



“Financial sustainability of the state pension system of Ukraine”

AUTHORS	Olena Horbunova Viktoriiia Kartseva Nataliya Pedchenko  https://orcid.org/0000-0001-5093-2453 Myroslav Ostapenko
ARTICLE INFO	Olena Horbunova, Viktoriiia Kartseva, Nataliya Pedchenko and Myroslav Ostapenko (2018). Financial sustainability of the state pension system of Ukraine. <i>Investment Management and Financial Innovations</i> , 15(2), 17-28. doi: 10.21511/imfi.15(2).2018.02
DOI	http://dx.doi.org/10.21511/imfi.15(2).2018.02
RELEASED ON	Friday, 20 April 2018
RECEIVED ON	Wednesday, 20 December 2017
ACCEPTED ON	Monday, 02 April 2018
LICENSE	 This work is licensed under a Creative Commons Attribution 4.0 International License
JOURNAL	"Investment Management and Financial Innovations"
ISSN PRINT	1810-4967
ISSN ONLINE	1812-9358
PUBLISHER	LLC “Consulting Publishing Company “Business Perspectives”
FOUNDER	LLC “Consulting Publishing Company “Business Perspectives”



NUMBER OF REFERENCES

29



NUMBER OF FIGURES

0



NUMBER OF TABLES

7

© The author(s) 2022. This publication is an open access article.



BUSINESS PERSPECTIVES



LLC "CPC "Business Perspectives"
Hryhorii Skovoroda lane, 10, Sumy,
40022, Ukraine

www.businessperspectives.org

Received on: 20th of December, 2017

Accepted on: 2nd of April, 2018

© Olena Horbunova, Viktoriia
Kartseva, Nataliya Pedchenko,
Myroslav Ostapenko, 2018

Olena Horbunova, Assistant at the
Department of Finance and Banking,
Poltava University of Economics and
Trade, Ukraine.

Viktoriia Kartseva, Doctor of
Economics, Professor, Head of the
Department of Finance and Banking,
Poltava University of Economics and
Trade, Ukraine.

Nataliya Pedchenko, Doctor of
Economics, Professor, First Vice-
Rector of Poltava University of
Economics and Trade, Ukraine.

Myroslav Ostapenko, Ph.D. Student,
Department of Finance, Banking and
Insurance, Sumy State University,
Ukraine.



This is an Open Access article,
distributed under the terms of the
[Creative Commons Attribution 4.0
International license](https://creativecommons.org/licenses/by/4.0/), which permits
unrestricted re-use, distribution,
and reproduction in any medium,
provided the original work is properly
cited.

Olena Horbunova (Ukraine), Viktoriia Kartseva (Ukraine),
Nataliya Pedchenko (Ukraine), Myroslav Ostapenko (Ukraine)

FINANCIAL SUSTAINABILITY OF THE STATE PENSION SYSTEM OF UKRAINE

Abstract

The financial situation of the Ukrainian pension system and the problems of its reforming play an important role in determining the general standard of living in the country. The institutional weaknesses in the financial management of the state pension system have led to an unbalanced budget of the Pension Fund of Ukraine and a low standard of living for pensioners. In order to identify the potential for building an effective system of pension insurance, it is necessary to study the modern aspects of financial provision of the Ukrainian pension system. The article defines the economic interrelations between the processes of forming the financial resources of the Pension Fund of Ukraine and the volume and structure of the gross domestic product. In view of this, the financial sustainability of the state pension system of Ukraine has been researched and the determinants of its stable functioning in the years 1999–2017 have been identified, which enables to influence the process of effective formation and use of pension resources and to identify the strategic directions of reforming the pension system.

Keywords

pension provision, financial provision, sustainability,
determinants, financial resources

JEL Classification

G23, H55, J26

INTRODUCTION

Pension provision is largely able to provide social protection of citizens and support for social stability of the society. In a socially-oriented economy, the state pays attention to the formation of such a system of pension provision, which would become a guarantor of material protection for the population at the expense of the workers themselves, employers and the state. The main task of the state in this context is to optimize the financial resources of the Pension Fund. This, in turn, requires qualitatively new approaches to the study of pension sustainability, which is characterized by the accumulation of pension funds in the state budget and in the budget of the state trust fund at the expense of taxes, insurance premiums and other revenues, as well as transfers from the state budget.

According to Davis and Whittas (1995), the financial sustainability of pension provision is an incentive for the country's financial development. The peculiarity is that financial sustainability of pension provision increases the supply of long-term funds, enhances their efficient distribution and stimulates financial infrastructure of the country. Buiter and Grafe (2004) considered the importance of sustainability based on a "permanent balance rule", according to which the growth of deficit is possible with the increase of transfer payments, state consumption and gross capital accumulation, which exceeds the expected average level in the future. The authors believed that the growth of fu-

ture state pensions would lead to the fact that permanent pension contributions exceed the current ones, which in turn leads to a reduction of the state deficit or even an excess.

The current state of the pension system is in crisis and is accompanied by a number of demographic, political and economic problems. At the same time, there are no clearly defined areas of strategic management of the Pension Fund's revenues. This is due to insufficiency of the financial provision of the pension system and its inability to fully fulfill the main function of social justice. It is impossible to solve this problem without the diagnosis of the formation of revenues and expenditures of the Pension Fund of Ukraine and identifying the main determinants ensuring its stable functioning.

1. LITERATURE REVIEW

In many scientific works, issues related to the formation and establishment of the pension system, and the directions of its reform are considered. National system of compulsory state social insurance, in particular current problems and development strategy, is being studied by the Institute of Demography and Social Research of the National Academy of Sciences of Ukraine. Economists pay great attention to the problems of the pension system functioning.

For example, Zaichuk (2005) disclosed the social nature of pension insurance, the legal framework and the socio-economic principles of compulsory state pension insurance, characterized the pension and compulsory accumulation pension system, in particular, the functions, rights and obligations of participants, insurance premiums, types of payments, the order and terms of calculation and payment of insurance premiums, tariffs.

Tyshchenko and Tomin (2009) investigated social and legal aspects of the pension reform implementation in Ukraine and the EU countries; Tolubiak (2011) substantiated the functioning of the financial mechanisms of pension provision; Omelianovych (2012) disclosed topical issues of reforming the pension system of Ukraine and its impact on socio-economic development of society.

Grynchyshyn (2015) identified the main trends in the formation and use of financial resources of pension funds of Ukraine, highlighted the problematic aspects that require more effective use of elements of the financial mechanism of the pension funds functioning in Ukraine. Mishchuk and Shyshkina (2016) developed new approaches to reforming pensions by simulating the transfor-

mation period, taking into account the interests of different generations of depositors, justified retirement age qualification and improved organizational and economic principles for ensuring the sustainability of accumulative pension provision. Chuhunov (2017) elaborated the basic principles of strengthening the financial stability of the pension system, generalized and systematized the experience of foreign countries regarding the financial support of the pension protection for population.

Davis (1995) and Vitas (1995), and Buiters and Grafe (2004) contributed significantly to solving problems related to pension provision research. Bodie and Davis (2000) substantiated the government's obligation to guarantee the minimum level of overall participation in the national pension program; Diamond (2009) investigated the main features of the solidarity pension system such as income redistribution, paternalism, and cost effectiveness.

While paying tribute to the scientific achievements of the issues identified, an important task in this context is to clarify the financial determinants of the sustainable functioning of the pension system in order to prepare the ground for determining the priorities for its development.

2. METHODS

To achieve the goal, general and special methods of scientific knowledge were used. Methods of induction and deduction, analysis and synthesis were used during the study of theoretical and practical aspects of pension provision. Dialectical and abstract-logical methods are the basis of theoretical generalization and formulation of conclusions.

3. RESEARCH RESULTS

The Pension Fund of Ukraine as the budgetary system institution administrates the solidarity system of compulsory state pension insurance through pension revenues accumulation and distribution. The key to the study of the effective functioning of the pension system is assessing the possibilities of its financial provision in the solidarity income formation. This approach allows to determine the main financial determinants of sustainable functioning in order to create an effective mechanism for the growth and development of pension provision.

In Ukraine, the formation of the Pension Fund budget is based on current legislation and normative and legal acts in pension provision and is approved annually by the Cabinet of Ministers of Ukraine. According to the Law of Ukraine "On Mandatory State Pension Insurance" as of July 9, 2003, the sources of the formation of the Pension Fund's capital are (The Verkhovna Rada of Ukraine, 2012):

- 1) the proceeds from the payment of unified contribution for compulsory state social insurance towards the compulsory state pension insurance in the amounts determined by law, except for the part of insurance premiums, which is directed to the accumulation system of pension insurance;
- 2) investment income, which is derived from investment of the reserve of resources for covering the deficit of the Pension Fund budget in future periods;
- 3) funds from the state budget and trust funds;
- 4) amounts from financial sanctions and penalties (except for the amount paid by the employer for late payment (through his fault) of the insurance premiums of the insured person to the pension insurance accumulation system), applied in accordance with the laws to legal and natural persons for violating the established procedure of accrual, calculation and payment of insurance premiums and the use of the Pension Fund means, as well as the amount of administrative penalties imposed by the law on officials and citizens for these violations;
- 5) charitable contributions of legal entities and individuals;
- 6) voluntary contributions;
- 7) other receipts according to the legislation.

The main source of filling the Pension Fund budget is the unified contribution (unified tax) to the compulsory state social insurance, which included fees such as pensions, in the event of unemployment, from work accident, and social insurance due to temporary inability to work. Thus, according to Article 8 of the Law of Ukraine "On the Collection and Registration of the Unified Contribution to the Compulsory State Social Insurance" (The Verkhovna Rada of Ukraine, 2017), the size of the unified contribution for each category of payers determined by law and the proportion of its distribution by types of compulsory state social insurance are established taking into account that they must provide insured persons with insurance payments and social services provided by the legislation on compulsory state social insurance; financing of measures aimed at insurance cases prevention; creation of a reserve for insurance payments and provision of social services to insured persons; covering of administrative expenses for ensuring the functioning of the system of compulsory state social insurance.

Until 2016, the unified social tax (UST) was the highest compared to foreign countries, and was determined according to the occupational risk class: 36.76-49.7% for employers and 3.6% for employees. To compare, the UST average rate in the EU countries is 24.0% of the employer (12.8% of the employee); in the OECD countries – 20.6% of the employer (11.0% of the employee); on average in the world – 17.2% of the employer (10.2% of the employee) (Servatynska, 2015, p. 802).

In addition, high rate of contribution to pension insurance in Ukraine did not include a health insurance fee, had almost no impact on the size of the pension and displaced the workforce in the shadow economy.

As of January 1, 2016, there is a UST uniform rate in the amount of 22%, the deduction of UST from wages of employees has been canceled, and

the maximum amount of the UST calculation from 17 to 25 living wages for able-bodied persons has been increased (The Verkhovna Rada of Ukraine, 2015). The rate of insurance premium, contribution period and other parameters of the pension system not only determine the future level of state pensions, but also directly affect the quality of life of the current generation (Berezina, 2017).

The analysis of the dynamics of UST indicators for the compulsory state social insurance during the years 2013–2016 indicates a decrease in revenues from insurance funds (including penalties, fines, etc.) to the social insurance system, that is, less by UAH 54,944,862.0 ths (29.4% deceleration). In aggregate, the sum of the proceeds of insurance funds amounted to UAH 131,826,764.3 thousand – this is 21.5% of the state budget revenue in 2014 (35% in 2015, 51% in 2014) (Table 1).

According to Table 1, there is some positive dynamics in the growth of UST indicators: the total amount of citizens' income (wages, money support, etc.) increased by 140,548,722.1 ths or by 28.9%, which made it possible to expand the calculation base of the UST, namely: by UAH 119,795,274.12 thousand or by 25.8%.

In the context of a socially-oriented economy, an important problem of the Ukrainian pension system functioning is the real budget deficit of the Pension Fund of Ukraine. To take a closer look at the state of filling the Pension Fund of Ukraine's budget and its financial support sources, we will analyze the approved budgets of the Pension Fund of Ukraine during the ten and twenty year periods. The dynamics of the real budget deficit of the Pension Fund is shown in Figure 1.

It can be argued that over the past ten years, the Pension Fund deficit has constantly risen from UAH 6 bln in 2008 up to UAH 141.3 bln in 2017; special attention should be paid to its rapid increase in 2014 to 2017. This is related to a number of objective and subjective factors influencing the formation of the Pension Fund's revenues.

The most significant changes occurred in the dynamics of the external sources of financing the Pension Fund deficit. For the first time, attraction of funds to cover the budget deficit of the Pension Fund took place in 2005 for the amount of UAH 16.34 billion, and in 2006, the amount of such revenues was reduced more than twice – to UAH 7.29 billion with a growth rate of 44.6% compared to the previous year (Kyrylenko, 2013). Beginning in

Table 1. Dynamics of UST indicators for compulsory state social insurance during 2013–2016

Source: Compiled and calculated based on Federation of Employers of Ukraine (n.d.).

No.	Indicator's name	2013	2014	2015	2016	Deviation 2016/2013	
						Absolute, UAH ths	Relative, %
1	Total income, UAH ths	487,353,288.0	471,685,156.2	512,428,795.3	627,902,010.07	14,054,822.1	28.9
2	Total income, which is accrued by UST (within the maximum value of the calculation basis), UAH ths	464,459,795.6	445,048,580.0	472,771,828.5	584,255,069.72	11,979,574.12	25.8
3	Amount of UST accrued, UAH ths	168,247,756.0	161,779,297.3	165,738,654.4	126 100 178.81	-4,214,757.2	-25.0
4	Amount of UST kept back from wages, UAH ths	16740532,8	16 053127,1	16 905217,3	-648,84	-1674121,6	-100.0
5	Receipt of insurance funds (including penalties, fines, etc.), UAH ths	186,771,626.3	181,127,988.2	185,689,904.3	131,826,764.26	-5,494,482.0	-29.4
6	Amount of arrears of UST payment at the end of the reporting period, UAH ths	2,766,206.4	4,683,296.8	6,671,053.9	7,058,839.35	4,292,632.9	153.6
7	Amount of arrears of penalty and fine payment at the end of the reporting period, UAH ths	107,985.3	243,349.3	477,497.49	956,545.2	848,559.9	786.1

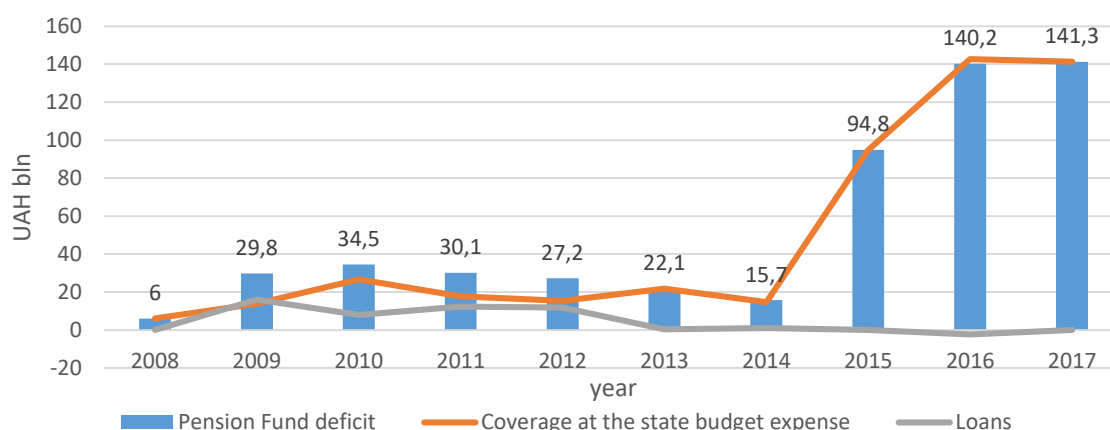


Figure 1. Dynamics of underlying deficit of the Pension Fund of Ukraine in 2008–2017, UAH bln

2007, a new practice was started, namely borrowing from a single treasury account to cover temporary cash disruptions with pension payments, and no funds from the state budget were involved. In 2007, this resulted in the Pension Fund of Ukraine attracting UAH 2.41 trillion, and the maximum amount of such a loan amounted to UAH 17.374 billion in 2009 (The Verkhovna Rada of Ukraine, 2014, p. 120). Since 2009, the coverage of the Pension Fund deficit of Ukraine is accompanied both through a single treasury account and at the expense of funds from the state budget of Ukraine.

Applying fees to compulsory state pension insurance from certain types of business transactions is a positive aspect over the past 10 years (see Table 2).

With that, one of the important additional sources of the Pension Fund of Ukraine financing is the proceeds from the sale and purchase of cashless foreign currency for hryvnia, which was eliminated in 2011–2013 to improve the investment climate in Ukraine. However, the proceeds have been returned in accordance with the Law of Ukraine No. 1200-VII dated April 1, 2014 “On Preventing Financial Crisis and Creating Preconditions for Economic Growth in Ukraine” (The Verkhovna Rada of Ukraine, 2014), and its share in the overall structure of revenues from certain types of economic operations was near 69% in 2014. That is, the application of special fees for certain types of business entities activity is one of the strategic directions of the Pension

Table 2. The dynamics of fund flows to the state budget of Ukraine to be transferred to the Pension Fund of Ukraine in 2005–2016, UAH mln

Source: Compiled by authors based on The Verkhovna Rada of Ukraine (2014) and the Accounting Chamber of Ukraine (2017) data.

Years	Proceeds from the foreign currency purchase transactions in cashless and/or cash form	Proceeds from trade in gold (excluding wedding rings), platinum and precious stones jewelry	Proceeds from cars alienation	Proceeds from real estate acquisition (purchase and sale)	Proceeds from the use and provision of cellular mobile communications	Total
2005	2,112.8	15.1	615.1	285.1	594.9	3,623.0
2006	2,444.7	20.7	988.0	467.5	941.4	4,862.3
2007	2,661.0	27.2	1,649.9	620.6	1,159.7	6,118.5
2008	2,358.8	37.4	2,103.7	584.0	1,413.6	6,497.7
2009	1,054.2	35.0	982.5	397.6	1,226.3	3,695.6
2010	1,005.1	36.5	1,279.1	459.5	1,358.0	4,138.2
2011	–	43.9	1,688.9	518.4	1,407.3	3,658.6
2012	–	39.9	1,669.6	655.0	1,431.8	3,796.3
2013	–	45.3	1,900.7	853.6	1,495.7	4,295.3
2014	6,658.5	33.6	1,056.2	562.9	1,320.6	9,631.8
2015	–	–	1,254.8	778.1	1,384.2	3,912.8
2016	–	–	2,045.2	841.0	1,568.9	5,056.8

Fund financing. The proposal of wealth taxation in Ukraine remains topical.

From January 1, 2015, new rules on proceeds when buying foreign currency entered into force: the fee rate has increased from 0.5% to 2%, it is paid only by individuals who buy cash (except for citizens who have foreign currency loans and buy foreign currency for the repayment). Also, as of January 1, 2015, instead of receipts for sale of gold, platinum and precious stones in Ukraine, the proceeds from jewelry and household items marking by the state sampler were introduced at the public testing enterprises (the fee is 10% of the value of the main precious metal (gold, silver, platinum, palladium) related to the weight of pure metal) (The Pension Fund of Ukraine, 2015).

To study the financial sustainability of the Ukrainian pension system, it is necessary to analyze pension security expenditures and their share

of GDP in the country. However, the study of this problem will be more detailed and deep subject to the foreign experience analysis. This approach will help to identify both positive and negative processes, with a view to their implementation in domestic practice.

The current trends of financial provision of the Pension Fund of Ukraine remain negative: the PFU budget is becoming shorter, and the share of pension expenditures to GDP is the highest among developing countries: as early as in 1970, this indicator was 7.4% and was at the level of countries such as Argentina, Bulgaria, Lithuania, Romania, and Russia in 2010 (Table 3). The forecast of the share of expenditures on pensions in GDP by 2050 gives grounds for asserting that the largest share of this indicator is in Ukraine at 26.1%, and in Brazil (16.8%), Russia (14.9%), and Turkey (17.0%), which is explained primarily by the high level of population aging in these countries.

Table 3. The share of government pension provision in GDP of emerging countries, %

Source: Compiled based on The Verkhovna Rada of Ukraine (2015, pp. 52-53).

Country	1970	1980	1990	2000	2010	2020	2030	2040	2050
						Forecast			
Argentina	–	9.2	5.2	5.5	7.4	8.1	8.9	10.2	11.9
Brazil	–	5.0	5.1	8.0	9.1	9.0	10.4	13.4	16.8
Bulgaria	7.0	6.5	8.6	8.1	7.2	5.9	6.0	7.0	8.2
China	–	–	1.0	2.3	3.4	4.7	6.7	7.9	9.2
Chile	2.7	3.4	8.5	7.6	5.5	4.6	3.6	3.7	3.8
Egypt	–	–	3.0	3.2	4.0	5.9	8.1	7.3	6.6
Estonia	–	–	–	10.3	9.3	7.4	6.8	6.7	6.6
Hungary	4.6	9.3	8.5	7.5	10.6	8.5	7.6	7.5	7.5
India	–	0.2	0.2	0.7	1.0	1.0	1.0	0.9	0.7
Indonesia	–	–	0.5	0.6	0.7	0.9	1.1	1.4	1.6
Jordan	–	–	–	–	4.1	5.3	7.3	10.1	13.1
Latvia	–	–	–	9.5	6.1	6.2	7.1	7.3	6.9
Lithuania	–	–	–	7.8	7.6	7.1	8.4	9.3	10.4
Malaysia	0.7	0.5	1.6	2.4	3.0	4.0	4.9	5.8	6.9
Mexico	–	0.3	0.5	0.9	1.5	2.0	2.8	1.8	1.3
Pakistan	–	–	0.0	0.4	0.6	0.6	0.7	0.9	1.2
Philippines	–	0.2	0.5	1.2	1.7	2.2	2.6	3.2	3.9
Poland	4.9	6.9	7.1	11.8	11.3	9.4	9.2	9.0	8.8
Romania	–	–	4.9	6.1	7.5	8.8	9.0	9.4	9.6
Russia	–	–	–	4.5	8.1	10.0	11.2	12.9	14.9
Saudi Arabia	–	–	1.4	1.6	2.2	3.2	4.9	6.6	8.1
South Africa	–	–	–	–	1.9	2.4	2.8	3.0	3.5
Thailand	–	–	–	0.5	1.0	1.4	1.7	1.9	2.0
Turkey	0.4	1.3	2.4	5.0	6.3	8.0	10.7	14.1	17.0
Ukraine	7.4	11.1	14.2	16.0	17.7	18.5	19.4	21.9	26.1

Over the past twenty years, no article on retirement expenditures has been reduced, while the GDP growth rate was not able to outpace the growth rate of social spending. At the same time, a larger proportion of retirement spending is spent on relatively young and healthy people who in other European countries would not have the right to a pension. A number of negative trends, in particular, the demographic situation in the country, the employment level, population poverty, and the structure of forming the Pension Fund financial resources, only complicated the situation.

During 1998–2017, the total amount of the Pension Fund of Ukraine expenditures increased by almost 23.8 times (Table 4). Nevertheless, revenues increased both at the expense of own receipts, and at the expense of other sources of financing. Own receipts for the period since 1998 increased by 14.4 times, mainly due to insurance premiums to the pay-as-you-go pension scheme by legal entities and individuals, and starting from 2011, at the expense of a unified social tax. Thus, today, out of 17.3 million working people, only 7.9 million pay insurance premiums, although, according to the principle of equity, all able-bodied citizens must take part in the pension system functioning (Berezina, 2017).

The analysis of the main indicators characterizing the financial provision of the Pension Fund of Ukraine for the period 1998–2017 showed that as of January 1, 2017, there are positive trends in the formation of the pension system financial provision. Thus, in 2017, the ratio of the PFU budget expenditures to GDP decreased by 1.94%, the share of PFU expenditures from the state budget to total expenditures decreased by 1.3%, the level of budget expenditures increased at the own expense by 6.78 %.

A survey of sources of pension income generating suggests that particular attention should be paid to financial sustainability in this context, which is the key to the pension system development. Financial sustainability is appropriate to measure by using indicators that characterize the relationship between own and borrowed sources of funds used to generate financial resources and reflected in the budget structure. Moreover, stability and growth of the indicators of its activity develop-

ment are important, as the reverse suggests unsustainable development.

Taking into account the peculiarities of forming the income of the solidarity level of the pension system, we consider that the key determinants of the financial sustainability of the state pension provision are as follows:

the ratio of Pension Fund budget expenditures to *GDP*:

$$\frac{Ex}{GDP}, \quad (1)$$

where *Ex* – Pension Fund budget expenditures, *GDP* – gross domestic product;

- 1) the level of budget expenditures provision at the expense of own funds:

$$\frac{Ex}{IR}, \quad (2)$$

where *IR* – internal revenues of the Pension Fund;

- 2) the share of the Pension Fund's expenditures from the state budget to total expenditures:

$$\frac{Ex(SB)}{Ex}, \quad (3)$$

where *Ex(SB)* – the Pension Fund expenditures at the expense of the state budget.

Given the pace of change of the main determinants of state pension provision stability, the author's vision for identifying the financial sustainability of the state pension system of Ukraine is proposed (Table 5).

In general, the identification of the pension system financial sustainability makes it possible to determine the strategic guidelines for managing the pension system and the directions for its further reformation. Thus, given this problem analysis, the authors proposed the following types of financial sustainability of the state pension system: 1) absolute financial sustainability; 2) moderate financial sustainability; 3) current financial sustainability; 4) potential financial sustainability; 5) variable financial sustainability; 6) limited financial sustainability; 7) critical financial sustainability; and 8) financial imbalance.

Table 4. Key indicators characterizing the financial provision of the Pension Fund of Ukraine functioning for the period 1998–2017

Source: Compiled based on State Statistics Service of Ukraine data.

Indicator	Years									
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
PFU budget expenditures, UAH mln	11,894.1	13,099.4	14,160.1	16,452.3	21,732.3	25,2669.8	36,182.9	65,502.1	70,202.3	95,592.9
GDP, UAH mln	102,600	130,400	170,100	204,200	225,810	267,344	345,113	441,452	544,153	720,731
Ratio of PFU budget expenditures to GDP, %	11.59	10.05	8.32	8.06	9.62	9.45	10.48	14.84	12.90	13.26
Own revenues taking the residual into account, UAH mln	9,930.2	11,745.8	11,553.4	13,283.3	19,439.7	23,154.9	30,010.9	42,214.8	52,841.4	70,440.4
Level of budget expenditures at the own expense, %	83.49	89.67	81.59	80.74	89.45	91.64	82.94	64.45	75.27	73.69
Expenditures at the expense of the state budget, UAH mln	700.0	876.0	1,832.2	2,128.1	1,980.5	1,846.1	5,884.3	5,345.7	7,854.7	22,954.3
Share of PFU expenditures from the state budget to the total expenditures, %	5.89	6.69	12.94	12.94	9.11	7.31	16.26	8.16	11.19	24.01

Indicator	Years									
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
PFU budget expenditures, UAH mln	147,761.4	164,142.1	192,282.0	209,036.0	228,763.7	252,049.2	248,945.1	267,346.5	254,066.0	283,169.9
GDP, UAH mln	948,056	913,345	1,082,569	1,302,079	1,411,238	1,454,931	1,566,728	1,979,458	2,383,182	3,247,700
Ratio of PFU budget expenditures to GDP, %	15.59	17.97	17.76	16.05	16.21	17.32	15.89	13.51	10.66	8.72
Own revenues taking the residual into account, UAH mln	106,166.9	114,913.3	127,043.2	152,414.0	165,834.6	170,822.4	169,127.7	174,177.9	110,808.5	142,693.7
Level of budget expenditures at the own expense, %	71.85	70.01	66.07	72.91	72.49	67.77	67.94	65.15	43.61	50.39
Expenditures at the expense of the state budget, UAH mln	39,206.5	33,448.1	35,016.3	36,048.1	43,778.7	54,455.7	57,233.1	55,648.6	54,490.7	57,057.4
Share of PFU expenditures from the state budget to the total expenditures, %	26.53	20.38	18.21	17.24	19.14	21.61	22.99	20.82	21.45	20.15

Table 5. Definition of the type of the Ukrainian pension system financial sustainability based on financial determinants

Source: Compiled based on Omelianovych (2012), Berezina (2017), Kaminska (2009, pp. 128-132), EGGSI (2011), Pallares-Mirallas, Romero, and Whitehouse (2012), Kozmenko and Mospanova (2016).

No.	Ex/GDP	Ex/IR	$Ex(SB)/Ex$	Type of financial sustainability of the pension system	Characteristics of the financial sustainability of the state pension system
1	↓	↑	↓	Absolute financial sustainability	Observance of such a structure of sources of funding that will ensure the stable socio-economic development over a long period of time
2	↓	↓	↓	Moderate financial sustainability	Optimal allocation and effective use of financial resources, increase of financial potential for the long term
3	↑	↑	↓	Current financial sustainability	Formation of financial resources sufficient to guarantee the smooth functioning of the state pension system
4	↓	↑	↑	Potential financial sustainability	Formation of alternative financial resources and increase of financial potential for the short term
5	↑	↓	↓	Variable financial sustainability	Change in the state of financial resources of pensions and changes in the financial strategy of their formation
6	↓	↓	↑	Limited financial sustainability	Financial equilibrium observance due to financing of the state budget and lack of financial potential
7	↑	↑	↑	Critical financial sustainability	The formation of financial resources is not sufficient to guarantee the smooth functioning of the state pension system
8	↑	↓	↑	Financial imbalance	The lack of optimal allocation and effective use of financial resources and the inability of the pension system to function in the future

Note: “↑” means the indicator increase; “↓” – the indicator decrease; “+” means years in which revenues \geq expenditures (the Pension Fund profit); “-” means years in which revenues \leq expenditures (the Pension Fund deficit).

Based on the above characteristics of the pension system financial sustainability, the authors identified the type of financial sustainability for the period from 1998 to 2017 (Table 6).

The increase in the share of pension provision in the GDP is due not only to the increase in pensions, but also to the increase in the proportion of pensioners who are entitled to pensions under spe-

Table 6. Calculation of financial determinants for defining the type of financial sustainability of the Ukrainian pension system for 1999–2017

Years	Ex/GDP , %	Ex/IR , %	$Ex(SB)/Ex$, %
1999	10.05	89.67	6.69
2000	8.32	81.59	12.94
2001	8.06	80.74	12.94
2002	9.62	89.45	9.11
2003	9.45	91.64	7.31
2004	10.48	82.94	16.26
2005	14.84	64.45	8.16
2006	12.90	75.27	11.19
2007	13.26	73.69	24.01
2008	15.59	71.85	26.53
2009	17.97	70.01	20.38
2010	17.76	66.07	18.21
2011	16.05	72.91	17.24
2012	16.21	72.49	19.14
2013	17.32	67.77	21.61
2014	15.89	67.94	22.99
2015	13.51	65.15	20.82
2016	10.66	43.61	21.45
2017	8.72	50.39	20.15

Table 7. Identification of financial sustainability of the Ukrainian pension system for 1999–2017

No.	Type of financial sustainability of the state pension system	Years
1	Absolute financial sustainability	2003(+), 2011(-), 2017(-)
2	Moderate financial sustainability	2010(-), 2015(-)
3	Current financial sustainability	2002(+)
4	Potential financial sustainability	1999(+); 2006(-); 2014(-)
5	Variable financial sustainability	2004(+); 2005(-); 2009(-)
6	Limited financial sustainability	2000(+); 2001(+), 2016(-)
7	Critical financial sustainability	–
8	Financial imbalance	2007(+), 2008(+), 2012(-), 2013(-)

Note: “+” means years in which revenues \geq expenditures (the Pension Fund profit); “-” means years in which revenues \leq expenditures (the Pension Fund deficit).

cial laws, which are financed from the state budget. Some reduction of expenditures in the general structure of GDP in 2000–2001, 2006, 2011, and 2014–2017 is explained by the faster growth of wages against social benefits. From 1999 to 2017, the share of own revenues decreased from 89.67% to 50.39%, which suggests the faster growth of expenditures for pensions when compared to the financial capacity of the Pension Fund of Ukraine and the impact on the steady functioning of the pension system.

The proposed levels of financial sustainability are appropriate and need to be clarified in terms of identifying information. For example, 2017 and 2011 can be characterized as absolutely financially sustainable years, but given the fact that the PFU's budget is scarce, this stage of financial provision

can be considered “absolutely stable” for our purpose, while 2003 reveals absolute financial sustainability (Table 7).

Hence, identifying the financial sustainability types is important, because it makes possible to determine the pension management quality and the strategic benchmark for its further reforming. This approach determines the need for II tier pension system, since some problems with its implementation remain unaddressed, namely: the stock market underdevelopment, lack of financial instruments for investment in pension assets, possible political influence due to obligatory pension savings in the event of a significant deficit of the state budget, shadow economy and war in the east of the country (anti-terrorism operation).

CONCLUSION

The structural study of the financial sustainability of Ukraine's pension provision in the context of the analyzing the dynamics of incomes and expenditures in recent years shows that the budget of the Pension Fund of Ukraine is unbalanced. The sources of pension revenues formation in Ukraine are non-systematic and uneven. Given the theoretical generalization of the pension system financial provision, a new vision of the financial sustainability of the state pension system is introduced, under which we suggest the understanding the reflection of stable income excess over expenditures and their effective use. Therefore, the goal of managing financial sustainability is to ensure the financial obligations fulfillment in the short and long term in the context of strategic directions of pension reform.

According to the proposed determinants of financial sustainability, namely: the ratio of expenditures of the Pension Fund budget to GDP; the level of budget expenditures provision at the expense of own funds and the specific weight of the Pension Fund's expenditures from the state budget to total expenditures one could argue about ineffective policies and the lack of a strategic vision for the functioning of the pension system in the long run. As a result of the study, it has been proved that the financial sustainability of the state pension system should be considered according to the following types: 1) absolute financial sustainability (2003, 2011, 2017); 2) moderate financial sustainability (2010, 2015); 3) current

financial sustainability (2002); 4) potential financial sustainability (1999, 2006, 2014); 5) variable financial sustainability (2004, 2005, 2009); 6) limited financial stability (2000, 2001, 2016); 7) critical financial sustainability; and 8) financial imbalance (2007, 2008, 2012, 2013).

The above approach to identifying a system of financial sustainability indicators of pension provision is not exhaustive, since it is impossible to consider absolutely all elements of financial provision and the connection between them. Therefore, further research in this direction should be aimed at forming an integral indicator of pension provision assessment, which would enable to identify the factors affecting it.

REFERENCES

- Barr, N., & Diamond, P. (2009). *Reforming Pensions* (CESIFO Working Paper, No. 2523).
- Berezina, S. (2017). Definition and parameter analysis of the accumulative pension system. *Investment Management and Financial Innovations*, 14(1), 124-133. [https://doi.org/10.21511/imfi.14\(1\).2017.13](https://doi.org/10.21511/imfi.14(1).2017.13)
- Berezina, S. (2017). Perspectives of accumulation of funds in the accumulative pension insurance system of Ukraine. *Investment Management and Financial Innovations*, 14(2), 128-138. [doi:10.21511/imfi.14\(2\).2017.12](https://doi.org/10.21511/imfi.14(2).2017.12)
- Bodie, Z., & Davis, E. P. (Eds.) (2000). *The Foundations of Pension Finance*. Cheltenham: Edward Elgar Pub.
- Buiter, W. H., & Grafe, C. (2004). Patching up the Pact. Suggestions for Enhancing Fiscal Sustainability and Macroeconomic Stability in an Enlarged European Union. *Economics of Transition*, 12(1), 67-102.
- Chuhunov, I. Ya., & Nasibova, O. V. (2017). *Фінанси пенсійного забезпечення [Finansy pensiihoho zabezpechennia]* (247 p.). Kyiv: Kyiv. nats. torh.-ekon. un-t.
- Davis, P. (1995). *Pension Funds: Retirement-Income Security and Capital Markets. An International Perspective*. Oxford: Clarendon Press.
- EGGSI (2011). The socio-economic impact of pension systems on the respective situations of women and men and the effects of recent trends in pension reforms. *Expert Group on Gender Equality and Social Inclusion, Health and Long-Term Care Issues (EGGSI)*, VC/2010/1443.
- Federation of Employers of Ukraine (n.d.). Retrieved from <http://www.fru.org.ua>
- Hrynychshyn, I. (2015). Фінансовий механізм функціонування пенсійних фондів в Україні [Finansovyi mekhanizm funktsionuvannia pensiiinykh fondiv v Ukraini] (182 p.). Lviv: In-t rehion. doslidzh. im. M. I. Dolishniho.
- Kaminska, I. M. (2009). *Механізми забезпечення фінансової спроможності соціально-економічного розвитку регіону [Mekhanizmy zabezpechennia finansosovi spro-mozhnosti sotsialno-ekonomichno-ho rozvytku rehionu]*. Lutsk: Lutsk National Technical University.
- Kozmenko, O., & Mospanova, Ya. (2016). Priority directions of improvement of state of pension coverage in Ukraine. *Investment Management and Financial Innovations*, 13(3-2). [https://doi.org/10.21511/imfi.13\(3-2\).2016.02](https://doi.org/10.21511/imfi.13(3-2).2016.02)
- Kurylenko, O. P., Malyniak, B. S. (Eds.). (2013). *Розвиток державного пенсійного страхування в умовах пенсійної реформи [Rozvytok derzhavnoho pensiihoho strakhuvannia v umovakh pensiihoho refofnyu]* (349 p.). Ternopil: TNEU.
- Mishchuk, H. Yu., & Shyshkina, O. O. (2016). Пенсійне забезпечення в Україні: оцінка стану та моделювання трансформації [Pensiine zabezpechennia v Ukraini; otsinka stanu ta modelivannia transformatsii] (176 p.). Rivne: Nats. un-t vod. hosp-va ta pryrodokorystuvannia.
- Omelianovych, L. O., & Rad, N. S. (2012). Вплив реформування пенсійної системи України на соціально-економічний розвиток суспільства [Vplyv reformuvannia pensiihoi systemy Ukrainy na sotsialno-ekonomichnyi rozvytok suspilstva] (282 p.). Donetsk: DonNUET.
- Pallares-Miralles, M., Romero, C., & Whitehouse, E. (2012). *International Patterns of Pension Provision II A Worldwide Overview of Facts and Figures* (WB Discussion Paper No. 1211). Washington, DC: World Bank.
- Servatynska, I. M. (2015). Адміністрування та справляння єдиного соціального внеску: зарубіжні та вітчизняні реалії [Administruvannia ta spravliannia yedynoho sotsialnoho внеску: zarubizhni ta vitchyzniani realii]. *Hlobalni ta Natsionalni Problemy Ekonomiky*, 6, 799-805.
- The Accounting Chamber of Ukraine (2017). Retrieved from http://www.ac-rada.gov.ua/doc-catalog/document/16751519/RP_8-7_2017.pdf
- The Challenge of Public Pension Reform in Advanced and Emerging Economies (n.d.). Retrieved from <http://www.imf.org/external/np/pp/eng/2011/122811.pdf>
- The Pension Fund of Ukraine (2015). Retrieved from http://www.pfu.gov.ua/pfu/control/uk/publish/article?art_id=225280&cat_id=201432
- The Verkhovna Rada of Ukraine (2012). Retrieved from <http://zakon.nau.ua/doc/?uid=1088.397.65&nobreak=1>

22. The Verkhovna Rada of Ukraine (2014). Retrieved from <http://zakon3.rada.gov.ua/laws/show/1166-18>
23. The Verkhovna Rada of Ukraine (2015). Retrieved from <http://zakon3.rada.gov.ua/laws/show/909-19>
24. The Verkhovna Rada of Ukraine (2017). Retrieved from <http://zakon2.rada.gov.ua/laws/show/2464-17>
25. Tyshchenko, O. V., & Tomin, Ye. F. (2009). Соціально-правові аспекти реалізації пенсійної реформи в Україні та країнах Європейського Союзу [*Sotsialno-pravovi aspekty realizatsii pensiinoi reformy v Ukraini ta krainakh Yevropeiskoho Soiuzu*] (186 p.). Kyiv: Obrii.
26. Vittas, D. (1995). *Pension Funds and Capital Markets*, mimeo. The World Bank, Washington, D.C.
27. World Bank (2014). *The Inverting Pyramid: Pension Systems Facing Demographic Challenges in Europe and Central Asia*. Washington, DC: World Bank.
28. Zaichuk, B. O., Zarudnyi, O. B., Berezina, S. B., Aleksandrov, V. T., & Nedbaieva, S. M. (2005). *Загальнообов'язкове державне пенсійне страхування [Zahalnooboviazkove derzhavne pensiine strakhuvannia]* (244 p.). Kyiv: ABT.
29. Національна система загальнообов'язкового державного соціального страхування: сучасні проблеми та стратегія розвитку [Natsionalna systema zahalnooboviazkovoho derzhavnoho strakhuvannia: suchasni problemy ta stratehiia rozvytku] (2006) (180 p.). Kyiv: Instytut Demohrafii ta Sotsialnykh Doslidzhen NAN Ukrainy.