DOI: 10.15838/esc.2022.4.82.11
UDC 314.174, LBC 60.7

Demographic Dividends: Formation and Use in the CIS and the Baltic Countries

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For citation: Dobrokhleb V.G., Kuchmaeva O.V., Bragin A.D., Afzali M. (2022). Demographic dividends: Formation and use in the CIS and the Baltic countries. *Economic and Social Changes: Facts, Trends, Forecast,* 15(4), 172–188. DOI: 10.15838/esc.2022.4.82.11

Abstract. The article investigates one of the most pressing problems of the modern world – demographic aging and its impact on demographic security in the CIS. Changes in the age structure are happening on a global scale, and show increasing dynamics. At the same time, demographic aging has significant regional differences. The purpose of the study is to identify general trends, regional differences in population aging in the post-Soviet countries, the formation and use of demographic dividends. When analyzing the second demographic dividend, we propose to apply the term "resource potential of the older generation" that largely determines the capabilities of the aging population. We use the following methods: logical analysis, synthesis, generalization, induction and deduction, a systems approach to the analysis of demographic phenomena, calculations of demographic coefficients used in assessing the age structure, its dynamics and the formation of demographic dividends. The information base of the study includes data of the current accounting of demographic events presented by the Statistical Committee of the CIS, materials of Eurostat, the UN, domestic and foreign scientific publications, as well as materials of own research on the topic of the article. The main results of the work confirm the conclusion that the post-Soviet countries have significant differences in the age structure of their population and the intensity of demographic aging. We determine that the acceleration of the aging process was a general trend in most of them. This brings to the fore the problems associated with the need to form and effectively use the second demographic dividend, which will promote economic welfare of the countries.

Key words: demographic aging, first demographic dividend, second demographic dividend, post-Soviet countries.

Introduction. Problem statement

Countries go through different stages of the demographic transition in the course of their development. In a number of cases (two are known so far), "windows of demographic opportunities" open. States can use the demographic factor (size, structure, and quality of the population) for economic development. At the same time, it is necessary to take into account the trends in demographic dynamics, which requires significant organizational and financial investments in the implementation of economic and social policy, considering emerging demographic changes.

The purpose of the study is related to the identification of common trends, regional differences in the aging of the population of the post-Soviet countries, the formation and use of demographic dividends.

This paper attempts to determine the features of the relationship between the transformation of the population age structure in the post-Soviet countries, including trends in demographic aging and the formation of demographic dividends, and their socio-economic development. The results of the analysis can be significant for the construction of socio-economic policies by states at different stages of the demographic dividend implementation.

The concept of demographic security has become part of economic and political disciplines. In the vast majority of countries in the world, an assessment of the situation suggests an increasing influence of the demographic component on socio-economic development (Bloom et al., 2003; Chand, 2017; Misra, 2017; Kashif, Shahid, 2019). As a consequence, the governments of various states are objectively forced to deal with a wide range of demographic problems. Most often, in the context of demographic security, one considers the protection of socio-economic development of the country from demographic threats, which provides the potential for population reproduction.

Research in recent years proves that demographic factors play a significant role in the observed changes in the share of labor income. There is a link between changes in the share of the working-age population and per capita economic growth and poverty rates (Bloom et al., 2003; Macunovich, 2012). The mechanisms by which demographic change can affect economic performance, thereby ensuring the well-being of a country's population, are of particular interest. Increases in the proportion of the working-age population and decreases in the proportion of dependent children have been found to be associated with increases in gross domestic product per capita, which has a similarly positive effect on poverty reduction (Cruz, Ahmed, 2018).

The impact of age structure on socio-economic development has attracted the attention of researchers from different countries. For example, the demographic dividend has been one of the most significant factors that have contributed to economic growth in East Asian countries (Bloom et al., 1999; Bloom, Canning, 2001). The most significant demographic dividend was received in South Korea between 1965 and 2000 (Gribble, 2012).

The fixed-effects model analysis of the BRICS countries and the European Union has shown that there is a positive relationship between GDP growth rates and the demographic dividend (Misra, 2017). However, the situation is very differentiated even within individual regions. In Brazil, for example, a study of microdata suggests that attention needs to be paid to creating tools for a second demographic dividend (Baerlocher et al., 2019). A second demographic dividend is being considered for Spain. Using data from intergenerational transfer accounts, researchers conclude that after 2040, given population aging trends, using a second demographic dividend will be very problematic (Abío et al., 2017).

A number of states on the Asian continent have seen very significant increases in their young populations in recent years, which can contribute to economic growth. In Uzbekistan, for example, over 26 years (1991–2017), the share of the working-age population increased by almost 17.5%, and now this figure is almost 60.5% (Mirzakarimova, Khajiyev, 2020).

Evidence from South Asian countries shows that demographic potential without sound macroeconomic and demographic policies will not become a demographic dividend. Econometric models reveal that increasing the proportion of young dependents without effective education and health measures reduces economic growth in South Asian countries in the long run (Kashif, Shahid, 2019). Countries in the region need to think about the possibility of a second demographic dividend as the aging process progresses. An aging population leads to numerous problems in the region, including rising pension and health care costs, higher dependency ratios, and changing family dynamics (Chand, 2017).

Significant attention in the context of demographic dividend opportunities is currently being paid to African states, where the possible economic development benefits of the first demographic dividend are in question (Cardona et al., 2020).

The relationship between demographic and economic processes is complex and ambiguous. Demographic dividends with declining population growth rates increase well-being in the short term and decrease it in the long term (Ziesemer, Gässler, 2021). The identification of these relationships is due to the high relevance of the study of the demographic dynamics of the CIS and Baltic countries, as these regions are characterized by significant differences in the structure of population reproduction.

While previous works have demonstrated the significant contribution of the first demographic

dividend to China's economic growth (Wang, Mason, 2005), current research on China's age structure is focused on finding ways to take advantage of the second demographic dividend – increasing employment and labor force participation among the elderly (Fang, 2020). Researchers prove the increasing role of education and investment in education in the formation of human capital (Bairoliya, Miller, 2021) in China under the changing focus of demographic policy. Education policy, according to the researchers, will mitigate the effects of a possibly higher birth rate in the future, without increasing which it is difficult to solve the problems of the pension system caused by an aging population.

The increase in labor supply due to changing demographic structure is not a purely demographic gift. The magnitude of the benefit depends on the economy's ability to use additional workers productively. For the demographic dividend to work, the young population must have access to quality education, adequate nutrition, and health care.

Researchers identify a number of conditions required for the use of the benefits derived from the demographic dividend. According to Z.G. Kazbekova, who supports the viewpoint of D. Bloom and D. Canning (Bloom, Canning, 2004), the most important condition is the ability of the economy to create jobs for an ever-increasing working-age population; this depends on the quality of state institutions, macroeconomic governmental policy, and education policy. If the government does not pursue a proper macroeconomic policy aimed at implementing the demographic dividend, then the growth of working-age population can lead to rising unemployment, political instability, crime, and a decline in social capital; all this aggravates the problem of demographic security (Kazbekova, 2018).

In the conditions of demographic changes two directions of research become important. The first direction makes it possible to determine general trends in demographic dynamics in a particular region; the second is related to the identification of specific demographic trends. On the one hand, the age distribution of the populations in the countries that became independent in 1991 was influenced by general sociopolitical shocks, in particular the Great Patriotic War (1941–1945) and demographic policy measures (e.g., those aimed at increasing the birth rate in 1981–1983). On the other hand, there are very significant differences in the role of cultural factors in shaping demographic behavior patterns, national traditions, and economic well-being. All this determines the relevance of considering the transformation of the age distribution in the post-Soviet countries, identifying typical and specific characteristics, the stages of formation of the demographic dividend. The article presents the author's definitions of the second demographic dividend, as well as some findings on the dynamics of the population aging and the formation of the demographic dividend in the CIS and Baltic countries, and poses the problems of demographic security associated with these processes. The study focuses on the consideration of the demographic parameters of societal development as a condition for economic well-being.

Research methodology. Sources and methods

The research methodology is based on a system approach to the analysis of demographic phenomena, with wide application of both general scientific methods, including logical analysis, synthesis, generalization, induction and deduction, and specific tools for studying demographic events and processes, including calculations of demographic coefficients. The analysis is based on the data of the current record of demographic events, published on the website of the CIS Statistical Committee[1], in particular the data of the

[1] CIS Statistical Committee. Available at: http://www.cisstat.com/ (accessed: January 1, 2022).

compilation "Population and social indicators of the CIS countries and individual countries of the world 2017–2020". We used UN ECE, Department of Economic and Social Affairs Population Dynamics UN statistics since 1950, including forecasts up to 2050. To achieve this goal, we analyzed scientific publications on the issue, taking into account the results of the author's research.

We conducted calculations of demographic coefficients used in assessing the age structure, its dynamics, and the formation of demographic dividends, including the potential support ratio, considered as the ratio of the working-age population (15–64 years old) to one elderly person (aged 65 years and older). To analyze changes in the age structure, we used dependency ratios, which show the ratio of the population aged 0–14 and over 65 to the population aged 15–64.

The application of these approaches made it possible to identify general trends and differences in the demographic dynamics of the CIS and Baltic countries over the thirty years since the dissolution of the USSR, to show how demographic dividends are formed in these countries, and to formulate demographic security problems associated with these demographic processes, which determines the importance of taking demographic characteristics into account in economic development strategies.

General trends and differences in the dynamics of the age distribution in the post-Soviet countries

Researchers argue that the growing number and proportion of the elderly and old people in the population ("demographic aging") is a challenge for modern society, both globally and nationally (Sidorenko et al., 2013; Alper et al., 2016). Demographic aging is a process associated with a change in the age structure of the population, namely an increase in the number and proportion of old people in its composition. It touches on a variety of aspects of individual and family life, as well as society as a whole. These challenges also affect, to varying degrees, the countries of the former USSR, which are at different stages of the demographic transition. The multidirectional and differentiated changes in demographic processes in the countries of the former USSR have led to significant shifts in the age structure of the population.

The countries of the former Soviet Union can be divided into three groups according to the level of demographic aging.

In 2020, the demographically "oldest" countries in the former Soviet Union with the highest proportion of people aged 65 and older were Latvia (20.7%), Lithuania (20.6%), Estonia (20.4%), Ukraine (17.0%), Belarus (15.6%), Russia (15.5%), and Georgia (15.3%). The countries with a "young" population are most of the Central Asian countries and the Republic of Azerbaijan. In Uzbekistan and Turkmenistan, the share of the population aged 65 and older is less than 5% *(Tab. 1)*.

For most countries over the hundred years considered, the share of the population in the older age group has increased. At the same time, it is noteworthy that the relative number of elderly people in Azerbaijan, Uzbekistan, Turkmenistan, Kyrgyzstan and Tajikistan decreased during the 1990s, which is associated with the growth of fertility in these territories.

In the post-Soviet period, the process of demographic aging was most intense in the Baltic states, where the share of people aged 65 and older almost doubled.

The aging process is accompanied by a significant disproportion in the gender structure of the population at older ages *(Tab. 2)*. Due to the significant excess of women's life expectancy over that of men, there is a serious outnumbering of women, especially in the ages over 75. Belarus, Russia, Kazakhstan, and Kyrgyzstan stand out in this respect.

Table 1. Proportion of population aged 65 and older in the republics of the USSR and the former Soviet Union in 1950–2050, % (countries are presented in decreasing order in 2050)

Country	1950	1970	1990	2000	2010	2020	2030	2050
Lithuania	9.4	10.2	10.9	13.9	17.3	20.6	26.4	29.0
Estonia	10.6	11.8	11.7	15.0	17.5	20.4	23.6	28.7
Latvia	5.6	12.0	11.9	15.0	18.2	20.7	25.0	27.8
Ukraine	7.6	9.3	12.0	13.8	15.7	17.0	20.0	25.5
Belarus	8.6	9.0	10.7	13.5	14.0	15.6	20.5	24.0
Moldova	7.7	6.3	8.3	9.4	10.2	12.5	17.0	23.0
Russia	4.8	7.7	10.3	12.4	13.1	15.5	19.6	22.9
Georgia	10.1	7.7	9.3	12.9	14.2	15.3	18.5	21.8
Armenia	8.3	5.6	5.6	10.0	11.0	11.8	16.9	21.4
Azerbaijan	7.1	5.2	4.6	5.9	5.9	6.7	11.8	17.5
Kazakhstan	6.5	5.4	5.9	6.8	6.8	7.9	11.1	14.2
Uzbekistan	5.9	5.9	4.1	4.6	4.5	4.8	7.6	12.2
Turkmenistan	5.9	4.7	3.8	4.3	4.1	4.8	7.1	10.6
Kyrgyzstan	8.2	6.2	5.0	5.5	4.5	4.7	7.2	10.1
Tajikistan	4.4	5.1	3.8	3.6	3.3	3.2	5.1	7.5

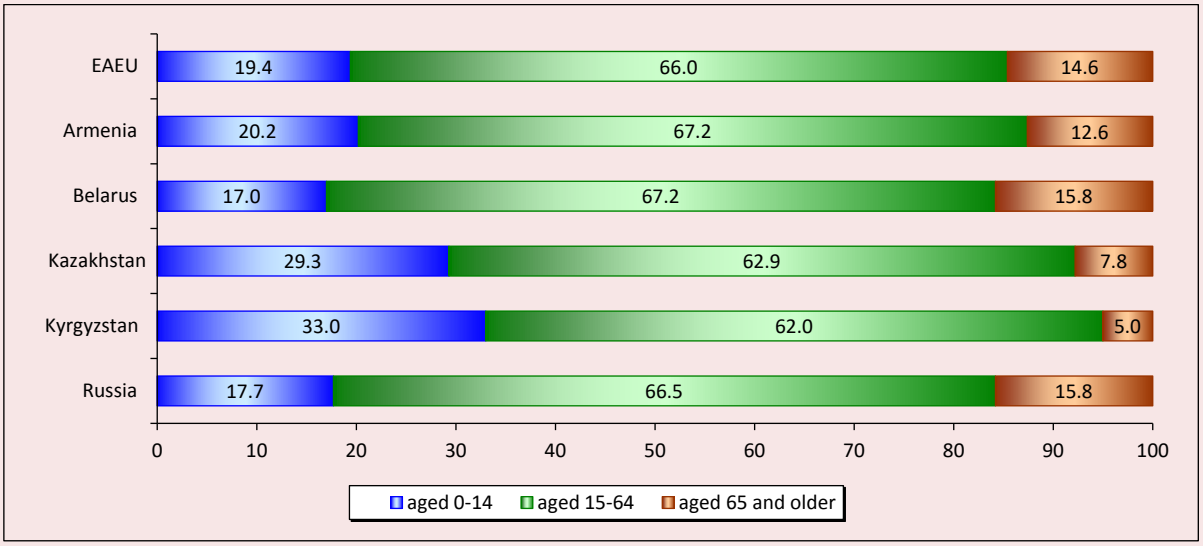
Source: United Nations, Department of Economic and Social Affairs, Population Division, 2019. *World Population Prospects 2019,* Volume II: Demographic Profiles (accessed: January 15, 2022).

Table 2. Ratio of men to women at older ages in the former USSR countries in 2020, number of men per 1,000 women

Country	Age, years								
	60–64	65–69	70–74	75–79	80–84	85–89	90–94	95–99	100+
Lithuania	769	663	553	479	506	326	246	193	187
Estonia	819	699	629	502	396	329	269	192	140
Latvia	775	659	560	456	412	313	237	170	165
Ukraine	720	620	558	450	369	337	240	169	152
Belarus	749	640	582	414	328	257	203	107	69
Moldova	767	688	641	512	411	382	247	159	132
Russia	722	630	554	422	359	298	223	121	91
Georgia	785	708	633	549	465	436	317	198	162
Armenia	746	711	669	603	550	559	488	321	227
Azerbaijan	867	821	739	673	578	524	399	230	149
Kazakhstan	772	653	590	467	421	373	263	112	82
Uzbekistan	874	852	764	755	661	536	458	286	244
Turkmenistan	786	726	733	710	592	502	408	261	220
Kyrgyzstan	810	744	611	504	376	340	200	109	57
Tajikistan	922	877	862	919	759	698	719	463	308

Source: United Nations, Department of Economic and Social Affairs, Population Division, 2019. *World Population Prospects 2019,* Volume II: Demographic Profiles (accessed: January 15, 2022).

Figure 1. Proportion of age groups of the population as of January 1, 2021, % of the total population



Source: Statistical Yearbook of the Eurasian Economic Union. Moscow: Eurasian Economic Commission, 2021.

We turn our attention to the dynamics of demographic aging in the relatively new union, the Eurasian Economic Union (EAEU), which has been formed in the post-Soviet space since 2014. The Republic of Kazakhstan, the Russian Federation, the Republic of Belarus, the Republic of Armenia, and the Kyrgyz Republic joined the union. Its goal is the freedom of movement of capital, goods and services, and labor. The EAEU member states have significant demographic differences. For example, on the one hand, the populations of the republics of Kazakhstan and Kyrgyzstan are almost one-third younger than 15 years old, while the share of the population over 65 years old is 5–8% *(Fig. 1)*. On the other hand, in Russia and the Republic of Belarus the share of the younger generation is 17–18%, and the share of the elderly is about 16%. These circumstances make integrating countries interested in different areas of economic and social policy, the challenges of demographic security in the states are different.

The process of demographic aging affects all countries in the region. Three main features of this process can be distinguished: different levels of demographic aging in the countries of the former USSR; different rates of change in the age structure of the population; and demographic asymmetry of the genders across the countries of the region (the difference between the numbers of men and women in older age cohorts).

At the same time, the process of population aging in the former Soviet Union is currently not as dramatic as, for example, in Italy or Japan, where in 2019 the demographic dependency ratio of the elderly was 42.5 and 55.9%, respectively.

Demographic dividend, why do "demographic windows" open

In the course of demographic development in the modern world, countries develop a certain age structure of their populations. Researchers have shown that the proportion and size of the working-age population compared to the younger and older working-age cohorts increases during

certain periods (Bloom, Canning, 2001; Bloom, Canning, 2004; Wang et al., 2005; Cruz, Ahmed, 2018). In other words, the number of able-bodied people is greater than the number of dependents, the dependency ratio decreases. A "window of opportunity" or "demographic window" for economic growth opens, which is directly linked to changes in the age structure of the population.

At the same time, we should emphasize that the "demographic window" is a chance, an opportunity to obtain an economic benefit. The economic benefit received in the period of this demographic structure is considered a "demographic dividend"[2]. There are two main factors to gain a demographic dividend: first, the growth in the number and quality of the working-age population, and second, the formation of conditions in the labor market for employment. This dividend is called the first demographic dividend. Examples from different regions show that countries can miss their chance, because the probability of a demographic dividend appears for a limited period of time. According to UNFPA, there was a significant demographic dividend in Asia at the end of the twentieth century[3]. Asia's gross domestic product increased sevenfold, there was an economic boom, described as the "Asian economic miracle", which was largely due to the realization of demographic potential because of the reduction of the demographic burden. In Latin America at this time, growth was only twofold, due to unequal access to investments in education and health, including reproductive health and rights for women and girls (Barsukov, 2019).

Previously, the possibility of a demographic dividend was thought to close as the working generation aged. The demographic dividend is often associated with a simple life-cycle model in which people of working age produce more than they consume, and the difference is divided between dependents – children and pensioners. Researchers have shown that a more complex and probably closer-to-life model is possible, in which the forces that cause a demographic dividend to turn into its opposite are capable of causing another (second) demographic dividend to come to life[4] (Bloom et al., 2003; Bloom et al., 2006).

In this approach, the emergence of the second demographic dividend is related to the influence of the dynamics of the demographic structure on capital accumulation. For example, in response to rising life expectancy, middle-aged people may fundamentally change their financial behavior by saving more for retirement and building up their endowment and capital, thereby offsetting the decline in the overall savings rate caused by the increasing proportion of seniors with low savings rates (Bloom et al., 2006). P. Lee and E. Mason noted differences between the first and second demographic dividends. In their view, the first dividend brings a temporary benefit, while the second converts that benefit into more assets and sustainable development. None of this appears automatically, but is due to the implementation of effective policies. The dividend period is more of an opportunity than a guarantee of higher living standards (Lee, Mason, 2006). We should agree with the authors' conclusion: the degree to which the second demographic dividend is realized depends on how society supports older citizens.

An essential element in the formation of both the first and second demographic dividend is the ability of the state to build social policy with demographic change in mind, creating opportunities for further

[2] Demographic dividend. United Nations Population Fund. Available at: https://www.unfpa.org/demographic-dividend#readmore-expand (accessed January 16, 2022).

[3] Ibidem.

[4] Vasin S. Demographic aging and the demographic dividend. Available at: http://www.demoscope.ru/weekly/2008/0317/tema01.php (accessed: January 16, 2022).

socio-economic development with an equitable redistribution of public goods (Barsukov, 2019).

As it was noted earlier, the most important condition for using the benefits of the demographic dividend is the ability of the economy to create jobs for an increasing number of the working-age population and for an aging population as well; this ability depends on the quality of state institutions, macroeconomic policy, and education policy. In the absence of a proper governmental macroeconomic policy aimed at implementing the demographic dividend, an increase in the working-age population can lead to an increase in unemployment, political instability, crime, and a decrease in social capital (Kazbekova, 2018).

Today, there are an unprecedented number (1.8 billion) of young people living in the world. The term "youth bulge" or "youth bubble" has emerged in economic and demographic studies, referring to the significant increase in the population aged 15–29. One of the main indicators of a country's success in turning "youth bulge" into a demographic dividend is the level of youth employment. Unfortunately, in many countries around the world, the rate of increase in youth unemployment is about twice as high as for the labor force as a whole (Macunovich, 2012).

That is why the focus of UNFPA's work for young people in Eastern Europe and Central Asia is on such tasks as "promoting the rights of young people; preventing sexually-transmitted infections; involving young people in decision-making processes; supporting comprehensive age-appropriate sex education; combating practices that cause harm, such as early marriage and gender-based violence..."[5]

[5] UNFPA Annual Report, 2014. UNFPA – United Nations Population Fund. Available at: https:www.unfpa.org/fr/annual-report-2014 (accessed: January 17, 2022).

The second mechanism for the dividend is an increase in savings. As the dependency burden decreases, people can save more. This increase in the national savings rate raises the capital stock and leads to increased productivity as accumulated capital is invested. According to the researchers, the highest level of savings is observed among the population 40 to 65 years of age, which is due to two factors: people at this age, as a rule, have no need to invest in their children; people begin to save more before retirement in order to maintain a stable level of consumption over the next decades of their life (Kazbekova, 2018; Bloom et al., 2003).

The third mechanism is the formation of human capital. It requires investment in human capital, health, education, professional skills. Decreasing fertility leads to a healthier state of women and a reduction of their economic burden at home, an increase in women's participation in the economy. It also allows parents to put more resources into their child's upbringing and education, which leads to better health and educational outcomes.

The fourth growth mechanism is an increase in domestic demand, caused by the growth of GDP per capita and a decrease in the dependency ratio. An important condition for increasing domestic demand is an increase in the standard of living of the population and a policy of combating poverty.

When forming the demographic dividend, not only the number of age groups participating in the labor force is significant, but also their qualitative characteristics. The quality of the population is particularly important in the formation of the second demographic dividend (Rimashevskaya, 2003). The use of the definition of resource potential of the older generation can serve as a tool for identifying significant characteristics of older age groups. The resource potential of the older generation is a set of socially and personally significant characteristics of the elderly and old people. Methodologically, the

concept of resource potential allows distinguishing the "third" and "fourth" ages, taking into account the level of preservation of human potential of the older age cohorts. The main structural elements of resource potential are health, educational and qualification, motivational, social, material, and institutional (Dobrokhleb, 2014).

The situation in the field of age structure, condition and prospects of the formation of the demographic dividend is characterized by considerable diversity.

Demographic dividend in the countries of the former USSR.

The countries of the former Soviet Union differ significantly in the age structure of their populations and the intensity of their demographic processes. Within the framework of the demographic transition there are usually four stages or phases, determined by the ratio of the fertility dynamics and mortality processes[6]:

Stage 1 – high birth rate and high mortality;

Stage 2 – persistence of high fertility rates and declining mortality rates due to improved medicine, sanitation and hygiene, quality of life, the spread of urban lifestyles;

Stage 3 – low mortality and declining fertility; there is a change in fertility patterns, the spread of families with few children;

Stage 4 – fertility and mortality rates level off, further reduction of natural increase takes place.

In the context of the considered stages of the demographic transition, researchers distinguish several groups of post-Soviet countries:

❖ stage III of the demographic transition: Republic of Tajikistan, Kyrgyz Republic, Turkmenistan, Republic of Uzbekistan;

❖ stage IV – Republic of Azerbaijan, Republic of Armenia, Republic of Georgia;

Completion of the demographic transition – the Russian Federation, the Republic of Belarus, Ukraine, the Republic of Moldova (Bezverbnyi, Bardakova, 2021).

This differentiation is reflected in the formation of a demographic dividend.

Some demographic indicators make it possible to assess the situation with the demographic dividend in the post-Soviet countries. The most common is the potential support ratio – the number of working-age population (15–64 or 25–64 years old) per one elderly person (aged 65 and older). As the population ages, the potential support ratio decreases. This means that there are fewer and fewer potential workers to support the elderly. To analyze changes in the age structure of the population, we turn to dependency ratios, both general and calculated separately in relation to groups of people under the age of 15 or over 65, who are unemployable.

According to the authors' calculations, the gap in dependency ratio of the former USSR countries ranges from 1.4% for Ukraine (excess of the old-age dependency ratio over the young-age dependency ratio) to 57.3% for Tajikistan (excess of the young-age dependency ratio over the old-age dependency ratio). Considerable dependency ratio is observed in countries with significant numbers of young people (Tajikistan, Kyrgyzstan, Kazakhstan, Turkmenistan) and in countries with significant levels of aging (Latvia, Lithuania, Estonia). The structure of the dependency ratio differs: the first case refers to the prospect of growth of the absolute and relative workforce size, the second – to the growth of the old-age dependency, increasing life expectancy in general and working life in particular (with the creation of favorable conditions).

The Baltic states, as well as Russia, Belarus, Ukraine, Armenia, and Georgia, have largely exhausted their first demographic dividend. From

[6] Notestein F.W. (1945). Population: The long view. *Food for the world.*

1997 to 2011, the demographic dividend from the increase in the working-age population provided the Russian Federation with about one-third of its per capita GDP growth from an average annual rate of 4.9%[7]. The demographic aging of the population in the Georgian SSR was noted as early as 1959. Between the last two censuses in Georgia (2002–2014), the population in the 25–34 age group declined by 31% – more than twice as much as the rest of the population. Both natural and migratory population decline play a role (Sulaberidze, Archvadze, 2018). The decline in the potential support ratio here began no later than the 1990s (and in a number of states even earlier, for example, in Ukraine and Russia since the 1970s). This was due to a gradual decline in the number of people of working age against the backdrop of the aging of the population. However, a favorable situation – a large proportion of the working-age population – lasted for quite a long time, from the 1970s to the 2020s. And in recent years, the proportion of the population of working age, including the most highly productive (25–64 years old), has been most significant. This period is also characterized by a decrease in the dependency ratio due to a decrease in the young-age population (under the age of 15 and under 25). After 2020 in most of the above-mentioned states there is an increase in the old-age dependency ratio *(Tab. 3)*, which already now amounts to a very significant value, from 17.2% in Moldova to 32.9% in Latvia. By 2050, the proportion of people over 65 in the total population of the states will be from 1/5 to 1/3. In the medium term (about 2030) in these countries the proportion of the population under the age of 15 will increase – a waning demographic wave, a consequence of a certain increase in fertility, in particular in the early 1980s (under the influence of demographic policy measures). But in general, in this group of countries the dependency ratio will increase due to the

Table 3. Dependency and potential support ratios (2020 assessment, countries are presented in descending order of potential support ratio)

Country	Dependency ratio, %	Young-age dependency ratio, %	Old-age dependency ratio, %	Potential support ratio
Tajikistan	67.9	62.6	5.3	18.7
Turkmenistan	53.6	47.8	5.8	17.1
Uzbekistan	50.6	43.4	7.2	13.9
Kyrgyzstan	59.7	52.1	7.5	13.2
Azerbaijan	43.4	33.7	9.7	10.3
Kazakhstan	58.8	46.3	12.6	8.0
Armenia	48.4	30.9	17.5	5.7
Moldova	39.6	22.2	17.4	5.7
Belarus	48.9	25.7	23.2	4.3
Russia	51.2	27.8	23.5	4.3
Georgia	55.0	31.3	23.6	4.2
Ukraine	49.1	23.8	25.3	4.0
Lithuania	50.2	21.5	28.7	3.5
Estonia	58.4	26.1	32.3	3.1
Latvia	59.0	26.1	32.9	3.0

Source: compiled according to the Department of Economic and Social Affairs Population Dynamics UN. Available at: https://population.un.org/wpp/Download/Standard/Population/ (accessed: January 15, 2022).

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growth of the share of the elderly, which actualizes the formation of tools and mechanisms to obtain a second demographic dividend. This problem is especially significant for the Baltic states, where the old-age dependency ratio already exceeds those of the young-age. The considered group of countries is currently characterized by the lowest values of the potential support coefficient (no more than 5.7).

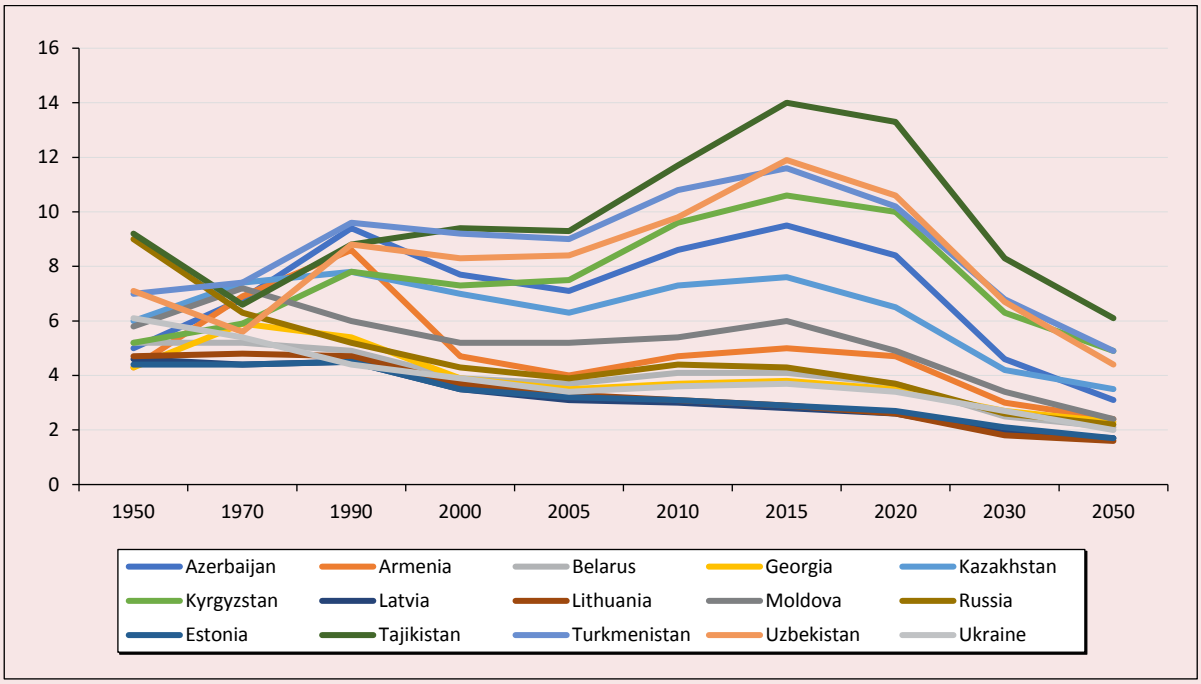
Moldova, where the increase in the population aged 25–64 years will last until 2030, closely adjoins the fairly representative group of countries discussed above. The first demographic window is still open for Azerbaijan as well.

The European countries of the former USSR are characterized by a higher rate of population aging. Russia, Moldova, Belarus, Ukraine, Lithuania, Latvia, and Estonia have almost exhausted their first demographic dividend.

Kazakhstan and Kyrgyzstan have a fairly young age structure, which is affected by fertility rates. The "window of opportunites" for the Kyrgyz Republic's demographic dividend opened in the 1980s due to a slight decrease in fertility, mortality and total fertility rates (Dzholdosheva, 2018). In the future, this will lead to the formation of a significant proportion of the working-age population and after 2030, reducing the burden of young people. However, the proportion of the elderly will also increase by 2050 only to 10.1% in Kyrgyzstan and 14.2% in Kazakhstan.

Tajikistan, Turkmenistan, and Uzbekistan still have very young populations, the proportion of the elderly is quite insignificant, and the dependency ratio is mainly formed by the young population of unemployable age. In Tajikistan, the young-age dependency ratio began to decline only in

Figure 2. Dynamics of the potential support ratio in the USSR republics and former USSR countries in 1950–2050 (ratio of the population aged 25–64 to 65 and older)



Source: compiled according to (Sulaberidze, Archvadze, 2018; Dzholdosheva, 2018; Bezverbnyi, Bardakova, 2021; Fang, 2020).

2005, along with an increase in the proportion of the population aged 25–64. These processes will continue in 2050. In Turkmenistan and Uzbekistan, the demographic window began to open a decade earlier. Countries should pay attention to the experience of states that were able to take advantage of the first demographic dividend by creating conditions for human capital formation, labor force participation, and increasing the productivity of young people.

The value of the dependency ratio in the post-Soviet states is converging after a significant increase in the indicator in 2005–2020 in Tajikistan, Turkmenistan, Uzbekistan, Kyrgyzstan and Azerbaijan, which is due to a significant, but fairly short-time excess of the working-age population over the number of unemployables. According to UN projections, after the rise of the potential support ratio, there will be a long-term decline *(Fig. 2)*. A significant decline in most countries by 2030 indicates the "closure of the first demographic window".

Conclusions

The post-Soviet countries are characterized by significant differentiation in the formation and use of demographic dividends, which is due to the specific demographic situation, cultural, social and economic determinants. Analysis of data on the proportion of the population aged 25–64 allows concluding that the proportion of the working-age people in the total population for Russia, Moldova, Belarus, Ukraine, Armenia, Azerbaijan, Lithuania, Latvia and Estonia is now at its peak. In the long term, after 2030, its absolute and relative numbers will decrease. In countries where the working-age population will soon dominate (Kyrgyzstan, Turkmenistan, Uzbekistan, Tajikistan), it is necessary to introduce institutions that motivate people to make savings and invest in the development of human potential, to promote the use of the demographic dividend in the economy. Uzbekistan is at the stage of an early demographic dividend, which provides a unique opportunity to achieve significant and lasting economic growth that can affect the well-being of the population, given the necessary investment in human capital, the formation of a flexible economic model, the introduction of innovative technologies, and increased opportunities for youth and women to participate in the socio-economic development of the country. According to UN projections of the age structure of Uzbekistan's population, the working-age population will peak around 2048. It is important to use this period.

The main challenge of the former USSR countries comes from the need for socio-economic development in the context of an aging population. The challenge is to use the positive aspects of aging societies (Fang, 2020). It is with this direction that the possibilities of solving the problems of demographic security are connected. Taking into account the features of the age distribution will make it possible to more effectively solve emerging economic problems. However, this implies the formation of policies aimed at the preservation, support and development of the resource potential of the older generation. The urgency of appropriate policies is exacerbated by the fact that the "demographic dividend" is followed by a time when the dependency ratio begins to increase again.

In this connection, the opinion of F. Notestein is relevant: "The problem of aging is not a problem at all, but only a pessimistic view of humanity's greatest triumph" (Notestein, 1954). But for this triumph to become a reality, decisive measures are needed to improve the living conditions of the older age cohorts in the former post-Soviet countries. Without real investment in the development of the potential of the aging population, there is no way out.

The expansion of opportunities for older age cohorts is connected, on the one hand, with the preservation of their resource potential (health, qualifications, motivation to participate in the labor market and in other socially useful activities), on the other hand, with reforming the structure of jobs, including for highly qualified professionals of older age. In addition, the second demographic dividend is realized if demographic changes lead to an increase in worker productivity. This is important to consider when forming educational and labor market policies.

Demography does not determine the fate of economic growth, but it is certainly a key determinant of an economy's growth potential. An aging population, combined with a declining birth rate, points to a very likely decline in future economic growth.

Productivity gains can reduce the impact of demographic shifts, and technological advances are an ideal source of productivity gains. However, it is important to note the following: technological advances increase productivity, but at the same time they can completely eliminate jobs, increasing unemployment.

It will be workers with computer and technological skills who will thrive in the economy of the future. As the age structure of the workforce changes in the future, so will the structure of the jobs that are in demand in the economy. This is important for countries that currently or in the near future can benefit from the first demographic dividend. The lack of highly productive jobs will lead to a migration outflow of the working-age population, which will also have a negative impact on the socio-economic and demographic situation in the future.

Productivity at older ages depends on health and disability policies, tax incentives, and barriers, especially the structure of retirement programs and pension measures. Countries that are on the threshold of a possible first demographic dividend (Turkmenistan, Tajikistan, Uzbekistan) or those countries where the window of demographic opportunity has not yet closed (Kyrgyzstan, Azerbaijan, Armenia) need to pay attention to creating the conditions for its realization, paying attention to education and the structure of youth employment. It is worth drawing on the experience of East Asian states, which place a high value on spending on children's education. Poor education during the period of declining birthrates will lead to a decrease in incomes of the population as fewer people in society work and their labor becomes inefficient.

For aging societies, an urgent problem is the formation of mechanisms that ensure the investment activity of people of older working age and the older generation as a whole. In addition, social policy in the interests of older people requires serious financial, personnel, organizational costs. A number of countries, in particular the United States of America, allocate a significant share of resources to health care for the elderly.

Countries around the world are implementing a strategy for older people – the Madrid international plan of action on ageing, adopted in 2002 by the Second World Assembly on Ageing. It includes actions to create conditions for older people to participate in development, to ensure health and well-being in old age, to create favorable conditions for life.

The extent to which the second dividend is realized depends on how society supports its citizens in old age. In developing countries, the elderly are supported by their families and the public sector, but beyond that they depend on the funds they have accumulated over the years, which include housing, retirement reserves, and personal savings. As the population ages,

the support burden on families and the state increases relative to GDP, which is a serious concern in many countries. However, through the second dividend, more middle-aged workers can substantially increase the amount of capital relative to GDP if policies encourage workers to save for after retirement, and appropriate institutions function in the country.

To the extent that countries are able to solve the problems associated with the aging of the population by expanding transfer programs – family, not backed by reserves, or state – the growth of assets is reduced, and the second dividend is reduced. In contrast, if workers have incentives to save and build retirement funds, an aging population can lead to more capital per worker and more income per capita. Thus, when developing socio-economic policy, it is necessary to focus on creating reliable financial systems that are credible and accessible to millions of people who want to secure their financial future. This needs to be done now, so that as the population ages, its potential for economic growth can be realized. Creating conditions for increasing the second demographic dividend can contribute to both more effective socio-economic development of countries and their security.

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Received April 20, 2022.