
DEPENDENCE BETWEEN BASIC SOCIO- DEMOGRAPHIC CHARACTERISTICS OF THE POPULATION AND THE SIZE OF GOVERNMENT EXPENDITURE ON SOCIAL PROTECTION

Konstantin N. Kolev¹,

¹University of Forestry – Sofia, Bulgaria

E-mail: ¹konstantinklv@yahoo.com

Maya A. Tsoklinova²,

²University of National and World Economy – Sofia, Bulgaria

E-mail: ²maya.koleva@unwe.bg

Abstract: One of the serious public questions for years has been related to the size of government expenditure and government revenues and the formed government budget. The latter determines the amount of government intervention in the economy and the public goods provided by the state. The growth of government expenditure is influenced by various factors, both on the demand side of public goods and on the supply side. In this context, in the present article the author's interest is focused on the study of the dependence between basic socio-demographic characteristics of the population and the size of government expenditure on social protection. The guiding working hypothesis for the research is that there is a positive relationship between government expenditure on social protection in the European Union (EU) Member States from Central and Eastern Europe (CEE) and basic socio-demographic characteristics of the population. The verification of the hypothesis is carried out in the following sequence: first, on the basis of a study of literary sources, quantitative indicators reflecting basic socio-demographic characteristics of the population are substantiated; secondly, on the basis of the adopted indicators, socio-demographic population indices are calculated for the EU Member States from Central and Eastern Europe; third, the relationship between the government expenditure on social protection and the socio-demographic population index is measured by means of the coefficient of K. Pearson. The working hypothesis has been confirmed, as it

has been established that there is a positive relationship between the studied variables in each year of the analyzed period 2017-2021. The values of the correlation coefficient during the period 2017-2021 in chronological order are as follows: 0.7336; 0.7128; 0.7011; 0.7006; 0.7063.

Key words: socio-demographic population index, government expenditure on social protection, dependence, quantitative assessment, Pearson coefficient, CEE.

This article shall be **cited** as follows: **Kolev, K.; Tsoklinova, M.** (2024). Dependence between basic socio-demographic characteristics of the population and the size of government expenditure on social protection. *Economic Archive*, (2), c. 60-72.

URL: nsarhiv.uni-svishtov.bg

DOI: <https://doi.org/10.58861/tae.ea-nsa.2024.2.04.en>

JEL: H41; H5; C18; C38.

* * *

Introduction

Government intervention in the economy is measured by the volume of government spending on public goods. In recent years, and especially after the Covid-19 pandemic, there has been a global trend of increasing government expenditure, especially those for social protection. As an institutional pillar of society, governments legally intervene when they have to correct emerging market imperfections and assist in reducing income inequalities between individual social groups. In this context, government expenditure appears as a sustainable mechanism for internalizing positive or negative effects resulting from activities of economic agents. The latter necessitates the need for continuous study and research of the factors influencing the trend of the increase in government expenditure, with an emphasis on government expenditure for social protection. This type of expenditure has the largest relative share in the total government expenditure in all European countries and reflects the social economic policy related to the support of socially disadvantaged public groups. To a large extent, the amount of government expenditure on social protection is influenced by the demographic structure of the population. Both health care and social protection expenditure are known to be particularly sensitive to changes in the demographic characteristics of the population. Therefore, the purpose of this article is to find out the relationship between basic socio-demographic characteristics of the population, through which socio-demographic indices are constructed for each CEE country, member of the EU and the amount of government expenditure on social protection in the respective country. K. Pearson's coefficient is used to

measure the relationship between government expenditure on social protection and socio-demographic indices. The obtained results show that during the analyzed period, Poland and the Czech Republic are characterized by the highest socio-demographic assessment and Bulgaria and Latvia respectively by the lowest. The author's hypothesis has been proven: there is a positive relationship between the government expenditure of social protection in the CEE countries, members of the EU and the assessment of basic socio-demographic characteristics of the population.

1. Determinants of Government Expenditure Growth: A Theoretical Review

There is a trend of increasing government expenditure, which suggests that a large part of scientific research is related to identifying the reasons for their increase. The economic theory identifies two groups of factors giving rise to the tendency for the growth of government expenditure - demand-side and supply-side factors. Demand-side factors are income growth; industrialization and the associated increased importance of cities to the economy; the demographic and social structures of the population, as well as the way of decision-making in the public sector through the vote of the average voter. In turn, supply-side factors include productivity in the public economy; the bureaucrat's utility function; as well as the institutionalization of the budget process (Marinov, 2017, s. 138; Beev & Yotova, 2021, s. 397; Braun & Dzhaksan, 1998, s. 604). Over the years, research interest has focused on creating models explaining the causes of government expenditure growth. In this connection is the work of the German economist Adolf Wagner, who defined that with the growth of GDP, the size of public expenditure will increase, which will also increase the degree of state participation in the economy (Braun & Dzhaksan, 1998, c. 604; Akitoby, Clements, Gupta & Inchauste, 2006, pp. 908-924; Tsoklinova, 2021, s. 162). The economist points out that the reason for the increasing size of government expenditure is related to the emergence of new unsatisfied needs, while the existing ones are satisfied more fully (Tsoklinova, 2021, s. 162). The latter means that with the development and improvement of public activities, there is a need to increase the supply of public goods, which in turn generates a larger amount of government expenditure. In addition to the above, the production of public goods is costly and largely violates the established principles of generating economic efficiency.

In the specialized scientific literature, there are a number of studies devoted to identifying and systematizing the reasons leading to an increased

demand for public goods, which is a prerequisite for an increase in government expenditure for their production (Seitz, Freigang & Kempkes, 2005, p. 21; Das & Kar, 2016, p. 40; Korwatanasakul, Sirivunnabood & Majoe, 2021; Hondroyiannis & Papapetrou, 2000, pp. 468-488; Owino, 2017, p. 266-276; Lee, Kim & Park, 2016, p. 36; Žokaji, 2016, pp. 383-412; Institute of Macroeconomic Analysis and Development, 2016, p. 17; Ahn, Herce & Garcia, 2005, p. 29). In this context, W. S. Yun (2021) examines the impact of changes in the demographic structure of Malaysia's population on public health expenditure (Yun, 2021, pp. 21-42). The author reaches interesting empirical results that prove that there is a large positive relationship between the demographic structure of the population and the size of government expenditure on healthcare (Yun, 2021, pp. 21-42). In addition to the above, this type of research helps to optimize management decisions in the direction of building a sustainable and balanced social policy, which has a mechanism to prevent the existing conflict between generations regarding the costs and benefits of the production of the public good "healthcare" (Yun, 2021, pp. 21-42). Globally, scientists agree on the establishment of two permanent trends that determine and will determine the specifics of the economic situation and the values of macroeconomic indicators - demographic changes and technological progress. Much of the available research focuses on the consequences for the economy as a result of the demographic changes that have occurred. For example, population aging poses major challenges to the financial sustainability of countries, associated with less income from the economic activity of individuals and, accordingly, higher costs for health care and social protection. The latter is related to the reorganization of a number of activities in the public sector of the national economy, with the implementation of new models of pension and health insurance, which further violates the principles of equality in the distribution of income and resources. In an annual report of the Spanish bank (2018) on the economic consequences of demographic changes, three main factors are systematized: (1) the retirement of the "baby boomers" born in the 1960s; (2) the decline in the birth rate - a process that began in the mid-1970s and (3) the increase in life expectancy characteristic of the current century compared to the beginning of the last century (Economic Consequences of Demographic Change, Banco de Espana, Annual Report, 2018, pp. 211-252). The economic analysis in the report unequivocally emphasizes the impact of demographic factors and the new social structure of the population as a reason for increasing the pressure on the structuring of the state budget and the new realities that the countries will face, related to an increase in government expenditure for the production of public goods in the field of health and social care. In addition, authors A. Chłoń-Domińczak, W. Łatkowski, P. Strzelecki and I. E. Kotowska (2016)

present an interesting study related to the impact of demographic changes on income and expenditure in Europe (Chłoń-Domińczak, Łątkowski, Strzelecki & Kotowska, 2016, p. 19). The article, based on regression models, concludes that a large number of countries in Europe have not adapted their income and expenditure counts in accordance with the demographic changes that have occurred (Chłoń-Domińczak, Łątkowski, Strzelecki & Kotowska, 2016, p. 14). The latter is related to the fact that, due to an aging population, fiscal pressure will increase if radical actions are not taken in terms of social policy (Chłoń-Domińczak, Łątkowski, Strzelecki & Kotowska, 2016, p. 14). The authors support the thesis of other researchers of the need to continuously reflect current trends in the demographic structure of the population in applied public policies (Chłoń-Domińczak, Łątkowski, Strzelecki, & Kotowska, 2016, p. 15). In the context of demographic changes and their impact on economic stability and the size of public health expenditure in Poland, is the article of authors M. Chawla, D. Kawiorska и G. Chellaraj (Chawla, Kawiorska & Chellaraj, p. 17). The author team draws many important conclusions concerning all countries characterized by demographic and political-economic transitions. Accordingly, the demographic and economic changes that have occurred additionally put pressure on the balanced functioning of state budgets and are one of the reasons that provoke transformations of the currently existing health and pension systems in these countries (Chawla, Kawiorska & Chellaraj, p. 13). At the same time, such research and the obtained results emphasize the search for efficient approaches to financing, especially of health services and more efficient management of budgetary resources, especially in periods of continuous growth of government expenditure, which in turn is a prerequisite for the formation of large budget deficits and use of debt financing.

The literature review shows that the efforts of scientists in this field are focused on the study of demographic changes on the growth of health care expenditure, because they are particularly sensitive to the change in the demographic structure of the population (Yun, 2021, pp. 21-42). In this regard, authors C. Okafor and O. Eiya (2011) use 4 variables – (1) inflation; (2) national debt; (3) tax revenues and (4) population size and based on a regression model look for a relationship with the growth of total government expenditure in Nigeria for the period 1999 – 2008 (Okafor & Eiya, 2011, pp. 44–50). The authors identified some interesting relationships: inflation has a negative impact on the growth of total government expenditure, while government debt, tax revenues and population size have a significant positive impact on the growth of total government expenditure, which proves the theoretical hypothesis of a number of authors that the general cause for of the increase in government spending is the size of population (Okafor & Eiya, 2011, pp. 47-48). In addition to the size of population as a significant factor in

the growth of government expenditure, a large number of studies determine that the age structure of the population also influences their size and, more specifically, the amount of government expenditure on health care.

In this regard, the article by U. Korwatanasakul, P. Sirivunnabood and A. Majoe (2021) examines the demographic transition and its impact on the fiscal stability of East and Southeast Asia (Korwatanasakul, Sirivunnabood & Majoe, 2021, p. 23). The authors use the following variables that describe the demographic transition of the studied countries – (1) government expenditure on healthcare as a share of GDP, including healthcare goods and services consumed, but excluding healthcare capital expenditure; (2) age dependence, as a ratio of the population over 64 years to the number of the working-age population between 15 and 64 years and (3) the share of the population over 64 years in the total population (Korwatanasakul, Sirivunnabood & Majoe, 2021, p. 11). An important conclusion that the authors make based on the obtained results is that the trend towards population aging has a positive correlation with the growth of government expenditure on healthcare, and specifically: a 1% increase in the share of the elderly population causes between 0.1% and 0.2% increase in government expenditure on healthcare (Korwatanasakul, Sirivunnabood & Majoe, 2021, p. 13).

In addition to the above, much of the research has focused on building macro models that account for the existing differences between countries in terms of the amount of government expenditure on healthcare, with a commonly used variable in macro models being the share of the population over 65 years in the total population (Ahn, Herce & Garcia, 2005, p. 6). Here it is necessary to specify that a large number of researchers prove that certain types of government expenditure such as those related to education and healthcare are related to the so-called generational conflict (Ahn, Herce & Garcia, 2005, p. 27; Borge & Rattsø, 1995, pp. 705-726) and scientists define them as expenditure of age. In their article, N. Ahn, N., J. A. Herce and J. R. Garcia (2005), in examining the demographic situation in Spain and its impact on healthcare expenditure, use the following variables: (1) government healthcare expenditure; (2) government expenditure on education; (3) population over 15 years; (4) population between 15 and 64 years; (5) population over the age of 64; (6) real gross domestic product per capita (Ahn, Herce & Garcia, 2005, p. 29). Demographic factors that influence the amount of government healthcare expenditure are defined in the article by C. Lindeberg and T. McCarthy (2021), namely: (1) the change in the size of the population; (2) change in the age structure of the population; (3) change in the gender structure of the population; (4) projections of population health status and (5) trends in population aging (Lindeberg & McCarthy, 2021, p. 49). The authors emphasize the so-called “demographic expenditure pressure” resulting from an

increasing global population and aging trends (Lindeberg & Mccarthy, 2021, p. 49).

Many authors are looking for the cause for the increase of the government expenditure on healthcare. Some of the publications are concerned with determining the economic drivers driving the growth of government healthcare expenditure, others look for factors beyond the economic motive, while still others combine both economic and demographic factors influencing the size of government healthcare expenditure. In this context is the article by Z. Mitkova, M. Doneva, N. Gerasimov, K. Tachkov, M. Dimitrova, M. Kamusheva and G. Petrova (2022). In the category of demographic indicators, the authors included: (1) average life expectancy; (2) population size; (3) the population share of people beyond 65 and (4) population outside working age (retirement age) with data taken from the National Statistical Institute (Mitkova, Doneva, Gerasimov, Tachkov, Dimitrova, Kamusheva & Petrova, 2022, p. 49). At the same time, the demographic transformation is the cause of changes in economic indicators. In this context, indicators such as the aging of the population, the increase in life expectancy, mortality and natural increase, as well as birth rates affect the demand for health services related to the fact that the treatment of diseases that, with longer life, become chronic, is always costly and affects the amount of government healthcare expenditure.

2. Research methodology

Based on the theoretical study on the subject, the research interest is focused on measuring the dependence between the main socio-demographic characteristics of the population of the EU Member States from CEE and the size of government expenditure on social protection. For this purpose, a group of quantitative indicators reflecting basic socio-demographic characteristics of the population is used and a quantitative assessment - index is constructed for each EU Member States from Central and Eastern Europe during the period 2017 - 2021. Based on the studied literature and comparability the following indicators are used for the indicators measuring basic socio-demographic characteristics of the population in the EU Member States from Central and Eastern Europe: *indicator 1. Population size; indicator 2. Old-age dependency ratio (population 65 years or over to population 15 to 64 years); indicator 3. Average life expectancy; indicator 4. At-risk-of-poverty rate; indicator 5. Long-term unemployment from 15 to 74, percentage of population in the labour force; indicator 6. Gini coefficient of equivalised disposable income and indicator 7. Persons at risk of poverty or social exclusion by age and sex.* These indicators serve to generate a complex quantitative assessment (index)

of basic socio-demographic characteristics of the population of each EU Member States from Central and Eastern Europe. Accordingly, the correlation coefficient (r) measures the dependence between the size of government expenditure on social protection and the resulting value of the socio-demographic population index for each EU Member States from Central and Eastern Europe for the period 2017-2021.

Calculating the socio-demographic population index of the EU Member States from Central and Eastern Europe requires first determining their distance to a reference point in the multidimensional space. The coordinates of the reference point are the extreme values of the seven socio-demographic indicators mentioned above, and the location of the countries relative to it is determined by formula 1 (Tsoklinova & Kolev, 2021, pp. 53-66; Stoenchev, 2016, s. 122):

$$k_{ie} = \sqrt{\sum (z_{ij} - z_{ej})^2}, \quad (1)$$

where k_{ie} is the Euclidean distance between basic socio-demographic indicators for i -th EU member state from CEE and the reference point;

z_{ij} is the standardized meaning of j -th socio-demographic indicator of the i -th EU member state;

z_{ej} is the standardized value of the j -th socio-demographic indicator at the reference point.

The socio-demographic index of the i -th EU member state from CEE is normalized between 0 and 1 and is determined by a formula (2) (Tsoklinova & Kolev, 2021, pp. 53-66; Stoenchev, 2016, s. 122):

$$I_{SDi} = 1 - \frac{k_{ie}}{k_e}, \quad (2)$$

where I_{SDi} is the socio-demographic index of the i -th EU member state from CEE;

k_e is the sum of the arithmetic mean of the 11 Euclidean distances determined by formula (1) and their double standard deviation.

3. Results and discussion

Table 1 presents the socio-demographic population index of the EU Member States from Central and Eastern Europe for the period 2017-2021. As can be seen from the table, during the analyzed five years Poland has the largest socio-demographic index of the population among CEE countries, respectively: 2017 - 0.6809; 2018 - 0.6606; 2019 - 0.6578; 2020 - 0.6529 and 2021 - 0.6433. Despite the first place it occupies, the socio-demographic index of Poland decreases in each subsequent year of the considered period. The situation is identical with the Czech Republic, which is in second place in the five analyzed years, ranking after Poland in terms of the value of the socio-demographic index. In third and fourth place are Slovenia and Hungary, respectively, and only in 2020 Slovenia ranks fourth, giving way to Hungary's third place. In this line of thought, the worsening socio-demographic characteristics of Slovenia in 2020 (0.4425) and 2021 (0.4496) compared to the previous three years – 2017 (0.4644); 2018 (0.4730) and 2019 (0.4600). According to the calculated values of the socio-demographic population index, during the analyzed period, Slovakia ranks fifth, marking the lowest value of the socio-demographic population index in 2021. The table shows that at the bottom of the ranking during the period under consideration are Lithuania, Latvia and finally Bulgaria. It is visible from the obtained results for Bulgaria that the value of the socio-demographic population index in the first two years - 2017 (0.0516) and 2018 (0.0723) tends to increase, while in 2019 (0.0287) and 2020 (0.0245) sharply declines to mark an increase in 2021 (0.0418). In terms of the calculated index, Bulgaria lags behind Romania, which was ranked seventh in 2017 (0.3043) and eighth in the remaining four years: 2018 (0.2770); 2019 (0.2646); 2020 (0.2676) and 2021 (0.2658). The obtained values of the socio-demographic population index of the CEE countries in the period 2017-2021 indicate large differences between the individual countries in terms of the first and last in the ranking

At the same time, table 2 presents the values of the correlation coefficient, reflecting the degree of dependence between government expenditure for social protection in the EU Member States from Central and Eastern Europe in the period 2017-2021, and their socio-demographic population index, presented in table 1. From the values of correlation coefficients, it can be concluded that the degree of dependence between the studied variables is large during the five years of the studied period, as the most significant value of the coefficient of correlation (r) were found in 2017 and it is 0.7336.

Table 1.

Ranking of the EU Member States from CEE by values of the socio-demographic population index for the period 2017-2021.

Socio-demographic population index of the EU Member States from CEE for 2017		Socio-demographic population index of the EU Member States from CEE for 2018		Socio-demographic population index of the EU Member States from CEE for 2019		Socio-demographic population index of the EU Member States from CEE for 2020		Socio-demographic population index of the EU Member States from CEE for 2021	
Poland	0.6809	Poland	0.6606	Poland	0.6578	Poland	0.6529	Poland	0.6433
Czech Republic	0.5568	Czech Republic	0.5430	Czech Republic	0.5332	Czech Republic	0.5322	Czech Republic	0.5103
Slovenia	0.4644	Slovenia	0.4730	Slovenia	0.4600	Hungary	0.4458	Slovenia	0.4496
Hungary	0.4428	Hungary	0.4434	Hungary	0.4446	Slovenia	0.4425	Hungary	0.4272
Slovakia	0.4019	Slovakia	0.4190	Slovakia	0.4122	Slovakia	0.4174	Slovakia	0.3703
Estonia	0.3100	Croatia	0.3133	Croatia	0.3247	Croatia	0.3229	Estonia	0.2988
Romania	0.3043	Estonia	0.2944	Estonia	0.3033	Estonia	0.3112	Croatia	0.2718
Croatia	0.2952	Romania	0.2770	Romania	0.2646	Romania	0.2676	Romania	0.2658
Lithuania	0.1824	Lithuania	0.1885	Lithuania	0.2314	Lithuania	0.2096	Lithuania	0.2256
Latvia	0.1593	Latvia	0.1184	Latvia	0.1335	Latvia	0.1840	Latvia	0.1270
Bulgaria	0.0516	Bulgaria	0.0723	Bulgaria	0.0287	Bulgaria	0.0245	Bulgaria	0.0418

Source: Authors' calculations based on Eurostat data (2024)

Table 2

Dependence between government expenditure on social protection and the socio-demographic population index in the period 2017-2021

Years	Correlation coefficient (r)*	Degree of dependence
2017	0.7336; 0.010	large
2018	0.7128; 0.014	large
2019	0.7011; 0.016	large
2020	0.7006; 0.016	large
2021	0.7063; 0.016	large

Source: Authors' calculations based on Eurostat data (2024)

*Correlation coefficients are significant at the 0.05 level (2-tailed). After the correlation coefficients, the significance levels are presented. The data were processed in SPSS.

Conclusion

Based on the literature review, calculated socio-demographic population index and correlation analysis, the following conclusions can be drawn:

➤ During the analyzed period 2017-2021, Poland and the Czech Republic stand out among the EU Member States from Central and Eastern Europe with the largest socio-demographic assessment. The socio-demographic population index (I_{SD}) values for Poland in chronological order are 0.6809, 0.6606, 0.6578, 0.6529 and 0.6433, and for the Czech Republic 0.5568, 0.5430, 0.5332, 0.5322 and 0.5130.

➤ According to the values of the calculated index (I_{SD}), Bulgaria and Latvia stand out with the most unfavorable socio-demographic characteristics during the analyzed period. Regarding the first side, the index values in chronological order are 0.0516, 0.0723, 0.0287, 0.0245 and 0.0418, and regarding the second side they are respectively 0.1593, 0.1184, 0, 0.1335, 0.1840 and 0.1270.

➤ From the values of the socio-demographic index presented in table 1, it is obvious that the socio-demographic characteristics of the population of the 11 EU Member States from Central and Eastern Europe worsened at the end of the analyzed period compared to its beginning.

➤ The values of the correlation coefficient (r), measuring the degree of dependence between government expenditure on social protection and the socio-demographic population index (I_{SD}) are respectively 0.7336 (2017), 0.7128 (2018), 0.7011 (2019), 0.7003 (2020) and 0.7063 (2021). This proves the hypothesis guiding the research, namely that there is a positive relationship between social expenditure in the EU Member States from Central and Eastern Europe and the assessment of basic socio-demographic characteristics of the population.

References

- Beev, Iv. Yotova, L. (2021). *Ikonomika na obshtestveniya sector – UNSS*, Sofiya, s. 397.
- Braun, S. B. Dzhaksan, P. M. (1998). *Ikonomika na publichniya sector. Adaptirab variant*, izdatelstvo “PSSA”, Sofiya, s. 604.
- Marinov, E. (2017). *Ikonomika na publichiya sector – lektsionen kurs*, Sofiya, Izdatelstvo EBM, ISBN 978-619-90568-3-7. s. 138.
- Stoenchev, N. (2016). *Kachestvo na zhivot i spetsializatsiya na teritoriyata po ikonomicheski deynosti v Balgariya (statisticheski aspekti)*, Sofiya, s. 122.

- Tsoklinova, M. (2021). Tendentsii v razvitiio na razkhodite na podsektor "Tsentralno dŕzhavno upravlenie" v strani chlenki na ES, "Avangard Prima", ISBN 978-619-239-564-3, p. 162.
- Akitoby, B., B. Clements, S. Gupta, G. Inchauste. (2006). Public spending, voracity, and Wagner's law in developing countries. *European Journal of Political Economy* 22. pp. 908-924.
- Ahn, N., Herce, J. A., Garcia, J. R. (2005). Demographic Uncertainty and Health Care Expenditure in Spain, No 2005-07, Working Papers from FEDEA, Madrid, p. 29.
- Borge, L-E., Rattsø, J. (1995). Demographic shift, relative costs and the allocation of local public consumption in Norway, *Regional Science and Urban Economics*, 25(6), pp. 705-726.
- Chawla, M., Kawiorska, D., Chellaraj. G. The Impact of Economic and Demographic Factors on Government Health Expenditures in Poland, Data for Decision Making Project Department of Population and International Health Harvard School of Public Health, Boston, Massachusetts, p. 13-17, https://www.hsph.harvard.edu/international-health-systems-program/wp-content/uploads/sites/1989/2020/01/Poland_No-72.pdf, посетено на: 6.01.2024 г.
- Chłoń-Domińczak, A., Łątkowski, W., Strzelecki, P., Kotowska, I. E. (2016). Impact of Demographic Change on Public Expenditure and Revenue in Europe, 14th International Conference on Pension, Insurance and Savings – Paris, p. 19.
- Das, P. K., Kar, S. (2016). Public Expenditure, Demography and Growth: Theory and Evidence from India, IZA Discussion Paper No. 9721, p. 40.
- Economic Consequences of Demographic Change, Banco de Espana, Annual Report, 2018, pp. 211-252.
- Institute of Macroeconomic Analysis and Development, Demographic change and its economic and social consequences, 2016, p. 17.
- Hondroyiannis, G., Papapetrou, E. (2000). Do Demographic Changes Affect Fiscal Developments?, *Public Finance Review*, Vol. 28 No. 5, pp. 468-488.
- Korwatanasakul, U., Sirivunnabood, P., Majoe, A. (2021). Demographic Transition and its Impacts on Fiscal Sustainability in East and South-east Asia. ADBI Working Paper 1220. Tokyo: Asian Development Bank Institute. Available: <https://www.adb.org/publications/demographic-transition-impacts-fiscal-sustainability-east-southeast-asia>, посетено на: 7.01.24 г.
- Lee, S. H., Kim, J., Park, D. (2016). Demographic Change and Fiscal Sustainability in Asia, ERIA Discussion Paper Series, p. 36.

- Lindeberg, C., Mccarthy, T. (2021). Impact of Demographic Change on Health Expenditure 2022-2025, DEPARTMENT OF HEALTH, Spending Review 2021, p. 49.
- Mitkova, Z., Doneva, M., Gerasimov, N., Tachkov, K., Dimitrova, M., Kamusheva, M., Petrova, G. (2022). Analysis of Healthcare Expenditures in Bulgaria. *Healthcare* 2022, 10, 274, p. 49, <https://doi.org/10.3390/healthcare10020274>
- Okafor, C., Eiya, O. (2011). Determinants of growth in government expenditure: An empirical analysis of Nigeria. *Research Journal of Business Management*, 5(1), 44–50.
- Owino, B. (2017). Public Expenditure in the Social Sector and Economic Growth in Kenya, *Journal of Economics and Sustainable Development*, ISSN 2222-1700 (Paper) ISSN 2222-2855 (Online), Vol.8, No.14, p. 266-276.
- Seitz, H., Freigang, D., Kempkes, G. (2005). Demographic Change and Federal Systems, Working Paper 2005 (7), IIGR, Queen's University, p. 21.
- Tsoklinova, M., K. Kolev. (2021). Estimation of Life Quality in EU Member States, *Journal of Balkan Ecology*, Volume 24, No 1, ISSN 1311-0527, pp. 53-66.
- Yun, W. S. (2021). Impact of Demographical Structural Change on Public Health Care Expenditure in Malaysia *Applied Economics Journal* Vol. 28, No. 2, pp. 21-42.
- Žokaji, M. (2016). The impact of population aging on public finance in the European Union, *Financial Theory and Practice*, 40 (4), pp. 383-412. https://ec.europa.eu/eurostat/databrowser/view/gov_10a_exp/default/table?lang=en&category=gov.gov_gfs10.gov_10a, Eurostat, General government expenditure by function (COFOG), visited on: 11.02.2024.
- <https://ec.europa.eu/eurostat/web/main/data/database>, Eurostat, Population and social conditions, visited on: 17.01.2024.

Konstantin N. Kolev, PhD is an Associate Professor, at the Department of Forestry Management of the University of Forestry – Sofia, Bulgaria. **Scientific interests:** application of quantitative methods in the analysis of economic processes; analysis of national and company competitiveness; assessment of investments in real assets.

ORCID ID: 0000-0002-7060-9087.

Maya A. Tsoklinova, PhD is a Chief Assistant Professor, at the Department of Economics of the University of National and World Economy – Sofia, Bulgaria. **Scientific interests:** microeconomic theory, macroeconomic theory, economy and public sector, welfare economics.

ORCID ID: 0000-0001-5388-8056.

ISSN 0323-9004

Economic Archive

Svishtov, Year LXXVII, Issue 2 - 2024

Marketing Strategy for a Public Library

**Tax and Social Insurance Burden on Labour Force
in Bulgaria and the European Union**

**Economic Recovery and Impacts of Crises on the Tax
Base in Bulgaria**

**Dependence Between Basic Socio-demographic
Characteristics of the Population and the Size
of Government Expenditure on Social Protection**

Solutions and Prospects for Ensuring Energy Security

D. A. TSENOV ACADEMY OF ECONOMICS
SVISHTOV



EDITORIAL BOARD:

Prof. Andrey Zahariev, PhD – Editor-in-chief
Prof. Yordan Vasilev, PhD – Deputy Editor
Prof. Stoyan Prodanov, PhD
Prof. Todor Krastevich, PhD
Assoc. Prof. Iskra Panteleeva, PhD
Assoc. Prof. Plamen Yordanov, PhD
Assoc. Prof. Svetoslav Iliychovski, PhD
Assoc. Prof. Plamen Petkov, PhD
Assoc. Prof. Anatoliy Asenov, PhD

INTERNATIONAL BOARD:

Prof. Mihail A. Eskindarov, DSc (Econ) – Financial University under the Government of the Russian Federation, Moscow (Russia).
Prof. Grigore Belostechnik, DSc (Econ) – Moldovan Academy of Economic Studies, Chisinau (Moldova).
Prof. Mihail Zveryakov, DSc (Econ) – Odessa State Economic University, Odessa (Ukraine).
Prof. Andrey Krisovatiy, DSc (Econ) – Ternopil National Economic University, Ternopil (Ukraine).
Prof. Yon Kukuy, DSc (Econ) – Valahia University, Targovishte (Romania).
Prof. Ken O'Neil, PhD – University of Ulster (Great Britain)
Prof. Richard Thorpe, PhD – Leeds University (Great Britain)
Prof. Olena Nepochatenko, DSc (Econ) – Uman National University of Horticulture, Uman (Ukraine)
Prof. Dmytro Lukianenko, DSc (Econ) – Kyiv National Economic University named after Vadym Hetman, Kyiv (Ukraine)
Assoc. Prof. Maria Cristina Stefan, PhD – Valahia University of Targoviste (Romania)
Assoc. Prof. Anisoara Duica, PhD – Valahia University of Targoviste (Romania)
Assoc. Prof. Vladinir Klimuk, PhD – Baranovichi State University, Branovic (Belarus)

Support Team

Rositsa Prodanova, PhD – Technical Secretary
Anka Taneva – Bulgarian Copy Editor
Ventsislav Dikov – Senior Lecturer in English – Translation from/into English
Margarita Mihaylova, PhD – Senior Lecturer in English – Translation from/into English

Editorial address:

2, Emanuil Chakarov street, Svishtov 5250
Prof. Andrey Zahariev, PhD – Editor-in-Chief
☎ (+359) 889 882 298
Rositsa Prodanova, PhD – technical secretary
☎ (+359) 631 66 309, e-mail: nsarhiv@uni-svishtov.bg
Blagovesta Borisova – computer graphic design
☎ (+359) 882 552 516, e-mail: b.borisova@uni-svishtov.bg

© Academic Publishing House “Tsenov” – Svishtov

© D. A. Tsenov Academy of Economics – Svishtov

ECONOMIC ARCHIVE

YEAR LXXVII, BOOK 1 – 2024

CONTENTS

Lyubomir Lyubenov

Marketing Strategy for a Public Library /3

Angel Angelov

Tax and Social Insurance Burden on Labour Force in Bulgaria
and the European Union /21

Petko Angelov

Economic Recovery and Impacts of Crises on the Tax Base in Bulgaria /47

Konstantin Kolev, Maya Tsoklinova

Dependence Between Basic Socio-demographic Characteristics of the
Population and the Size of Government Expenditure on Social Protection /60

Miroslav Dimitrov, Anatoly Andreev

Solutions and Prospects for Ensuring Energy Security /73