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Instytut Statystyki i Demografii Szkoła Główna Handlowa w Warszawie





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## Future demographic changes in Europe critical remarks about population projections until 2052 for 27 European countries

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# Future demographic changes in Europe – critical remarks about population projections until 2052 for 27 European countries

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#### 1. Introduction

The papers concerns results of the project "Impact of international migration on population dynamics and labour force resources in Europe", carried out by the Central European Forum for Migration Research. The study covers 23 countries of the European Union (without Cyprus and Malta), Norway and Switzerland as well as Bulgaria and Romania (accession countries). For the purpose of that paper the reports by Bijak (2004), Bijak, Kupiszewski, Kicinger (2004) and Bijak, Kupiszewska, Kupiszewski, Saczuk (2005) have been used.

To evaluate the foreseen population changes until 2052 in 27 European countries I will comment both assumptions on future developments of components of population change (fertility, mortality and migration) as well as results of population projections *i.e.* the population size and the age composition. The main attention is paid to the qualitative reasoning of the assumed changes and their quantitative patterns. I will not assess the analytical solutions adopted.

Since the study has focused on effects of international migration on the population dynamics and labour force changes in Europe, projection scenarios differ in terms of migration assumptions while fertility and mortality assumptions are identical. And that approach is justified from the point of view of main goals of the study.

In the two subsequent sections of this paper concern fertility and mortality assumptions are commented. They have been formulated by referring to some theoretical explanations as well as to their developments in Europe during the recent decades (Bijak, 2004). Next, three migration scenarios are evaluated. And the last part refers to the total population and its age composition as well as the labour force size foreseen under three projection scenarios.

#### 2. Fertility changes

The main theoretical framework for considerations of possible fertility changes is the second demographic transition (Lesthaeghe, van de Kaa 1986, van de Kaa 1987) as well as Becker's economic theory of the family (Becker 1991). His hypothesis of opportunity costs of marriage and motherhood in contemporary societies developed further by Liefbroer and Corijn (1999) allows to discuss both family and fertility changes in terms of the structural and cultural incompatibility between family and women's employment. Recently, this way of thinking in both theoretical and empirical research seems to receive more attention in debates on fertility changes. And I highly appreciate the fact that this aspect has also been reflected in the report by Bijak (2004). However, in my opinion that aspect should be more focused on, since the labour market changes and work-family reconciliation issues seem to be crucial for future fertility developments.

There are at least two reasons to pay more attention on the labour market and the reconciliation issue. First, the growth of paid employment among women, which has been one of the major social and economic developments of recent years, will be likely reinforced. The predicted decline in the working age population in Europe along with the rapid population ageing as well as the labour force ageing deteriorate the proportion between the labour force and those out of the labour market. That change justifies raising concerns about an adaptability of European economy to rising competition imposed by globalisation and technological change. In searching for work force reserves women are considered as primary resources. Also young people and older workers are thought as potential resources. And a rise in women's employment is defined a key element in the Employment Strategy of the European Union (*e.g.* Kok 2004).

Second, increasing employment levels of women are recently more and more linked to a concern about the low fertility in the EU (*e.g.* Green Paper "Confronting demographic change: a new solidarity between the generations" 2005). As viewed over time, a rise in employment was accompanied by a fertility decline. There are signs that the negative interrelationship between employment and fertility has weakened or even changed the sign. Nordic countries demonstrate that the high female participation in employment can be associated with a relatively high fertility. But it depends on the level of the structural and cultural incompatibility between family and employment of women. It has been shown that the lowest fertility concerns countries where family and work are in a strong competition, which results in polarisation of family-employment related behaviour (countries in Southern

and Central Europe) (Kotowska et al. 2005; Muszyńska 2003, 2004, 2005; Liefbroer, Corijn 1999). In these countries the level of both types of incompatibility is high: a structural lag in adjustments of welfare state institutions to new conditions under which families live, imposed by women's labour market attachment, and the cultural incompatibility resulting from the traditional perception of women's roles. The lowest structural and cultural incompatibility is found in Nordic countries while the other European countries are in the intermediate position.



Source: Muszyńska M. (2003), Gender, structural conflict and family formation in Europe, European Population Conference, Warsaw, August 2003.



Source: Employment in Europe 2004. Recent Trends and Prospects, Employment & Social Affairs, European Commission, Directorate General for Employment and Social Affairs, Unit EMPL/A.1, August 2004.

Results from the international project "Population Policy Acceptance Study – The Viewpoint of Citizens and Policy Actors regarding the Management of Population Related Change" (DIALOG), carried out under the Fifth Research Framework of the EC (HPSE-CT-2002-00153) and based on the national surveys on population change and population-related policies, confirmed difficulties in combining employment with care for small children, experienced mostly in the countries of Central Europe and Italy, and the meaning of the part-time work for reconciling work and parenthood (Figure 3).



Figure 3. Employment rates by the age of the youngest child (women aged 20-50 years)

Źródło: I.E.Kotowska, A.Matysiak, M.Muszyńska, A.Abramowska, Work and Parenthood -Comparative Data Analysis and Policy Implications, Workpackage 6. DIALOG project, The Institute of Statistics and Demography, Warsaw School of Economics, Warsaw 2005

Therefore, reconciliation of work and family is becoming one of the fundamental challenges to be faced in contemporary societies. Steadily increasing involvement of women in the labour market, necessary for many reasons on the one hand, and a low fertility in Europe, which also needs to be responded on the other hand, make that issue highly relevant. A better reconciliation of work and family life is clearly stated as a topic that should be given a higher priority in the future social policy (Vignon, 2004; Green Paper "Confronting demographic change: a new solidarity between the generations" 2005).

In my opinion, the issue to reduce the incompatibility between work and family seems to be even more challenging when one accounts for transformations that are taking place on the contemporary labour market. They result in unstable and discontinuous employment, which requires more individual efforts and time to be managed. Additionally, employees are expected to be highly available and mobile. These conditions for the labour market participation are in essence not conducive to the family and increase competition between family and employment. They also prompt for dual earning to diversify risks related to deterioration of family welfare due to the employment discontinuity. Moreover, deinstitutionalisation and destabilisation of the family, low fertility, ageing and reforms of social security provide with a new rationale for female employment. Therefore, when discussing about possible changes in fertility the level of employment-family incompatibility and possibilities of its reduction should be directly taken into account.

These considerations can also be situated within the framework of the second demographic transition since that concept covers three main components: the structural one(development of the post-industrial economy and the welfare state), the cultural one (changes in norms and values, secularisation, individualisation, ideological pluralism, etc.) and technology (the second contraceptive revolution, improvements in transport, communication, progress in biosciences, health care) (van de Kaa, 1994). Usually, in discussions about the second demographic transition and its different timing and progress across European countries the processes related to the second and third components of that framework are mainly referred to while advancements in the market economy do not receive an adequate attention. But the increasing labour force participation and their rising education attainment along with the weakening position of the family as a result of the welfare state development have been included by van de Kaa to the structural processes decisive for changes in family-related behaviours.

The idea to look at future fertility developments from the perspective of different country schedules of changes leads to a distinction of nine clusters for which different target values of the total fertility rates have been formulated. Moreover, to set up possible patterns of changes the *tempo* and *quantum* effects have been taken into account. However, that main drawback of the fertility assumptions is that despite theoretical considerations about possible changes in fertility patterns by age such changes have not been taken into account. The shift of the fertility pattern by age towards the pattern with older mean age of first birth, which is particularly important for the former socialist countries, has been neglected in projection assumptions.

In 2002 twelve of 27 countries had the TFR at the level not exceeding 1.30 – there are countries of South-Eastern, Southern and Central Europe. In 17 countries the TFR was below 1.50. The fertility scenario assumes a slow recovery for the most of countries: *"the fertility scenarios assume a short-term continuation of past trends and a long-term slight increase of* 

the total fertility rates. The target values for 2052 reflect to a large extent the current diversity of childbearing patterns across Europe, as well as the level of advancement of particular countries in the process of the second demographic transition" (Bijak, 2004, p.32).

In general, the target values of the TFR, diversified across regions (Table 1), look reasonable as well as their qualitative justification. The target values range from 1.4 for Bulgaria, Romania and 1.5 for Central Europe, Southern Europe as well as the German-speaking countries to 1.8 - 1.9 for the North-Western and Northern Europe. They reflect the diversity in fertility which will remain despite declining regional differences.

Clustor	Countries	TED 2002	Target TFR	Mean age of women		
Cluster	Countries	1FK 2002	2052	at first birth 2002		
1. South-Eastern	Bulgaria, Romania	1.21; 1.26	1.40	23.9; 24.1		
Europe						
2. Southern	Greece, Italy,	1.27; 1.26;	1.50	27.9; 28.0*;		
Europe	Slovenia, Spain	1.21; 1.27		27.2; 29.2		
3. German-	Austria, Germany,	1.39; 1.31	1.50	26.8; 28.2**		
speaking	Switzerland	1.40		28.9		
countries						
4. Central Europe	Czech Republic,	1.17;	1.50	25.6;		
	Hungary, Latvia,	1.30; 1.24;		25.6; 24.9;		
	Lithuania, Poland,	1.24; 1.24;		24.3; 25.0;		
	Slovak Republic	1.19		24.7		
5. Estonia	Estonia	1.37	1.60	27.7**		
6. Portugal	Portugal	1.47	1.70	26.8		
7. North-Western	Belgium,	1.62;	1.80	27.3*;		
Europe (1)	Luxembourg,	1.63;		28.8;		
	United Kingdom	1.64		22.5		
8. North-Western	Denmark, Finland,	1.73; 1.72;	1.90	27.7**; 27.6;		
Europe (2)	the Netherlands,	1.73; 1.75;		28.7;		
	Norway, Sweden	1.65		27.2; 28.3		
9. High-fertility	France, Ireland	1.88; 1.97	1.90	27.9; 27.8		
countries						

Table 1. Assumptions on target TFR values forecasted for 2052

\* for 1995; \*\* for 2000

Source: J.Bijak, Fertility and mortality scenarios for 27 European countries, 2002-2052, CEFMR Working Paper 3/2004, p. 14; Recent Demographic Developments in Europe, 2004, Council of Europe Publishing, Strasbourg Cedex 2005.

In 2002 the TFR belonged to the interval 1.17-1.97 while in 2052 the interval 1.4-1.9 is assumed. The convergence in fertility trends within clusters is assumed along with the steady persistence in differences between clusters, however, they are expected to be slightly smaller than in 2002. I agree with that view since both the cultural context and country specific

institutional settings (despite the joint general direction of social policy) will contribute to these differences. What I miss here is an assumption about changes in mean age of birth. The stable fertility pattern by age in the future is difficult to be accepted, particularly for Central Europe countries, Portugal, Bulgaria and Romania.

It should also be added that a precondition for a future fertility recovery in the lowest-low fertility countries is not only improvement in the economic situation but also implementation of policies aimed at reducing the incompatibility between family and work. And as the cultural incompatibility reduces impacts of reconciliation policies on labour participation of mothers, one cannot neglect policies that diminish the traditional perception of gender roles by promotion of equality between men and women. They are supposed to strengthen a use reconciliation measures already implemented (like part-time and flexible time of employment, maternity and parental leaves, etc.). The promotion of equal opportunities for employment and an equality in family responsibilities seems to be of a special relevance in the countries of South-Eastern, Southern and Central Europe.

#### 3. Mortality changes

The qualitative justification of mortality trends refers to basic research outcomes, including theories of the epidemiologic transition and the health transition as well as to several concepts which combine explanations offered by various disciplines of science (biology, epidemiology, medicine, economy, demography, psychology, etc.) (Bijak, 2004). That reasoning seems to be better grounded in recent mortality research than the section on fertility. I highly evaluate the comprehensive and concise overview of several important interpretations of mortality trends in the second half of the 20th century in both countries with developed market economies and the socialist countries of Central and Eastern Europe. That synthesis points rightly to main determinants of mortality changes and their possible future impacts on mortality.

I also agree with the basic statement with respect to set up the mortality scenario that mortality developments in Europe may likely be a hybrid of three possible pathways suggested by Martens and Huynen (2003) (after Bijak, 2004, p.24). One cannot exclude the emergence of new infectious diseases but their impact on health countries will likely be offset by technological, institutional and behavioural responses.

The basic assumption for the mortality scenario is that life expectancy patterns in Europe will converge due to further advances in the health transition which result from health-related

behaviours to be widespread relatively quickly and the possible institutional and economic improvements. One can also expect that the countries of Central and Eastern Europe will follow the path of mortality developments of Western Europe. It reasonable to assume that the cultural and behavioural factors will be not so significant like in the past contrary to economic and institutional determinants. Initial disparities in living standards and institutions (social security and health care systems) allow only for gradual diminishing the mortality gap over time. Therefore, mortality improvements supposed for the countries under study will slowly diminish the West-East mortality gap while more convergence can be expected among Western Europe countries.

The scenario assumes also the narrowing gender gap and diversified contributions of different ages to the overall increase in life expectancy of both males and females. The pattern of declines in age-specific rates, which vary at different stages of life expectancy changes, can be summarised as follows: until reaching the life expectancy of 70 years for males (75 for females) mortality improvements result from reducing death rates in the age group 0–19. Life expectancy increase from 70 to 80 years for males (from 75 to 85 for females) can be mainly attributed to mortality declines in all age groups while decreasing mortality of the adult population (persons aged 20 and more) with the increasing contribution of life expectancy at birth more than 80 years for males and 85 for females.

The summary of mortality assumptions is presented in Table 2. The highest life expectancy values in 2052 are expected for the Western European countries, especially for Switzerland, Italy, Spain, France, Scandinavian countries, Austria, Germany, Belgium, the Netherlands and Luxembourg. They are close to around 85 years for males and 90 years for females. The lowest values are assumed for Estonia, Latvia and Lithuania, Bulgaria and Romania. The declining differences between life expectancies in Western Europe, particularly for males, reflect the convergence in mortality patterns. In 2002 life expectancy for males ranged from 74 years (Portugal) to 77,9 (Sweden) while in 2052 the interval 83,5 (Portugal)- 84,7 (Sweden, Norway) is predicted. Female life expectancy for males ranged from 79,5 years (Denmark) to 83,6 years (Spain) in 2002 while in 2052 the interval 86,8 (Denmark) - 89,6 (Italy) is assumed.

In 2002 males in Estonia had the lowest values of life expectancy (65,3) and the maximum was found in Slovenia (73,2). Assumed mortality improvement result in values of that

parameter from the interval 76,1 (Estonia) to 82,7 (Slovenia). Also differences between life duration of females are slightly declining over time; in 2002 the lowest figure was in Romania (74,8) and the highest figure in Slovenia (80,7). Fifty years late the values are shifted to the interval 82,3 (Romania) – 87,7 (Slovenia).

The gender gap being in 2002 at the highest level in France is declining to 5,1 years (Spain, France) in 2052. In Eastern and Central Europe the gender gap is assumed to shift from 11,8 years in 2002 (Estonia) to 8,5 years in 2052 (Estonia).

Countries	Life expectancy males		Life expectancy females		Gender gap	
	2002	2052	2002	2052	2002	2052
AT - Austria	75.9	84.5	81.6	88.7	5.7	4.2
BE - Belgium	75.1	84.2	81.1	88.2	6.0	4.0
BG - Bulgaria	68.9	79.4	75.6	83.0	6.7	3.6
CH - Switzerland	77.9	84.7	83.0	89.6	5.1	4.9
CZ - Czech Republic	72.0	82.2	78.5	86.1	6.5	3.9
DE - Germany	75.5	84.5	81.3	88.5	5.8	4.0
DK - Denmark	74.9	84.1	79.5	86.8	4.6	2.7
EE - Estonia	65.3	76.1	77.1	84.6	11.8	8.5
ES – Spain	76.9	84.5	83.6	89.6	6.7	5.1
FI – Finland	75.1	84.1	81.8	88.5	6.7	4.4
FR – France	75.8	84.4	83.0	89.5	7.2	5.1
GR - Greece	76.4	84.4	81.1	87.9	4.7	3.5
HU – Hungary	68.3	79.0	76.5	84.2	8.2	5.2
IE – Ireland	75.2	84.1	80.3	87.0	5.1	2.9
IT – Italy	77.0	84.7	82.9	89.6	5.9	4.9
LT – Lithuania	66.5	77.0	77.9	84.9	11.4	7.9
LU – Luxembourg	74.9	84.1	81.5	88.5	6.6	4.4
LV – Latvia	65.9	75.7	76.9	83.5	11	7.8
NL – Netherlands	76.2	84.6	80.9	87.9	4.7	3.3
NO – Norway	76.4	84.7	81.5	88.5	5.1	3.8
PL - Poland	70.4	80.8	78.7	86.0	8.3	5.2
PT - Portugal	74.0	83.5	80.6	87.7	6.6	4.2
RO – Romania	67.4	78.2	74.8	82.3	7.4	4.1
SE - Sweden	77.9	84.7	82.4	89.0	4.5	4.3
SI – Slovenia	73.2	82.7	80.7	87.7	7.5	5
SK – Slovak Republic	69.8	80.4	77.8	85.2	8	4.8
UK – United Kingdom	75.9	84.6	80.5	87.7	4.6	3.1

 Table 2. Assumptions on target life expectancy for 2052

Source: J.Bijak, Fertility and mortality scenarios for 27 European countries, 2002-2052, CEFMR Working Paper 3/2004, p. 29; Recent Demographic Developments in Europe, 2004, Council of Europe Publishing, Strasbourg Cedex 2005.

#### 4. Migration scenarios

To study possible impacts of the international migration on population and the labour force dynamics three migration scenario have been formulated. The **base scenario** has been developed under an assumption of a stable socio-economic situation in Europe, a sustainable economic growth and a long-term convergence of income levels in the European countries (Bijak, Kupiszewski, Kicinger 2004, p.47). Therefore, by referring to global trends of mobility one can expect an overall increase in mobility within Europe due to increasing job opportunities. It seems to be relevant for the East-West migration, especially in a short- and middle-term as gradual opening of Western European labour markets for the citizens of Central and Eastern Europe is to be expected. I can also agree with arguments that on the world-wide scale the base migration scenario means also a moderate improvement of economic, political and social situation what in turn would result in moderate overall population inflows from the developing regions of the world into Europe. Migration policies in this scenario are not assumed to be very restrictive.

The base scenario for future migration is considered as the probable future developments. However, migration assumptions are subjected to a high uncertainty. To capture uncertainty two additional scenarios have been formulated: the **high migration scenario** and the **low migration scenario**. The **high scenario** refers to a good overall socio-economic situation in all European countries, including declining disparities between countries in terms of economic development and the living standards (Bijak, Kupiszewski, Kicinger 2004, p.47). Emerging employment possibilities would increase the overall mobility within Europe as well as reduce push factors to leave the less developed regions, including Central and Eastern Europe. Therefore, increasing the East-West population flows are expected to be a short-term effect, rather moderate in size. The high economic growth and social development in Europe would result in demands for foreign labour from outside of the countries under study. It might lead to a relative relaxation of immigration policies.

On the contrary, the **low scenario** has been formulated under an assumption on the economic stagnation in Europe, higher unemployment and structural problems on the labour markets. Countries of Central and Eastern Europe are assumed to experience short- and mid-term economic disturbances (Bijak, Kupiszewski, Kicinger 2004, p.47). The disparities between the more and less developed parts of Europe are assumed to persist and will lead to the migration pressure. Therefore, one can expect increasing flows to Western Europe, which

would be strengthened by gradual opening of the labour markets within the enlarged European Union. The wave of migration in the low scenario will be higher and longer-lasting. Simultaneously, a worldwide economic stagnation assumed on a global scale would lead to a strong migration pressure from developing countries. To counteract that pressure one can expect very restrictive migration policies to be implemented in order to protect the European labour markets and to reduce social tensions. As results one can expect declines in registered immigration to the European countries under study.

Despite the subjective bias of assumptions on future directions and magnitude of population flows in all projection scenarios mostly due to a high uncertainty of these processes, I have found them acceptable. They are based on an extended qualitative analysis of migration determinants presented by Bijak, Kupiszewski, Kicinger (2004). Also, an interpretation of the high and low scenarios as providing the envisaged bounds of the possible migration developments rather than the trajectories for the projection period for the countries under study confirms the cautious and reasonable approach to migration projections.

#### 5. Population change

The main population changes projected under three projections scenarios, which differ by migration assumptions, are presented in Table 3.

Projection scenario	Population (million)		Immigrants (million)	ODR (persons aged 65+ per 100 of persons aged 15-64)		Labour force (million)		
	2002	2052	2002–2052	2002	2052	2002	2052	
Base migration scenario	494.1	494.9	58.5	23.9	54.9	232.8	209.7	
High migration scenario		563.0	109.0		48.7		246.6	
Low migration scenario		446.9	22.8		60.8		184.0	

Table 3. Population projections until 2052 according to projection scenarios	for	27
European countries		

Source: Bijak, Kupiszewska, Kupiszewski, Saczuk (2005)

Under the base scenario interpreted as a probable future, the total population of the countries under study in 2052 will remain at the 2002 level. However, despite the assumed fertility

recovery and improvements in the life duration this stability is mostly immigration flows: 58.5 million people are expected to immigrate to the countries under study *i.e.* 1.2 million persons yearly on average. Immigrants from outside of 27 European countries together with their descendants amount to 80.2 million people at the end of the projection period. Without that flow from outside of the countries under study the total population in 2052 would be smaller on average by 16%.

Immigration flows under the high migration scenario predicted at the level of 109.0 million people i.e. 2.2 million persons yearly on average affect to the population growth: in 2052 the population is expected to rise by around 13% as compared to 2002. Immigrants from outside of 27 European countries together with their descendants amount to 148.2 million people.

And under the low migration scenario the total population is expected to decline in 2052 by nearly 10% as compared to 2002. The number of immigrants is predicted at the level of 22.8 million *i.e.* by 61% less than under the base scenario. Immigrants together with their descendants amount to 32.2 million people only.

The size of the labour force is more sensitive on migration scenarios. The increase by 6% can be expected under the high migration scenario only. The base migration scenario would lead to its decline by 10% while the low migration scenario shows the decline by 21%.

The overall contribution of immigration to the total population and the labour force is illustrated by Figure 4 and 5. The post -2002 immigrants and their descendants account for 7% of the total population in 2052 under the low scenario, in the base scenario their share increases to 16% to reach 26% under the high scenario.



#### Figure 4. Post-2002 immigrants and their descendants in 27 countries, 2052

Source: Bijak, Kupiszewska, Kupiszewski, Saczuk (2005), p. 30.

Figure 5. Post-2002 immigrants and their descendants in the labour force of 27 countries, 2052 (%)



Source: Bijak, Kupiszewska, Kupiszewski, Saczuk (2005), p. 30.

The overall contribution of immigration to the labour force is even more significant. The post – 2002 immigrants and their descendants account for 9%, 20% and 32% of the labour force in 2052 under the low, base and high scenarios respectively. This result confirms again that immigration affects stronger the labour force that the total population.

Impacts of migration scenarios on the age structure can be illustrated by referring to the age pyramids (Figure 6) and the old-age dependency ratios (ODR) (Table 3).

Advancement in population ageing are manifested by declines in the number and proportion of people in younger ages (ageing from the bottom of the age pyramid) and increases in the number and shares of persons at older age groups (changes at the top of the age pyramid). The graphs for 2052 show the age structure of the population present in the countries under study already in 2002 ('original' population, darker shading) and the age composition of the post-2002 immigrants and their descendants ('newcomers', lighter shading). The most advanced ageing can be expected under the low migration scenario. In fact, immigrant does not improve age proportions resulted from the initial population of 2002 and predicted fertility and mortality changes. Inflows of immigrants foreseen under the base migration scenario slightly improve the age composition by their contributions to the bottom of the pyramid and to working-age groups. The ageing is mitigated at most under the high migration scenario mainly due to contributions to the working-age groups. However, irrespectively of the projection scenarios the ageing will strongly intensify in the future. Immigration can only mitigate that process to some extent.

The old-age dependency ratios (ODR) illustrate the advanced ageing to be an unavoidable future of the European countries. The number of persons aged 65 and more per 100 persons aged 15-64 years will increase from 24 in 2002 to 55 persons in 2052 under the base scenario. More immigrants under the high migration scenario might diminish that figure to nearly 49

persons only while low inflows of immigrants under the low migration scenario contribute to its increase to 61 persons.



Figure 6. Changes in the age structure in 27 countries, 2002-2052: base, high and low migration scenarios

Source: Bijak, Kupiszewska, Kupiszewski, Saczuk (2005), p. 17, 23, 27.

The migration scenarios do not affect the regional patterns of ageing in terms of the ODR values. They slightly affect an advancement of changes.

Under the base migration scenario the ODR in 2052 ranges from 43.0 in Ireland to 67.4 in Italy and 67.5 persons in Spain. The lowest values are predicted in countries with the highest fertility levels: Luxembourg (44.2), the Netherlands (44.5), Denmark (44.7) and Norway (44.9) while the

highest values concern countries from Southern and South-Eastern Europe, including Bulgaria (66.5), Slovenia (62.8) and Greece (62.6).

The high migration scenario slightly improves the figures. The lowest ODR has been found in Luxembourg (38.1) and Ireland (38.2) and the highest values concern again Italy (58.8) and Spain (60.0). Countries, where the ageing process expected to be least advanced in the coming years, are additionally the Netherlands (39.7) and the United Kingdom (40.5), followed by the Nordic countries. The most advanced ageing is again in countries of Southern and South-Eastern Europe (Bulgaria - 58.7, Greece -54.7 and Slovenia - 54.1).

Reducing immigration under the low scenario would lead to increases in the ODR - its values range from 46.6 in Ireland to 77.1 persons in Bulgaria. Again in Denmark (48.1), Norway (48.2) and the Netherlands (48.9) the ageing is relatively least advanced in terms of the ODR contrary to countries of Southern and South-Eastern Europe (Italy - 75.5, Spain -74.2, Slovenia - 71.5, and Greece 70.2).

#### 6. Concluding remarks

Despite the fact that within such a long projection period unpredictable changes of the factors underlying fertility and mortality may occur, the main direction and pace of their course can be assessed as a probable future. I highly appreciate the assumption that fertility levels are divergent between the clusters of countries to be distinguished and convergent within the clusters. However, the fertility patterns by age cannot be assumed to remain stable over time, especially in Central and Eastern Europe. Also in Portugal one can expect progressing shifts towards late fertility.

The assumed patterns of the slow fertility recovery result in persisting cross-region differences, smaller than in 2002. However, the Western-North versus the Central &Eastern-South divide will remain. More convergence can be expected in mortality developments but the disparities existing in 2002 need more than fifty years to disappear. Therefore, one can reasonably predict that in 2052 the visible West-East mortality differences will still persist. The mortality changes are discussed in terms of the life expectancy at birth, but they reflect detailed assumptions on changes in mortality patterns by age resulting from different contributions of particular age groups to mortality improvements and declines of gender gaps. More convergence in mortality trends has been assumed in Western countries that in Central and Eastern Europe.

Prediction assumptions have been deeply grounded in analyses of their past trends and theoretically based considerations about determinants of fertility, mortality and migration and their possible impacts in the future. Especially mortality and migration assumptions have broadly been justified.

Predictions results demonstrate clearly that assumed improvements in fertility and mortality cannot counteract the total population decline in 27 countries under study. Under the baseline migration scenario, interpreted as a likely future, the population will remain stable. Without the flow from outside of the countries under study the total population would be smaller on average by 16% in 2052. Lower immigrant's inflows mean simply the population decline. It has also been shown that it would be even more difficult to counteract the labour force shrinking. Only the high migration inflow would reverse that trend.

Regional differences in ageing seem to be more attributed to differences in fertility than to mortality patterns, which will converge slowly. Therefore, the regional differences in ageing reflect those found for fertility.

The population age structures, foreseen under projection scenarios, show that fertility and mortality are decisive factors for ageing. Figure 6 demonstrates the validity of reproduction for long-term changes in the age composition. Impacts of immigration are like lifting the age structure – immigration does not change the main shape of the age pyramid but only affects slightly proportions between age groups i.e. mitigates that process to some extent. Projection results confirm again that one cannot expect immigration to be an influencing factor to improve the age composition i.e. to counteract effectively ageing. The only determinant which really matters in that respect is fertility since one cannot suggest to slowdown mortality improvements. Therefore, the fertility recovery in Europe is the only reasonable measure to be recommended to improve age proportions and counteract the population decline.

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