) to 157% in Bremen (DE50). By contrast, the annual average GDP-PPP per capita growth rate between 2001 and 2005 of 4.7% is above LFS space average – again very similar to Type 2. It ranges from 0.5% in Molise (ITF2) up to 11.5% in Estonia. The share of the foreign population of 2.2% is rather small, whereby Non-EU citizens dominate by a factor of 4. Just around 20% of the foreign population stock moved during the last 10 years to regions of Type 5.

At first glance, the educational composition of Type 5 looks well off by matching roughly the composition of the overall LFS space population. Considering only the higher educated population by age, one stumbles over the fact that it is, in fact, not increasing by younger ages, as it does in all other types of regions. Distinguishing by origin, the share of tertiary educated Non-EU citizens is higher than those of the national population – a phenomenon, which is unique to regions of Type 5 and Type 2.

The unemployment rate in Type 5 – Challenge of Decline (11.1%) was the highest of all types of regions in 2007. It is noticeable that the unemployment rate of older workers between 55 and 64 years (12.4%) is by far the highest, whereby the youth unemployment is just slightly above the LFS space average. The unemployment rate of immigrants with EU27 citizenship (16.3%) is the highest, but might be distorted...
by the low share of foreign population in general. Beyond that, long-term unemployment is pervasive in this type of region. The labour force participation rate of 64.0% is just slightly below the LFS space average.

With respect to the distribution of the economic activities, Type 5 features a relatively weak service sector, similar to Type 2. Thus, the agricultural and industrial sector together absorb more than a third of the total workforce. In the service sector, it is especially the number of employees within “public administration” that is considerably high in comparison to all other types of regions. Conversely, some other service sectors are underrepresented, e.g. “financial intermediation”, “real estate, renting and business services” and especially “private households”. The relative small foreign labour force is employed, above all, in the industrial sector.

5.3.6 TYPE 6 – YOUNG POTENTIALS

This type of region can be demographically characterised by its relatively young age structure and the consistently positive population development of both components: a positive natural population balance and a positive net migration (cf. Chapter 4.2.2).

From the point of view of economic performance, Type 6 matches the LFS space average, be it by GDP-PPP level or growth. The regional GDP-PPP level ranges from 80% of the EU27 average in Andalucia (ES61) to 158% in Southern and Eastern Ireland (IE01). Among all Type 6 regions, Andalucia features the highest annual average GDP-PPP growth of 5.9% between 2001 and 2005.

The foreign population stock of 10.8% in 2007 and the strong in-flow of migrants between 2001 and 2005 are outstanding, whereby migrants from Non-EU countries are dominating. The proportion of older immigrants (aged 50 or older), primarily from EU27 countries, is the highest of all types of regions. The vast majority of all immigrants are residing in this type of region since less than 10 years.

The population of Type 6 – Young Potentials has the highest share of people with only basic education (52.2%), and simultaneously the highest share of people with tertiary education (23.3%), which is driven by an exceptional high share of tertiary educated younger adults below age 35. As a result the proportion of upper secondary educated people (22.3%) is by far the lowest of all types of regions. Similar to the national population, most of the Non-EU citizens also enjoyed only a basic education. However, the share of tertiary educated EU27 citizens (30.8%) is the highest of all types of regions.

In terms of the labour status, regions of Type 6 feature unemployment rates above the LFS space average: 8.0% overall and 17% for the age group 15 to 24 years. Similar to Type 4, the female unemployment rate is substantially higher at all ages compared to those of men. Around two thirds of all unemployed persons and three quarters of the younger unemployed persons aged 15 to 24 years are short-term job seekers. The unemployment rate of Non-EU citizens (11.1%) is the second lowest next to Type 4. The overall labour force participation rate (66.0%) corresponds to the LFS space average and the labour force participation rate of younger people aged 15 to 24 years (41.2%) is the highest overall. In general, a considerable gender is prevailing in regard to all labour status indicators.

Looking at the distribution of the labour force within the economic activities in this type of region, the proportion of the three main sectors – i.e. agriculture, industry and services – is very close to the LFS average. When further differentiating, the share of employees in some particular sectors significantly deviates from the overall average. The sector “private household”, for instance, employs three times more people compared to the LFS space average. Besides that, also sectors like “hotels and restaurants” and “construction” are overrepresented. Only relatively few people are employed in the sectors “health and social work”, “public administration” and “education”. The foreign labour force is overrepresented in sectors like “private households”, “hotels and restaurants”, “construction”, and in the agricultural sector, and is underrepresented in “public administration”, “financial intermediation”, “education”, “health and social work”, “wholesale and retail trade”, as well as in the industrial sector.
5.4 COMPARING THE TYPES OF REGIONS

After discussing the socio-economic characteristics of the different types of regions, this chapter concludes the analysis of the EU-LFS data set with a comparison of the different types of regions. For a better differentiation, Table 14 also portrays the main indicators per type of region in relation to the LFS space average (=100).

Above all, the analysis of the EU-LFS 2007 data set demonstrates, that the geographical patterns revealed by the demographic typology (see Chapter 4.2.4) also withstand a socio-economic examination. Some (dis-)similarities can be distinguished quite well.

TYPE 1 & 3
The regions of Type 1 – Euro Standard and Type 3 – Family Potentials are concentrated in the central-western and northern parts of the EU27+4 territory. Both types feature values close to the EU27+4 and LFS space average with respect to the demographic variables used in the cluster analysis. These two types of regions share some common socio-economic characteristics:

− Above average GDP-PPP per capita level (2005)
− Below average annual GDP-PPP growth rates (2001-2005)
− Above average share of migrants (2007)
− Above average share of tertiary educated people (2007)
− Below average unemployment rate (2007)
− Above average labour force participation (2007)

TYPE 2 & 5
The two distinctive Eastern European types of regions, Type 2 – Challenge of Labour Force and Type 5 – Challenge of Decline, also cover some Western European urban regions and Northern and Southern European peripheral regions. Demographically, both types are affected by a population decrease. These losses are more dramatic in Type 5, which also has to bear pronounced population ageing. In terms of their socio-economic orientation, the similarities of Type 2 and Type 5, as listed below, are contrary to Type 1 and Type 3:

− Below average GDP-PPP per capita level (by 2005)
− Above average annual GDP-PPP growth rates (2001-2005)
− Below average share of migrants (2007)
− Below average share of tertiary educated people (2007); especially in Type 2.
− Above average unemployment rate (2007)
− Below average labour force participation (2007)

TYPE 4 & 6
The regions covered by Type 4 – Challenge of Ageing and Type 6 – Young Potentials are located mainly in the southern and western parts of Europe. Because of the strong net migration gains and hence overall population increases, both types of regions constitute demographic growth regions. The socio-economic similarities can be summarised as follows:

− Above average GDP-PPP per capita level (2005) – similar to Type 1 and Type 3.
− Above average share of foreign population (2007) – similar to Type 1 and Type 3, whereby the foreign population stock of Type 2 and Type 5 results from rather recent in-flows – contrary to Type 1 and Type 3.
− Around average labour force participation (2007)

However, these two types of regions cannot be aggregated and thus distinguished as easily by means of socio-economic indicators as the other two groups of regions. Some indicators show significant differences, when comparing Type 4 and Type 6:

− GDP-PPP growth rates (between 2001 and 2005) are above the LFS space average in Type 6 and below average in Type 4.
− The share of tertiary educated people (2007) is above LFS space average in Type 6 and below average in Type 4.
− The unemployment rate (2007) is above LFS space average in Type 6 and below average in Type 4.

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<td>3.05</td>
<td>10.80</td>
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Table 14: Socio-economic indicators per type of region

Data source: ESPON 2013 Database & EU-LFS 2007 (EUROSTAT 2008)
6. CONCLUDING REMARKS

This final chapter summarises the analyses conducted in this thesis, which focuses on the demography of Europe and its regions, with a special emphasis on the territory of the EU27+4 (Chapter 6.1). Based on the aims and objectives explained in Chapter 1.2, the research findings are presented in Chapter 6.2, while some thoughts with respect to research limitations and the consequent potentials for further research are outlined in Chapter 6.3.

6.1 SUMMARY

The aim of this diploma thesis – and also of the research resumed under Activity 2 (UNIVIE) of the ESPON project DEMIFER (see Chapter 1.1) – was to develop a typology of European regions based on demographic variables and to link the resulting typology to economic variables. This newly developed classification will serve as basis for subsequently elaborated models, projections and case studies within the DEMIFER project and sheds more light on the main research question (cf. Chapter 1.2):

“How will the demographic development, i.e. natural population development as well as migration, affect different types of regions and cities?”

A “demographic toolbox” was compiled in Chapter 2 before tackling the necessary demographic analyses. This toolbox outlines the basics of demography by addressing commonly used demographic indicators, the most important theories and models, as well as the principles of population projections. Chapter 3 discussed the state of the demography of Europe. First, the scale of Europe countries was addressed, followed by a spatial analysis of European regions on NUTS 2 level, before investigating the question, if something like a European demographic regime exists. This question was assessed by an analysis of the convergence and/or divergence of demographic trends and patterns at different scales.

Based on the awareness, that particular demographic trends and patterns exist across Europe, the thesis approached the actual task of developing a classification of European regions based on demographic variables. Chapter 4.1 described the making of this classification by means of cluster analyses. The resulting typology of the demographic status of European NUTS 2 regions in 2005 was presented in Chapter 4.2. The subsequent Chapter 4.3 further illustrated the classification achieved by applying more and more refined demographic indicators. In order to link the resulting demographic typology to socio-economic variables, Chapter 5 analysed the EU-LFS 2007 data set in terms of the different types of regions originated from the final cluster solution.
6.2 RESEARCH FINDINGS

Hereafter, the research findings and also its limitations will be addressed according to the aims and the research objectives of this thesis.

DRIVERS OF DEMOGRAPHIC CHANGE

In Chapter 3, Europe’s demographic status and trends, as well as the underlying population dynamics were presented in order to identify the drivers of demographic change. In the second half of the 20th century, Europe’s demography was shaped by the final stages of the demographic transition, with a previously unconceivable decline in the levels of fertility and especially mortality. The emergence of new post-modern values like self-fulfilment, personal freedom of choice, individual life styles and emancipation affects family foundation and have demographic consequences (BILLARI & LIEF-BROER 2005:1f; van de KAA 2008:23). As a result, fertility dropped below replacement level and natural population growth rates became negative. This happened first in Northern and Western Europe during the 1970s and 1980s in the aftermath of the fading baby boom. Southern Europe followed with some delay, and after the fall of the “Iron Curtain” no stone was left standing in Eastern Europe, also in terms of demography.

“Societal change often shows up first in demographic indicators, and almost all of cultural evolution (...) has a demographic component.”
Paul R. EHRlich (2008:111)

At the turn of the millennium, population numbers in large parts of Europe were kept from falling dramatically only because of the influx of migrants (van de KAA 2008:14). Beyond any doubt, by today migration became the driver of demographic change in Europe. At least since the early 1990s, European population growth has been mainly caused by international migration and some 80% of recent overall population growth results from migration (ESPON 2009:22).

A CONVERGING OR DIVERGING EUROPEAN DEMOGRAPHIC REGIME?

To some extent, some demographic developments across European countries have been following the same trends since 1950, e.g. the decline of fertility or the increase in life expectancy, while others again, e.g. net migration rates or population growth rates do not show any convergence at all. Based on the elaborations in Chapter 3.4, it can be stated that similar directions in the development of particular demographic indicators can be observed, rather than convergence by definition.

Weak trends of demographic convergence across Europe, coupled with regional heterogeneity lead to the conclusion that different countries and regions are affected differently by different demographic trends. The results are different patterns of demographic challenges. Population decline, for instance, which is often assumed as the major demographic challenge, seems to be a regional problem rather than a threat for all of Europe (cf. SOBOTKA 2008:30).

“Specific indices of convergence (or divergence) do not seem to have been developed.”
David A. COLEMAN (2002:323)

The question of convergence and divergence of demographic developments must be considered more in-depth, when aiming for a more satisfying answer. Such an analysis should concentrate on the process of change itself and should apply a more specified methodology such as statistical approaches to similarity or multi-level analysis (cf. COLEMAN 2002:323f).

DEMOGRAPHIC TYPOLGY OF EUROPEAN REGIONS

The developed typology of 286 NUTS 2 regions is a comprehensive classification of the demographic structure and short-term trends in the EU27+4, based on four variables: the share of the age groups 20 to 39 years and 65 years and older in 2005, as well as the annual average natural population increase and the net migration rate during the period 2001 to 2005. The typology distinguishes between seven types of regions, and in addition between two to four subtypes each, which are affected differently by demographic and migratory flows (see below). This regional level classification enables the user to capture the demographic diversity of European regions in 2005 at first glance.

- Type 1 – Euro Standard comes close to the overall average of the EU27+4 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 prevails.
- Type 2 – Challenge of Labour Force features a high share of population in young working ages and a slight population decline, which is 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 a natural population decrease. Nevertheless, the population size still increases 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 older population. The strong natural population increase is more than counterbalancing the negative migratory balance.
Beyond demographic characteristics, the typology reveals spatial patterns in terms of 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) and rather Southern European types (Type 4 and Type 6), as well as a non-European mainland type (Type 7).

**DEMOGRAPHIC CHALLENGES**

An additional analysis illustrates the demographic characteristics of the different types of regions by means of more and more refined variables, which were not used in the cluster analysis (see Chapter 4.3). This analysis concentrates on population development and the demographic challenges of low fertility, population ageing and the size of the working age population.

“A regional level classification would allow extremes within each region that may not be identified at a national scale (...) to be more clearly identified.”


First and foremost, population decline is a demographic challenge for the two distinctive Eastern European types of regions of Type 2 and especially of Type 5. All other types of regions had a positive population development during the period 2001 and 2005. These two types of regions and – to some extent – also Type 4 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 Type 7 regions, the level of fertility is predominately around or above two children per woman. In terms of the population development between 2001 and 2005, indeed all other types of regions, besides Type 2 and Type 5, compensated below replacement fertility by immigration.

Demographic ageing is measured by the share of the older age groups, most commonly by the age group 65 years and older, which is in general the strongest growing age group. Above average proportions of elder populations can be observed in 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 live expectancy in regions of Type 5 is the lowest next to Type 2 regions, the widespread emigration of the younger drives 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 Type 2 regions is due to the momentum originating from the last strong birth cohorts born before 1950, 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 and 64 years, challenges are bound to occur in the foreseeable future in all types of regions, except of 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 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 still increases. 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) already decreased during the period 2001 to 2005. Only in 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 Type 2 and Type 6, the proportion of the population in working ages is not only clearly above the overall average, it is even still increasing, especially the younger working age population.

**SOCIO-ECONOMIC ILLUSTRATION OF THE CLASSIFICATION**

Using the European Labour Force Survey proved to be a fruitful approach to link the demographic typology with socio-economic data. Although the EU-LFS 2007 data set is not as consistent as it would be desirable (cf. Chapter 5.1.4), it enables the examination of the relationship between demographic and socio-economic differences for the six main types of regions. In the EU-LFS adapted typology, Type 7 was not analysed as it only consists of two regions (i.e. Ceuta and Melilla).

“The European Labour Force Survey is undoubtedly one of the core databases for the comparative study of European Societies.”

Walter Müller & Markus Gängl (2000:1)

The analysis of the socio-economic characteristics of the different types of demographically distinguished regions includes indicators of the economic performance, i.e. GDP per capita levels of 2005 and annual average growth rates between 2001 and 2005, which were taken from the ESPON 2013 Database. All other indicators, i.e. share of foreign population, highest level of education, as well as unemployment rate and labour force participation rate, are related to the year 2007 and are obtained from the EU-LFS data set. When examining the socio-economic characteristics, a special emphasis was placed on the foreign population, distinguishing between national population and immigrants with a foreign citizenship, either from another EU country or from outside the EU27 (cf. Chapter 5.2)

When differentiating by economic performance, those types of region with GDP-PPP per capita levels above the EU27 average in 2005, i.e. Type 1, Type 3, Type 4 and Type 6, 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 those types of regions with below EU27 GDP-PPP per capita levels, i.e. Type 2 and Type 5, the reverse is true. Considerable stocks of foreign populations can be found in 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 between 2001 and 2005 can be observed in 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 EU27+4, 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 3 and Type 4. Differentiated by the length of stay, Type 4 and Type 6 constitute “new demographic growth regions”, where 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 have been living in these types of regions since ten years or longer.

Taking the share of tertiary educated people aged 15 years and over in 2007 as an indicator for the human capital stock, this proportion is highest in Type 5 and Type 3, followed by Type 1. In regions of Type 5, the share of higher educated people is around the overall average, but does not increase in younger ages, as it does in other types of regions. On average, the share of tertiary educated people is lowest in regions of Type 2 and Type 4. In terms of the foreign population, the share of EU27 citizens with higher education surpasses 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 almost 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 higher compared with non-EU citizens, and even higher than the participation 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 the national working age population.

THE POWER OF REGIONS
When zooming beyond the geography of nation states, an often-underestimated extent of regional heterogeneity of demographic characteristics becomes apparent, especially with respect to population development. Without denying the strong influence of national systems, e.g. family welfare in regard to fertility behaviour, Europe’s regions show demographic variances, which exceed those at the country level by far (see Chapter 3.3).

As Phil REES pointed out in a poignant remark during a DEMIFER meeting in early 2010, all the hopes and worries projected into demography per se can be both confirmed and discarded when looking at the variety at the regional scale. Nearly every conceivable demographic scenario can be found only by looking at the map of Europe. On the one hand, there are regions like Liguria in Italy (Type 4 – Challenge of Ageing), where population ageing was already so far advanced by 2005 – more than 26.5% were older than 65 years – as it is projected for the whole of Europe not before 2050. Nevertheless, the population of Liguria will not become extinct. In fact, it even increases in size due to immigration. The GDP-PPP per capita level is above and unemployment is below the EU27 average. Economically, Liguria seems to be an attractive place to live. There are even a few urban European regions, for instance Vienna (Type 6 – Young Potentials), where the population did not only increase in recent years, but also became younger (cf. LUTZ et al. 2003). On the other hand, there are depopulated regions like Severozapaden in the Northwest of Bulgaria (i.e. Type 5 – Challenge of Decline), where the age structure is already so distorted that every birth is counterbalanced by more than two deaths. The share of young adults is decreasing dramatically, and the same is true for the entire working population. On top of that, the GDP-PPP per capita level does not even reach 10% of the EU27 average, while the unemployment rate outperforms the European average by far. If the challenge of population decline in regions like Severozapaden can be tackled in a constructive way – which remains to be seen – we might gain valuable insights on how to solve, or even avoid such circumstances on a broader spatial scale.

Europe’s demographic future – in its full range – is already depicted in today’s regions. Regions are blueprints for demographic worst-case scenarios and examples for best practise, as well as for unexpected processes as illustrated by the example of Vienna. The demographic knowledge grounded in regions should not be left unexploited.

ADDED VALUE OF THE REGIONAL TYPOLOGY
A classification is an important first step in all research areas and always serves a specific purpose (cf. VICKERS 2006a:288f). In this respect and for the last time, the main research question of this thesis shall be raised: How will the demographic development, i.e. natural development of population as well as migration, affect different types of regions and cities?

The typology of the demographic status sheds light on the prevailing demographic pluralism across Europe. At the beginning of the 21st century, the demographic landscape of European regions offers diverse and heterogeneous spatial patterns beyond traditional categories like growth and decline. The regional classification reveals the similarities within this heterogeneity. Demographic ageing, although varying by extent and rate of increase, prevails across Europe. However, population ageing and growth do not exclude each other. Only a small number of regions are affected by
distinct depopulation. Indeed, in the vast majority of regions fertility levels are below replacement level, which accelerates the process of population ageing. Nevertheless, most populations still increase due to a moderate to strong influx of international migrants. International migration was the main driver of this predominately positive population development in most regions between 2001 and 2005. Although international migration is mitigating the speed of ageing, it will be no panacea for all demographic challenges in Europe as demonstrated by the development of the size of the working age population. In general, the share of the working age population (20 to 64 years) still increases, but the proportion of the younger workforce already declines in many regions.

“(…) if population issues are to be addressed properly by policy measures, they require a prior spatial assessment.”
Marcia CALDAS DE CASTRO (2007:17)

Besides the scientific applications within the DEMIFER project – i.e. the utilization of the different types of regions as input and output areas for the scenarios and projections as well as the choice of appropriate case studies – this classification of 286 European regions is addressed to policy makers and researchers interested in demographic and socio-economic differences at the regional level. The information, which can be gained from the analyses based on the regional level typology, might be a useful addition to perspectives often focused exclusively on the state of nation states. The European Union’s Community Policies identified the ongoing demographic changes as one of the main challenges in the context of social and economic cohesion (EC 2008a:1). It is impossible to aim for 286 different policies for every NUTS 2 region. In order to obtain homogeneous spatial patterns as a point of departure, a regional aggregation in terms of clustering makes sense. It facilitates the identification of similar challenges and solutions and enables to compare the various impacts of different regional policies.

6.3 POTENTIAL FOR FURTHER RESEARCH

At this final point, a few thoughts for potential further research with respect to the demographic typology shall be mentioned. Above all, the question of scale – a geographer’s destiny – could be addressed by means of different approaches, be it temporal or spatial.

The presented regional demographic typology of the demographic status in 2005 reveals different kinds of regions by assessing the effects of demographic and migratory flows on the size and structure of the population. Although taking the short-term trends of the period 2001 to 2005 into account, the classification refers to the demographic status by 2005. In order to examine changes over time, be it demographic or socio-economic, it would be interesting to apply the classification to other periods of time, accounting for the past (e.g. 1996 to 2000) as well as for the presence (2006 to 2010). Thinking of potential changes of socio-economic and demographic behaviour associated with the impacts of the recent economic crisis, a comparison of the period 2001 to 2005 – constituting the precrisis status – with later periods could provide valuable insights into the associated societal impacts. However, the explanatory power of a regional demographic status typology, as presented in this thesis, will be always linked to a certain period. When applied to another date in time, a cluster analysis will deliver a different result, implicating different cluster characteristics and deviating cluster numbers. This might complicate the comparison to some extent, rendering a meaningful interpretation impossible.

Another possibility to overcome the snapshot character of a status classification is the application of trend indicators, e.g. growth rates. However, this might solve the issue of the static nature of the applied indicators, but would open the door for other analytical problems, e.g.: how to connect particular trends to an actual status without weighting procedures, which are complicating the interpretation? This would be a contradiction to the very own meaning of a classification, i.e. the simplification of a complex data set.

The question of scale – be it temporal or spatial – is always connected to the question of data availability. With respect to the given data situation, the final classification was elaborated at NUTS 2 level, although NUTS 3 would have been preferable from the analytical point of view. The spatial resolution of NUTS 2 does not allow the explicit examination of certain smaller aggregated territories like urban regions. However, other ways and means will be accomplished in order to analyse the assumingly important role of cities and urban societies with respect to demographic change.
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