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Diagnostics of the current state of Ukraine's state budget

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DIAGNOSTICS OF THE CURRENT STATE OF UKRAINE'S STATE BUDGET

The example of Ukraine shows that the indicator of fiscal sustainability $s1^a$ for one year can be used to diagnose the current state of the state budget. Six principles of construction of such an indicator are considered, which include: 1) construction of the indicator $s1^a$ for the current year; 2) calculation of the value of the indicator $s1^a$ for the current year every month, that is, with the frequency with which information on the implementation of Ukraine's State Budget for the period from the beginning of the current year to the current month of the current year is published; 3) calculation of the indicator $s1^a$ based on the planned value of the state debt of Ukraine at the end of the current year, the actual value of the state debt of Ukraine at the end of the previous year, the planned and forecast values for the current year of the rest of its components; 4) the assumption that the planned values of the components of the indicator $s1^a$ are those whose values are approved in the regulatory and legal acts of Ukraine for the current year (namely: the Resolution of the Cabinet of Ministers of Ukraine on approval of the forecast of economic and social development of Ukraine regarding the nominal GDP and the Law of Ukraine on the State Budget of Ukraine for the current year regarding the remaining components) or calculated based on the above mentioned approved values; 5) the assumption that the planned values of components of the indicator $s1^a$ for a month of the current year are equal to one twelfth of their planned values for the current year; 6) the assumption that the forecast values of the components of the indicator $s1^a$ for the current year are equal to the sum of their actual values for the period from the beginning of the current year to the current month of the current year and their planned values for the current month and the following months of the current year.

It is indicated that when constructing the indicator $s1^a$ on the specified principles, it can be calculated not only as a fiscal gap of the

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one-year budget constraint, but also in two alternative ways: by calculating the difference between the actual value of the change in the state debt of Ukraine for the period from the beginning of the current year to the current month of the current year and its planned value for this period, as well as by calculating the difference, taken with the opposite sign, between the actual value of the adjusted balance of the State Budget of Ukraine for the period from the beginning of the current year to the current month of the current year and its planned value for this period.

The author reveals the diagnostic capabilities of the indicator $s1^a$, namely: the ability to reflect the current state in the state finance sector, as well as in the financial sector in whole, the ability to define the impact of its components on it, the ability to define the impact of amending the Law of Ukraine on the State Budget of Ukraine for the current year and the Resolution of the Cabinet of Ministers of Ukraine on approval of the forecast of economic and social development of Ukraine on it. It is noted that the use of the indicator $s1^a$ will strengthen the validity of decisions on issues of fiscal and debt policy.

Keywords: *fiscal gap, fiscal sustainability, fiscal sustainability indicator, State budget of Ukraine, fiscal policy, debt policy*

When making decisions on fiscal policy, indicators of fiscal sustainability are widely used - *the medium-term fiscal sustainability indicator* $S1$ and *the long-term fiscal sustainability indicator* $S2$, which measure the size of the fiscal gap that arises when the budget constraint is not fulfilled. The size of the fiscal gap shows the scale of challenges to fiscal sustainability (the ability of the government to meet its debt obligations on time and in full) and the size by which it is necessary to adjust budget receipts and/or expenses in order to avoid such challenges, and also, in the absence of these challenges, - the size of the fiscal space within which the government can finance an expenditure contingency without generating such challenges [1; 2; 3; 4, pp. 156-159; 5, p. 11; 6, p. 9].

The fiscal gap is estimated either for a *limited* (*finite*) number of time periods (the medium-term fiscal sustainability indicator $S1$), or for an *unlimited* (*infinite*) number of time periods (the long-term fiscal sustainability indicator $S2$). As a rule, the time period is a year, and the number of years for calculating the medium-term fiscal sustainability indicator $S1$ is no less than two. The medium-term fiscal sustainability indicator $S1$ for one year is practically not used.

The **purpose** of this article is to show that the medium-term fiscal sustainability indicator $S1$ for one year has prospects for application, in particular, it can be used to *diagnose the current state of the budget.*

The methodology for the construction of the $s1^a$ **indicator.** *The indicator*

of medium-term sustainability of the budget[2] for one year (hereinafter referred to as the $s1^a$ indicator) is described by formula (1)[3]:

$$s1^a = \sigma_0 \cdot \frac{1+r_1}{1+\gamma_1} - \sigma_1 - cnc_1,\tag{1}$$

where $s1^a$ - fiscal gap in year 1, *% of GDP*; σ_0 - state debt of Ukraine[4] at the end of year 0, *% of GDP*; σ_1 - state debt of Ukraine at the end of year 1, *% of GDP*; r_1 - effective nominal interest rate on the state debt in year 1, annual, *coefficient*; γ_1 - rate of the growth of the nominal GDP of Ukraine (hereinafter - GDP) in year 1, *coefficient*; cnc_1 - adjusted primary balance of budget[5] in year 1, *% of GDP*.

In theory, the $s1^a$ indicator (see formula (1)) is calculated based on the *target* value of the state debt at the end of year 1 (σ_1) which is set depending on the goals of the fiscal policy, the *actual* value of the state debt at the end of year 0 (σ_0) and the *forecast* values of the rest of its components for year 1 (r_1, γ_1, cnc_1).

In order for the $s1^a$ indicator to reflect *the current state of the budget*, the State Institution "Institute for Economics and Forecasting, NAS of Ukraine" has suggested calculating the $s1^a$ indicator on the following principles [8, p. 31-35].

1. It is assumed that year 1 is the current year of budget execution, and year 0 is the previous year.

2. The value of the $s1^a$ indicator for the current year is calculated monthly, that is, with the frequency with which information on the budget execution for the period from the beginning of the year to the current month is published (updated).

[2] Hereinafter the *budget* refers to the *Ukraine's State Budget*.

[3] The $s1^a$ indicator is based on variables of the Ukraine's government finance statistics, compiled according to the methodology of the *IMF's Government Finance Statistics Manual* in the 1986 edition (GFSM 1986) (except for revenues from privatization which are treated as financing). Variables of government finance statistics of other countries of the world (European Union countries, Great Britain, the USA, Canada and others) are compiled according to the methodology of the *IMF's Government Finance Statistics Manual* in the 2001 edition (GFSM 2001) or in the 2014 edition (GFSM 2014). Therefore, for these countries, the formula of the medium-term fiscal sustainability indicator for one year has a different form: in it, the adjusted primary balance of budget (cnc_1) is substituted by the primary balance of budget (nc_1) [7, p. 89-99]:

$$S1 = \sigma_0 \cdot \frac{1+r_1}{1+\gamma_1} - \sigma_1 - nc_1.$$

[4] *The state debt of Ukraine* (hereinafter referred to as the state debt) does not include the state-guaranteed debt. If guarantee liabilities come into force, the debt paid by the state instead of the borrower is recorded as a *loan provided* to such a borrower *from the budget*.

[5] *The adjusted primary balance of the budget* is the primary balance of the budget, increased by the amount of financing of budget from state property privatization and by the amount of financing of budget from active transactions and reduced by the value of the deviation of the change in state debt from the amount of debt financing of budget.

A total of twelve values of the $s1^a$ indicator are calculated for the current year. Each subsequent value clarifies the previous one (see Graph 1).
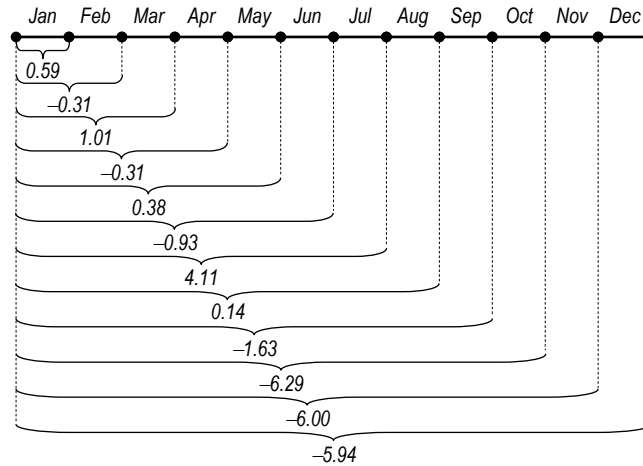
Graph 1. Values of the $s1^a$ indicator for 2022, *% of GDP*

Note: for 2022, twelve values of the $s1^a$ indicator were calculated. Each subsequent one clarifies the previous one. The first value of the $s1^a$ indicator for 2022 was calculated in February 2022 on the basis of information on the budget execution for January 2022, the second one - in March 2022 on the basis of information on the budget execution for January-February 2022, the third one - in April 2022 based on information on the budget execution for January-March 2022, etc. The eleventh value of the $s1^a$ indicator for 2022 was calculated in December 2022 on the basis of information on the budget execution for January-November 2022, and the twelfth one - in January 2023 on the basis of information on the budget execution for January-December 2022.
Source: constructed by the author.

3. The $s1^a$ indicator is calculated based on the *planned* value of the state debt at the end of the current year ($\delta_1^{план}$), the *actual* value of the state debt at the end of the previous year (δ_0) and also the *planned* and *forecast* values of the rest of its components for the current year ($\gamma_1^{план}$, $r_1^{прогноз}$, $cnc_1^{прогноз}$) (see formula (2) taking into account formulas (3)-(7)):

$$s1^a = \delta_0 \cdot \frac{1 + r_1^{прогноз}}{1 + \gamma_1^{план}} - \delta_1^{план} - cnc_1^{прогноз}, \qquad (2)$$

$$\text{where} \quad \delta_0 = \frac{Б_0}{Y_0} \cdot 100\%, \qquad (3)$$

$$\delta_1^{план} = \frac{Б_1^{план}}{Y_1^{план}} \cdot 100\%, \qquad (4)$$

$$\gamma_1^{план} = \frac{Y_1^{план} - Y_0}{Y_0}, \qquad (5)$$

$$r_1^{прогноз} = \frac{Вб_1^{прогноз}}{Б_0}, \tag{6}$$

$$cnc_1^{прогноз} = \frac{СПС_1^{прогноз}}{Y_1^{план}} \cdot 100\%, \tag{7}$$

where $s1^a$ - fiscal gap in the current year, *% of GDP*; $б_0$ - actual value of the state debt at the end of the previous year, *% of GDP*; $б_1^{план}$ - planned value of the state debt at the end of the current year, *% of GDP*; $r_1^{прогноз}$ - forecast value of the annual effective nominal interest rate on the state debt for the current year, *coefficient*; $\gamma_1^{план}$ - planned value of the nominal GDP growth rate for the current year, *coefficient*; $cnc_1^{прогноз}$ - forecast value of the adjusted primary balance of budget for the current year, *% of GDP*; $Б_0$ - actual value of the state debt at the end of the previous year, *UAH*; $Б_1^{план}$ - planned value of the state debt at the end of the current year, *UAH*; Y_0 - actual value of the nominal GDP for the previous year, *UAH*; $Y_1^{план}$ - planned value of the nominal GDP for the current year, *UAH*; $Вб_1^{прогноз}$ - forecast value of the budget expenditures on the state debt servicing for the current year, *UAH*; $СПС_1^{прогноз}$ - forecast value of the adjusted primary balance of budget for the current year, *UAH*.

4. The *planned* values of the components of the $s1^a$ indicator for the current year ($Y_1^{план}$, $Б_1^{план}$ and others) mean such their values that are approved by the regulatory and legal acts of Ukraine for the current year or calculated based on such approved values. Thus, the planned value of the nominal GDP for the current year ($Y_1^{план}$) is such its value for the current year, which is approved by the Resolution of the Cabinet of Ministers of Ukraine on approval of the forecast of economic and social development of Ukraine and chosen as the basis for calculating the values of budget indicators approved in the Law of Ukraine on the State Budget of Ukraine for the current year. The planned values of the rest of components of the $s1^a$ indicator for the current year ($Б_1^{план}$ and others) are such their values for the current year, which are approved in the Law of Ukraine on the State Budget of Ukraine for the current year or calculated based on such approved values.

The planned values are monitored monthly and updated in case of entry into force of amendments to the Resolution of the Cabinet of Ministers of Ukraine on approval of the forecast of economic and social development of Ukraine regarding the value of the nominal GDP for the current year or of entry into force of amendments to the Law of Ukraine on the State Budget of Ukraine for the current year regarding the values of the rest of components of the $s1^a$ indicator for the

current year. For the calculation of the $s1^a$ indicator, such planned value of its component for the current year is taken, which is valid at the end of the month preceding the current month.

5. The planned value of the component of the $s1^a$ indicator for a month is one-twelfth of its planned value for the year.

6. The *forecast* values of components of the $s1^a$ indicator for the current year ($B\delta_1^{прогноз}$, $C\Pi C_1^{прогноз}$ and others) are such their values, which are calculated based on the actual and planned values of these components in the current year. The forecast value of the component of the $s1^a$ indicator for the current year is calculated monthly and equal to the sum of its actual value for the period from the beginning of the current year to the current month and its planned values for the current month and subsequent months of the current year (see Graph 2).
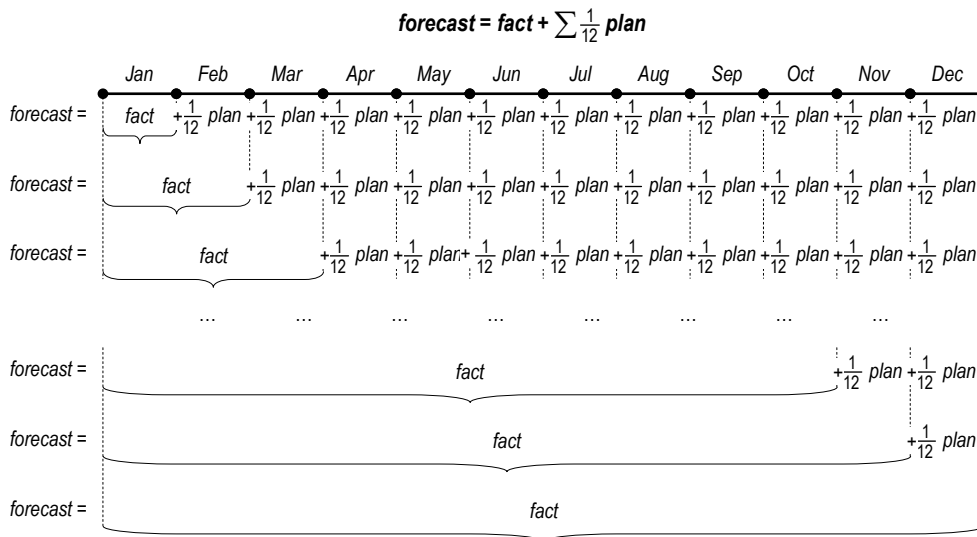
Graph 2. Calculation of the forecast value of the component of the $s1^a$ indicator for the current year

Note: forecast - the forecast value of the component of the $s1^a$ indicator for the current year, calculated in the current month; *fact* - the actual value of the component of the $s1^a$ indicator for the period from the beginning of the current year to the current month; *plan* – the planned value of the component of the $s1^a$ indicator for the current year, which is valid at the end of the month preceding the current month.
Source: constructed by the author.

Alternative ways of calculating the $s1^a$ indicator. It was theoretically proven and confirmed by calculations that the $s1^a$ indicator, calculated according to the formula (2), has two alternative methods of calculation, which, taking into account the formula (8), are given by formulas (9)-(10) [8, pp. 39-43]:

$$s1^a = \frac{S1^a}{Y_1^{план}} \cdot 100\% , \qquad (8)$$

$$s1^a = \frac{Б_1^{прогноз} - Б_1^{план}}{Y_1^{план}} \cdot 100\% = \frac{\Delta Б_1^{прогноз} - \Delta Б_1^{план}}{Y_1^{план}} \cdot 100\% , \qquad (9)$$

$$s1^a = - \frac{CC_1^{прогноз} - CC_1^{план}}{Y_1^{план}} \cdot 100\% , \qquad (10)$$

where $s1^a$ - fiscal gap in the current year, *% of GDP*; $S1^a$ - fiscal gap in the current year, *UAH*; $Y_1^{план}$ - planned value of the nominal GDP for the current year, *UAH*; $Б_1^{прогноз}$, $Б_1^{план}$ - forecast and planned values of the state debt at the end of the current year, respectively, *UAH*; $\Delta Б_1^{прогноз}$, $\Delta Б_1^{план}$ - forecast and planned values of the change in state debt for the current year, respectively, *UAH*; $CC_1^{прогноз}$, $CC_1^{план}$ - forecast and planned values of the adjusted balance of budget[6] for the current year, respectively, *UAH*.

Formula (8) links the $s1^a$ indicator expressed in relative quantity (i.e. in % of GDP) with the same indicator expressed in absolute quantity (i.e. in UAH) ($S1^a$).

Formula (9) shows that the $S1^a$ indicator in absolute quantity (i.e. in UAH) can be calculated as the difference between the forecast value of the state debt at the end of the current year ($Б_1^{прогноз}$) and the planned value of the state debt at the end of the current year ($Б_1^{план}$) or, which is the same as the difference between the forecast value of the change in state debt for the current year ($\Delta Б_1^{прогноз}$) and the planned value of the change in state debt for the current year ($\Delta Б_1^{план}$). It is proved that these differences are equal to *the difference between the actual value of the change in state debt for the period from the beginning of the current year to the current month of the current year and its planned value for this period.*

Formula (10) shows that the $S1^a$ indicator in absolute quantity (i.e. in UAH) can be calculated as the difference, taken with the opposite sign, between the forecast value of the adjusted balance of budget for the current year ($CC_1^{прогноз}$) and the planned value of the adjusted balance of budget for the current year ($CC_1^{план}$). It is proved that such a difference is equal to *the difference, taken with*

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[6] *The adjusted balance of budget* is the balance of budget, increased by the amount of financing of budget from state property privatization and by the amount of financing of budget from active transactions and reduced by the value of the deviation of the change in state debt from the amount of debt financing of budget.

the opposite sign, between the actual value of the adjusted balance of budget for the period from the beginning of the current year to the current month of the current year and its planned value for this period.

Of the three calculation methods of the $s1^a$ indicator (see formulas (2), (9), (10)), the simplest method is its calculation according to formula (9), that is, as the difference between the actual value of the change in state debt for the period since the beginning of the year and its planned value for this period (an example of calculation the $s1^a$ indicator for 2022 according to formula (9) is given in Table A.1 of Annex A).

The practical meaning of formula (2) for calculating the $s1^a$ indicator is that it explains the value of the $s1^a$ indicator in term of the availability of challenges to fiscal sustainability, as well as in term of the size of the fiscal adjustments necessary eliminate such challenges, and of the size of fiscal space within which the government of Ukraine can, if necessary, incur an expenditure contingency without generating such challenges.

The practical meaning of formula (9) for calculating the $s1^a$ indicator is that, firstly, it provides the simplest calculation methods of the $s1^a$ indicator from all three calculation methods (see formulas (2), (9), (10)), and secondly, allows to determine the contributions to the formation of the fiscal gap ($s1^a$) of such components of the $s1^a$ indicator, as budget receipts from state borrowing; budget expenses for reimbursement of the state debt; amount of adjustment of debt operations; amount of budget financing by debt operations; deviation of the change in state debt from the amount of budget financing by debt operations (see Annex B).

The practical meaning of formula (10) for calculating the $s1^a$ indicator is that it allows to determine the contributions to the formation of the fiscal gap ($s1^a$) of such components of the $s1^a$ indicator, as budget revenues; budget expenditures; amount of loans provided from the budget; amount of loans refunded to the budget; balance of lending of budget; budget balance; amount of budget financing from state property privatization; amount of budget financing from active transactions; deviation of the change in state debt from the amount of budget financing by debt operations (see Annex C).

Diagnostic capabilities of the $s1^a$ indicator. The $s1^a$ indicator demonstrates a wide range of diagnostic capabilities.

Firstly, the $s1^a$ indicator assesses the current state of the sector of state finance.

Graph 3 presents the value of the $s1^a$ indicator for 2005-2022. The first eleven values of the $s1^a$ indicator for each year, calculated as of the end of each month of the respective year, show the scale of challenges posed by the current deviation of the forecast value of the state debt at the end of the current year

($Б_1^{прогноз}$) from its planned value approved in the Law of Ukraine on the State Budget of Ukraine for the current year ($Б_1^{план}$).The last twelfth value of the $s1^a$ indicator for each year shows the scale of challenges on the basis of results of the annual execution of the state budget posed by the deviation of the actual value of the state debt at the end of the reporting year from its planned value at the end of the reporting year ($Б_1^{план}$).
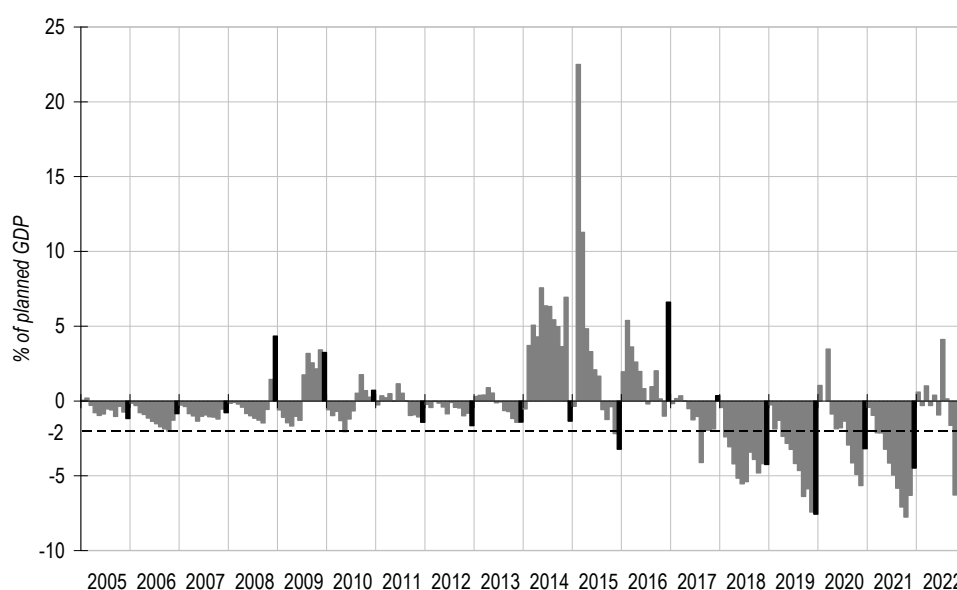
Graph 3. The $s1^a$ **indicator in 2005–2022,** *% of planned GDP*

Note: the first eleven values of the $s1^a$ indicator for the respective year, calculated on the basis of information on budget execution for the period from January to the respective month of such year, are marked in *gray*, and the twelfth value of the $s1^a$ indicator for the respective year, calculated on the basis of information on budget execution for such year, is marked in *black*.
Source: author's calculations.

If during the current execution of the budget, the value of the $s1^a$ indicator is *positive* ($s1^a > 0$) (that is, the *forecast* value of the state debt at the end of the current year ($Б_1^{прогноз}$) *exceeded* its *planned* value at the end of the current year ($Б_1^{план}$)), then *there are* fiscal sustainability *risks* until the end of the current year. In such a case, it is necessary for decision makers on fiscal and debt policy to take measures that by the end of the current year will lead to an *improvement* in the forecast adjusted primary balance of the budget ($cnc_1^{прогноз}$) by the quantity of the positive value of the $s1^a$ indicator (that is, will increase the forecast budget receipts by the end of the current year, or reduce forecast budget expenses by the end of the current year, or contribute to both at the same time) in order to avoid fiscal sustainability risks by the end of the current year (that is, return the forecast

value of the state debt at the end of the current year ($Б_1^{прогноз}$) to its planned value at the end of the current year ($Б_1^{план}$)).

If during the current execution of the budget, the value of the $s1^a$ indicator is *negative* or *equal to zero* ($s1^a \leq 0$) (that is, the *forecast* value of the state debt at the end of the current year ($Б_1^{прогноз}$) did *not exceed* its *planned* value at the end of the current year ($Б_1^{план}$)), then *there are no* fiscal sustainability *risks* until the end of the current year or they are *minimal*. In this case, decision makers on fiscal and debt policy might take measures that by the end of the current year will lead to a *deterioration* of the forecast adjusted primary balance of the budget ($cnc_1^{прогноз}$) within the absolute value of the negative value of the $s1^a$ indicator ($\left| s1^a \right|$) (that is, will reduce forecast budget receipts until the end of the current year, or increase the forecast budget expenses until the end of the current year, or contribute to both at the same time) without fiscal sustainability risks until the end of the current year (that is, so that the forecast value of the state debt at the end of the current year ($Б_1^{прогноз}$) will remain within its planned value at the end of the current year ($Б_1^{план}$))[7]. It also means that until the end of the current year, the government of Ukraine has a fiscal space in the size of the absolute value of the negative value of the $s1^a$ indicator ($\left| s1^a \right|$), within which, until the end of the current year, it can, if necessary, finance expenses that are not provided in the Law of Ukraine on the State Budget of Ukraine for current year.

At the end of 2008, in the second half of 2009 and 2010, in the first half of 2011 and 2013, almost throughout 2014, in the first half of 2015, in 2016, at the beginning of 2017 and 2020, in the first half of 2022, the $s1^a$ indicator had positive values (see Graph 3), which points to fiscal sustainability risks that arose due to the fact that the forecast/actual values of the state debt at the end of the year under consideration exceeded its planned value at the end of the year under consideration. The highest level of such risks was in February 2015 ($s1^a = 22.49\%$ of planned GDP). In other periods, the $s1^a$ indicator had negative values, which points to the absence of fiscal sustainability risks and the availability of fiscal space, since the current forecast/actual values of the

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[7] An example of such measures can include those aimed at easing the tax burden on business. Their adoption will lead to a decrease in forecast tax revenues of the budget in the current year, and therefore to a deterioration in the forecast adjusted primary balance of the budget in the current year. However, if the deterioration of the forecast adjusted primary balance of the budget in the current year does not go beyond the absolute value of the negative value of the $s1^a$ indicator, fiscal sustainability risks will not arise until the end of the current year.

state debt at the end of the year did not exceed its planned value at the end of the year.

Secondly, the $s1^a$ indicator assesses the current state of the financial sector as a whole.

The dynamics of the $s1^a$ indicator almost synchronously repeat the dynamics of the financial stress index, which is calculated by the National Bank of Ukraine to reflect the current state of the financial sector (see Graph 4). Therefore, the $s1^a$ indicator can be used for a preliminary assessment of the current state of the financial sector on a monthly basis.
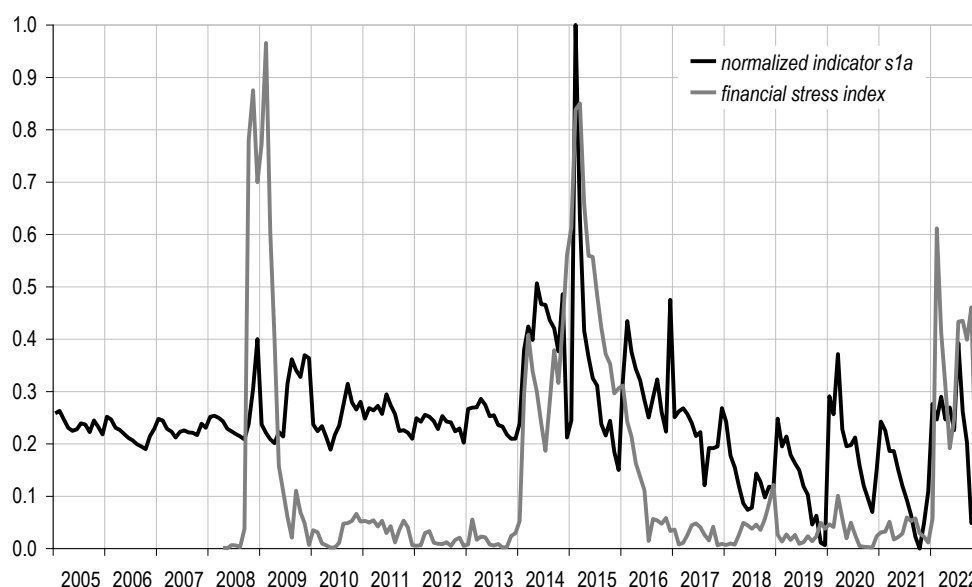
Graph 4. Normalized indicator $s1^a$ and financial stress index in 2005-2022

Notes. 1. The value of the $s1^a$ indicator is normalized, that is, brought to the range of values [0; 1] by the minimax method[8], which is used in calculating the financial stress index [9, p. 43].

2. The National Bank of Ukraine calculates the financial stress index for the period from April 2008.

3. The graph of the financial stress index is compiled from the index values calculated by the National Bank of Ukraine for the last day of each month.

Source: data from the National Bank of Ukraine [10] and author's calculations.

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[8] *The minimax method* of normalization of values assumes that each value of the $s1^a$ indicator in time period t ($s1_t^a$) is substituted by another value ($s1_t^{a*}$), calculated by formula:

$$s1_t^{a*} = \frac{s1_t^a - \min\left(s1^a\right)}{\max\left(s1^a\right) - \min\left(s1^a\right)},$$

where $\min\left(s1^a\right)$ is the lowest value of the $s1^a$ indicator among all its values in 2005–2022, $\min\left(s1^a\right) = -7.77$; $\max\left(s1^a\right)$ is the highest value of the $s1^a$ indicator among all its values in 2005–2022, $\max\left(s1^a\right) = 22.49$.

Thirdly, the $s1^a$ indicator allows to assess the value of the impact of its components on it.

Thus, according to the results of 2022, the fiscal space was formed in the size of 5.94% of the planned GDP ($s1^a = -5.94$) (see the twelfth value of the $s1^a$ indicator for 2022 in Graph 3). According to the formulas (C.1)-(C.3) of Annex C (see Graph 5a), the following components of the $s1^a$ indicator have created the fiscal space (that is, have had a negative contribution to the $s1^a$ indicator): *budget revenues*, *loans refunded to the budget, budget financing from active transactions* – due to the overfulfillment of the plan regarding these components by 4.37% of the planned GDP, 0.04% of the planned GDP and 0.92% of the planned GDP, respectively ($s1^a(Д) = -4.37$; $s1^a(Kn) = -0.04$; $s1^a(AO) = -0.92$), and *budget expenditures* and *loans provided from the budget*, – due to the underfulfilment of the plan regarding them by 6.18% of the planned GDP and 0.27% of the planned GDP, respectively ($s1^a(B) = -6.18$; $s1^a(Кн) = -0.27$). The following components of the $s1^a$ indicator have narrowed the fiscal space (that is, have had a positive contribution to the $s1^a$ indicator): *budget financing from state property privatization* - due to the underfulfilment of the plan regarding such financing by 0.12% of the planned GDP ($s1^a(Пр) = 0.12$), as well as the *deviation of the change in state debt from the amount of budget financing by debt operations* - due to the overfulfillment of the plan regarding such a deviation by 5.72% of the planned GDP ($s1^a(\Delta) = 5.72$).

If we detail the contribution of *budget revenues* to the $s1^a$ indicator, then *grants* have expanded the fiscal space by 6.52% of the planned GDP ($s1^a(Гранти) = -6.52$) due to the overimplementation of the plan regarding them, and *budget revenues excluding grants* have narrowed the fiscal space by 2.16% of the planned GDP ($s1^a(Д\_інші) = 2.16$) due to the underfulfilment of the plan regarding them.

If we detail the contribution of *budget expenditures* to the $s1^a$ indicator, then *budget expenditures excluding expenditures on defense and public order* have expanded the fiscal space by 11.32% of the planned GDP ($s1^a(B\_інші) = -11.32$) due to the underfulfillment of the plan regarding them, and *budget expenditures on defense* and *budget expenditures on public order* have narrowed the fiscal space by 2.64% of the planned GDP and 2.50% of the planned GDP, respectively ($s1^a(B\_об) = 2.64$, $s1^a(B\_г.п) = 2.50$) due to the overfulfillment of the plan regarding them.

According to the formulas (B.1)–(B.2) of Annex B (see Graph 5b), based on the results of 2022, the following components of the $s1^a$ indicator have created the fiscal space (that is, have had a negative contribution to the $s1^a$ indicator): *budget*
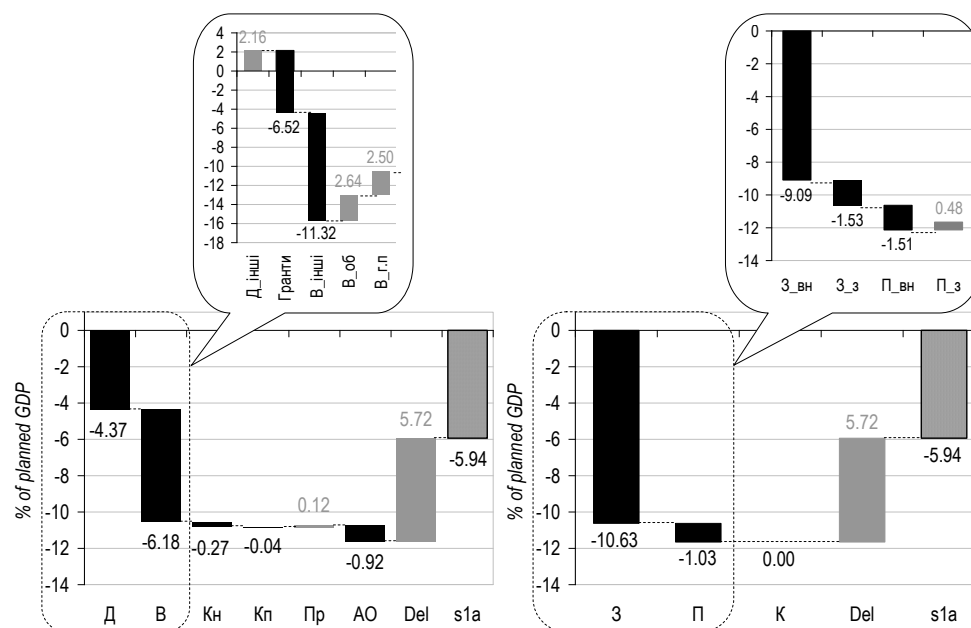
a) The contribution, calculated as the difference, taken with the opposite sign, between the actual and planned values of the adjusted balance of budget

Note. Д - budget revenues, including *Гранти* - item of budget revenues "Official transfers from the European Union, foreign governments, international organizations, donor institutions" (i.e. grants), *Д_інші* - budget revenues excluding grants; *В* - budget expenditures, including *В_об* - budget expenditures on defense, *В_г.п* - budget expenditures on public order, *В_інші* - budget expenditures excluding expenditures on defense and public order; *Кн* - amount of loans provided from the budget; *Кп* - amount of loans refunded to the budget; *Пр* - amount of budget financing from state property privatization; *АО* - amount of budget financing from active transactions; *Del* - deviation of the change in state debt from the amount of budget financing by debt operations; *s1a* - the $s1^a$ indicator.

b) The contribution, calculated as the difference between the actual and planned values of the change in state debt

Note. З - budget receipts from state borrowing, including *З_вн* - budget receipts from internal state borrowing, *З_з* - budget receipts from external state borrowing; *П* - budget expenses for reimbursement of the state debt, including *П_вн* - budget expenses for reimbursement of the internal state debt, *П_з* - budget expenses for reimbursement of the external state debt; *К* - amount of adjustment of debt operations; *Del* - deviation of the change in state debt from the amount of budget financing by debt operations; *s1a* - the $s1^a$ indicator

Graph 5. Contributions of components of the $s1^a$ indicators to the $s1^a$ indicator according to the results of the execution of Ukraine's State Budget in 2022, *% of planned GDP*

Source: author's calculations.

receipts from state borrowing – due to the underfulfilment of the plan regarding them by 10.63% of the planned GDP ($s1^a(3) = -10.63$), as well as *budget expenses for reimbursement of the state debt* – due to the overfulfilment of the plan

regarding them by 1.03% of the planned GDP ($s1^a(B) = -1.03$). Such a component of the $s1^a$ indicator as the *deviation of the change in state debt from the amount of budget financing by debt operations* has narrowed the fiscal space (that is, has had a positive contribution to the $s1^a$ indicator) - due to the overfulfillment of the plan regarding it by 5.72% of the planned GDP ($s1^a(\Delta) = 5.72$).

If we detail the contribution of *budget receipts from state borrowing* to the $s1^a$ indicator, then *budget receipts from internal state borrowing* have expanded the fiscal space by 9.09% of planned GDP ($s1^a(З\_вн) = -9.09$), and *budget receipts from external state borrowing* – by 1.53% of planned GDP ($s1^a(З\_з) = -1.53$).

If we detail the contribution of *budget expenses for reimbursement of the state debt* to the $s1^a$ indicator, then the *budget expenses for reimbursement of the internal state debt* have expanded the fiscal space by 1.51% of the planned GDP ($s1^a(П\_вн) = -1.51$) due to the overfulfillment of the plan regarding them, and the *budget expenses for reimbursement of the external state debt* have narrowed the fiscal space by 0.48% of the planned GDP ($s1^a(П\_з) = 0.48$) due to underfulfillment of the plan regarding them.

The contributions of components of the $s1^a$ indicators to the $s1^a$ indicator, calculated according to the results of the annual execution of budget, for 2005–2022 are given in Annex D.

Fourthly, the $s1^a$ indicator allows to assess the value of the impact on it on the part of the amendments, made to the regulatory and legal acts of Ukraine during the current year.

It is proved that the value of the $s1^a$ indicator in the current year is affected by the amendments to the Law of Ukraine on the State Budget of Ukraine for the current year regarding the *planned* value of the *state debt at the end of the current year* ($Б_1^{план}$), and the amendments to the Resolution of the Cabinet of Ministers of Ukraine on approval of the forecast of economic and social development of Ukraine regarding the *planned* value of the *nominal GDP for the current year* ($Y_1^{план}$). Moreover, in the first case, they affect the absolute (i.e. in UAH) and relative (i.e. in % of GDP) quantities of the $s1^a$ indicator, and in the second case – only the relative quantity of the $s1^a$ indicator (i.e. in % of GDP). The amendments to the Law of Ukraine on the State Budget of Ukraine for the current year regarding the planned values of the rest of components of the $s1^a$ indicators (budget revenues; budget expenditures; amount of loans provided from the budget; amount of loans refunded to the budget; budget receipts from state borrowing; budget expenses for reimbursement of the state debt; amount of budget financing by debt operations; amount of budget financing from state property privatization;

and amount of budget financing from active transactions) do not affect the value of the $s1^a$ indicator, but they affect the value of the contributions of such components of the $s1^a$ indicator and components, calculated on their basis, to the value of the $s1^a$ indicator [8, p. 58-63].

If, as a result of the amendments to the Law of Ukraine on the State Budget of Ukraine for the current year, the planned value of the state debt at the end of the current year shifts from $Б_1^{план}$ to $Б_1^{план*}$, that is, changes by $\left(Б_1^{план*} - Б_1^{план}\right)$ UAH, or $\left(\dfrac{Б_1^{план*} - Б_1^{план}}{Y_1^{план}} \cdot 100\%\right)$ % of the planned GDP, then the value of the fiscal sustainability indicator, calculated based on the information on budget execution for the first k months of the current year, will change by $\left(\left(Б_1^{план} - Б_1^{план*}\right) \cdot \dfrac{k}{12}\right)$ UAH, or $\left(\dfrac{\left(Б_1^{план} - Б_1^{план*}\right) \cdot \dfrac{k}{12}}{Y_1^{план}} \cdot 100\%\right)$ % of the planned GDP.

Thus, the Law of Ukraine of 15.03.2022 No. 2135-IX has increased the planned value of the state debt at the end of 2022, approved in the Law of Ukraine "On the State Budget of Ukraine for 2022" [11], from 2725.3 billion UAH to 2792.9 billion UAH. As a result, the third value of the $s1^a$ indicator (that is, the value of the $s1^a$ indicator calculated based on information on the budget execution the for January-March 2022, that is, for the first three months of 2022), has decreased by 0.31% of the planned GDP, the fourth value of the indicator has decreased by 0.42% of the planned GDP, the fifth one - by 0.52% of the planned GDP, the sixth one - by 0.63% of the planned GDP, the seventh one - by 0.73% of the planned GDP, the eighth one - by 0.84% of the planned GDP, the ninth one - by 0.94% of planned GDP, the tenth one - by 1.05% of planned GDP, the eleventh one - by 1.15% of planned GDP, and the twelfth one - by 1.26% of planned GDP (see column 3 of Table 1). That is, the amendments, made by this Law regarding the state debt at the end of 2022, have reduced the fiscal sustainability risk assessments in 2022 by the corresponding amounts. In Graph 6, such a reduction is reflected by a downward shift of the dashed line that connects the values of the $s1^a$ indicator calculated on the assumption that the planned value of the state debt at the end of 2022 at the level of 2725.3 billion UAH will remain valid until the end of 2022.

Each subsequent amendment to the Law of Ukraine "On the State Budget of Ukraine for 2022" regarding the planned value of the state debt at the end of 2022 (Laws of Ukraine of 21.04.2022 No. 2218-IX, of 31.05.2022 No. 2280-IX, of 09.07.2022 No. 2385-IX, of 15.08.2022 No. 2517-IX, of 30.08.2022 No. 2249-IX) has increased this planned value, which led to a further decrease of

the values of the $s1^a$ indicator by the values indicated in Table 1, and therefore, to a reduction of the level of fiscal sustainability risks in Ukraine in 2022. The amendments, made by the Laws of Ukraine of 21.09.2022 No. 2619-IX and of 18.10.2022 No. 2675-IX, have completely eliminated such risks and created substantial fiscal space until the end of 2022 (see Graph 6).

Table 1

Changes in the $s1^a$ indicator depending on amendments to the Law of Ukraine "On the State Budget of Ukraine for 2022" regarding the planned value of the state debt at the end of 2022

Period of the year	Number of months in the period	Changes in the $s1^a$ indicator caused by the specified laws, *% of planned GDP*						
		by the Law of Ukraine of 15.03.2022 No. 2135-IX	by the Law of Ukraine of 21.04.2022 No. 2218-IX	by the Law of Ukraine of 31.05.2022 No. 2280-IX	by the Law of Ukraine of 09.07.2022 No. 2385-IX	by the Law of Ukraine of 15.08.2022 No. 2517-IX	by the Law of Ukraine of 30.08.2022 No. 2249-IX	by the Laws of Ukraine of 21.09.2022 No. 2619-IX and of 18.10.2022 No. 2675-IX
1	2	3	4	5	6	7	8	9
January–March	3	–0.31	–	–	–	–	–	–
January–April	4	–0.42	–1.24	–	–	–	–	–
January–May	5	–0.52	–1.55	–	–	–	–	–
January–June	6	–0.63	–1.86	–2.68	–	–	–	–
January–July	7	–0.73	–2.17	–3.13	–0.86	–	–	–
January–August	8	–0.84	–2.48	–3.57	–0.99	–3.36	–	–
January–September	9	–0.94	–2.79	–4.02	–1.11	–3.77	–0.21	–
January–October	10	–1.05	–3.10	–4.47	–1.23	–4.19	–0.23	–6.04
January–November	11	–1.15	–3.41	–4.91	–1.36	–4.61	–0.25	–6.64
January–December	12	–1.26	–3.73	–5.36	–1.48	–5.03	–0.27	–7.24

Note: (–) - not observed.
Source: author's calculations.

To summarize the above, it should be noted that the values of the $s1^a$ indicator will be different if the monthly planned values of the components of the $s1^a$ indicator are not calculated as one-twelfth of their annual planned values (see principle 5 of the construction of the $s1^a$ indicator), but are chosen equal to their monthly planned values, established by the monthly schedule of the State Budget of Ukraine. At the same time, the diagnostic capabilities of the $s1^a$ indicator will not change.

It is also worth noting that such component of the $s1^a$ indicator as a *deviation of the change in state debt from the amount of budget financing by debt operations* (Δ) deserves special attention. Its impact on the $s1^a$ indicator can be substantial (see Annex D), especially during periods of sharp jumps in the official hryvnia exchange rate [8, p. 53, 57]. The analogue of this indicator in European statistics – *stock-flow adjustment* (*SFA*) - is studied by the statistical organization of the European Commission on an ongoing basis [12].
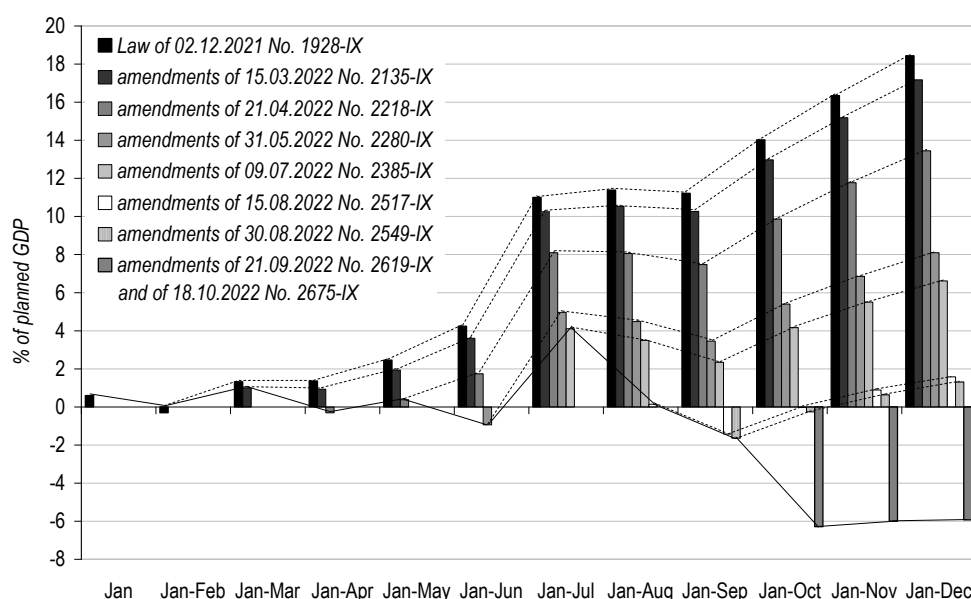
Graph 6. Values of the $s1^a$ indicator depending on the amendments to the Law of Ukraine "On the State Budget of Ukraine for 2022" regarding the planned value of the state debt at the end of 2022, *% of planned GDP*

Note: the *dashed* line connects the values of the $s1^a$ indicator, calculated on the assumption that the planned value of the state debt at the end of 2022, approved in the relevant amendments to the Law of Ukraine "On the State Budget of Ukraine for 2022", is valid from the month at the end of which such amendments entered into force until the end of 2022. The *solid* line connects the values of the $s1^a$ indicator, calculated at those planned values of the state debt at the end of 2022, which were actually valid at the end of the respective month of 2022

Source: author's calculations.

Conclusions

The medium-term fiscal sustainability indicator for one year $s1^a$ can be used to diagnose the current state of Ukraine's State Budget. For this, it should be constructed in such a way as to show how much it is necessary to change the forecast value of the adjusted primary balance of Ukraine's State Budget for the current year in order to reach the planned value of the state debt of Ukraine at the end of the current year. The planned value of the state debt of Ukraine, as well as the planned values of the rest of components of the $s1^a$ indicator (except for the nominal GDP of Ukraine) mean such their values, which are approved in the Law of Ukraine on the State Budget of Ukraine for the current year or calculated based on such approved values. The planned value of the nominal GDP of Ukraine is such its value, which is approved in the Resolution of the Cabinet of Ministers of Ukraine on approval of the forecast of economic and social development of Ukraine and chosen as the basis for calculating the values of the budget indicators approved in the Law of Ukraine on the State Budget of Ukraine for the current year. The forecast value of the adjusted primary balance of Ukraine's State budget for the

current year, as well as the forecast values of the rest of components of the $s1^a$ indicator (except the nominal GDP of Ukraine) mean such their values, which are calculated for the current year taking into account their planned values for the current year and their actual values obtained during the execution of Ukraine's State Budget.

If the planned and forecast values of the components of the $s1^a$ indicator are determined in the proposed way, then there are two alternative ways of calculating the $s1^a$ indicator: by calculating the difference between the actual value of the change in state debt of Ukraine for the period from the beginning of the current year to the current month of the current year and its planned value for this period, and also by calculating the difference, taken with the opposite sign, between the actual value of the adjusted balance of Ukraine's State Budget for the period from the beginning of the current year to the current month of the current year and its planned value for this period.

The $s1^a$ indicator has wide diagnostic capabilities. Firstly, it reflects the current state of the sector of state finance. Secondly, it can be used to pre-assess the current state of the financial sector as a whole on a monthly basis. Thirdly, it allows to assess the impact on it of its components. Fourthly, it allows to assess the impact on it of the amendments to the Law of Ukraine on the State Budget of Ukraine for the current year and to the Resolution of the Cabinet of Ministers of Ukraine on approval of the forecast of economic and social development of Ukraine. The use of the $s1^a$ indicator will strengthen the rationale for decisions on issues of fiscal and debt policy.

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Annex A

THE CALCULATION OF THE $s1^a$ INDICATOR FOR 2022 DURING THE BUDGET EXECUTION

Table A.1

The calculation of the $s1^a$ indicator for 2022 during the budget execution as the difference between the actual and planned values of the change in state debt

Period of the year	Number of months in the period	State debt, *UAH bn*		Change in state debt, *UAH bn*				Fiscal space for the year	
		planned at the end of the year, valid at the end of the period, ($Б_1^{план}$)	actual at the end of the period	planned, valid at the end of the period			actual for the period	UAH bn, ($S1^a$)	% of GDP, ($s1^a$)
				for the year, ($\Delta Б_1^{план}$)	for the month	for the period			
1	2	3	4	5 (=3– $Б_0$)	6 (=5/n)	7 (=2·6)	8 (=4– $Б_0$)	9 (=8–7)	10 (=9/ $Y_1^{план}$ ·k)
January	1	2725.33	2424.69	362.61	30.22	30.22	61.97	31.75	0.59
January February	2	2725.33	2406.59	362.61	30.22	60.43	43.87	–16.56	–0.31
January–March	3	2792.89	2524.23	430.17	35.85	107.54	161.51	53.97	1.01
January–April	4	2992.89	2556.40	630.17	52.51	210.06	193.68	–16.38	–0.31
January–May	5	2992.89	2645.84	630.17	52.51	262.57	283.12	20.55	0.38
January–June	6	3280.58	2771.45	917.86	76.49	458.93	408.73	–50.20	–0.93
January–July	7	3360.02	3164.92	997.30	83.11	581.76	802.20	220.44	4.11
January–August	8	3630.20	3215.27	1267.48	105.62	844.98	852.55	7.57	0.14
January–September	9	3644.90	3236.75	1282.18	106.85	961.63	874.03	–87.60	–1.63
January–October	10	4033.76	3417.42	1671.04	139.25	1392.54	1054.70	–337.83	–6.29
January–November	11	4033.76	3572.30	1671.04	139.25	1531.79	1209.58	–322.21	–6.00
January–December	12	4033.76	3715.12	1671.04	139.25	1671.04	1352.40	–318.64	–5.94

Notes.

1. Row of column numbering: $Б_0$=236272 billion UAH - state debt at the end of 2021[9]; n=12 - number of months in a year; $Y_1^{план}$=536870 billion UAH - planned nominal GDP for 2022[10]; k=100%.

2. Column 3: data are given in accordance with Article 5 of the Law of Ukraine "On the State Budget of Ukraine for 2022" (as amended and supplemented) [11].

3. Column 4: data from the Ministry of Finance of Ukraine[11].

Source: Database of the Verkhovna Rada of Ukraine "Laws of Ukraine", data from the Ministry of Finance of Ukraine and author's calculations.

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Annex B

CONTRIBUTIONS OF COMPONENTS OF THE $s1^a$ INDICATOR TO THE $s1^a$ INDICATOR CALCULATED AS THE DIFFERENCE BETWEEN THE ACTUAL AND PLANNED VALUES OF THE CHANGE OF STATE DEBT

If the $s1^a$ indicator is calculated as the difference between the actual and planned values of the change of state debt (see formula (9)), then the contributions of its components, such as: amount of budget financing by debt operations (*БО*), deviation of the change in state debt from the amount of budget financing by debt operations (Δ), budget receipts from state borrowing (*З*), budget expenses for reimbursement of the state debt (*П*), amount of adjustment of debt operations (*К*) - are determined from formulas (B.1)-(B.2) [8, p. 46-48]. Formulas and calculation methods of such contributions are given in Table B.1.

$$s1^a = \frac{Б_1^{прогноз} - Б_1^{план}}{Y_1^{план}} \cdot 100\% = \underbrace{\frac{БО_1^{прогноз} - БО_1^{план}}{Y_1^{план}} \cdot 100\%}_{\substack{\text{contribution of budget financing} \\ \text{by debt operations}}} +$$

(B.1)

$$+ \underbrace{\frac{\Delta_1^{прогноз} - \Delta_1^{план}}{Y_1^{план}} \cdot 100\%}_{\substack{\text{contribution of the deviation of the change in} \\ \text{state debt from the amount of budget financing} \\ \text{by debt operations}}} ,$$

where

$$\underbrace{\frac{БО_1^{прогноз} - БО_1^{план}}{Y_1^{план}} \cdot 100\%}_{\substack{\text{contribution of budget financing} \\ \text{by debt operations}}} = \underbrace{\frac{З_1^{прогноз} - З_1^{план}}{Y_1^{план}} \cdot 100\%}_{\substack{\text{contribution of budget receipts} \\ \text{from state borrowing}}} +$$

(B.2)

$$+ \underbrace{\frac{-\left(П_1^{прогноз} - П_1^{план}\right)}{Y_1^{план}} \cdot 100\%}_{\substack{\text{contribution of budget expenses} \\ \text{for reimbursement of the state debt}}} + \underbrace{\frac{К_1^{прогноз} - К_1^{план}}{Y_1^{план}} \cdot 100\%}_{\substack{\text{contribution of adjustment} \\ \text{of debt operations}}} ,$$

where $s1^a$ - fiscal gap in the current year, % of GDP; $Б_1^{прогноз}$, $БО_1^{прогноз}$, $\Delta_1^{прогноз}$, $З_1^{прогноз}$, $П_1^{прогноз}$, $К_1^{прогноз}$ - forecast values of the respective components of the $s1^a$ indicator for the current year, UAH; $Б_1^{план}$, $Y_1^{план}$, $БО_1^{план}$, $\Delta_1^{план}$, $З_1^{план}$, $П_1^{план}$, $К_1^{план}$ - planned values of the respective components of the $s1^a$ indicator for the current year, UAH.

Formulas and calculation methods of the contributions of components of the $s1^a$ indicator to the $s1^a$ indicator, calculated as the difference between the actual and planned values of the changes in the state debt

Component	Formula of the component contribution	Calculation method of the component contribution
Budget financing by debt operations, including	$\dfrac{БО_1^{прогноз} - БО_1^{план}}{Y_1^{план}} \cdot 100\%$	The difference between the actual and planned values of the amount of budget financing by debt operations for the period from the beginning of the current year to the current month of the current year, *% of GDP*
budget receipts from state borrowing	$\dfrac{З_1^{прогноз} - З_1^{план}}{Y_1^{план}} \cdot 100\%$	The difference between the actual and planned values of the budget receipts from state borrowing for the period from the beginning of the current year to the current month of the current year, *% of GDP*
budget expenses for reimbursement of the state debt	$\dfrac{-\left(П_1^{прогноз} - П_1^{план}\right)}{Y_1^{план}} \cdot 100\%$	The difference, taken with the opposite sign, between the actual and planned values of the budget expenses for reimbursement of the state debt for the period from the beginning of the current year to the current month of the current year, *% of GDP*
adjustment of debt operations	$\dfrac{К_1^{прогноз} - К_1^{план}}{Y_1^{план}} \cdot 100\%$	The difference between the actual and planned values of the amount of adjustment of debt operations for the period from the beginning of the current year to the current month of the current year, *% of GDP*
Deviation of the change in state debt from the amount of budget financing by debt operations	$\dfrac{\Delta_1^{прогноз} - \Delta_1^{план}}{Y_1^{план}} \cdot 100\%$	The difference between the actual and planned values of the deviation of the change in state debt from the amount of budget financing by debt operations for the period from the beginning of the current year to the current month of the current year, *% of GDP*

Source: constructed by the author.

Formulas (B.1)-(B.2) and Table B.1 show that such components of the $s1^a$ indicator as amount of budget financing by debt operations ($БО$), budget receipts from state borrowing ($З$), amount of adjustment of debt operations ($К$), and deviation of the change in state debt from the amount of budget financing by debt operations (Δ) have *positive* contributions to the $s1^a$ indicator if their *actual* values for the period from the beginning of the current year to the current month of the current year are *greater than* their *planned* values for this period, and have *negative* contributions to the $s1^a$ indicator if their *actual* values for the period from the beginning of the current year to the current month of the current year are *less than* their *planned* values for such period. Such component of the $s1^a$ indicator as budget expenses for reimbursement of the state debt ($П$) has a *positive* contribution to the $s1^a$ indicator if its *actual* value for the period from the beginning of the current year to the current month of the current year is *less than* its *planned* value for this period, and has a *negative* contribution in the $s1^a$ indicator if its *actual* value for the period from the beginning of the current year to the current month of the current year is *greater than* its *planned* value for such period.

Annex C

CONTRIBUTIONS OF THE $s1^a$ INDICATOR TO THE $s1^a$ INDICATOR, CALCULATED AS THE DIFFERENCE, TAKEN WITH THE OPPOSITE SIGN, BETWEEN THE ACTUAL AND PLANNED VALUES OF THE ADJUSTED BALANCE OF BUDGET

If the $s1^a$ indicator is calculated as the difference, taken with the opposite sign, between the actual and planned values of the adjusted balance of budget (CC) (see formula (10)), then the contributions of its components, such as: balance of budget (C), amount of budget financing from state property privatization (Πp), amount of budget financing from active transactions (AO), deviation of the change in state debt from the amount of budget financing by debt operations (Δ), budget revenues ($Д$), budget expenditures (B), balance of lending of budget (CK), amount of loans provided from the budget ($Kн$), and amount of loans refunded to the budget (Kn) - are derived from formulas (C.1)-(C.3) [8, p. 43-46]. Formulas and calculation methods of such contributions are given in Table C.1.

$$s1^a = \frac{-\left(CC_1^{прогноз} - CC_1^{план}\right)}{Y_1^{план}} \cdot 100\% = \underbrace{\frac{-\left(C_1^{прогноз} - C_1^{план}\right)}{Y_1^{план}} \cdot 100\%}_{\text{contribution of balance of budget}} +$$

$$+ \underbrace{\frac{-\left(\Pi p_1^{прогноз} - \Pi p_1^{план}\right)}{Y_1^{план}} \cdot 100\%}_{\substack{\text{contribution of budget financing} \\ \text{from state property privatization}}} + \underbrace{\frac{-\left(AO_1^{прогноз} - AO_1^{план}\right)}{Y_1^{план}} \cdot 100\%}_{\substack{\text{contribution of budget financing} \\ \text{from active transactions}}} + \quad \text{(C.1)}$$

$$+ \quad \underbrace{\frac{\Delta_1^{прогноз} - \Delta_1^{план}}{Y_1^{план}} \cdot 100\%}_{\substack{\text{contribution of the deviation of the change in} \\ \text{state debt from the amount of budget financing} \\ \text{by debt operations}}} \quad ,$$

where

$$\underbrace{\frac{-\left(C_1^{прогноз} - C_1^{план}\right)}{Y_1^{план}} \cdot 100\%}_{\text{contribution of balance of budget}} = \underbrace{\frac{-\left(Д_1^{прогноз} - Д_1^{план}\right)}{Y_1^{план}} \cdot 100\%}_{\text{contribution of budget revenues}} +$$

$$+ \underbrace{\frac{B_1^{прогноз} - B_1^{план}}{Y_1^{план}} \cdot 100\%}_{\substack{\text{contribution of} \\ \text{budget expenditures}}} + \underbrace{\frac{CK_1^{прогноз} - CK_1^{план}}{Y_1^{план}} \cdot 100\%}_{\substack{\text{contribution of} \\ \text{balance of lending of budget}}} ,$$

(C.2)

$$\underbrace{\frac{CK_1^{прогноз} - CK_1^{план}}{Y_1^{план}} \cdot 100\%}_{\substack{\text{contribution of} \\ \text{balance of lending of budget}}} = \underbrace{\frac{K\!H_1^{прогноз} - K\!H_1^{план}}{Y_1^{план}} \cdot 100\%}_{\substack{\text{contribution of loans provided} \\ \text{from the budget}}} +$$

$$+ \underbrace{\frac{-\left(Kn_1^{прогноз} - Kn_1^{план}\right)}{Y_1^{план}} \cdot 100\%}_{\substack{\text{contribution of loans refunded} \\ \text{to the budget}}} .$$

(C.3)

where $s1^a$ - fiscal gap in the current year, % of GDP; $CC_1^{прогноз}$, $C_1^{прогноз}$, $\Pi p_1^{прогноз}$, $AO_1^{прогноз}$, $\Delta_1^{прогноз}$, $Д_1^{прогноз}$, $B_1^{прогноз}$, $CK_1^{прогноз}$, $K\!H_1^{прогноз}$, $Kn_1^{прогноз}$ - forecast values of the respective components of the $s1^a$ indicator for the current year, UAH; $CC_1^{план}$, $Y_1^{план}$, $C_1^{план}$, $\Pi p_1^{план}$, $AO_1^{план}$, $\Delta_1^{план}$, $Д_1^{план}$, $B_1^{план}$, $CK_1^{план}$, $K\!H_1^{план}$, $Kn_1^{план}$ - planned values of the respective components of the $s1^a$ indicator for the current year, UAH.

Table C.1 shows that such components of the $s1^a$ indicator as balance of budget (C), budget revenues ($Д$), amount of loans refunded to the budget (Kn), amount of budget financing from state property privatization (Πp), and amount of budget financing from active transactions (AO) have *positive* contributions to the $s1^a$ indicator if their *actual* values for the period from the beginning of the current year to the current month of the current year are *less than* their *planned* values for this period, and have *negative* contributions to the $s1^a$ indicator if their *actual* values for the period from the beginning of the current year to the current month of the current year are *greater than* their *planned* values for such a period. Such components of the $s1^a$ indicator as budget expenditures (B), balance of lending of budget (CK), amount of loans provided from the budget ($K\!H$), deviation of the change in state debt from the amount of budget financing by debt operations (Δ), have *positive* contributions to the $s1^a$ indicator, if their *actual* values for the period from the beginning of the current year to the current month of the current year are *greater than* their *planned* values for this period, and have *negative* contributions to the $s1^a$ indicator if their *actual* values for the period from the beginning of the current year to the current month of the current year are *less than* their *planned* values for such period.

Table C.1

Formulas and calculation methods of the contributions of components of the $s1^a$ indicator to the $s1^a$ indicator, calculated as the difference, taken with the opposite sign, between the actual and planned values of the adjusted balance of budget
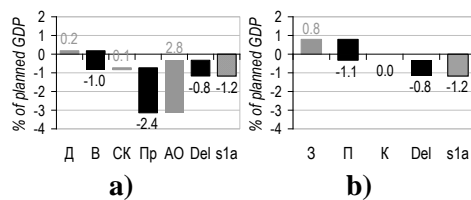
Component	Formula of the component contribution	Calculation method of the component contribution
Balance of budget, including:	$\dfrac{-\left(C_1^{прогноз} - C_1^{план}\right)}{Y_1^{план}} \cdot 100\%$	The difference, taken with the opposite sign, between the actual and planned values of the balance of budget for the period from the beginning of the current year to the current month of the current year, *% of GDP*
budget revenues	$\dfrac{-\left(Д_1^{прогноз} - Д_1^{план}\right)}{Y_1^{план}} \cdot 100\%$	The difference, taken with the opposite sign, between the actual and planned values of the budget revenues for the period from the beginning of the current year to the current month of the current year, *% of GDP*
budget expenditures	$\dfrac{B_1^{прогноз} - B_1^{план}}{Y_1^{план}} \cdot 100\%$	The difference between the actual and planned values of the budget expenditures for the period from the beginning of the current year to the current month of the current year, *% of GDP*
balance of lending of budget, including:	$\dfrac{CK_1^{прогноз} - CK_1^{план}}{Y_1^{план}} \cdot 100\%$	The difference between the actual and planned values of the balance of lending of budget for the period from the beginning of the current year to the current month of the current year, *% of GDP*
loans provided from the budget	$\dfrac{Кн_1^{прогноз} - Кн_1^{план}}{Y_1^{план}} \cdot 100\%$	The difference between the actual and planned values of the amount of loans provided from the budget for the period from the beginning of the current year to the current month of the current year, *% of GDP*
loans refunded to the budget	$\dfrac{-\left(Kn_1^{прогноз} - Kn_1^{план}\right)}{Y_1^{план}} \cdot 100\%$	The difference, taken with the opposite sign, between the actual and planned values of the amount of loans refunded to the budget for the period from the beginning of the current year to the current month of the current year, *% of GDP*
Budget financing from state property privatization	$\dfrac{-\left(Пр_1^{прогноз} - Пр_1^{план}\right)}{Y_1^{план}} \cdot 100\%$	The difference, taken with the opposite sign, between the actual and planned values of the amount of budget financing from state property privatization for the period from the beginning of the current year to the current month of the current year, *% of GDP*
Budget financing from active transactions	$\dfrac{-\left(AO_1^{прогноз} - AO_1^{план}\right)}{Y_1^{план}} \cdot 100\%$	The difference, taken with the opposite sign, between the actual and planned values of the amount of budget financing from active transactions for the period from the beginning of the current year to the current month of the current year, *% of GDP*
Deviation of the change in state debt from the amount of budget financing by debt operations	$\dfrac{\Delta_1^{прогноз} - \Delta_1^{план}}{Y_1^{план}} \cdot 100\%$	The difference between the actual and planned values of the deviation of the change in state debt from the amount of budget financing by debt operations for the period from the beginning of the current year to the current month of the current year, *% of GDP*

Source: constructed by the author.

Annex D

CONTRIBUTIONS OF THE COMPONENTS OF THE $s1^a$ INDICATOR TO THE $s1^a$ INDICATOR, CALCULATED ON THE RESULTS OF THE ANNUAL EXECUTION OF THE BUDGET, IN 2005-2022

Graphs D.1 - D.18 show the contribution values of the components of the $s1^a$ indicator to the value of the $s1^a$ indicator, calculated based on information on the budget execution for the year, in 2005-2022. The contribution values to the $s1^a$ indicator of such components of the $s1^a$ indicator as budget revenues ($Д$), budget expenditures (B), balance of lending of budget (CK), amount of budget financing from state property privatization ($Пр$), amount of budget financing from active transactions (AO), and deviation of the change in state debt from the amount of budget financing by debt operations (Δ) are calculated by formulas (C.1)-(C.3) and Table C.1 of Annex C (see Graphs D.1a – D.18a), and of such components of the $s1^a$ indicator as budget receipts from state borrowing (3), budget expenses for reimbursement of the state debt ($П$), amount of adjustment of debt operations (K), and deviation of the change in state debt from the amount of budget financing by debt operations (Δ) - by formulas (B.1)-(B.2) and Table B.1 of Annex B (see Graphs D.1b - D.18b).
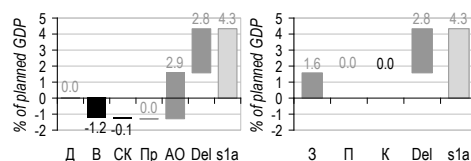

| a) | b) | a) | b) |

Note. The contributions of the components are explained by the *underfulfillment* of the plan regarding *Д*, *B*, *AO*, *Del* and the *overfulfilment* of the plan regarding *CK*, *Пр*.
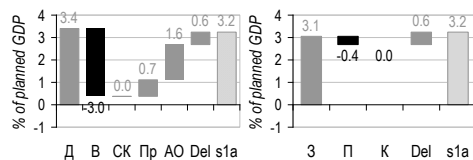
Note. The contributions of the components are explained by the *underfulfillment* of the plan regarding *Del* and the *overfulfilment* of the plan regarding *3*, *П*.

Note. The contributions of the components are explained by the *underfulfillment* of the plan regarding *B*, *CK*, *Пр*, *AO*, *Del* and the *overfulfilment* of the plan regarding *Д*.
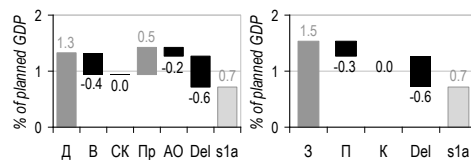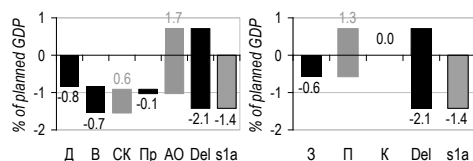
Note. The contributions of the components are explained by the *underfulfillment* of the plan regarding *П*, *Del* and the *overfulfilment* of the plan regarding *3*.

Graph D.1. Contributions in 2005
Source: author's calculations [8, p. 193, 197].
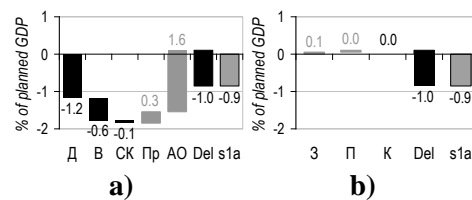
Graph D.2. Contributions in 2006
Source: author's calculations [8, p. 193, 197].

a)

Note. The contributions of the components are explained by the *underfulfillment* of the plan regarding *В*, *СК*, *Пр*, *АО*, *Del* and the *overfulfilment* of the plan regarding *Д*.

b)
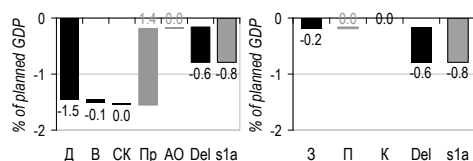
Note. The contributions of the components are explained by the *underfulfillment* of the plan regarding *З*, *П*, *Del*.

Graph D.3. Contributions in 2007

Source: author's calculations [8, p. 193, 197].

a)

Note. The contributions of the components are explained by the *underfulfillment* of the plan regarding *Д*, *В*, *СК*, *Пр*, *АО* and the *overfulfilment* of the plan regarding *Del*.
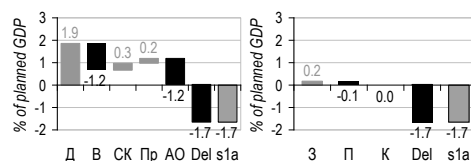
b)

Note. The contributions of the components are explained by the *underfulfillment* of the plan regarding *П* and the *overfulfilment* of the plan regarding *З*, *Del*.

Graph D.4. Contributions in 2008

Source: author's calculations [8, p. 194, 197].

a)

Note. The contributions of the components are explained by the *underfulfillment* of the plan regarding *Д*, *В*, *Пр*, *АО* and the *overfulfilment* of the plan regarding *СК*, *Del*.

b)

Note. The contributions of the components are explained by the *overfulfilment* of the plan regarding *З*, *П*, *Del*.

Graph D.5. Contributions in 2009

Source: author's calculations [8, p. 194, 198].

a)

Note. The contributions of the components are explained by the *underfulfillment* of the plan regarding *Д*, *В*, *СК*, *Пр*, *Del* and the *overfulfilment* of the plan regarding *АО*.
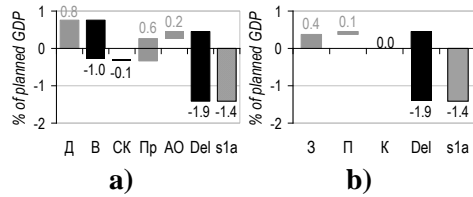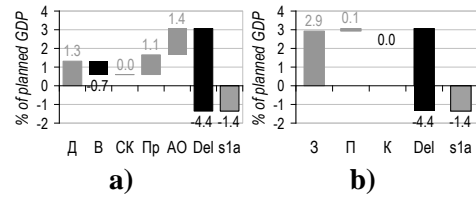
b)

Note. The contributions of the components are explained by the *underfulfillment* of the plan regarding *Del* and the *overfulfilment* of the plan regarding *З*, *П*.

Graph D.6. Contributions in 2010

Source: author's calculations [8, p. 194, 198].

a)

Note. The contributions of the components are explained by the *underfulfillment* of the plan regarding *В*, *АО*, *Del* and the *overfulfilment* of the plan regarding *Д*, *СК*, *Пр*.

b)

Note. The contributions of the components are explained by the *underfulfillment* of the plan regarding *З*, *П*, *Del*.

Graph D.7. Contributions in 2011

Source: author's calculations [8, p. 194, 198].

a)

Note. The contributions of the components are explained by the *underfulfillment* of the plan regarding *Д*, *В*, *Пр*, *Del* and the *overfulfilment* of the plan regarding *СК*, *АО*.

b)

Note. The contributions of the components are explained by the *underfulfillment* of the plan regarding *Del* and the *overfulfilment* of the plan regarding *З*, *П*.
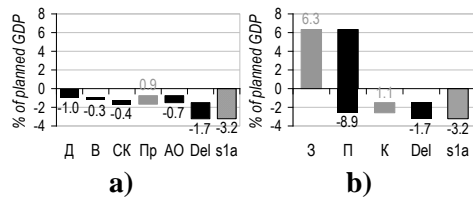
Graph D.8. Contributions in 2012

Source: author's calculations [8, p. 194, 198].

a)

Note. The contributions of the components are explained by the *underfulfillment* of the plan regarding *Д*, *В*, *СК*, *Пр*, *АО*, *Del*.

b)

Note. The contributions of the components are explained by the *underfulfillment* of the plan regarding *П*, *Del* and the *overfulfilment* of the plan regarding *З*.
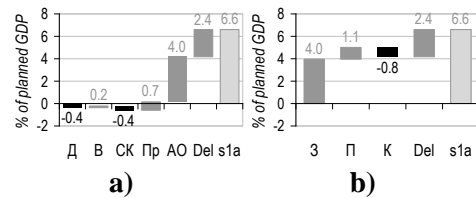
Graph D.9. Contributions in 2013
Source: author's calculations [8, p. 195, 199].

a)

Note. The contributions of the components are explained by the *underfulfillment* of the plan regarding *Д*, *В*, *Пр*, *АО*, *Del* and the *overfulfilment* of the plan regarding *СК*.

b)

Note. The contributions of the components are explained by the *underfulfillment* of the plan regarding *П*, *Del* and the *overfulfilment* of the plan regarding *З*.
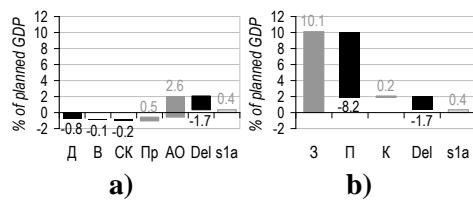
Graph D.10. Contributions in 2014
Source: author's calculations [8, p. 195, 199].

a)

Note. The contributions of the components are explained by the *underfulfillment* of the plan regarding *В*, *СК*, *Пр*, *Del* and the *overfulfilment* of the plan regarding *Д*, *АО*.

b)

Note. The contributions of the components are explained by the *underfulfillment* of the plan regarding *Del* and the *overfulfilment* of the plan regarding *З*, *П*, *К*.
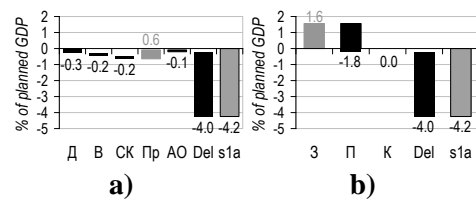
Graph D.11. Contributions in 2015
Source: author's calculations [8, p. 195, 199].

a)

Note. The contributions of the components are explained by the *underfulfillment* of the plan regarding *СК*, *Пр*, *АО* and the *overfulfilment* of the plan regarding *Д*, *В*, *Del*.

b)

Note. The contributions of the components are explained by the *underfulfillment* of the plan regarding *П*, *К* and the *overfulfilment* of the plan regarding *З*, *Del*.

Graph D.12. Contributions in 2016
Source: author's calculations [8, p. 195, 199].

a)

Note. The contributions of the components are explained by the *underfulfillment* of the plan regarding *В*, *СК*, *Пр*, *АО*, *Del* and the *overfulfilment* of the plan regarding *Д*.
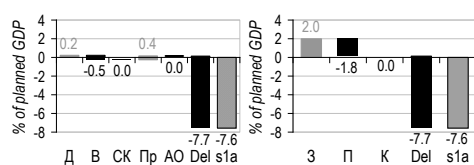
b)

Note. The contributions of the components are explained by the *underfulfillment* of the plan regarding *Del* and the *overfulfilment* of the plan regarding *З*, *П*, *К*.

Graph D.13. Contributions in 2017
Source: author's calculations [8, p. 195, 199].

a)

Note. The contributions of the components are explained by the *underfulfillment* of the plan regarding *В*, *СК*, *Пр*, *Del* and the *overfulfilment* of the plan regarding *Д*, *АО*.
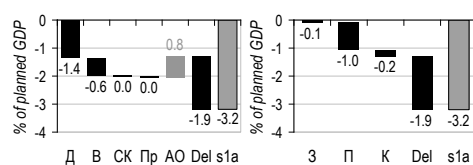
b)

Note. The contributions of the components are explained by the *underfulfillment* of the plan regarding *Del* and the *overfulfilment* of the plan regarding *З*, *П*.

Graph D.14. Contributions in 2018
Source: author's calculations [8, p. 196, 200].

a)

b)

Note. The contributions of the components are explained by the *underfulfillment* of the plan regarding *Д*, *В*, *СК*, *Пр*, *Del* and the *overfulfilment* of the plan regarding *АО*.

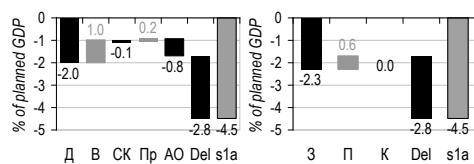*Note*. The contributions of the components are explained by the *underfulfillment* of the plan regarding *Del* and the *overfulfilment* of the plan regarding *З*, *П*.

Graph D.15. Contributions in 2019

Source: author's calculations [8, p. 196, 200].

Note. The contributions of the components are explained by the *underfulfillment* of the plan regarding *В*, *СК*, *АО*, *Del* and the *overfulfilment* of the plan regarding *Д*, *Пр*.

Note. The contributions of the components are explained by the *underfulfillment* of the plan regarding *З*, *К*, *Del* and the *overfulfilment* of the plan regarding *П*.

Graph D.16. Contributions in 2020

Source: author's calculations [8, p. 196, 200].
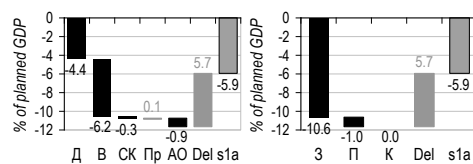
a)

b)

Note. The contributions of the components are explained by the *underfulfillment* of the plan regarding *СК*, *Пр*, *Del* and the *overfulfilment* of the plan regarding *Д*, *В*, *АО*.

Note. The contributions of the components are explained by the *underfulfillment* of the plan regarding *З*, *П*, *Del*.

Graph D.17. Contributions in 2021

Source: author's calculations.

Note. The contributions of the components are explained by the *underfulfillment* of the plan regarding *В*, *СК*, *Пр* and the *overfulfilment* of the plan regarding *Д*, *АО*, *Del*.

Note. The contributions of the components are explained by the *underfulfillment* of the plan regarding *З* and the *overfulfilment* of the plan regarding *П*, *Del*.

Graph D.18. Contributions in 2022

Source: author's calculations.

Діна Твердохлібова[12]

ДІАГНОСТИКА ПОТОЧНОГО СТАНУ ДЕРЖАВНОГО БЮДЖЕТУ УКРАЇНИ

На прикладі України показано, що індикатор бюджетної стійкості $s1^a$ для одного року може використовуватися для діагностики поточного стану державного бюджету. Розглянуто шість засад побудови такого індикатора, які включають: 1) побудову індикатора $s1^a$ для поточного року; 2) розрахунок значення індикатора $s1^a$ для поточного року щомісяця, тобто з тією періодичністю, з якою оприлюднюється інформація про виконання Державного бюджету України за період з початку поточного року до поточного місяця поточного року; 3) обчислення індикатора $s1^a$ на основі планового значення державного боргу України на кінець поточного року, фактичного значення державного боргу України на кінець попереднього року, планового та прогнозних значень на поточний рік решти його показників-складових; 4) припущення, що планові значення показників – складових індикатора $s1^a$ – це ті їх значення, які затверджені в нормативно-правових актах України на поточний рік (а саме: постанові Кабінету Міністрів України про схвалення прогнозу економічного й соціального розвитку України щодо номінального ВВП України та законі України про Державний бюджет України на поточний рік щодо решти показників-складових) або розраховані на основі таких затверджених значень; 5) припущення, що планові значення показників – складових індикатора $s1^a$ на місяць поточного року дорівнюють одній дванадцятій їх планових значень на поточний рік; 6) припущення, що прогнозні значення показників – складових індикатора $s1^a$ на поточний рік дорівнюють сумі їх фактичних значень за період з початку поточного року до поточного місяця поточного року та їх планових значень на поточний місяць та наступні місяці поточного року. Вказано, що при побудові індикатора $s1^a$ на зазначених засадах він може обчислюватися не тільки як бюджетний розрив однорічного бюджетного обмеження, а й двома альтернативними

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способами: шляхом розрахунку різниці між фактичним значенням приросту державного боргу України за період з початку поточного року до поточного місяця поточного року та його плановим значенням на цей період, а також шляхом розрахунку різниці між фактичним значенням скоригованого сальдо Державного бюджету України за період з початку поточного року до поточного місяця поточного року та його плановим значенням на цей період, взятій з протилежним знаком. Розкрито діагностичні можливості індикатора $s1^a$, а саме: здатність відображати поточний стан у секторі державних фінансів, а також у фінансовому секторі загалом, здатність визначати вплив на нього його показників-складових, здатність визначати вплив на нього змін до закону України про Державний бюджет України на поточний рік та постанови Кабінету Міністрів України про схвалення прогнозу економічного й соціального розвитку України. Зазначено, що використання індикатора $s1^a$ посилить обґрунтованість рішень з питань бюджетно-податкової та боргової політики.

Ключові слова: *бюджетний розрив, бюджетна стійкість, індикатор бюджетної стійкості, Державний бюджет України, бюджетно-податкова політика, боргова політика*