

Stepanova, Olena

## Article

# Fiscal sustainability under the conditions of emerging longevity economy

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**Olena Stepanova<sup>1</sup>**

## **FISCAL SUSTAINABILITY UNDER THE CONDITIONS OF EMERGING LONGEVITY ECONOMY**

*The article investigates the influence of the growing public expenditures on health caused by the demographic aging of the population, on the stability of public finances in the context of the establishment of the "longevity economy". The author conducts a scenario based assessment of the sustainability of public finances in Ukraine in the medium and long term, based on the calculation of the fiscal gap indicator.*

*In particular, investigated the "stress effect" of the changes in the indicators of macroeconomic development and the fiscal position on the sustainability of public finances under the condition of realization of the historical scenario. The author proves a significant influence of demographic aging of Ukraine's population on the sustainability of public finance. It is determined that in the long term there will be a fundamental transformation of the "spending profile" in the health care by sex-age groups, which, for example, is due to a shift in consumption of these expenditures by the population of older age groups and their increased share.*

*The author substantiates the necessity to expand the fiscal space for fulfilling the normative requirements of the Ukrainian legislation on health financing based on the calculation of the necessary structural primary balance to overcome the fiscal gap, which is proposed to be used as one of the benchmarks for the implementation of fiscal policy in order to attain medium and long-term sustainability of public finances for a given period of fiscal adjustment. It is proposed: to monitor and control the pace and the growth factors of health care expenditures in the medium and long-term; to develop indicators for assessing the fiscal space for healthcare with due regard to potential change in the demographic structure of the population; to assess the transformation of the fiscal space to finance the health care in the context of the establishment of the longevity economy while respecting the sustainability of the system of public finances.*

*Key words:* fiscal sustainability, public finances, health care, fiscal gap, demographic aging, fiscal space, age-related costs

JEL H51, H68, E62

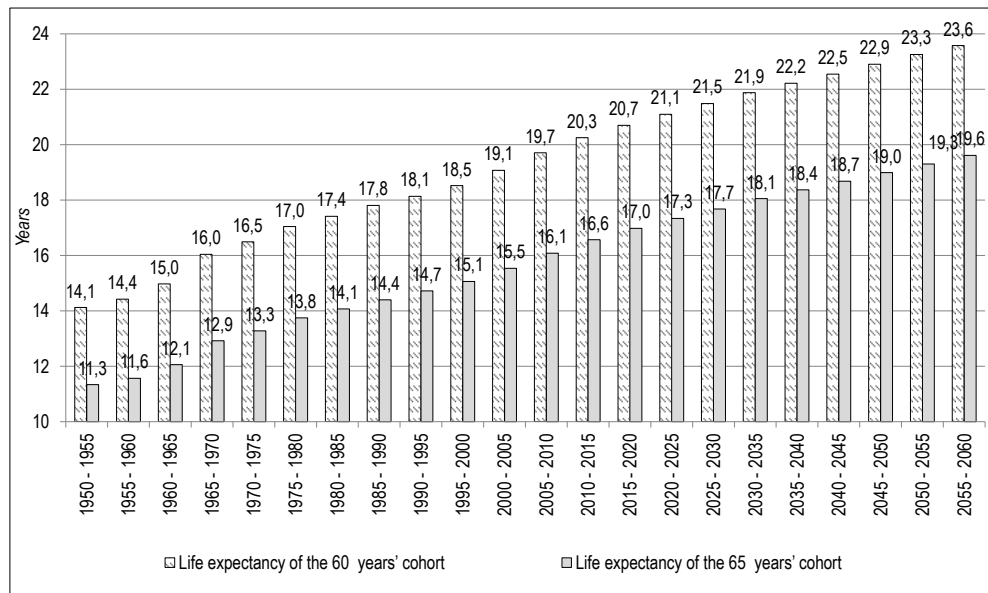
Evolution of public finance we observed over the last thirty years attributes to the new conceptual issues related to the economics and community functioning. One of such issues in many countries is the shift in the demographic structure to ageing population. The 80-plus years' cohort takes the place of the merely over 40-

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years' cohort of the 20th century in many communities [1]. Expansion of longevity coupled with the slowdown of the birth rate in the past two decades is the reason why the share of the aged people is growing and the working-age population share continues dropping [2]. Today, humanity enters the era of demographic tendencies (Fig. 1) that lay the basis for the new system of economic relations branded as the Longevity Economics [3, 4].

These processes drive new latent challenges and requirements to the fiscal sustainability and a need to find new sources to ensure the growth of the fiscal space to fund social protection and welfare system as well as healthcare services to the growing number of recipients whose needs in social and medical services are constantly increasing.



**Fig. 1. Dynamics for life expectancy of the 60-65 years' cohort in average throughout the world, years**

Source: Based on World Population Prospects: The 2017 Revision, custom data acquired via website / United Nations, Department of Economic and Social Affairs, Population Division. 2017. URL: <https://esa.un.org/unpd/wpp/>

Healthcare system constitutes a large share of the government expenditure and is the major driver for the economic growth in many countries. As a rule, the growth rates for expenditures to fund modern healthcare systems outpace the GDP and the public revenue growth rates [5]. According to the OECD projections, in 2031 and 2060, the government spending on healthcare systems will grow to 9% and 14% of the GDP respectively throughout the world. [6].

For example, in the U.S., with 17.9% of the GDP spending on the healthcare system, (the highest rate in the world (2017) [7]), the U.S. Government Accountability Office estimates that from 2018 through 2067 the government spending for healthcare system will grow by 2.2% of the GDP above all as the result of the age-



ing population<sup>2</sup> and the growth rate of such expenditures will be by 1% higher than the GDP growth rate. These issues are one of the causes of the fiscal gap acceleration: in 2017, it made 2.4% of the GDP (or 14.7% of the total government expenditures) as compared to 2016 (1.6%) [8].

In addition, many governments face another dilemma: It is the need to ensure fiscal sustainability as well as to develop fiscal space for healthcare system under the constantly expanding longevity effects and demographic ageing of population.

The purpose of this article is to estimate effects of the growth of expenditure for healthcare system attributed to the demographic ageing of population in Ukraine on the fiscal sustainability.

In 1990, Olivier Blanchard [9] offered the first ever comprehensive methodological approach to evaluation of the fiscal sustainability based on estimations of the fiscal gap and determination of the sustainability criteria.

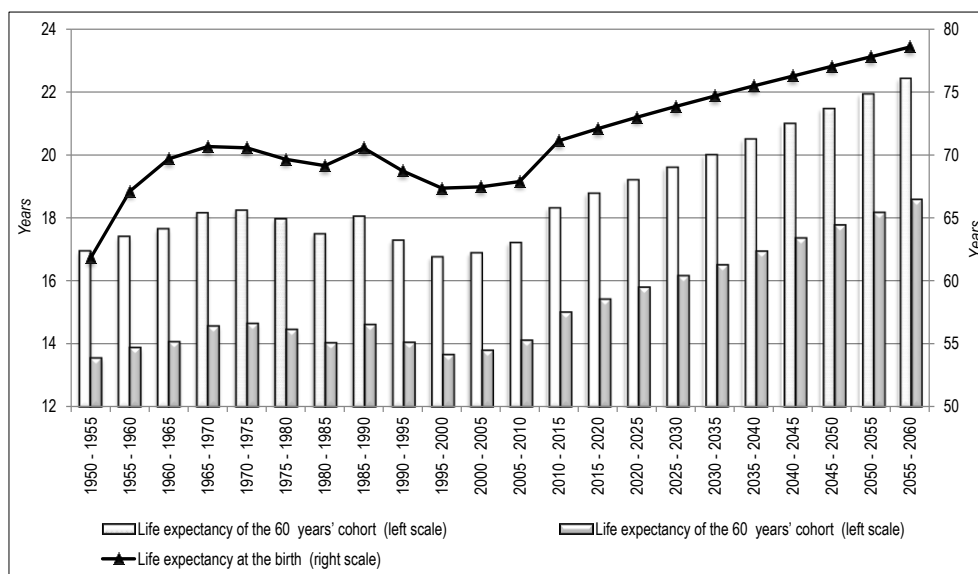
Based on the approach, Laurence Kotlikoff, Jay Gokhale and Alan Auerbach [10] estimated the effect of the debt burden on the fiscal sustainability and justified that in the longer terms the fiscal burden will sharply grow due to transformations in population structure gravitating towards ageing; in addition, they developed a methodological approach to determination of the fiscal gap meaning the difference between the future income and future expenditures required to cover age-related expenditures, which above all include a healthcare system. A pool of fundamental and practical researches may be found in the modern scientific world, which studies the effects of the longevity and demographic ageing on the fiscal sustainability and economic growth based on the above said methodological foundations [11–14].

Today, the world known organisations, such as the IMF, the World Bank, the OECD, the WHO, the ILO, European Commission, the APEC acknowledge the ageing as the determinant of effects on the fiscal sustainability and economic growth in the mid- and long terms. In addition, developed countries succeeded in developing long-term estimations of risks to public finance sustainability, in particular, due to the effect of the growth of the age-related expenditures for healthcare system. For example, the U.S. [15], Canada [16], Great Britain [17] and Germany [18] public institutions developed methodologies for estimation of fiscal sustainability in mid- and long terms. On the annual basis, they also perform diagnostics of changes in the effects of the factors of growing expenditures to the public finance sustainability caused by demographic ageing. Usually, such projections cover from 1 to 50 years horizon [19] and comprise detailed structural analysis of effects of drivers of the increase in spending for healthcare system including the ageing of population, based on which mechanisms of automated stabilizers are developed to address adverse effects of the said factors on the rates of the growth of healthcare expenditures and sustainability of the public finance system in general.

<sup>2</sup> Demographic shifts towards ageing within population structure will be the reason for significant growth of the number of recipients of Medicare, the government medical insurance programme for the poorest, as well as the number of the beneficiaries of Medicaid, the government medical insurance program for the elderly.

I. Bohdan, T. Bohdan, T. Bondarchuk, T. Iefymenko, V. Kudriashov, I. Lunina and D. Tverdokhlibova are among those Ukrainian scientists who study the basis for analysis of fiscal sustainability. However, the scientists do not pay enough attention to the study of the effect of the growing spending for healthcare system due to ageing population to the fiscal sustainability of Ukraine.

Two decades before, it seemed that the ageing was attributed only to developed countries. Today, we watch Silver Tsunami affecting the entire world, varying in scale and speed. In Ukraine, processes that strengthen longevity and ageing of population are present too (Fig. 2), driving the transformation of social and economic developments and fiscal policies.



**Fig 2. Dynamics for life expectancy at the birth and life expectancy of the 60-65 years' cohort in Ukraine**

Source: World Population Prospects: The 2017 Revision, custom data acquired via website / United Nations, Department of Economic and Social Affairs, Population Division. 2017. URL: <https://esa.un.org/unpd/wpp/>

The new requirements to funding Ukraine's healthcare system, in particular the one that aims at ensuring the stability and improving accessibility and quality of medical services, were set with the launch of the healthcare system reform in Ukraine and aligned with the Concept of the Healthcare Financing Reform in Ukraine [20] and the Law On State Financial Guarantees of Public Health Care [21].

Therefore, in Ukraine, we also face a need to adjust current methodological approaches to Ukrainian conditions and estimate the sustainability of public finances under the rise of longevity economics as well as demographic ageing. Based on the European Commission methodology [22] and formulas 1-4, we performed an analysis of effects on the age-related expenditures on healthcare system in Ukraine within the mid- and long term sustainability of public finances under several scenarios: the stabilising, convergent and historical ones.

Indicators of mid-term fiscal sustainability *SI* and long-term fiscal sustainability *S2* allow determining fiscal gaps that should be eliminated to ensure public finance sustainability and solvency in the relevant period [22]. The higher is the indicator, the more significant should be the adjustment of the public balance budget to ensure fiscal sustainability.

Mid-term public finance sustainability indicator *SI* (% of *GDP*) is determined according to the methodology of the European Commission based on the formula shown below [22]:

$$SI = \underbrace{\frac{D_{t_0}(\alpha_{t_0:t_2} - 1)}{\sum_{i=t_0+1}^{t_2} (\alpha_{i:t_2})}}_A - \underbrace{PB_{t_0}}_B + c \underbrace{\frac{\sum_{i=t_0+1}^{t_1} ((t_1 - i)\alpha_{i:t_2})}{\sum_{i=t_0+1}^{t_2} (\alpha_{i:t_2})}}_C + \underbrace{\frac{D_{t_0} - D_{t_2}}{\sum_{i=t_0+1}^{t_2} (\alpha_{i:t_2})}}_D + \underbrace{\frac{\sum_{i=t_0+1}^{t_2} (\Delta A_i \alpha_{i:t_2})}{\sum_{i=t_0+1}^{t_2} (\alpha_{i:t_2})}}_D, \quad (1)$$

where  $t_0$  means the last year before the mid-term projection

$t_{0+1}$  – the first year of the mid-term period projection, the year of the start of fiscal adjustments

$t_1$  – the year of the end of fiscal adjustments

$t_2$  – the last year of the period of the mid-term projection

$PB_{t_0}$  – structural primary balance <sup>3</sup> as at the end of the period  $t_0$ , % of *GDP*

$D_{t_0}$  – public debt as at the end of the period  $t_0$ , % of *GDP*

$D_{t_2}$  – estimated public debt at the end of the period  $t_2$ , % of *GDP*

$\Delta A_i$  – a change in the age-related expenditure (A) in the period  $i$  and before the period  $t_0$ ,  $\Delta A_i = (A_i - A_{t_0})$ , % of *GDP*

$c$  – a mean of the annual increase of the structural primary balance during the fiscal adjustment period

$s$  and  $v$  – respectively, starting and ending periods of discounting

$r_i$  – coefficient that embraces the ratio of nominal interest rate ( $R_i$ ) and the rate of the growth of the nominal *GDP* ( $G_i$ ) in the period  $i$  [22]:

$$r_i = \frac{1 + R_i}{1 + G_i} - 1. \quad (2)$$

Under the inconstant value  $r_i$  the coefficient  $\alpha_{s,v}$  is determined as follows:

$$\alpha_{s,v} = (1 + r_{s+1})(1 + r_{s+2}) \dots (1 + r_v) \quad (3)$$

As said in the formula 1, the indicator of the mid-term public finance sustainability *SI* comprises four key components. Component A: primary budget position

<sup>3</sup> Structural primary balance means the nominal balance of the budget adjusted to cycle components, except for one-time and temporary actions of fiscal policy [22].

representing a gap value to be addressed to reach the same value for primary structural balance that ensures debt stabilisation. Component *B* allows estimating the costs of the delay in the fiscal adjustment. Component *C* determines the amount of the additional fiscal adjustment required to reach the value of the public debt indicator at the end of the period  $t_2$ .

The indicator of the long-term sustainability of the public finances *S2* determines the necessity to adjust current structural primary balance to stabilise the ratio of the debt to the GDP during the long-term period including fiscal adjustments that aim at financing potential additional spending of the budget that may arise due to the ageing of population [24].

Indicator of the long-term sustainability of the public finance *S2* (% of GDP) is determined, if the primary structural balance and nominal percentage rate remain stable in comparison to the last year of the long-term projection period; the determination is based on the following formula [22]:

$$S2 = \frac{D_{t_0}}{\sum_{i=t_0+1}^{2059} \left( \frac{1}{\alpha_{t_0+1:i}} \right) + \frac{1}{r\alpha_{t_0+1:2059}}} - PB_{t_0} + \frac{\sum_{i=t_0+1}^{2059} \left( \frac{\Delta A_i}{\alpha_{t_0+1:i}} \right) + \frac{\Delta A_{2060}}{r\alpha_{t_0+1:2059}}}{\sum_{i=t_0+1}^{2059} \left( \frac{1}{\alpha_{t_0+1:i}} \right) + \frac{1}{r\alpha_{t_0+1:2059}}}, \quad (4)$$

where  $t_3$  is the last year of the long-term projection period

( $t \geq t_3 = 2060, \Delta A_t = \Delta A_{2060}, r_t = r$ ).

Indicators *S1* and *S2* comprise component *D* that allows in the mid- and long terms to consider changes in the age-related public expenditure (public expenditure for pension system, healthcare and long-term care)<sup>4</sup> as well as projection of population ageing [24].

Outcomes of the estimated indicator for the mid-term public finance sustainability in Ukraine (*S1*) are provided in Tables 1, 2, and indicators for longer term sustainability of public finance in Ukraine (*S2*) can be found in Table 3. Details on development of the scenarios are provided in the Annex. The research allows us to say that public expenditure for healthcare in Ukraine will grow as the result of effects of the demographic ageing of population<sup>5</sup> and technological progress in the sector of healthcare under all scenarios in the mid- and longer terms.

Moreover, we may say that in the mid- and long terms dramatic transformations will take place in the "spending portfolio" in part of the healthcare system by age and gender groups, which is specifically affected by the shift in consumption of these costs, towards the elder population (above 50 years old) and increase in their ratio.

<sup>4</sup> To perform the research, we estimated age-related spending only for healthcare system.

<sup>5</sup> Demographic projection for Ukraine until 2060 based on the data from Ptoukha Institute for Demography and Social Studies of the National Academy of Sciences of Ukraine.

Table 1

**Outcomes of the estimated indicator for the mid-term public finance sustainability in Ukraine (S1), % of GDP**

Indicator	Stabilising scenario	Converging scenario	Historical scenario
<i>Population projection: high birth rate – high life expectancy – high migration</i>			
indicator for mid-term public finance sustainability S1:	-1.68	0.42	3.04
including: effect of increasing of age-related budget spending on healthcare	0.53	0.51	0.53
Indicator of required primary structural balance (RSPB)	-0.8	2.02	1.84
<i>Population projection: high birth rate – low life expectancy – high migration</i>			
indicator for mid-term public finance sustainability S1:	-1.44	0.3	2.98
including: effect of increasing of age-related budget spending on healthcare	0.48	0.46	0.49
Indicator of required primary structural balance (RSPB)	0.16	1.9	1.78
<i>Population projection: low birth rate – low life expectancy – low migration</i>			
indicator for mid-term public finance sustainability S1:	-1.5	-0.03	2.92
including: effect of increasing of age-related budget spending on healthcare	0.41	0.53	0.43
Indicator of required primary structural balance (RSPB)	0.1	1.57	1.72

Source: author's calculations.

Analysis of the outcomes obtained shows that if the stabilising scenario materialises, the risk to the mid-term public finance sustainability in Ukraine (S1) should be determined as low<sup>6</sup>. However, even if the scenario materialises, the age-related costs for healthcare system may have stronger effects. The higher is the indicator that determines the risk of effects of the age-related budget spending for healthcare at the mid-term public finance sustainability (Table 1), the higher and the more sufficient the structural primary balance should be to consider the future age-related spending.

<sup>6</sup> The marginal values for risk estimation at the mid-term of the public finance sustainability are determined by the EC Methodology. Thus, if  $S1 < 0$ , the risk to the public finance sustainability is determined as low. Given the following:  $0 < S1 \leq 2,5$ , sustainability risk to public finance is determined as medium in case of  $S1 \geq 2,5$ , it turns to be high. The risk of age-related spending for healthcare system to affect the mid-term public finance sustainability is low, if component D is below 0.3; if the threshold is overrun, the risk is determined as high.



In these terms, we consider it reasonable also to estimate the *required structural primary balance (RSPB)* [25], which provides information on fiscal space that should be developed in the country to address the fiscal gap and should become a baseline for implementation of the fiscal policy aimed at achieving mid-term and/or long-term public finance sustainability at determined period of fiscal adjustment. The required structural primary balance indicator is determined as a sum of actual structural primary balance and amount of fiscal adjustment, the quantitatively determined indicator *S1* for the mid-term period and indicator *S2* for the long-term period [25].

With materialisation of the converging scenario, the risk to the public finance sustainability increases and the relevant indicator (*S1*) should be determined as medium, which requires implementation of measures focused on fiscal adjustment to stabilise the state of the public finance in the middle term.

Outcomes of the analysis of the obtained indicators in the mid-term fiscal sustainability show that the highest is the risk of materialisation of the historic scenario including its demographic projection<sup>7</sup>, which is developed based on considerations of the historic dynamics of the economic development of Ukraine and relevant fiscal policies that allow estimating their stress effects to fiscal sustainability (Table 1).

Table 2 shows outcomes of the estimations of the mid-term indicator of the public finance sustainability (*S1*) for adaptable scenario and scenario of regulatory control. Under these scenarios, the risk to the public finance sustainability is estimated on condition of increase in healthcare spending in the consolidated budget of Ukraine, as per Article 4 of the Law of Ukraine On State Financial Guarantees of Public Health Care (2018), to 5% of GDP in 2013 and to 6.21% of GDP, which is the average indicator of the public funding of healthcare in the EU states (2017).

Table 2

**Outcomes of calculations of the mid-term indicator of the public finance sustainability (*S1*) for various scenarios, % of GDP**

Indicator	Scenario	
	regulatory control	adaptable
Target indicator for healthcare system funding in 2030, % of GDP	5	6.21
Indicator for public finance sustainability <i>S1</i> :	0.5	1.4
including: share of effect of increase in spending on healthcare system	0.9	1.5
Indicator of required primary structural balance ( <i>RSPB</i> )	2.1	3.0

Source: estimated by the author.

<sup>7</sup> Demographic projection for Ukraine by 2060 based on the data from Ptoukha Institute for Demography and Social Studies of the National Academy of Sciences of Ukraine.



Application of alternative demographic projections<sup>8</sup> to estimate mid-term and long-term sustainability of public finance allows detecting potential challenges caused by changes in population demographic structure due to its ageing. The most significant effect on fiscal sustainability is the change in the age structure of population and its number under the scenario "high birth rate – high life expectancy – high migration".

In the long terms, the adverse effect of the ageing of population on public finance of Ukraine will intensify as we found it from the outcomes of calculations shown in Table 3.

Table 3

**Outcomes of calculated indicator for the long-term public finance sustainability in Ukraine (S2), % of GDP**

Indicator	Stabilising scenario	Converging scenario	Historical scenario
<i>Population projection: high birth rate – high life expectancy – high migration</i>			
Indicator for long-term public finance sustainability S1:	0.75	1.31	3.82
including: effect of increasing of age-related budget spending on healthcare	1.44	1.23	1.35
Indicator of required primary structural balance (RSPB)	2.35	2.91	2.62
<i>Population projection: high birth rate – low life expectancy – high migration</i>			
Indicator for long-term public finance sustainability S1:	0.45	1.07	3.54
including: effect of increasing of age-related budget spending on healthcare	1.14	0.98	1.07
Indicator of required primary structural balance (RSPB)	2.05	2.67	2.34
<i>Population projection: low birth rate – low life expectancy – low migration</i>			
Indicator for long-term public finance sustainability S1:	0.38	1.41	3.19
including: effect of increasing of age-related budget spending on healthcare	0.77	0.70	0.73
Indicator of required primary structural balance (RSPB)	1.98	3.01	1.99

Source: calculations of the author.

<sup>8</sup> The marginal values for risk estimation at the mid-term of the public finance sustainability are determined by the EC Methodology. Thus, if  $S1 < 0$ , the risk to the public finance sustainability is determined as low. With  $0 < S1 \leq 2,5$ , sustainability risk to public finance is as medium, and in case of  $S1 \geq 2,5$ , it turns to be high. The risk of age-related spending for healthcare system to affect the mid-term public finance sustainability is low, if component D is below 0.3; if the threshold is overrun, the risk is determined as high.

According to the data, the risk to the long-term sustainability of public finance (S2) under the major alternative scenarios may be determined as medium and low<sup>9</sup>. However, it is worth saying that the risk of effect of the increase in the age-related costs of healthcare system caused by the ageing of population of Ukraine on the fiscal sustainability is still present. Along with that, the required structural primary balance, which may be achieved given fiscal adjustment implemented and fiscal gap addressed (solved) in long-term prospects, is a significant and high compared to the primary structural balance of 2018. The estimated indicators possess huge practical meaning as they allow estimating a risk to the current fiscal position and determine vectors for fiscal system policy implementation, which include a set of measures aimed at ensuring a mid-term and long-term sustainability of public finance within the development of longevity economics.

### Conclusions

The calculations of the required structural primary balance makes it clear that even with optimistic stabilising scenario for Ukraine there exists a certain need to develop additional fiscal space to address the fiscal gap and ensure public finance sustainability in the longer terms, including debt sustainability as well as fiscal adjustment to ensure public finance sustainability in terms of funding the healthcare system under demographic ageing of population. However, given the materialisation of the scenarios, in particular the historic one, which allows us to study potentially possible stressful effect on macroeconomic development and fiscal policy of Ukraine, the amount of the fiscal adjustment and structural primary balance may require a significant increase.

In addition, there is a need, at the level of the government, to develop and implement an action plan aimed at determining potential challenges to the public finance sustainability in terms of funding the healthcare in the mid and long terms as well as establishing fiscal space, in particular: diagnosis of effects on increase of the healthcare expenditures as the result of multiple-factor's impact (ageing of population, technological progress, changes in the needs and priorities of population) on fiscal sustainability; monitoring of and control over rates and factors of the increase in the healthcare expenditures in the mid- and longer terms; implementation of an action plan aimed at addressing existing and preventing potential issues attributed to the public finance sustainability that are driven by the demographic ageing of population; estimation of fiscal space transformations aimed at funding healthcare system under the rise of longevity economics and simultaneous preservation of sustainability of the public finance system.

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<sup>9</sup> The marginal values of risk estimation at the long-term public finance sustainability are determined by the EC Methodology. Thus, if  $S2 < 2,0$ , the risk of the long-term public finance sustainability is determined as low. Given the following:  $2,0 < S2 \leq 6,0$ , sustainability risk to public finance is determined as medium in case of  $S2 \geq 6,0$ , it turns to be high. The risk of age-related spending for healthcare to affect the long-term public finance sustainability is low, if this component is below 0.7; if the threshold is overrun, the risk is determined as high.

## ANNEX

## Types of scenarios to estimate public finance sustainability given the increase in the age-related healthcare expenditures

Scenario	Macroeconomic indicators	Age-related expenditures' indicators
<b>Stabilising scenario</b>	Stabilising scenario envisages gradual stabilisation of social and economic situation in Ukraine; it is based on actual data from the reports of the Ministry of Finances of Ukraine on budget performance, estimated macroeconomic and fiscal data of the IMF on Ukraine for 2023. [26]. The last year before the long-term projection $t_0=2018$ . The first year of the long-term projection period, the beginning of fiscal adjustment $t_{0+1}=2019$ . The end of fiscal adjustment $t_1=2026$ . Target year to stabilise the ratio of the public debt and the GDP $t_2=2031$ . The last year of the long-term projection period $t_3=2060$ . Projected ratio of the public debt to the GDP in 2031 is determined based on the last value estimated by the IMF for Ukraine ( $D_{t2}=48.6\%$ ) [26]. Estimations of $S1$ and $S2$ are based on an assumption that the fiscal policy remains unchanged, which means the structural primary balance of the budget remains unchanged too [22]	Projection of the age-related expenditures are determined for the healthcare system only ( $A_4$ ) and estimated at the basis of: - decomposition of expenditures of the Consolidated Budget of Ukraine attributed to the healthcare system given the age and gender structure (based on the data of the State Statistics Service of Ukraine [27] and equivalents in provision of medical aid to one person depending on the age and gender in Ukraine [28] as determined according to the formal recommendations of the WHO
<b>Converging scenario</b>	Converging scenario requires gradual alignment of economical development of Ukraine to conditions of the EU development. According to the EC methodology on estimation of the public finance sustainability, convergence of the major macroeconomic indicators is assumed in the longer terms given the gradual linear changes in the GDP deflator in the five year perspective by 2% and the amount of the actual interest rate in the ten year perspective by 3% respectively [22]. According to the EC requirements, the projected target ratio of the public debt and GDP in 2013 is $D_{t2} = 60\%$ . The time periods (t) are determined as for the stabilising scenario. Estimations of $S1$ and $S2$ are based on an assumption that the fiscal policy remains unchanged, which means the structural primary balance remains unchanged too	- projection for Ukraine until 2060 (based on the data from Ptoukha Institute for Demography and Social Studies of the National Academy of Sciences of Ukraine [29]) - models for projecting public healthcare expenditures in Ukraine depending on the following factors: demographic ageing, elasticity of public healthcare expenditures by income of population, potential impact of technological progress of the healthcare system on the funding of the medical sector

Scenario	Macroeconomic indicators	Age-related expenditures' indicators
<b>Historical scenario</b>	Historical scenario allows estimating risks to the public finance sustainability of Ukraine given the previous ten years trends of economic development and based on actual data from the reports of the Minister of Finance of Ukraine on the budget performance. The GDP growth rates, interest rates of the public and guaranteed public debt, structural primary balance are determined as medium for the previous five years period under the IMF data on Ukraine by 2023 [23] and project the stressful effect on fiscal sustainability. The time periods ( $t$ ) are determined as for the stabilising scenario	
<b>Scenario of regulatory control</b>	Scenario of regulatory control provides projection of the public finance sustainability given the increase in the expenditures of the consolidated budget of Ukraine on the healthcare as set by Article 4 of the Law of Ukraine On State Financial Guarantees of Public Health Care (2018) [30]. The value of the nominal interest rate ( $R_i$ ), nominal GDP growth rate ( $G_i$ ) and $D_{t_2}$ – of the target value of the debt, are the same as for the converging scenario	The estimated values of costs for the healthcare system are calculated given the achievement of the public healthcare expenditures in 2031 at 5% of the GDP
<b>Adaptable scenario</b>	Adaptable scenario envisages projection of fiscal sustainability given the increase in the expenses of the Consolidated Budget of Ukraine on the healthcare system in accordance with the EC indicators. The value of the nominal interest rate ( $R_i$ ), nominal GDP growth rate ( $G_i$ ) and $D_{t_2}$ – the target value of the debt, are the same as for the converging scenario	The estimated values of costs for the healthcare system are calculated given the achievement of the public expenditures on the healthcare in 2031 at 6.21% of the GDP, which is the medium level of the healthcare expenditures in the EU states in 2017

Source: provided by the author.

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### **ФІСКАЛЬНА СТІЙКІСТЬ В УМОВАХ СТАНОВЛЕННЯ ЕКОНОМІКИ ДОВГОЛІТТЯ**

Досліджено процеси впливу зростання державних витрат на охорону здоров'я, спричинені демографічним старінням населення, на стійкість державних фінансів у контексті становлення "економіки довголіття". Проведено сценарну оцінку стійкості державних фінансів в Україні на середньострокову та довгострокову перспективу, що базується на розрахунку показника фіскального розриву. Зокрема, досліджено "стресовий вплив" зміни показників макроекономічного розвитку та фіскальної позиції на стійкість державних фінансів за умови реалізації історичного сценарію. Доведено суттєвий вплив демографічного старіння населення в Україні на стійкість державних фінансів. Визначено, що у довгостроковій перспективі відбуватиметься кардинальна трансформація "витратного профілю" на охорону здоров'я за статеві-віковими групами, що, для прикладу, зумовлена зменшенням споживання цих витрат до населення старших вікових груп та зростання їх частки.

Обґрунтовано потребу збільшення фіскального простору для виконання нормативних вимог законодавства України щодо фінансування охорони здоров'я на основі розрахунку необхідного структурного первинного балансу для подолання фіскального розриву, який запропоновано використовувати як один з орієнтирів для реалізації фіскальної політики з метою досягнення середньострокової та довгострокової стійкості державних фінансів за визначений період фіскального коригування. Запропоновано проведення моніторингу та контролю темпів і факторів зростання витрат на охорону здоров'я у середньостроковій та довгостроковій перспективах; розроблення індикаторів оцінки фіскального простору для охорони здоров'я з урахуванням потенційних змін демографічної структури населення; оцінку трансформації фіскального простору для фінансування охорони здоров'я в умовах становлення економіки довголіття та одночасного дотримання стійкості системи державних фінансів.

**Ключові слова:** *фіскальна стійкість, державні фінанси, охорона здоров'я, фіскальний розрив, демографічне старіння, фіскальний простір, віково-залежні витрати*



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### **ФИСКАЛЬНАЯ УСТОЙЧИВОСТЬ В УСЛОВИЯХ СТАНОВЛЕНИЯ ЭКОНОМИКИ ДОЛГОЛЕТИЯ**

Исследованы процессы влияния роста государственных расходов на здравоохранение, вызванных демографическим старением населения, на устойчивость государственных финансов в контексте становления "экономики долголетия". Проведено сценарную оценку устойчивости государственных финансов в Украине на среднесрочную и долгосрочную перспективу, основанную на расчете показателя фискального разрыва. В частности, исследованы "стрессовое воздействие" изменения показателей макроэкономического развития и фискальной позиции на устойчивость государственных финансов при реализации исторического сценария. Доказано существенное влияние демографического старения населения в Украине на устойчивость государственных финансов. Определено, что в долгосрочной перспективе будет кардинально трансформироваться "затратный профиль" на здравоохранение по половозрастным группам, что, например, обусловлено смещением потребления этих расходов к населению старших возрастных групп и возрастанием их доли.

Обоснована необходимость увеличения фискального пространства для выполнения нормативных требований законодательства Украины по финансированию здравоохранения на основе расчета необходимого структурного первичного баланса для преодоления фискального разрыва, который предложено использовать как один из ориентиров для реализации фискальной политики с целью достижения среднесрочной и долгосрочной устойчивости государственных финансов за определенный период фискальной корректировки. Предложено: проведение мониторинга темпов и факторов роста расходов на здравоохранение и осуществление контроля за ними в среднесрочной и долгосрочной перспективах; разработку индикаторов оценки фискального пространства для здравоохранения с учетом потенциальных изменений демографической структуры населения; оценку трансформации фискального пространства для финансирования здравоохранения в условиях становления экономики долголетия и одновременного соблюдения устойчивости системы государственных финансов.

**Ключевые слова:** *фискальная устойчивость, государственные финансы, здравоохранение, фискальный разрыв, демографическое старение, фискальное пространство, возраст-зависимые расходы*