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ANALYSIS OF DEMOGRAPHIC PROCESSES IN POLAND AND THE BALTIC STATES SINCE THE END OF THE XVIII CENTURY AND FORECAST UP TO 2096

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Abstract

Negative demographic tendencies are some of the most serious problems of development of post-Socialist countries. Goal of this research is historical analysis and forecast of demographic processes in Poland and the Baltic States (Estonia, Latvia and Lithuania). The demographic forecast is prepared on the basis of revision of forecast model of the Population Division of United Nations Department of Economic and Social Affairs. Scenario approach and simulation multi-factor modeling act as the main methods of this research. One of the key objectives is critical analysis of use of the hypothesis of stabilization of migration components of demographic processes in scenarios of UN Secretariat. According to the most probable scenario, Latvia (-49% of modern population) can become the leader in expected depopulation within the next 80 years among the considered countries, smaller indicators of depopulation are expected in Lithuania (-43%), Poland (-38%) and Estonia (-34%).

Key words

birth rate, mortality, migrations, modeling, demographic forecast, Poland, Estonia, Latvia, Lithuania.

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1. Introduction

Detailed studying of dynamics of demographic indicators forms a basis for decision-making in the questions touching current problems of social development. Results of the analysis of change of the demographic processes which are formed under the influence of various factors of development of territories are of interest to public and administrative

structures. The methodical basis for probabilistic forecasting is balance methods of demographic forecasts (balance of transitions across age cohorts, balance of births and deaths in different age cohorts, balance of migration). Demographic balance indicators also act as base for calculation of the standardized coefficients designed to commensurate demographic characteristics.

The demographic and migration situation in Poland and the Baltic States (Estonia, Latvia and Lithuania) in post-Socialist time is addressed in a rather large number of academic papers (Apsite et al., 2012; Berzins, Zvidrins, 2011; Jasilionis et al., 2015; Michalski, 2010, 2012a, 2012b; Sipavičienė, Stankūnienė, 2011; Мкртчян, Карачурина, 2014; Станайтис, Станайтис, 2012). What sets this research apart from these works is the analysis of demographic processes in the Baltic States and Poland for a rather long time interval – since the end of the 18th century to the present day. In addition to the demographic analysis, a long-term forecast (until the end of the 21st century) relying on multiple-factor mathematical modeling is presented in the article.

2. Source base and methodology of the research

Presented in this article are possibilities of use of bifurcation models which underlie the systems attempting to reflect the chaotic nature of empirical phenomena. Calculations used for forecasting are based on averaged Bayesian probabilistic predictions of the Population Division of United Nations Department of Economic and Social Affairs (World Population Prospects..., 2015a, 2015b). In particular, these include a forecast of total birth rate, average maternal age at the birth of children, probability of death in each age cohort, exceedance of expected life expectancy of women at birth (in relation to men), ratio of the number of births of boys to the number of births of girls. Revision of methodology of the year 2015 and retrospective demographic indicators since 1950 is considered. The main difference of the demographic modeling applied within this research is accounting of migration processes according to the government statistics of the aforementioned countries. Extrapolation of indicators of dynamics of migration processes in the Baltic States and Poland is made taking into account the divergence of standard deviations (according to the data from 2004–2015). (Baza Demografija GUS; Eesti Statistika; Latvijas statistika; Oficialiosios statistikos portalas). In the process of preparing the demographic forecast, the influence of migration processes on the aggregative age cohorts with account of gender differences is considered. The offered demographic scenario is based on the stabilization forecast of UN Secretariat and extrapolation of migration processes according to the government statistics. Positive, average and negative options of interaction of the migration factors causing transnational migrations in the concerned countries are considered. Changes of

influence of expelling and attracting factors on migration processes are proved by criteria of standard deviations in aggregative age cohorts distributed according to gender characteristics. As a comparison, the results of stabilization forecasting of UN Secretariat are presented.

The probabilistic forecast of birth rate, mortality and migration is based on the demographic indicators which are result of estimates of possible perspective values of births, death and migrations in each age cohort of the corresponding gender group in the population. The inbound migration flow of women of fertile age is considered in calculating the birth of the corresponding age cohorts, the outbound migration flow of women of fertile age is withdrawn from the corresponding age cohorts acting as base for calculation of births. The outbound external migration flows are withdrawn from structure of the corresponding age cohorts and cease to take part in age transition across territories. The inbound external migration flows are included in the corresponding age cohorts and begin to take part in age transition across territories.

Similar methods of optimization of demographic forecasts are presented in a significant amount of the scientific research relying on agent-oriented approach (Silverman et al., 2013; Wu, Birkin, 2012; Макаров et al., 2014). This technique has been evaluated by us during preparation of the demographic forecast for the Central and Eastern Europe countries (Манаков, Суворков, 2017).

3. Demographic processes within the modern territory of the Baltic States in 1795–1950

At the beginning of the 19th century, the Baltic region was characterized by a level of a natural increase that could be considered low for the Russian Empire. One can also note the high migration activity of this region's population, first of all the external migrations. The population of Kurland and Estonia even decreased slightly at the beginning of the 19th century. It can be seen that during Patriotic war of 1812 the territory of the modern Lithuania suffered drastic depopulation where the number of inhabitants decreased in 1795–1815 (Кабузан, 2009).

Growth of the population in the territory of the modern Baltic States was registered a bit later, which can be attributed to less significant epidemic losses in the 1830s, lack of serious crop failures, which led to positive migration balance. It is also necessary to note that serfdom had been abolished in Baltic provinces by 1820, however, under the condition that the nobility should retain full landed property. Since the

1940s the population of the region grew at extremely slow rates which were considerably lower than the average empire level. Across the Russian Empire the increase in population during the first half of the 19th century amounted to more than 70%. The decline in the rates of population growth can be associated with the high level of population density in the Baltic provinces, insignificant land allotments of the peasantry, the intensification of agriculture, and decrease in mortality at early age.

The population of territories of the modern Baltic states amounted to 2 million 622 thousand people in 1795. The highest population was observed in territories of modern Lithuania, a slightly smaller population inhabited the territories of modern Latvia and Estonia. During the first half of the 19th century the population of the territory of the modern Baltic states grew rather evenly.

The average annual natural increase of the population in 1804–1810 amounted to 0.7% within the territories of Esthonian Province and 1.2% in Kurland Province (Кабузан, 2009).

At the same time the increase in all the Baltic provinces has reached more than 1.6% a year (due to Livonia). In 1811–1820, the natural increase amounted to 1.0% in Esthonian Province, 1.2% in Kurland Province, and 1.2% across the Baltics in general. In 1821–1830 the natural increase in Esthonian Province grew and amounted to more than 1.2% per year, while it remained at the same level in Kurland and the Baltics in general. In 1831–1840, the rate of the natural increase in the Baltic provinces decreases and reaches about 0.9% per year (with a slightly lower level in the territories of Estonia). The average annual natural increase in 1841–1850 decreases to 0.4% in Esthonian Province while the increase in Livonian Province amounted to more than 1% for that period, and Kurland Province only grew by 0.7%.

During 1795–1858, growth of the population living in the territories of the modern Estonia amounted to 251.2 thousand people, or 51.1% of the population in 1795, with total population reaching 743.0 thousand people; in the modern Latvia – 368.8 thousand people, or 41.6% of the population in 1795, with total population reaching 1256.0 thousand people; in the modern Lithuania – 525.6 thousand people, or 42.3% of the population in 1795, with total population reaching 1768.8 thousand people.

During the second half of the 19th century, the population of the territory of the modern Baltic states starts growing unevenly. In the 1860s, the situation with allotments somewhat improves for the population living in the territory of the modern Lithuania since many land allotments of peasants were expanded in connection with landowners

participating in a revolt in Poland. It should be noted also that during the second third of the 19th century the increase in population in the territories of the modern Estonia, Latvia and Lithuania was higher than in Europe in general, but below that in the Russian Empire. In the 1880s, the increase in population in the territories of the modern Baltic States dropped even lower than that across Europe in general.

The greatest increase in population during the second half of the 19th century was registered in Latvia (Кабузан, 2009), while the territories of the modern Estonia had the lowest growth. Positive migration balance of the population in the territories of the modern Baltic states was insignificant in the 19th century, the migratory movement (within the Russian Empire) wasn't widespread among the population of the Baltic lands. At the same time, international (and transoceanic as well) migration from the territories of the modern Lithuania becomes quite widespread.

In the 1850–1860s, the annual increase in population in the Baltic provinces amounted to 0.7–0.9%. In the 1870s, the natural increase of the population in the provinces increased again and reached more than 1% per year, which was above the all-European level, but lower than the growth level across the Russian Empire. Thus, growth of the population living in the territories of the modern Estonia during 1858–1897 amounted to 215.3 thousand people, or 29.0% of the population of 1858, with total population reaching 958.3 thousand people; in the territories of the modern Latvia growth amounted to 673.3 thousand people, or 53.6% of the population of 1858, with total population reaching 1929.3 thousand people; in the modern Lithuania growth amounted to 984.9 thousand people, or 55.7% of the population of 1858, with total population reaching 2753.7 thousand people. It can be said that, during this period, the population of the territories of the modern Latvia and Lithuania had grown more considerably than the population of the territories of the modern Estonia.

During the first decade of the 20th century, the increase in population in the Baltic provinces decreased to 0.7% per year, and during the second decade of the 20th century – to 0.3%, which can be attributed to conducting warfare of World War I in those territories. Despite the aforementioned negative factors, the population of the territories of the modern Baltic States has experienced certain growth in relation to the level of the first 1897 population census of the Russian Empire, namely, it grew by 17.5% in Estonia, 23.1% in Latvia and 19.7% in Lithuania by 1915–1917. Most likely, the main losses in population of the territories of the modern Baltic

states connected with World War I, the civil war and the wars of independence were registered in the censuses of 1923-1925. Judging by these censuses, one may talk of reduction of population living in the territories of the modern Baltic states. The paramount decrease was recorded in the territories of the modern Latvia (-22.3% of the population at the end of the 1910s). Almost identical population loss was experienced in the territories of the modern Lithuania (-21.2%), a little lower one – in the territories of the modern Estonia (-11.3%). It can be observed that migrations affected the population considerably influence during this period, while earlier relatively intensive external immigrations were only registered from the territories of the modern Lithuania.

In the 20–30s of the 20th century, the Baltic region was outside the USSR. Sovereign republics – Estonia, Latvia and Lithuania originated in the Baltic States. The Vilna Region was a part of Poland from 1919 to 1939. During this period, the former Esthonian Province was joined by Estonia in its entirety, as well as a part of Livonia (including Kreis Werro, Kreis Pernau, Kreis Fellin, Kreis Ösel and Kreis Dorpat). Besides, a part of Kreis Walk of Livonia, Yamburgsky and Gdovsky Uezds of the Petrograd Province, and a northwest part of the Pskov Province were also within Estonia.

The Kovno Province, a part of the Suwalki Province of Poland were within Lithuania. In 1923, the Klaipeda Region of the former East Prussia was assigned to Lithuania to become a part of Germany in 1939, and in 1945 it became a part of Lithuania again.

The Kurland Province (with the exception of a small region which was a part of Lithuania), the Inflyanty part of the Vitebsk Province, a part of the former Province of Livonia, and a part of Ostrovsky Uezd of the Pskov Province became a part of Latvia all became parts of Latvia after 1920.

Demographic population censuses of the 1920–1930s in Estonia, Latvia and Lithuania also allow us to explore demographic processes of these countries. By 1939, the population of Estonia had grown by 53.2 thousand people, the population of Latvia – by 102.2 thousand people, and the population of Lithuania – by 353 thousand people. In general, the population of the Baltic States amounted to 5951.2 thousand people in 1939.

The further demographic situation in the Baltic States becomes unstable, which caused decrease of population in the borders of the modern Lithuania by 241 thousand people by 1959 (decrease by 8.2% as compared to the population of 1939, including losses in the period of the Great Patriotic War). On the contrary, the population in Estonia and Latvia

grew by 144.8 thousand people (growth by 13.8% as compared to the population of 1939) and 146.5 thousand people (7.5%), respectively.

4. Demographic Processes in Poland in the 1795–1950s

At the beginning of the 19th century, the territory of the modern Poland was characterized by high population density and an average level of natural increase (Кабузан, 2008). For example, 3151.6 thousand people inhabited the territories of Kingdom of Poland in 1795, and 4810.9 thousand people – in 1834. Thus, the increase in population of Kingdom of Poland during the 40-year period amounted to 1659.3 thousand people, or 52.6% of the population in 1795, which corresponds to annual increase of 1.1%. However, during the subsequent period of more than twenty years the population of Kingdom of Poland did not only stop increasing, but even decreased to 4696.9 thousand people in 1856. If we were to estimate an average annual increase for more than fifty years (from 1795 to 1856), then it is possible to come to a conclusion that the population in these territories grows with an average speed of 0.7% per year (while the average annual increase in population in the territories of the modern Baltic states amounted to 0.6% per year during this period).

It may also be noted that the high migration activity of the population of this region oriented towards outbound migrations (migration activity of the population of these territories remains high within the considered time period and further on). Growth of urbanization was a significant demographic factor in the Polish territories. The network of cities remains almost the same in comparison with the first half of the 19th century, but the population of Polish cities grows quickly. During the second half of the 19th century and the first one and a half decade of the 20th century, the population of the territory of Kingdom of Poland grew with an average speed of 1.7% per year and exceeded 12 million people by the beginning of World War I (while the average annual increase in population in the territories of the modern Baltic states amounted to 1.0% per year during this period) (Кабузан, 2008).

Influenced by military and political shocks of the 20th century, further demographic situation in the territory of the modern Poland is contradictory, but one can note the preservation of the high rate of increase in population until the end of the 1940s, exceeding 1.7% per year.

5. Population Processes in the Territories of the Baltic States in 1950–2015

At the present time, the demographic situation in the Baltic States is characterized by the low birth rate that is insufficient for each woman to be replaced by daughter who would attain the child-bearing age. During the analyzed period, the birth rate in the Baltic States is characterized by decrease in absolute values of births per woman, and change of the age profile of births.

If we were to consider an approximate number of births per woman by the end of the analyzed period that is necessary for natural reproduction of the population (about 2.14 births per woman), this coefficient was significantly below this mark by the end of the period. One can also note the minimum values of coefficient of total birth rate across Latvia (1.17) and Estonia (1.33) in 1995–2000, and in Lithuania (1.28) in 2000–2005, which was caused by peculiarities of the demographic paradigm change, socio-economic factors and characteristics of inter-generational connections in age cohorts of women (World Population Prospects ..., 2015a, 2015b).

One can note relative growth of number of births per woman at the end of the analyzed period across all Baltic States (more than 1.48). Compared to the East European values, it is a satisfactory indicator (for instance, in Hungary the indicator is 1.34, in Poland and Slovakia – 1.37, in the Czech Republic – 1.45). Relatively higher coefficient values are observed in Lithuania (1.57) and Estonia (1.59), the minimum value – in Latvia (1.48). Thus, the insufficient level of births in the Baltic States should not be viewed as a rare phenomenon and corresponds to the general tendencies reflected in the theory of demographic transition. Birth rate dynamics in the Baltic States reflects changes of age profiles of birth rate which highlight transformation of reproductive behaviour. Reduction of the contribution of younger age groups to coefficient of total birth rate and increase in the contribution of more advanced ages of women is manifestation of the second demographic transition. In the Baltic States, signs of the second demographic transition appeared in the second half of the 1990s – the first half of the 2000s.

For all Baltic States, the contribution of age cohorts of women up to 25 years to coefficient of total birth rate was considerably reduced since 1990–1995 (180.2 births per one thousand women not older than 25 years in Estonia, 175.5 – in Latvia, 192.0 – in Lithuania) by 2000–2005 (when it reached 101.8 births per one thousand women not older than 25 years in Estonia, 93.2 – in Latvia, 99.9 – in Lithuania), and it increased for the senior

age groups of reproductive age – since 1990–1995 (145.2 births per one thousand women older than 25 years in Estonia, 150.9 – in Latvia, 171.2 – in Lithuania) by 2000–2005 (when it reached 176.4 births per one thousand women older than 25 years in Estonia, 163.9 – in Latvia, 155.8 – in Lithuania). These changes have brought the age profile of birth rate in the Baltic States closer to that characteristic of Western Europe (World Population Prospects ..., 2015a, 2015b).

It can be noted that, historically, in the Baltic States the distribution of birth rate was such that peak coefficients accounted to the age cohort of 20–24 year old women in Estonia, Latvia (1950–2000) and Lithuania (1965–2000), and the age cohort of 25–29 year old women in Lithuania (1950–1965). By 1965–1970, the activity of child-bearing at the age up to 25 years had increased across all Baltic States, which can be attributed to the reduction of total number of births in general and the relative maintaining of the age of the first female child-bearing. In 1990–1995, the average age of mother at the child-bearing across all Baltic States was minimal (Estonia – 25.3 years, Latvia – 25.6 years, Lithuania – 25.6 years), which was connected to socio-economic factors. After 1995–2000, average age of mothers at the child-bearing increased rapidly, which was caused by the postponement of the first child-bearing until a later fertile age, as well as peculiarities of demographic transition (deformation of the gender and age pyramid graph). During 2010–2015, average age at the child-bearing amounted to 29.4 years in Estonia, 29.3 years in Latvia, and 29.0 years in Lithuania (World Population Prospects ..., 2015a, 2015b).

The highest relative weight of births in the age cohort of 20–24 year old women accounts for 1975–1980 (40.8% of all births); 1990–1995 (43.3% of all births). The highest relative weight of births in the age cohort of 25–29 year old women accounts for 1950–1955 (32.8% of all births); 2010–2015 (31.2% of all births). The greatest indicators of number of births in the senior fertile age cohorts of women (older than 30 years) are observed in 1950–1955 (39.3% of all births); 2010–2015 (33.8% of all births) (World Population Prospects ..., 2015a, 2015b).

Thus, in the conditions of the general negative dynamics of coefficient of total birth rate in the last 30 years, there was a shift of number of births to a younger age (up to 25 years) in Estonia in 1975–1980, in the 1950s in Latvia, and in 1990–1995 in Lithuania. At the same time, the return of the majority of births to senior women's age took place across all Baltic States in 1995–2000.

Gender and age pyramid graphs of the population in the Baltic States are substantially deformed.

We note a considerable decrease in the age cohorts which have suffered losses during World War II, and which were descendants of the age cohorts involved in World War I. At the same time, a considerable negative deviation in population of 30–39 year old men and older is observed in 1955, and also in population of women at the age of 35–39 years, which was a consequence of World War II. Decrease in the number of age cohorts born during World War II and directly after the war is not as evident (Fig. 1).

Deformations of gender and age pyramid graphs of the population in the Baltic States by 1985 are not so pronounced, however, deformations of cohorts still are clearly defined at the age of 40–44 years (born during World War II) in Estonia, 35–44 years (born during World War II and directly after the war) in Latvia, 35 years and older in Lithuania (Fig. 2).

In the mid-nineties of the 20th century, gender and age pyramid graphs in the Baltic States have received new deformations of structure due to considerable decrease in births.

In 2015, one should note a considerable decrease in number of 15–24 year old men and 15–19 year old women in Estonia, which, most likely, is caused by blurring of the borders of the periods of alternation of generations in connection with an unstable social and economic situation, the shift of births to older ages, active migrations of young men in the 2000s. The broadening of the direct basis of the pyramid is connected with economic and structural factors which have caused a certain increase in the number of postponed births, and blurring of the borders of alternation of generations. In an age cohort of 20–24 year old people, a non-standard distribution of number of men and women is observed (considerable overweight of women), which does not correspond to the difference in the accelerated men’s mortality and insignificant excess of number of births of girls in comparison with the number of births of boys. This phenomenon testifies to the migration component. It is possible to assume that men are more

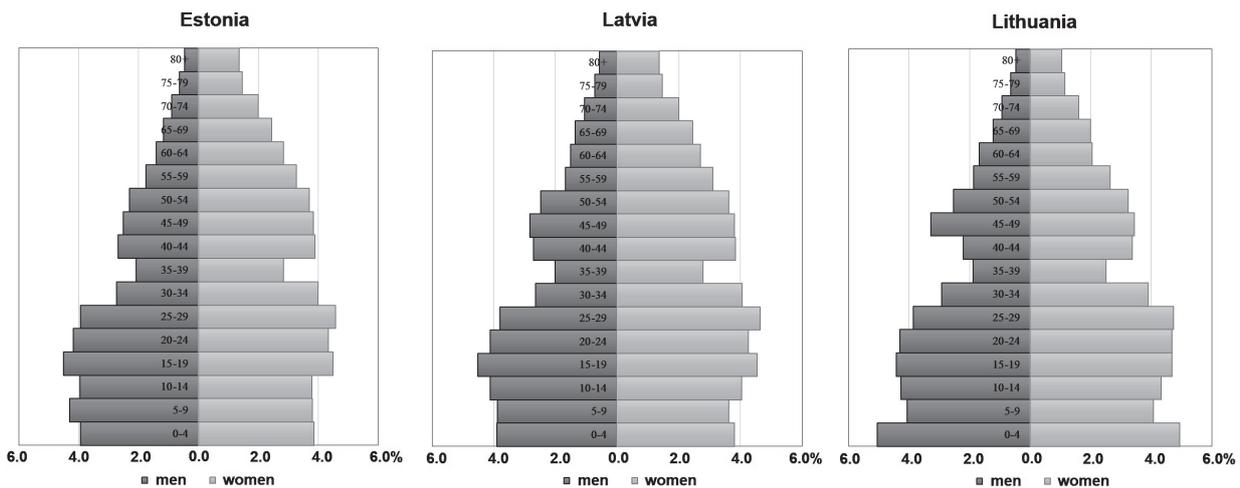


Fig. 1. Gender and age pyramid graphs of the population of Estonia, Latvia and Lithuania in 1955

Source: World Population Prospects..., 2015a, 2015b.

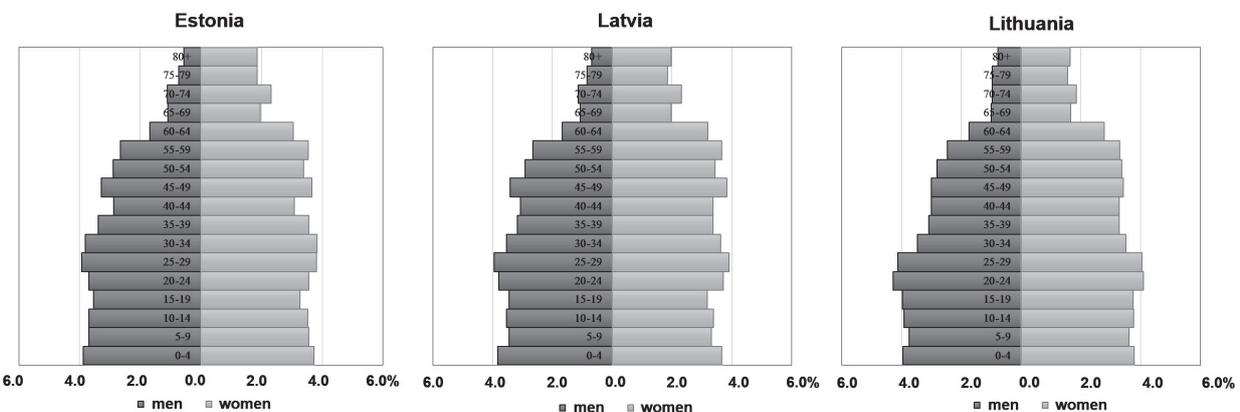


Fig. 2. Gender and age pyramid graphs of the population of Estonia, Latvia and Lithuania in 1985

Source: World Population Prospects..., 2015a, 2015b.

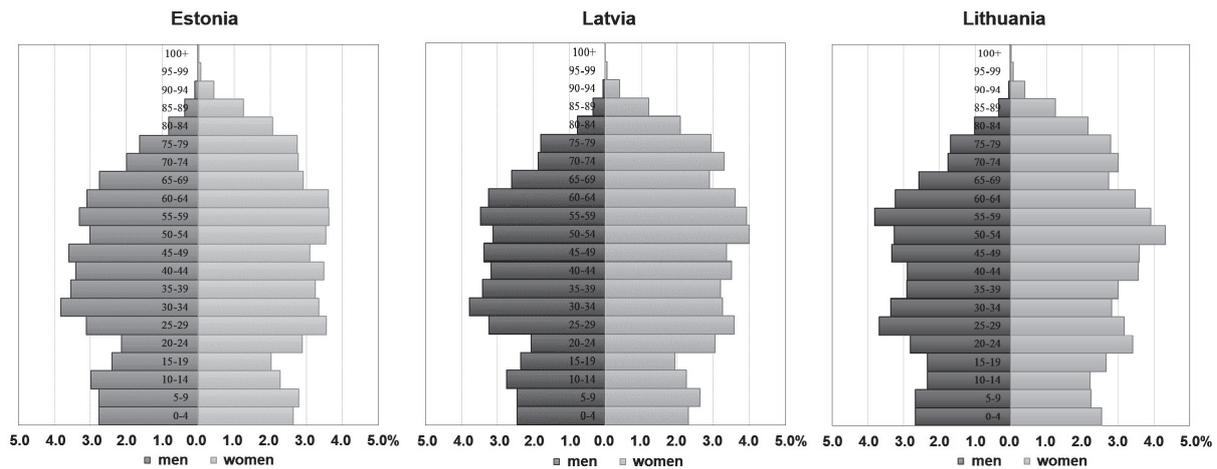


Fig. 3. Gender and age pyramid graphs of the population of Estonia, Latvia and Lithuania in 2015

Source: World Population Prospects..., 2015a, 2015b.

active in terms of change of residence during educational and labor activity.

In 2015, one can note a considerable decrease in the number of 15-19 year old and younger men and women in Latvia and Lithuania, which was caused by blurring of the borders of the periods of alternation of generations, an unstable social and economic situation, shift of births to an older age, and migrations. The pyramid basis practically is not broadening. In the age cohort of 20–24 year old people, the phenomenon similar to Estonia (Fig. 3) is observed.

6. Demographic Processes in Poland in 1950-2015

In Poland, birth rate was falling during the entirety of the considered period. Values of coefficient of total birth rate in Poland decrease from 3.6 at the beginning of the period to 1:37 at the end of the period. The minimum values of coefficient of total birth rate are recorded in 2000–2005 (1.24), which was generally caused by peculiarities of the demographic paradigm change (shift of births towards older age). It should be noted that the number of births per woman at the end of the analyzed period is slightly lower in Poland than in the Baltic States. Compared to the East European figures, number of births per woman in Poland is one of the lowest. Historically, the birth rate in Poland was at a high level, it becomes insufficient for simple reproduction of female generations only in the 1990s. In Poland, distribution of birth rate was almost equal in age cohorts of 20–24 year old and 25–29 year old women by 1950s. The activity of child-bearing at the age up to 25 years increased during the 1960s, with simultaneous fast decrease in number of absolute births per woman. At the

same time, the relative age of the first female child-bearing practically remained the same. Average age of mother at the child-bearing was higher in Poland than in the Baltic States, and during the entire analyzed period it was never lower than 26 years. In the second half of the 1990s, average age of mothers at the child-bearing increased, however, this growth was not as considerable as in the Baltic States, which is possibly connected with higher economic soundness of the population of Poland during the period of government reforms.

The highest relative weight of births in the age cohort of 20-24 year old women accounts for 1980–1995 (more than 39% of all births). The highest relative weight of births in the age cohort of 25–29 year old women accounts for 1995–2015 (more than 33% of all births). The greatest indicators of number of births in the senior fertile age cohorts of women (older than 30 years) are observed in 1950–1955 (40.0% of all births), as well as in 2010–2015 (41.1% of all births) (World Population Prospects ..., 2015a, 2015b).

Thus, in the conditions of the general negative dynamics of coefficient of total birth rate in Poland, as well as in the Baltic States, there was a shift of births towards senior women's age.

Due to the increase in life expectancy of the population in Poland during the second half of the 20th century and the fast decrease in number of births, there was an increase in median age of the population, which exceeded 30 years by the middle of the 1980s, and by the end of the analyzed period it amounted to 40 years already. Accelerated aging of the population is verified by the median age considerably exceeding the average age.

Deformations of gender and age pyramid graphs in Poland are considerable and similar to

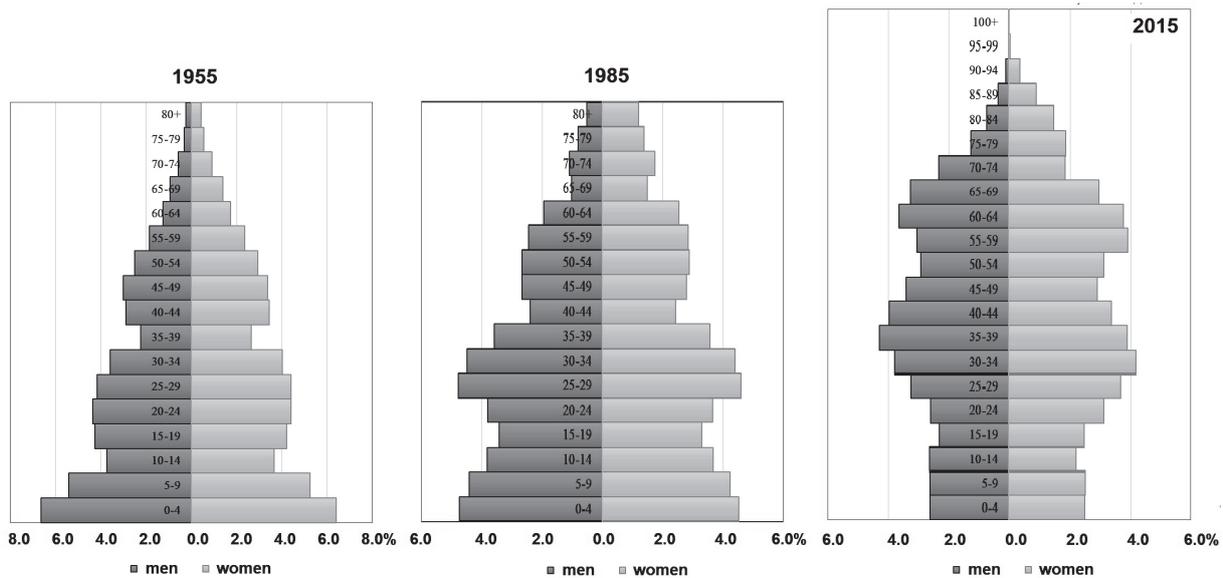


Fig. 4. Gender and age pyramid graphs of the population of Poland in 1955, 1985 and 2015

Source: World Population Prospects..., 2015a, 2015b.

the deformations which were observed in the Baltic States. In 1955, a considerable negative deviation in population of 35–39 year old men and older is observed, as well as women at age of 35–39 years. The decrease in number of the age cohort of the 10–14 year old people born during World War II is quite significant (Fig. 4).

Decrease in deformation of gender and age pyramid graphs of the population of Poland was not as pronounced as in the Baltic States. Deformations of cohorts are significant at the age of the 40–44 year old people (born during World War II) and the main age of their descendants – 10–19 year old people. Deformations of structure of the gender and age pyramid graphs in Poland are close to those across the Baltic States in 2015.

7. The forecast of dynamics of the population of the Baltic States and Poland until 2096

According to fundamental principles of UN and EUROSTAT, outbound net migrations across the Baltic States have to be minimized by 2035. If the expected minimization of outbound net migrations does not happen, the population of the Baltic States will decrease considerably as a result of migration outflow. On the basis of the carried-out analysis of intensity of migrations in the Baltic States during 2004–2015, we suggested that the average net migrations of separate ages distributed according to gender should be used.

For imitating modeling for 2017–2096 we have used average values of coefficient of net migrations

for 2004–2015 for population at the beginning of the year distributed according to gender and age categories. In case of implementation of the extrapolation migration scenario, if stabilization of number of births per woman and growth of life expectancy within the next 80 years takes place, average annual decline in population will amount to 0.5% for Estonia (for the age older than 50 years – 0.3%), 1.6% for Latvia (for the age older than 50 years – 1.3%), 1.8% for Lithuania (for the age older than 50 years – 1.5%), 0.7% for Poland (for the age older than 50 years – 0.2%).

In case of implementation of the scenario assuming increase in migration attractiveness, stabilization of number of births per woman and growth of life expectancy, a small positive increase in population of 0.1% per year (for the age older than 50 years – 0.3%) will become possible in Estonia. In other countries, decline in population is expected even in case of the positive scenario implementation, which will amount to 0.9% for Latvia (for the age older than 50 years – 0.7%), 0.7% for Lithuania (for the age older than 50 years – 0.6%), 0.6% for Poland (for the age older than 50 years – 0.2%).

In case of implementation of the scenario assuming decrease in migration attractiveness, stabilization of number of births per woman and growth of life expectancy, average annual decline in population will amount to 1.1% for Estonia (for the age older than 50 years – 0.9%), 2.3% for Latvia (for the age older than 50 years – 2.0%), 2.8% for Lithuania (for the age older than 50 years – 2.4%), 0.7% for Poland (for the age older than 50 years – 0.3%).

According to the authors, the most probable is the realization of the “high” version of the forecast for Lithuania, Latvia, Poland, and the average version of the forecast for Estonia. According to the expected scenario chosen through the use of expert method, the greatest population losses (more than 49%, with population reaching 995 thousand people at the beginning of 2096) are predicted in Latvia. Less considerable decrease in number (more than 43%) is expected in Lithuania (the predicted number for the beginning of 2096 – 1635 thousand people). In Poland, population loss is predicted to amount to more than 38% (the predicted number for the beginning of 2096 – 23747 thousand people). The smallest losses of the population (more than 34%), according to the chosen version of the forecast, can be expected in Estonia (the predicted number for the beginning of 2096 – 861 thousand people).

8. Conclusions

Thus, the leader in expected depopulation among the countries chosen for the analysis during the 80-year period is Latvia (-49%), smaller indicators of depopulation are expected in Lithuania (-43%), Poland (-38%) and Estonia (-34%). The negative demographic factors which aren't related to migrations are more pronounced in Latvia than in Lithuania, during the forecast period. One can note quite high importance of migration processes for dynamics of the population of the Baltic States in the 21st century, and a considerably lower importance of migrations for the demographic situation in Poland. At the same time Poland and Estonia have bigger demographic stability in relation to Latvia and Lithuania. In general, it is possible to say that if the attractiveness of Latvia and Lithuania (as the countries for accommodation) does not increase as is expected by the authors, these countries will have to expect the most drastic demographic crisis in their whole history.

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