Problems of income and expenditure balance of the pension fund budget of Ukraine

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Abstract
The steady budget deficit of the Pension Fund of Ukraine necessitates balancing its budget and finding effective opportunities to improve the current pension system. The revenue and expenditure part of the budgets of the Pension Fund for the last 7 years has been analyzed, time series characterizing various aspects of its activity have been constructed, polynomial modeling of trend series of revenues and expenditures has been carried out. To improve the actuarial basis of the joint pension system, it has been suggested to segregate social pensions, which are not provided by insurance premiums, and therefore cannot be the object of insurance payments, but should be subject to state (budget) funding. The shadow sector of the economy and the arrears of enterprises for the payment of salary to employees have been identified as a significant factor in the disproportion of the budget of the Pension Fund of Ukraine, measures to respond to these violations have been identified and analyzed. Relevant recommendations included a revision of the institutional position on limiting the amount of salaries on which SSC (single social contribution) is accrued, the redistribution of relevant contributions between employees and employers, and the harmonization of the accrual base with the average salary. Further research is recommended to focus on the peculiarities of balancing the revenues and expenditures of the budget of the Pension Fund in the case of entrusting it with the functions of other social insurance funds of Ukraine, as well as in connection with the introduction of the second level of pension provision.

Keywords: solidary pension system; labour payment; pension payments; state subsidies; administrative expenses; shadow economy.

Introduction
The budget deficit of the Pension Fund of Ukraine (PFU), due to the systematic violation of the principle of economic dependence of consumer expenditures on income levels, for many years leads to significant imbalances in the development of the Ukrainian pension system of the solidarity type. Pension reform has become one of the main conditions for Ukraine’s cooperation with the International Monetary Fund under the Stand-by program (Ministry of Finance of Ukraine, 2018). In addition, the reform of Ukraine’s pension system should be seen as a driving force for other social and economic reforms, including strategic labor market reform aimed at reducing the effects of the shadow economy. Therefore, special attention needs to be paid to balancing the PFC budget and finding reserves to grow its revenue side.

Various aspects of PFU activity in recent years are quite often in the field of view of scientists.

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Thus, Mokhova & Pysarenko (2018) identified the features of the functioning and key problems of the pension system of Ukraine, analyzing the indicators of its development, including the volume of PFU expenditures and the average pension. The authors suggest to reform the pension system in accordance with the best international experience of implementing savings programs.

The solution to the current problems of social protection of pensioners was proposed by Tryfonov & Shebalkov (2017) by structuring the pension system. The authors proved the need for pension reform according to EU standards and with the help of the method of factor-by-factor analysis of structural changes identified the factors that ensure the socio-economic development of Ukraine. We also agree with the conclusions of Boreiko (2019) that the increase in contributions from the state budget to cover the PFU deficit has a negative impact on the development of the national economy and suggests to start implementing a funded pension system in Ukraine without reference to the unfavorable socio-economic situation.

Ostrovetskyi (2017) notes the need to develop and implement a system of effective measures to improve the pension system, as the solidarity system, according to his findings, is unable to ensure a decent level of pension benefits. Tulai & Kobylnyk (2017) emphasize that in order to improve the activities of the PFU, it is necessary to turn it into an insurance fund and exempt it from uncharacteristic expenses, as well as to introduce into circulation pension bonds and mandatory accounts for accumulation of funds.

In general, a significant number of researchers, agreeing with the conclusions on the main problems of PFU, provide recommendations for the introduction of a savings system or analyze the activities of private pension funds. In particular, Burdeniuk (2020) emphasized the need to attract funds from the State Budget of Ukraine for pension payments and justified the need to introduce a second tier of the pension system to restore the appropriate level of pensions, analyzing the conditions and prospects for mandatory funded pension insurance. Shymko (2019) described in detail the specifics of their operation and identified the main elements of normative-legal regulation of professional administrators and asset management companies.

Also, important information for the analysis of innovative development of the pension system was provided by the research of Kalashnikova & Kalashnikov (2017), who substantiated the need to modernize the PFU to increase the quality of services and identified prospects for the introduction of new services in the process of reforming the pension system.

As for foreign studies, they a priori cannot reveal the peculiarities of the development of the Ukrainian pension system. Instead, modern research reveals the possibilities of innovative scientific approaches to the study of our problems, as well as highlights some nuances in the development of pension systems in different countries. In particular, there was an interesting experience of modeling political manipulations with pension reserve funds in a modified model of the political budget cycle proposed by Wang & Bohn (2019). The studies of Leroux et al. (2019), which highlighted the role of institutional impact in reducing tax evasion through the close link between salary taxation and pension benefits. Boon et al. (2018) examined the impact of investment regulations on the risk of asset allocation of pension funds in the United States, Canada and the Netherlands, which may be useful while studying the functioning of private pension funds in Ukraine.

Taking into account the rapid deterioration of the demographic situation in Ukraine, of particular value to us was the study Fenge & Peglow (2018), devoted to the forecast analysis of the impact of demographic development on the German pension system until 2060. The author’s decomposition revealed the consequences of the development of mortality, birth rate and migration on the dynamics of the pension system, which is extremely important for the implementation of effective and sustainable pension reform in Ukraine.

At the same time, in the development of the pension system of Ukraine today there are a
number of problems with the formation of PFU revenues, their effective use and budget balancing, which are especially exacerbated by the difficult socio-economic situation, deteriorating demographics and prolonged economic crisis.

The aim of the study was to highlight the problems of balancing the budget of the Pension Fund of Ukraine and outline possible ways to improve the current pension system in Ukraine.

Material and methods

The study is based on the detailed analysis of the revenue and expenditure parts of the PFU budgets during 2014-2020 with a clear identification of the real steps of the PFU to reduce imbalances and outline the prospects for improvement. The main time series (the ratio of PFU expenditures and GDP, the dynamics of the number of old-age pensioners, the dynamics of the PFU budget deficit, the prospective dynamics of PFU own revenues and expenditures), as well as the structure of PFU administrative expenditures in 2020 are presented graphically. Polynomial modeling of trend series of PFU own revenues, its total expenditures and expenditures for pension benefits based on the analysis of statistical data has been carried out.

Results and discussion

The principles of social insurance were introduced into the pension system of Ukraine in 2004 (The Verkhovna Rada of Ukraine, 2004). It was announced that a three-tier pension system would be established, which would include a joint system of compulsory state pension insurance, additional mandatory individual pension accounts and voluntary private pension insurance. Thus, the basis was laid for the creation of a mixed public-private solidarity-accumulation system in Ukraine, although the second level of pension provision still remains institutionally unrealized. The pension reforms carried out in the following years were mostly parametric in nature, giving the pension system its current form.

The main element of the social protection system in Ukraine is the pension provision of the population, the financial mechanism of which is provided by the PFU. PFU budget revenues are generated from both own revenues and subsidies from the state budget of Ukraine (Table 1).

| Table 1. Structural dynamics of budget revenues of PFU during 2014-2020 (UAH. mln.) |
|-----------------------------------|-----|-----|-----|-----|-----|-----|-----|
| PFU income                        | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
| Own income                        | 165923 | 169874 | 111707 | 158910 | 202084 | 241851,2 | 300623,9 |
| Chain rates of change, %          | 2.4 | -34.2 | 42.3 | 27.2 | 19.7 | 24.3 |
| SSC                               | 159473 | 165366 | 107148 | 154300 | 196854 | 236262 | 274173,9 |
| Chain rates of change, %          | 3.7 | -35.2 | 44.0 | 27.6 | 20.0 | 16.0 |
| - paid by enterprises to cover the costs of payment / delivery of pensions | 4006.2 | 4102.7 | 4234.5 | 4337.7 | 4975.5 | 5209 | 5436,4 |
| Chain rates of change, %          | 2.4 | 3.2 | 2.4 | 14.7 | 4.7 | 4.4 |
| - paid by banks for the use of temporarily free funds | 1159 | 61 | 55.8 | 50.9 | 131.4 | 153.5 | 144,9 |
| Chain rates of change, %          | -94.7 | -8.5 | -8.8 | 158.2 | 16.8 | -5.6 |
| State budget funds                | 75813 | 94812 | 142586 | 133459 | 150091 | 193105,5 | 189211,6 |
| Chain rates of change, %          | 25.1 | 50.4 | -6.4 | 12.5 | 28.7 | -2.0 |

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As we can see, the dynamics of budget revenues in 2014-2020 was heterogeneous both in time and in terms of structural content. In general, PFU revenues doubled, including own revenues increased in 1.8 times (due to SSC in 1.7 times), subsidies from the state budget increased in 2.5 times.

Analysis of the structural dynamics of PFU expenditures for the same period (Table 2)

The considered dynamic distribution of revenues and expenditures of PFU budgets for 2014-2020 (Fig. 1) indicates the systemic dependence of social security of persons of the retirement age on state subsidies, i.e. on the general state of the economic system of Ukraine.
Institutional strengthening of the revenue side of the PFU budget as the main basic tool for the development of the solidarity level of the pension system is considered by us as an extremely important strategic goal to ensure long-term sustainability of the state pension system. In our opinion, the actuarial basis of the scheme of providing the first level of the pension system needs to be improved. We consider it appropriate to recommend PFU to separate social pensions (as those that do not provide for insurance premiums, and therefore cannot be considered as an object of insurance benefits), providing their financing exclusively through state subsidies. This proposal is especially relevant due to the development of tools to stimulate savings and contributions of employees to various pension programs of the second (in the near future) and third levels of the pension system.

Let us analyze the balancing of the PFU budget on the example of 2020. The total amount of revenues to the PFU budget from all sources of funding amounted to UAH 489.8 billion, including own revenues amounted to UAH 300.6 billion or 61.4% of the total PFU budget revenue (by UAH 58.7 billion more than own revenues in 2019). The total amount of expenditures on pensions and other planned payments amounted to UAH 489.6 billion (by UAH 53.7 billion more than expenditures in 2019). In particular, 97.4% of expenditures were directed to pension payments, 0.8% were targeted payments from the Covid-19 fund to provide one-time assistance to insured citizens, 0.2% of expenditures were payments to repay the PFU loan in 2019, 0.5% were payment of postage and settlement and cash service, 1.1% of all expenses were administrative expenses. Pension and other payments in the amount of UAH 184.5 billion were financed from the State Budget of Ukraine.

As of the beginning of 2021, 11,131.0 thousand pensioners were registered in the PFU (203.8 thousand people less than at the beginning of 2020), among them 61.5% women and 38.5% men. (6845.6 and 4285.4 thousand people correspondingly). At the same time, 2,467.5 thousand SSC payers were registered (42.4 thousand more than at the beginning of 2020), including 646.4 thousand legal entities (26.2%), 1792.7 thousand individual entrepreneurs (72.7%), 24.7 thousand persons engaged in independent professional activity (1.0%) and 3.7 thousand members of farms (0.1%).

However, the established budget deficit of the PFU encourages more careful monitoring of
the State Register of Compulsory State Insurance for signs of the use of undocumented workers and violations of SSC payments. In 2020, the indicator of the average salary, from which SSC is paid (the same indicator is taken into account for the calculation of pensions), increased by 12.3% and amounted to UAH 10,340.35 per month. Receipts of SSC per 1 insured person increased by 10.3% and amounted to UAH 25,119.23 in a year. At the same time, in December 2020 out of more than 9.9 million employees, salaries in the amount less than the statutory minimum (UAH 5,000) were received by 1,127.5 thousand people (232.5 thousand people more than in December 2019), 236.3 thousand people of which were employees from the budget sphere (Table 3), which negatively affected the level of revenues to the PFU budget.

Table 3. Distribution of income of insured persons in 2018-2020

| The amount of salary                                       | December 2018 | December 2019 | December 2020 |
|-----------------------------------------------------------|---------------|---------------|---------------|
|                                                           | thousand of people | %         | thousand of people | %         | thousand of people | %         |
| Less than the minimum                                     | 1441.4        | 13.9          | 1252.1        | 12.2      | 1785.7            | 18.0      |
| From minimum to 10000 UAH                                 | 5696.6        | 54.9          | 5082.6        | 49.5      | 3733.4            | 37.5      |
| From 10000,01 to 20000 UAH                                | 2389.9        | 23.0          | 2682.4        | 26.2      | 2809.4            | 28.2      |
| From 20000,01 to the maximum amount for which SSC is accrued | 771.4         | 7.4           | 1150.3        | 11.2      | 1528.1            | 15.4      |
| More than the maximum amount for which SSC is accrued     | 86.4          | 0.8           | 95.7          | 0.9       | 91.5             | 0.9       |
| Total number of insured persons                           | 10385.7       | 100           | 10263.1       | 100       | 9948.1            | 100       |
| Minimum salary (UAH)                                      | 4173          | 4723          | 5000          |           |
| The maximum amount for which SSC is accrued (UAH)         | 62595.01      | 70845.01      | 75000.01      |

Source: compiled according to the data of the Pension Fund of Ukraine (2020)

In 2020, the territorial bodies of the PFU conducted 180.8 thousand inspections of the subjects of the system of compulsory state pension insurance, of which 85.5% (154.6 thousand) were on the validity of the issuance of documents for registration of pensions, 12.1% (21.9 thousand) were on compliance with the requirements of the legislation in the field of pension insurance, 1.7% (3.1 thousand) were on the use of PFU funds, which resulted in violations totaling UAH 17.5 million.

Significant factors in the PFU budget deficit are the significant volume of the shadow sector of the economy and the growth of arrears of salaries, which leads to arrears of SSC payments. Thus, according to the State Statistics Service of Ukraine (2021), in 2020 about 3.3 million people (over 25% of all employees) worked without registration of labor relations, most often this violation was recorded in agriculture (45.2%), trade (15.7%), construction (16.8%), industry (5.5%) and transport (4.0%). Accordingly, in 2020, more than UAH 769.2 million was collected in court in favor of the PFU.

It should be noted that the PFU systematically takes appropriate measures to respond to the described violations, in particular, in 2020 the results of such activities were an increase of 30.5 thousand people (1.6%) in the number of individual entrepreneurs, a decrease of 21.9 thousand persons (by 1.9%) in the number of employees with a level of salary below the minimum and legalization of more than 153.7 thousand jobs, as a result of which about 227.4 million UAH SSC was additionally attracted to the budget of the PFU.
At the same time, the institutional position on limiting the amount of salaries on which SSC is accrued remains unclear, as about 91.5 thousand people in 2020 received salaries exceeding this limit, while the PFU budget did not receive the relevant SSC deductions. Thus, solving these problems of balancing the income and expenditure parts of the PFU budget requires a comprehensive solution to a number of general economic problems: growth of productive employment, minimization of hidden unemployment and shadow employment, repayment of salary arrears and increasing of its size, pension insurance coverage of all categories of legal entities and individuals. In addition, we recommend an institutional redistribution of pension insurance contributions between employees and employers in the ratio of 50:50. It is clear that such an innovation can be ambiguously perceived in society, so it is worth legislating the appropriate compensation from employers in connection with the increase in the rate of insurance contributions of employees. Taking into account that the SSC rate in Ukraine is quite high (22%), we do not recommend its further growth. Moreover, given the established PFU budget deficit, it is worth considering reducing the SSC rate, which could potentially reduce staff costs, increase the competitiveness of Ukrainian enterprises and, consequently, increase employment growth and fill the PFU budget. At the same time, we see it expedient to change the basis for accrual of SSC for individual entrepreneurs, self-employed persons and members of farms who now pay SSC from the minimum salary, whereas it would be more expedient to choose the average Ukrainian salary as a basis for the accrual. PFU expenditures on pensions are the largest component in the structure of total expenditures, while the largest share of pension payments falls on the provision of old-age pensioners (Table 4).

Table 4. Distribution of PFC pension benefits by types in 2020

| Type of pension provision | At the beginning of 2020 | At the end of 2020 |
|---------------------------|-------------------------|-------------------|
|                           | Number                  | The average pension, UAH | Number | The average pension, UAH |
|                           | persons | % |          | persons | % |          |
| By age                    | 8534558 | 79.16 | 3064.77 | 8330485 | 78.74 | 3538.97 |
| On disability             | 1405704 | 13.04 | 2480.41 | 1426553 | 13.48 | 2679.45 |
| After the loss of a breadwinner | 539097 | 5.00 | 2699.7 | 531849 | 5.03 | 3012.50 |
| For years of service      | 220594 | 2.05 | 2841.74 | 214301 | 2.03 | 3205.53 |
| Social pensions           | 77632 | 0.72 | 1644.25 | 72843 | 0.69 | 1786.06 |
| Lifetime financial support for judges | 3378 | 0.03 | 45874.27 | 3538 | 0.03 | 67961.39 |
| Total in Ukraine          | 10780963 | 100.00 | 2968.95 | 10579572 | 100.00 | 3399.33 |

Source: compiled according to the data of the Pension Fund of Ukraine (2021)

Until 2011, pensions were granted to men after reaching the age of 60 with at least 25 years of insurance experience and to women after reaching the age of 55 with 20 years of insurance experience. Age and length of employment requirements were relaxed for those who worked in difficult (dangerous) conditions, for women who gave birth to and raised 5 or more children and other categories. The pension reform of 2011 provided for a gradual increase in the retirement age for women, and an increase in the length of service for a full pension to 30 years for women and up to 35 years for men (The Verkhovna Rada of
Ukraine, 2012), which became a significant factor influencing the reduction in the number of pensioners (Fig. 2). The decision to raise the retirement age for Ukrainian women was based on an estimate of their residual life expectancy at the time of retirement (18.4 years after the end of the reform), whereas in men life expectancy is much shorter both at birth and at retirement (14 years) (European Center for Social Security Policy and Research, 2012). In addition, the life expectancy of men under the age of 65 is only 52.6% (in the EU it is 84.9%), so raising the retirement age for men was not considered. At the same time, the reduction of persons entitled to pensions is also due to the general trend of reducing life expectancy in Ukraine. In addition, the gradual annual increase in the minimum required length of retirement introduced in 2017 (from 2028 the minimum required length of employment will be 35 years) with the definition of later retirement dates in case of its absence or insufficiency, also affected the decrease in the number of old-age pensioners (The Verkhovna Rada of Ukraine, 2017).

The PFU is responsible for financing pension supplements to bring them into line with the legislatively defined minimum pension. As the analysis of the expenditure part of the PFU budget has shown, these additional payments are made at the expense of contributions of insured persons, which contradicts the principles of pension insurance and significantly increases the burden on the PFU budget.

The PFU budget also incurs additional costs in connection with the financing of preferential pension systems. Today in Ukraine, preferential pension payments are made at the expense of state subsidies, and since 2017 are made also at the expense of targeted revenues of enterprises for people whose work was associated with harmful and particularly difficult working conditions. In our opinion, the availability of benefits in the pension system may contain known corruption risks, so this practice should be institutionally stopped in the near future. Instead, the optimal tool for taking into account differences in working conditions should be an appropriate adjustment of the level of remuneration of such employees, which will contribute to a further correspondingly high level of pension provision by increasing the SSC.

If we assess the PFU budget deficit solely as the difference between own income and total expenditures, its indicators and dynamics are extremely unsatisfactory (Fig. 3).

At the same time, polynomial modeling on the basis of statistical data for 2014-2020 of the trend series of PFU own income, its total expenditures and expenditures for pension benefits (Fig. 4) with sufficient probability (R2> 0.9) shows that in the near future the PFU will fully provide pension payments from its own revenues.
The possibility of PFU to provide total expenditures, including administrative costs, payment for banking services and Ukrposhta for the payment and delivery of pensions, as well as other payments to citizens (for example, in the structure of 2019 expenditures, benefits and housing subsidies to citizens amounted to UAH 10.8 billion in cash, in 2020 for the payment of one-time cash benefits amounted to UAH 9.9 billion because of the negative consequences of the spread on the territory of Ukraine of acute respiratory disease COVID-19 caused by coronavirus SARS-CoV-2).

Estimating the dynamics of costs for payment of services for payment and delivery of pensions, we note that in 2020 the number of pensioners receiving pensions through banks is more than 7.6 million people (68.6% of the total), which is in 143.3 thousand more than in 2019, this allowed to reduce the corresponding PFU expenditures by UAH 8.2 million, but about 3.5 million pensioners (31.4%) still receive pension payments through JSC “Ukrposhta”.

Administrative expenses of PFU in 2020 amounted to UAH 5,290.1 million. (1.1% of total PFU expenditures), which is by UAH 49.7 million less than the corresponding figure in 2019, the share of accrued salaries in their structure was 84.3% (Fig. 5).

Fig. 4. Promising dynamics of own income and expenditures of PFU

![Graph showing dynamics of own income and expenditures of PFU](image)

**Fig. 5. The structure of administrative expenditures of PFU in 2020**

*Source: based on the data of Pension Fund of Ukraine (2020)*
Estimating the number of PFU employees, as of the beginning of 2021, it should be noted that the staff list provides for 246 positions in the central office and 21,319 positions in the territorial bodies of PFU, while in fact there work 188 (76.4%) and 19501 (91.5%) state employees. The central office employs 18 (9.6%) men (4 under the age of 35 and 12 aged 36-60, and 2 civil servants over 61 years old) and 170 women (25 under the age of 35, 142 aged 36-60, and 3 over the age of 61). In 2020 the territorial bodies employed 1705 (8.7%) men (542 under the age of 35, 1116 aged 36-60 years and 47 over the age of 61) and 17796 women (3147 under the age of 35, 14439 aged 36-60 years and 210 over the age of 61 years).

The average monthly salary of staff in 2020 was UAH 14,204.34, however, the average value in this case is not indicative, because according to the declaration of income submitted by the Chairman of the Board of PFU in 2020, his annual salary was UAH 131268, i.e. UAH 109.4 thousand per month. At the same time, the average monthly salary of the Director of the Pension Department in 2020 was UAH 89,171.83, the Chief Specialist of the Department of Administration of Information Systems Management of Maintenance and Development of Information Systems and Electronic Registers had the salary UAH 26,829.92, and the Chief Specialist of the Department of Citizens’ appeals of the Department of Pension Provision had the salary UAH 21,327.58.

Thus, despite the importance and responsibility of PFU civil servants, taking into account the systemic deficit of its budget, it may be worth reconsidering the remuneration policies of its leaders.

One of the priorities of the PFU in 2020 was the digital transformation of administrative processes, which included information integration of services and increasing the availability of services through the introduction of digital technologies. In particular, information interaction with the user’s e-cabinet was introduced on the Unified State Web Portal of e-services "Portal Diya", digitization of pension cases continued in all regions of Ukraine (as of the beginning of 2021 about 1.6 million cases were digitized), there was also created technical base for the introduction of electronic workbook accounting and automated centralized subsystem “Assignment and payment of pensions based on electronic pension business” of the Integrated Comprehensive Information System of PFU (Pension Fund of Ukraine, 2021).

The integrated information system is designed for comprehensive automation of the main technological processes of PFU (collection, accumulation and expenditure of pension funds, including personalized accounting, appointment and payment of pensions, maintaining a register of insured persons) and other processes related to the main functions of the PFC (providing visitor services, informing citizens, analysis and forecasting, comprehensive information protection, etc.). The cost of the contract with LLC “Medirent Research and Production Enterprise” for the modernization of this system in 2020 amounted to UAH 4.8 million. (Prozorro, 2020). At the same time, already in March 2021 PFU orders from the same company services for support, maintenance and modernization of subsystems of the Integrated Information System in the amount of over 11 million UAH. As part of our study, we will not provide recommendations to PFU to improve their digitization policy, but note that each step related to spending PFU finances should be carefully considered and reasonably appropriate.

Conclusions

The analysis of the main indicators of the PFU budget reflects its imbalance and dependence during 2014-2020 on subsidies from the state budget of Ukraine. The financial instability of the solidarity system is caused by demographic, economic and political factors. To improve the balancing of income and expenditure parts of the PFU budget, it is recommended:
- to separate social pensions, which are not the object of insurance payments, providing their financing exclusively at the expense of state subsidies;
- to review the institutional position on limiting the amount of salary on which SSC is accrued;
- to carry out institutional redistribution of pension insurance contributions between employees and employers;
- to consider the possible potential for reducing the SSC rate to boost employment growth and fill the PFU budget;
- to consider the possibility of changing the base of accrual of SSC for individual entrepreneurs, persons engaged in independent economic activity and members of farms, from the minimum to the average salary in Ukraine;
- to institutionally stop the existence of benefits in the pension system, instead of that to introduce the practice of appropriate adjustment of the level of remuneration of such employees;
- PFU management to review the remuneration policy of civil servants.

In the future, it is advisable to thoroughly analyze the opportunities and threats to the PFU, related to the possible assignment of the functions of the Social Insurance Fund of Ukraine and the Fund of Compulsory State Social Insurance in case of unemployment, as well as the introduction of the second level of pension provision.

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