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THE FACTORS OF DEMOGRAPHIC RISK IN SOCIAL INSURANCE OF THE SELECTED EUROPEAN UNION COUNTRIES

Summary: Of the study its presents the forecasts for value of selected demographic measures, obtained from the forecasts of population age structure, elaborated by national statistical offices and available as a part of EUROSTAT base. This is the next version of forecasts worked out by the authors of the study – the previous ones were achieved with the method of arithmethic mean, harmonic wights as well as trend function determined on the basis of time series for years 1991 to 2006. Due to the fact that there are no ideal forecasts, there are only more or less accuarate forecasts, it pays to use the next possibility to determine them for the same measures. It gives the chance to compare forecasts and choose the best ones.

The following part of the study focuses on the forecasts for value of coefficients that determine the scale of ageing process. The EU countries selected for comparative analyses include these from the group of countries newly joining the EU, ie. The countries which pose a peculiar mystery for the union.

Key words: demographic risk, demographic measure, work activity.

1. Introduction

Demographic risk belongs to the group of the least elaborated economic risks in the sense of classification. The influence of this category of risk on the formation of economic processes is undeniable, therefore it is impossible to omit it in considerations concerning the dynamics of changes in economic processes. The easiest way to describe and diagnose demographic risk is a detailed analysis of the dynamics of change in population age structure, taking into consideration the number of subpopulations of people at the pre-productive, productive and post-productive age. It is obvious that the age strucure of each of these subpopulations directly influences the formation of demographic risk. From the point of view of social insurance at least a simple replaceability of generations is important, which is equivalent to the reconstruction of population and improvement of financial standing of the social insurance system. Admittedly, the pension reform iplemented in 1998 leads to the change of repartition system into a capital system in the whole structure of insurance, however, the repartition system will function up to the situation where there are no beneficiaries of this system.

The presented study includes a summary of detailed analyses within the scope of dynamics of selected demographic measures that enable the evaluation of demographic risk. Considering the fact that evaluation of demographic risk in case of Poland has already been carried out in other publications and the attempts to create a homogenous insurance market within the EU regulations, it is worth to perform proper analyses for selected demographic measures. The forecasts of their value may influence the directions of legal and administrative changes in the creation, or actually in the improvement of the constantly corrected pension reform.

With regard to a limited size of the study its further part presents only the forecasts for value of selected demographic measures, obtained from the forecasts of population age structure, elaborated by national statistical offices and available as a part of EUROSTAT base. This is the next version of forecasts worked out by the authors of the study- the previous ones were achieved with the method of arithmethic mean, harmonic wights as well as trend function determined on the basis of time series for years 1991 to 2006. Due to the fact that there are no ideal forecasts, there are only more or less accuarate forecasts, it pays to use the next possibility to determine them for the same measures. It gives the chance to compare forecasts and choose the best ones.

The following part of the study focuses on the forecasts for value of coefficients that determine the scale of ageing process. The EU countries selected for comparative analyses include these from the group of countries newly joining the EU, ie. the countries which pose a peculiar mystery for the union.

2.The results of detailed analyses

The group of basic demographic measures which enable the evaluation of the scale of demographic risk includes the following measures:

- the coefficient of demographic old age $$W_{OA} = \frac{L_{65+}}{L_{gen}}$$

- the coefficient of work activity $$W_{WA} = \frac{L_{15-64}}{L_{gen}}$$

- the coefficient of work resource ageing $$W_{WRA} = \frac{L_{50-59}}{L_{20-59}}$$

- the coefficient of work resource load $$W_{WRL} = \frac{L_{50-59}}{L_{20-49}}$$

- the coefficient of „early pensioners" $$W_{EP} = \frac{L_{50+}}{L_{og}}$$

- the coefficient of generations replaceability $W_{GR} = \dfrac{L_{65+}}{L_{0-14}}$

The group of EU countries for which comparative analyses have been performed include:
- Bulgaria
- Estonia
- Lithuania
- Latvia
- Poland
- Romania

The countries were not selected for comparative analyses by chance. As mentioned before, they constiue the group of countries newly joining EU and therefore they encounter the same problems within the scope of operation of given organs, including also social insurance system. Thus, the dynamics of changes in coefficients influencing the insurance risk may enable us to point out the similarites and differences in the bases for the functioning of insurance systems.
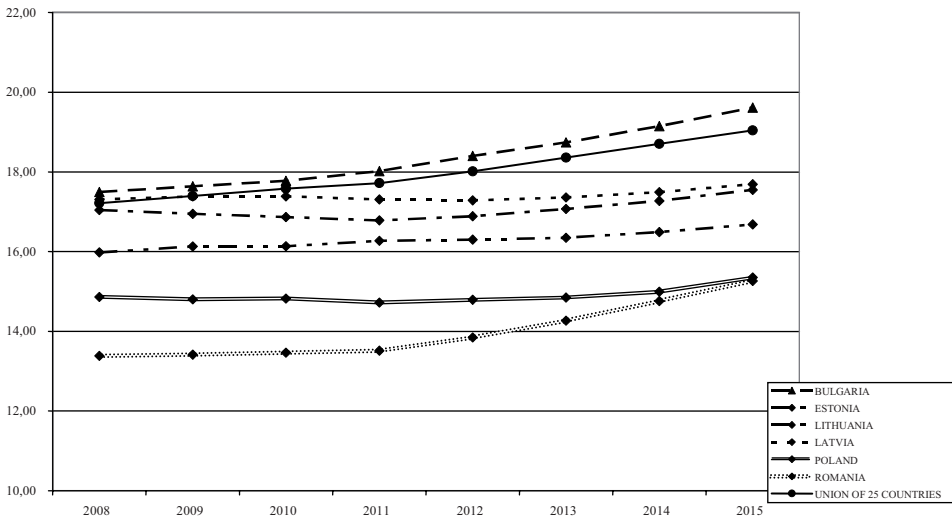

Fig. 1. The forecasts for the coefficient of demographic old age for selected EU countries for years 2008-2015
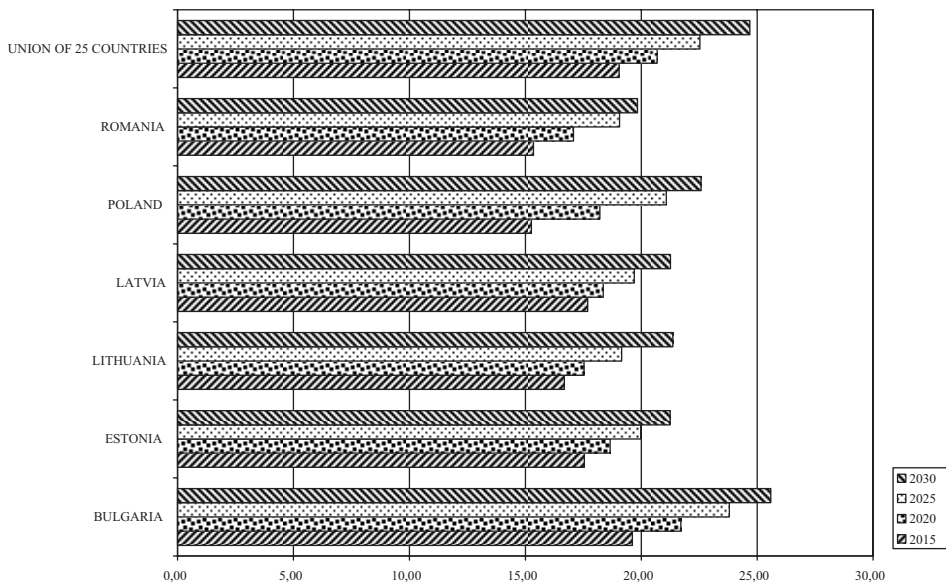
Source: elaboration own.

Below, in a graphic form, there are presented the results of forecasts for values of selected coefficients. The first type graphs show the values of forecasts for successive years from 2008 to 2015 in the form of empirical trend function so that the determination of the general tendency of change in future values of measures could

be more visible. The second type graphs are column graphs constructed for discrete analyses, prepared for five-year-intervals in years 2015 to 2030. For higher clarity and readability of the graphs, the values of forecasts for 2015, 2020, 2025 and 2030 are additionally presented in tables.

The forecasts are determined merely for the basic version of forecasts for population age strcture elaborated by EUROSTAT. The next stage will be the construction of forecasts for the versions that take into consideration a high and low coefficient of births and deaths, migration as well as slow or quick changes in the structure of society age.

Graphic representation of the results of detailed analysis.

Graph 1. The forecasts for the coefficient of demographic old age for selected EU countries for years 2015, 2020, 2025 and 2030

Source: elaboration own.

On the basis of the presented results of analyses one can draw the following conclusions:

- The coefficient of demographic old age reveals a constant upward trend while the growth rate for Poland in the course of nearest years is stronger than for other countries. This tendency remains unchanged with the elongated horizon of forecast.
- In comparison to all EU countries only in case of Bulgaria the value of coefficient of demographic old age is higher for each year included in the analysis, which indicates a definitely most progressing process of population ageing. The percentage of people over the age of 65 years exceeds 25%.

Table 1. The forecasts for the coefficient of demographic old age
for selected EU countries for years 2015, 2020, 2025 and 2030

| Country/year	2015	2020	2025	2030
Bulgaria	19,61	21,71	23,80	25,59
Estonia	17,55	18,66	19,98	21,25
Lithuania	16,68	17,53	19,16	21,37
Latvia	17,69	18,36	19,70	21,26
Poland	15,27	18,21	21,08	22,57
Romania	15,35	17,07	19,06	19,83
Union of 25 countries	19,04	20,68	22,53	24,68

Source: elaboration own.

- The lowest percentage of people at the post-productive age is expected in the group of Baltic countries from the region of the former Union of Soviet Socialist Republics, namely in Estonia, Lithuania and Latvia.The prepared forecasts are based only on the expected level of age structure without any consideration regarding migration of population. One can expect that the intensified migration will influence the growth of its value.
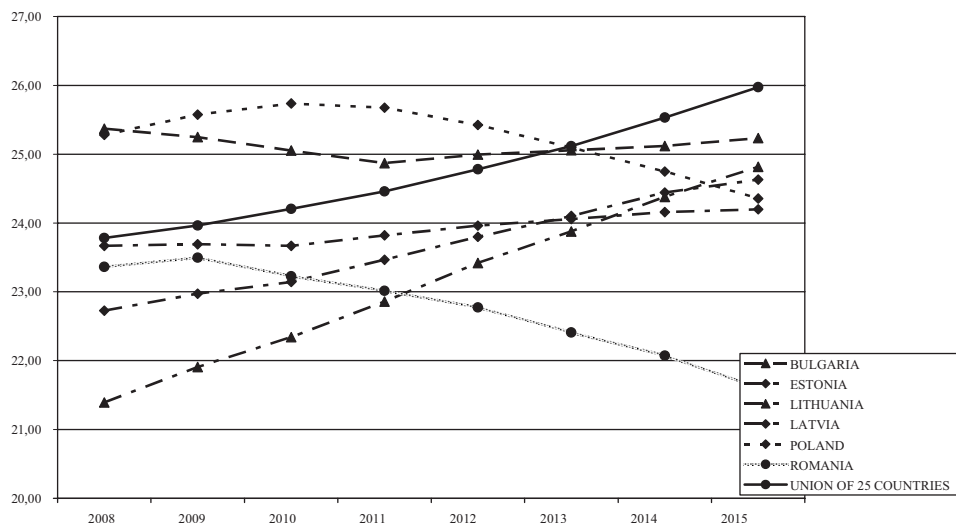
Fig. 2. The forecasts for the coefficient of work resource ageing for selected EU countries for years 2008-2015

Source: elaboration own.

The coefficient of work resource ageing is the measure which will confirm, at least partly, the above listed conclusions. The forecasts of changes in its value basi-

cally confirm the conclusions drawn from the analysis of changes in the coefficient of demographic old age. Some differences are visible in case of comparisons for particular countries.
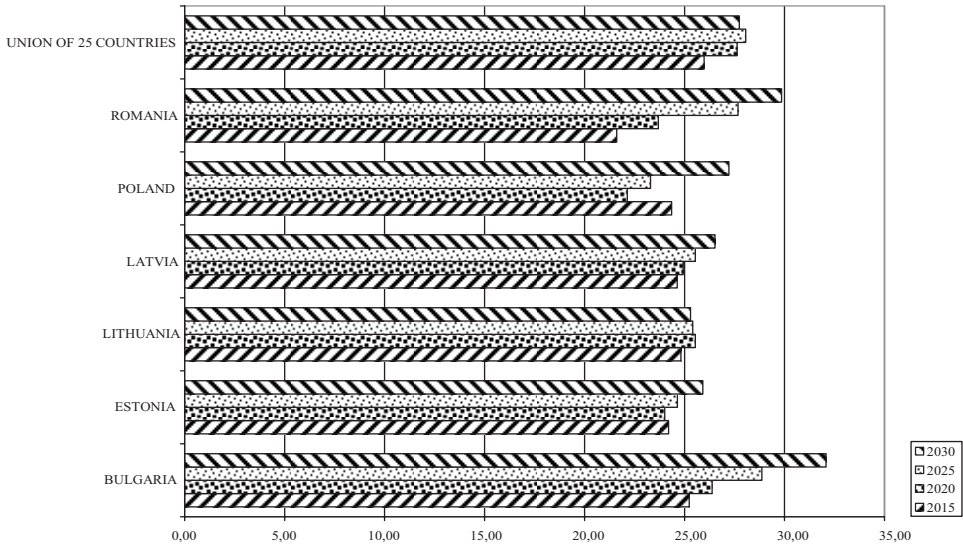
Graph 2. The forecasts for the coefficient of work resource ageing for selected EU countries for years 20015, 2020, 2025 and 2030

Source: elaboration own.

Table 2. The forecasts for the coefficient of work resource ageing
for selected EU countries for years 20015, 2020, 2025 and 2030

Country/year	2015	2020	2025	2030
Bulgaria	25,23	26,37	28,86	32,07
Estonia	24,20	24,00	24,64	25,91
Lithuania	24,82	25,54	25,41	25,29
Latvia	24,63	24,93	25,54	26,52
Poland	24,36	22,13	23,29	27,22
Romania	21,61	23,69	27,67	29,85
Union of 25 countries	25,97	27,63	28,06	27,73

Source: elaboration own.

The forecasts for the coefficient of work resource ageing, as mentioned before, show tendencies of changes similar to theforecasts for the coefficient of demographic old age. One can formally state that:

- The forecasts for year 2015 for the selected group of countries are more optimistic than for all EU countries because the values of measures that determine the level of work resource ageing are lower.
- The dynamics of changes in the considered period for all countries is the same, which indicates the upward trend of the coefficient, while the tempo of rise remains diverse.
- Only for Bulgaria and Romania one can observe the measure with value exceeding its expected level for all EU countries in case of the forecast for the furthest time point, namely year 2030.
- For Baltic countries from the former Union of Soviet Socialist Republics the growth rate for the coefficient of work resource ageing is the slowest, which indicates a strong slowdown of ageing process.This is an interesting phenomenon from a demographic point of view because a decreasing percentage of people at the post-productive age and at the close of productive age with reference to the total population should mean the increase in the number of subpopulation of young people, which does not correspond to the forecasts of parity coefficients expected for this period.
- One can suppose that also in case of forecasts for this coefficient its values may change with regard to the intensification of migration phenomena, which is related to the changes of society age structure.
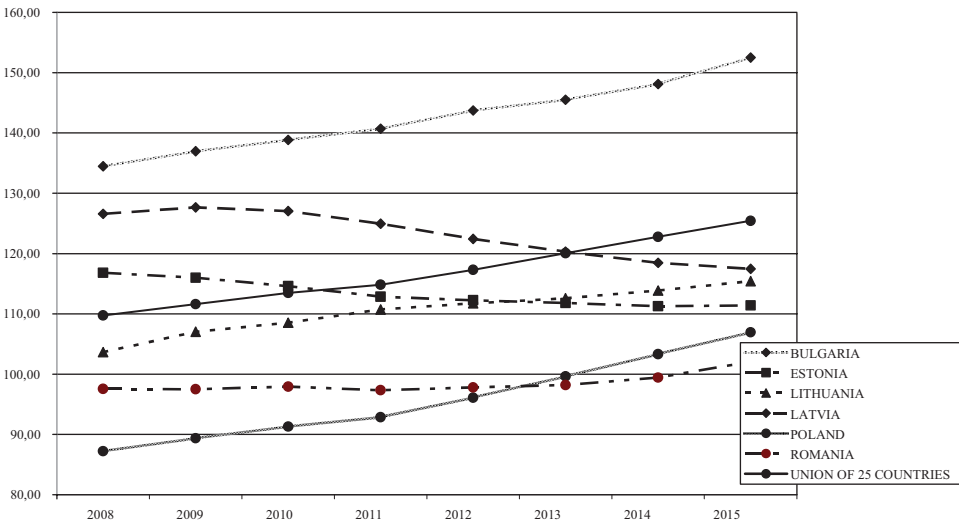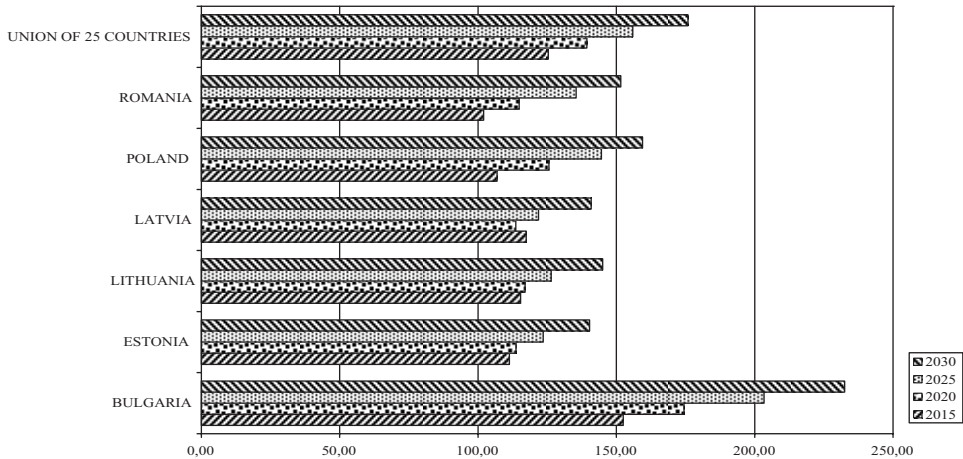

Fig. 3. The forecasts for the coefficient of generation replaceability for selected EU countries for years 2008-2015

Source: elaboration own.

The changes of age structure are visible, first of all, in the number relationships of subpopulations of people at the pre-productive and post-productive age, it means in relationships between the number of "grandparents" and "grandchildren". They are presented in the following graphs and table.

Graph 3. The forecasts for the coefficient of generation replaceability for selected EU countries for years 2015, 2020, 2025 and 2030

Source: elaboration own.

Table 3. The forecasts for the coefficient of generation replaceability for selected EU countries for years 2015, 2020, 2025 and 2030

Country/year	2015	2020	2025	2030
Bulgaria	152,52	174,47	203,43	232,52
Estonia	111,39	113,71	123,54	140,35
Lithuania	115,43	117,07	126,48	145,06
Latvia	117,47	113,64	121,90	140,93
Poland	106,94	125,64	144,66	159,47
Romania	102,06	114,90	135,51	151,62
Union of 25 countries	125,44	139,37	155,99	175,95

Source: elaboration own.

The presented values indicate the expected number of hypothetical grandparents who are dependent on their grandchildren.The forecasts are unfortunately pessimistic because there is a clear growth trend to the intensificiation of the number of grandparents dependent on their grandchildren. Table 3 presents the forecast values of the coefficient for following years: 2015, 2020, 2025 and 2030. The analysis of

their values and the form of trend function of change in the measure for years 2008--2015 enables the formulation of these conclusions:

• Similar to the forecasts of the coefficient of demographic old age and work resource ageing, also the forecasts for the measure that determines the intensification of the number of subpopulation of people at the productive age in relation to the number of subpopulation of people at the pre-productive age are not optimistic because they indicate the advanced tempo of population ageing in each of the analysed countries.

• The growth rate of the coefficients in each of the analysed countries is upward, however it is of diverse intensity.

• In case of Poland, Bulgaria and Romania as well as all EU countries in the period of 2015-2030 one expects the growth of the coefficient value by about 50%, while for the countries of the former Union of Soviet Socialist Republics, namely Lithuania, Latvia and Estonia, the expected growth rate is significantly lower as it reaches only 30%.

• Similarly to the case of forecasts for the coefficients of ageing the highest values of the coefficient of generation replaceability are observed in Bulgaria as 100 grandchildren should replace 232 grandparents, which may be difficult or even unfeasible.

Summing up the results of deduction procedures one can state that the process of society ageing, visible in the change of population age structure, is a progressive process. The tempo of changes in the age structure towards the development of the process of society ageing is different, however, the direction of changes is the same for all analysed countries. For the purpose of the analysis the countries newly joining the European Union were selected, because it might seem that the societies of these countries form the group of "young" countries. It was suggested by the age structures observed in the current years. Yet, the forecasts for age structure elaborated by EUROSTAT do not indicate the maintenance of these properties. It turns out that the dynamics of changes in the age structure points to a pretty quick achievement of development level of ageing process similar to the EU level.It is worth mentioning that the performed analyses concerned merely one of the several versions of forecasts for society age structure, namely a basic version. Much more interesting and more diversified values of relevant coefficients were obtained for the case of a changed assumption concerning the level of fertility (productivity) coefficient or the case of taking the assumption regarding a changed rate of society ageing.

At the same time it should be added that due to a limited size of this study only three out of six coefficients, presented in the course of performed analysis as basic coefficients, have been minutely discussed, being regarded as the most characteristic and expressive.General conclusions that can be formulated on the basis of broader analyses correspond to these presented above.

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CZYNNIKI RYZYKA DEMOGRAFICZNEGO W UBEZPIECZENIACH SPOŁECZNYCH WYBRANYCH PAŃSTW UNII EUROPEJSKIEJ

Streszczenie: W artykule zostały zaprezentowane prognozy wartości wybranych mierników demograficznych uzyskane na podstawie prognoz struktury wieku ludności opracowanych przez krajowe urzędy statystyczne i dostępnych w ramach bazy EUROSTAT. Jest to kolejna wersja prognoz opracowanych przez autorów artykułu – poprzednie uzyskano metodą średniej geometrycznej, wag harmonicznych i na podstawie funkcji trendu wyznaczonej na podstawie szeregów czasowych za lata 1991-2006. Ponieważ nie ma prognoz doskonałych, są jedynie mniej lub bardziej dokładne, warto wykorzystać kolejną możliwość ich wyznaczenia dla tych samych wskaźników. Daje to możliwości porównań i wyboru prognoz najlepszych.

W dalszej części artykułu uwaga została skupiona na prognozach wartości współczynników określających skalę procesu starzenia. Państwa UE wybrane do przeprowadzenia analiz porównawczych to państwa z grupy państw nowo wstępujących do Unii, czyli stanowiące dla wspólnoty unijnej swoistą zagadkę.