

The development of the marriage rate, the divorce rate, the birth rate and the death rate in the Czech Republic in size-related groups of urban areas

Vývoj sňatečnosti, rozvodovosti, porodnosti a úmrtnosti v České republice podle velikostních skupin obcí

J. DUFEK

Mendel University of Agriculture and Forestry, Brno, Czech Republic

Abstract: The article aims to analyze the development of the basic characteristics of the demographic dynamics in the CR in urban areas divided according to size in 1993–2004 and to express the changes in the development of the natural increase. Urban areas in the CR were divided into 3 groups according to their size (size-related groups): urban areas of up to 2 000 inhabitants – a country type, urban areas with 2 000 to 10 000 inhabitants – a transition type, urban areas with more than 10 000 inhabitants – towns. In 2004, there were 26% of inhabitants living in the country group, 20% in the transition group and 54% in towns. There was a decline in marriage rate in all the groups; in the country, with its higher level, the decline was more moderate. The divorce rate shows a moderate increase except 1999, when it dramatically fell thanks to the legislation. The divorce rate was the highest in towns and the lowest in the country. The birth rate continued its sharp decline in urban areas of all sizes during the first four years of the researched period, then it levelled off, and it has even been slightly rising in the last years. It was considerably lower in bigger towns than in the other two groups, which had practically an identical development. There was a kind of balance at the end of the period. The death rate was generally going down; it was the highest in the country areas, however, it was approximating the values in the other two groups. The dramatic fall of the natural increase levelled off and it also showed a moderate rise. Trends are expressed with polynomial functions. The article presents the characteristics development in graphs and the reasons for changes are being commented upon.

Key words: the Czech Republic, size-related groups of urban areas, marriage rate, divorce rate, birth rate, death rate, natural increase, development

Abstrakt: Cílem příspěvku je analýza vývoje základních charakteristik demografické dynamiky v ČR podle velikostních skupin obcí v období let 1993–2004 a vyjádření změn ve vývoji přirozeného přírůstku. Obce ČR byly rozděleny do tří velikostních skupin: obce do 2 000 obyvatel venkovského typu, obce s 2 000 až 10 000 obyvateli jako přechodná skupina, obce nad 10 000 obyvatel charakterizující města. V roce 2004 žilo ve venkovské skupině obcí 26 % obyvatel, v přechodné skupině 20 % a ve městech 54 %. Ve všech skupinách docházelo ke snižování sňatečnosti, přičemž u venkovských obcí byl při vyšší úrovni pokles mírnější. Rozvodovost vykazuje mírný nárůst s výjimkou roku 1999, kdy vlivem legislativy prudce poklesla. Nejvyšší rozvodovost je ve městech, nejnižší ve venkovských obcích. Porodnost v prvních čtyřech letech hodnoceného období pokračovala v prudkém poklesu u všech velikostních skupin obcí, poté se stabilizovala a v posledních letech dokonce mírně roste. Ve větších městech je výrazně nižší než ve zbývajících dvou skupinách, které mají prakticky shodný vývoj. V závěru období dochází k vyrovnání. Úmrtnost všeobecně klesá, nejvyšší je ve venkovských obcích, avšak postupně se přibližuje zbývajícím dvěma skupinám. Prudký pokles přirozeného přírůstku se ustálil a vykazoval dokonce mírný vzestup. Trendy jsou vyjádřeny polynomickými funkcemi, v textu příspěvku je vývoj charakteristik prezentován graficky a jsou komentovány příčiny změn.

Klíčová slova: Česká republika, velikostní skupiny obcí, sňatečnost, rozvodovost, porodnost, úmrtnost, přirozený přírůstek, vývoj

Supported by the Ministry of Education, Youth and Sports of the Czech Republic (Grant No. MSM 6215648904).

After the political, social and economic changes which began at the end of 1989, there were gradual demographic changes, with a lot of the changes happening as early as during the 1980s. The country went through the transition from the Eastern European standard to the demographic development typical of Western Europe, with all its negatives and positives. The marriage rate decreased considerably, the divorce rate remained high, the birth rate and the fertility, the children's and the general death rate decreased as well. The changes cause the decrease of the population and the deterioration of its age structure, therefore, the population is ageing. The demographic development is accompanied by a higher freedom of an individual, self-development efforts, the increase of economic activity, more opportunities for study including study abroad, a higher interest in travelling etc.

It is obvious that the demographic changes do not occur in the same intensity all over the Czech Republic, but there is a certain degree of regional differences and there are also differences of the population development in towns and in the country.

The article aims to analyze the development of the basic characteristics of the demographic dynamics, i.e. the marriage rate, the divorce rate, the birth rate and the death rate in urban areas divided according to size and to express the changes in the development of the natural increase.

MATERIAL AND METHODS

The data sources for the analysis have been obtained from the statistical records of the Czech Statistical Office. The data on the population migration in the Czech Republic from its becoming independent in 1993 to 2004 were taken as the basic data for the analysis.

Table 1 show the middle class of the Czech Republic in the individual years of the researched period and the indicators of the demographic dynamics absolutely and relatively.

To simplify the development analysis and make it better understandable, the urban areas were divided into three size-related groups:

- (1) urban areas up to 2 000 inhabitants (country, villages),
- (2) urban areas with 2 000–10 000 inhabitants (transition between the country and the town),
- (3) urban areas with over 10 000 inhabitants (towns).

As the basic data are annual and as they are organized in a temporal arrangement, only the characteristics of dynamics have been used out of statistical methods and the trend of indicators has been defined. The graphical expression has a higher information capability, as it enables us to see when the development in the various groups is different and when it is quite the same for both the country and towns.

Table 1. The middle class and the characteristics of the demographic dynamics in the Czech Republic

Year	Middle class	Characteristics of the demographic dynamics							
		marriages		divorces		live births		deaths	
		abs.	rel.	abs.	rel.	abs.	rel.	abs.	rel.
1993	10330607	66 033	6.39	30 227	2.93	121 025	11.72	118 185	11.44
1994	10336162	58 440	5.65	30 939	2.99	106 579	10.31	117 373	11.36
1995	10330759	54 956	5.32	31 135	3.01	96 097	9.30	117 913	11.41
1996	10315353	53 896	5.22	33 113	3.21	90 446	8.77	112 782	10.93
1997	10303642	57 804	5.61	32 465	3.15	90 657	8.80	112 744	10.94
1998	10294943	55 027	5.35	32 363	3.14	90 535	8.79	109 527	10.64
1999	10282784	53 523	5.21	23 657	2.30	89 471	8.70	109 768	10.67
2000	10272503	55 321	5.39	29 704	2.89	90 910	8.85	109 001	10.61
2001	10224192	52 374	5.12	31 586	3.09	90 715	8.87	107 755	10.54
2002	10200774	52 732	5.17	31 758	3.11	92 786	9.10	108 243	10.61
2003	10201651	48 943	4.80	32 824	3.22	93 685	9.18	111 288	10.91
2004	10206923	51 447	5.04	33 060	3.24	97 664	9.57	107 177	10.50

RESULTS AND DISCUSSION

The total population of the Czech Republic is characteristically declining. The average annual decrease in 1993–2004 was by 11 244 people and the average growth coefficient was 0.9989 (the average decrease rate is then 0.11%). The decrease of the population in the researched period can be expressed by the trend function

$$y'_i = 10\,366\,897 - 14\,134 t_i$$

with the correlation coefficient $r = 0.956$ and a high statistical conclusiveness of the function and its parameters. The decline in population is also confirmed in Dufek and Ospalá (2002), who state the number of the deceased exceeds the number of the newly born, therefore, the natural population increase is negative in the long term. Burcin and Kučera (2002) claim that the decline in the number of inhabitants and their ageing will also become the basic feature of the future population development in the CR.

It is obvious that the number of inhabitants is influenced by the number of the newly born and the deceased, and the difference is the natural increase (or decrease). The number of the born alive children decreased in the researched period because in 1993 121 025 children were born but in 2004 only 97 664 children were born. There was a considerable decrease in the first four years, then the development remained stable and at the end of the period, there was a slight increase. The decrease at the beginning was caused by a new life style, when child birth is postponed until a higher age. The later change was, among others, the

consequence of the fact women born in stronger years came into the reproductive age. Generally spoken, there was an average annual decrease of 2 124 children born alive with an average growth coefficient 0.9807 (average decrease rate 1.02%).

There was also a decline in the number of the deceased; the decline was more or less gradual. The average annual decrease was 1 001 deceased with an average growth coefficient 0.9911 (average decrease rate 0.89%). We can see that the decline is more moderate than the decline in the number of the children born alive, however, considered in absolute terms, the number of the deceased is higher. The decline in the number of the deceased is caused not only by the population age structure but also by the fact the average life span is rising thanks to better health conditions, and the middle stage of the life is longer.

The demographic situation in the Czech Republic in the times of the economic and social transformation was analysed by Růžková and Aleš (1994), who stated the change of population development trends; these are manifested in the substantial decline of the marriage rate and the concurrent decline of the birth rate. The trends have continued in the following years.

For the analysed indicators of the dynamics, the development in the Czech Republic is expressed by trend functions with correlation indices and statistical importance:

Marriage rate:

$$y'_i = 6.1934 - 0.2038 t_i + 0.0090 t_i^2 \quad I = 0.821^{**}$$

Divorce rate:

$$y'_i = 2.9333 + 0.0138 t_i \quad I = 0.196$$

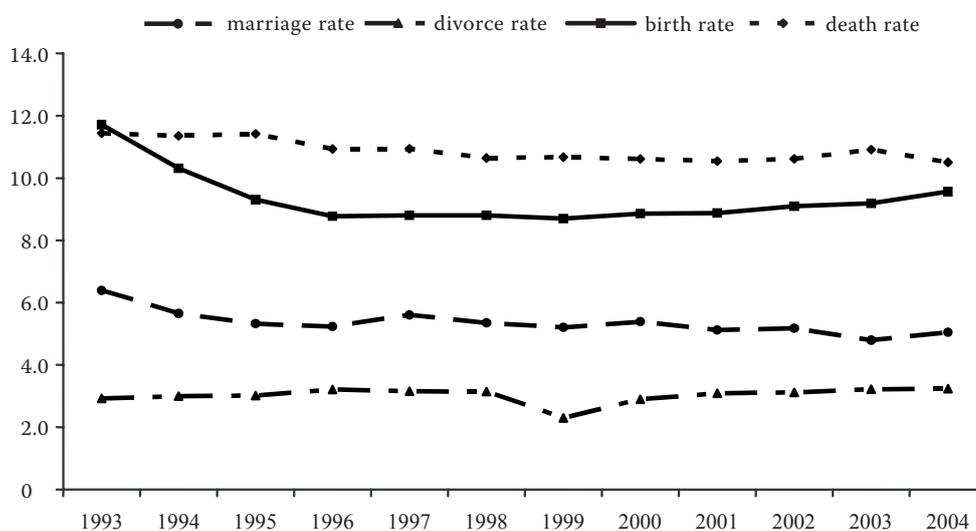


Figure 1. The development of the basic indicators of the demographic dynamics in the Czech Republic

Birth rate:

$$y'_i = 12.0323 - 0.9417 t_i + 0.0631 t_i^2 \quad I = 0.932^{**}$$

Death rate:

$$y'_i = 11.7768 - 0.2414 t_i + 0.0124 t_i^2 \quad I = 0.915^{**}$$

The birth rate shows a more considerable non-linear course. In the first years, there was a substantial decline as a result of postponing marriages and birth-giving, then the trend levelled off and later there was a slight growth influenced by the fact that people of stronger years came into the reproductive age. The marriage rate and the death rate declined slightly, the divorce rate fell dramatically in 1999, which was caused by a change of the legislation, then the development continued rising slightly. Figure 1 provides a clear view.

As obvious, the development of the analysed demographic indicators was not the same in all the Czech

Republic; there were differences dependent on the size of urban areas. Figure 2 shows the structure of the size-related groups as of 31/12/2004.

In all three groups, the marriage rate development is negative. The average age for marriage is higher and higher, people often get married either only after a child has been born or not at all, the premarital sex is more and more widespread. As far as the differences of the marriage rate development shown visually in Figure 3 are concerned, there is a considerably smaller decline in villages and country urban areas of up to 2 000 inhabitants. Both other groups have a more dramatic decline, which is probably influenced by a faster transition to the new life style.

The divorce rate, presented in Figure 4, is slightly rising in all three groups and the development is also almost identical in the groups including the substantial decrease in 1999. However, the real values are considerably different. As expected, the divorce rate is the highest in towns, the lowest in the country,

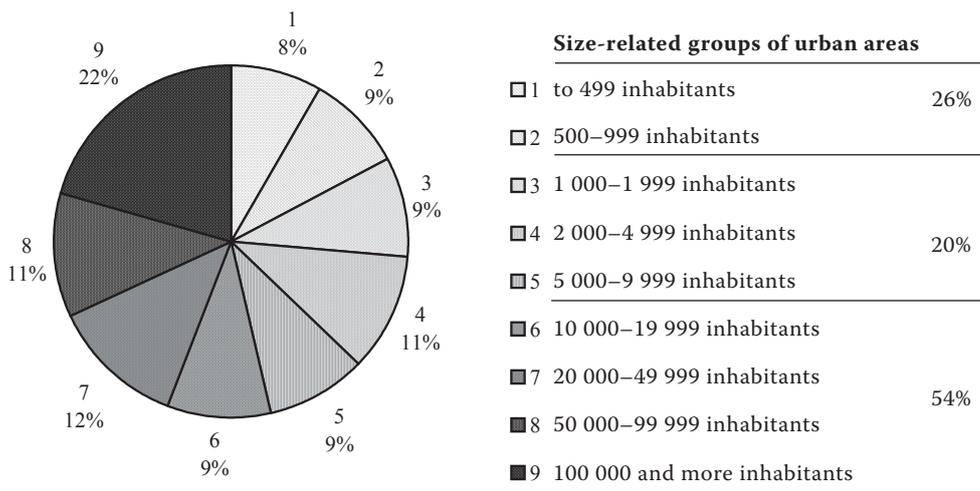


Figure 2. Proportional structure of the population in the CR in the size-related groups of urban areas in 2004

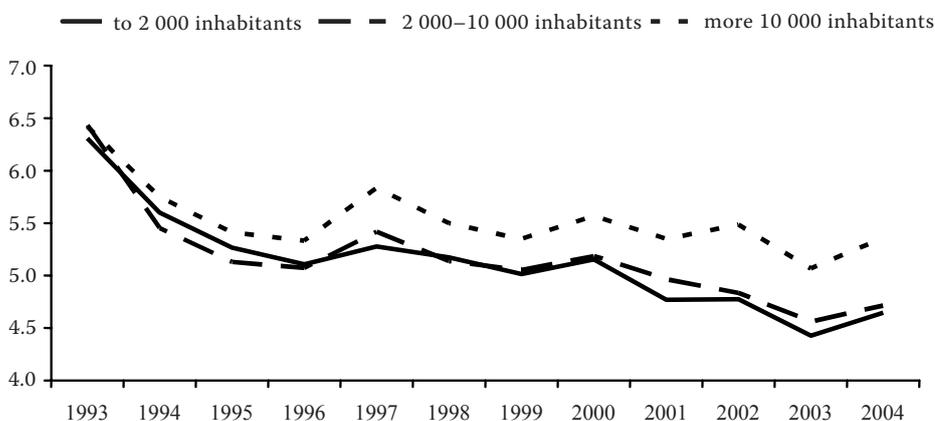


Figure 3. The marriage rate development in the CR in the size-related groups of urban areas

where it is affected by a higher conservativeness and also the religion.

The transition to the Western European standard and to the new life style is the most visible in the birth rate, which continued to fall sharply. The Czech Republic was even placed to one of the last positions when compared to other European and world countries. This is a result of better contraception, the reduction of unwanted children, postponing the child birth until after the wedding, partners' emotional satisfaction when they have one or two children etc. Moreover, the financial burden placed on the partners when a child is born and the reduced chances of self-fulfilment and relaxation are also of a high importance in this trend.

When we consider the size-related groups, we can state that the birth rate had been considerably lower in towns than in the transition group and in the country, but it achieved almost the same level in all three groups (Figure 5).

According to Kučera and Šimek (2000), the main demographic cause of the decrease in the number of newly born children is the decrease in marriages. Young people replace married life with cohabitation more and more often, at least at the beginning of their partnership. Although there is an increase of the unmarried women fertility, it cannot compensate for the decrease of the married women fertility. Fiala (2002) also puts the decline in the birth rate down to the decline in the marriage rate, and even though there is a higher proportion of children born of unmarried parents, the decline in the fertility of married couples was caused by postponing child-birth to a later time. According to him, the interval between the wedding and the child birth is getting longer and longer. Many authors point out the causal dependence of the number of children born on the marriage rate. Dufek (2005) proved, calculated to 1 000 inhabitants, a high bilateral statistically considerable correlation between the number of marriages

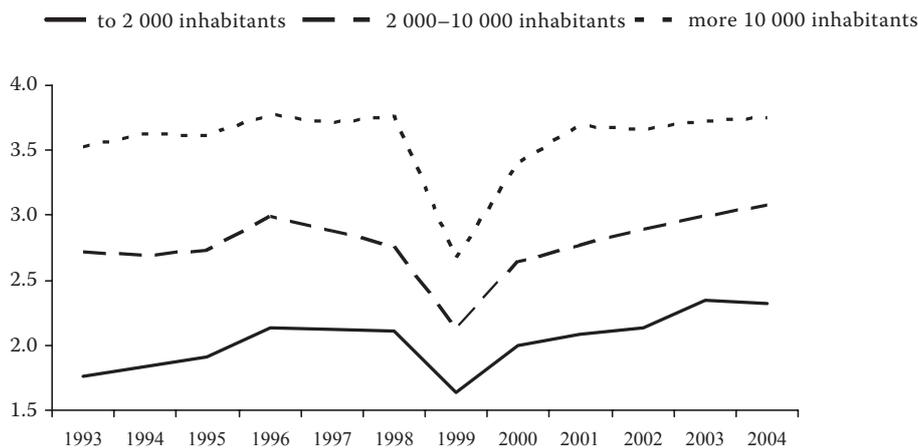


Figure 4. The divorce rate development in the CR in the size-related groups of urban areas

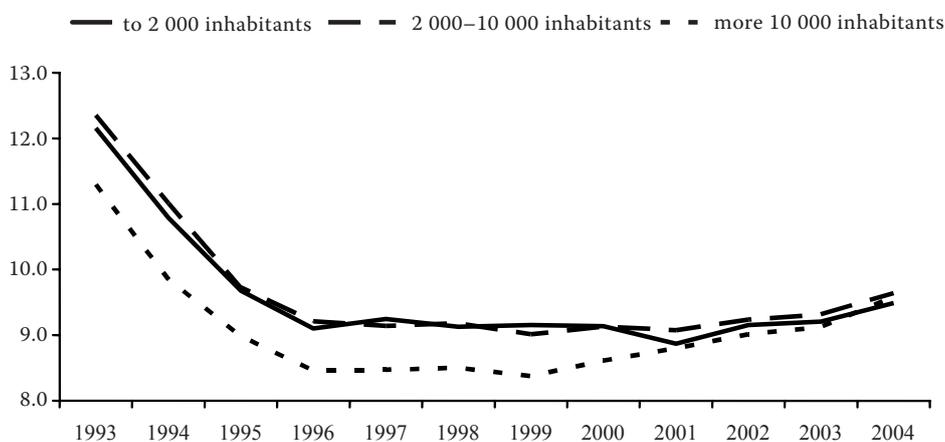


Figure 5. The birth rate development in the CR in the size-related groups of urban areas

and the number of children born alive. According to Hudečková (2003), postponing the marriage and forming a family at a higher age negatively influences the population because the number of the inhabitants in the pre-productive age is falling and, by contrast, the number of the inhabitants in the post-productive age is rising. The result is population ageing.

In contrast with the previous indicators of the demographic dynamics, the death rate development is positive, as it proves to be slightly decreasing. This is a consequence of the fact that middle age is being prolonged as a result of better environment and a healthier way of life. It is interesting to compare the size-related groups because the death rate is the lowest in towns and the highest in the urban areas with up to 2 000 inhabitants. This is shown in Figure 6. We can explain the trend with the population structure because the small municipalities have a higher proportion of the oldest people.

The changes in the development of the number of inhabitants are quantified as the natural and the migration increase. The comparable relative changes consequent to the birth rate and death rate are expressed as *the natural increase for 1 000 inhabitants*. Its development is shown in Figure 7.

There was a rapid decline in the natural increase, which caused the decrease in the number of inhabitants in all the size-related groups of urban areas in the first years of the researched period (1993–1995). This was only a continuing negative development from the previous years influenced by postponing marriages and childbirth until a higher age. In the following years, the development stabilized and there was even a slight growth, which was more distinct at the end of the period, because a large group of women came into the reproductive age. As a result of depopulating the country and a high proportion of old people there, the country urban areas manifest

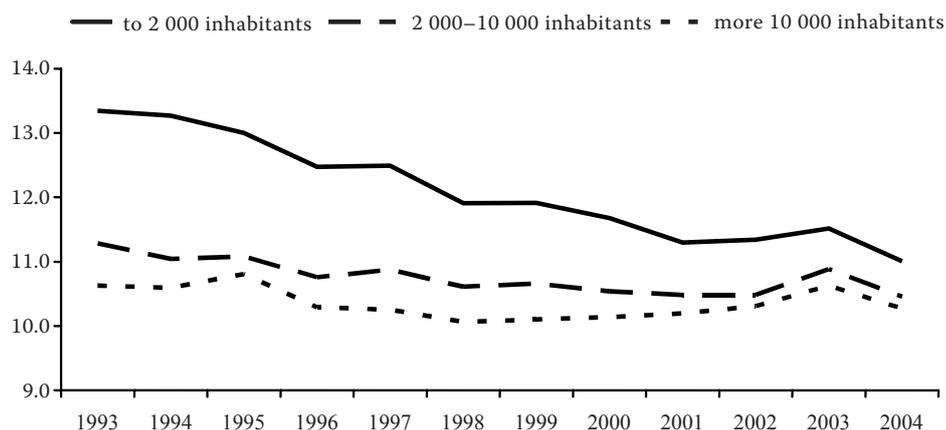


Figure 6. The death rate development in the CR in the size-related groups of urban areas

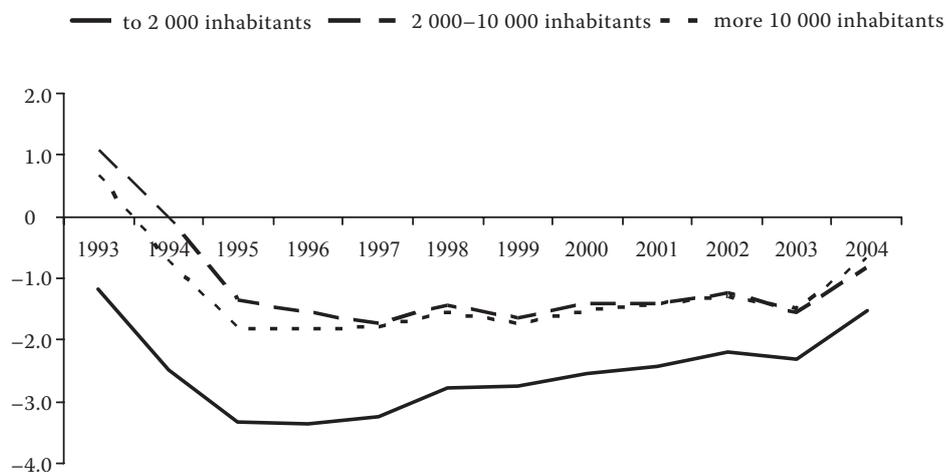


Figure 7. The natural increase for 1 000 inhabitants in the CR in the size-related groups of urban areas

a much sharper decrease than the other two groups, which even had a positive increase in the first year of the researched period (1993).

Trend functions of *the natural increase for 1 000 inhabitants*:

– urban areas up to 2 000 inhabitants:

$$y'_i = 1.5557 - 3.4361 t_i + 0.8236 t_i^2 - 0.0785 t_i^3 + 0.0027 t_i^4$$

$$I = 0.988^{**}$$

– urban areas with 2 000–10 000 inhabitants:

$$y'_i = 3.6853 - 3.0870 t_i + 0.6447 t_i^2 - 0.0573 t_i^3 + 0.0019 t_i^4$$

$$I = 0.978^{**}$$

– urban areas with over 10 000 inhabitants:

$$y'_i = 3.4986 - 3.5321 t_i + 0.8158 t_i^2 - 0.0777 t_i^3 + 0.0026 t_i^4$$

$$I = 0.983^{**}$$

The calculated trend functions of the natural increase express the development in the researched period very well, which is evident thanks to the statistically very conclusive correlation indices reaching high values. However, the functions cannot be used to predict the future development, not only because of higher levels of polynomials, but also and mainly because the prediction cannot be made solely on the base of the natural increase development – it is necessary to consider other demographic characteristics development and the expected conditions and changes.

According to the basic version of Šimek's (1994) projection processed without the migration influence, the future development will be a prolongation of the current birth and death rates. Aleš and Šimek (1996) based their construct of the Czech Republic population projection until 2020 on the study of the demographic development in Western European countries, and they concentrated on the prognosis of the development of the individual age groups including its relations to the economic and social development.

CONCLUSION

The demographic development of the Czech Republic is strongly influenced by the Western European standard; the reproduction and the life style are considerably changing in quality. The number of inhabitants is decreasing, the age structure is deteriorating, the marriage rate is decreasing and the divorce rate increasing slightly, the birth rate is declining as well as, in a smaller amount, the death rate, the natural increase starts to grow gradually after the sharp drop; however, it is still negative.

The development according to size-related groups of urban areas more or less resembles the state-wide development. Possible differences can be seen mainly in the higher or lower levels of indicators, as follows from the presented graphs. In contrast to towns, people still keep traditions in the country; therefore, the demographic changes there are slower.

This work is a partial output of the research project No. MSM 6215648904 "The Czech economy in the integration and globalization processes and the development of the agrarian and the service sectors in the new conditions of the European integrated market" carried out at the Faculty of Business and Economics of the Mendel University of Agriculture and Forestry in Brno, topic group 5 "Social economic connections of sustainable multifunctional agriculture and the agrarian and regional politics measures" and its partial task "The analysis of the demographic development in the CR, the consequences of delay in contrast to the developed Western European countries, the country environment manifestations of the basic demographic characteristics generally and according to the specific conditions of the CR regions".

REFERENCES

- Aleš M., Šimek M. (1996): Projekce obyvatelstva České republiky 1995–2002 (The projection of the Czech Republic population 1995–2002). *Demografie*, 38: 1–17; ISSN 0011-8265.
- Burcin B., Kučera T. (2002): Stárnutí obyvatelstva a hranice důchodového věku (Population ageing and the retirement age). *Demografie*, 44: 30–34; ISSN 0011-8265.
- Dufek J. (2005): Vývoj sňatečnosti, rozvodovosti a porodnosti v Jihomoravském kraji (The development of the marriage rate, the divorce rate and the birth rate in the South Moravian region). *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, LIII, (6): 53–62; ISSN 1211-8516.
- Dufek J., Ospalá M. (2002): An analysis of the basic characteristics of demographic development in an urban, a suburban and a provincial district in the Czech Republic. *Agricultural Economics – Czech*, 45, (12): 533–543.
- Fiala T. (2002): Vývoj manželské plodnosti druhého a třetího pořadí v České republice během posledních padesáti let (The development of marital fertility of second and third order in the Czech Republic in the last fifty years). *Demografie*, 44: 81–93; ISSN 0011-8265.
- Hudečková J. (2003): Demografický a sociální vývoj v Jihomoravském kraji ve srovnání s Českou repub-

likou (The demographic and social development in the South Moravian region compared to the Czech Republic). Sborník příspěvků z mezinárodní vědecké konference Firma a konkurenční prostředí, Brno, pp. 101–106; ISBN 80-7157-699-9.

Kučera M., Šimek M. (2000): Vývoj obyvatelstva České republiky v roce 1999 (The population development in the Czech Republic in 1999). Demografie, 42: 169–182; ISSN 0011-8265.

Růžková J., Aleš M. (1994): Populační vývoj v České republice v roce 1993 (The population development in the Czech Republic in 1993). Demografie, 36: 225–237; ISSN 0011-8265.

Šimek M. (1994): Populační prognóza České republiky (Population prognosis of the Czech Republic). Demografie, 36: 82–87; ISSN 0011-8265.

Arrived on 12th May 2006

Contact address:

Jaroslav Dufek, Mendel University of Agriculture and Forestry in Brno, Zemědělská 1, 613 00 Brno, Czech Republic
tel.: +420 545 132 402, e-mail: dufek@mendelu.cz
