THE PROCESS OF POPULATION AGEING IN COUNTRIES OF THE VISEGRAD GROUP (V4)

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With 8 figures and 1 table
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Summary: The study presents a comprehensive analysis of the issue of population ageing in the countries of the Visegrad Group (V4). Unprecedented changes in the populations' age structure are examined and described within the broader context of social, economic and demographic developments in Europe. By comparing the demographic behaviour in the examined countries, the study provides new and relevant findings about inherent differences between the individual countries as well as within individual regions (NUTS 2).A comprehensive approach to study of the issue was maintained through the use of a broad range of methods. The temporal analysis was conducted by means of Rosset's classification and the Ossan triangle. The time period for examining the demographic changes was from 1960 to 2012. The Ossan triangle and cartographic analysis facilitate the comparison of age structure at the regional level. The study identifies the degree of population ageing, the key factors at work, and the internal structure of the phenomenon within the studied areas. Right from the onset of population ageing in the Czech Republic and Hungary, these countries have been converging to levels typical for Western European counterparts. A delayed onset of population ageing has been typical for the more conservative countries of Slovakia and Poland. Over the years in this study, several factors have affected population ageing – from economic and social developments to the emergence of new ideological currents as well as the absence of population policies. However, the internal structure of ageing within the examined countries has not been homogeneous. In North Western Czech Republic, Northern Hungary, the Northern Great Plain of Hungary, and Central and Eastern Slovakia, a relatively early timing of fertility is considered as standard due to the different ethnic, religious or educational characteristics of the population as well as weaker economies in these regions. On the other hand, Western Slovakia, Prague, South Eastern Central Hungary and Central Transdanubia have become centers of the newer ideological currents. Eastern Slovakia, Northern Hungary, the Northern Great Plain and the eastern part of Poland, with underdeveloped infrastructure and capital, have quickly become an ageing eastern periphery of the European Union.

Zusammenfassung: Präsentiert wird eine komplexe Übersicht der Alterungsstruktur in den Ländern der Visegrad-Gruppe. Die Besonderheiten der Entwicklung werden quantifiziert, die Unterschiede zwischen den Ländern analysiert, in den gesamteuropäischen Zusammenhang eingeordnet und im Kontext der allgemeinen sozio-ökonomischen Entwicklung diskutiert. Die vergleichende Betrachtung offenbart sowohl nationale Unterschiede, aber ebenso Gemeinsamkeiten auf regionaler Ebene (NUTS 2). Für den Zeitraum von 1960–2012 wird die Entwicklung analysiert, klassifiziert und kartographisch sowie in Form eines Dreieckdiagramms visualisiert. Während die Entwicklung in Tschechien und Ungarn sich sehr früh dem Entwicklungsmuster in westeuropäischen Staaten angenähert hat, wird für Polen und die Slowakei ein eher konservatives Entwicklungsmuster ersichtlich. Die Veränderungen während des Untersuchungszeitraums lassen deutliche Zusammenhänge zu der sozio-ökonomischen Entwicklung und dem politischen Umbruch zum Ende des 20. Jahrhunderts erkennen und ebenso das Fehlen einer aktiven Bevölkerungspolitik. Neben den Gemeinsamkeiten und Besonderheiten der Visegrad-Staaten wird zudem deutlich, dass auch hinsichtlich der innerstaatlichen Altersstruktur Disparitäten in Abhängigkeit von Ethnie, Religion, Bildung, wirtschaftlicher und infrastruktureller Entwicklung ausgeprägt sind.

Keywords: Population geography, Europe, ageing, age structur, Visegrad Group, seniors

1 Introduction

Historically, Southern and Eastern Europe has lagged behind Western and Central Europe in demographic terms. The first demographic transition occurred much later than in the West. Particularly noticeable was the late decline in fertility, which only happened by the end of the 19th century – more than a century later than in France, half a century later than in the rest of Western Europe and even trailing the Central European 'laggards' Austria, Germany and the Czech Republic (Chesnais 1992).

In the second half of the 20th century, Europe experienced significant shifts in demographic behaviour. By the end of the 1960s countries of Western and Northern Europe experienced a series

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of interrelated changes in fertility, family formation, and partnership behaviour referred to by Van De Kaa (1987) as the second demographic transition. Behavioural changes were characterised by the four main shifts: (1) from the golden age of marriage to the dawn of cohabitation; (2) from an era of the king-child with parents to that of the king-pair with a child; (3) from preventive contraception to self-fulfilling conception; and (4) towards pluralistic families and households. The transformation of the reproductive regime in Western Europe developed in two phases. The first drop in the total fertility rate in the period from 1965 to 1975 was caused by a decline in the number of children born in the third order or above. The stagnating fertility rates also led to a rise in the average age at first giving birth (Kocourkova 1998). Thus, a gradual and ongoing change in reproductive behaviour was established. The total fertility rate dropped to levels of around 1.5 children per woman. The emergence of the second demographic transition, although with some delay, can also be observed in Southern Europe. Several irregularities that did not follow the usual course of development can be observed in this region. According to Castiglioni and Dalla Zuanna (1994) the Italian population that rejected cohabitation followed a completely different course of development than the countries of Northern and Western Europe. The drop in fertility of higher order births, combined with an increase in the average age for first birth, occurred simultaneously and led to a sharp drop to very low fertility levels (below 1.3). Conversely, Western Europe, after completing the second demographic transition and removal of the tempo effect, recorded more favourable total fertility rates (at 1.5 to 2.0) and hence topped the ranking for all of Europe.

Developments in the post-communist countries in this period offer a completely different picture. Following the post-World War II baby-boom, a drop in fertility can also be observed in this region; however that drop was related to more active engagement of women in the labour market. Nevertheless, child care remained the exclusive responsibility of women. This created the so-called 'double burden' with women performing both productive and reproductive functions. The drop in the fertility rate in this period corresponded to the rapidly growing urbanization in Eastern Europe. In general, those in an urban area tend to have fewer children as a result of different tradition as well as a different social, economic and religious environment. In this period, communist regimes introduced several policies that contributed to the erosion of traditional families which were often closely related to the emergence of the second demographic transition – divorce and abortion laws. On the other hand, these countries also managed to create very favourable conditions for early family formation, which in the final analysis led to relatively high fertility figures. Those measures included primarily a direct allowance for children, a maternity leave allowance and a broad range of services for children along with significant preferential treatment of families with children on the waitlists of applicants for distribution of government-owned flats. Family-oriented and pronatalist sexual education went hand-in-hand with distorted information about contraception (health risks). The zero unemployment rate, combined with weakened motivation of young people to study or find other forms of self-realization led the population to retreat into family life. So-called Eastern European reproductive regime has emerged – patterns of mortality, fertility and family formation were characterized by adjectives high and early: family formation and childbearing were early and nearly universal; nuptiality, fertility and mortality were on the high side, compared to Western European countries (Monier and Rychtaříková 1992; Sobotka 2002). This led to a situation in which only 5–6% of women remained unmarried and a similar percentage remained childless (Sobotka et al. 2003).

After the fall of the communist regimes, former Eastern bloc countries experienced dramatic changes in their population's reproductive behaviour. Significantly-delayed family formation (a higher average age at marriage and first childbirth) led to a decline in the total fertility rate and the nuptiality, as well as growing instability of marital unions (cohabitation, divorce). Some authors ascribe these changes to the proliferation of Western social paradigms or an extension of the second demographic transition (Rabušic 1997; Fialová and Kučera 1997; Vishnevskii 1999; Hoem et al. 2009; Van de Kaa 2002). In a narrower sense, these views have also been presented by authors who regard the key drivers of those trends as the proliferation of contraception and also set those trends in the context of the contraceptive and sexual revolution (Sobotka 2011). Others see them as a response of the population to economic difficulties and changes in their social situation (Cornia and Paniccià 1998; Stloukal 1998; Rychtaříková 2000; Kohler and Kohler 2002; Hoff 2008); alternatively, they describe these changes as a combination of the aforementioned concepts (Billingsley 2010; Sobotka 2011). Some

authors prefer the term 'postponement transition' (Kohler et al. 2002) because the total fertility rate, net of the tempo effect, remained at the same level. In some countries there are voices calling for a return to a family model west of the Hajnal's line – something that was artificially interrupted by including this area in the Eastern bloc (the Czech Republic – Rabušic 2001; Hungary – Tomka 2002). The drivers of those changes, however, are not clear as they are intertwined or apply differently in individual countries, or specifically to individual social groups of the population in the Eastern bloc (for more details see chapter 4.1).

The current age structure of the European population has been regressing as a result not only of fewer births but also due to rising life expectancy at birth. In that respect, differences between Western and Eastern Europe are obvious. In the post-war period, the situation in terms of infectious diseases in Eastern Europe improved significantly and over a period these countries have quickly caught up with Western Europe in terms life expectancy at birth. By the 1960s, Western countries recorded significant progress in medicine, especially in the treatment of cardio-vascular diseases – something that had not been successfully addressed in Eastern Europe where life expectancy at birth stagnated or even dropped (Meslé and Vallin 2002). Thus, it can be concluded that ageing of the European population is far from homogeneous. At the level of large regions, we may see certain differences in ageing of the population, reflecting a larger ageing differentiation at the level of individual countries. Two large regions – Northern and Western Europe – currently have similarly low infant mortality, higher rates of total fertility, and higher proportions of elderly population. In contrast, Eastern and Southern Europe have a slightly higher infant mortality, lower total fertility rate, and lower proportions of the population group of seniors (Káčerová et al. 2014).

A special attention was paid to countries of the Visegrad Group (V4) representing an informal group of 4 countries in Central Europe – Slovak Republic, Czech Republic, Hungary and Poland. These nations belonged during their development also to common states (the Great Moravian Empire, Austria-Hungary), what to a certain degree influenced the development of population in the past. After World War I the independent Poland and the Republic of Hungary were formed. Slovak and Czech nation were united into a single state. Their demographic behaviour was affected by the similar population and family policy.

The aim of this study was to examine the process of population ageing in the V4 countries, to understand the process and its development in terms of time and spatial characteristics, and to identify the mechanisms and factors behind the unprecedented changes that have swept these countries' populations in terms of their age structure and to examine them within the context of broader developments in Europe. The study aims to achieve the following three partial objectives: (1) quantify the speed of population ageing in Europe and identify differences between Western and Eastern European countries, and the group of V4 countries; (2) quantify the changes in the age structure of the V4 countries and analyse them in the context of broader demographic, social and economic developments within the time period from 1960 to 2012; (3) identify the speed of population ageing in regions of the V4 countries and identify the root causes behind differences in the regions. It should be noted that the regional perspective represents geographic areas in the NUTS 2 level (these are regions (regiony and régiói) in the Czech Republic and Hungary, areas (oblasti) in Slovakia and voivodeships (województwa) in Poland). The Visegrad Group has 35 regions of this level, with an average population size from one to two million inhabitants. The envisaged outcome of this effort is a comprehensive analysis of population ageing revealing the heterogeneous nature of population ageing in a seemingly homogeneous demographic area comprised of the post-communist V4 countries.

2 Methodological approach

To provide a comprehensive analysis of the process of population ageing in the V4 countries, a series of methodological procedures were used in this study.

The onset of population ageing in Europe was properly documented by the Rosset's classification of the share of the population aged 60 years and older (Fig. 1). We used 60 years as the threshold of old age in this paper (and we used the term seniors for this age category) with regard to life expectancy as well as the socioeconomic context (especially access to a pension) within Eastern Europe. This classification provides a simple systematic classification of the level of ageing. Rosset's classification of demographic ageing quantifies its level as follows (Rosset 1959; Abramowska-Kmon 2011): 1st stage to 8% demographic youth; 2nd stage 8–10% early stages of ageing; 3rd stage 10–12% proper ageing; 4th stage

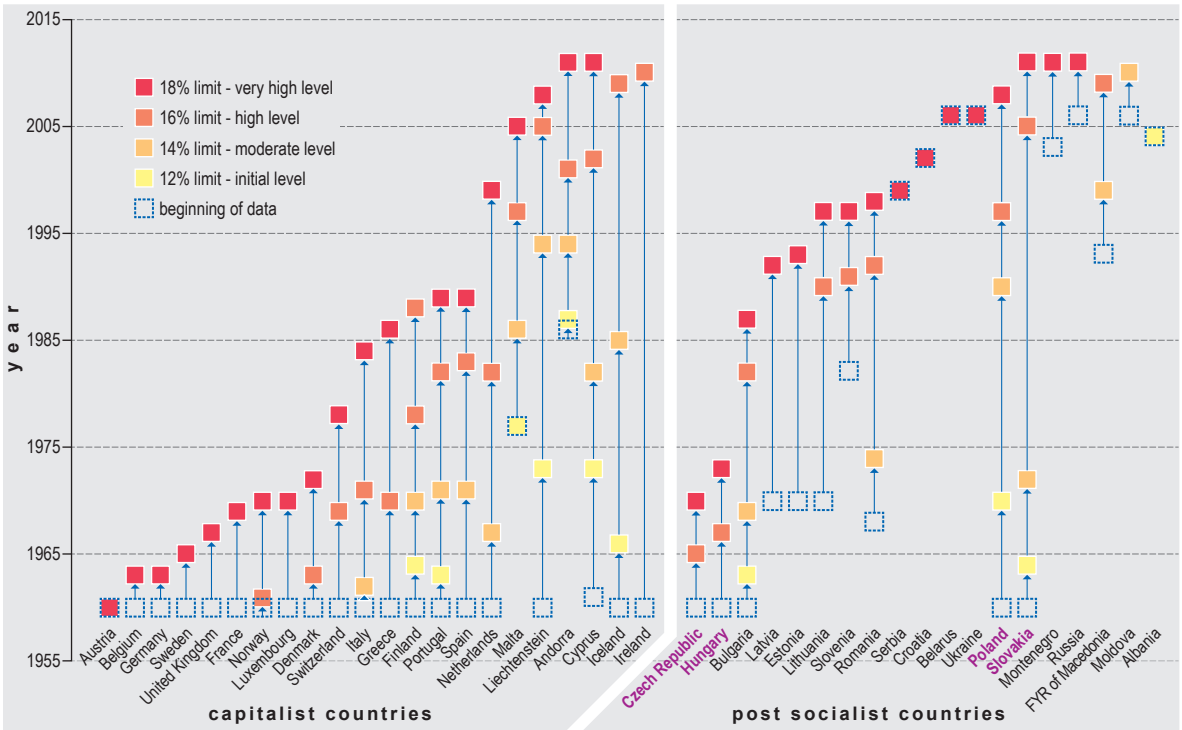

Fig. 1: Period of time in which the share of population 60 years old and older increased from 12–18%
Source: own calculation based on Eurostat 2014

12% and more demographic old age, divided into an initial level 12–14%, moderate level 14–16%, high level 16–18% and very high level 18% and more.

The current status of the senior population was examined by means of cartographic analysis by using the cartogram and cartodiagram methods (Fig. 2). When using the cartogram method, the ROSSET's classification was applied; when assessing life expectancy in the cartodiagram, the natural breaks classification was applied.

An aggregate overview of the age structure is presented by means of the Ossan triangle (Fig. 3). The Ossan triangle is an equilateral triangle that characterizes the observed population based on three coordinates (0–14 years old, 15–59 years old, 60 years and older). A cluster of points indicates similar age structures; more distant points indicate the contrary – a difference in the observed structures. A ternary plot (Ossan triangle) was also used to identify differences within the entire V4 region. Productive groups of the population in the V4 were applied to the ternary plot on the decisive average value (15.00% - 64.15% - 20.85%). By creating parallel lines to individual axes (representing age groups) the ternary plot is divided into six parts, with each part corresponding to a different age structure in terms of the share of productive age groups (Fig. 8). Subsequently, the regional populations within the V4 countries were applied to the ternary plot and assigned one of the six types of age structures according to their position within the divided diagram.

3 Population ageing in Europe

Although world population continuously grows in numbers, Europe is a continent where the number of seniors grows more dynamically than the total population. In 2012 a 23.9% share of seniors in the total population was recorded and their share is expected to reach 32.9% by 2060.

ROSSET's classification of share of population aged 60 years and older clearly indicates variously quick pace and significant heterogeneity of top-down ageing of European populations. (Fig. 1). The change of family and reproductive behaviour that spread throughout Europe in the west-east direction more or less corresponds with the development of the respective share of population in individual European populations. It can be expected on the grounds of available data that all countries have probably crossed the first threshold of old age and reached in 1960 the value of 8%.

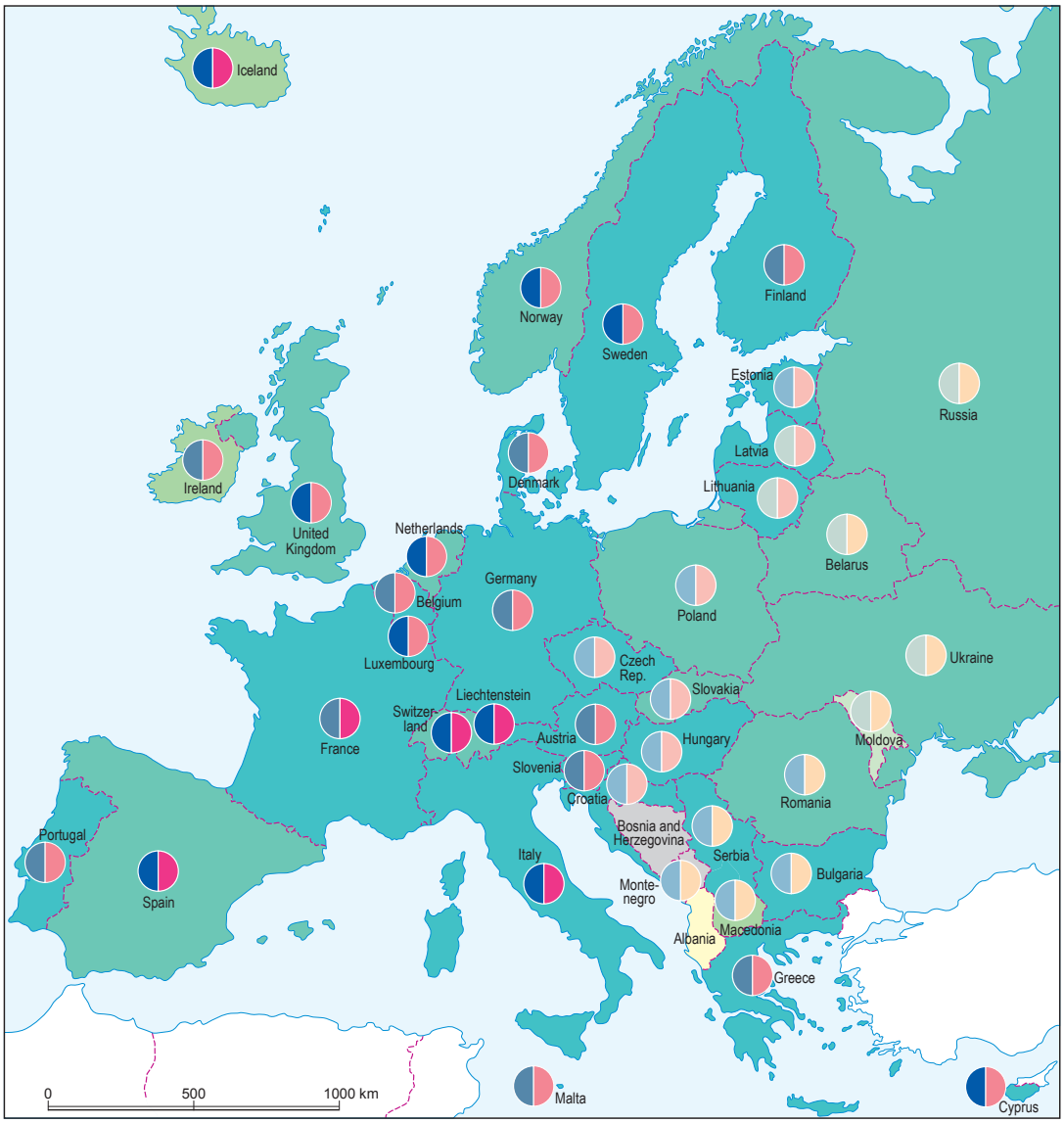

Fig. 2: Proportion of population 60 years old and older in Europe in 2012

Countries of Western and Northern Europe (Austria, Belgium, Germany, Sweden, England, France, Luxembourg) and also one country of Eastern Europe (Czech Republic) crossed the value of 18% until the end of the sixties. Those are populations that could be considered, according to Rosset,

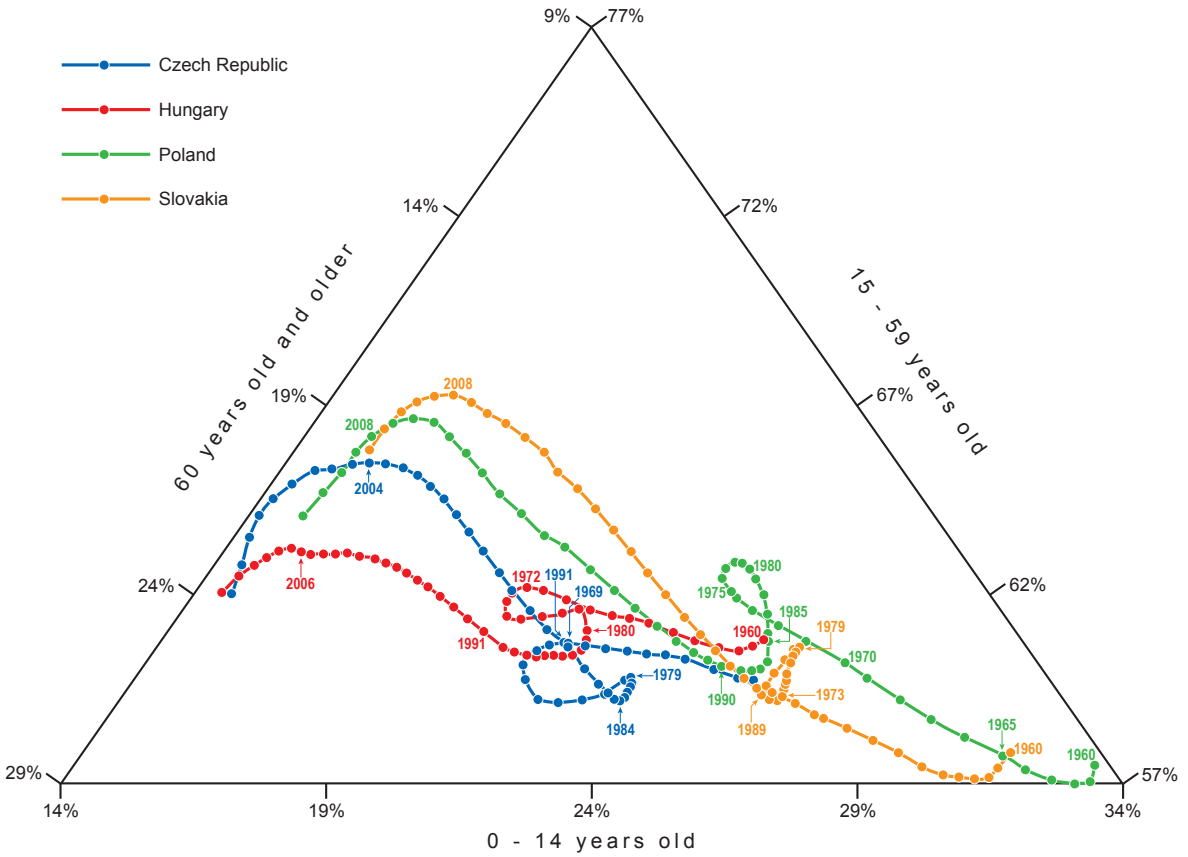

Fig. 3: Ossan triangle – changes of the age structures of countries V4 1960–2012
Source: own calculation based on Eurostat 2014

demographically old already after World War II. Their share of population aged 60 years and older was already at that time over 12%. The age structure of Western Europe countries is thus the result of decades of low fertility rate when almost every cohort of those born after 1965 was smaller than the one preceding it (PRB 2004). Slower growth of elderly population was achieved by Denmark and Hungary, which got to the very high level (18%) only in 1975. As much as 30% of evaluated populations reached the representation of 60 years old and older over 18% (Tab. 1) until the end of 1980.

Countries of Southern Europe crossed 18% during the eighties. Delayed increase of the share of elderly population is recorded by the western European country of Netherlands, which reaches the share over 18% only at the beginning of the nineties. That is caused by the relatively late decrease of fertility and significant baby boom in years immediately following World War II (Nimwegen et al. 2003).

Toward the end of the 1980s, Europe experienced significant diversification based on geographic and political affiliations. The non-communist bloc of countries reached – except for the Netherlands, strongly-Catholic Ireland and some smaller states (Malta, Liechtenstein, Andorra, and Cyprus) – the threshold of the advanced state of a demographically-aged population. Among the Eastern bloc countries this higher share of seniors was recorded only in the Czech Republic, Hungary and Bulgaria. In the case of the Czech Republic and Hungary this was the result of primarily long-term low fertility rates. Bulgaria, by its inclusion in the Soviet bloc, experienced a significant cultural shock and the total fertility rate dropped dramatically from 2.94 (1950) to 2.45 (1951). Moreover, all three of these countries experienced significant post-war migration. Czechoslovakia deported 1.57 million ethnic Germans and a further 200,000 fled following the Soviet invasion in 1968 (Council of Europe 1992). Hungary experienced significant migration of its population to neighbouring countries, and subsequently a wave of mass emigration of about 200,000 residents after the suppression of the uprising in 1956. The Bulgarian communist regime formally granted personal freedoms to minorities; however

Tab. 1: Development of share of population 60 years old and older

Proportion of the population 60+	1960–1970		1971–1980		1981–1990		1991–2000		2001–2012	
	n	%	n	%	n	%	n	%	n	%
up 12	2	4,88	0	0,00	0	0,00	0	0,00	0	0,00
(12–14>	6	14,63	6	14,63	2	4,88	0	0,00	1	2,44
(14–16>	6	14,63	6	14,63	8	19,51	7	17,07	1	2,44
(16–18>	6	14,63	5	12,20	4	9,76	2	4,88	3	7,32
over 18	9	21,95	12	29,27	18	43,90	25	60,98	36	87,80
data not available	12	29,27	12	29,27	9	21,95	7	17,07	0	0,00
Σ	41	100	41	100	41	100	41	100	41	100

Note: n – absolute frequency of countries, % – relative frequency of countries in %
Source: own calculation based on Eurostat 2014

church schools were unacceptable and based on an agreement, as many as 150,000 Turks left the country in the period 1950–1951 (Levene 2005). Hence, the original communities were significantly disrupted in all countries of the region.

The Polish population in 2008 and the Slovak population in 2011 have an 18% share. As Frejka (2008) points out in that respect, by the mid-20th century both Poland and Slovakia, along with Portugal, Macedonia, Bosnia and Herzegovina, Albania and Romania, were economically and socially underdeveloped and this also was translated into reproductive behaviour. Five of 41 evaluated countries did not reach this value even at the end of the twentieth century.

The European continent was still relatively significantly diversified in the share of population aged 60 years and older in 2012 (Fig. 2). This indicator has a variance of 14.5 percentage points, with 87% of the countries having a value over 18%. The most intensive top-down ageing is observed in Italy, Germany, Bulgaria, Greece, Portugal, Finland and Sweden. In these countries more than a quarter of the total population is made up of people over 60 years. However, this group of countries is also heterogeneous in terms of the onset (timing) of population ageing (Fig. 1). The underlying reasons include differing timing of the drop in fertility and mortality as well. Life expectancy at birth differs in these countries by 10.8 years for women and as much as 18.8 years for men.

In contrast, the countries of Moldavia, Ireland, Macedonia and Iceland have the lowest share of seniors (less than 18%). The heterogeneity of this group of countries is determined not only spatially, but also by reason of their (within the European context) relatively lower level of top-down population ageing. Although Central and Eastern Europe recorded improvement in life expectancy for men during the last ten to twenty years, both still lagged behind the EU average (Hoff 2008). The reason for these regions' lagging behind the West stemmed primarily from mortality of the productive and post-productive age group. Meslé and Vallin (2002) regard cardio-vascular diseases and an unhealthy lifestyle (excessive consumption of alcohol, red meat, and smoking) as the primary causes. However, the situation began to diverge even in this area. While the V4 countries began to catch up with the levels reached in Western Europe, the current mortality levels in the Balkans and in the former countries of the Soviet Union countries remain below average.

4 Population ageing of V4 countries

The countries of the Visegrad Group (V4), with their similar historical development, could also show similar development in their population processes and structures. The time analysis of Rosset's classification indicates different onsets in the ageing of their populations.

4.1 Temporal aspect of population ageing

4.1.1 The impact of fertility

A summary image of the development of individual age groups is offered by the triangle graph – Ossan triangle (Fig. 3). We can observe significant differences already in the initial year of our re-

search. The share of children in the Czech Republic and Hungary is 25% while the share of children in Slovakia and Poland is as much as 31–33%. What occurred in Hungary was that there was no compensation stage –the so-called baby boom after World War II in contrast to other countries in Europe and North America (Tomka 2002). Moreover, Hungary, as well as the Czech Republic, was closer to the Western model than to the Eastern model of the Hajnal line with its nuptial and reproductive behaviour in the period before World War II (Rabušic 2001; Tomka 2002). The Western model was typical for its older age at marriage and since sexual intercourse before marriage was not accepted in this period, the older age at giving first birth led to fewer children in families. This is also confirmed by the total fertility rate, which started to fall under the replacement level (2.0–2.1) in Hungary and the Czech Republic in 1960 while Slovakia was still reaching the level of 3.0 and Poland the level of 2.9 (Fig. 4).

The studied populations in the period until the first half of the 1970s were characterized by divergent development trends. Poland and Slovakia completed their first demographic transition and the total fertility rates of the two countries continuously diminished to the levels of 2.2 and 2.4 (Fig. 4). In the Czech Republic at the beginning of the 1960s, the total fertility rate was close to the edge of the replacement level at 2.1. From 1962 onwards a slight increase can be observed as a forerunner of broader pronatalist measures – prolongation of maternity leave and linking the retirement age for mothers based on the number of children born (Kučera 1968). Despite these measures the short-term recovery in the fertility rate in 1967 was followed by a drop in the total fertility rate below the replacement level, as well as a drop in the gross and net reproduction rate. Initially, Hungary experienced a drop to as low as 1.79 in 1962 and after a short period of stagnation it climbed back to the level of 2.06 in 1968. This bottoming-out was also stimulated by the introduction of several pronatalist measures in Hungary. In 1967 the Communist Party of Hungary introduced a 2.5-year maternity leave along with a maternity allowance of 40% of salary and a guaranteed return to the mother's original job after maternity leave (Spéder and Kamarás 2008). In general, all V4 countries have recorded a decline in the share of the pre-reproductive age group to the total population – in Hungary and Czech Republic at 19–21% and in Poland and Slovak Republic at 24–26% (Fig. 3).

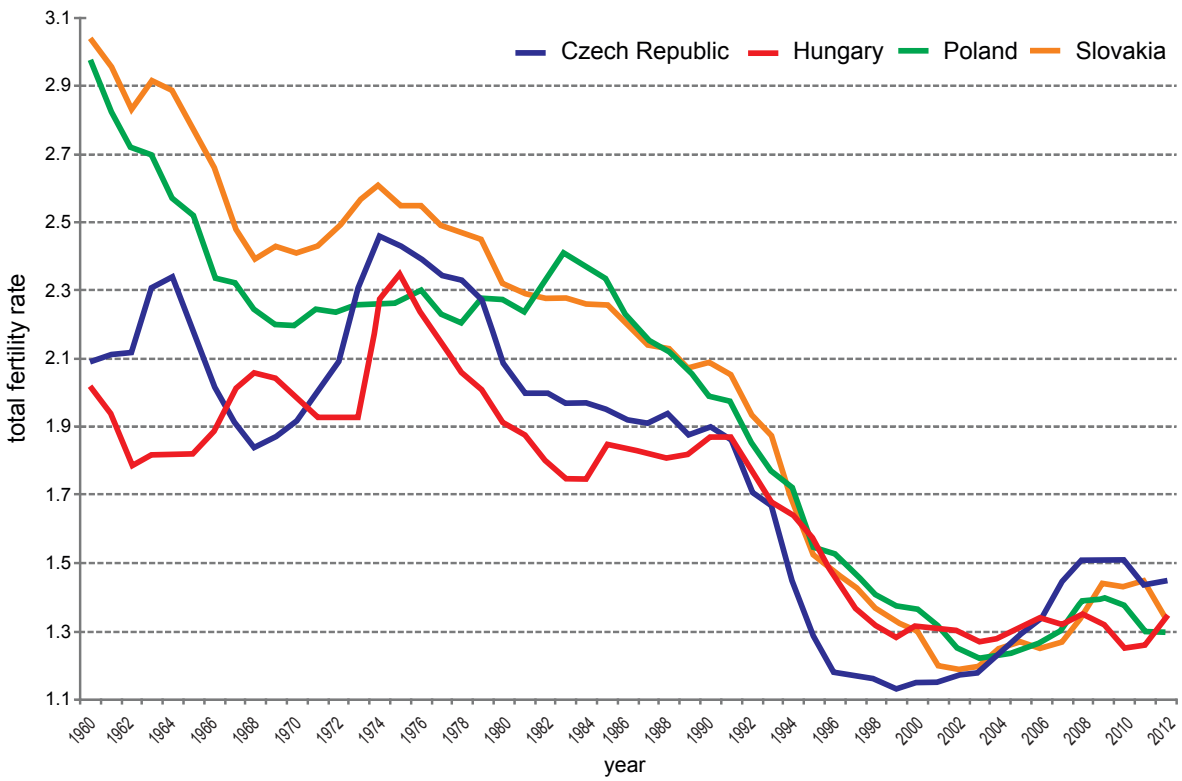

Fig. 4: Development of total fertility rate in countries V4 1960–2012. Source: own calculation based on Eurostat 2014

At the beginning of the 1970s, Hungary, the Czech Republic, Slovakia and Poland (with a certain time lag) started to deal with the unfavourable situation in the area of falling number of births by a series of pronatalist measures. Both single-time and flat benefits were differentiated based on the child's order in line, prolongation of maternity leave, marriage loans bearing very favourable interest rates (amounting to 1% for a flat and to 2.5% for flat furnishings), which were moreover reduced by an extra instalment at the birth of a child, were measures gradually implemented in the Czech and Slovak Republics (Kučera 1968). Pronatalist measures created room for early timing of fertility. In 1946 the average age of mothers at first childbirth in the Czech Republic was 25 years but in the 1970s it was 22.5 years, and this indicator remained unchanged until the fall of the communist regime. Similar measures were taken also in Poland – a network of nurseries was built, maternity leave was prolonged and benefits were paid during maternity leave. Although these were less extensive measures in comparison with Czechoslovakia, their effect was similar especially because this strongly Catholic country did not experience more pronounced secularization even during communism. Hungary particularly used prolongation of maternity leave, various benefits, tax bonuses and employment protection (Oláh 2003). These comprehensive interventions (and the absence of other opportunities for self-realization) resulted in an increase in fertility for all studied populations for a certain time. In Czechoslovakia, the total fertility rate peaked (in both parts of the currently independent countries) in 1974, similar to the development of fertility of the Hungarian population that culminated in 1975. A delay in the pronatalist measures in Poland translated into a delay in the peak of total fertility in that country, which occurred in 1983. The share of the population aged 0–14 increased in the Czech Republic and Hungary to the level of about 21–23%, while Slovakia and Poland experienced increases to the level of about 25–26%. Residents of Slovakia, under the influence of a stronger reaction to the implemented population measures, overtook Poland in this period, which had until then been the most stable country of the V4 with regard to the share of children to the total population.

The period from the second half of the 1980s to the present has been characterized by convergent behaviour and accompanied in the V4 countries with significant ageing, especially at the bottom but also at the top of the age pyramid. The total fertility rate reached very low levels of 1.2–1.4. The share of the pre-reproductive population has converged for the first time in history in all V4 countries and in 2012 the population share aged 0–14 was at 14–15%; simultaneously a certain stabilization of values in that respect also occurred. The change in the political regime was a key factor in the development in these countries that translated into changes in demographics. Temporary 'freeze' in births, but also in marriages and divorces, is often seen as a rational reaction to the new institutional and economic environment after the unification, bringing about an introduction of the new currency, new laws, massive economic restructuring, huge unemployment, but also new opportunities literarily overnight (Conrad et al. 1996).

However the total fertility rate did not immediately recover after improved GDP and unemployment figures in the late 1990s as one might have predicted but rather only after accession of these countries to the EU. Economic factors are not the only 'culprit' of lower fertility rates. On the other side, even though the majority of signs of the second demographic transition can be traced in the studied populations, the sequence of events has not occurred in line with the logical order of the concept of the second demographic transition as suggested by Van de Kaa (1987). Some changes could be observed already in the period of communism (a rising divorce rate, legalization of abortion, a drop in the number higher order childbirths), while others occurred suddenly and unrestrainedly in the first five years of the post-transition period. Moreover, marriage is ideologically still highly valued in all countries of the V4 region (Sobotka et al. 2008; Spéder and Kamarás 2008; Kotowska et al. 2008; Potančoková et al. 2008). In most cases, cohabitation serves as a trial period for marriage and despite rising non-marital fertility most people marry later, which is also connected with insufficient legal grounding of cohabitation (e.g. inheritance laws). Cohabitation represents an alternative to marriage only within selected social groups or those divorced or widowed. Moreover, the second demographic transition assumes a permanent drop in fertility due to the preference for other forms of self-realization. Nevertheless from the ideological perspective the population of the V4 countries aspires to have at least one child and childless families (as part of a secondary effect of the second demographic transition) remain marginal.

Postponement transition is relatively compatible with both economic theory and the second demographic transition; however, it should be noted

that unlike these theories, here the changes in the established norms and values are seen as "products rather than drivers of the structural changes in society" with cohort fertility remaining stable (SOBOTKA 2011) but often insufficient to ensure simple reproduction.

4.1.2 The impact of mortality

Similarly, by the beginning of the 1970s, the birth and mortality rates followed different courses of development. The Czech and Slovak Republics showed improved life expectancy figures (66 and 74 years for men and women, respectively) and these can be regarded as stable during that period (Fig. 5, Fig. 6). On the other hand, Poland and Hungary recorded a significant rise for both genders due to improved ability to treat infectious diseases. The share of seniors in the Czech Republic and Hungary grew from 13–14% to the level of a very high level of old age (18%) while in Poland and Slovakia the shares increased from 9–10% to 13–14%. However, the 1970s also saw a stagnating share of seniors in all four countries. Progress in the area of cardiovascular disease during this period became problematic in comparison with Western Europe (MESLÉ and VALIN 2002) and the mortality of especially middle-aged men worsened, leading to stagnation or even a drop in life expectancy (KAPOSZTÁZ and MONIGL 1987; TOMKA 2002). This was mainly due to unhealthy lifestyles (alcoholism, smoking), relatively low living standards and growing deficiencies in health care. Women recorded a slight increase in life expectancy during this period in the entire V4 region, except the Hungarian population differed significantly from the other three countries (a difference of 1 year). The age structures of Poland and Slovakia in this period already approached those of Hungary and the Czech Republic from the 1960s (Fig. 3). Throughout the 1980s prolonged period of stagnation can be observed in Poland and Czechoslovakia. A further drop occurred in Hungary. However, at the beginning of the 1990s, the figures for all V4 countries converged initially and took the course of a slight drop due to the social and economic transition, followed by a rise in life expectancy at birth for both genders in all studied populations. Hungary continued to nar-

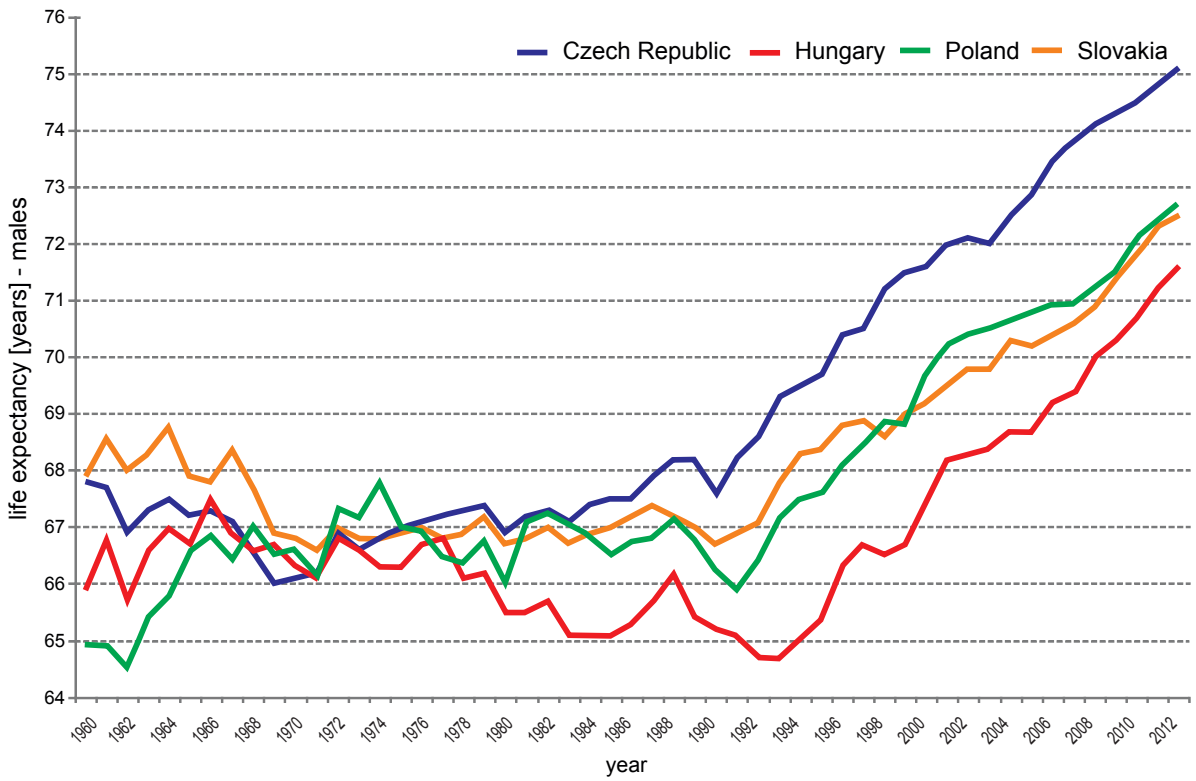

Fig. 5: Life expectancy of males in countries V4 1960–2012. Source: own calculation based on Eurostat 2014

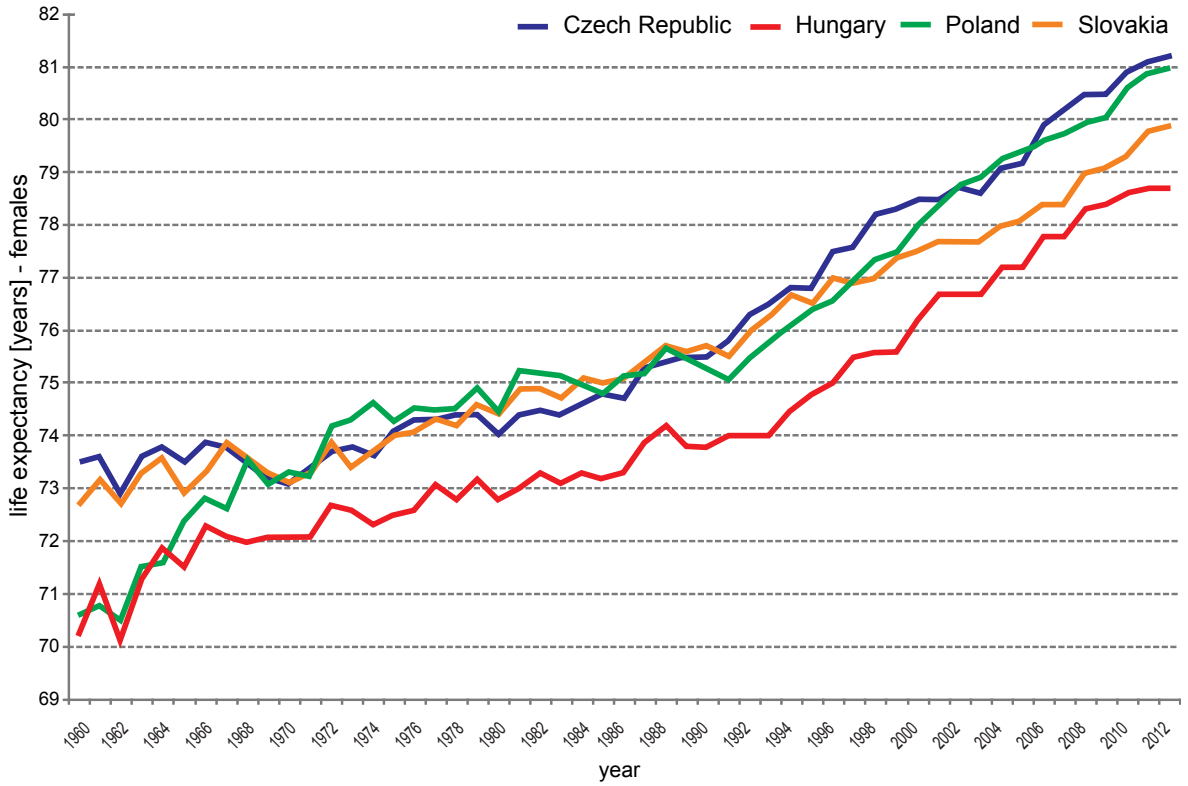

Fig. 6: Life expectancy of women in countries V4 1960–2012. Source: own calculation based on Eurostat 2014

row its deficit from previous periods but women in Slovakia – despite the continued rise in life expectancy at birth – began to lag behind the Czech Republic and Poland. This trend was to a great extent related to the heavily indebted Slovak healthcare system and unreasonably long waiting times for examinations or surgeries. Disinterest in prevention within the population was also a significant factor.

The divergent situation remained with regard to the share of seniors. The Czech Republic and Hungary reached 16–17% share of seniors while in Slovakia and Poland seniors were 13–14% of the population. At the same time, we note success in the area of the mortality rate in the Czech Republic because life expectancy of men is currently 75.1 years while it is only 71–72 years in the other three V4 countries. Hungary had to catch up from a significant drop during the previous period when the life expectancy of men fell from 67.5 years (1966) to 64.7 years (1993). Nevertheless, a common trend of an increase in the share of seniors can be observed, caused by the numerically strong generation born after World War II moving into the age group of 60 years and older.

4.1.3 The impact of migration

Another factor that had an impact on the age structure of these populations was migration. International migration was de facto significantly restricted or even completely stopped with the establishment of the communist regime. The net migration rate in all V4 countries did not exceed 1% (Fig. 7). Only migratory flows between the Slovak and Czech Republics, which at that time represented internal migration, were significant. As it was mainly young residents who migrated, they contributed to a slight rejuvenation of the population in the Czech Republic and, to the contrary, population ageing in Slovakia (Mašková 1991). However, instances of illegal migration (off the statistical records) had been occurring in the V4 countries. After the violently-suppressed Hungarian uprising in 1956, an estimated 200,000 persons emigrated and a similar number fled Czechoslovakia after the occupation of the country by Warsaw Pact military forces in 1968.

After the collapse of the Soviet bloc there were concerns about massive migration streams from the East to the West. These concerns, how-

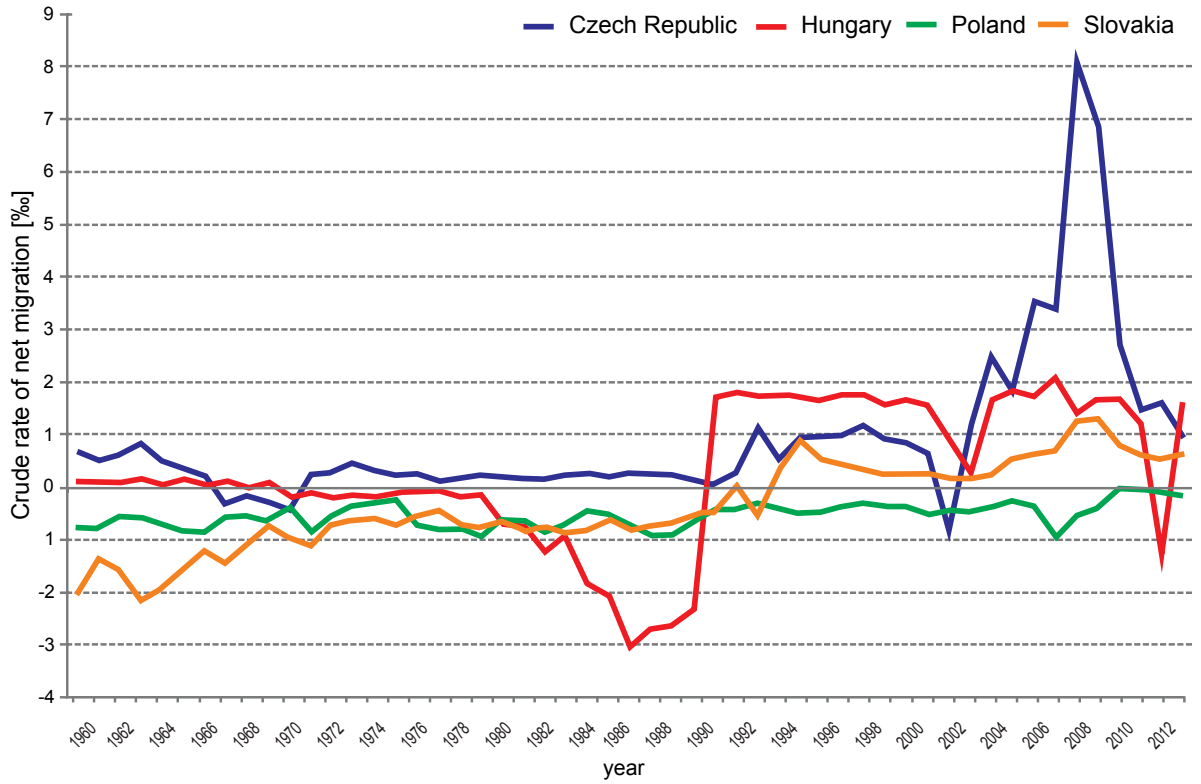

Fig. 7: Migration balance in countries V4 1960–2012. Source: CZSO 2013, HCSO 2013 (calculation based on data of population and natural increase) CSO 2012, SOSR 2013

ever, did not materialize. Hungary recorded net migration gains thanks to immigration of ethnic Hungarians from Romania and the former Yugoslavia. A similar trend can be observed in the Czech Republic after the division of the joint Czechoslovak state (1993). The records of the statistical offices are somewhat problematic for that period due to significantly understated emigration figures. Following accession to the European Union, economic migration from the V4 countries has increased. However, since most of the emigrants planned to return to their home countries, they did not de-register with the national authorities. But even despite this, it can be concluded that except for Poland rising migration has slowed the ageing of the population of the V4 countries. The new EU member states became an attractive transit point and later also target destinations for foreign migrants. Poland was characterised with migration losses of productive residents after the labour markets of Western Europe countries were opened, directed mainly towards the UK, Germany and Ireland.

4.2 Spatial aspects of population ageing

However, changes in demographic behaviour adapted in regions of the V4 countries with regard to their historical, social, economic and cultural specifics have in the end resulted in a differing pace and intensity of population ageing within the regions (Fig. 8). For this reason, a ternary plot (Ossan triangle) was used to identify differences within the V4 region. The regional populations were applied to the ternary plot and assigned one of the six types of age structures according to their position within the divided diagram.

Due to the earlier onset of population ageing in the Czech Republic and Hungary, there are only two types typical for a higher share of persons 60 years and older, and a lower share of the productive age group. Both countries at the same time have only two regions with an above-average share of 0–14 years old. The Slovak Republic has only two types of age structure, but in this case these are structures typical for a lower share of seniors. The most diverse internal structure is recorded in Poland, which is to a certain degree also related to a higher number of NUTS 2 units. All 6 types of age structures were found in Poland.

1 below standard percentage of pre-productive and post-productive pop., above standard percentage of productive population
2 below standard percentage of pre-productive pop., above standard percentage of post-productive and productive population
3 below standard percentage of pre-productive and productive pop., above standard percentage of post-productive population
4 above standard percentage of pre-productive and post-productive pop, below standard percentage of productive population
5 above standard percentage of pre-productive and productive pop., below standard percentage of post-productive population
6 above standard percentage of pre-productive pop., below standard percentage of post-productive and productive population

Fig. 8: Types of age structure in countries V4 (NUTS2)

The first three types of age structure represent populations with a below-average share of the pre-reproductive age group. The first type of age structure is characterized by an above-average share of the productive age group and occurs in five regions: West Pomeranian, Opole and Podlaskie in Poland and within Slovakia in the Bratislava region and Western Slovakia. Bratislava Region and Western Slovakia have higher economic activity, a higher number of enterprises and job opportunities and have been attracting productive Slovaks for a long time, leading to above-average values. Polish regions of this type do not represent a continuous area, but along with two other regions (Silesia and Lower Silesia) of the second type of age structure, a belt of regions in the south-eastern part of the country is formed with an above-average share of productive-age population. This is a heavily urbanized region with strong economic potential. During communism this area profited from significant immigration due to numerous job opportunities in coal and iron ore extraction, as well as accessible housing. Thus, a strong category of population aged 15–59 was formed. However, after the fall of communism the labour market experienced differentiation due to social stratification as well as regional differences (Sobotka 2011). Following the transition and restructuring of industry, unemployment also dropped due to a lower share of the population with only primary education. This led to emigration of the younger part of the productive age group and thus a relatively lower share of the pre-reproductive age group in the total population. The Opole region and Upper and Lower Silesia have the extremely lowest TFRs (below 1.0 (Kurek 2008)).

The third and the most widely represented type of structure is characterized by both forms of population ageing – bottom-up ageing (a below-average share of the pre-reproductive age group) and top-down ageing (an above-average share of the post-productive age group). This type of structure dominates in parts of the Czech Republic and Hungary due to the earlier onset of population ageing. In these areas, the effect of drops in fertility rates and the associated population shifts toward higher age began earlier than in other parts of the countries. For instance, the regions of Györ (Central Transdanubia), Budapest (Central Hungary) and Csongrád (Southern Great Plain) are characterized by a specific type of above-average fertility in females over 30 and can be regarded as centres of the second demographic transition in Hungary. Central and Northeast Moravia are characterized by above-average life expectancy at birth. Another special case is represented by parts of Southwest, Southeast and Northeast Moravia bordering Central Bohemia. This region is also regarded as the Czech inland periphery. It is formed by a network of numerous small villages suffering from poor amenities and few job opportunities. The reason for this can be found in the introduction of a centralized policy in the 1970s that divided the villages into municipalities of 'central' significance and 'non-central' significance. The non-central municipalities suffered from limited investment and lagged behind in terms of amenities and technical infrastructure, which led to emigration of the young population. Similarly in Poland, regions of Eastern and Central Poland are typical for quickly ageing rural settlements focused on agriculture at the periphery of big cities (Kurek 2011).

The fourth, fifth and sixth types of age structure (Fig. 8) are characterized by an above-average share of the pre-productive age group. The fourth type has a below-average share of the productive age group with a significant share of aged population and is present in several regions of the Czech Republic (Central Bohemia, Northwest) and in Hungary (Northern Hungary, Northern Great Plain) as well as in one region in Poland (Masovian). Central Bohemia has younger inhabitants especially because of the suburbanization tendencies of Prague residents and also due to trends in migration from other parts of the republic. In addition to jobs, these areas also offer more affordable housing when compared to the area of the capital. The Northwest, after the expulsion of German inhabitants, was quickly resettled due to developing industry and the migrants came predominantly from Czech up-country and Slovakia. These migrants had higher fertility that was subsequently continued in succeeding generations (Bartoňová 1999). This territory was also characterized by people with lower education and high unemployment. The people with lower education tended to engage in different life strategies, earlier timing of family formation and a higher number of offspring. The age structure in this region has been partially influenced by numerous groups of Roma (especially those living in ghettos), and due to their high total fertility rate, have retained the most progressive age structure in the Czech population until today. In Hungary, regions located in the east of the country (Fig. 8) have an above-average number of children because there is a larger share of people with the Greek-Catholic religion who have maintained the highest fertility from among all main religious groups in Hungary over a long-term basis. However, Harrach (2013) pointed

out in this regard that this has not only been due to religion but also to a geographic factor. His research from the beginning of the 20th century indicates that all religions in the area of the Carpathian Basin have had higher general fertility rates than their religious cohorts in other regions. Leibert (2009) pointed to differing economic factors also applicable to this region. While the Northwest has been characterized by low unemployment, relatively high per capita income and above-average GDP, these indicators for other parts of the country are significantly more negative. The economic problems of Eastern Hungary are to be ascribed above all to the insufficient competitiveness of the industries established during communist times, the collapse of Soviet markets and the low willingness of foreign businesses to invest there. These areas of Hungary are also characterized by people with lower education, early timing of family formation and higher fertility rates. According to Leibert (2009), the number of new-born infants with at least three siblings has increased significantly since 1991 while the classic two-child family of the communist era is on the wane, indicative of the possibility of crisis behaviour in North Eastern Hungary. From this perspective, the behaviour observed in Eastern Hungary is counterproductive, especially as having one's first child early and having a large number of children are obstacles to women's integration into the labour market.

The Masovian region, including the capital, records a below-average share of the productive age group. Being the strongest region economically, in 2009 the Masovian voivodeship contributed 21.9% of the GDP of Poland (Godlewska-Majkowska et al. 2012). However, this region is internally heterogeneous in several respects in terms of social, economic and demographic structure. Despite economically-strong and densely-populated Warsaw, with a high share of productive and post-productive age groups, the northern and eastern outskirts of this region are sparsely populated and their demographic behaviour is much closer to other neighbouring regions.

The fifth type of age structure can be found only in one region of Poland – in Lublin. This is a region significantly impacted by migration that has resulted in a below-average share of the productive age group. The region has lost population both to other regions of Poland and to other countries. From 2000 to 2006 the number of regional residents moving to other countries increased by more than 600%. At the same time, international inward migration to this voivodeship is only rising slowly: mostly from neighbouring Eastern European countries. Regional anecdotal evidence points to a 'double loss' of population in smaller and more peripheral areas of Poland: on top of emigration to Western countries there are also 'domestic' emigrants who have moved to the larger Polish cities (Gerőházi et al. 2011).

The last type of age structure can be found in Poland and Slovakia. Central and Eastern Slovakia are typical for emigration based on employment reasons. The above-average share of the pre-reproductive age group in Central Slovakia also encompasses the region of Orava and Kysuce (in Northern Slovakia), characterized by strong religious beliefs that imply higher birth rates. In Eastern Slovakia, a greater share of the younger population is influenced by many Roma with specific demographic behaviour, living in separate municipalities or in segregated parts of cities and municipalities.

The age structure with an above-average share of 0–14 year-olds and a below-average share of other age groups is dominant as it is present in 43% of Polish regions. The North Western parts of the country were moreover resettled after World War II, as in the Czech Republic, by new arrivals and the share of seniors remain low also in Poland in this area (Kurek 2011). These regions are typical, particularly for their higher rate of fertility and also for emigration (Szymańska et al. 2009). In the northern parts of Poland, the Kashubian ethnic group has contributed to a favourable demographic structure, with the highest TFR levels (Kurek 2008). Two other regions with this type of age structure are located in the southern part of Poland. The young age structure of the Lesser Poland voivodeship has been caused by both the natural increase in the population in the southern part of this area and positive migration to areas around the city of Krakow (Biegańska 2013).

5 Theories and explanations

5.1 Understanding of changes of reproductive behaviour

The temporal differences of Rosset's classification in the years 1960 to 2012 in countries of the Visegrad Group can be considered significant. This corresponds to the development of productive age groups in the Ossan triangle. It is obvious from both methods that the main differences in age structures of the V4 countries were formed before 1960 and were influenced by the onset of the first demographic transition as well as by belonging to a different type of demographic behaviour beyond the Hajnal line.

Recent developments show signs of this levelling out. Changes in reproductive behaviour during this period must be understood in the context of the overall social and economic environment. The transitional period was characterized by two major periods of economic decline – due to the collapse of the communist markets and privatization of large companies. People were therefore deprived of three major certainties: (1) guaranteed employment from completion of their full-time education to retirement, (2) social protection by means of stable low prices through government subsidies, and (3) various enterprise-based, in-kind social benefits (housing, public childcare, healthcare, etc.) (Hoff 2008). The less-educated population was also hit by a new phenomenon – unemployment – that caused further problems for the poorer segment of the population and led to their social exclusion. Meanwhile, significant social stratification occurred. Paradoxically, less-educated people retained the earlier timing of fertility during that period while people with higher education took more time to start a family. The share of the population with university education increased, mainly due to new requirements of the labour market. The shrinking labour market eroded the originally higher levels of employed women (Macura 2000). Based on economic theory, a less severe loss of job opportunities for women should have led to increased fertility. This, however, did not happen due to inflation and a decline in real income. Young families struggled to cover their needs from a single salary. Moreover, the discontinuation of all government-funded development projects, including construction of flats, rendered housing inaccessible to young families. Buying a flat without a long-term mortgage loan became impossible for a majority of the population.

Other economic factors included rising prices of goods and services, especially the rising cost of having children – something that had previously been heavily subsidized. Proponents of economic theory point out that the number of children depends on how cost-effective it is for parents to have them in terms of both direct and indirect cost (loss of time, the parents' income, limits on other investments) and the related benefits of having children (Loužek 2010). According to Becker and Barro (1988) the reason for the drop in fertility is linked with economic recessions and the higher cost of having children. The aforementioned authors, however, dispute the assertion of the second demographic transition that suggests people think egoistically. According to the authors, present-day parents are altruistic and prefer quality (higher investments in education, skills and well-provided children) to the number of children, with a negative correlation between these two.

The concept of the second demographic transition assumes that initiation of this process required having the following three major components in place: structure (industrialization, development of services), culture (political and global changes) and technology (contraception, means of spreading information). Contraception can be regarded as one of the key changes. With the proliferation of contraception, people could regulate their fertility and introduce planned parenthood. At the beginning of the 1990s oral contraception was used by 2–4% of women in the Czech Republic, Slovakia and Poland and by 2004–2006 it was 20–47% (Potančoková et al. 2008; Kotowska et al. 2008; Sobotka et al. 2008). A similar increase can be observed in the share of the population using condoms or intrauterine devices. In Hungary, contraception was used by 72% of women by 1977 and this trend continued after 1989 (Spéder and Kamrás 2008). As a result, there has been a major drop in the number of unintended pregnancies that previously had been a key driver of early marriages.

The on-going changes can be ascribed to a no longer existent population policy that people had been accustomed to during the previous regime. In the post-communist period, these policies began to be perceived as infringement of personal freedom and they were generally viewed as outdated. Moreover, the political elite of the time were focused on economic reforms or addressing more pressing social issues (poverty). Macura (2000) argues that one of the main reasons for the fertility decline was precisely the retrenchment of state support in the 1990s that made child-raising less attractive. Family policy in the studied period was characterized by frequent changes that added to uncertainty in starting families. The key form of support within the V4 countries was the payment of a maternity allowance in the amount of 65–80% of the salary in previous employment for a period of 20–34 weeks. The maternity allowance was followed by a parental allowance paid in the amount of € 96–439 to parents of children aged 2–4. One-off allowances at childbirth (only for lower social groups) or tax bonuses had a less significant impact. The allowance payments based on previous income can be regarded as a favourable element of the population policies. However, due to a gener-

ally low income in these countries combined with gender inequalities (women earned 20% less on average than men), this kind of funding might not have been sufficient. Hidden discrimination against working mothers with small children in the labour market has also become a major issue.

In addition to the sweeping economic changes and insufficient support on the part of the government, new ideologies emerged and influenced reproductive behaviour. New forms of self-realization and jobs at global corporations associated with extensive travel have put pressure on the growth of individualistic interests that has in turn led to fewer marriages and proliferation of cohabitation, divorces or the so-called single lifestyle. These have taken root more quickly in the more secularized and liberal Czech Republic and Hungary where the divorce rates and proliferation of cohabitation were already relatively high before the collapse of the communist regime. Such a development was, to a certain extent, also related to the religious structure of the studied populations. Across Europe, cohabitation and non-marital fertility have tended to take root far more quickly among people without any religious creed or with a Protestant religious affiliation. In Slovakia, despite persecution of church representatives during the communist regime, religion (especially the Roman Catholic Church) prevailed as a respected social institution. In a population with strong religious beliefs, divorce continued to be regarded as unacceptable. In Poland, also a country with strong Roman Catholic tradition, the divorce rate also remained very low. Conservative discourse has emphasised traditional views on division of gender roles, has viewed motherhood as women's main role, has promoted marriage and opposed abortion, homosexuality, sex education, and unmarried living arrangements. This view is not only pronatalistic but also in opposition to the ongoing family changes symptomatic of the second demographic transition (Sobotka 2011). New forms of behaviour are accepted almost exclusively by young people living in urban environments (Kotowska et al. 2008). Cohabitation initially followed a bottom-up course of development, i.e. it proliferated mainly in lower (poorer) social strata as a substitute for marriage, especially among the divorced. After 1989, it began to trickle down from the top strata as well (top-down) with more educated young people preferring to live together with their future spouses for a trial period prior to marriage, and later cohabitation became accepted among this group as an alternative to marriage.

5.2 What future is there for regions?

Significant differences evolved within various regions of the V4 countries and further polarization in those regions is expected to increase further. The internal structure of the drop in total fertility rate across regions of the countries was not homogeneous. In some regions (the Northwest of the Czech Republic, Northern Hungary, the Northern Great Plain in Hungary, Central and Eastern Slovakia) a relatively early timing of fertility occurred due to differing ethnic, religious or educational structures as well as weaker economies in these regions. Paradoxically, people with significantly problematic predispositions for the labour market and providing income for their families were unable to respond by adjusting the timing of fertility. The communist regime characterized by a single form of self-realization through having a family, has prevailed in the lower social and economic strata of society. Moreover, current measures of family policy are aimed more so at the poorer segments of the population. The current economic crisis is expected to further preserve this situation. Within the regions with seeds of new ideological currents (such as in Western Slovakia, Prague, the Southeast of the Czech Republic, Central Hungary and Central Transdanubia) a slight rise in fertility can be expected due to the removal of the tempo effect on total fertility rates. With introduction of effective instruments that empower the population to combine their working and personal lives (part-time jobs, nursery centres, flexible payout of an individual maternity allowance based on the duration of maternity leave, more effective protection of mothers during maternity leave, etc.), fertility in these regions may increase even further. Further deepening of differences in the productive group of the population in certain regions also seems to be of great concern. Regions such as Eastern Slovakia, Northern Hungary and the Northern Great Plain continue to struggle with insufficient technical infrastructure and relatively worse accessibility to more sophisticated human capital, which also results from disinterest by (foreign) investors in those regions. The loss of a productive population also brings about the loss of the pre-reproductive age group and thus the potential future productive group. Along with emigration tendencies in some (mostly rural) parts of Eastern Poland, these three countries are slowly becoming a periphery of the entire European Union, marked by a rapidly rising share of an aged population.

6 Conclusion

This paper examines the processes behind the ageing of the population in the V4 countries. Within the population of Europe, the share of seniors is significantly differentiated in terms of both timing and spatial characteristics. Western European countries reached a very high level by the mid-1970s. In the Eastern European region, however, the onset of population ageing was slowed by a social climate which on one hand created favourable conditions for high and universal birth rate levels but on the other hand lagged behind in terms of mortality. However, within a period of few years the turbulent events of the past 25 years have irreversibly 'catapulted' many post-communist countries into a very high level in terms of the share of seniors to the total population. Changes in demographic behaviour in this area occurred in a significantly shorter timeframe and the internal mechanism also differed significantly. The transformation of the social and political environment in these countries brought about a number of economic and social difficulties that had a major impact on changes in family behaviour of the population.

Further evaluation of the V4 countries shows that even within the region of Eastern Europe ageing was far from homogeneous. Within the V4 area, pairs were created of the more liberal Czech Republic and Hungary – that had an earlier onset of population ageing – and the more conservative Slovakia and Poland with a stronger link to the traditional family and a younger age structure. However, it should be noted that in Poland and Slovakia some signs of secularization, or rather de-institutionalization of the church, can be observed. Although a majority of the population still declare a religious affiliation, its real-life implication is not that significant (e.g. growing use of contraception, pre-marital sex, un-married fertility). Thus, the differences are gradually disappearing. The total fertility rate dropped to very low levels due to increased unemployment, a decline in real income, unavailability of housing, rising prices of goods and services and the absence of a population policy, as well as proliferation of tertiary education, contraception and new forms of self-realization. Thus, just as the drop in fertility has been due to several factors, a long-term rise in fertility can only be achieved with a favourable interplay of several economic and social factors as well as broader measures supporting pro-family policies.

The analysis conducted on the regional level (NUTS 2) also points to significant internal differences within individual countries and the need to consider the specifics of individual regions as well. Furthermore, at the lower regional level, other factors come into play such as urbanization, the specific ethnic or religious composition of the population, and the particular region's level of economic development.

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