How the household structure will change in aging post-communist countries in the future decades?
Case study for the Czech Republic

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Household projections belong to the group of derived forecasts and basically answer the questions how many households will occur in studied population over the next decades. Furthermore, the structure of household by size and type contributes to estimate how many dwellings will be needed, future demand for various consumer goods, or how many families would be in need of the state social support. In-depth knowledge of household and family structure contributes to understanding the changes in population development in given population. The purpose of the study is to examine the household and family structure and their changes in several post-communist countries with special focus on the Czech Republic for the period 2013-2040. In addition, the projection methodology is discussed, because of two reasons:

1) Limitations caused by the data availability and needs of the forecast,
2) Application of two different approaches, deterministic and probabilistic, where the probabilistic approach is in some way extension of the original methodology.

The Czech Republic as the central European country underwent, due to collapse of Communism in 1989, profound social and economic transformation over the last two decades. The changes significantly affected the population development. While the life expectancy at birth increased both for men and women from 68.1 and 75.4 years in 1989 to 75.0 and 80.9 years in 2012 respectively, the total fertility rate declined from 1.87 to 1.48 children per woman in given period (Czech Statistical Office, 2013a). Age structure of the Czech population is recently characterised by the average age above 40 years. It is obvious that population ageing is present, because the average age increased by 5.1 years in the period from 1989 to 2012. In addition, the ageing index which relates the number of persons 60 years or over to persons under age 15 almost doubled, i.e. from 57 in 1989 to 113 per cent in 2012 (Czech Statistical Office, 2013b). Taking into account current state of population development, population of the Czech Republic will be ageing rapidly in the future what will influence not only the demographic development but also social conditions in the country.

The changes in reproductive pattern of the Czech population are remarkably apparent in household and family structure. Share of one-couple families on housekeeping families

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declined from almost 80 in 1961 to 50 per cent in 2011. In addition, the proportion of one-parent families and one-person household on housekeeping households increase to 14 and 32 per cent in 2012 in the given order. Table 1 presents the basic household structure in the Czech Republic in the period 1961-2011.

Table 1: Households by studied type, censuses 1961–2011, the Czech Republic

Census year	Housekeeping households	One-couple families	Lone-parent families	One-person households	One-couple families	Lone-parent families	One-person households
	In thousands				In % of Housekeeping households		
1961	3035	2405	250	515	79.2	8.2	17.0
1970	3365	2488	307	669	73.9	9.1	19.9
1980	3791	2557	325	939	67.5	8.6	24.8
1991	3984	2513	434	1090	63.1	10.9	27.4
2001	4216	2334	576	1276	55.4	13.7	30.3
2011 [*]	4375	2193	612	1422	50.1	14.0	32.5

*) one-couple and lone-parent families without families in households consisting of three or more families
Source: Czech Statistical Office, 2013c

Considering available data for the Czech Republic, the extension of the conventional headship rate method (United Nation, 1973) is applied in the study. The method is still frequently used by the statistical agencies for its robustness and consistency. As Sherbov and Ediev (2007) pointed out, the age-specific headship rates are particularly stable and vary moderately with significant changes in fertility and mortality. The changes in age structure are more important for the headship rates than the demographic processes themselves. The method proposed by Ediev (2007) is in the core of our household projection. Therefore, distribution of projected households according to their type and size is derived from the average size of the household. The deterministic household projection has three basic variants, i.e. high, medium, low, which reflect the population projection and changes in applied headship rates. The headship rates mirror not only the demographic development in the Czech Republic, but also socioeconomic conditions. Because the approach to population ageing is formed in the Czech society recently, additional model scenarios taking into account public and scientific discussion are drawn up. The following step in our research, which is in progress these days, is probabilistic approach to household projection.

The period 2013-2040 is chosen for the purpose of analyzing the most actual available data. Furthermore, we assume that time horizon of 27 years could be taken as reasonable, because it corresponds to a length of one generation and numbers of potential partners are known already. The headships rates, important input to the calculation, came from the Population and Housing Census held in the Czech Republic in 2011. Due to the UN census regulation about usual residence and almost fully data processing this census has in comparison with the previous populations censuses modified methodology. While the more detailed so called census households derived on the basis of permanent residence

were studied in the period 1961-2001, the housekeeping households derived on the basis of the household member´s usual residence are the core of the current census. Therefore, time series census data for the Czech Republic are not fully consecutive what had to be accommodated to applied method. The future distribution of population by sex and age provides the Population projection for the Czech Republic 2013-2100 which is based on the cohort-component method. It is official forecast built up by the Czech Statistical Office in 2013 based on the most recent demographic trends. Another data source considered with respect to probabilistic approach is the World Population Prospect, the 2012 Revision constituted by the Population Division of the United Nations.

Following Figure 1 presents preliminary results of the deterministic household projection in medium variant based on the headship ratios of the year 2011. The chart shows moderate increase in the total number of projected housekeeping households in a given period. In comparison with one-couple families and lone-parent families which only slightly contribute to the increase, the number of one-person households is expected to grow significantly. A closer look reveals that proportion of one-couple families size 2 would probably increase on the total number of one-couple families and that the number of lone-parent families could rise till cca 2026 and afterwards might slightly decline. The number of lone-parent families size 3, 4, 5 and 6 and more would rather stagnate between 2013 and 2040. As a result, the average size declines from 2.48 in 2013 to 2.21 in 2040 for all the projected housekeeping households in medium variant. These results are consistent with observed and expected population development in the Czech Republic as well as household projections built up for neighbouring post-communist countries.

The research contributes not only to the knowledge of population development in the Czech Republic, but the results will be discussed in the broader context of the transformation process in post-communist countries. The partial goal is to compare obtained results with development trends in household structure of other Eastern European countries, where population ageing is also present and for which any household projection is available (i.e. Slovakia, Russia, etc.). It reveals the consequences of rapid and deep demographic changes occurred in post-communist countries during the 1990s for the changes in household structure which is closely related to living and social conditions in the studied region or country. Moreover, the possible methodological approach and its weaknesses and extensions will be introduced in more detail.

Figure 1: Projected housekeeping household by type and size, the Czech Republic, 2013-2040, medium variant
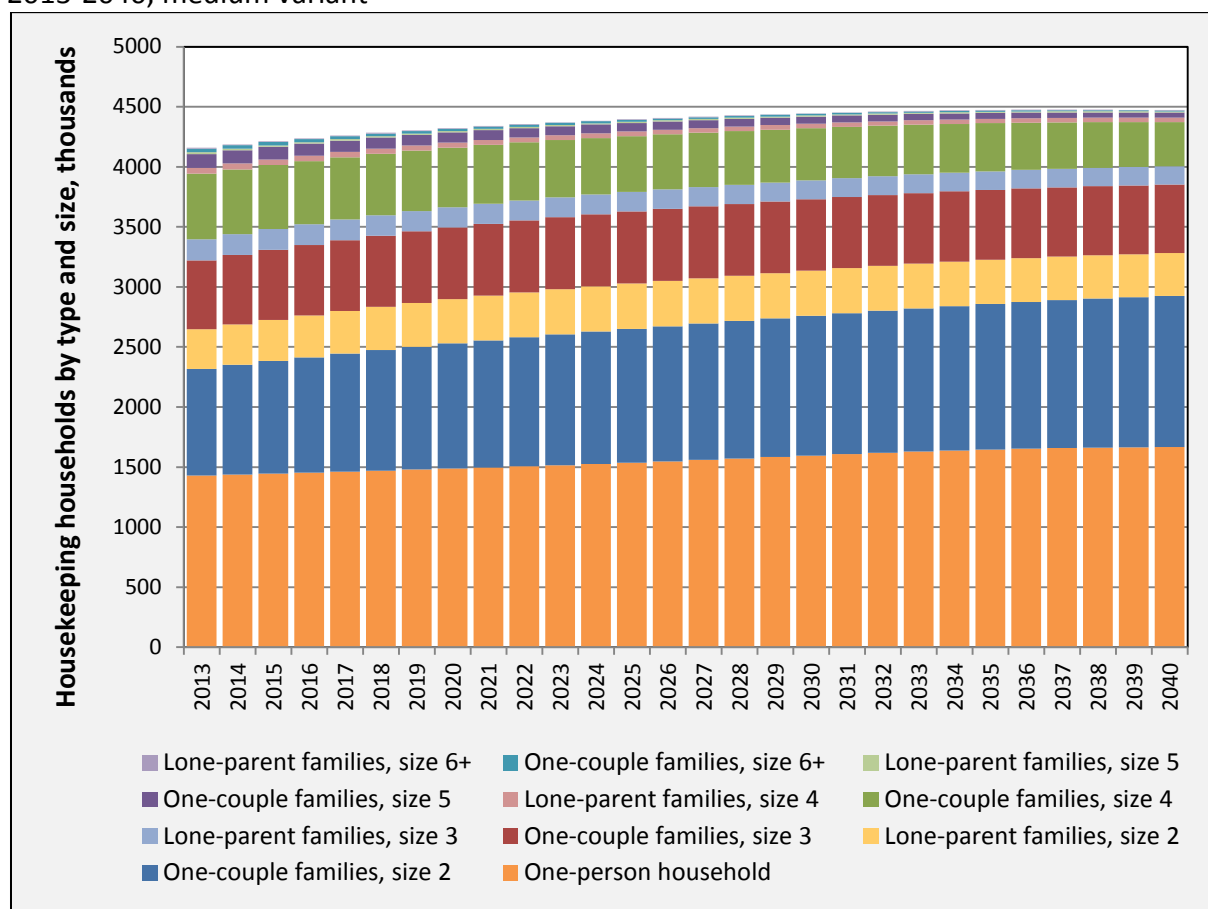
Source: Authors' calculation

Literature and data sources

Czech Statistical Office. 2013a. Population- annual time series. Available online: <http://www.czso.cz/csu/redakce.nsf/i/obyvatelstvo_hu>.

Czech Statistical Office. 2013b. The Czech Republic in numbers from 1989. Available online: <http://www.czso.cz/csu/redakce.nsf/i/cr_od_roku_1989#01>.

Czech Statistical Office. 2013c. Czech Demographic Handbook 2012. Available online: <http://www.czso.cz/csu/2013edicniplan.nsf/engpubl/4032-13-eng_n_2013>.

Ediev, D. 2007. On Projecting the Distribution of Private Households by Size. Vienna Institute of Demography, Working Papers, 4/2007.

Sherbov, S.; Ediev, D. 2007a. Probabilistic household projections based on an extension of headship rates method with application to the case of Russia. Work session on demographic projections Bucharest, 10–12 October 2007. ISBN 978-92-79-04759-6.

United Nations .1973. *Methods of projecting households and families* (United Nations publication, Sales No. E.73.XIII.2